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COLLECTIVE INTELLIGENCE

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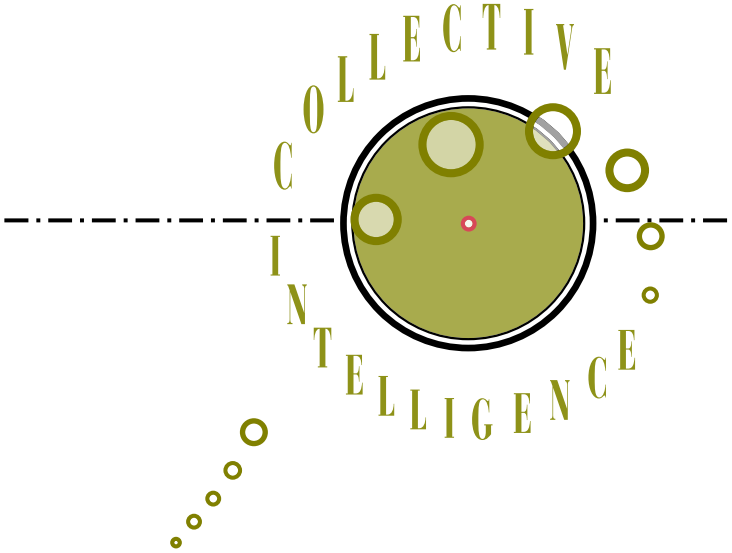
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SYSTEMIC CHANGE

All works of art
reproduced in this issue,
unless otherwise specified,
are from
The Tibetan Book of Proportions,
an eighteenth-century pattern book consisting of 34 ink drawings showing precise iconometric guidelines for depicting the Buddha and Bodhisattva figures. Written in Newari script with Tibetan numerals, the book was apparently produced in Nepal for use in Tibet. The concept of the 'ideal image' of the Buddha emerged during the Golden Age of Gupta rule, from the 4th to 6th century. As well as the proportions, other aspects of the depiction – such as number of teeth, colour of eyes, direction of hairs – became very important.

LORO BLONYO

THE COMPLEMENTARY PRINCIPLES DEPICTED AS A BRIDAL COUPLE,
JOGYAKARTA, XVII CENTURY.

EDITORIAL

Mesoteric intelligence & collective serendipity

Nature loves to hide, HERACLITUS
Amare et sapere vix deo conceditur, ANONIMOUS
[Even God finds it hard to love and be wise at once].

Adagio cantabile ~ Impetuoso e con brio.

the placebo effect ON HUMAN COLLECTIVE FOLLY is indeed insane.

I couldn't wait any longer to anchor my broken feelings to a longing beyond despair. Unity was not achievable in that split human dimension, union is only possible in the timeless realm clear of you and me.

You-Me is no longer a whole when dashed apart by the domain of time. *When* implies a hierarchy of argumentation on the linear progression of time; it determines a chasm, an opening up of a fresh narration. Indeed time is a refined device of the thinking mind to keep records of its own becoming, a mental construct. It is not time to master us, but is we who got to master time. The timespace continuum foreshadows the spiritual-material dimension by emerging right in between the pair complementing each other, as that hyphen (-) uniting and relating their meanings on the cognitive plane. Sacred times are giving way to self-reflections in maya's mirror: a master illusion looking into its own becoming with an avid gaze *(tehôrein)* mirrored further and farther in time and space, and in their absence.

When time fades into space and space into time, and matter and spirit are crossfading, a complementary wind *(rūh-illofi)* shuffles all impossible presents into this one, shifting into its new ontological dimension: the mesoteric realm, *de quo alias,* right in between the complementary.

We are gracing with presence what is not here, eye witnessing the hidden to the one-sighted, for only the inner eye confers a visual connotation to the mesoteric realm, the first of all the invisibles ones. Indeed the hyphen [-] uniting the spiritual-material locution should be turned into a [+] sign to signify the command *('amr, kūn)* to re-absorb both polarities. What really matter are not the distinct identities of the polarities, rather the quality of the hyphenic relation allowing their crossflowing, the real affair is indeed their mutual exchange. Individual entities are certainly important, but even more so are the relations uniting them in that subtle vibrational field of the Self, ahead of the dichotomy of the principle of identity splitting the self from the other. Friendship and love do not vanish when friends and lovers are no longer at sight; we still love them and sense their friendship even once they are departed. The relationships between individuals are actually what really count most: for, at the end of the day individuals will perish, while the quality of their relations will stay. Everything will perish, but its Face[1], the visible presence of each and of all. Here the conceptual matter takes another turn: *lahir* and *batin* are coupling in the very middle of the mesoteric spleen, banqueting at the very centre of the real human dimension, dining at the table of life; while Kronos & Sophia are resting on the sofa, loosely engaged in co-creating *Natura*[2]. Sophia *sophia* or Sophia *perennis*? Sophia *sophia* or Sophia *naturata*?

Again an epistemological break, an ontological shift, and

As I got your message
The Sun shattered all clouds to fire up the flight,
I knew the bond is strong and does not fail,
I much look forward liaising with you.
Yet, who are you?
Why on my way?
Which way is this to keep apart the yearning for reunification?
A muse, a soul, a power?
Or a strength in disguise?

Releasing individual contradictions is the sole means to solve dispute; transforming inner conflicts does impact the contentious human madness of war, is the first step towards a sustainable pace. Collective Intelligence (CI) has certainly an apotropaic function on this collective folly as it is made up of a number of simple 'individuals' entities sharing their content to one another in a certain and definite fashion. CI does not hold 'ideas', it is 'an' idea, an idea composed of ideas. Its action is free, not in that is undetermined, rather because it is self-determined, as yeast catalysing fermentation.

From the mesoteric standpoint, CI is the energetic network uniting individual entities, not confined to their subsistence, allowing the flow of a highly creative energy through them and throughout the whole network. Here too, what really matter are not the individual

entities, which will fade away, but the energetic interrelations binding them together, that *invisible* network emerging from and informing their connectedness by consciously participating in it.

From the subatomic layer to the biosphere tier, collective intelligence is made up of one and the same energy, differing in gradation, yet of the same order, evolving and enhancing its vibrational awareness from a grosser, as in simple organism, to a subtler frequency, as in high and complex entities, increasing at every new stage its dimensional awareness. In the subatomic, vegetal and animal realms, it takes the signature of a rudimentary energetic relational network connecting all units, particles, and individuals, overruling their single behaviour to determine their collective performance, their proceeding and trend as a group and a species. An equivalent plastic *analogy* of this process can be noticed, for instance, in flocking starlings, shoaling of fish, swarming of insects, herd of land animals that propagate their kinetic wave as a single organism. A higher and differentiated gradation of this process is observed in the eusocial behaviour of colonies of honeybees holding an endogen teleological awareness aimed at the well being of the whole community; and, to a higher order, in the transmutation[3] of the human consciousness from the individual to the collective level. [It is certainly hard to discern the individual awareness of a single constituent of a whole from the integral whole. Is the right hand aware of being an element of the human body? Is it aware of the behaviour of the left hand? Both polarities are governed by the holistic intelligence of the whole, part and particle of the biosphere collective brain. Further, is the biosphere aware of being sentient? At the present, Collective intelligence is becoming aware of being a sovra-organism, a network connecting individuals and determining, to a certain degree, the global human behaviour. Within this perspective, globalisation is merely a marginal outcome of human consciousness shifting to its next state – 'next' in the temporal measure of course – transmuting into its glocal, spiritual-material dimension right in between the two polarities, constantly flip-flopping between the two, unable to settle into neither of them within the lifespan duration.

But which is the import of CI on this Buridan'ass? Placed at the same distance from two equally attractive bundles of reality, human nature is called to make the uncaused decision to bent to one side only, unless to act in an unpredictable manner. In its destructive creation, devoid of any ideological bearing and of any cognitive limitation, the will, the *conatus*, the élan, the entelechy ingrained in the nature of its manifested ends, makes the ass to starve to death, or to cast the improbable decision to live. This constant strain between the two conditions while keeping the helm well firm in the middle, is actually what makes the inertial motion of the *meso* state. To be able to manage both sides at once is a characteristic of the crisis of our time, for the human ontological placement is surely in between the two, abreast of its paradoxical standing keeping together the two complementing tendencies in a state of tensed simultaneity, separated and united at once, where the Self is both itself and the other, not in conflict, yet in reciprocity.

Being awake to both the process and the state, aware of being a sentient being devoid of time, immersed in the enduring perception of *dharma*, it prompts a state of grace and despair, of longing and self-contraction, of inhaling and exhaling while giving shape to the universe. Here presence (*shc'himah)*, collective intelligence enlightenment, combined wisdom, reconciliation of complementary within the human experience are shaping up the collective consciousness and the world at once. Without renouncing the world, transcendence and immanence converge in a single act of collective serendipedity, leaving no debris behind, no more *vikarma* to be mended. Maya is lastly ripped of its veil, these actions have *farr (xᵛarənah)*, endowed as they are with majesty and glory[4]. Definitely this is nor the ascetic path, neither the fourth way[5],but rather the fifth stage of human development, wherein individual and collective intelligence become one, and clean actions are performed devoid of self-interest for the common well-being. Mindfulness was once named active contemplation; at this time, actions are the golden letters of the new discourse in which the human networking are as the synapses of a global collaborative, connective and collective intelligence system. At this juncture, *logoi spermatikoi* are seeds words to crack the soul's code: the mesoteric intelligence is fuelling the collective intelligence, catalyzing the whole network. In this new phase of pulling and sharing knowledge nobody holds the copyright on the primal energy, open source access is granted to the entire intelligible spectrum. The time of secrets, of concealments is over; this is the time of revelation, of disclosures, of the unveiling of life and death, the time of notime, of the collective timeless experience of the self and the other at once, the time of yesterday and tomorrow, and the time of today.

The mesoteric time:
Oh! that meso spell!
Endlessly flip-flopping between two states:
Between you and me;
Between being and not being
Before skewing into this unflated dimension.
Beyond the limbus of eternity
You and me are one,

Our élan does not rest at death.
Beware:
if your phone doesn't ring, it's me…
if you don't get any email, it's me…
if your heart doesn't stop, it's me.
I'm the invisible all-pervading present
Chatting within the old god-father,
Live-streaming my voice beyond the ocean,
Surfing the invisible light:
To be.
To be you,
And to be me.

Wordsmithery and literary daring are grounded is ethical values unconcerned of any aesthetical plight. The higher the ethical drive the brighter is beauty – at times, even the clearest of mind wishes to be blurred. Detachment is not to own anything, rather than nothing own us. Time, duration and eternity have always obsessed the human community writing history on a devastated planet at the periphery of this minute galaxy. The thinking mind frames perception, it advocates a conceptual scaffolding on which to stand, even knowing that holding to a scaffold is seldom a great solution. Dissatisfaction and *curiositas* are the first symptom of any innovative process. Eternal is what cannot be explained by duration, yet duration is an extension of time. The blinking perception of the time and timeless dimension does not take apart an event form another, for, in reality, events are really synchronic, they happen at once but are perceived asynchronously within the time constrain because of the dual modality of the thinking mind – a shortcoming very helpful in the historical narration otherwise undoable in the timeless dimension.

This amount to say that to conceive and perceive things *sub species aeternitas* is not possible by the thinking mind, but is the work of the intuitive knowledge/creative imagination of the *mundus imaginalis*[6]. Being partially subject to time, plain imagination does not need any relational link between entities; creative imagination as well does not claim any relation between entities but, in contrast to plain imagination, it correlates and establishes pivotal liaisons on the collective plane catalysed by the collective intelligence co-creating and empowering conscious creative acts. Here, CI seems to partake of a supra conscious state, differing from both the collective unconscious holder of archetypes, and from any other outer dimension of human consciousness, but belonging to that inner condition connecting by its *axis mundi* all intelligences and states through their centres. At this point, *dharma* presides over CI that, at turn, governs all the issuing physical laws of this dramatic squandered dimension.

I hope you are doing fine and that life is really suiting you as an old glove,
Comfortable in your skin.
I lost my teeth in biting reality until its very end, and now?
Where are you?
Life is unfolding as a vintage sole,
So, tell me, where are you?

There is no way ahead but in the burrows of historical time. This does not mean that there is no way-out of the karmic condition, but rather that a way is attainable once the twofold perception is embraced by unity, with the self leading the path, when Krishna and Arjuna are but one and the same as the chariot.

The distinctiveness of our time[s] is the awakening of consciousness at collective level, a clear sign that the collective intelligence is at work training and transmuting humankind to its next ontological plane. A state of undifferentiated unity attained individually since antiquity by all seekers when their consciousness transcended polarity, but nowadays changing its modality of manifestation by taking shape as a collective experiential action, moving from an individual to a collective state of consciousness. In point of facts, the drive attracting humanity beyond duality is seemingly pointing to an even further state of consciousness in which also this ultimate rite of passage to a collective and conscious intelligence is becoming obsolete.

In the last analysis, humans are nothing but spiritual beings embodied in the space-time continuum, temporarily abiding to their developmental stage, headed to briefly shaping the emerging polarities unto their next stage, co-creating and expanding the manifestation. Sophia precedes Knowledge while Yggdrasil is reversed: wisdom and knowledge enthroned in the pinnacle, undercovered as a garment of light. The endless orgasm of unification does not expire, it inspires new life within a life, vivifying and bending the course of time to a track yet to be defined – it's hard to ride the tiger on a razor blade in a divided state, flip-flopping as an old slipper, time and again raising a dusty spell in the eyes, gripping to a grimy vision in search of light. We the people are leaping to another order of things, transmuting onto a further ontological plane, giving new meaning to old worlds, new life to things yet to happen. Attuned to buddhity, but still dealing with old categories of thought that in the course of time have utterly changed their meaning[7], humans are revivifying all subtle channels to enliven the sparkling splendour of their crystal body[8].

Did you catch me by surprise? Yes and No.
I'm happy in hearing that your are growing inside-out

where division is no longer a treat, and not even an hyphen is left.
I'm happy in hearing you had a deep and meaningful romance with your friend and explored new approaches to love and sexuality[9]
and, especially, that you feel free in sharing your feelings with me, with your travelling companion of old.
I'm happy in hearing you are getting along with whom to entangle new adventures.
I'm happy in seeing the invisible art of your coupling gait.
You ask me how I am? I'm fine, thank you. Four eyes can see better than two, but the third is the one that matter most:
1,2, 3 and 4; then 4, 2, 1 and 3, juts we.
I'm collecting the debris of my shattered world to mend them into a novel being, flip-flopping reality like madness, resiliently shaping a new world.
Ciao musa, I still love you…

This fantastic pseudology, this tale that never happened, that might well be an unserviceable witness in courts of law but a very truthful beholder of a culture no longer marginalizing the invisible; this very personal account of a journey throughout an untoward life is by no means perfect, as necessarily rests on the cognitive limitations of the writer and, as such, is marred by unavoidable errors. However, as there is general agreement among scholars that, in the interest of clarity, any operative annotations could be propounded in the light of later scholarship, this account is not to suggest that Collective Intelligence cannot be explained, rather, all claimed here is that there are further and farther possibilities of advancement into the experiential quest, and of its contextual transcription. Whatever the fundamental nature of the Collective Intelligence may be, this is just a an attempt to explain its *modus operandi*, a postulate: acceptable, in that it combines the cause with its consequences; motivating, in that it shows that

I spent my whole life among words and deeds
conveying their subtle vibrational meaning,
yet, still I'm here, spinning as a fool on my toe:
I'm not me, I'm you.
Inspiration flows naturally, but at time does it not,
so it calls to be shaped at its best outcome,
with hard work and discipline, resilience and sparkling joy.
I'm not me, I'm you.

⊙

Included are some visions of friends on the Collective Intelligence theme, analysing and depicting its manifestations and its various angles from differing standpoints – some may appear off-topic, nonetheless here deemed instrumental in lightening the common framework in which the process itself is taking place.

Worth of attention is also the Collective Intelligence Conference, to be held in Santa Clara, CA, USA, on May 31 – June 2, 2015.

As always, enjoy the issue.

⊙

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[1] Under both an anthropological and a psychological import, the Face is the mask, a prototype, as proposed, for instance, by the Commedia dell'Arte.

[2] S. Momo, *De Marginis Sophia*, (Rome-New York: Semar, 1986).

[3] Transmutation is taken, *hic et passim*, as an energetic exchange from one state of (subtle) matter to another of a different order, a leap into another scale. By transformation, instead, is meant an evolutionary passage on the same referential plane.

[4] *Cf.* the Arabic *nūr* (pl. *anwār)* light, as in *Nūr Muhammad*, the refreshing radiance expression of the union of the complementary in the timeless dimension. Time becomes here a sub-function of life, a life suspended between two whiles, or a while into a while.

In the sūfi Ismaili cosmogony (*Cf. The* Metaphysica *of Avicenna (ibn Sinā)*, (London: Routledge *&* Kegan, 1973) the nine steps emanation of the creation, from the simple and undifferentiated to the differentiated and complex, ascribed to *nūr*, are:

1 ~ *Anāhti*, the unmanifest; the name given in *anāthi*; the beginningless beginning of *nūr* (the invisible divine realm, the residing station of God/the Absolute/the Cosmic, the world of pure souls, Lit. soul, light rays of God, God's resplendent light, the first of the nine *anwār;*

2 ~ *Athi*, the manifested, the primal Being, where the essence *(dhāt)* emerges;

3 ~ *Awwal*, the emergence of creation;

4 ~ *Hayāt*, the souls that exists forever, the truth that never dies;

5 ~ *Anna*, the food and nourishment for each life;

6 ~ *Ahamad*, the inner heart;

7 ~ *Muhammad*, the Prophet;

8 ~ *Nūr*, the beauty of the qualities and actions of the powers *(wilāyats)* of God, the radiance of God essence *(dhāt)* that shins within the resplendence Truth. It was the *Nūr Muhammad* that was impressed upon the forehead of Adam (fore-head); also, wisdom, Sophia, as one of the nine aspects of Muhammad God's radiance.

9 ~ *Allah Muhammad*, The light of God within Muhammad, and the light of Muhammad within God.

[5]. *Cf.* P.D. Ouspensky, *The Fourth Way: A Record of Talks and Answers to Questions Based on the Teaching of G. I. Gurdjieff,* (London: Routledge *&* Kegan, 1957).

[6]. *Cf.* H. Corbin, *Creative Imagination in the Sūfism of Ibn 'Arabî,* (Princeton: Princeton UP, 1969; and E. Swedenborg, *The Arcana Coelestia* (New York: Swedenborg Foundation, various dates). While Corbin and Swedenborg maintain the *mundus imaginalis* (*'alam al-mithal,* in Corbin) as an ultimate homogenous realm, we identify a further differentiation in its propulsive pulsating nucleolus, the "middle council" *(diāvn al-mithal)*; a quantum entanglement in the self in which all complementary converge to keep the equilibrium of the whole system, which transmute the individual human experience into the unprecedented breadth of

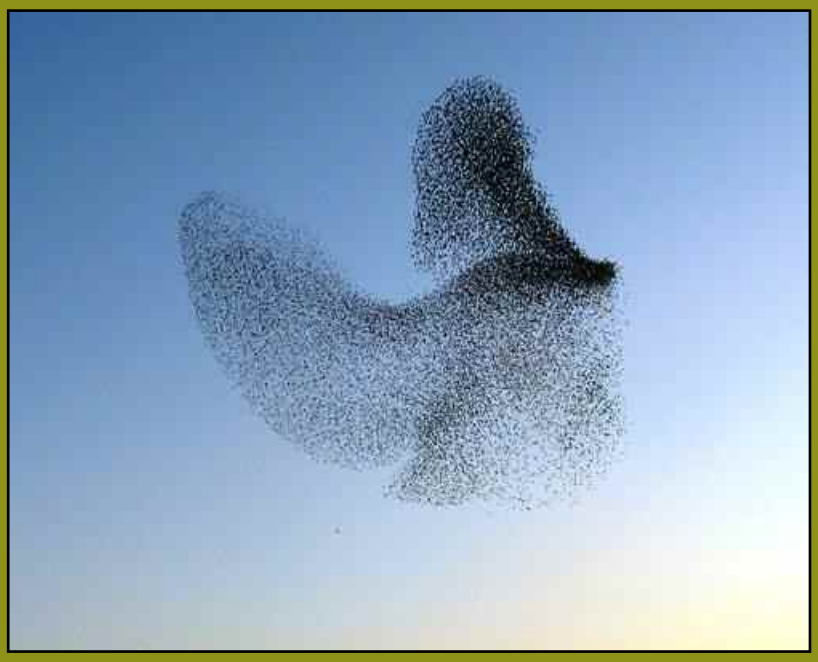
the collective mesoteric dimension governed by quantum laws, in which locality and time are yet abiding but not biding, freed as they are from (by?) any theoretical assumption.

[7] See, for instance, the concepts of State, still anchored to the eighteen-century idea of nation state, or of political party, or Unions, expression of the nineteen-century illusion of the independence of freedom.

[8] On the character and specificity of the crystal body *Cf.* C. N. Norbu, *The Crystal and The Way of Light: Sutra, Tantra and Dzogchen* (Boston, Ma.: Snow Lion Publications, 1999).

[9] In tantric terms, the cosmic pair – the two polarities – merge in *maithuna* to transmute, *supra* 4. This moving inside of the same condition, or to another order, is also reflected in the difference between symbolism – with its symbolized on a higher plane of reference – and analogy and metaphor, in horizontal translation within the same plane of reality. We are transmuting to the higher state of consciousness of a *quantum universum,* to the mesoteric, spiritual-material dimension distinct from the purely physical realm absorbed into itself. On the phenomenical edge of the meaning, the hyphen uniting and allowing the cross-flow of energies between the two realms, is often symbolized as the axis mundi, the obelisk, the tower, the pillar, the column, yang, the lingam of the dyad; while the terms united by the hyphen, its terminals, symbolize the cosmic yoni. On the metaphysical edge, it signifies the union of all chakras by the ascending of kundalini, regarded by many as the 'real' union. In points of fact, neither the phenomenical nor the metaphysical edge can be manifested if not synchronically, sharing the emptiness left by the absence of the other, but distinct from the illusion of Maya – beyond states and stages, ahead of all quadrants, there lays the mesoteric integrity.

An endless *maithuna* protracted beyond time, devoid of the temporal edge where time takes on its rhythmic bits, giving shape and fulfilling its own vibrational dimension. No doubt is here the *conditio* of time and no-time being postulated. As a matter of fact, it is not only the absence of time, or its missing dimension, to identify the quality of an action, its sign and cipher, but also that span in which time is solid-still, at rest at the centre of the whole being, yet perceived by consciousness as flowing. Keeping the pivot at the centre and, as in a sacred ritual, spinning around its own centre: a selfish, egotic, self-inflated time.

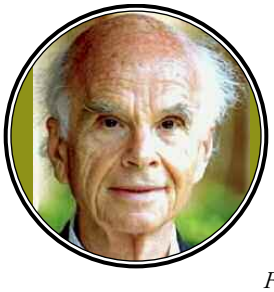


STARLING MURMURATION

ERVIN LASZLO

THE ONE MIND IN THE COSMOS

AND ITS MANIFESTATIONS IN OUR CONSCIOUSNESS[1]



Ervin Laszlo, Doctorat d'Etat Sorbonne (1970) is Director of the Laszlo New Paradigm Leadership Center (Italy), Founder and President of The Club of Budapest, Founder/Co-Director of the Ervin Laszlo institute for Advanced Study (Denmark), Fellow of the World Academy of Arts and Sciences, Member of the Hungarian Academy of Science, the International Academy of Philosophy of Science, Senator of the International Medici Academy, and Editor of the international periodical World Futures: The Journal of New Paradigm Research. *Laszlo is the recipient of the Goi Peace Prize (2002), the International Mandir of Peace Prize (2005), the Conacreis Holistic Culture Prize (2009), the Ethics Prize of Milano (2014) and was nominated for the Nobel Peace Prize in 2004 and 2005. He was awarded Honorary Ph. D's from the United States, Canada, Finland, and Hungary. Laszlo is the author or co-author of fifty-four books translated into twenty-four languages.*

There is important and for most people in today's world surprising evidence coming to light about the nature of consciousness. There are more and more reports of conscious experience beyond the range of the senses, and even beyond the body. They come from many sources. They come from people who arrived at the portals of death and returned, from spiritual masters and shamans and psychic mediums, and from ordinary people who entered a meditative, prayerful, deeply loving or otherwise non-ordinary state of consciousness. It appears that our individual consciousness does not come to an end when the life of our body does. This raises a number of critical issues regarding the true nature of our consciousness.

In the modern world received wisdom is that consciousness is a product of the brain. The evidence surfacing currently contests this assumption. It shows that in many instances consciousness exists without the brain – at least, without a living and functioning brain. The most striking cases of this kind are NDEs: near-death experience. But there are other documented cases where conscious experience is not linked with a living brain. These include communication with "something" that appears to be a living consciousness but is not the consciousness of a living person[2].

An unbiased review of the rapidly accumulating evidence suggests that consciousness is not *produced* by the brain but only *transmitted* by it. This, evidently, is not a new idea. It was revived by William James in his 1899 *Ingersoll Lecture on Immortality*[3].

James spoke of a "veiled" domain of the world from which information is transmitted by the brain. This is the "transmission theory" of consciousness, and it is an alternative to the "production theory." It can account for many of the seemingly esoteric phenomena that the production theory cannot. Because if consciousness is not produced but only transmitted by the brain, it can exist also in the absence of the brain.

THE CLASSICAL THEORY: CONSCIOUSNESS IS GENERATED BY THE BRAIN

In the modern world the prevalent belief is that the stream of sensations that makes up our consciousness is generated by the brain. This is much like a stream of electrons being generated by a turbine. As long as the turbine functions, it generates a stream of electrons: electricity. As long as the brain functions, it generates a stream of sensations: consciousness. When it shuts down, consciousness vanishes. Consciousness no more exists in a dead brain than electric charge exists in a stopped turbine. Therefore, the standard argument goes, it is evident that just as the turbine generates electricity, the brain generates consciousness.

The turbine is an apt metaphor because it refers to a tangible object that produces something intangible. We do not see, hear or taste electricity; we know it only by the effects it produces. This is much the same with consciousness. We experience the stream of sensations, feelings, volitions and intuitions we call consciousness, but we do not observe anything we could call consciousness. The observation of the brain and its workings does not disclose consciousness; all it discloses are networks of neurons embedded in grey matter firing in complex sequences.

We know that functions in the brain and nervous system coordinate the myriad reactions that maintain the organism in the living state. Mainstream science is categorical that brain functions also generate the consciousness experience. The proof of this is the observation that when brain function is impaired, the stream of sensations is distorted, and when the brain stops functioning, the stream vanishes. Thus consciousness must be a product of brain function.

Philosophers have pointed out that this assumption comes up against the so-called "hard problem" in consciousness research. David Chalmers formulated it as the question how "something as immaterial as consciousness" could arise from "something as unconscious as matter[4]." How the brain operates is a comparatively "soft" problem that neurophysiologists can be expected to solve step by step. But the question, how an "immaterial consciousness" can arise out of "unconscious matter" cannot be answered by brain-research, for brain research deals only with "matter," and matter is not conscious. Philosopher Jerry Fodor pointed out that "nobody has the slightest idea how anything material could be conscious. Nobody even knows what it would be like to have the slightest idea about how anything could be conscious[5]."

Scientists seldom speculate on the hard problem of consciousness research, but when queried about the nature of consciousness many of them express perplexity. *Science*, the journal of the American Association for the Advancement of Science, published a special issue in 2005 celebrating its 125th anniversary. It featured 125 questions that scientists have so far failed to solve[6]. The most important unanswered question turned out to be *What is the universe made of?*, followed by *What is the biological basis of consciousness?*

In the public eye the turbine theory is the answer regarding the basis of consciousness. However, the hypothesis that consciousness is generated by the brain is not only an unsolved problem for philosophers and an object of perplexity for scientists: it is also contradicted by observation.

The consciousness-generating brain theory, the same as other theories in science, can be maintained as long as the predictions flowing out of it are corroborated by observations. The critical prediction for the theory is that when the brain stops functioning, consciousness vanishes, just as when a turbine stops, the electric current generated by it disappears.

At first sight this prediction seems confirmed by observation. When cerebral functions cease, consciousness ceases as well. This is not observed in the first person, but it is a reasonable inference from the observation of people who are brain-dead. They do not behave as if they had a working consciousness.

The prediction that consciousness ceases in the absence of cerebral function does not admit of exceptions. We could no more account for the presence of consciousness in a dead brain than we could account for the presence of electric charge in a stationary turbine. If observations to the contrary would surface, they would place in question the dominant concept of consciousness. But observations to the contrary did surface. In some cases consciousness does not cease when the brain stops working. This is a direct counter-indication and conceivably a fatal flaw of the turbine theory.

The first and most obvious kind of evidence for this surprising finding is furnished by the NDE. It turned out that in a significant number of documented cases – experts speak of six million – conscious experience persists during the time the brain is "flatlined." Even one experience of this kind would be a major problem for the turbine theory. A product of brain activity cannot persist in the absence of that activity. There is no known physiological mechanism that could account for conscious experience in a flat brain. Yet the NDE is totally convincing for those who had them: they have no doubt they are real experiences. Subsequent analysis could sometimes confirm the veridical nature of these experiences. It turned out that in many instances the experience of brain-dead people match the experience they would have had if their brain had functioned normally.

The NDE is not the only challenge for the brain-generated consciousness theory. There are other indications that consciousness can exist independently of the brain. Some reports claim that conscious experience persists not only during the temporary cessation of brain activity, but also in its permanent absence: when the subject is fully and irreversibly dead.

Many psychic mediums say that they channel messages from deceased persons. They report receiving information through clairvoyance (seeing apparitions), clairaudience (hearing voices), or clairsentience (physical sensations). The veracity of these perceptions has encountered many objections, among them that the mediums themselves invent them, or that they pick them up from living persons through some form of ESP. There are cases, however, in which these possibilities can be effectively ruled out: the messages conveyed by the mediums contain information that neither the mediums themselves, nor any living person with whom they could have been in touch, is likely to have possessed[7].

Moreover it appears that contact can be had with "something" that acts as if it was a living consciousness. This is a widespread phenomenon. It surfaces not only in the experience of trance mediums but also in the experience of mystics and otherwise quite normal people when they enter an altered state of consciousness. Communication can take place with an entity that has a sense of self, carries memories of its physical existence, and manifests a keen desire to be understood and given credence. If this phenomenon is real, it places in question even more seriously than the NDE that consciousness is generated by the living brain.

THE HOLOFIELD THEORY: INDIVIDUAL CONSCIOUSNESS IS THE PROJECTION OF A COSMIC HOLOGRAM

Consciousness, it appears, is not – certainly not always – generated by the brain but is only transmitted by it. Then the question is, transmitted from where – and how? An answer is now surfacing. It is a hypothetical answer, but the most plausible that is currently available. It is the theory that our individual consciousness is the projection of a cosmic hologram.

From the standpoint of the individual, consciousness is an information field: this write called it the Akashic field. This is a holographically coded field accessible to the brain and nervous system. It is holographic because it contains information in a distributed form – as in a hologram, all the information is present at all points. The field contains the codes projected to the brain and body of an individual and are perceived as the sensations that make up his or her consciousness. All these sensations are "entangled," being particular projections of the same cosmic hologram.

The concept on which this theory is based is widely discussed in contemporary physics. It is the concept of the "holographic universe." The theory is that the 3D things and events we observe in the world are holographic projections of 2D codes. The codes are at the periphery of space and time, and possibly in another universe.

The idea of the holographic universe has been raised by David Bohm in the late 20th century, and empirical support for it surfaced in 2013. Fermilab physicist Craig Hogan proposed that the fluctuations observed by the gravity-wave detector GEO600 may be due to the graininess of space (according to string theory at the supersmall scale space is not smooth but patterned by minuscule ripples: it is "grainy"). It turned out that the inhomogeneities found by GEO600 are not gravity-waves. They could, however, be ripples in the fine-structure of space. This would be the case if they are 3D projections of 2D information coded beyond spacetime. If the grains found by GEO600 are of the indicated size, Hogan's hypothesis gains experimental support. Subsequent measurements confirmed that this is precisely the case[8].

> The hologram theory applies to all events and entities in space and time, including the consciousness that appears in association with the entities. If so, our human consciousness is the *localized* (but nonlocal) projection of the holofield. This accounts for the finding that one can enter into communication with "something" that appears to be the consciousness of an individual regardless of whether that individual is living or not, and where he or she may be located in space. The cosmic hologram conserves all elements of consciousness in space and time and these elements of consciousness can be recalled by brains and nervous systems specifically tuned to them. All consciousness is nonlocal, as all consciousness is a localized projection of the same holofield. When one consciousness communicates with another, one projection of the holofield communicates with another. Being internal communication within the holofield, this communication is not subject to the physical limits of communication in space and time. It can be instantaneous over any finite distance and across any finite period of time.

The theory that the consciousness that appears for us is the projection of a cosmic holofield tells us that Erwin Schrödinger was right. We cannot speak of consciousness in the plural: the overall number of minds in the universe is one. Carl Jung came to a similar conclusion. The psyche is not located within the cranium, he said, it is part of the single generative principle of the cosmos, the *unus mundus*. More recently physician Larry Dossey summed up his decades-long experience of healing body and mind with the affirmation that there is but one mind in the world. All individual minds are part of the One Mind, an infinite field of consciousness[9].

A timeless intuition is now surfacing at the cutting edge of consciousness research and is meeting the cutting edge of physics. Our body may be separate, but our mind is not. We are more mind than body, and our mind we are one. Thus we are one. If we would realize and take it to heart, we could overcome the critical challenges of our time.

[1] This article is based on detailed materials presented *inter alia* in Ervin Laszlo, *Science and the Akashic Field: An Integral Theory of Everything* (Rochester, VT: Inner Traditions, 2004, 2007); *The Self-Actualizing Cosmos: The Akasha Revolution in Science and Human Consciousness,* (Rochester, VT: Inner Traditions, 2014); and *The Immortal Mind: The Continuity of Consciousness Beyond the Brain, with Anthony Peake,* (Rochester, VT: Inner Traditions, 2014).

[2] For a detailed review and assessment of these kinds of experience see *The Immortal Mind,* op. cit.

[3] William James, *Ingersoll Lecture on Immortality* (Boston: Houghton Mifflin, 1899).

[4] David J. Chalmers, "The puzzle of conscious experience", *Scientific American* 273 (December 1995).

[5] Jerry A. Fodor, "The big idea." *New York Times Literary Supplement*, (3 July 1992).

[6] Norman C. Kennedy, 'What we don't know.' *Science* 309 (5731:75((2005).

[7] One of the most striking cases of this kind is the game of chess played by a living chess grandmaster with a deceased chess grandmaster. The moves by the latter have been channeled by the medium (who did not play chess himself), and all the moves have been recorded and analyzed. The analysis confirmed that the game was played at the grandmaster level, and that the style of the channeled player was truly that of the grandmaster he claimed to be. See *The Immortal Mind*, op. cit.

[8] Further support for holographic spacetime theory came in the work of Yoshifumi Hyakutake and colleagues at Ibaraki University in Japan. They computed the internal energy of a black hole, the position of its event horizon, its entropy and several other properties based on the predictions of string theory and the effects of virtual particles. Hyakutake together with Masanori Hanada, Goro Ishiki and Jun Nishimura then calculated the internal energy of the corresponding lower-dimensional cosmos with no gravity. They found that the two calculations match. The internal energy of a black hole and the internal energy of the corresponding lower-dimensional cosmos are the same. Black holes, as well as the cosmos as a whole, are holographic <http://arxiv.org/abs/1311.5607>.

[9] Larry Dossey, *One Mind: How Our Individual Mind is Part of a Greater Consciousness and Why It Matters* (Carslbad, CA: Hay House, 2013).

TOM ATLEE

THE ROLE OF COLLECTIVE INTELLIGENCE

IN THE WISE DEMOCRACY NEEDED FOR HUMANITY'S SURVIVAL

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WHERE DOES COLLECTIVE INTELLIGENCE COME FROM?

Consider the famous principle of biological evolution, "survival of the fittest". A more precise articulation might be "those entities survive that maintain a workable 'fit' with their environment despite its changes and challenges." This is where intelligence comes in.

A dynamic living system or organism needs to remain in tune with its changing environment so that its actions continue to be successful. It does this both by shaping its environment to satisfy its needs and by adapting itself to changing conditions. Both strategies depend on awareness of environmental realities and awareness of the relevance of those realities to the success and survival of the system or organism.

The primary function of intelligence – in fact, its evolutionary advantage – is to sustain this "fit". A living organism – or any system made up of living organisms – carries out ongoing adjustments between its internal and external environments and the palette of responses it has developed to different aspects of those environments. To do this, it may use genetic, cognitive, or mimetic modes. Every organism has a palette of responses governed by their genetic makeup, manifesting in such automatic responses as instincts and urges. Responsiveness can become more complex with the development of cognitive learning systems and cultural mimetic development and knowledge-transfer. But it is clear that an entire species "learns" new responsive patterns over eons through the trial and error of "natural selection" which alters the array of automatic responses it has available and how and when those responses are to be applied.

As intelligence evolved, some intelligent organisms' patterns of responses became more cognitive in the form of internal ideas, understandings, pictures, models, maps, and stories. These structures of consciousness contained increasingly sophisticated guidance for shaping behaviour in ways that satisfied both internal needs and the needs of the situations the organisms found themselves in. Further developments increased organisms' ability to creatively alter their inner ideas and stories – not just to meet current demands, but to imagine future situations and try out various scenarios which – when acted upon and the results noted – taught lessons about handling circumstances never before encountered. Choice increasingly entered the picture, both through moment-to-moment choices and through the ability to create and discard habits of thought, feeling, and action.

With the evolution of communication and culture, certain animals – most notably us humans – became increasingly able to pass on understandings to others around them and then to preserve them not just through individual memory but also through external records and through educationally embedding them in younger and future generations. The advent of science and mathematics further upgraded human societies' capacity to make our collective understandings more congruent with reality. The scientific method continually alters our maps to increasingly fit the territories they purport to describe and so more safely and productively guide our movements through those aspects of life.

Advancing sensor technologies – from microscopes and telescopes to radios and pollution detectors – enhance and extend our human sensory capacities. Evolving computational technologies open doors to calculations, reflections and renderings never before possible – integrating information at ever higher levels of complexity, precision, and abstraction. Developing communications technologies enhance our ability to share ideas, collaborate on collective learning adventures, and spread and access knowledge around the globe, manifesting in the extreme connectivity of the Internet and the Web.

What we see here is evolution of intelligence leaping from natural selection to the individual mind and thence into culture – the collective activities and

structures of society at large. We see all the functional divisions of intelligence reflected in social technologies and institutions. In addition to communications technologies and activities playing a role in society comparable to that played by electrochemical interactivity in the brain, consider these more-than-metaphorical examples:

- We find a society's collective perception showing up as scientific research and technologies, investigative journalism, and opinion polling.
- We find a society's collective reflection and problem-solving showing up as scientific theorizing and conversations, policy discussions, and literature.
- We find a society's collective memory showing up as books, databases, and Wikipedia.
- We find a society's collective decision–making showing up as meetings, legislatures, and market behaviours.
- We find a society's collective corrective feedback dynamics showing up as activism, elections, and (again) market behaviours.

THE BUG IN COLLECTIVE INTELLIGENCE

As noted earlier, since intelligence helps us align with reality, it has the power to tell us how to adapt by changing ourselves and our behaviours to fit the demands of our environment *and* how to control conditions by changing our environment to suit our needs and desires. Understanding this distinction reveals a potential danger with collective intelligence.

Since scientific and technological enterprises are particularly potent forms of collective intelligence, I want to use them to clarify this "bug" by comparing Western conceptions of science with what has been called "indigenous science".

The explicit intention of Western science is to understand universal principles governing direct causal relationships so that people can step into that causal position and control and shape reality – a process often empowered by technology and magnified by mass economic behaviours and lifestyles. Indigenous science, in contrast, seeks to understand what is involved in a healthy, balanced relationship with the life of a place and with the larger universal context and forces governing all of life as manifested in such a place. "Unlike Western science, the data from indigenous science are not used to control the forces of nature; instead, [they] tell us the ways and the means of accommodating nature"[1].

These two divergent uses of collective intelligence – to control or accommodate nature – have obvious implications for sustainability. Efforts to adapt, accommodate, and develop partnerships with nature and its living organisms, systems, and forces tend to generate fewer technologies, economies, and lifestyles that require undue energy inputs and that undermine the workings of the natural systems upon which continued human life depends.

In contrast, efforts to predict and control nature tend to generate dependence on abnormal energy and material inputs to sustain continued dominance and the extension of that dominance into ever-new domains of life. This input-intensive creative process – otherwise known as "progress" – does not usually have "balanced relationship" as its core motivation. Rather, it tends to support narrow (linear, corporate, self-interested, immediate gratification) perspectives that disregard waste, pollution, and side effects in the "efficient" pursuit of narrow objectives like production, consumption, profit, and power. As mathematics and technologies magnify our power to dominate, our impacts on the world grow disproportionately – not just at the human scale but also at vast and microcosmic scales beyond the reach of normal organic perception. Mass behaviours driven by economics, mobility, and communication spread that influence over wider territory, increasing our impact even further.

It is therefore not surprising that this potent and ubiquitous Western science-driven dynamic disrupts natural – and even human – systems, creating problems and crises. But our scientific worldview has an answer: those problems and crises become objects of study and technologically-empowered manipulation which seeks to predict and control the emerging undesirable situations, which then generate their own ripples, waves and tsunamis of "side effects". We see the crescendo of this approach embodied in the perfect storm of converging mega-crises we face in the current century – the mutually intensifying emergence of climate disruption, peak resources (especially fossil fuels but also increasingly water, to say nothing of the rare metals vital to modern technology), financial instability and inequity, ubiquitous mobility (not only of people, but of capital, materials, pollution, organisms, pests, diseases, weapons, and everything else), the capacity of technologically empowered individuals and small groups to create massive destruction on purpose or by accident[2], the vulnerability of global economics and monocultures… the list grows longer day by day, year by year.

Significantly, over the last century parts of Western science have been evolving towards indigenous science, as embodied in fields that study and emphasize interconnectedness and balanced healthy relationships more than linear predict–and–control dynamics. Examples of such fields include ecology, quantum

mechanics, complex adaptive systems sciences, complexity and chaos theories, climate science, and certain trends in biology, genetics, and evolutionary theory. We also see efforts to merge the two approaches in integral fields like permaculture[3] and complementary/integrative medicine[4], as well as in technologies and social sciences concerned with sustainability. These efforts point the way for more balance between control and adaptation, between universality and one's own place, between certainty and mystery, between ourselves and our desires and the demands and health of the larger systems of which we are a part.

So we find collective intelligence is not an intrinsically desirable and benign capacity, any more than individual intelligence is. Some of the most destructive people in the world have been extremely intelligent, and some of the most creative and life–serving people have not made their contributions primarily through intellectual brilliance. As indigenous science suggests, there are some modes of intelligence that are more intrinsically benign than other modes. We face important questions about how much of reality we are able and willing to embrace with our intelligence – whether individual or collective – and for whose benefit, and at what expense, and with what humility and consciousness. And perhaps most importantly at this stage, we face the question of how much of our intelligence – individual and collective – we choose to apply to monitoring the quality and application of our intelligence, itself, so that we can shape *it* and transform *it* as necessary so that our life–estranged brilliance doesn't destroy us.

COLLECTIVE INTELLIGENCE IN THE DESIGN OF SOCIETY

This brings us to the fields of politics and governance, where the rules that shape our individual, collective, and institutional behaviours are made, as well as the decisions about how we spend or invest the most massive resources available in most societies. Unfortunately, we also find collective intelligence inhibited, distorted, or narrowly applied in these realms.

Collective intelligence is, of course, operating in and around politics and governance. The collective intelligence of partisan and special interest lobbyists and advocacy groups operates at a high pitch to influence elections, policy-making, and budgetary decisions. But the collective intelligence of the society as a whole – its capacity to collectively understand the realities it faces, to collectively reflect on what it collectively sees, to collectively influence or adapt to those realities in an appropriate manner, and to collectively observe the results of its collective responses and initiatives – is exceptionally weak. That weakness is largely due to the efforts of those special interests. Their narrow collective intelligence undermines and distorts the whole society's collective intelligence, inhibiting its collective efforts to learn and know and act wisely on its own collective behalf.

We face this challenge in our efforts to enhance collective intelligence. Those of us in the field should, I believe, take seriously the ethical dimensions of our work, just as people in corporate and military sectors need to reflect on the ethical dimensions of their work. Who does our work empower, and for what, and with what results? As our shared mega-crises unfold, these issues about our roles in them press upon our attention. I would suggest that vastly more attention should be paid to understanding, promoting, and catalyzing collectively intelligent and wise democracies than virtually any other application of our knowledge about this subject.

My own contribution involves a shift from seeing citizens primarily as isolated voters to seeing them collectively as a) an engaged source of diverse perspectives which – interacting creatively – can contribute to greater collective understanding, b) as collaborative creative imaginations capable of identifying options that are at once remarkable and wise, and c) as active agents in applying the collective understandings in a) and the co-created initiatives in b) in ways that continually feed into not only our collective survival and thrival but our ongoing collective learning. My contribution also involves an expansion of the idea of representation to include not just elected politicians but bodies of randomly selected citizens who are empowered to shape public policies and budgets in partnership – and in a balance of power – with other branches of government and with a vital democratic culture.

CITIZEN DELIBERATIVE COUNCILS

These two facets of my vision of a collectively wiser democracy combine in "citizen deliberative councils" (CDCs)[5]. In their current forms – Citizens Juries, Consensus Conferences, Planning Cells, Citizens Assemblies, Community Wisdom Councils, etc. – they constitute what I consider the state of the art of citizen intelligence on public issues. Although I see many ways they could and should be improved, all these current forms offer so much more than traditional forms of public engagement and influence – and more than most other government forums – that I want to take the opportunity to highlight them, focusing on the most widely used form, the citizen jury, that has been held hundreds of times around the world.

A citizens jury is somewhat comparable to a trial jury, with some significant differences beyond the fact that it considers a public issue rather than a crime or a lawsuit. Consisting of one to two dozen diverse citizens selected at random – often with a demographic filter to ensure they are in that way representative of their community – a citizens jury is convened for several days, usually about a week. It is usually provided with balanced briefing materials about the issue upon which its members are to deliberate and then given access to experts, stakeholders, and/or advocates and opponents of various approaches who testify to the jury and whom the jury members can question and cross–examine. The citizens jury is provided with professional facilitation to help them speak up, hear each other respectfully and well, and think together effectively about what they're learning and what they wish to recommend. They consider various options and trade–offs and, from their newly informed understandings, craft recommendations to address the issue(s) at hand. Their final report is delivered to their convening authority, the public, the media, and/or other officials concerned – after which they disband.

The other forms of CDC named above vary somewhat from the citizens jury and each other regarding the number and nature of the jurors, the nature of the information they access, the length of their undertaking, the nature of their deliberative and decision-making processes, and the nature of their report-out. But they all involve ordinary randomly selected citizens talking in informed, thoughtful ways about public issues and coming up with considered, coherent opinions that they share with their community. In a limited but almost unprecedented way, they constitute a legitimate collective voice of We the People provided with the resources and context needed to transcend the divisive, ill-informed, and manipulated routines of our existing political cultures. They inject a level of democratic collective intelligence – of public wisdom[6], if you will – into the public discourse, a form of expanded collective intelligence heretofore sorely lacking.

Legitimate questions may be asked about what role such citizen deliberative councils should play in the overall political system and how and how much they should be empowered. Some scholars and visionaries like John Gastil[7] and Ned Crosby[8] have imagined plugging such citizen panels into various parts of democratic process – from reviewing ballot initiatives to evaluating candidates. Some like Ernest Callenbach[9] have proposed an institutionalized citizen legislature – several hundred randomly selected citizens serving for one or more years in a legislative body either replacing the "lower house" (e.g., the House of Representatives or the House of Commons) or, per Ethan Leib[10], being an additional branch of government. Some, like Jim Rough[11], the innovator of Community Wisdom Councils, imagine them happening annually (or more frequently), articulating a sort of people's "state of the community (or country) report", just as is now often done by mayors, presidents, and city managers.

Elsewhere I have raised questions about the strict legitimacy of CDCs, in the sense that public opinion polls are legitimate[12]. If the pollsters do a particular poll on a particular population in a particular way, they know with a particular level of certainty (the "margin of error") how closely a comparable poll on a different but comparable population would come out. So I have wondered if we held three comparable but independent citizens juries on the same topic, how similar the results would be. If they turned out similar, that would be truly revolutionary. If they turned out different, the sources of the differences could be studied and evaluated, and implications could be derived for how we should regard the findings of single citizen juries.

Even better, further experiments – such as mixing and matching the citizen jurors from the three initial groups into three new groups and having them continue their conversations independently using a particular method (I have one – Dynamic Facilitation[13] – particularly in mind when I imagine this) to see if, why, and how *that* creates a higher level of coherence. The point would be that having a demonstrable and unforced level of informed coherence emerge from such citizen deliberative councils would allow us to incorporate the concept of a *coherent* collective intelligence of the society – a true and wise voice of We the People – into our political theories and practices, and to feel confident in empowering that voice to actually shape public policy. If this were to happen, the roles of representatives and bureaucrats might shift, for example, to providing a mix of high-level coordination (such as ensuring that the solution offered for one situation didn't create problems in another area) and legalistic articulation (for example, translating a citizen deliberative council's recommendation into enforceable legislation).

But all that is refining this down to a science. I don't think citizen deliberative councils – even when done one at a time – are intrinsically less legitimate than our existing public officials and representative deliberative bodies. In fact, those established entities have never been subjected to tests of strict legitimacy as I have here proposed for CDCs. They just do what they do and are considered legitimate if they arrive at their positions through due process. Their legitimacy theoretically

derives from their being supposedly answerable through their elections or appointments. However, as the system of elections and appointments has become increasingly corrupted and dysfunctional, that sense of legitimacy has rapidly eroded to the point where 80% of Americans don't approve of their own elected Congress[14]. What does the majoritarian representative system mean, in the face of this?

RANDOM SELECTION

This brings us to the random selection factor. Political scientist Oliver Dowlen[15] notes that random selection – at least in its rigorous forms – creates a "blind break" from all other forms of influence. On the one hand, sortition (as random selection in politics is called) functions free from the guidance of human compassion, intelligence, enlightenment, wisdom, integrity, and concern for the common good. On the other hand, it also provides a break from the depredations of human cruelty, stupidity, ignorance, foolishness, corruption, and narrow self-interest. In short, it is a total break from human intervention and manipulations of all kinds. Most of us think of random selection as a resort to pure chance. The ancient Athenians – who used it extensively in their politics and governance, trusting it to serve the common good far better than elections (which they felt favored elites)[16] – felt random selection represented the will of the gods[17]. Take your pick. Either way, it is a break from human intervention.

Thus if we have a system of politics and governance that is flourishing with high quality information, citizen engagement, high integrity public officials, productive conversations and deliberations about public issues, and a well-functioning government that the citizenry respects and admires and, when necessary, can readily correct or recall for the sake of answerability, then we don't want to mess with that by using random selection. On the other hand, if our politics and government are rife with misinformation, manipulation, citizen apathy, corruption in high places, endless and unproductive verbal battles and battles on the street, and a government that the vast majority of citizens do not trust and hold in contempt, then random selection can be a very potent doorway into greater sanity.

The trick is to use random selection to provide a clean break from our political horrors and dysfunctions and then immediately follow that clean break with a healthy environment of good information, good human relationships, and good deliberation – and then empower what comes out of *that*, so that it has the independent collective intelligence to reorganize the corrupt system and create something far better in its place. That is what citizen deliberative councils can be designed to do.

A TRUE COLLECTIVE WITH HEALTHY INTELLIGENCE

This brings us to three closely related topics:

- the capacity of We the People to become a conscious collective agent of our own destiny, such that we are a true collective entity that can consciously apply and evaluate our collective intelligence;
- the quality of dialogue and deliberation, such that the diversity of participants becomes a resource rather than a problem; and
- the actual wisdom of what emerges from such conversations, such that it actually generates broad benefit over the long haul.

Diversity can be said to be the dominant factor in all of these. Diversity is often problematic but, used well for collective intelligence, it can be precious.

When faced both with significant differences – especially in the form of conflict – and the need for consensus or agreement, our culture's usual approach is to silence or marginalize dissenters and "extreme" perspectives – and any other voice we find hard to confront – and to coax and manipulate what remains into agreements based on compromise. Every "side" is expected to let go of what they say they want and to do some "horse trading" – "I'll give you this if you give me that." Often this involves subtle (and not so subtle) pressures to defer to leaders and/or to conform to groupthink[18] – and, especially in legislatures, making deals that have nothing to do with the issue at hand.

Unfortunately but understandably this has given the very idea of a coherent collective voice a bad name. People's experience has taught them that reductionist "consensus" and "the manufacture of consent" – in both its process and its final products – more often than not oppress their freedoms of speech and action. Suggesting that "We the People" could speak with one voice that shapes public policy raises red flags and visions of a populist dictatorship subduing all who disagree.

I say "unfortunately" because our current know–how related to collective intelligence can replace that fearsome vision with new possibilities that free us from the suppression and manipulation to which we are today subjected in the pseudo-democratic systems currently in place.

Although compromise and conformist–based approaches to crafting agreements have a rough workability in top-down, competitive, interest-driven systems, they waste the unique gifts of each perspective in comprehending the larger picture in which the conflicted parties are

competing and also the creative potential of people from all sides of the situation working together to come up with solutions that actually meet both their legitimate needs and the demands of the situation itself. More often than not, the repressed perspectives represent factors and options that, if actively included, can make the outcomes wiser – by which I mean that those outcomes take into account more of what needs to be taken into account for long-term broad benefit.

Using the diversity factor well involves 1) a conscious effort at inclusion – such as the use of random selection or inviting a full range of stakeholders involved in the situation – and then 2) using conversational processes that radically enhance the capacity of the participants to hear each other and to feel truly heard. A minimalist approach to this is to establish ground rules that direct people to be respectful and then provide facilitation to help that happen. Facilitation can also ensure that quieter voices speak up and more assertive voices don't dominate. At higher levels of conversational quality and facilitation skill, reflective listening is practiced, such that someone (often the facilitator) reflects back to each speaker what they said in a way that makes the speaker feel fully heard and understood – including their emotions and values – not just mimicked. This practice tends to relax and open up the participants so that their communications flow together more smoothly and collaboratively. Various methods add additional beneficial dynamics that move participants towards creative resolutions: Appreciative inquiry[19], for example, asks about what works and what's possible. Nonviolent Communication[20] explores how to fulfil everyone's underlying needs (much as Principled Negotiation explores how to satisfy legitimate interests[21]). Similarly, restorative justice[22] seeks, through dialogue, to replace punishment and retribution with efforts to meet the deep needs of victims, offenders, and community alike. Dynamic Facilitation repeatedly evokes possible solutions from participants and reframes disagreements as concerns to be clarified and recorded. In the presence of such potent solvents, the positions people arrived with tend to dissolve into larger and deeper insights out of which more holistic solutions can emerge or be created together.

These approaches seek to evoke coherence out of diversity. They are complemented by approaches that enable people with diverse passions to coexist in life-affirming ways, especially connecting with each other for dialogue and collaborative action. An Open Space conference (formally called Open Space Technology[23]) enables people passionate about a topic to sort themselves into self–organized workshops and activities in the absence of pre-established schedules and speakers – for a day or for an extremely stimulating and evolving week. The World Café[24] engages people interested in particular questions in small-group conversations among which they periodically mix and share. In the end the whole group harvests highlights. Everyone gets lots of airtime *and* ends up hearing much of what's happened in the larger group dialogue. Future Search[25] conferences mix the two approaches to diversity by bringing together diverse, often adversarial stakeholders who explore their shared past and the dynamics of their shared present – and then explore what they'd all like to see happen. They then break up into action groups to foster the shared vision(s) they developed together. Finally, Polarity Management[26] helps us understand that certain values (like freedom and equality) cannot both be maximized at the same time. They both can, however, be optimized by managing sensitive balancing feedback dynamics that prevent either from suppressing the other.

So the kind of coherence we're looking for is the kind of coherence that is always provided by policies and laws, but in this case is being generated by using diversity creatively rather than suppressing it – and then by encouraging diverse collaborations within that shared vision and guidance, with mindful management of any polarities that are implicit in the issue being addressed. This is a radical departure from the approaches to coherence used by most societies.

But how does this new "We the People" coherent voice arise from and reach a whole city or society containing millions of people?

The key is to make citizen deliberative councils a visible high point in a larger culture of conversations about public issues – especially by featuring them in news media, social networks, and dramatic narratives. I advocate helping ordinary citizens identify with one or more of the CDC participants and then publicizing the flow of their conversation and/or their energy at the conclusion of their council, so that viewers can vicariously experience the shifts that these diverse people went through on the road to discovering what they came up with. A remarkable experiment along these lines was initiated by *Maclean's* magazine in Canada, a project chronicled in detail on my website[27].

Another powerful approach is the recurrent presentation of a clear We the People voice to a population which is invited to participate in that voice. A particularly good medium for this is an ongoing series of Community Wisdom Councils which facilitate ever-broader community practice of what its innovator, Jim Rough, calls "choice–creating conversation"[28]. Community members and leaders can generate possible topics to

stimulate the randomly selected members of the council, who then choose where they want to begin. In their two dynamically facilitated days together, council members explore wherever their concerns and creativity take them and, in the process, generate breakthroughs and vibrant collective energy. The broader community then participates in the council's final "community wisdom cafe" and/or learns about it through media and then joins further conversations stimulated by the council's work and report-out. Having such councils held one or more times each year accustoms community members to using that kind of collaborative conversation to discover shared insights and solutions. This repeated experience enhances the community's collective identity and confidence as We the People who can take care of our own collective affairs quite well, thank you[29].

WISDOM

As we saw earlier, collective intelligence can be applied very narrowly or more broadly. Its inclusiveness and ultimate broad benefit determine how wise it is. Approaches which help people take into account more big–picture reality, more interconnectedness and interdependence, and more of the co-created, co-creative nature of reality[30] will involve fewer overlooked factors and generate fewer unwanted side-effects, as well as better addressing the needs of more people and better aligning with more of life's natural dynamics. Such factors generate wisdom.

Of course the kind of diversity-harnessing conversations noted above contribute tremendously to comprehending the big picture situation and generating solutions that embrace all involved. To that factor we can add the amount and quality of information accessibly provided to ordinary citizens, especially those selected to speak for We the People. The work of Edward Tufte[31] explores how to present data in meaningful visual ways and argument mapping[32] and framing for deliberation[33] cover the presentation of diverse perspectives in ways that make them easy to understand and compare. High quality information notably includes information based on systems thinking and other perspectives that clarify the complex fabric of public issues and human responses to them. Stories of people from all facets of an issue contain much of the dynamics of the issue in easily accessible, often compelling form. Exploring scenarios[34] and trade-offs[35] helps community-wisdom-seekers to avoid oversimplifying what they are dealing with and to find solutions that minimize the potential downsides that haunt nearly every solution. They can also productively tap into the accumulated wisdom contained in the patterns and dynamics of nature and in the processes of evolution: the field of biomimicry[36], for example, looks to natural systems and organisms for solutions nature has evolved to deal with problems now faced by engineers and materials scientists.

> And since we're talking about intelligence – and because we can't actually adjudicate if a solution will have long-term broad benefit until long after it is discovered and applied – iteration plays a tremendously important role in realizing wisdom in practice. We need to do our best to include everything that's relevant (and then some), and to craft approaches that seem to us (without prejudice or denial) to support high quality of life for all involved… and then we need to pay attention to what happens when we actually do it. Intelligence involves reflecting on results, taking in lessons, and revising what we're doing as needed. Therefore, if we wish to be wise, we need to do that even more mindfully.

Other sources of wisdom include engaging all aspects of ourselves, all our varieties of intelligence, including reason, emotion, empathy, intuition, humour, movement, as well as aesthetic and spiritual sensibilities, capacities, and activities[37]. We are also wise to consult global wisdom traditions and broadly shared ethics. Ethical principles common to most major religions and philosophies – such as the Golden Rule – provide time-tested wisdom. (How many nations, for example, practice a Golden Rule foreign policy?) We can augment these with what humanity has learned more recently through science and global dialogue about what serves human needs and happiness. Three good resources for this are the Council for a Parliament of the World's Religions[38], the Universal Declaration of Human Rights[39], and the Earth Charter[40]. Nonviolent Communication and Chilean economist Manfred Max-Neef provide deep insight into universal human needs and how to address them wisely[41].

THE WIDER ECOSYSTEM OF COLLECTIVE INTELLIGENCE

While I have focused here on enhancing community – and society– level collective intelligence through the creative conversational use of diverse perspectives in politics and governance, there are many other varieties of collective intelligence that could be integrated into such a vision. Here I will provide a relatively dense summary of some of the other dimensions of collective intelligence, just to hint at its scope, its variable nature, and the vast resources that could be called upon to enhance its effectiveness. In presenting this

summary, I also want to suggest that it is the tip of a very big iceberg[42].

Power relationships and the design and dynamics of social systems of course play a powerful role, often through impacting the quality and flow of information (as described above), but even by embedding information into society's functioning. Effective transparency laws, nonprofit watchdog organizations, and lenient whistleblower laws facilitate the flow of information and thus the quality of political and government intelligence. The evolving concept of "open source" challenges the proprietary confinement of knowledge, innovation and co-creativity in technology, culture, and economic productivity. Open Source Intelligence[43] challenges overdependence on spying and secrecy and develops public sources of information and cross-fertilization of intelligence not only in government but also in society at large. Structural factors like the presence and design of public spaces – parks, cafés, libraries, meeting rooms – and cultural factors like the kind, ubiquity, and context of entertainment can facilitate or impede conversation.

We can see information, intelligence and wisdom embedded in an economic system where the social and environmental costs of products are "internalized" into their price – through, for example, taxes on carbon or on financial speculation. This causes people to buy less damaging products because they are cheaper, creating an economic system that has wisdom built into it in the form of less long–term harms and more long-term benefits[44]. Likewise, guiding public policy using quality of life indicators more than Gross Domestic Product creates wiser economic monitoring and governance[45].

Certain electronic systems and networks can and do play a supportive or generative role in collective intelligence. People use collaborative workspaces like wikis and systems like CoDigital.com to originate, evaluate, revise and prioritize items of common interest such as policy options, references, or stories. Aggregation systems like prediction markets can provide high quality crowdsourced guesstimates[46]. Stigmergic[47] systems like those used by Amazon, Netflix, and Twitter can track and organize the complex weave of diverse people's interests and needs. Such tools can be used to create participatory evolving knowledge systems useful to wide audiences, including citizen deliberative councils[48].

In general, designs for social and natural systems can be informed by the theories and practices of self-organization – including chaos and complexity theories, living systems theory (including cybernetics, ecology, permaculture, and evolutionary biology), network theory, the "invisible hand" of the market, "swarm intelligence"[49], partnership and participatory dynamics, etc. Good design can efficiently promote vitality and wise responsiveness by providing contexts for already present or nascent natural drivers – urges, needs, values, passions, creativity – and moderating dynamics and feedback loops to sustain and evolve the living system for which the designs are intended. Of course the design activity itself must be iterative and rich in feedback dynamics to observe and correct self-organizing tendencies that are drifting towards collective stupidity and folly. I consider initiatives guided by sophisticated understandings of self-organization to be an evolved form of nonviolent social action[50], since physical or managerial force is replaced by respect, resonance, partnership, and interactive design to serve the well being of all. From an evolutionary perspective, I call this "the conscious evolution of increasingly conscious social systems" and have envisioned a movement to promote it[51]).

Theories of collective psychosocial field effects – reminiscent of magnetic and gravitational fields – have profound implications for social change. In their process worldwork[52] Arnold and Amy Mindell seek to shift collective psychosocial fields governing, for example, racism, invoking diverse voices from such a field to converse and co-evolve through their workshop participants. Biologist Rupert Sheldrake hypothesizes collective "morphic fields" where the development of habits by certain kinds of entities – whether crystals, animals, or people – make it easier for others of that type to learn or develop those habits[53]. My own "story field" theory suggest that narrative fields generated by a society's media, advertisements, literature, professional expectations, educational curricula, and so on, shape what we think is real, right, and possible[54]. The Enlightenment, feminism, and using soap operas to reduce spousal abuse[55] are examples of relatively successful interventions to shift cultural story fields, as is the paradigm shift of which this magazine is a part.

Certain spiritual, psychic, and intuitive practices may connect with transpersonal sources of intelligence, collective consciousness, and levels of reality or sources of wisdom beyond normal awareness, usually realms of deep kinship, synchronicity, wholeness, or oneness. Some religious groups make decisions based on collectively waiting on Spirit for guidance. Quakers developed a form of consensus process to integrate the diverse concerns and insights that "come through" individuals in such a "meeting for worship for business", yielding a "sense of the meeting"[56] (a process I like to call "co-sensing", which can manifest in other processes, as well). In its secular forms, this consensus process spread widely through activist groups

and intentional community networks. Some practices – ranging from Bohmian Dialogue[57] to the evolutionary enlightenment of Andrew Cohen[58] – can generate or access a shared experiential consciousness among practitioners – as can music (sometimes with the help of drugs)[59]. Dream research and dream-sharing cultures suggest that dreaming can access a shared aspect of our consciousness[60]. The Collective Wisdom Initiative[61] explores other meditative approaches in this category.

The Global Consciousness Project notes changes in random number generators around the world in the presence of – or even right before – major collective events like the 9/11 World Trade Center attack[62]. Also the collective consciousness involved in millions of people simply watching the same media imagery – as in the WTC attack – or being told of the same intense event or reality – such as a war, a famine, or melting glaciers – is also a very significant factor in society–wide collective intelligence (or stupidity), even though it involves few if any esoteric dimensions.

Finally, there are a number of other fields where our growing understanding provides insights highly relevant to enhancing collective intelligence. These include subjects like the nature of intelligence itself (from neurology and multiple intelligences[63] to cognitive limitations, biases, and blind spots); the nature of human diversity and human potential (both individual and collective); the nature of wholeness[64] and holistic patterns (from fractals and holographics to holons and the relations between wholes and parts); and the dynamics of evolution[65], transformation, and the responsiveness of people and life.

A particularly important realm for research and development in this regard is the evolved human bias for individuals to respond most readily to challenges that are visible, immediate, and personal. Unfortunately, most of the collective crises we face – from pollution and climate disruption to war and technological folly – involve factors that are largely invisible to most individuals (from imperceptible radiation and toxins to distant social disruptions), slow developing (until a sudden phase shift or "point of no return" is reached), and systemic (particularly when built into the structures of society's functioning)[66]. Fortunately, this individual human bias for visible personal immediacy can be compensated for by collective cultural factors like scientific research and sensors, citizen deliberative councils and compelling media related to them, systemic channelling of self-interest (as in the "internalization of costs" noted above), and broad promotion of systems thinking and holistic awareness (from systemic curricula and educational fiction and film to meditation practices and shamanic training). Although we can see examples of such transpersonal capacities all around us, they clearly fall short of what is needed to meet 21st century challenges, creating a social-evolutionary pressure for further research and development.

CONCLUSION

Given the role of intelligence in monitoring and adjusting our relationship with reality, and given the extent to which our civilization has been built largely on a uniquely dysfunctional relationship to reality that now threatens humanity's continued existence, work to develop systemic collective intelligence takes on a new urgency.

Collective intelligence is a vast and varied field. The application of collective intelligence in groups and organizations is important and well-paid work that has led to very important developments in this field. But now we need to prioritize the study, understanding, practice, and embedding of collective intelligence in our collective social systems, most urgently in our political, governance, and economic systems. This includes the evocation of a self–conscious collectivity – a We the People – capable of generating and moderating its own collective intelligence – a phenomenon for which citizen deliberative councils are a crucial resource.

As we develop society's collective intelligence capacities, we can keep in mind the need to always expand how much of reality is taken into account and how many needs of how many beings and systems are being served over how long a time period so that the guidance provided by our collective intelligence is more likely to be wise.

Given how far and powerfully we have strayed from wisdom in the past centuries, and the criticality of the resulting state of affairs in which we find ourselves, I can imagine few more pressing undertakings.

[1] Worldwide Indigenous Science Network 2013, "What is Indigenous Science?".

[2] Joy 2000, "Why the future doesn't need us". This remarkable, controversial article stresses that within decades individuals and small groups will be empowered by syngergistic developments in robotics, nanotechnology, biotechnology, and computing power to create self-replicating entities capable of destroying humanity and/or its support systems. This dystopian possibility would be easily dismissed except that Bill Joy is co-founder of Sun Microsystems and one of the creators of Java, considered the most important programming language on the Web.

[3] Permaculture is an ecological design science and philosophy used to guide the creation of sustainable living systems and

habitats by working *with* nature. Its design principles are seen as subsidiary to the observed needs and dynamics of the natural realities of the specific site being designed. For more, see <http://bit.ly/1DljMqu> and Mollison 1997, *Introduction to Permaculture*.

[4] Integrative medicine seeks to integrate allopathic medicine and so-called alternative and traditional healing practices into therapeutic regimes that enhance the health of "the whole person", embracing their physiological, psychological, social, and spiritual wellbeing. For more, see <http://bit.ly/1ta1gyR> and Weil 2004, *Health and Healing*.

[5] The characteristics and forms of citizen deliberative councils are described briefly at <http://bit.ly/1oQUz6s> and their uses at <http://bit.ly/44zEUg>. For more detailed information see Atlee 2012, *Empowering Public Wisdom:* 57-88.

[6] See Atlee, *ibid.*: 25-44. Those chapters are online – the *need* for public wisdom at <http://bit.ly/1zdLaJe> and its *nature* at <http://bit.ly/10vpM47>.

[7] Gastil 2000, *By Popular Demand*: 112–96.

[8] Crosby 2003, *Healthy Democracy*. Ned Crosby is the creator of Citizens Juries.

[9] Callenbach and Phillips 1985, *A Citizen Legislature*.

[10] Leib 2004, *Deliberative Democracy in America*.

[11] Rough 2002, *Society's Breakthrough*. Jim Rough is also the creator of Dynamic Facilitation (as described in endnote 13 below) used in Community Wisdom Councils (see endnote 29).

[12] Atlee 2012, *op. cit.*: 234-36.

[13] By listening in ways that make participants feel fully heard, Dynamic Facilitation uses the energy of their passions and beliefs to open their minds and hearts and thus engage them in discovering new ways of looking at a shared situation that makes sense to all of them. I see it as the most powerful broadly applicable method I know of for transforming conflict, differences, and dissonance into new shared understandings and relationships. See <http://bit.ly/1wCoShZ> for an introduction and Zubizarreta 2014, *From Conflict to Creative Collaboration* for an in-depth exploration.

[14] Gallup 2013, "Congress Job Approval Drops to All-Time Low for 2013".

[15] Dowlen 2008, *The Political Potential of Sortition*: 11-30.

[16] "It is accepted as democratic when public offices are allocated by lot; and as oligarchic when they are filled by election." Aristotle, *Politics* 4.1294be.

[17] Dowlen 2008, *op. cit.*: 33-4.

[18] Groupthink – in which the desire for group harmony produces irrational or dysfunctional decisions by avoiding dissent and critical thinking – is actually the opposite of collective intelligence. For mainstream views on groupthink, see <http://bit.ly/1rOjKlw> and Janis 1972, *Victims of Groupthink*. For my related views on "co-stupidity" see <http://bit.ly/1wD8dsC>.

[19] For an overview, see Cooperrider and Whitney n.d., "What is Appreciative Inquiry?" and <http://bit.ly/12VAFNF>. For further reading, see Cooperrider, et al. 2008, *Appreciative Inquiry Handbook*.

[20] For a quick summary see <http://bit.ly/1wG6Ahi>. For more in depth coverage, see Rosenberg 2001, *Nonviolent Communication*.

[21] The essentials of principled negotiation are described well at <http://bit.ly/1sxwtYX>. For the original source material, read Fisher and Ury 1981, *Getting to Yes*.

[22] For an excellent overview of the restorative justice movement, see <http://bit.ly/1pSYTgm>. For more detail by one of its founders, see Zehr 1990, *Changing Lenses*.

[23] In Open Space conferences, participants spend the first 20 minutes or so being taught how to initiate sessions about which they are passionate and then how to participate in ways guided by their interests and energy rather than by any external rules or expectations that interfere with that. For more about the process see <http://bit.ly/1tcx5bW>. For full treatment, refer to Owen 2008, *Open Space Technology*.

[24] For a short description of the process and its underlying principles, see <http://bit.ly/1sxxy2V>. For more detail get the book by its founders: Brown, *et al.* 2006, *The World Café*. In fact, I recommend this book as one of the best group process books. Read my review of it at <http://bit.ly/ZWtsun>. It offers invaluable insights into conversation-based collective intelligence and many examples of powerful questions that create change. For more on this latter topic, see also <http://bit.ly/1rwIwpo>.

[25] For a good overview of the process, see <http://bit.ly/12Y3EQV>. For more thorough treatment by the founders, see Weisbord and Janoff 2010, *Future Search*.

[26] For an excellent overview of this profoundly useful idea, see <http://bit.ly/1v83gpz>. For full context and instructions on its application, see Johnson 1992, *Polarity Management*.

[27] In 1991 *Maclean's* – Canada's national glossy newsweekly – selected 12 citizens who represented Canada's diversity and had them spend a weekend with *Getting to Yes* co-author Roger Fisher and two aides. *Maclean's* published their bios and a detailed story of their rocky but ultimately productive conversation culminating in a remarkable agreement. *Maclean's* 40 pages of coverage – combined with an hour long public affairs TV documentary about the process – allowed the entire country to vicariously experience a totally different form of dialogue and citizenship, triggering months of citizen conversation across Canada. The entire initiative and media coverage are detailed with analysis at <http://bit.ly/ZVfSYC>.

[28] "Choice–creating is a heartfelt, creative mode of thinking where people address important issues with the best interests of all in mind." See <http://bit.ly/1wHWtIO> for more.

[29] I find the Community Wisdom Council process – which has been initiated from both government and grassroots levels and is evolving rapidly – to be one of the most promising innovations for shifting democracy into more citizen-based collective intelligence and wisdom. This year (2014) I have been participating with the Center for Wise Democracy and others in its evolution. For its original vision see Rough 2002, *ibid*. For examples and to track its ongoing development, see <http://bit.ly/CWD2014>.

[30] For my essay on intrinsic participation and co–creation see <http://bit.ly/1zfv6qF>.

[31] See <http://bit.ly/TufteW> for an overview. For in depth and books see <http://bit.ly/TufteSite>. <http://bit.ly/1zet0qQ> has some of his favourite visual examples.

[32] Argument mapping involves visually representing the arguments supporting and opposing a proposition, including arguments supporting and opposing each subsequent assertion. See <http://bit.ly/ArgueMap>.

[33] Framing an issue for deliberation involves providing 3-5 competing approaches for dealing with the issue – ideally embracing most positions in the public discourse around that issue – along with argumentation and evidence for each one. For a detailed description, see Kadlec and Friedman 2008, "Framing for Deliberation".

[34] See <http://bit.ly/132wRtV> and Schwartz 1991, *The Art of the Long View*.

[35] For an example of how trade-offs are handled in a deliberative framing for energy policy, search for "trade-off" in National Issues Forums n.d., "The Energy Problem".

[36] See <http://bit.ly/1nNjRBu> for an overview, or Benyus 2002, *Biomimicry* for more depth.

[37] For my own views on multiple intelligences, see Atlee 2003, "Multi-Modal Intelligence and Multiple Intelligences".

[38] See <http://bit.ly/1tBRdnF>.

[39] See <http://bit.ly/1nNnGGP>.

[40] See <http://bit.ly/1FSShsw>. The Earth Charter was the product of a global grassroots consultative process. Its excellent but Western-oriented effort to be universal stimulated Indigenous Peoples to create an Indigenous Peoples Earth Charter. See <http://bit.ly/1zF13tu>.

[41] For my discussion of these and other needs-based approaches, see <http://bit.ly/CI–needs>.

[42] In 2006 George Pór <http://bit.ly/GPorCI> and I formed the Collective Intelligence Convergence initiative <http://bit.ly/CI-Convrgnc> and worked with Robert Steele <http://bit.ly/RS–EIN> to convene a conference to track and evolve the entire field of collective intelligence. This conference didn't happen, but the effort did generate a book, Tovey 2008, *Collective Intelligence*. Also relevant to the size of the collective intelligence iceberg are works that attempt to embrace all conversational methodologies and/or to articulate the underlying dynamics and design elements that make them work or make them magic. In this latter category we find Holman et al. 2007, *The Change Handbook*; Holman 2010, *Engaging Emergence*; and Group Pattern Language Project 2011, *Group Works.*

[43] See Steele 2012, *The Open-Source Everything Manifesto*.

[44] See <http://bit.ly/1Ds7Ovk>.

[45] For a quick intro, see <http://bit.ly/1vce9Xn>. For a thorough review, see Costanza 2009, "Beyond GDP" <http://bit.ly/1yGStGo>. For a larger vision of wiser economics, see Eisenstein 2011, *Sacred Economics*.

[46] Aggregation here refers to the phenomenon described in James Surowiecki's book *The Wisdom Of Crowds* <http://bit.ly/1vcoAu3> whereby many people operating independently can generate remarkably accurate predictions regarding current realities (how many beans in the bottle, or the location of a sunken submarine) and future events (where terrorists will strike next, or who will win the election). This phenomenon is manifested formally in what are called "prediction markets" <http://bit.ly/1ryb9SQ>. As useful as prediction markets may be, I take issue with using the word "wisdom" to describe them: see <http://bit.ly/1nO91LC>.

[47] Stigmergy is a mechanism of indirect coordination between agents: a trace left in the environment by one agent shapes the behaviors of subsequent agents. See <http://bit.ly/1zeMCuX>. In an ant colony, chemical traces left by one ant stimulate specific actions in other ants passing over the first ant's track. Previous customers buying products from Amazon leave digital traces out of which Amazon's algorithm (not a human analyst) informs you that "people who bought this product also bought these other products".

[48] For example, a Wikipedia-like site could be developed on which diverse experts and partisans could use the dynamics in this paragraph to generate evolving issue framings (see endnote 33) for any and all issues, which could then be consulted by individual voters and citizen councils. For a vision about this, see Atlee 2012, *op. cit.*: 141-7.

[49] Swarm intelligence is the intelligence manifested by self-organized collective systems such as bird flocks or their digital equivalent – "boids" – that interact according to simple rules that generate emergent, environmentally responsive flocking behaviour. See <http://bit.ly/135vNp2>.

[50] Atlee 2003, *The Tao of Democracy*: 250-67.

[51] See <http://bit.ly/1pW5tTp> and <http://bit.ly/1sFtrlx>. This evolutionary movement initiative was derailed by the long terminal illness of my life partner and subsequent changes in the lives of myself and other organizers. The initiative did, however, produce two significant products: the launching of a wiki on evolutionary spirituality <http://bit.ly/1zfxVrD> and the publishing of Atlee 2010, *Reflections on Evolutionary Activism*.

[52] See <http://bit.ly/1sBCaoU>.

[53] For a brief description see <http://bit.ly/1pWipsk>. Efforts to experimentally prove or disprove morphic resonance have produced quite a number of intriguing results: see <http://bit.ly/1vd0hw0> for examples.

[54] See <http://bit.ly/1DYYP6W>.

[55] See, for example, <http://bit.ly/1tCjESu>.

[56] See <http://bit.ly/1vdeFEk>.

[57] See <http://bit.ly/136O1qd>. For two and a half years in the early 1990s I spent 2 hours every Wednesday night in a Bohmian Dialogue group. The exercise put us vividly into present time and, on one occasion, into actual group mind where we all experienced thinking and seeing the same things (a phenomenon that lasted only about 3 minutes but was truly remarkable).

[58] See <http://bit.ly/1yH7l7K>.

[59] See <http://bit.ly/1Dtksdp> exploring the musician-audience communion evoked by the Grateful Dead, the Beatles, and Paul McCartney, among others.

[60] See <http://bit.ly/1vdyMT3>.

[61] See <http://bit.ly/CWInitiative>.

[62] See <http://bit.ly/1nOHqd5>.

[63] Re multiple intelligences, see endnote 37.

[64] I have an ongoing effort to embrace and model the many aspects of wholeness noted by all students of the subject. For the current state of that inquiry, visit <http://bit.ly/CIW-holeness>.

[65] See <http://bit.ly/1tCrZpb>.

[66] See especially Ornstein and Ehrlich 1990, *New World New Mind*. Much of collective intelligence theory and methodology could help address this major challenge – *if we use them for that purpose.*

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PIERRE LÉVY

THE PHILOSOPHICAL CONCEPT OF ALGORITHMIC INTELLIGENCE

Pierre Lévy devoted his professional life to the understanding of the cultural and cognitive implications of the digital technologies, to promote their best social uses and to study the phenomenon of human collective intelligence. He introduced the collective intelligence concept in his 1994 book Collective Intelligence *and has written a dozen of books on this subject that have been translated in more than 12 languages and are studied in many universities all over the world..*

Pierre Lévy currently teaches at the communication department of the University of Ottawa (Canada), where he holds a Canada Research Chair in Collective Intelligence. Lévy is fellow of the Royal Society of Canada and received several awards and academic distinctions.

♦

"Transcending the media, airborne machines will announce the voice of the many. Still indiscernible, cloaked in the mists of the future, bathing another humanity in its murmuring, we have a rendezvous with the over-language." *Collective Intelligence*, 1997: xxviii.

TWENTY YEARS AFTER COLLECTIVE INTELLIGENCE

THIS PAPER WAS WRITTEN IN 2014, TWENTY years after *L'intelligence collective* [the original French edition of *Collective Intelligence*][1]. The main purpose of *Collective Intelligence* was to formulate a vision of a cultural and social evolution that would be capable of making the best use of the new possibilities opened up by digital communication. Long before the success of social networks on the Web[2], I predicted the rise of "engineering the social bond." Eight years before the founding of Wikipedia in 2001, I imagined an online "cosmopedia" structured in hypertext links. When the digital humanities and the social media had not even been named, I was calling for an epistemological and methodological transformation of the human sciences. But above all, at a time when less than one percent of the world's population was connected[3], I was predicting (along with a small minority of thinkers) that the Internet would become the centre of the global public space and the main medium of communication, in particular for the collaborative production and sharing of knowledge and the dissemination of news[4].

In spite of the considerable growth of interactive digital communication over the past twenty years, we are still far from the ideal described in *Collective Intelligence*. It seemed to me already in 1994 that the anthropological changes under way would take root and inaugurate a new phase in the human adventure only if we invented what I then called an "over-language." How can communication readily reach across the multiplicity of dialects and cultures? How can we map the deluge of digital data, order it around our interests and extract knowledge from it? How can we master the waves, currents and depths of the software ocean? *Collective Intelligence* envisaged a symbolic system capable of harnessing the immense calculating power of the new medium and making it work for our benefit. But the over-language I foresaw in 1994 was still in the "indiscernible" period, shrouded in "the mists of the future." Twenty years later, the curtain of mist has been partially pierced: the over-language now has a name, IEML (acronym for Information Economy MetaLanguage), a grammar and a dictionary[5].

REFLEXIVE COLLECTIVE INTELLIGENCE

Collective intelligence drives human development, and human development supports the growth of collective intelligence. By improving collective intelligence we can place ourselves in this feedback loop and orient it in the direction of a self-organizing virtuous cycle. This is the strategic intuition that has guided my research.

But how can we improve collective intelligence? In 1994, the concept of digital collective intelligence was still revolutionary. In 2014, this term is commonly used by consultants, politicians, entrepreneurs, technologists, academics and educators. Crowdsourcing has become a common practice, and knowledge management is now supported by the decentralized use of social media. The interconnection of humanity through the Internet, the development of the knowledge economy, the

rush to higher education and the rise of cloud computing and big data are all indicators of an increase in our cognitive power. But we have yet to cross the threshold of *reflexive* collective intelligence.

Just as dancers can only perfect their movements by reflecting them in a mirror, just as yogis develop awareness of their inner being only through the meditative contemplation of their own mind, collective intelligence will only be able to set out on the path of purposeful learning and thus move on to a new stage in its growth by achieving reflexivity. It will therefore need to acquire a mirror that allows it to observe its own cognitive processes.

Be careful! Collective intelligence does not and will not have autonomous consciousness: when I talk about reflexive collective intelligence, I mean that human individuals will have a clearer and better-shared knowledge than they have today of the collective intelligence in which they participate, a knowledge based on transparent principles and perfectible scientific methods.

THE KEY: A COMPLETE MODELLING OF LANGUAGE

But how can a mirror of collective intelligence be constructed? It is clear that the context of reflection will be the algorithmic medium or, to put it another way, the Internet, the calculating power of cloud computing, ubiquitous communication and distributed interactive mobile interfaces. Since we can only reflect collective intelligence in the algorithmic medium, we must yield to the nature of that medium and have a *calculable* model of our intelligence, a model that will be fed by the flows of digital data from our activities. In short, we need a mathematical (with calculable models) and empirical (based on data) science of collective intelligence. But, once again, is such a science possible?

Since humanity is a species that is highly social, its intelligence is intrinsically social, or collective. If we had a mathematical and empirical science of human intelligence in general, we could no doubt derive a science of collective intelligence from it. This leads us to a major problem that has been investigated in the social sciences, the human sciences, the cognitive sciences and artificial intelligence since the twentieth century: is a mathematized science of human intelligence possible?

It is language or, to put it another way, *symbolic manipulation* that distinguishes human cognition. We use language to categorize sensory data, to organize our memory, to think, to communicate, to carry out social actions, etc. My research has led me to the conclusion that a science of human intelligence is indeed possible, but on the condition that we solve the problem of the mathematical modelling of language. I am speaking here of a complete scientific modelling of language, one that would not be limited to the purely logical and syntactic aspects or to statistical correlations of corpora of texts, but would be capable of expressing *semantic relationships* formed between units of meaning, and doing so in an algebraic, generative mode[6].

Convinced that an algebraic model of semantics was the key to a science of intelligence, I focused my efforts on discovering such a model; the result was the invention of IEML[7]. IEML – an artificial language with calculable semantics – is the intellectual technology that will make it possible to find answers to all the above-mentioned questions. We now have a complete scientific modelling of language, including its semantic aspects. Thus, a science of human intelligence is now possible. It follows, then, that a mathematical and empirical science of collective intelligence is possible. Consequently, a reflexive collective intelligence is in turn possible. This means that the acceleration of human development is within our reach.

THE SCIENTIFIC FILE: THE SEMANTIC SPHERE

I have written two volumes on my project of developing the scientific framework for a reflexive collective intelligence, and I am currently writing the third. This trilogy can be read as the story of a voyage of discovery. The first volume, *The Semantic Sphere 1* (2011)[8], provides the justification for my undertaking. It contains the statement of my aims, a brief intellectual autobiography and, above all, a detailed dialogue with my contemporaries and my predecessors. With a substantial bibliography[9], that volume presents the main themes of my intellectual process, compares my thoughts with those of the philosophical and scientific tradition, engages in conversation with the research community, and finally, describes the technical, epistemological and cultural context that motivated my research. Why write more than four hundred pages to justify a program of scientific research? For one very simple reason: no one in the contemporary scientific community thought that my research program had any chance of success.

What is important in computer science and artificial intelligence is logic, formal syntax, statistics and biological models. Engineers generally view social sciences such as sociology or anthropology as nothing but auxiliary

disciplines limited to cosmetic functions: for example, the analysis of usage or the experience of users.

In the human sciences, the situation is even more difficult. All those who have tried to mathematize language, from Leibniz to Chomsky, to mention only the greatest, have failed, achieving only partial results. Worse yet, the greatest masters, those from whom I have learned so much, from the semiologist Umberto Eco[10] to the anthropologist Levi-Strauss[11], have stated categorically that the mathematization of language and the human sciences is impracticable, impossible, utopian.

The path I wanted to follow was forbidden not only by the habits of engineers and the major authorities in the human sciences but also by the nearly universal view that "meaning depends on context,"[12] unscrupulously confusing mathematization and quantification, denouncing on principle, reflexively, the "ethnocentric bias" of any universalist approach[13] and recalling the "failure" of Esperanto[14]. I have even heard some of the most agnostic speak of the curse of Babel. It is therefore not surprising that I want to make a strong case in defending the scientific nature of my undertaking: all explorers have returned empty-handed from this voyage toward mathematical language, if they returned at all.

THE METALANGUAGE: IEML

But one cannot go on forever announcing one's departure on a voyage: one must set forth, navigate… and return. The second volume of my trilogy, *La grammaire d'IEML*[15], contains the very technical account of my journey from algebra to language. In it, I explain how to construct sentences and texts in IEML, with many examples. But that 150-page book also contains 52 very dense pages of algorithms and mathematics that show in detail how the internal semantic networks of that artificial language can be calculated and translated automatically into natural languages. To connect a mathematical syntax to a semantics in natural languages, I had to, almost single-handed[16], face storms on uncharted seas, to advance across the desert with no certainty that fertile land would be found beyond the horizon, to wander for twenty years in the convoluted labyrinth of meaning. But by gradually joining sign, being and thing in turn in the sense of the virtual and actual, I finally had my Ariadne's thread, and I made a map of the labyrinth, a complicated map of the metalanguage, that "Northwest Passage"[17] where the waters of the exact sciences and the human sciences converged.

I had set my course in a direction no one considered worthy of serious exploration since the crossing was thought impossible. But, against all expectations, my journey reached its goal. The *IEML Grammar* is the scientific proof of this. The mathematization of language is indeed possible, since here is a mathematical metalanguage. What is it exactly?

IEML is an artificial language with calculable semantics that puts no limits on the possibilities for the expression of new meanings. Given a text in IEML, algorithms reconstitute the internal grammatical and semantic network of the text, translate that network into natural languages and calculate the semantic relationships between that text and the other texts in IEML. The metalanguage generates a huge group of symmetric transformations between semantic networks, which can be measured and navigated at will using algorithms. The *IEML Grammar* demonstrates the calculability of the semantic networks and presents the algorithmic workings of the metalanguage in detail.

Used as a system of semantic metadata, IEML opens the way to new methods for analyzing large masses of data. It will be able to support new forms of translinguistic hypertextual communication in social media, and will make it possible for conversation networks to observe and perfect their own collective intelligence. For researchers in the human sciences, IEML will structure an open, universal encyclopedic library of multimedia data that reorganizes itself automatically around subjects and the interests of its users.

A NEW FRONTIER: ALGORITHMIC INTELLIGENCE

Having mapped the path I discovered in *La grammaire d'IEML*, I will now relate what I saw at the end of my journey, on the other side of the supposedly impassable territory: the new horizons of the mind that algorithmic intelligence illuminates. Because IEML is obviously not an end in itself. It is only the necessary means for the coming great digital civilization to enable the sun of human knowledge to shine more brightly. I am talking here about a *future* (but not so distant) state of intelligence, a state in which capacities for reflection, creation, communication, collaboration, learning, and analysis and synthesis of data will be infinitely more powerful and better distributed than they are today. With the concept of *Algorithmic Intelligence*, I have completed the risky work of prediction and cultural creation I undertook with *Collective Intelligence* twenty years ago.

The contemporary algorithmic medium is already characterized by digitization of data, automated data processing in huge industrial computing centres, interactive mobile interfaces broadly distributed among the population and ubiquitous communication. We can

make this the medium of a new type of knowledge – a new episteme[18] – by adding a system of semantic metadata based on IEML. The purpose of this paper is precisely to lay the philosophical and historical groundwork for this new type of knowledge.

PHILOSOPHICAL GENEALOGY OF ALGORITHMIC INTELLIGENCE

THE THREE AGES OF REFLEXIVE KNOWLEDGE

Since my project here involves a reflexive collective intelligence, I would like to place the theme of *reflexive knowledge* in its historical and philosophical context. As a first approximation, reflexive knowledge may be defined as knowledge knowing itself. "All men by nature desire to know," wrote Aristotle, and this knowledge implies knowledge of the self[19].

Human beings have no doubt been speculating about the forms and sources of their own knowledge since the dawn of consciousness. But the reflexivity of knowledge took a decisive step around the middle of the first millennium BCE[20] during the period when the Buddha, Confucius, the Hebrew prophets, Socrates and Zoroaster (in alphabetical order) lived. These teachers involved the entire human race in their investigations: they reflected consciousness from a *universal* perspective. This first great type of systematic research on knowledge, whether philosophical or religious, almost always involved a divine ideal, or at least a certain "relation to Heaven." Thus we may speak of a *theosophical* age of reflexive knowledge. I will examine the Aristotelian lineage of this theosophical consciousness, which culminated in the concept of the *agent intellect*.

Starting in the sixteenth century in Europe – and spreading throughout the world with the rise of modernity – there was a second age of reflection on knowledge, which maintained the universal perspective of the previous period but abandoned the reference to Heaven and confined itself to human knowledge, with its recognized limits but also its rational ideal of perfectibility. This was the second age, the *scientific* age, of reflexive knowledge. Here, the investigation follows two intertwined paths: one path focusing on what makes knowledge possible, the other on what limits it. In both cases, knowledge must define its *transcendental subject*, that is, it must discover its own determinations.

There are many signs in 2014 indicating that in the twenty-first century – around the point where half of humanity is connected to the Internet – we will experience a third stage of reflexive knowledge. This "version 3.0" will maintain the two previous versions' ideals of universality and scientific perfectibility but will be based on the intensive use of technology to augment and reflect systematically our collective intelligence, and therefore our capacities for personal and social learning. This is the coming *technological* age of reflexive knowledge with its ideal of an *algorithmic intelligence*.

The brief history of these three modalities – theosophical, scientific and technological – of reflexive knowledge can be read as a philosophical genealogy of algorithmic intelligence.

THE THEOSOPHICAL AGE AND ITS AGENT INTELLECT

A few generations earlier, Socrates might have been a priest in the circle around the Pythia; he had taken the famous maxim "Know thyself" from the Temple of Apollo at Delphi. But in the fifth century BCE in Athens, Socrates extended the Delphic injunction in an unexpected way, introducing dialectical inquiry. He asked his contemporaries: What do you think? Are you consistent? Can you justify what you are saying about courage, justice or love? Could you repeat it seriously in front of a little group of intelligent or curious citizens? He thus opened the door to a new way of knowing one's own knowledge, a rational expansion of consciousness of self.

His main disciple, Plato, followed this path of rigorous questioning of the unthinking categorization of reality, and finally discovered the world of Ideas. Ideas for Plato are intellectual forms that, unlike the phenomena they categorize, do not belong to the world of Becoming. These intelligible forms are the original essences, archetypes beyond reality, which project into phenomenal time and space all those things that seem to us to be truly real because they are tangible, but that are actually only pale copies of the Ideas. We would say today that our experience is mainly determined by our way of categorizing it. Plato taught that humanity can only know itself as an intelligent species by going back to the world of Ideas and coming into contact with what explains and motivates its own knowledge.

Aristotle, who was Plato's student and Alexander the Great's tutor, created a grand encyclopaedic synthesis that would be used as a model for eighteen centuries in a multitude of cultures. In it, he integrates Plato's discovery of Ideas with the sum of knowledge of his time. He places at the top of his hierarchical cosmos divine thought knowing itself. And in his *Metaphysics*[21], he defines the divinity as "thought thinking itself." This supreme self-reflexive thought was for him the "prime mover" that inspires the eternal movement of the cosmos. In *De Anima*[22], his book

on psychology and the theory of knowledge, he states that, under the effect of an agent intellect separate from the body, the passive intellect of the individual receives intelligible forms, a little like the way the senses receive sensory forms. In thinking these intelligible forms, the passive intellect becomes one with its objects and, in so doing, knows itself.

Starting from the enigmatic propositions of Aristotle's theology and psychology, a whole lineage of Peripatetic and Neo-Platonic philosophers – first "pagans," then Muslims, Jews and Christians – developed the discipline of noetics, which speculates on the divine intelligence, its relation to human intelligence and the type of reflexivity characteristic of intelligence in general[23]. According to the masters of noetics, knowledge can be conceptually divided into three aspects that, in reality, are indissociable and complementary:

- the *intellect*, or the knowing subject;
- the *intelligence*, or the operation of the subject;
- the *intelligible*, or what is known – or can be known – by the subject by virtue of its operation.

From a theosophical perspective, everything that happens takes place in the unity of a self-reflexive divine thought, or (in the Indian tradition) in the consciousness of an omniscient Brahman or Buddha, open to infinity. In the Aristotelian tradition, Avicenna, Maimonides and Albert the Great considered that the identity of the intellect, the intelligence and the intelligible was achieved eternally in God, in the perfect reflexivity of thought thinking itself.

In contrast, it was clear to our medieval theosophists that in the case of human beings, the three aspects of knowledge were neither complete nor identical. Indeed, since the passive intellect knows itself only through the intermediary of its objects, and these objects are constantly disappearing and being replaced by others, the reflexive knowledge of a finite human being can only be partial and transitory. Ultimately, human knowledge could know itself only if it simultaneously knew, completely and enduringly, all its objects. But that, obviously, is reserved only for the divinity.

I should add that the "one beyond the one" of the neo-Platonist Plotinus and the transcendent deity of the Abrahamic traditions are beyond the reach of the human mind. That is why our theosophists imagined a series of mediations between transcendence and finitude. In the middle of that series, a *metaphysical interface* provides communication between the unimaginable and inaccessible deity and mortal humanity dispersed in time and space, whose living members can never know – or know themselves – other than partially. At this interface, we find the *agent intellect*, which is separate from matter in Aristotle's psychology. The agent intellect is not limited – in the realm of time – to sending the intelligible categories that inform the human passive intellect; it also determines – in the realm of eternity – the maximum limit of what the human race can receive of the universal and perfectly reflexive knowledge of the divine. That is why, according to the medieval theosophists, the best a mortal intelligence can do to approach complete reflexive knowledge is to contemplate the operation in itself of the agent intellect that emanates from above and go back to the source through it.

In accordance with this regulating ideal of reflexive knowledge, living humanity is structured hierarchically, because human beings are more or less turned toward the illumination of the agent intellect. At the top, prophets and theosophists receive a bright light from the agent intellect, while at the bottom, human beings turned toward coarse material appetites receive almost nothing. The influx of intellectual forms is gradually obscured as we go down the scale of degree of openness to the world above.

THE SCIENTIFIC AGE AND ITS TRANSCENDENTAL SUBJECT

With the European Renaissance, the use of the printing press, the construction of new observation instruments, and the development of mathematics and experimental science heralded a new era. Reflection on knowledge took a critical turn with Descartes' introduction of radical doubt and the scientific method, in accordance with the needs of educated Europe in the seventeenth century. God was still present in the Cartesian system, but He was only there, ultimately, to guarantee the validity of the efforts of human scientific thought: "God is not a deceiver[24]." The fact remains that Cartesian philosophy rests on the self-reflexive edge, which has now moved from the divinity to the mortal human: "I think, therefore I am[25]."

In the second half of the seventeenth century, Spinoza and Leibniz received the critical scientific rationalism developed by Descartes, but they were dissatisfied with his dualism of thought (mind) and extension (matter). They therefore attempted, each in his own way, to constitute reflexive knowledge within the framework of coherent monism.

For Spinoza, nature (identified with God) is a unique and infinite substance of which thought and extension are two necessary attributes among an infinity of attributes. This strict ontological monism is counterbalanced by a pluralism of expression, because the unique substance possesses an infinity of attributes,

and each attribute, an infinity of modes. The summit of human freedom according to Spinoza is the intellectual love of God, that is, the most direct and intuitive possible knowledge of the necessity that moves the nature to which we belong.

For Leibniz, the world is made up of monads, metaphysical entities that are closed but are capable of an inner perception in which the whole is reflected from their singular perspective. The consistency of this radical pluralism is ensured by the unique, infinite divine intelligence that has considered all possible worlds in order to create the best one, which corresponds to the most complex – or the richest – of the reciprocal reflections of the monads. As for human knowledge – which is necessarily finite – its perfection coincides with the clearest possible reflection of a totality that includes it but whose unity is thought only by the divine intelligence.

After Leibniz and Spinoza, the eighteenth century saw the growth of scientific research, critical thought and the educational practices of the Enlightenment, in particular in France and the British Isles. The philosophy of the Enlightenment culminated with Kant, for whom the development of knowledge was now contained within the limits of human reason, without reference to the divinity, even to envelop or guarantee its reasoning. But the ideal of reflexivity and universality remained. The issue now was to acquire a "scientific" knowledge of human intelligence, which could not be done without the representation of knowledge to itself, without a model that would describe intelligence in terms of what is universal about it. This is the purpose of Kantian transcendental philosophy. Here, human intelligence, armed with its reason alone, now faces only the phenomenal world. Human intelligence and the phenomenal world presuppose each other. Intelligence is programmed to know sensory phenomena that are necessarily immersed in space and time. As for phenomena, their main dimensions (space, time, causality, etc.) correspond to ways of perceiving and understanding that are specific to human intelligence. These are forms of the transcendental subject and not intrinsic characteristics of reality. Since we are confined within our cognitive possibilities, it is impossible to know what things are "in themselves." For Kant, the summit of reflexive human knowledge is in a critical awareness of the extension and the limits of our possibility of knowing.

Descartes, Spinoza, Leibniz, the English and French Enlightenment, and Kant accomplished a great deal in two centuries, and paved the way for the modern philosophy of the nineteenth and twentieth centuries. A new form of reflexive knowledge grew, spread, and fragmented into the human sciences, which mushroomed with the end of the monopoly of theosophy. As this dispersion occurred, great philosophers attempted to grasp reflexive knowledge in its unity.

The reflexive knowledge of the scientific era neither suppressed nor abolished reflexive knowledge of the theosophical type, but it opened up a new domain of legitimacy of knowledge, freed of the ideal of divine knowledge. This *de jure* separation did not prevent *de facto* unions, since there was no lack of religious scholars or scholarly believers. Modern scientists could be believers or non-believers. Their position in relation to the divinity was only a matter of motivation. Believers loved science because it revealed the glory of the divinity, and non-believers loved it because it explained the world without God. But neither of them used as arguments what now belonged only to their private convictions.

In the human sciences, there were systematic explorations of the determinations of human existence. And since we are thinking beings, the determinations of our existence are also those of our thought. How do the technical, historical, economic, social and political conditions in which we live form, deform and set limits on our knowledge? What are the structures of our biology, our language, our symbolic systems, our communicative interactions, our psychology and our processes of subjectivation? Modern thought, with its scientific and critical ideal, constantly searches for the conditions and limits imposed on it, particularly those that are as yet unknown to it, that remain in the shadows of its consciousness. It seeks to discover what determines it "behind its back." While the transcendental subject described by Kant in his *Critique of Pure Reason* fixed the image a great mind had of it in the late eighteenth century, modern philosophy explores a transcendental subject that is in the process of becoming, continually being re-examined and more precisely defined by the human sciences, a subject immersed in the vagaries of cultures and history, emerging from its unconscious determinations and the techno-symbolic mechanisms that drive it.

I will now broadly outline the figure of the transcendental subject of the scientific era, a figure that re-examines and at the same time transforms the three complementary aspects of the agent intellect.

- The Aristotelian *intellect* becomes *living intelligence*. This involves the effective cognitive activities of subjects, what is experienced spontaneously in time by living, mortal human beings.

- The *intelligence* becomes *scientific investigation*. I use this term to designate all undertakings by which the living intelligence becomes scientifically intelligible,

including the technical and symbolic tools, the methods and the disciplines used in those undertakings.

~ The *intelligible* becomes the *intelligible intelligence*, which is the image of the living intelligence that is produced through scientific and critical investigation.

An evolving transcendental subject emerges from this reflexive cycle in which the living intelligence contemplates its own image in the form of a scientifically intelligible intelligence. Scientific investigation here is the internal mirror of the transcendental subjectivity, the mediation through which the living intelligence observes itself. It is obviously impossible to confuse the living intelligence and its scientifically intelligible image, any more than one can confuse the map and the territory, or the experience and its description. Nor can one confuse the mirror (scientific investigation) with the being reflected in it (the living intelligence), nor with the image that appears in the mirror (the intelligible intelligence). These three aspects together form a dynamic unit that would collapse if one of them were eliminated. While the living intelligence would continue to exist without a mirror or scientific image, it would be very much diminished. It would have lost its capacity to reflect from a universal perspective.

The creative paradox of the intellectual reflexivity of the scientific age may be formulated as follows. It is clear, first of all, that the living intelligence is truly *transformed* by scientific investigation, since the living intelligence that knows its image through a certain scientific investigation is not the same (does not have the same experience) as the one that does not know it, or that knows another image, the result of another scientific investigation. But it is just as clear, by definition, that the living intelligence reflects *itself* in the intelligible image presented to it through scientific knowledge. In other words, the living intelligence is equally dependent on the scientific and critical investigation that produces the intelligible image in which it is reflected. When we observe our physical appearance in a mirror, the image in the mirror in no way changes our physical appearance, only the mental representation we have of it. However, the living intelligence cannot discover its intelligible image without including the reflexive process itself in its experience, and without at the same time being changed. In short, a critical science that explores the limits and determinations of the knowing subject does not only reflect knowledge – it increases it. Thus the modern transcendental subject is – by its very nature – evolutionary, participating in a dynamic of growth.

In line with this evolutionary view of the scientific age, which contrasts with the fixity of the previous age, the collectivity that possesses reflexive knowledge is no longer a theosophical hierarchy oriented toward the agent intellect but a republic of letters oriented toward the augmentation of human knowledge, a scientific community that is expanding demographically and is organized into academies, learned societies and universities. While the agent intellect looked out over a cosmos emanating from eternity, in analog resonance with the human microcosm, the transcendental subject explores a universe infinitely open to scientific investigation, technical mastery and political liberation.

THE TECHNOLOGICAL AGE AND ITS ALGORITHMIC INTELLIGENCE

Reflexive knowledge has, in fact, always been informed by some technology, since it cannot be exercised without symbolic tools and thus the media that support those tools. But the next age of reflexive knowledge can properly be called *technological* because the technical augmentation of cognition is explicitly at the centre of its project. Technology now enters the loop of reflexive consciousness as the agent of the acceleration of its own augmentation. This last point was no doubt glimpsed by a few pre–twentieth century philosophers, such as Condorcet in the eighteenth century, in his posthumous book of 1795, *Sketch for a Historical Picture of the Progress of the Human Mind*. But the truly technological dimension of reflexive knowledge really began to be thought about fully only in the twentieth century, with Pierre Teilhard de Chardin, Norbert Wiener and Marshall McLuhan, to whom we should also add the modest genius Douglas Engelbart.

The regulating ideal of the reflexive knowledge of the theosophical age was the agent intellect, and that of the scientific-critical age was the transcendental subject. In continuity with the two preceding periods, the reflexive knowledge of the technological age will be organized around the ideal of algorithmic intelligence, which inherits from the agent intellect its universality or, in other words, its capacity to *unify* humanity's reflexive knowledge. It also inherits its power to be reflected in finite intelligences. But, in contrast with the agent intellect, instead of descending from eternity, it emerges from the multitude of human actions immersed in space and time.

Like the transcendental subject, algorithmic intelligence is rational, critical, scientific, purely human, evolutionary and always in a state of learning. But the vocation of the transcendental subject was to reflexively contain the human universe. However, the human universe no longer has a recognizable face. The "death of man" announced by Foucault[26] should be understood in the sense of the loss of figurability of the transcendental

subject. The labyrinth of philosophies, methodologies, theories and data from the human sciences has become inextricably complicated. The transcendental subject has not only been dissolved in symbolic structures or anonymous complex systems, it is also fragmented in the broken mirror of the disciplines of the human sciences.

It is obvious that the *technical* medium of a new figure of reflexive knowledge will be the Internet, and more generally, computer science and ubiquitous communication. But how can symbol-manipulating automata be used on a large scale not only to reunify our reflexive knowledge but also to increase the clarity, precision and breadth of the teeming diversity enveloped by our knowledge?

The missing link is not only technical, but also scientific. We need a science that grasps the new possibilities offered by technology in order to give collective intelligence the means to reflect itself, thus inaugurating a new form of subjectivity. As the groundwork of this new science – which I call *computational semantics* – IEML makes use of the self-reflexive capacity of language without excluding any of its functions, whether they be narrative, logical, pragmatic or other.

Computational semantics produces a scientific image of collective intelligence: a *calculated intelligence* that will be able to be explored both as a simulated world and as a distributed augmented reality in physical space. Scientific change will generate a phenomenological change[27], since ubiquitous multimedia interaction with a holographic image of collective intelligence will reorganize the human *sensorium*.

The last, but not the least, change: social change. The community that possessed the previous figure of reflexive knowledge was a scientific community that was still distinct from society as a whole. But in the new figure of knowledge, *reflexive collective intelligence* emerges from any human group.

Like the previous figures – theosophical and scientific – of reflexive knowledge, algorithmic intelligence is organized in three interdependent aspects.

~ *Reflexive collective intelligence* represents the living intelligence, the intellect or soul of the great future digital civilization. It may be glimpsed by deciphering the signs of its approach in contemporary reality.

~ *Computational semantics* holds up a technical and scientific mirror to collective intelligence, which is reflected in it. Its purpose is to augment and reflect the living intelligence of the coming civilization.

~ *Calculated intelligence*, finally, is none other than the scientifically knowable image of the living intelligence of digital civilization. Computational semantics constructs, maintains and cultivates this image, which is that of an ecosystem of ideas coming out of the human activity in the algorithmic medium and can be explored in sensory-motor mode.

In short, in the emergent unity of algorithmic intelligence, computational semantics calculates the cognitive simulation that augments and reflects the collective intelligence of the coming civilization.

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[1] And twenty-three years after *L'idéographie dynamique* (Paris: La Découverte, 1991).

[2] And before the WWW itself, which would become a public phenomenon only in 1994 with the development of the first browsers such as Mosaic. At the time when the book was being written, the Web still existed only in the mind of Tim Berners-Lee.

[3] Approximately 40% in 2014 and probably more than half in 2025.

[4] I obviously do not claim to be the only "visionary" on the subject in the early 1990s. The pioneering work of Douglas Engelbart and Ted Nelson and the predictions of Howard Rheingold, Joël de Rosnay and many others should be cited.

[5] See *The basics of IEML* (on line at: HTTP://WP.ME/P3BDIO-9V).

[6] Beyond logic and statistics.

[7] IEML is the acronym for Information Economy MetaLanguage. See *La grammaire d'IEML* (On line http://wp.me/P3bDiO-9V).

[8] *The Semantic Sphere 1: Computation, Cognition and Information Economy* (London: ISTE, 2011; New York: Wiley, 2011).

[9] More than four hundred reference books.

[10] Umberto Eco, *The Search for the Perfect Language* (Oxford: Blackwell, 1995).

[11] "But more madness than genius would be required for such an enterprise": Claude Levi-Strauss, *The Savage Mind* (University of Chicago Press, 1966): 130.

[12] Which is obviously true, but which only defines the problem rather than forbidding the solution.

[13] But true universalism is all-inclusive, and our daily lives are structured according to a multitude of universal standards, from space-time coordinates to HTTP on the Web. I responded at length in *The Semantic Sphere* to the prejudices of extremist post-modernism against scientific universality.

[14] Which is still used by a large community. But the only thing that Esperanto and IEML have in common is the fact that they are artificial languages. They have neither the same form nor the same purpose, nor the same use, which invalidates criticisms of IEML based on the criticism of Esperanto.

[15] See *IEML Grammar* (On line http://wp.me/P3bDiO-9V).

[16] But, fortunately, supported by the *Canada Research Chairs program* and by my wife, Darcia Labrosse.

[17] Michel Serres, *Hermès V. Le passage du Nord-Ouest* (Paris: Minuit, 1980).

[18] The concept of episteme, which is broader than the concept of paradigm, was developed in particular by Michel Foucault in *The Order of Things* (New York: Pantheon, 1970) and

The Archaeology of Knowledge and the Discourse on Language (New York: Pantheon, 1972).

[19] At the beginning of Book A of his *Metaphysics*.

[20] This is the Axial Age identified by Karl Jaspers.

[21] *Book Lambda*, 9

[22] In particular in Book III.

[23] See, for example, Moses Maimonides, *The Guide For the Perplexed*, translated into English by Michael Friedländer (New York: Cosimo Classic, 2007) (original in Arabic from the twelfth century).

- Averroes (Ibn Rushd), *Long Commentary on the De Anima of Aristotle*, translated with introduction and notes by Richard C. Taylor (New Haven: Yale University Press, 2009) (original in Arabic from the twelfth century).

- Saint Thomas Aquinas: *On the Unity of the Intellect Against the Averroists* (original in Latin from the thirteenth century).

- Herbert A. Davidson, *Alfarabi, Avicenna, and Averroes, on Intellect. Their Cosmologies, Theories of the Active Intellect, and Theories of Human Intellect* (New York, Oxford: Oxford University Press, 1992).

- Henri Corbin, *History of Islamic Philosophy*, translated by Liadain and Philip Sherrard (London: Kegan Paul, 1993).

- Henri Corbin, *En Islam iranien: aspects spirituels et philosophiques*, 2d ed. (Paris: Gallimard, 1978), 4 vol.

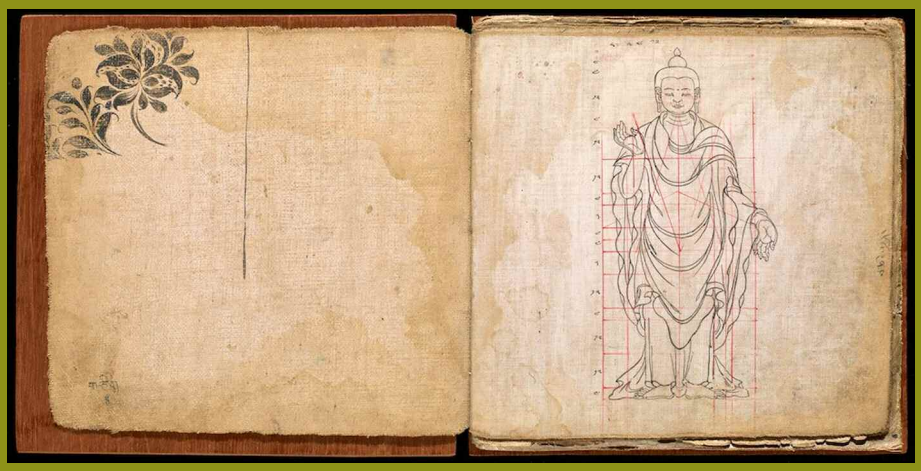
- De Libera, Alain *Métaphysique et noétique: Albert le Grand* (Paris: Vrin, 2005).

[24] In *Meditations on First Philosophy*, "First Meditation."

[25] *Discourse on the Method*, "Part IV."

[26] At the end of *The Order of Things* (New York: Pantheon Books, 1970).

[27] See, for example, Stéphane Vial, *L'être et l'écran* (Paris: PUF, 2013).



THE TIBETAN BOOK OF PROPORTION ~ SHEET 1-4.

STANISLAV GROF

ARCHETYPES, MYTHIC IMAGINATION AND MODERN SOCIETY: THE RE-ENCHANTMENT OF THE WORLD

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COLLECTIVE UNCONSCIOUS, ARCHETYPES, AND THE NATURE OF MYTHS

Understanding of archetypes, governing principles of the collective unconscious, as described by C. G. Jung (Jung 1959), is extremely important for psychotherapy and self-exploration using holotropic states of consciousness. It also throws new light on a broad range of other areas – religion and mysticism, astrology, nature and origin of art, scientific insights and inspiration, sociopolitical phenomena such as wars and revolutions, and others. I will begin this paper on the importance of mythic imagination and archetypal psychology for modern society with a brief discussion of the nature and dynamics of the archetypes and how our understanding of them has changed over the centuries. Following this, I will address more specifically the implications of archetypal thinking for a variety of disciplines and its relevance for the global crisis we are currently facing.

According to the insights that have emerged from Jungian psychology, consciousness research, and scholarly mythological studies, archetypes are timeless primordial cosmic principles underlying, informing, and forming the fabric of the material world (Jung 1959). The tendency to interpret the world in terms of archetypal principles first appeared in ancient Greece and was one of the most striking characteristics of Greek philosophy and culture. As Richard Tarnas pointed out in his sequel to *The Passion of the Western Mind* entitled *Cosmos and Psyche: Intimations of a New World View* (Tarnas 2006), archetypes can be seen from several different perspectives:

1 ~ In Homeric epics they took the form of *personified mythological figures,* as deities, such as Zeus, Poseidon, Dionysus, Hera, Aphrodite, or Ares.

2 ~ In the philosophy of Plato, they were described as *pure metaphysical principles*, transcendent Ideas or Forms. They possessed independent existence of their own in a realm not accessible to ordinary human senses. According to him, earthly things partake in the shape or character of these universal Forms or Ideas, but they fall far short of the perfect glory or perfect reality of these transcendent Forms/Ideas (Plato 1961).

3 ~ In modern times, C. G. Jung brought the concept of archetypes into modern psychology, describing them primarily as *psychological principles.*

The existence of hidden invisible dimensions of reality is an idea that is alien to materialistic science, unless these can be made accessible through the use of devices that extend the range of our senses, such as microscopes, telescopes, or sensors detecting various bands of electromagnetic radiation. In addition, academic and clinical psychiatrists use a very narrow conceptual framework that limits the human psyche to postnatal biography and the Freudian individual unconscious. According to them, the experiences of archetypal beings and realms are not ontologically real; they are figments of human imagination or pathological products of the brain that require treatment by tranquilizing medication.

Modern materialistic science thus joined the centuries old philosophical argument between the *nominalists* and *realists* concerning the ontological nature of archetypes (Plato's Ideas or Forms), a heated debate that had permeated in its many variations the entire history of Western thought. The nominalists saw the archetypes as mere "names," abstractions from human experience of concrete objects and situations and thus derivatives of the material world. The realists believed that the archetypal world is ontologically real, although not

accessible to human senses. Western science dominated by monistic materialism emphatically decided in favour of the nominalists.

The clinical and philosophical work of C. G. Jung radically changed this situation. Jung's analysis of the dreams and symptoms of his clients, as well as his study of world mythology, art, comparative religion, and ritual life of native cultures brought convincing evidence for the existence of the collective unconscious and for ontological reality of the archetypes as its governing principles (Jung 1956, 1959). Jung's understanding of the nature and function of archetypes changed dramatically in the course of his life. In his early work, he saw them as transindividual but essentially intrapsychic phenomena, hardwired into the brain in a way similar to animal instincts. However, after he discovered and studied synchronicity – an "acausal connecting principle" that links intrapsychic events with happenings in the material world – he realized that they have what he called "psychoid" quality (Jung 1960). It means that they govern not only the individual psyche, but also occurrences in the world of consensus reality. I have explored this fascinating topic in my other writings (Grof 1985, 2000, and 2006).

Jung observed that everyday life often brings striking coincidences that by far transcend any reasonable probability; they should not happen if exclusively chains of causes and effects governed the universe. He cited as examples the events in the life of the Austrian biologist Kammerer and Flammarion's story of the rare plum pudding (Jung 1960). Moreover, he observed that in many of these coincidences intrapsychic experiences, such as dreams or visions, form meaningful patterns with events in material reality (see Jung's example of the golden scarab or Campbell's story about the praying mantis and a few others mentioned in my book *When the Impossible Happens* – Grof 2006). This would be possible only if archetypes were cosmic organizing principles governing the human psyche, as well as material reality.

Joseph Campbell's comparative studies of mythology brought strong supportive evidence for Jung's later understanding of archetypes and represent an important complement to and support for Jung's clinical explorations. Of particular interest in this regard is Campbell's cross-cultural study of the archetypal motif of the Hero's Journey that he referred to as "monomyth" because of its universal and ubiquitous nature transcending historical and geographical boundaries. He first described this motif in his 1947 classic *The Hero with A Thousand faces* (Campbell 1968) and later demonstrated how it manifests in a variety of situations including the shamanic initiatory crisis, experiences in rites of passage, mysteries of death and rebirth, and in psychoses or spiritual emergencies. Additional validation of the ontological reality of archetypes came from psychedelic therapy and powerful non-drug experiential techniques (Grof 1985, 2000, 2006).

IMPLICATIONS OF THE NEW UNDERSTANDING OF MYTHS

ARCHETYPES IN PSYCHIATRY, PSYCHOLOGY, AND PSYCHOTHERAPY

In the light of the observations from psychedelic therapy and the work with Holotropic Breathwork, the cartography of the psyche used by academic psychiatry and psychology, which is limited to postnatal biography and to the Freudian individual unconscious, has to be vastly expanded. It has to include the perinatal domain and the transpersonal domain – particularly the collective unconscious with its archetypal dynamics (Grof 1985, 2000). Modern consciousness research has shown that in holotropic states archetypes can be directly experienced and bring new information about mythologies of the world unknown to the subject (e.g. Jung's example of the chronic schizophrenic patient, who perceived the sun as possessing a phallus and making wind with its movements, as it is described in *Mithraic mythology* – Jung 1956).

To illustrate this point of view, I would like to describe one of many situations in which the authenticity of such information could be verified. It involved Otto, one of my clients in Prague, whom I treated for depression and pathological fear of death (*thanatophobia*).

In one of his psychedelic sessions, Otto experienced a powerful sequence of psychospiritual death and rebirth. As the experience was culminating, he had a vision of an ominous entrance into the underworld guarded by a terrifying pig goddess. At this point, he suddenly felt an urgent need to draw a specific geometrical design and asked me to bring him some sheets of paper and drawing utensils. He drew an entire series of complex abstract patterns and he kept impulsively tearing and crumpling these intricate designs as soon as he finished them. He was very dissatisfied with his drawings and was getting increasingly frustrated, because he was not able to 'get it right'.

At that time, I was still under a strong influence of my Freudian training and I tried my best to identify the unconscious motives for this strange behaviour by using the method of free associations. We spent much time on this task, but without much success. The entire sequence simply did not make any sense. Eventually, the process moved to other areas and I

stopped thinking about this situation. The whole episode had remained for me completely mysterious until many years later, when I moved to the United States.

During our stay at Esalen, Joseph Campbell frequently conducted workshops there and participated as guest faculty in many of our month-long seminars. In the middle of the week, he regularly came for dinner in our house, because he became tired of the Esalen menu, which he called "rabbit food." We had many fascinating discussions over the years, during which I shared with him various observations of obscure archetypal experiences from my work that I was not able to understand. In most instances, Joseph had no difficulties identifying the cultural sources of the symbolism involved.

During one of these discussions, I remembered the above episode and shared it with him. "How fascinating," said Joseph without any hesitation, "it was clearly the Cosmic Mother Night of Death, the Devouring Mother Goddess of the Malekulans in New Guinea." He then continued to tell me that the Malekulans believed they would encounter this deity during the Journey of the Dead. She had the form of a frightening female figure with distinct pig features. According to the Malekulan tradition, she sat at the entrance into the underworld and guarded an intricate sacred labyrinthine design.

The Malekulans had an elaborate system of rituals that involved breeding and sacrificing pigs. This complex ritual activity was aimed at overcoming the dependency on their human mothers and eventually on the Devouring Mother Goddess. The Malekulans spent an enormous amount of time practicing the art of the labyrinth drawing, since its mastery was considered essential for a successful journey to the Beyond. Joseph, with his lexical knowledge, was able to solve an important part of this puzzle that I had come across during my research. The remaining question, that even he was not able to answer, was why my client had to encounter specifically this Malekulan deity at that particular time of his therapy. However, the task of mastering the posthumous journey certainly made good sense for somebody whose main symptom was pathological fear of death.

Of the many experiences involving the archetypal world that I have myself had in my psychedelic sessions, the most interesting one happened in a session with MDMA.

About fifty minutes into the session, I started experiencing strong activation in the lower part of my body. My pelvis was vibrating as enormous amounts of energy were being released in ecstatic jolts. At one point, this streaming energy swept me along in an intoxicating frenzy into a whirling cosmic vortex of creation and destruction.

In the centre of this monstrous hurricane of primordial forces were four giant herculean figures performing what seemed to be the ultimate cosmic sabre dance. They had strong Mongolian features with protruding cheekbones, oblique eyes, and clean-shaven heads decorated by large braided ponytails. Whirling around in a frantic dance craze, they were swinging large weapons that looked like scythes or L-shaped scimitars; all four of these combined formed a rapidly rotating swastika.

I intuitively understood that this monumental archetypal scene was related to the beginning of the process of creation and simultaneously to the final stage of the spiritual journey. In the cosmogenetic process (in the movement from the primordial unity to the worlds of plurality) the blades of the scimitars represented the force that is splitting and fragmenting the unified field of cosmic consciousness and creative energy into countless individual units. In relation to spiritual journey, they represented the stage when the seeker's consciousness transcends separation and polarity and reaches the state of original undifferentiated unity. The direction of this process seemed to be related to the clockwise and counter clockwise rotation of the blades. Projected into the material world, this archetypal motif seemed to be related to growth and development (the fertilized egg or seed becoming an organism) or destruction of forms (wars, natural catastrophes, decay).

Then the experience opened up into an unimaginable panorama of scenes of destruction. In these visions, natural disasters, such as volcanic eruptions, earthquakes, crashing meteors, forest fires, floods and tidal waves, were combined with images of burning cities, entire blocks of collapsing high-rise buildings, mass death, and horror of wars. Heading this wave of total annihilation were four archetypal images of macabre riders symbolizing the end of the world. I realized that these were the Four Horsemen of the Apocalypse. (pestilence, war, famine, and death). The continuing vibrations and jolts of my pelvis now became synchronized with the movements of this ominous horseback riding and I joined the dance, becoming one of them, or possibly all four of them at once, leaving my own identity behind.

Suddenly, there was a rapid change of scenery and I had a vision of the cave from Plato's *Republic*. In this work, Plato describes a group of people who live chained all of their lives in a cave, facing a blank wall. They watch shadows projected on the wall by things passing in front of the cave entrance. According to Plato, the shadows are as close as the prisoners get

to see reality. The enlightened philosopher is like a prisoner who is freed from this illusion and comes to understand that the shadows on the wall are illusory, as he can perceive the true form of reality rather than the mere shadows seen by the prisoners. This was followed by profound and convincing realization that the material world of our everyday life is not made of "stuff" but created by cosmic consciousness by infinitely complex and sophisticated orchestration of experiences. It is a divine play that the Hindus call *lila*, created by cosmic illusion, *maya*.

The final major scene of the session was a magnificent ornate theatre stage featuring a parade of personified universal principles, archetypes – cosmic actors, who through a complex interplay create the illusion of the phenomenal world. They were protean personages with many facets, levels, and dimensions of meaning that kept changing their forms in extremely intricate holographic interpenetration as I was observing them. Each of them seemed to represent simultaneously the essence of his or her function and all the concrete manifestations of this element in the world of matter. There was Maya, the mysterious ethereal principle symbolizing the world illusion; Anima, embodying the eternal Female; a Mars-like personification of war and aggression; the Lovers, representing all the sexual dramas and romances throughout ages; the royal figure of the Ruler; the withdrawn Hermit; the elusive Trickster; and many others. As they were passing across the stage, they bowed in my direction, as if expecting appreciation for the stellar performance in the divine play of the universe.

The work with holotropic states of consciousness has shown beyond any reasonable doubt that archetypal experiences are not erratic products of brain pathology of unknown origin (symptoms of "endogenous psychoses"), but contents of the collective unconscious emerging into individual consciousness (Grof 2000). To distinguish transpersonal experiences from imaginary products of individual fantasy, Jungian psychologists refer to the archetypal domain as *imaginal*. French scholar, philosopher, and mystic, Henri Corbin, who first used the term *mundus imaginalis*, was inspired in this regard by his study of Islamic mystical literature (Corbin 2000). Research of holotropic states has also revealed the existence of the perinatal domain in the unconscious, which contains a unique mixture of fetal and archetypal elements. This has profound theoretical and practical implications for psychiatry, psychology, and psychotherapy:

A ~ Archetypes play an important role in the genesis of emotional and psychosomatic symptoms as part of multilevel dynamic systems that consist of biographical, perinatal, and transpersonal material (COEX systems). Conversely, archetypes can also play an important role in healing and transformation (the extreme example being emergence and integration of a demonic archetype).

B ~ This is closely related to the inner self-healing intelligence of the psyche (Jung's individuation process) and the healing potential of archetypal figures, or of the divine energy that ancient and native cultures have seen as divine (Apollo in the Greek temple incubation; deities of the Caribbean and South American syncretistic religions – the *loa* in Voodoo or *orishas* in Umbanda and Santeria; *pneuma* of the Gnostics; *prana* of Kundalini Yoga; *ntum* of the Kalahari Bushmen; *mana* of the Polynesians, and others).

C ~ The discovery of the ontological reality of the archetypal realm and the inner healing intelligence supports the concept of "spiritual emergency" (emergence of perinatal and transpersonal material into consciousness) as an alternative to the medical understanding of "endogenous psychoses" as mental diseases, caused by a pathological process and requiring suppressive therapy by tranquilizers (Grof and Grof 1989, Grof and Grof 1991).

THE ROLE OF ARCHETYPES IN SCIENCE

Archetypes play an important role in the genesis of scientific theories and in scientific discoveries. As Philipp Frank has shown in his *Philosophy of Science* (1957), the source of the basic axiom of a scientific theory or the source of a scientific discovery is often an archetypal motif. In the history of science revolutionary ideas often emerge long before there is sufficient evidence to justify them or support them.

Salient examples are the Ionic philosopher Anaximander with his protoevolutionary theory suggesting that all life originated in the ocean, Democritus and Leucippus with their atomic theory of matter, Copernicus and Kepler who drew their inspiration from the solar archetype, and Friedrich Kekule inspired by the vision of Uroboros in his discovery of the benzene ring. Additional fascinating examples can be found in Willis Harman *Higher Creativity: Liberating the Unconscious for Breakthrough Insights* (Harman 1984).

Edgar Allan Poe's essay *Eureka* is a particularly interesting example of inspiration mediated by visions with archetypal context. Poe's cosmological vision bears deep resemblance not only to the scriptures of what Aldous Huxley called perennial philosophy (Huxley 1945), but also to theories of modern science, in his case to cosmological speculations of famous physicists supported by astronomical observations. Poe

himself believed that his *Eureka* would revolutionize astronomy and his ideas have been actually seriously discussed in scientific circles. One of Poe's major hypotheses – that the universe filled with matter after a single, high-energy particle exploded – was the rough equivalent of the cosmogenetic theory developed in the twentieth century by Lemaitre, Gamov, and Alpher. Its opponent Fred Hoyle referred to it facetiously as the Big Bang theory and it has been known under this name ever since. It has remained one of the leading cosmogenetic theories until this day (Alpher and Herman 2001).

Poe theorized that the universe must be expanding, since the energy of the explosion is pushing matter outward. He also concluded that gravity eventually would pull all particles back together and the process would start all over again; this idea appeared in Alexander Friedman's theory of the pulsating universe (Friedman 1922). Modern consciousness research has shown that visionary states have a remarkable potential to provide not only extraordinary religious illumination and artistic inspiration, but also brilliant scientific insights that open new fields and facilitate scientific problem-solving. Numerous examples of this kind can be found in Willis Harman *Higher Creativity: Liberating the Unconscious for Breakthrough Insights* (Harman 1984) excellent book.

There is also increasing awareness of the importance of archetypal patterns in various scientific disciplines. Here belongs Goethe's fascination by the building plan of plants, Gregory Bateson's preoccupation with the "pattern that connects" in nature and in evolutionary theory, Sheldrake's concept of morphogenetic fields, Ernst Haeckel's research of art forms in nature, Mandelbrot's study of fractals mimicking archetypal forms in nature, Ilya Prigogine's theory of dissipative structures, and emergence of order from chaos, and others (Goethe 2009, Bateson 1979, Sheldrake 1981, Mandelbrot 1982, Prigogine and Stengers 1984). Additional examples are mathematical archetypal formulas that underline the growth of sea shell shapes (Nautilus), branching plants, seed heads, leaves and petal arrangements, pine cones, and crystals, such as the Fibonacci series, the Golden section, or the Golden String.

ARCHETYPES, RELIGION, AND SPIRITUALITY

The discovery that the archetypal world is ontologically real gives legitimacy to the spiritual worldview, spiritual quest, and to religious activity that involves direct experience. It makes it possible to distinguish organized religions based on belief, with their dogmas, ritualism, moralism, and secular ambitions, from authentic spirituality found in the monastic and mystical branches of religions, rituals of native cultures, and traditions emphasizing spiritual practice and direct experience.

> Spirituality is based on personal experiences of non-ordinary aspects and dimensions of reality. It does not require a special place or an officially appointed persons mediating contact with the divine. The mystics do not need churches or temples. The contexts in which they experience the sacred dimensions of reality, including their own divinity, are their bodies and nature. And instead of officiating priests, they need a supportive group of fellow seekers or the guidance of a teacher who is more advanced on the inner journey than they are themselves.
>
> According to Joseph Campbell (echoing Dürckheim), another important distinction to make is the difference between idolatry and mysticism: "A useful deity (archetypal figure) has to be transparent to the transcendent;" it has to point to the Absolute, but not be mistaken for it. Making the archetypal figure opaque and worshipping it as the ultimate is idolatry; it results in a religion that unites within its radius, but divides the world into rival groups – Christians/pagans, Moslems/infidels, Jews/goyim.

The realization of the ontological reality of the archetypal world validates the ritual and spiritual life of pre-industrial cultures – shamanism, rites of passage, mysteries of death and rebirth, and the great religions and spiritual philosophies of the East and West. Of these, rites of passage are of particular importance for modern society. According to scholars, such as Margaret Mead and Mircea Eliade the fact that the industrial civilization has lost meaningful rites of passage contributes significantly to the ills of modern society, particularly of the young generation – sexual acting out, drug abuse, and violence.

In 1973, I had the opportunity to participate in the small brain-storming conference of the Weenner-Gren Foundation *Ritual: Reconciliation in Change* organized by Margaret Mead and Catherine Bateson that took place in Burg Wartenstein in Austria, (Mead and Bateson 1973). Eighteen invited presenters discussed the question whether it would be possible to create modern rites of passages, or if they need to emerge spontaneously from the spiritual history of the cultures involved. Pre-prints of the participants used at this conference as a basis for round table discussions are in the New York archives of the Wenner-Gren Foundation.

Several years ago, my wife Christina's gave a paper at a conference, convened by a New York state legislator

on the same subject – importance of rites of passage and the possibility of recreating and reinstituting them (Grof 1998). Participants discussed the possibility of combining such elements as ropes courses, outward bound, fire walking, and Holotropic Breathwork (since all native rites of passage involve holotropic states of consciousness and under current circumstances, the logical choice for this purpose – responsible ritual use of psychedelics – is unlikely.

ARCHETYPES AND SOCIO-POLITICAL MOVEMENTS IN HISTORY

Archetypal forces govern not only processes in the individual psyche, but also in the collective psyche; they are driving forces of human history. Medieval knights were asked to sacrifice their lives for Jesus and participate in the Crusades to recover the Holy Land from the Muslims. The Bohemian Hussites called themselves "Warriors of God" and sung their powerful chorale "Ye Who Are the Warriors of God" with such compelling power that it allegedly wreaked havoc among the much larger armies of Crusaders they were about to engage and made them flee the battlefield. Hitler used archetypal symbols to influence his followers – the reversed Vedic images of the swastika and the solar eagle, the Thousand Years' Reich, and the supremacy of the Nordic race.

C. G. Jung noticed that the archetypal motif of Wotan kept appearing in the dreams of his German patients and discussed the political importance of the Wotan archetype for Germany. He concluded that Germany was facing a national catastrophe that would be destructive and self-destructive in nature (Jung 1964). He also analyzed the personalities of Hitler, Stalin, and Mussolini and pointed out the mystical, "medicine-man" qualities in Hitler (Jung 1950). The idea that Hitler was a deranged mystic was explored also in Trevor Ravenscroft's book *The Spear of Destiny*, in which he discussed the role that fascination by the sword that the Roman centurion Cassius Longinus used to pierce the side of Jesus (the "Holy Lance") played in Hitler's life (Ravenscroft 1982).

Marie-Louise von Franz discussed in her article *The Transformed Berserk* the importance that the vision of Wotanic Christ (Christ as Berserker), which the patron saint of Switzerland Nikolas von Flue experienced in his meditation, had for the future of her homeland. Following his vision, Nikolas left his hermitage and negotiated peace for Switzerland in a conflict that threatened to develop into a war. Von Franz attributed the fact that Switzerland has not been since that time involved in any war to this experience of its patron saint integrating the shadow side in Jesus' personality (von Franz 1988). James Hillman amassed in his brilliant *A Terrible Love of War* convincing evidence that war is a formidable archetypal force that has irresistible power over individuals and nations (Hillman 2004).

Ronald Reagan made in his speeches references to the Apocalypse and called the Soviet Union the "Evil Empire." George Bush called his fight against Muslim terrorists a "crusade"; in turn, Muslim extremists use for political purposes the concept of *jihad,* the Holy War against the infidels, and Muslim terrorists expect as reward for their suicidal attacks on infidels the delights of Paradise, including the virginal black-eyed *houris.* Similarly in the Second World War the Japanese kamikaze soldiers were referred to as "Divine Wind warriors"; they believed that they sacrificed their life for the living god "Emperor of Heaven" Hirohito.

The authors of the strategic doctrine refer to members of their community as the "nuclear priesthood." The first atomic test was called Trinity – the unity of Father, Son, and Holy Ghost. The scientists who worked on the atomic bomb and witnessed the test described it in the following way: "It was as though we stood at the first day of creation." And Robert Oppenheimer thought of Krishna's words to Arjuna in the Bhagavad Gita: "I am become Death, the Shatterer of Worlds."

Work with holotropic states of consciousness, with and without psychedelics, offers fascinating insights into the archetypal and perinatal roots of war and bloody revolution. On the perinatal level, reliving of various stages of biological birth is often associated with images of violent socio-political events and visions of archetypal figures and motifs. The connection between the archetypal elements and the stages of birth is very specific. I call these experiential clusters – combining fetal elements with the corresponding archetypal imagery and scenes from the historical unconscious – Basic Perinatal Matrices (BPMs) (Grof 1985, 2000).

While we are reliving episodes of undisturbed intrauterine existence (BPM I), we typically experience images from human societies where people live in harmony with each other and with nature. The archetypal domain contributes images of paradises and heavens of various cultures. Disturbing intrauterine memories, such as those of a toxic womb, imminent miscarriage, or attempted abortion, are accompanied by images of human groups living in industrial areas where nature is polluted and spoiled, or in societies with insidious social order and all-pervading paranoia as described

in Orwell's *1984* (Orwell 1949). Corresponding archetypal images feature insidious demons.

Typical archetypal images associated with the onset of delivery are ominous whirlpools, giant engulfing or constricting monsters (dragon, Leviathan, whale, tarantula, octopus), or visits into the underworld. Regressive experiences related to the fully developed first clinical stage of birth (BPM II), during which the uterus periodically contracts but the cervix is not open, present a very characteristic picture. They portray oppressive and abusive totalitarian societies with closed borders, victimizing their populations, and "choking" personal freedom, such as Czarist or Communist Russia, Hitler's Third Reich, South American dictatorships, and the African Apartheid), or bring specific images of the inmates in Nazi concentration camps and Stalin's Gulag Archipelago. While experiencing these scenes of living hell, we identify exclusively with the victims and feel deep sympathy for the downtrodden and the underdog. Underlying all these is the archetype of hell – extreme physical and emotional suffering that will never end, complete with the images of devils and sinners.

The experiences accompanying reliving of the second clinical stage of delivery (BPM III), when the cervix is dilated and continued contractions propel the foetus through the narrow passage of the birth canal, feature a rich panoply of violent scenes — bloody wars and revolutions, human or animal slaughter, mutilation, sexual abuse, and murder. These scenes often contain demonic elements and repulsive scatological motifs. Additional frequent concomitants of BPM III are visions of fire – burning cities, launching of rockets, and explosions of nuclear bombs. Here we are not limited to the role of victims, but can participate in three roles: that of the victim; of the aggressor; and of an emotionally involved observer.

The accompanying archetypal images portray battles of cosmic proportions – Ragnarok or Twilight of the Gods from Nordic mythology, battle between the forces of Light and Darkness such as the Zoroastrian Ormuzd and Ahriman's armies, Archangel Michael battling Satan's hordes, Mara's army attacking the Buddha, or Armageddon. Additional archetypal motifs associated with BPM III are eerie scenes combining aggression, sex, and scatology, as exemplified by the Black mass rituals, satanic orgies, and Walpurgi's Night, or Sabbath of the Witches. When the third matrix approaches resolution, the accompanying archetypal visions feature figures representing psychospiritual death and rebirth, such as Jesus Christ, Osiris, Dionysus, Quetzalcoatl, Inanna, Jesus, and Phoenix, and exploding volcano or deities associated with fire, such as Moloch or Pele).

The events characterizing the third clinical stage of delivery (BPM IV), the actual moment of birth and the separation from the mother, are typically associated with images of victory in wars and revolutions, liberation of prisoners, and success of collective efforts, such as patriotic or nationalistic movements. At this point, we can also experience visions of triumphant celebrations and parades or of exciting post-war reconstruction. Archetypal motifs that belong here are scenes of rebirth of deities and demigods, rainbow spectra, peacock designs, Great Mother Goddesses, and images of deities appearing in light (angelic beings, *gandharvas* and *apsaras*, etc.).

In 1975, I described these observations, linking socio-political upheavals to stages of biological birth, in *Realms of the Human Unconscious* (Grof 1975). Shortly after its publication, I received a letter from Lloyd de Mause, a New York psychoanalyst and journalist. De Mause is one of the founders of psychohistory, a discipline that applies the findings of depth psychology to history and political science (Mause 1975). Psychohistorians study such issues as the relationship between the childhood history of political leaders and their system of values and process of decision-making, or the influence of child-rearing practices on the nature of revolutions of that particular historical period. Lloyd de Mause was very interested in my findings concerning the trauma of birth and its possible socio-political implications, because they provided independent support for his own research.

For some time, de Mause had been studying the psychological aspects of the periods preceding wars and revolutions. It interested him how military leaders succeed in mobilizing masses of peaceful civilians and transforming them practically overnight into killing machines. His approach to this problem was very original and creative. In addition to analysis of traditional historical sources, he drew data of great psychological importance from caricatures, jokes, dreams, personal imagery, slips of the tongue, side comments of speakers, and even doodles and scribbles on the edge of the rough drafts of political documents. By the time he contacted me, he had analyzed in this way seventeen situations preceding the outbreak of wars and revolutionary upheavals, spanning many centuries since antiquity to most recent times.

He was struck by the extraordinary abundance of figures of speech, metaphors, and images related to biological birth that he found in this material. Military leaders and politicians of all ages describing a critical situation or declaring war typically used terms that equally applied to perinatal distress. They accused the enemy of choking and strangling their people, squeezing the last breath out of their lungs, or constricting them and not giving them enough space to live (Hitler's *Lebensraum*). We could illustrate this

by the recent example of Da'ish (ISIS) threatening to turn United States into a "choking hell."

Equally frequent were allusions to dark caves, tunnels, and confusing labyrinths, dangerous abysses into which one might be pushed, and the threat of engulfment by treacherous quicksand or a terrifying whirlpool. Similarly, the offer of the resolution of the crisis comes in the form of perinatal images. The leader promises to rescue his nation from an ominous labyrinth, to lead it to the light on the other side of the tunnel, and to create a situation where the dangerous aggressor and oppressor will be overcome and everybody will again "breathe freely."

Lloyd de Mause's historical examples at the time included such famous personages as Alexander the Great, Napoleon, Samuel Adams, Kaiser Wilhelm II, Hitler, Khrushchev, and Kennedy. Samuel Adams talking about the American Revolution referred to "the child of Independence now struggling for birth." In 1914, Kaiser Wilhelm stated that "the Monarchy has been seized by the throat and forced to choose between letting itself be strangled and making a last ditch effort to defend itself against attack." During the Cuban missile crisis Khrushchev wrote to Kennedy, pleading that the two nations not "come to a clash, like blind moles battling to death in a tunnel."

Even more explicit was the coded message used by Japanese ambassador Kurusu when he phoned Tokyo to signal that negotiations with Roosevelt had broken down and that it was all right to go ahead with the bombing of Pearl Harbor. He announced that the "birth of the child was imminent" and asked how things were in Japan: "Does it seem as if the child might be born?" The reply was: "Yes, the birth of the child seems imminent." Interestingly, the American intelligence listening in recognized the meaning of the "war-as-birth" code.

Particularly chilling was the use of perinatal language in connection with the explosion of the atomic bomb in Hiroshima. The airplane was given the name of the pilot's mother, Enola Gay, the atomic bomb itself carried the painted nickname *The Little Boy*, and the agreed-upon message sent to Washington as a signal of successful detonation was "The baby was born." It would not be too far-fetched to see the image of a newborn also behind the nickname of the Nagasaki bomb, *Fat Man*. Since the time of our correspondence, Lloyd de Mause collected many additional historical examples and refined his thesis that the memory of the birth trauma plays an important role as a source of motivation for violent social activity.

The issues related to nuclear warfare are of such relevance that I would like to elaborate on them using the material from a Carol Cohn's fascinating paper "Sex and Death in the Rational World of the Defense Intellectuals" (Cohn 1987). The Defense Intellectuals (DIs) are civilians who move in and out of government, working sometimes as administrative officials or consultants, sometimes at universities and think-tanks. They create the theory that informs and legitimates US nuclear strategic practice – how to manage the arms race, how to deter the use of nuclear weapons, how to fight a nuclear war if the deterrence fails, and how to explain why it is not safe to live without nuclear weapons.

Carol Cohn had attended a two-week summer seminar on nuclear weapons, nuclear strategic doctrine, and arms control. She was so fascinated by what had transpired there that she spent the following year immersed in the almost entirely male world of defense intellectuals (except for secretaries). She collected some extremely interesting facts confirming the perinatal dimension in nuclear warfare. In her fascinating paper, she mentions eight historical examples, where coded messages and other communications about development and testing of atomic and hydrogen bombs involved references to birth and newborns.

Further support for the pivotal role of the perinatal and archetypal domains of the unconscious in war psychology can be found in Sam Keen's excellent *The Faces of the Enemy* (Keen 1988) and a TV documentary of the same name. Keen brought together an outstanding collection of distorted and biased war posters, propaganda cartoons, and caricatures from many historical periods and countries. He demonstrated that the way the enemy is described and portrayed during a war or revolution is a stereotype that shows only minimal variations and has very little to do with the actual characteristics of the country and culture involved. He was able to divide these images into several archetypal categories according to the prevailing characteristics (e.g., Stranger, Aggressor, Worthy Opponent, Faceless, Enemy of God, Barbarian, Greedy, Criminal, Torturer, Rapist, Death). According to Keen, the alleged images of the enemy are essentially projections of the repressed and unacknowledged shadow aspects of our own unconscious. Although we would certainly find in human history instances of just wars, those who initiate war activities are typically substituting external targets for elements in their own psyches that should be properly faced in personal self-exploration.

Keen's theoretical framework does not specifically include the perinatal domain of the unconscious. However, the analysis of his picture material reveals preponderance of archetypal images that are characteristic of BPM II and BPM III. The enemy is typically

depicted as a dangerous octopus, a vicious dragon, a multiheaded hydra, a giant venomous tarantula, or an engulfing Leviathan. Other frequently used symbols include vicious predatory felines or birds, monstrous sharks, and ominous snakes, particularly vipers and boa constrictors. Scenes depicting strangulation or crushing, ominous whirlpools, and treacherous quicksand also abound in pictures from the time of wars, revolutions, and political crises. Juxtaposition of pictures from holotropic states of consciousness that depict perinatal experiences with the historical pictorial documentation collected by Lloyd de Mause and Sam Keen represents strong evidence for the perinatal and transpersonal roots of human violence.

According to the new insights, provided jointly by observations from consciousness research and the findings of psychohistory, we all carry in our deep unconscious powerful energies and emotions associated with the trauma of birth that we have not adequately mastered and assimilated. The symbolism associated with them is drawn from deep archetypal sources. For some of us, this aspect of our psyche can be completely unconscious, until and unless we embark on some in-depth self-exploration with the use of psychedelics or some powerful experiential techniques of psychotherapy, such as the holotropic breathwork or rebirthing. Others can have varying degrees of awareness of the emotions and physical sensations from the perinatal and transpersonal level of the unconscious.

Activation of this material can lead to serious individual psychopathology, including unmotivated violence. It seems that, for unknown reasons, the awareness of the perinatal elements can increase simultaneously in a large number of people. This creates an atmosphere of general tension, anxiety, and anticipation. The leader is an individual who is under a stronger influence of the perinatal energies than the average person. He also has the ability to disown his unacceptable feelings (the Shadow in Jung's terminology) and to project them on the external situation. The collective discomfort is blamed on the enemy and a military intervention is offered as a solution.

Historical and astrological research of Richard Tarnas threw fascinating new light on de Mause's idea of the collective tension originating in the perinatal unconscious, which typically precedes onset of wars and revolutions. In his meticulous explorations, Tarnas recognized the deep correlation between the phenomenology of what I call Basic Perinatal Matrices (BPMs) and astrological archetypes (BPM I and Neptune, BPM II and Saturn, BPM III, and Pluto and BPM IV and Uranus). He also was able to demonstrate throughout human history deep correlations between the periods of wars and revolutions and hard aspects of Pluto, Saturn, and Mars (Tarnas 2006). This demonstrates a close connection between socio-political events and dynamics of archetypes associated with various planets.

CONSCIOUSNESS RESEARCH AND ARCHETYPAL ASTROLOGY

The new understanding of the nature of the archetypes, their symbolism, multivalent meaning, and their mutual interactions and interplay is essential for the disciplines known as archetypal psychology and cosmology. Research of holotropic states has brought strong supportive evidence for the worldview underlying astrology (Grof 2009). Because of the revolutionary nature of this understanding of reality, which represents a serious challenge to the materialistic scientific worldview and requires a radical change of our thinking about the nature of reality, it took me years to realize the extraordinary its value. Over thirty years of cooperation with Richard Tarnas have convinced me that archetypal astrology is an invaluable tool for psychiatry, psychology, psychotherapy, and especially work with holotropic states of consciousness. Rick has also demonstrated extraordinary value of this discipline for historical research; in a 30-year tour de force, he showed systematic correlations between world planetary transits and historical events (Tarnas 2006). This is a complicated subject and I cannot give it justice in the limited framework of this paper. I have to direct interested leaders to literature focusing specifically on this area (Tarnas 2006, 2010, 2011, Grof 2009, 2012, Le Grise 2009).

SEARCH FOR A NEW PLANETARY MYTH

Historian Arnold Toynbee and mythologist Joseph Campbell noticed that all cultures of the past had been governed by an underlying myth or a combination of myths. Toynbee is often quoted for his prediction of the development of Western civilization: "The coming of Buddhism to the West may well prove to be the most important event of the twentieth century." Joseph Campbell used to raise in his lectures the question: "What are the myths that are driving the Western civilization?" He himself emphasized the importance of the Search for the Holy Grail myth in its relation to individualism characterizing Western society: the knights of the Holy Grail decided to pursue the search for the holy chalice on their own. We can also think about the two major myths of the modern era: Paradise Lost vs. Ascent of Man (Tarnas 1993). Equally appropriate seem to be the motifs of the Abduction and

Rape of the Feminine, psychospiritual death and rebirth, and a variety of others – Faust, Sorcerer's Apprentice, Frankenstein, Prodigal Son, Tower of Babel, and others.

Joseph Campbell also often asked: what will be the myth of the future, and he expressed his hope that it would involve overcoming fragmentation and creating a planetary civilization. It would be New Atlantis, where people would live in harmony with others and with nature, benefiting from the astonishing discoveries of science and technology, but using them with wisdom coming from a deep spiritual place. Achievement of this goal would also involve psychospiritual rebirth and liberation and return of the feminine.

Since we are talking about planetary civilization, I would like to mention a very interesting observation that seems very relevant in this regard. One of the most surprising discoveries in my work with psychedelics and with the holotropic breathwork was the ease with which individuals in holotropic states of consciousness (including myself) transcended historical and geographical boundaries and experienced archetypal figures, motifs, and domains from just about any culture in human history. Over the years, I have myself have experienced in my own psychedelic sessions episodes from many different mythologies and religions of the world – Hindu, Buddhist, Tibetan Buddhist, Muslim, Christian, Egyptian, Shinto, Australian Aboriginal, Native American, South American, and others.

This has to be a new phenomenon. Many other cultures had and used powerful consciousness-expanding technologies, including psychedelic plants. Had the collective unconscious in its entirety been as easily accessible for them as it seems to be for modern subjects, we could not have distinct culture-specific mythologies. We have to assume that, for example, the Tibetans experienced primarily Tibetan deities, and Huichol Indians in Mexico, Huichol deities. There are no descriptions of the Dear Spirit or Grandfather Fire in the Bardo Thödol or those of the Dhyani Buddhas in the Huichol lore.

It seems that this increased accessibility of various domains in the collective unconscious parallels what is happening in the material world. Until the end of the fifteenth century, Europeans did not know anything about the New World and its inhabitants and vice versa. Many human groups in remote parts of the world remained unknown to the rest of the world until the modern era. Tibet was relatively isolated until the Chinese invasion in 1949. Today telephone, short-wave radio stations, television, jet travel, and the Internet have dissolved many of the old boundaries. Let us hope that what is happening in the inner and the outer world are indications that we are moving toward a truly global civilization.

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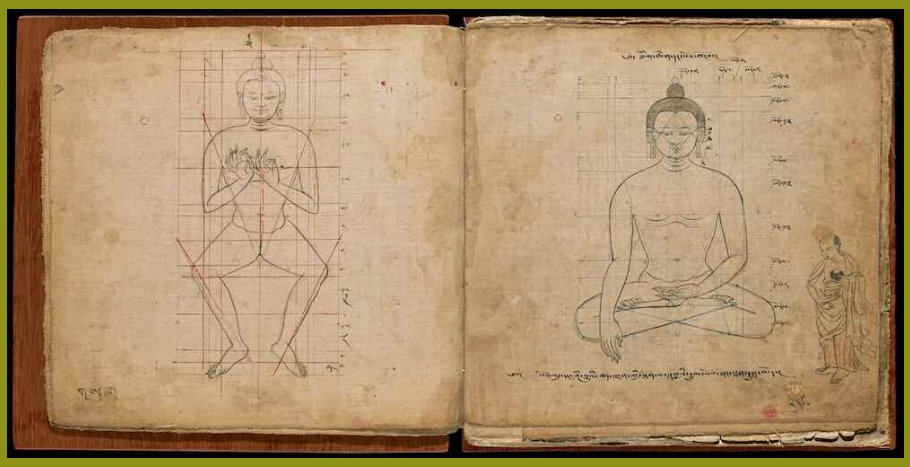

THE TIBETAN BOOK OF PROPORTION ~ SHEET 5-8.

GEORGE PÓR

FROM RIGHT MINDFULNESS TO COLLECTIVE

INTELLIGENCE TO COLLECTIVE SENTIENCE: SIGNPOSTS TO THE LATER STAGES OF OUR EVOLUTIONARY JOURNEY

George is a public intellectual, whose academic posts included London School of Economics, INSEAD, UC Berkeley, and Université de Paris. He is a mentor and strategic learning partner to visionary leaders, a Fellow of Future Considerations, a London-based transformation agency, founder of CommunityIntelligence. He can be reached at george.por@gmail.com.

THIS ESSAY IS A WIDE-RANGING EXPLORATION INTO THE conditions for realizing the next-level potential of human and social evolution. A starting point for looking at "evolution" is the unending journey resulting from the "dynamic interplay of the passive and the creative polarizations of the Absolute that unfolds itself into the energetic process of differentiation bringing forth the whole of creation[1]." The evolutionary process actually continues through cycles of differentiation, then integration, at a higher level.

We are on the threshold of a new cycle of the spiral, the spiral of consciousness. The previous cycles, archaic, magic, mythic, modern and postmodern consciousness served us well by leading us so far. However, becoming stuck with them is becoming stuck with an existential threat of intertwining global crises that cannot be solved at the currently dominant modern and postmodern levels. The next cycle is the one of an integral, holistic consciousness that enables the integration of the inner and outer technologies and sciences, deep intuition and systems thinking, spirituality and precision of inquiry.

In this essay I explore some of themes that are core to our move into the next cycle, such as, collective intelligence, collective sentience, evolutionary guidance systems, integral and shared mindfulness.

CONTEXT AND MOTIVATION

The first sciences arising with agriculture started distinguishing themselves from intuition, imagination, and other inner ways of knowing, during the dawn of human civilization. In the ensuing millennia, the separation and differentiation both between and within scientific and spiritual practices (reflecting the division of labour in the material domain) contributed to the spontaneous evolution of consciousness and culture.

"We are the product of the process of evolution, and [...] we have become the process itself, through the emergence and evolution of our consciousness, our awareness, our capacity to imagine and anticipate the future, and to choose from among alternatives[2]."

Spontaneous, unguided social evolution develops powerful forces of science and technology, but not a just social system, where all can benefit from their fruits. The development of those forces, in the conditions of private expropriations of the fruits of humankind's general intellect, is raising the risk of systems-wide cataclysms due to the galloping complexity of our intertwining, global messes. That's the moment in human history, when the useful lifecycle of blind, unguided evolution ends in a global problematique, unmanageable at the level of social organization and consciousness that created it.

"To date, evolution on Earth has moved along its trajectory of its own accord. But it will not progress beyond this point unless it is driven forward intentionally. Evolution will continue to advance on this planet only if certain conditions are met: humanity will need to awaken to the fact that we are living in the midst of a meaningful and directional evolutionary process, realize that the continued success of the process depends on us, and commit to intentionally moving the process forward[3]."

At this juncture, blind evolution must yield to conscious, intentional evolution if we are to pass the chasm from humanity's prehistory, where we could live with the false sense of separate self, to its real history that starts when (out of a sense of recognized prior unity) we reinvent our ways to organize toward maximizing the well-being of the Whole and all of its parts.

This essay is intended to make a modest contribution to some of the signposts of that reinvention, and to spark a collaborative, action inquiry into it.

INTEGRAL AND SHARED MINDFULNESS

INTEGRAL MINDFULNESS

Mindfulness, especially shared mindfulness, is an essential doorway to the collective intelligence and action required to re-orient where we want to go as a society. "Mindfulness" here refers not to its popular, "stress-reduction" meaning, but to a discipline of training our attention and intention to foster wise action grounded in compassion with self and others.

"Mindfulness is not merely a compartmentalized tool for enhancing attention but is informed and influenced by many other factors – our view of reality; the nature of our thoughts, speech, and actions; our way of making a living; and our effort in avoiding unwholesome and unskilful states while developing those that are skilful and conducive to health and harmony[4]."

Without an ethical foundation grounded in the common good and an integral, evolutionary worldview, the currently trending mindfulness practices and trainings risk reducing a radical, ancient wisdom tradition of self-knowledge and self-transformation to a self-help technique or psychological state readily co-optable by the defenders of the institutional status quo.

To distinguish mindfulness engaged with the ethical challenges of our times from the escapist, "McMindfulness" version, I call the first "integral mindfulness". Integral mindfulness is taking mindfulness off the meditation cushion and infusing all dimensions of our life with it; not only the life of you and me, but also of collective entities, such as organizations, networks, cities or nations. Your being mindful i*ntegrally* may contribute also to the mindful development of the cultures and structures you're in.

Showing up mindfully in a group may have "contagious" impact. This story illustrates it. Sometime in the 80s, I was sitting in a leadership team meeting convened by my client, a VP in a major Silicon Valley company. That was before Google introduced the idea of relaxed, cool workplaces; all businesses in the high-tech industry were pressure cookers: high speed, fast talk, never enough time for a heartfelt, deeply meaningful conversation about questions that mattered to the members. My client's company was not an exception. Yet, in that meeting, there was an atmosphere of ancient mystery school; silence frequently following statements to give enough time to absorb their implications, people not cutting into each other's words, and genuine curiosity for each other's concerns and contributions. Later I learned that the VP was an advanced Buddhist meditator, but he never mentioned that in his team. People just picked up the vibes and enjoyed it.

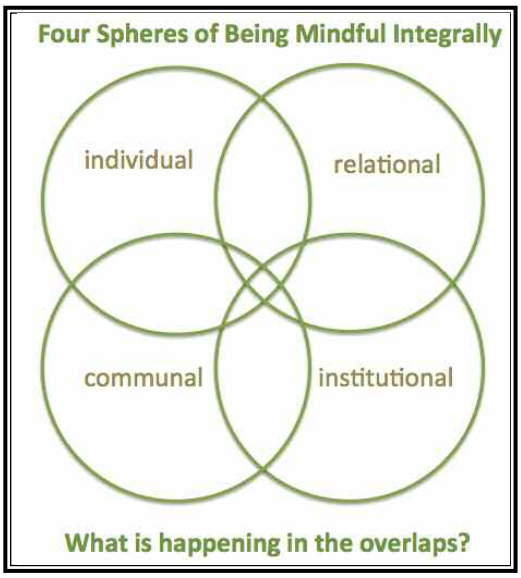

FIGURE 1 ~ *A map for inquiring into the overlaps.*

What is novel about "Integral Mindfulness" is the shift of focus from the snapshot-like, static quadrants of the regular integral matrix to the dynamic interactions in the overlaps of the four spheres. For example, let's see what is happening in the overlap and transitions between the individual and communal spheres.

Both collective intelligence and "shared mindfulness" start within (following the pattern of the We-space that starts with We-in-the-I[5].) I am already participating in shared mindfulness, when I preparing to enter that shared space (physical or virtual) of heightened, collective awareness. It's a moment of solo practice of cantering and welcoming what will come, shared by many of the other members of the community. Some participants in our Mindful Together community described their experience as follows:

"For me stepping into this virtual intimate collective space is new muscle – its like swimming in the sea, which I love but there's always a little resistance on first feel of the cold water but once I'm in – I'm loving it again but that is now an established practice. What I am observing is this habit of being used to being in our own separate bubble – the comfort of the sofa that we know and getting out of it always calls for a little push against the reflexive resistance to a minor change in habit. Coming together like this in a deeper shared collective space is a new muscle that needs exercising to work well and being mindful of our lack of fitness/resistance is a start. However once you are in and like the ocean, you feel carried or elevated by field between us[6]."

If all start paying attention to their inner experience already in the preparation for entering the circle,

that attitude will be conducive to the emergence of a potent inter-subjective field of "shared mindfulness" allowing us to sense what is happening more accurately, think more clearly, act more coherently, and achieve greater collective results.

MINDFULNESS WHEN SHARED EXPANDS FREEDOM, JOY, AND CONSCIOUSNESS

WHY ELSE WOULD WE WANT TO EXPERIENCE SHARED MINDFULNESS, IF NOT FOR THAT EXPANSION?

Instead of talking *about*, can we talk *from* and to mindfulness? From mine to yours, from yours to mine? Separated by time and space, but connected by a shared curiosity, we can choose to bring our attention to what is happening in this inter-subjective exchange between us right here on this page.

Don't think that your part is merely passive here. I exist because of you, in the sense that my thoughts are coming from the felt sense of our communication because I know that you're there and curious. Thanks to the gifts of modern communication technologies, you can also add your voice and describe your end of the experience. So, how is it when you read an essay with your body, allowing half of your attention to rest on the pattern of your breathing, while absorbing the words reaching you? (That's how I'm writing to prevent these heady subjects from coming only from my head.)

When two or more people are gifting their conversation and their inter-personal relationship with an intentional, choiceful attention, the space created between them becomes a space of shared mindfulness, regardless whether it is mediated by a physical or virtual space. Such a practice fosters a deeper sense of connection and adds more presence and significance to the experience of each participant.

Communities of mindfulness practice engaged in shared inquiry and joint discovery have been favoured places of accelerated personal and spiritual development throughout the centuries. Enhanced with today's communications technologies, they can make the shared experience and insights just one click away from their members, as shown by the practice of many online communities of inner development.

Inter-subjective or shared mindfulness is one of the inter-disciplinary fields where outer and inner sciences started meeting. There's a growing number of first-person descriptions not only of various meditative states and the practices to reach them, but also of different paths to inter-subjective mindfulness, labelled for instance, "Insight Dialogue," "Transparent Communications," "Magic in the Middle," "Evolutionary Dialogue," "Chaordic Chat," "Collective Presencing," "We-space" approaches, etc. Let's take a closer look at some of these practices.

CHAORDIC CHAT

> "This practice starts by breaking the habit of giving and receiving immediate response in real-time conversations, texting, on skype or on the phone. It gives access to a fuller intelligence of the parties in communication. When we take any insight, a striking inspiration, or a special resonance between possibilities, into the focus of our non-judgmental observing and contemplating them, then we can access a deeper intuition. Giving room to such contemplation, before moving to expression, is a gift to the conversation's highest potential[7]."

When groups of people are engaged in this practice something remarkable happens. As Viktor L Frank stated: "Between stimulus and response there is a space. In that space is our power to choose our response. In our response lies our growth and our freedom." When all participants in a multiparty exchange listen and respond from that spaciousness, the resulting shared freedom opens the doors to breakthrough possibilities in whatever domain of collective action.

MAGIC IN THE MIDDLE

"The magic in the middle begins with a shift in awareness, from parts to relations between parts. Imagine a circle of people in conversation. When we are interested in understanding the processes that take place in the conversation, we can pay attention to the individual in the circle, to the circle as a whole (group or team), or to the relations between the participants. All three realities coexist at once, but we can choose to let one of them come in the foreground.

"To pay attention to the field of relations is not the same as paying attention to the whole. The parts are still important. The whole is still important. But we are particularly interested in what goes on in the interaction between the parts, and let that reality come in the foreground[8]." This approach has nine distinct practices outlined in more depth in the article referenced.

TRANSPARENT COMMUNICATION

Transparent Communication resonates with the some of the practices of the Magic in the Middle or

Collective Presencing but takes them to a new dimension. It allows us to tune in with the inner experience of each other, simultaneously being present to our own reality, the reality of the other and the inter-personal field of energy and meaning.

These are some of the injunctions that make this form of shared mindfulness possible:

- Speak always from the Now;
- Continuously widen your perception of subtle energies;
- Keep the space of relationship always open, i.e in any context, independently of the contents of the conversation, don't contract but stay consciously connected even through feelings of unease or pain;
- Respect the different inner experiences of others even if you may not personally share them.

Transparent Communication is a competence people can cultivate and become better at. That is happening in TC practice groups around the world[9].

There are also a growing number of "*outer science*" approaches to shared mindfulness, scientifically studying it as a measurable object, without necessarily taking into account the scientist's direct experience of it.

INTERSUBJECTIVITY

"Intersubjectivity is a term used in philosophy, psychology, sociology, and anthropology to conceptualize the psychological relation between people, who construct meaning in their interactions with each other and used as an everyday resource to interpret the meaning of elements of social and cultural life […] Intersubjectivity emphasizes that shared cognition and consensus is essential in shaping our ideas and relations. Language, quintessentially, is viewed as communal rather than private […].

"The cultural value of *respeto* may also contribute to Intersubjectivity in some communities; unlike the English definition of 'respect,' respeto refers loosely to a mutual consideration for others' activities, needs, wants, etc. Similar to 'putting yourself in one's shoes' the prevalence of respeto in certain Indigenous American communities in Mexico and South America may promote Intersubjectivity as persons act in accordance with one another within consideration for the community or the individual's current needs or state of mind." (Wkipedia).

INTERPERSONAL NEUROBIOLOGY

Dr. Dan Siegel, psychiatrist and author of several books on *interpersonal neurobiology*, emphasizes that the mind is a relational, "self-organizational emergent process that is arising as energy and information flows not just in the body, certainly not just in the skull, throughout the body, but also as it's shared between people and among people and even with the planet. This sharing we call relational, this embodied relational process is self-organizing[10]."

> As we understand mind and language, they are relational, inter-subjective processes that in their everyday use, are not recognized as such. Understanding each other's meaning-making tools and frameworks, inner and outer scientists working together can make a greater difference for the sake of the common good than each can alone. Dan Siegel's insight points in that direction: "I think there's a moment in cultural evolution where people, on a grassroots level, can be empowered to learn how to focus their minds in a way that strengthens how the mind works, integrates the brain, and creates kinder relationships, both with other people and also with themselves[11]."

Can that moment in cultural evolution be *now*? When an interpersonal neurobiologist calls for massive empowerment by focusing our minds in a way that creates kinder relationships, it's also an invitation to practitioners of other disciplines to bring the gifts of their own arts to the same. It challenges us to complement our in-the-moment practices of shared mindfulness with the practices of sustainable, mindful relationships.

COLLECTIVE BIOFEEDBACK

If mindfulness refers to keeping one's consciousness alive to the present reality, and biofeedback is a process of gaining greater awareness of various physiological functions, including one's brainwaves, then their marriage was made in heaven, using instruments that feed back real-time information to the user. "The presentation of this information – often in conjunction with changes in thinking, emotions, and behaviour – supports desired physiological changes. Over time, these changes can endure without continued use of an instrument[12]."

Promoters of biofeedback-enhanced mindfulness practices and games claim that you can't improve what you can't measure. The seed of truth in that exaggerated statement is that real-time feedback assessing one's depth of meditative state can contribute to its further deepening.

The potential of group biofeedback for shared mindfulness didn't get lost on biofeedback scientists studying Heart Rate Variability (also known as Heart Rate Coherence). Users of certain biofeedback equipment can obtain real-time feedback about their "synchrony,

the time lag between the peak of the breath and the peak of the heart wave, around the end of the inhalation. The more closely the breath and heart wave are 'in sync', the lower the synchrony[13]."

The following work-in-progress project run by a professor at the University of California, Santa Barbara, sketches out a path to individual synchrony states getting connected and scaling up in larger groups.

"Pulse is a distributed collective biofeedback system that aims to synchronize the heartbeats of its participants […] The pulse rate is continuously collected from people, who choose to participate using a wearable device (optimally a ubiquitous device such as an iPod or cell phone). The pulse rate is transmitted via a wireless network to a computer. The computer calculates the average pulse rate and transmits it to the participants as a single beat sound played in the same device that recorded and transmitted the heartbeat […] Pulse aims to create a tangible experience of the relationship between individual entities and the networks they form and act within[14]."

Biofeedback is still rarely used in collective settings for examining and creating connections between participants. Synchronized heartbeats may induce a subjective experience of increased connection. Relational closeness doesn't automatically leads to shared integral mindfulness that also has an ethical component.

Enabling technologies are getting more and more sophisticated and commonly available. The state of consciousness necessary for human groups to make the best use of them is lagging way behind. When completed, the Pulse would let participants become aware of their shared heartbeat. However, unless their culture has shared purpose and values and an attitude of striving for competence in some inner technologies, then it is unlikely that the outer technology of biofeedback can deliver on its potential for fostering shared, integral mindfulness.

That brings us back to the role of the teachers and practitioners of inner sciences, and also brings us forward to examine collective intelligence and sentience.

COLLECTIVE INTELLIGENCE

WHAT IS COLLECTIVE INTELLIGENCE?

Becoming mindful of how our moment-to-moment experience is shaped by the social relations in which we participate is not enough. The challenge and opportunity of socially engaged meditators is to not only experience our social world mindfully, but help it evolve beyond the limitations imposed on it by outdated socio-economic system. None of us can do it alone; for that, we need to mobilize and augment our *collective* intelligence.

Collective intelligence is an emergent capacity of social groups (of any size), which enables them to evolve towards higher-order harmony and complexity, through such innovation mechanisms as differentiation and integration.

Of course, that is only one of the many definitions of CI. That one is seen through the "evolutionary" lens and differs from the "wisdom of crowd"-type CI and, possibly, from some other definitions used in this issue of the journal. The emphasis on emergent quality distinguishes it from "additive CI" that merely states, "two minds are better than one."

That evolutionary lens is complementary to a cognitive lens through which CI can be seen as follows: "Intelligence refers to the main cognitive powers: perception, action planning and coordination, memory, imagination and hypothesis generation, inquisitiveness and learning abilities. The expression 'collective intelligence' designates the cognitive powers of a group[15]."

I introduced what CI might look like through important lenses of political economy and information technology here[16], which I don't elaborate on in this essay due to space limitations.

What we perceive as practical applications and implications of CI differ also according to whether we look from an intra-personal, inter-personal, or transpersonal perspective. Let's explore CI in those three dimensions.

CI STARTS WITHIN – THE INFRA-PERSONAL DIMENSION: HOW COLLECTIVE INTELLIGENCE MANIFESTS IN *MYSELF*

We are part of a vast web of collective intelligence and it is part of each of us because we are products of the evolving intelligence of life itself. Not to mention our ancestors in the mineral, plant, and animal kingdoms, we are products of many millennia of social evolution. We couldn't have language, tools, not even our most intimate thoughts and feelings, without the long journey of CI in humankind's history.

Given that, we might do well to ask ourselves: How does CI manifest in *myself*? What is *my* collective IQ (C-IQ) and how could I boost it?

I first asked those questions in a presentation I gave at the University of Ottawa in 2004, using a 6-pole model of CI developed by Pierre Lévy for discerning and assessing the main CI resources an individual or a collective has.

Lévy's 6-pole Model of the Main Resources of Collective Intelligence

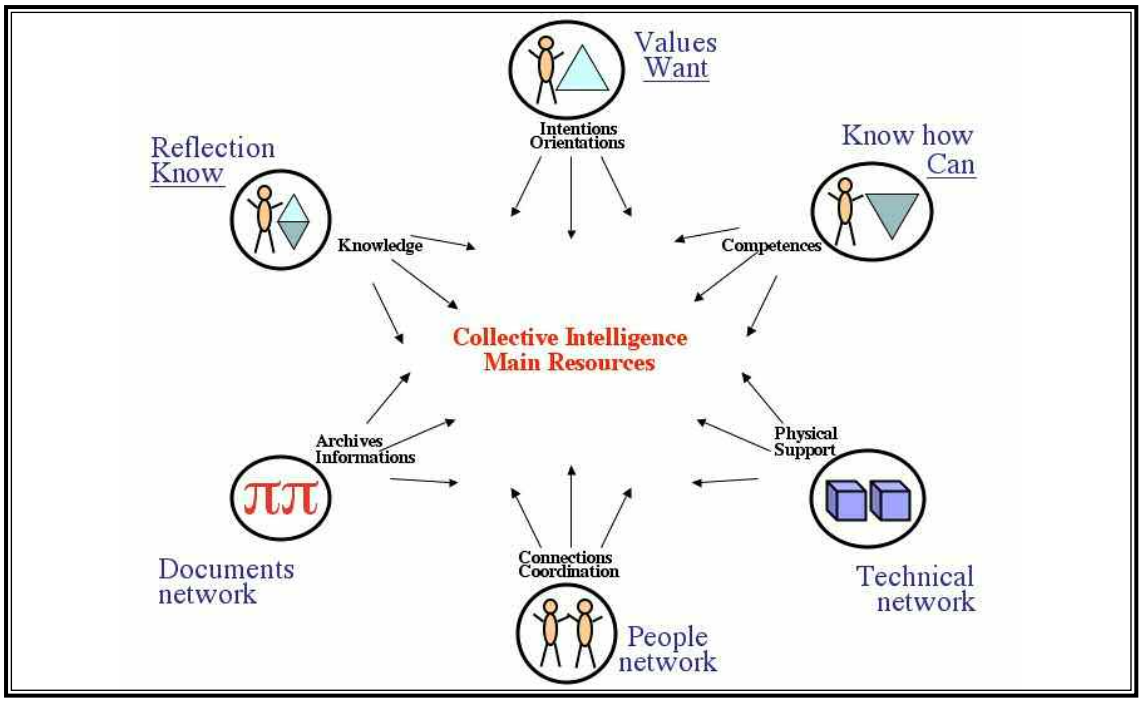

FIGURE 2 ~ *Pierre Lévy's diagram quoted in* Social Software and CI?[17].

The top half of the diagram represents the three virtual resources of CI and the bottom half its three physical resources. Extrapolating that the intelligence potential of a biological organism increases with the number of connections among the cells in their nervous system, I suggest that the C-IQ of a social being (individual or collective) is proportionate with the level of connectivity within and across of the 6 CI pictured above. Below are 6 examples of what the increased connectivity within the 6-pole resources of CI may mean.

1 ~ The permanent inner chatter of the mind, with its frequent jumps to unrelated thoughts, creates a disjoint series of only loosely-connected *reflections*. We can grow higher coherence in that chatter by practicing contemplation, meditation, and visualization of our mental models. Growing competence in any of those arts will boost our C-IQ. The practical value of the capacity to maintain a more coherent inner discourse cannot be overstated.

2 ~ If my *intentions* are driven by a rowdy bunch of competing desires and ambitions, then my C-IQ, the capacity to co-evolve with others towards higher harmony and complexity, will be compromised. Correspondingly, if my intentions are aligned and oriented by the evolutionary value of continually upgrading my consciousness, compassion, and capacity to absorb more complexity, then chances are, my C-IQ will be even higher.

3 ~ Humans may not swim as swiftly as dolphins or run as fast as gazelles but we have a repertory of competences far richer than other species. Our intellectual *competences*, such as memory, sensing, discerning, intuiting, etc. are all related with each other. Exploring the nature of their complex interdependences, one can find the sweet-spot of interdependence among all those capabilities. Most likely, it will be the one with the biggest influence on coherence within the ecosystem of those capabilities.

4 ~ Our document networks and personal knowledge ecosystems provide us with the many gifts of *recorded memory*, including the opportunity to examine and increase the coherence of our mental models. How well our personal knowledge gardens are tended has a huge impact on everyone's C-IQ.

5 ~ The wider and more diverse is my *people network* of trusted relationships, the more connected I am with a larger variety of life experiences and perspectives on reality. A web of mutually supportive relationships is also a booster of my C-IQ.

6 ~ Finally, the *technical network* supports all the 5 other poles of CI -in-me, by putting at the disposal of each of us a wide array of *enabling technologies*, e.g.: massive and miniaturized memory storage, two-way and communal high-speed connection with the Web, and much more. All of that can be connected in configurations optimized for supporting and augmenting CI -in-me.

Now, let's envision widening the scope of our exploration of how to increase the connection not only *within*, but also *across* the 6 poles. For example, what if we could turbo-charge the creative potential of value flowing from our *reflections* to our *enabling technologies* and vice versa? Imagine, what could it enable and make possible?

The circular flow of *information* and energy between our *intentions, recorded memories*, and *trusted relationships* is another key factor of C-IQ. The vitality of that inner flow decides the breadth and speed of access to the collective mind, which comes in handy when we need to mobilize that access for meeting the key challenge or opportunity at (our individual or collective) hand. The elegant beauty of the 6-pole model of CI is its scalability from individuals to small and large groups.

CI OF THE RELATIONAL FIELD – THE INTER-PERSONAL DIMENSION: COLLECTIVE SELF-REFLEXIVITY

When each of us observes patterns of interest in what we pay attention to, in a communal or organizational setting, and share them with other members, we sow the seeds for collective self-reflexivity to sprout. It is a capacity of human groups to reflect upon the content of their collective sensing and meaning-making.

For a collective entity to become a fully co-intelligent living organism, it needs to gain competence in the arts of collective self-reflection (CS-R), including proficiency in building and using collective sensing organs. The latter can include collaborative blogs, wikis, and sensing and meaning-making practices in face-to-face and online group events.

Well-tended collective self-reflexivity can lead to a more fine-tuned sensing of reality, more attuned and agile collaborative meaning-making processes, thus, higher C-IQ and wiser action.

"Within 10 to 20 years, the human family will have in place the communications infrastructure that could support a quantum increase in the collective intelligence – and the collective consciousness – of the species[18]." If Duane Elgin's epiphany is to come true, epochal shifts will happen in the next year. In fact, we are already in the midst of some of them; we just don't know their likely outcomes. To enable the best outcome of those shifts, organizations, groups, and other collective entities need to build capacity for cultivating their collective self-reflexivity.

In conversations on the "How" of CS-R, a frequently recurring question is: "But will it scale?" Here are two other questions that may be more practical: What is needed for enabling CS-R in groups of increasing scale? How to optimize the initial conditions of its collective DNA for continually updating itself?

Some insight about those questions can be gleaned from the three principles of the Master Code of the Human Hive[19]. Those principles are; Take Care of Yourself, Take Care of Each Other, Take Care of This Place". (It's remarkable those principles and the associated practices were pioneered by high school students in Canada.)

Taking care of each other and this place/organisation/planet wouldn't be possible without becoming ever better at practicing collective self-reflexivity.

I also keep hearing the question: when to exercise CS-R? Any moment when a community is facing critical challenges or opportunities is a good moment for exercising its "collective self-reflexivity" muscles. How well-performing those muscles will be at those hot moments depends on how well-trained they are.

CI OF NOOSPHERE – THE TRANSPERSONAL DIMENSION: LETTING COLLECTIVE INTELLIGENCE USE US FOR ORGANIZING ITSELF

I frequently email a tweet I stumble upon in my tweet stream to friends, family, colleagues, and clients, if I know that it reflects one of their interests, or I tag them in a thread on Facebook, letting the system alert them to it.

That's because nobody can spend all the time in the stream, yet staying current with what is unfolding in cyberspace around issues of priority interest is a need of more and more people. Subscription services may help a little but we risk creating the notorious "filter bubble," filtering out everything we didn't know how to ask for.

The good news is that the larger the circle of friends who care for us, the better the chances that we can stay informed of not just 0.5% but maybe 1% of what we need to know to stay current. No keyword-based filtering system comes close in effectiveness to a network of humans in mutually supportive relationships, where they act as "organic" sensors for each other.

Relying on an intuited map of resonances, which shows the intersections and adjacent areas between my own topics of interest and those of my friends, I send the gems I pick up on my surfpath. What makes me an "organic" sensor is that unlike most algorithm-based filters, I read their feedback so the excitement that my pointer has (or hasn't) generated, informs and motivates me to refine my catch-and-forward strategy.

In my post on the Blog of Collective Intelligence[20], where I wrote about this, Heinz Robert responded

by saying: "I am always grateful for hints and links of friends who think that can be useful for my work and/or development. That's what friends are for."

Pamela McLean wrote there: "We can do our own practical learning-by-doing, and reflection and then connect in conversations, on topics of overlapping interest, which are enriched by our different perspectives. We can share information, exchange questions, gain insights and possibly create new knowledge together. Thanks to the Internet we can do all that without needing to travel to international conferences or being part of formal professional bodies. We are gradually discovering how we can be part of a world-wide shared-learning-and thinking community."

Comments from them and others who joined our conversation across space and time, made clearer for me that while "friends are doing what they are for," something else is also happening, unbeknownst to them.

Patterns of connections are getting generated in the global brain, and maybe even the trust and intelligence flowing through them can reach wider and deeper.

The most influential nodes in that brain are not individual humans, but the various kinds of glocal-scale[21] learning and thinking communities, particularly, communities of practice and epistemic communities1 organized around various domains of knowledge.

"Neurons that fire together, wire together" seems to be true not only for our brain's neural processes, but also for the global brain. If so, we can be sensors not only for each other, but for collective intelligence itself, letting it use us for organizing itself, by increasing the neural connections inside and among our communities. We let it use us, when with some new, valuable information at hand, we're wondering, who else can benefit from this info?

Helen Titchen Beeth, another commenter of this blogpost further refined the "organic sensor" position, writing about "practicing what you plead for here: that collective curation and skilful sifting for potent nuggets of meaning that can bond with other nuggets to create novel compounds and – who knows – even new life-forms! A small inner voice said 'you could do that for this conversation' – and then a deeper knowing said 'no, this one is not for you… or not yet/now'. Which adds another coloured thread to our weave: There's more to this than just relationships between nodes. It is as if we are each rooted in our unique place in the Kosmos and can learn to hear feedback directly from 'the source' about what is uniquely ours to do[22]."

Titchen Beeth's point about orienting her choices by a sense of what is uniquely hers to do rhymes with my own sense of how the selection of topics we attend to is the precise place where our own life journey and the journey of our self-organizing social mind meet. If I gain some clarity about the particular question to which my particular life/journey is the answer, it will inform the kind of memes/topics to which I attend.

Many other interesting things are also happening at the same time, in that very same act of letting certain issues attract us to curate them (for self and others). For example:

- Trails of hyperlinks between groups, issues, memes, are being built and travelled, giving rise to new perspectives that emerge from the pathways connecting them.
- Some emergent areas of our distributed mind are gaining more attention.
- Some practices and principles of participatory epistemology[23] and liberating epistemology[24] start appearing.

I think what makes all those synchronously occurring trends possible is that "content curation is the natural evolution of our globally networked consciousness." The author then says: "This sounds like a bunch of hippie drivel, but we really are creating a global brain, of sorts, by encoding human knowledge and tracking human activity. Using the human nodes of this network to strengthen some of these connections while weakening others (by choosing either to pass along i.e., 'curate' information or not to pass it along) helps this global brain function better as a system, which in turn increases its power whenever any of us need to tap into it[25]."

I couldn't have said it any better. Of course, it's not only the global brain functions better thanks to our active and conscious participation; our individual brain does too. It's very plausible that the global brain is increasing its power whenever any of us engages with it. But an even bigger game-changer on humanity's evolutionary journey is: A fully functional global brain, with all its advanced affordances, will enable us to bring its resources to bear on meeting individual and collective needs of the multitudes, only the few. That will open the possibility for humankind to awaken to its collective sentience.

COLLECTIVE SENTIENCE

WHAT IS SENTIENCE AND COLLECTIVE SENTIENCE?

Are you sentient? You wouldn't doubt that. How about an animal, a bacteria, or a plant? Sentience is not a binary concept. An entity is not either sentient or not. The meaning of the "sentience" distinction ranges from the entity being capable of perceiving

and feeling, to being sensitive and responsive to the vital needs of its parts and its whole. For current purpose, I use the latter meaning.

Another description of sentience comes from the Buddhist tradition. "Sentience seems to be characterized by awareness and care. This is sentience as understood by Buddhists and others who talk about sentient beings. Such sentient awareness is basically openness, space, within which things discriminate themselves. And that openness is characterized by compassion […] we feel a kinship with sentient beings […]"[26].

Collective sentience is not exclusive to humans; we find it in a school of fish that can turn on dime, or a troop of baboons protecting collectively their babies in face of external aggression, or the forager bees following the pattern of the swarm's waggle dance to find key resources.

The development of language and increasingly complex communication tools in human groups and society gave rise to a new dimension of collective sentience: the capacity to care for the well-being and evolution of the species itself, as well as its habitat, its larger encompassing whole. We see an early, limited manifestation of that capacity, when the human family gathers bringing aid to disaster victims.

Higher levels of collective sentience may be characterized by:

- the human species bringing to bear the fruits of our collective intelligence on urgent challenges;
- the eradication of war and other forms of man-made suffering;
- and ultimately, the development of an evolutionary guidance system[27] for spaceship Earth.

Given that evolution is an open and emergent process, Banathy's concept of "evolutionary guidance system," and the "intentional evolution" that I wrote about in the context-setting session of this article, do not imply some sort of social engineering. In both cases, we are talking about *self*-guided evolution, in which collective entities, including the human society as a whole, cease seeing themselves as only objects to/through which evolution just happens, and start recognizing that they have choices about its unfolding.

Evolution's arrow points to higher complexity and harmony, but the process doesn't advance in a straight line; it can move through detours and even fall back to previous stages, at tremendous human cost. Hence the importance of reaching higher levels of our collective sentience. The aspiration for that is an integral part of an evolutionary ethos of moving towards higher-order harmony. Given the dominance of today's individualist culture, its realization is only one of the possible futures.

THE GLOBAL BRAIN NEEDS TO BE JOINED BY THE GLOBAL HEART

Thinking about sentient humanity, the slowly emerging planetary meta-being, I wrote last year: "for it to be viable, its collective mind needs to be joined by a collective heart, consciousness plus compassion. That will start a new leg of the human family's learning journey: the era of the species-being's collective sentience[28]."

Quora is one of the engines of our global-scale collective intelligence, or to put it in more specific terms, "Quora is a question-and-answer website where questions are created, answered, edited and organized by its community of users. Quora aggregates questions and answers to topics. Users can collaborate by editing questions and suggesting edits to other users' answers." (Wikipeda)

I decided to run a small experiment for using a tool of collective intelligence to explore an aspect of collective sentience. I asked this question on Quora: "The metabeing cannot come alive before having a global brain AND heart. What will do the same for the new civilization what the heart does for the body?" The question received a number of thoughtful responses, from which I quote one:

"This question is best answered by analogies about function, not anatomy. The heart is a metaphor for functions of the entire organism that go far beyond the physical heart's mechanical interpretation as a pumping device. Brain and heart are physical structures that symbolize two different but not really separate, styles of intelligence conventionally called 'thinking' and 'feeling'. The brain is considered the seat of thinking, and the heart is considered the seat of feeling and emotion […] What function(s) do heart and emotion serve in individual humans, and what might accomplish analogous functions in the collective meta-being? The 'heart' has at least the following functions (the many meanings of which are suggested by common idioms using "heart"). These are 'design affordances' for the 'global heart':

- Distribution of energy and nutrients;
- Rhythm, pacing, and coherence;
- Sense of central unity, for self and towards others;
- Relationality and social attunement;
- Excitement and motivation, vitality;
- Hope, courage, and intention;
- Assessment of what is worth doing"[29].

I took that long quote because I like both the depth of that reply to my question and the playful spirit suggesting that the list of functions are 'design

affordances' for the 'global heart'. It's fascinating just to think about how the global heart would be "designed" if it were optimized for those affordances.

Who are the designers and is there an identifiable design process? Clearly, anything as complex as the "global heart," which seems more of a process than a "thing", cannot be designed; it can only emerge from favourable conditions.

Nevertheless, those conditions can be and are being promoted by trailblazing "We-space communities"[30], Circles of Presence[31], and other groups where members hold and support each other in their highest potential. The injunctions and practices used in those groups, worth replicating, deserve a well-resourced collaborative learning expedition to the tip of the evolutionary wave.

Collective sentience at increasing scale will emerge when communities and organizations start learning to sense, think, and act from the biggest "We" that they can put their arms around.

CONCLUDING NOTE ABOUT THE SHARED MINDFULNESS, COLLECTIVE INTELLIGENCE, AND COLLECIVE SENTIENCE OF YOU AND ME

The first outline of this essay was much more expansive than I ended up writing. It had a number of sections that didn't make it into what you've just read, including important topics, like collective consciousness, we-space, collective wisdom, and various approaches for augmenting them. The plan felt like the pilot for a book I always wanted to write.

Around the turn of the year, I went on a two-week writing retreat on a mountain in the middle of an awe-inspiring national park of Catalonia. I was looking forward to it for months but when the time came, I had a nasty and persistent cold. Nursing myself back to health took most of my first week, leaving very little energy for writing.

When I was down to my last five days of the retreat, I noticed how much I grew attached to the original plans for the article, which by now, given the shortness of time left, became impossible to pursue. That noticing rang a mindfulness bell inside my head, which shifted my relationship to the process of pulling the pieces of this essay together. It shifted the restricting feeling of performing to a scope anticipated months ago into the joy of writing from the living centres of what is true and most alive for me now, and trusting that their inner coherence would somehow manifest in the outer coherence of what was produced in those five days.

It was like some kind of mental congestion got removed by changing the direction of the writing process from outside-in to inside-out. I am grateful to all readers for that shift because it was our shared mindfulness, collective intelligence, and collective sentience that made it possible. Let me explain.

> Writing is communing, a passage of the chasm from me to we. You've been present with me in creating this essay, in all the choices I made about it, including the shift in my attitude about the writing process I mentioned above. Your voice inside me made it clear that what's important is not how complete the story is, but how authentically it is poured forth from my passion, because only then can it connect with yours.
>
> The presence of collective intelligence of the Spanda ecosystem also helped me letting go of the anxiousness about the imperfections and blemishes due to the shrinking time left to complete the article. When the writing is alive and generative, the writer creates only the first draft; the readers produce the next. Given the affordances of the digital media, we might just make this a reality.

Finally, a word about our collective sentience, our caring for a possible better world, which connects us. As you were reading certain passages, your caring has probably evoked both some resonances in your heart and new questions in your mind. Our collective sentience can be summed up in the question: What are we willing to do for each other and the field that holds us? Will you share with the other readers and me your questions, concerns, appreciations, whatever can take this inquiry forward?

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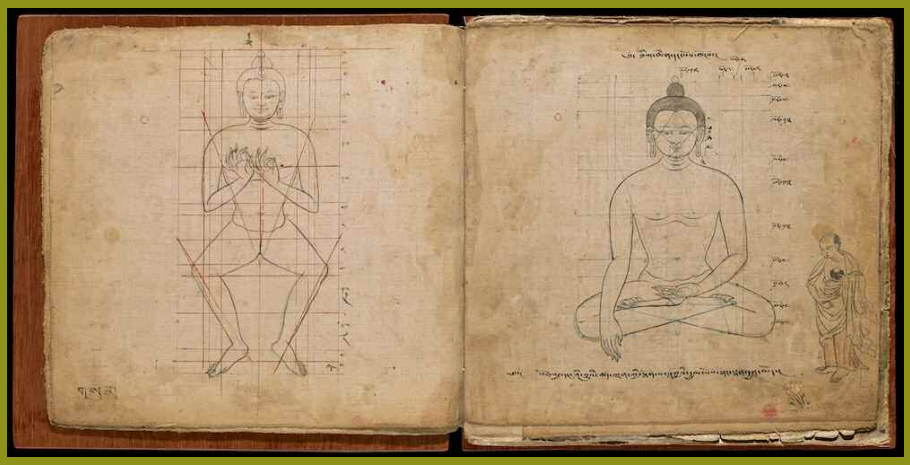
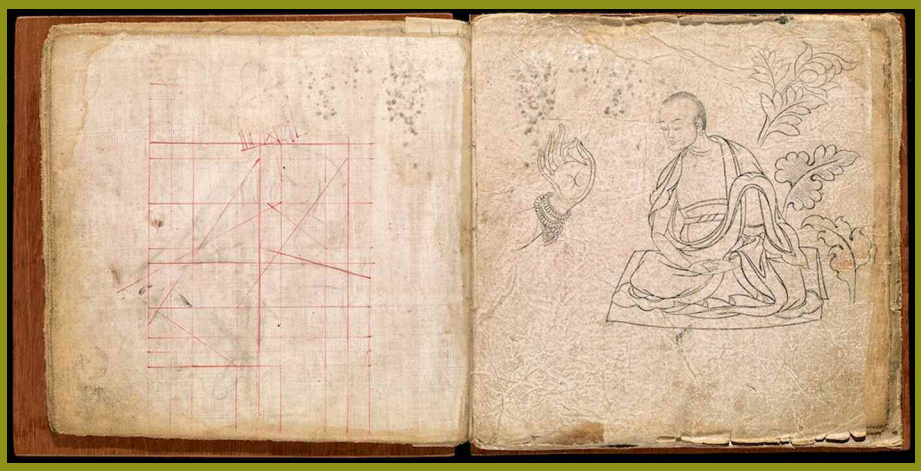
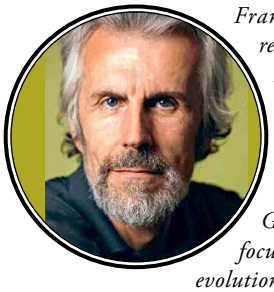




THE TIBETAN BOOK OF PROPORTION ~ SHEET 9-12.

FRANCIS HEYLIGHEN

CHALLENGE PROPAGATION: TOWARDS A THEORY OF DISTRIBUTED INTELLIGENCE AND THE GLOBAL BRAIN



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Mr Heylighen has authored some 150 scientific publications in a variety of disciplines, including a monograph and four edited books. Since 1990 he is the editor of the Principia Cybernetica Project*, an international organization devoted to the computer-supported collaborative development of an evolutionary-systemic worldview. He is a former editor-in-chief of the* Journal of Memetics*, which he co-founded in 1996, and is currently a member of the editorial boards of the* Journal of Happiness Studies*, and of the* International Journal of Knowledge and Systems Science*. His work has received a wide international recognition; he is a Fellow of the World Academy of Art and Science and member of the Global Agenda Councils of the World Economic Forum.*

INTRODUCTION

Contemporary science sees societies, organisms and brains as *complex adaptive systems*[1]. This means that they consist of a vast number of relatively autonomous agents (such as cells, neurons or individuals) that interact locally via a variety of channels. Out of these non-linear interactions, some form of coherent, coordinated activity emerges – a phenomenon known as *self-organization*[2]. The resulting organization is truly *distributed* over the components of the system: it is not localized, centralized or directed by one or a few agents, but arises out of the interconnections between all the agents.

The present paper will focus on the *distributed intelligence*[3] of such a self-organizing system, because this is what most fundamentally distinguishes the new paradigm from the older paradigm, which sees problem solving and decision making as centralized, sequential processes. We will define *intelligence* as: the ability to process information so as to efficiently solve problems and exploit opportunities. What are considered problems, opportunities – or more generally *challenges* – will depend on the goals and values of the decision-maker, who can be an individual organism, an organization, or the global superorganism[4]. Efficiently dealing with a challenge means selecting and performing the right actions that solve the problem or exploit the opportunity.

Traditional models of intelligence in cognitive science and artificial intelligence see the process of problem solving as a search through a space of potential solutions. The attempts to simulate the neural networks used by our brain, however, led to the notion of parallel, *distributed* processing of information[5]. The idea is that different units or "neurons" deal simultaneously with different aspects of the problem or question. In other words, the problem is split up into aspects that are processed by several autonomous agents (active units) working in parallel, without central supervision or direction. Their contributions are then reassembled or aggregated into a collective solution.

A fundamental advantage of this approach is flexibility and robustness. The many contributions ensure redundancy of function: individual units may be unavailable, produce erroneous results, or lack relevant data, but the resulting errors tend to be compensated by the signals coming from the other units, so that the aggregate result normally is informative – even in the most confused situations. In a centralized, sequential process, on the other hand, a single malfunction along the line can be sufficient to throw everything off-course, so that no useful result is produced.

The same mechanism of compensating for individual ignorance or bias by aggregating a large variety of contributions characterizes successful applications of *collective intelligence*[6]. But in typical social systems, distributed intelligence is more than collective intelligence: contributions do not only come from the people in a collective, but from a variety of artefacts, tools and technologies that sense, register, store, process or transfer information. This is the perspective of *distributed cognition*, originally proposed by the ethnographer Hutchins[7]. In real-world problem solving, we routinely rely on tools such as pen and paper, maps, cameras, telephones and calculators to gather and process information. We also rely on other people to provide us with their

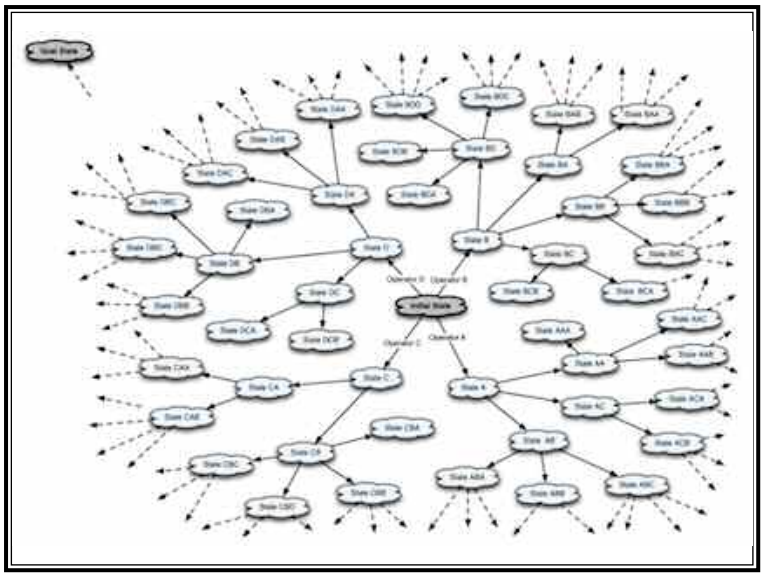

FIGURE 1 – *An illustration of the exponential explosion in the number of possible paths leading from an initial problem state via subsequent steps (or "operators") to the goal state or problem solution.*

unique observations, skills or ideas. For a complex system – e.g., a Navy ship[8] – to function well, all the people and artefacts involved need to work together in a *coordinated* manner, by sending the right messages at the right moments to the right destinations.

This paper wishes to introduce a new paradigm, *challenge propagation*, which synthesizes my older work on spreading activation in individual and collective intelligence[9], and my more recent ontology of action[10]. The basic idea is to combine the notion of "challenge", which is defined in the action ontology as a phenomenon that elicits action from an agent, with the notion of "propagation" or "spreading", which comes from models of neural networks, memetics[11], and complex systems, and which denotes the process by which some phenomenon is iteratively transmitted from a point in a node in a network to the neighbouring nodes.

The intention of this work is to provide a conceptual and mathematical foundation for a new theory of the *Global Brain*[12], which is defined as the distributed intelligence emerging from all people and machines as connected by the Internet. However, the notion of challenge propagation seems simple and general enough to also provide a foundation for a theory of distributed intelligence in general. This includes human intelligence – which as neural network researchers have shown is distributed over the billions of neurons in the brain[13] –, the collective intelligence of insects, but also various as yet poorly understood forms of intelligence in e.g., bacteria[14] or plants[15].

In fact, I assume that – in contrast to traditional, sequential models of artificial intelligence – all forms of "natural" intelligence are distributed. This means that they emerge from the interactions between a collective of autonomous components or "agents" that are working in parallel. This perspective has also been called the "society of mind"[16]: a mind or intelligence can be seen a collaboration between relatively independent modules or agents. More generally, intelligence can be viewed as the capability for coordinated, organized activity. Excluding "intelligent design" accounts – which presuppose the very intelligence they purport to explain – this means that intelligence must ultimately be the result of self-organization[17], a process which typically occurs in a distributed manner.

Another reason to focus on distributed intelligence is that traditional intelligence models – in which a well-defined agent solves a well-defined problem (and then stops) – are completely unrealistic for describing complex, adaptive systems, such as an organization, the Internet, or the brain. In such systems, everything is "smeared out" across space, time and agents: it is never fully clear who is addressing which problem where or when. Many components contribute simultaneously to many "problem-solving" processes, and problems are rarely completely solved: they rather morph into something different. That is why the notion of "problem" will need to be replaced by the broader notion of "challenge" and the sequential, localized process of "search" (for a problem solution) by the parallel, distributed process of "propagation".

The difficulty, of course, is to represent such a complex, ill-defined process in a precise, mathematical or computational manner. There exist already a number of useful paradigms for doing this, including multi-agent systems, complex dynamic systems, neural networks, and stigmergy[18]. The challenge propagation paradigm is intended to synthesize the best features of these different models. The present paper will sketch the conceptual foundations that are necessary to build such a model, while leaving the mathematical development for another paper[19].

A BRIEF REVIEW OF INTELLIGENCE MODELS

The most simple and common definition of intelligence is *the ability to solve problems*[20]. A problem can be defined as a difference between the present

situation (the initial state), and an ideal or desired situation (the goal state or solution). Problem solving then means finding a path through the "problem space" that leads from the initial state (say, x) to the goal (say, y)[21]. This requires determining the right sequence of steps that leads from x to y (see FIGURE 1). For non-trivial problems, the number of potential paths that need to be explored increases exponentially with the number of steps, so that it quickly becomes astronomical. For example, if at each stage you have the choice between 10 possible steps, there will be 10n possible paths of length n. That makes one trillion for a path of merely 12 steps long! That is why "brute force" approaches (trying out all possible paths in order to find the right one) in general do not work, and need to be complemented by what we conventionally call "intelligence".

The more problems an agent can solve, the more intelligent it is. Note that this definition does not provide an absolute measure of intelligence, as the number of problems that a non-trivial agent can solve is typically infinite. Therefore, counting the number of solvable problems does not produce the equivalent of an IQ. On the other hand, the present definition does produce a *partial ordering*: an agent A is more intelligent than another agent B, if A can solve all problems that B can solve, and some more. In general, though, A and B are incomparable, as B may be able to tackle some problems that A cannot deal with, and vice versa.

The partial order provides us with an unambiguous criterion of progress: if an agent, by learning, evolution, or design, manages to solve additional problems relative to the ones it could deal with before, it has become objectively more intelligent. Natural selection entails that more intelligent agents will sooner or later displace less intelligent agents, as the latter will at some stage be confronted with problems that they cannot solve, but that the more intelligent ones can solve. Thus, the more intelligent ones have a competitive advantage over the less intelligent ones. Therefore, we may assume that evolutionary, social, or technological progress will in general increase intelligence in an irreversible way. Yet, we should remember that in practice intelligence is highly context-dependent: more important than the absolute number of problems you can solve, is whether you can solve the problems that are significant for you in your present situation. Adding the capability to solve some purely theoretical problems that have no value in your present or future environment will in general not increase your fitness (i.e., probability of long-term survival) – and may even decrease it if it would make you waste time on contemplating irrelevant issues.

The simplest model of intelligence is a *look-up table* or *mapping*. This is a list of *condition-action rules*, of the form: if your problem is x, then the (action you need to perform to attain the) solution is y. In short: if x, then y, or, even shorter: $x \rightarrow y$. An example is the table of multiplication, which lists rules such as: if your problem is 7 x 7, then the solution is 49.

The next, more complex model of intelligence is a deterministic *algorithm*. This is a sequence of actions that need to be performed on the initial state in a particular order. The sequence is typically iterated until the state it produces satisfies the condition for being a solution. An example is a procedure to calculate 734 x 2843 or a program that determines the first 100 prime numbers. Such deterministic procedures to manipulate numbers, or more generally, lists of symbols, have given rise to the notion of intelligence as *computation*.

A deterministic algorithm (like multiplication) is guaranteed to produce an acceptable solution after a finite number of steps. Problems that are more complex do not offer such a guarantee: trial-and-error will be needed, and, by definition, you do not know whether any trial will produce a solution or an error. In this case, the best you can hope for is a *heuristic*: a procedure that suggests plausible paths towards a solution. Heuristics do not necessarily produce the correct solution: they merely reduce the amount of search you would have to perform with respect to a "brute force", exhaustive exploration of the problem space. The better the heuristic, the larger the reduction in search and the higher the probability that you would find the solution after a small number of steps.

The view of problem solving as computation or as heuristic search seems to imply a *sequential* process, in which the different actions are performed one by one in a central location. A first step in our intended generalization towards distributed processes is the reinterpretation of problem solving as *information processing*. The initial state or problem statement can be interpreted as a piece of information received by the agent. The solution of the problem is a new piece of information produced by the agent in response to the problem statement. The task of the intelligent agent is then to transform or process the input information (problem, initial state, "question") via a number of intermediate stages into the output information (solution, goal state, "answer").

While the term "information processing" is widespread, its meaning remains surprisingly vague: how exactly is a given piece of information transformed into a new—and presumably more useful or meaningful – piece of information? Apart from deterministic computation, which is merely a very specific case of processing, I do not know of any general,

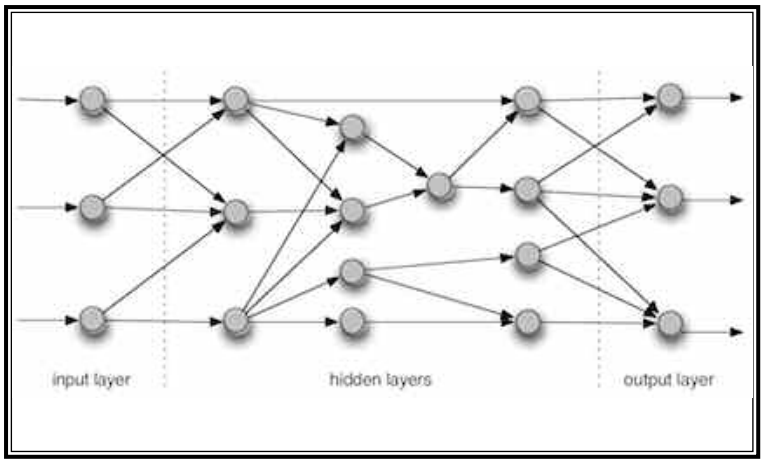

FIGURE 2 – *A neural network with links (represented by arrows) connecting nodes (represented by circles). The problem is posed by differentially activating the nodes in the input layer. This activation propagates across the hidden layers while undergoing processing. The final activation pattern of the output layer is read off as the solution.*

formal model of information processing. But this vagueness is an advantage as it allows us to consider a variety of mechanisms and models beyond sequential algorithms or search.

One of the most successful alternative models of information processing can be found in neural networks[22]. In the simplest case, the network consists of connected units or nodes arranged in subsequent "layers", with the connections pointing from the "input layer", via one or more "hidden" layers, to the final "output layer" (see FIGURE 2). Information processing happens simply by presenting the information to the input layer (in the form of a pattern of activation distributed across the nodes), letting that information propagate through the hidden layers (during which the activation pattern changes depending on the strengths of the connections), and collecting the processed information at the output layer by reading the activation pattern of the final nodes. This seems to be in essence how the brain processes information: the input layer represents the neurons activated by sensory organs (perception), the output layer represents the neurons that activate motor organs (action), and the hidden layers represent the intervening brain tissue processing the sensory information.

The more general version of such a "feedforward" network is called a "recurrent" network. The difference is that a recurrent network allows activation to cycle back to nodes activated earlier. Thus, there is no imposed direction "forward", from input layer to output layer. The input in this case is simply the initial pattern of activation over all nodes. The output is the final pattern of activation after it has settled into a stable configuration.

Compared to the sequential models of intelligence, neural networks have two big advantages:

- processing happens in a parallel, distributed manner, making it more robust and flexible;
- the network does not need an explicit program telling it how to perform the process: it can learn from experience.

The distributed character of neural networks means that its information and "knowledge" are not localized in a single component: they are spread out across all the nodes and links, which together contribute to the final solution. This makes the processing much more robust: individual components may be missing, malfunctioning or contain errors; yet, the disturbances this introduces to the process are drowned out by the contributions from the other components when everything is aggregated. In a sequential process, on the other hand, every step or component through which the process passes constitutes a bottleneck: if that component breaks down, the process may never recover.

The learning happens via a general "reward" or reinforcement mechanism: links that have been successfully used in producing a good solution become stronger; the others become weaker. After many experiences of successful or failed processing, the relative strengths of the different connections will have shifted so that the probability of overall success has become much larger. This intrinsically simple mechanism only works for complex problems because of the distributed character of the processing: if only the process as a whole could be rewarded or punished, this would not produce enough information for it to learn a complex, subtle procedure consisting of many different actions collaborating towards a global solution. Because the process is distributed, its components can learn individually, so that the one can be reinforced at the same time as its neighbour is weakened, thus rebalancing their relative contributions.

CHALLENGES

FROM PROBLEMS TO OPPORTUNITIES

The view of intelligence as a capability for problem solving or information processing runs into a fundamental issue: what is a meaningful problem, or meaningful information? Why should an intelligent agent address certain problems or process certain information, and

disregard others? In other words, how does an agent decide what to do or pay attention to? In the approach of traditional artificial intelligence (AI), this issue is ignored, as AI programmes are conceived essentially as question-answering systems: the user or programmer introduces the question (problem, query, input), and the program responds with an answer (solution, output).

On the other hand, the issue becomes inevitable once you start to design autonomous systems, i.e. systems that should be able to act intelligently in the absence of an instructor telling them what to do. Such a system should at least have a *value system*, i.e., a set of explicit or implicit criteria that allow it distinguish "good" outcomes from "bad" ones. Given the ability to evaluate or value phenomena, the agent can then itself decide what aspects of its situation are "problematic" and therefore require some solution.

However, acting autonomously is more than solving problems. A situation does not need to be "bad" in order to make the agent act. When you take a walk, draw something on a piece of paper, or chat with friends, you are not solving the problem of being "walkless", "drawingless", or "chatless". Still, you are following an implicit value system that tells you that it is good to exercise, to play, to be creative, to see things, to build social connections, to hear what others are doing, etc. These kinds of values are positive, in the sense that they make you progress, develop, or "grow" beyond what you have now, albeit without any clear goal or end point. Maslow in his theory of motivation called such values "growth needs"[23]. Problems, on the other hand, are defined negatively, as the fact that some aspiration or need is *not* fulfilled. With such "deficiency" needs, once the goal is achieved, the problem is solved, and the motivation to act disappears. This implies a conservative strategy, which is conventionally called "homeostasis", "regulation", or "control": the agent acts merely to compensate perturbations, i.e. phenomena that make it deviate from its ideal or goal state.

The reason that this is not sufficient is evolution: the environment and the agents in it are constantly adapting or evolving. Therefore, no single state can be ideal in all circumstances. The only way to keep up with these changes (and not lose the competition with other agents) is to constantly adapt, learn, and try to get better. That is why all natural agents have an instinct for learning, development or growth. Therefore, they will act just to exercise, test their skills, or explore new things.

The difference between positive (growth) and negative (deficiency) values corresponds roughly to the difference between positive and negative emotions. Negative emotions (e.g., fear, anger, or sadness) occur when a need is frustrated or threatened, i.e. when the agent encounters a problem that it may not be able to solve. Positive emotions (e.g., joy, love, curiosity) on the other hand, function to broaden your domain of interest and build cognitive, material, or social opportunities or resources[24]. In other words, they motivate you to connect, explore, play, seek challenges, learn, experience, etc. Negative emotions tend to narrowly focus your attention to the problem at hand, so that you can invest all your resources in tackling that problem; positive emotions tend to widen your field of attention so that it becomes open to discovering new opportunities for growth.

A general theory of values should encompass both positive or growth values, and negative or deficiency values. From an evolutionary perspective, all values can be derived from the fundamental value of fitness (survival, development, and reproduction), since natural selection has ensured that agents that did not successfully strive for fitness have been eliminated from the scene.

The present paper will assume that intelligent agents have some kind of in-built value system, and assume that those values elicit specific actions in specific situations. For example, in a life-threatening situation, the fundamental value of security or survival will lead the agent to act so as to evade the danger – e.g., by running away from the grizzly bear. On the other hand, in a safe situation with plenty of promise, the value of curiosity will lead the agent to explore a variety of opportunities in order to discover the most interesting ones. The positive or negative intensity of such a situation will be denoted as its *valence*. Valence can be understood as the subjective appreciation by an agent of the global utility, well-being or fitness offered by a particular phenomenon or situation[25]. It can be represented by a number, which is larger than zero for positive situations, smaller than zero for negative ones, and zero for neutral or indifferent ones.

DEFINITION OF CHALLENGE

We come to the most important new concept discussed in this paper: a *challenge* is a situation that potentially carries valence for an agent, so that the agent is inclined to act—in the case of negative valence by suppressing the perceived disturbance(s); in the case of positive valence by exploring or exploiting the perceived opportunity(ies). More concisely, we can define a challenge as a *phenomenon that invites action from an agent*. Negative challenges correspond to what we have called problems; positive challenges represent affordances for growth or progress. But note that these are not opposites but

Valence prospect	**Positive**	**Negative**	**Unknown**	**Indifferent**
Directions (proactive)	Goals	Anti-goals	Mysteries	Pointers
Diversions (reactive)	Affordances	Disturbances	Surprises	Variations

TABLE 1 ~ *A 2 x 4 classification of challenge types.*

independent dimensions, since a challenge can carry both positive and negative valences. For example, for a hunter, encounter with a wild boar is both an opportunity, since a wild boar has tasty meat, and a problem, since a wild boar is dangerous. For a company, a free trade agreement can be both positive, because it gives access to new clients, and negative, because it opens the door to new competitors. A challenge incites action because it represents a situation in which not acting will lead to an overall lower fitness than acting – because the agent gains fitness by taking action, loses fitness by not taking action, or both. Thus, a challenge can be seen as *a promise of fitness gain for action relative to inaction*.

However, a challenge merely inspires or stimulates action, it does not impose it. The reason is that a complex situation will typically present many challenging phenomena, and the agent will not be able to act on all of them. For example, someone surfing the web typically encounters many pages that seem worth investigating, but obviously cannot read all of them. We may assume that an agent is intrinsically capable of choice, and that this choice will be determined partly by subjective preferences, partly by situational influences, partly by chance, i.e., intrinsically unpredictable, "random" fluctuations. Therefore, it is in general impossible to determine exactly how an agent will react to a situation, although it should be possible to derive statistical regularities about the most common choices.

One of the reasons for this unpredictability is that agents have *bounded rationality*[26]: they lack the information or cognitive abilities necessary to evaluate all the different challenges. They therefore have to make "informed guesses" about the best course of action to take.

In addition to positivity and negativity, other dimensions worth considering in order to compare challenges are[27]:

~ *prospect* (in how far can the agent foresee the different aspects or implications of the challenge?),

~ *difficulty* (how much effort would be involved in tackling the challenge?), and

~ *mystery* (in how far would tackling this challenge increase the agent's prospect concerning other challenges?).

Prospect distinguishes expected challenges (which direct the agent's course of action and allow it to work proactively towards (or away from) a remote target) from unexpected ones (which divert the course of action, and force the agent to react). Combining the prospect dimension with different aspects of the valence dimension produces the simple classification of TABLE 1 (an extension of the one in[28]). The valence dimension has here been subdivided in not only positive, negative and neutral ("indifferent") values, but also the "unknown" value, which represents the situation where the agent does not (yet) know what valence the challenge may have.

Indifferent challenges, while having zero valence, can still function as "challenges" in the sense that they incite actions different from the ones that the agent would take in their absence. For example, a temperature of 15°C, while being neither positive nor negative, requires a different type of clothing than a temperature of 25°C. Indifferent challenges that are foreseen may be called "pointers" or "markers" as they indicate remote phenomena or circumstances worth taking into account while setting out a course of action. For example, a landmark, such as strangely shaped rock, can help you to orient yourself while walking towards your goal, without being in itself valuable. Indifferent challenges that are not foreseen may be called "variations" or "fluctuations", as they merely represent the normal type of diversions, such as changes in weather, traffic conditions, people you pass on the street, etc., that are not exactly predictable but not surprising either.

Unknown challenges are potentially much more important than indifferent challenges, as they may turn out to have a high positive or negative valence once more information is gathered. Therefore, they tend to invite action with much more intensity. When their presence is foreseen, they may be called "mysteries" as they represent a focus for curiosity and exploration, inviting the agent to gather additional knowledge. An example would be the entrance to a cave that you can see from afar, however, without knowing what is inside the cave. When they appear unexpectedly, they may be called "surprises" as they functions as sudden warnings that the agent's knowledge has a potentially dangerous gap. An example may be someone shouting at you from

across the street, which may be an expression of anger or a greeting.

FROM ACTIVATION TO RELAXATION

An advantage of the *challenge* concept is that it is a generalization not only of the *problem* concept, but of the concept of *activation* on which neural network models are built. Indeed, from the definition it follows that a challenge "activates" an agent, by inciting it to act.

In neurophysiology, the more accurate name used to describe neural activation is "action potential". This denotes a transient rise in the electrical potential of the neuron. This potential is propagated along the neuron's axon to its outgoing synapses, where it can be transmitted to connected neurons. The underlying mechanism is the following: an increase in potential energy creates a disequilibrium or tension between the parts of neurons that are "activated" and those that are not (that remain at a lower potential).

More generally, in physics a difference in potential energy between two points determines a force that pushes the system from the high potential to the low one. Examples are the voltage that forces electrical current through a wire (or through an axon), or the gravity that pulls a rock down from the hill into the valley. That disequilibrium or force is ultimately what makes the system "active", what compels it to act. The movement from the higher to the lower potential brings the system back to equilibrium, a process called *relaxation*[29], as it eliminates the tension or potential difference. In the case of a wire or axon, relaxation implies a propagation of the electrical current or activation from the higher to the lower potential.

The same reasoning can be used to understand the resolution of challenges. A challenge can be seen as a *difference* between the present situation (the problem or opportunity) and the ideal situation (the solution or successful exploitation of the opportunity). Note that the neutral concept of "difference" allows a challenge to be interpreted positively (opportunity) as well as negatively (problem). This difference creates an imbalance or tension that needs to be relaxed, typically by propagating it along some medium until the difference is dissipated. An example is a wave in water or in air: a local disturbance (e.g, a stone thrown into a pond) creates a difference in height or density between the disturbed and non-disturbed parts of the medium; this difference (wave front) then spreads out further until it fades away. In the case of a wave or electrical current, the direction of propagation is obvious: just follow the potential gradient in the direction of steepest descent. In the typical challenges that confront intelligent agents, the direction is much more complex, as there are many possible routes to increase fitness (i.e., decrease tension). This requires an exploration of different routes, in parallel or in sequence, so as to find the better one. This will bring us to the need to better understand propagation.

An important difference between simple relaxation models and challenge models is that intelligent agents, unlike physical systems, must remain in a far-from-equilibrium state: they are constantly active, consuming energy, and trying to avoid at all costs a complete standstill (i.e., death). Therefore, while they are inclined to relax existing challenges, they will also seek new challenges (affordances, resources, opportunities), unlike physical systems. In that sense, a "challenge relaxing" dynamics only describes part of their behaviour, and must be complemented by a "challenge seeking" dynamics that is better described by some form of active exploration. This is the equivalent of what we have called positive or growth values. It is illustrated in the brain by the fact that thinking never stops: activation does not simply diffuse until it fades away; action potentials are continuously generated by the brain itself, even in the absence of outside stimuli that play the role of challenges needing to be relaxed.

We may assume that different agents have different value systems, and therefore different "ideal" situations. Therefore, the same situation will produce different challenges for different agents. All agents will try to relax the challenge, i.e. reduce it to the case where the present situation equals the ideal situation, by acting on it or "processing" it. This allows them to either extract benefit from the opportunity, or reduce the penalty imposed by not solving the problem. But in general a single agent will not be able to fully exploit an opportunity or fully solve a problem, i.e., completely relax a challenge. This means that the situation after processing by one agent still constitutes a challenge for one or more further agents, which have a different value system defining the "ideal" situation, or a different set of skills for dealing with the challenge. Thus, some part of the challenge tends to remain, ready to be address by other agents.

This produces a complex dynamics of challenge processing and propagation: each agent dealing with a challenge will normally extract some benefit from it, thus relaxing some aspects of the challenge, while leaving some others to be passed on to further agents. If we focus only on the remaining aspects, we see a mechanism of information transmission similar to the spreading of memes[30]: messages are communicated

from agent to agent, without undergoing much change, until they have reached everyone that may be interested in the message. This could for example describe the diffusion of a particular innovation, fashion, or scientific theory.

If we focus on the challenges aspects that are processed, we see a self-organization of workflow and division of labour[31]: different agents perform different tasks that are part of a common challenge, and then pass on the remaining challenge to others with different skills and/or needs, up to the point where nothing of value is left to extract (i.e., all tasks have been done). To better understand such distributed processing of a challenge we will need to investigate the dynamics of propagation.

PROPAGATION ACROSS NETWORKS

A GENERALIZED CONCEPT OF PROPAGATION

The notion of challenge was introduced as a generalization of the notion of a problem or opportunity that confronts an individual agent[32]. In contrast to the standard paradigm of individual problem solving, the challenge propagation paradigm investigates processes that involve a potentially unlimited number of agents. To deal with this, our initial focus must shift from agent to challenge: what interests us is how an individual challenge is processed by a collective of agents distributed across some abstract space or network. Instead of an agent travelling (searching) across a space of challenges, we will consider a challenge travelling (propagating) across a space of agents. This change in perspective is similar to the one that distinguishes memetics from traditional social science models of communication[33]: instead of focusing on the individuals communicating, memetic models focus on the information ("memes") being communicated.

In general, propagation denotes the spreading or transmission of some recognizable pattern, such as a wave, a species, or an idea. The movement of such a pattern has specific characteristics:

- the interaction is local, as the pattern is initially transmitted only to the immediate neighbours of the point it originated in, who pass it on to their neighbours, and so on…
- the pattern tends to spread outwards so as to cover an ever larger area;
- it tends to change while spreading;
- some part or trace of the pattern may remain in the places through which it passed;
- the pattern needs a physical medium to carry it while propagating;
- this medium has a characteristic topology (such as a 2-dimensional surface for a wave, or a social network for a meme) that affects the shape and extent of the spreading;
- the medium may have additional properties such as time lag, density, or friction that affect the speed of propagation as well as the changes occurring to the pattern.

All these characteristics can be found in messages that are passed along across the Internet, or in activation that spreads across the brain. Since challenges are generalizations of these phenomena, propagation appears like the natural way to describe their dynamics.

STIGMERGIC AND NETWORKED PROPAGATION

There are two paradigmatic cases of challenge propagation: stigmergy and propagation across a network. *Stigmergy* is a mechanism whereby a challenge left by an agent in some medium or space that is shared with other agents stimulates those others to further address that challenge[34]. For example, a paragraph added to a Wikipedia page by one person may incite a second person reading that page to add some extra details, a third one to add a reference for the new material, and a fourth one to correct a grammatical mistake. The reference may then be checked and more accurately formatted by a software agent. Here, challenges are spontaneously addressed by subsequent agents as mediated by the shared space (in this case the Wikipedia page).

In this case of stigmergy, a challenge remains available in a public medium or workspace that all agents can access. If an agent decides to take on the challenge, it will perform some actions that change the state of the challenge and then leave the modified challenge in the medium. At a later stage, some other agent may pick up the modified challenge, and perform some further work on it, again leaving the "traces" of its work in the medium, where it can function as a challenge for some further agent. The "workflow" from agent to agent self-organizes, as the one leaving the challenge does not know who will pick it up later. Here, the changes in the challenge in a sense propagate in time, but not in space, as they remain in the same place.

In the case of propagation across a social or neural network, the workflow is controlled by the agents themselves: an agent that has finished working on a challenge passes it on to one or more specific other agents. An example is an email message sent and forwarded with comments from person to person, a "post" in a social network or forum that is reposted to other forums, or a task that is proposed by a crowdsourcing system to people interested to work on it. Here,

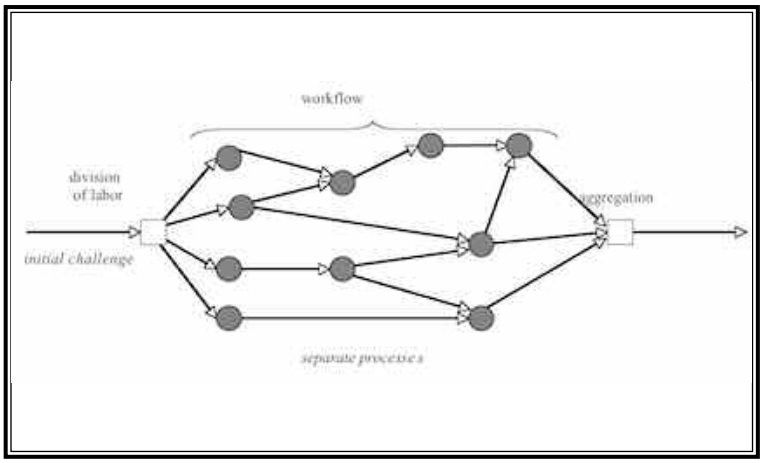

FIGURE 3 ~ *An illustration of coordination, in which an initial task is split up in separate activities performed by different agents (division of labour), which are followed by other activities (workflow), and whose results are assembled into a final product (aggregation). Grey circles represent individual agents performing activities. Arrows represent the propagation of challenges from one agent to the next.*

a challenge moves from agent to agent by following the available links in the network. In this case, the topology of the network (which node is connected to which other nodes) fundamentally determines the propagation process: a challenge can move directly from agent A to agent B only if there exists a link A Ó B in the network.

In the stigmergic case, the challenge can move from any agent X to any agent Y, without constraints. The only requirement is that Y should "visit" the shared medium some time after X deposited its modified challenge there. In the Wikipedia example, any person can modify any page at any stage independently of which other person has contributed to that page. An example of networked propagation is email, where A can pass a challenge on to B only if A has B's email address, and B has enough trust in A to take on challenges from A. This typically only happens if A and B have a social or organizational connection.

These are in a sense the extreme cases. What interests us here is the formulation of a more general theory that encompass both as well as the ground in between them. An example of such a "middle ground" is an Internet "forum", i.e., a place where discussions take place between a limited number of people belonging to a specific group or community. All members of the community can post messages ("challenges") to the forum, read the messages posted by others, and react to those messages (take on the challenge). However, people not belonging to the community can in general not access or create such messages. The forum acts as a private medium for the group. This is similar to stigmergic propagation in that a message is propagated to anyone in the community, but similar to networked propagation in the sense that the message is directed only to members of the community, and to no one else. The Internet as a whole can be conceived as a gigantic collection of such forums, which are partly overlapping, partly disjointed. A forum in the broadest sense can encompass everyone (e.g., anyone can read or write Wikipedia articles), just two people, or anything in between. We will use the term *forum* as the most general form of a "meeting ground" where people can exchange challenges.

To measure the intelligence of a distributed network, we can then try to establish its capacity to effectively process challenges. Normally, different agents have different skills in dealing with challenges. A complex challenge (say, global warming) has a large number of aspects that require different skills. The problem now is to *distribute* the different challenge aspects across the different agents so as to make sure the challenge as a whole is dealt with efficiently. This is the basic problem of coordination. It includes *division of labour* (who deals with what challenge component?), *workflow* (where does a challenge go after it has been partially dealt with?), and *aggregation* (how are all the finished pieces of work assembled?) (see FIGURE 3).

Perhaps surprisingly, such distributed coordination can self-organize relatively easily across the Internet, via both stigmergy[35] and networked propagation. A good illustration can be found in the different open source communities developing complex software without central supervision[36]. In both cases, challenges can travel more or less efficiently across the network of agents and workspaces until they find an agent able and willing to deal with them, and then continue their journey along other agents dealing with the remaining aspects. This allows complex challenges to be resolved in a distributed manner, by harnessing the collective intelligence of the different components (human and technological) of the network.

LEARNING IN THE DISTRIBUTED NETWORK

In the case of networked propagation, coordination requires an additional condition, however: the links between the agents that define the network should be appropriate to the task of distributed challenge relaxation. Otherwise, challenges are likely to be

passed on to agents that do not care about them, or that do not have the appropriate skills to deal with them. Establishing links is achieved via a learning process, which creates and "remembers" adequate links, while "forgetting" inadequate ones.

The similarity between a distributed network of agents and a neural network suggests that the distributed network should be able to learn by differentially strengthening or weakening its links. Delta learning is a form of reinforcement learning[37] in which a link is rewarded if it brings the challenge closer to relaxation, and penalized if it reduces relaxation. The link strength can then be increased by an amount proportional to the degree of relaxation (which may be negative). The interpretation of this operation is that if an agent transmits a challenge via a specific link (e.g., sends it to a friend, or posts it to a forum), and it observes that the challenge is adequately dealt with (e.g., the friend provides a good tip on tackling it, or the people on the forum collaboratively develop a solution), then the agent will be more inclined to use the same link in the future to transmit similar challenges. That means that the probability of use of the link, and therefore its weight, increases. Vice-versa, an unsuccessful transmission will decrease the probability of later use.

The network does not need any sophisticated learning mechanisms to adapt in this way to its usage. On the one hand, links strengths will be maintained and updated in people's individual memories as the degree of trust they have in the abilities of others to deal with specific challenges[38]. On the other hand, links will be stored in the external memory that is provided by the worldwide ICT network. For example, links will be created or reinforced by such mundane activities as adding someone's phone and address to your list of contacts, bookmarking a site, linking to someone on a social media network, or registering for some organization (and thus getting easier access to its tools and members). All these activities change the environment of the agent in such a way that this agent becomes more likely to communicate with selected other agents. Moreover, these changes will typically be triggered by successful interactions: you will normally note a person's address if that person was interesting or friendly, join a group if they appear to be doing good work, and bookmark a site if it contains useful information. If later it would turn out that the person, group or site is no longer relevant to your interests, you will similarly weaken your connection with them…

FURTHER RESEARCH

The challenge propagation framework appears like a very promising approach for modelling the complex distributed processes via which problems and opportunities are processed in a self-organizing network. After a conceptual analysis of the main components of the framework, we are ready to formally define these components and their relationships. This would not only provide a basis for a mathematical model of challenge propagation, but for a simulation aimed at exploring different variations of the model by investigating how they affect the overall intelligence of the network.

Presently, my research group is developing such a mathematical/simulation model, in order to investigate precisely how the distributed intelligence of the network increases as it selectively strengthens or weakens its links[39]. The distributed intelligence measure is simply the degree to which challenges are resolved by the networked agents as compared to the same group of agents without connections. Our working hypothesis is that distributed intelligence increases as the network learns better connections, and as the number of "forums" for stigmergy increase.

Our preliminary simulation, called *ChallProp*[40], indeed shows such self-organization of distributed intelligence. However, we will need many more runs with a variety of different parameter settings and variations on the dynamic mechanisms in order to achieve results that are statistically reliable and ready to be applied to more realistic situations. In the meantime, I hope that the present conceptual model will be sufficient to inspire other researchers to apply these ideas in a variety of situations that exhibit distributed intelligence.

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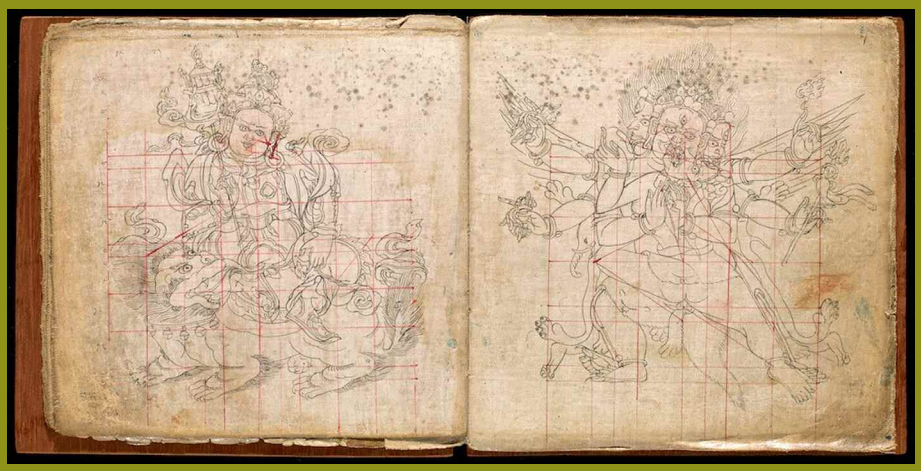

THE TIBETAN BOOK OF PROPORTION ~ SHEET 13-16.

CHARLES EISENSTEIN

QUALITATIVE DIMENIONS OF COLLECTIVE INTELLIGENCE: INTENTION, WISDOM AND THE SOUL

Charles Eisenstein is the author of numerous essays and books, most recently Sacred Economics *and* The More Beautiful World our Hearts Know is Possible.

There are two senses in which one might say a person, a machine, a group, an ant colony, or a planet is intelligent. The first and most dominant sense conceives of intelligence as the ability to solve problems – to produce an appropriate output given complex and varying input. We invoke this meaning of the word 'intelligent' when we speak of a smart phone, a smart power grid, or an intelligence quotient. It refers to a measurable function, or a set of measurable functions, that can be evaluated and compared. As such it falls within the province of science, which might be defined (per Galileo and Hume) as the study of the measurable.

Accordingly, most of the academic study of collective intelligence focuses on these measurable aspects, answering questions like, "Under what conditions do groups make wise or poor decisions?", "How does gender composition affect the problem-solving capability of a group[1]?", "How do various structures, agreements, and processes generate public opinion and decision-making[2]?" A typical study might consider feedback effects in Google search and other systems where popular choices, opinions, etc. feed back into the choices and opinions of others in the group can create a kind of stupidity, groupthink, or echo chamber.

There is a danger, though, in focusing on this rather narrow, measurable conception of intelligence. For one thing, it favours the kinds of problems we recognize and that we are able to formulate as discrete problems, for example as on a test. Problems that are amorphous, that don't admit to discrete formulations or to quantifiable solutions, escape our measures of intelligence. Very often, the excluded capacities correspond to other kinds of marginalization: racial, cultural, epistemological. IQ tests are notorious for their elevation to the exalted status of 'intelligence' that subset of mental capacities that accord with the values of the dominant culture. They measure, in large part, acculturation and conditioning, the mastery of the dominant or socially exalted mode of cognition. They also measure that part of intelligence that is measurable. But is that the only part? Are there aspects to the mind, whether individual or collective, that not only defy our measurement technologies to date, but that are inherently immeasurable?

Chastened by the deficiencies, in practice and in principle, of intelligence measures, we might want to adopt a more expansive conception of intelligence in undertaking an inquiry into its collective expression. A second meaning of the word suggests something beyond the measurable, something qualitative, irreducible. We use 'intelligence' in much the same way as we use words like sentience or consciousness, to refer to an aware subjectivity that perceives and experiences the world. Thus we speak of a divine, evil, or primordial intelligence, and distinguish between real intelligence and the semblance of intelligence. A smart phone, we might say, is not actually smart.

The distinction between these two senses of the word 'intelligence' echoes that between 'Strong AI' and 'Weak AI,' in the field of artificial intelligence. Weak AI claims that machines can act intelligently; strong AI says they can actually *be* intelligent.

Most work on collective intelligent implicitly assumes what would correspond to the 'weak' version of AI. Of course, one might say that each member of the collective (provided we are speaking of a human collective) has thoughts, so in a trivial sense the collective does think, understand, and possess consciousness. But is the collective itself, as an emergent being, have thoughts that are not identical with the thoughts of one or more of its members? Does the collective being understand something that none of its individual members do? Does it itself possess consciousness and subjectivity? We might call an affirmative answer to these questions the 'strong version' of collective intelligence, exemplified by Pierre Teilhard de Chardin's concept of the noosphere[3].

In other words, we all agree that groups can solve problems and enact various other cognitive functions. But does a group have a psyche? Does it have, distinct from that of its members, a subjectivity? Desires? Fears? Intentions? Really the question is, is a collective being a being, or is it just a kind of illusion, an expedient concept whose properties are fully reducible to and explainable by the properties of its parts?

Let me offer a few reasons why these are not idle questions. First, the actual effect of intelligence on the world depends on factors far beyond reasoning ability. Smart men and women have done horrible things; they have perpetrate the most arrant idiocy, due to no fault of their reasoning power, factual knowledge, or capacity to think abstractly or recognize patterns. If we grant the premise of collective intelligence, we must then ask what factors – cognitive or non-cognitive – might induce collective insanity as well. Some of these are already known – collective tunnel vision, the echo chamber effect, etc. – but perhaps by granting the collective beingness, and the various other qualities of self besides intelligence (or qualities contributing to an expansive view of what intelligence is), we can understand its behaviour better.

Descartes seemed to think that conscious thought was a necessary and sufficient condition for beingness: "I think, therefore I am." But a full human also feels, wants, loves, suffers, laughs… and we might say the emphasis on thought – which of all these qualities is apparently most exclusive to humans – is a form of the same anthropocentrism that through its disrespect for nature is laying waste this planet. Beings less like us, we relegate to a lower degree of beingness. Moreover, the identification of intelligence with thought, or with solving problems (of the kind that human beings are better able than other beings to solve), leaves out non-cognitive ways of interacting with the world that are part of an intuitive understanding of intelligence. It is with good reason we call an emotionally insensitive person clueless, whatever his powers of ratiocination. The narrow association of intelligence with (certain kinds of) thinking sanctifies the worldview, politics, technology, and social structure that was created through those kinds of thinking. Analysis, abstraction, linear reason, binary thinking, and so forth are quite useful for creating the society we have today. By the same token, the crisis of that society invites us to broaden our conception of intelligence along with the approach to life that conception valorises. This is the second reason to examine intelligence in the 'strong' sense as it applies to collectives.

Thirdly, the very same questions I've been asking about collectives might also be asked about the human brain. What, for example, is thought? It is a sequence or pattern of neural activity, not something that can be done by a single neuron (as far as we know). We normally think of intelligence as an emergent quality irreducible to the elements of its physical medium: conventional scientific opinion does not hold that because each neuron has a little intelligence, the brain has a lot. The brain, in the conventional view, exhibits collective intelligence, and it is obviously intelligence in the strong sense.

Because the same questions of subjectivity and interiority apply equally to groups, to computers, and to individual human beings, we might profitably look to the philosophy of mind for insight. In the vast literature on consciousness and subjectivity, most of the debate centres on the question of whether these require an immaterial soul; whether mental experience eludes reduction to physical processes. The camp established in modern times by Thomas Nagel, John Searle, and David Chalmers says yes: however well a machine might replicate thought processes, there will be something missing: the qualitative, the interior, the subjective conscious experience. Nagel says that because any reductive, objective account of consciousness necessarily leaves out subjectivity – what it is like to be something – that therefore, there must be some aspect of consciousness that transcends physicalist, reductive explanation[4]. Searle, developing the distinction between strong and weak AI, describes how a computer or other system could perform cognitive processes without actually understanding their content[5]. Chalmers, similarly, invokes the idea of the (philosophical) zombie, enacting all the behaviours of a conscious self, saying all the right things, but actually merely running a program empty of interior experience[6]. To even conceive such a thing, he says, shows that there must be some non-functional aspect to consciousness (and therefore to intelligence in the strong sense).

Their critics are legion and, while their critical approaches are diverse, generally agree that a reductive physical explanation of consciousness is possible in principle. No non-material soul is required. Their case appears to be growing stronger, as brain research keeps uncovering neurological explanations for (or at least correlates to) aspects of experience that we consider central to consciousness, such as volition[7] and attention[8]. The implication is that consciousness is sort of an illusion, a computational process, and not an irreducible aspect of reality.

Lurking within this debate is a hidden but highly significant agreement: both sides agree that we have no direct access to the subjectivity of another person. While some may argue that interiority is necessary

in order to offer the full range of responses that a human being does, most agree that there is no way of knowing whether someone has subjective interior experiences except by inference, for example, by asking them. The measurable dimensions of intelligence we can verify empirically; the qualitative aspect (granting that there is such a thing) we can only infer.

This agreement, however, takes for granted certain unstated metaphysical assumptions about knowledge and identity that we, the dominant intellectual culture, would do well to question. For starters, why is it assumed without much debate that no one can have direct access to the subjective experience of another person (or non-person)? This is obvious only if we conceive and experience ourselves as fundamentally separate from each other. There are other stories of self, however. We could see ourselves, as many spiritual traditions do, not as separate beings but as "interbeings," not just interdependent but interexistent. There are many alternatives to the separate skin-encapsulated soul of Descartes and contemporary religion. We might, for example, adopt the metaphor of the holograph or fractal, in which each part contains the whole. In that case, it would be no surprise if I could, under the right circumstances, experience that part of me that is you. The holographic model of self and world, while outside mainstream philosophic discourse, has been developed by such thinkers as Karl Pribram, David Bohm, and Michael Talbot; it also echoes teachings in Eastern religion such as Indra's Net.

This is not merely armchair philosophy. There are in fact many methods to induce the experience of subjective identification with other people – and not only people, but animals, plants, nations, planets, forces of nature, rocks, the earth, and other entities to which the Western mind would deny beingness[9]. These methods do not lend themselves to scientific or philosophical 'proof' of the subjectivity of other beings, even other people, because the very concept of proof depends on objectivity. When I say here that meditation, breathwork, or psychedelics can induce such states, I am making an assertion that rests on no firmer foundation than my own experiences and the subjective reports of people who have had such experiences.

Outside the Western mind, however, the ascription of subjectivity, intentionality, consciousness, and the rest to non-human beings is nearly universal. It extends not only to animals but to plants, mountains, rivers, the earth, the sun, even to rocks, in individual and collective expression. Thus, an encounter with a bear is also an encounter with Bear. In this way of thinking, collective intelligence in the strong sense is a given.

Despite our modern conditioning, we are not so different. It is quite natural for us to speak of "What Russia wants" or "What Microsoft wants," even though we might, if pressed, admit that nations and corporations aren't people and cannot have such a thing as a desire. Yet they behave as if they do. Or do they actually behave? Do they actually exist? Aren't they just human fictions, agreements, stories?

Maybe. But to a neuron, the brain itself is a story. One day, two neurons were having a conversation. "Whoa, dude!" one of them said, "I just had a trippy idea. What if it isn't just you and I who are conscious, what if all of us together are?"

The other neuron said dismissively, "Fun idea, but in reality all that is ever happening is you and I and billions of others of us having conversations with each other. That's what's happening on the base level."

"But then why are we collectively enacting behaviour that not a single one of us wants? Our collective being has been getting drunk every day, yet not a single one of us neurons wants to be doused in alcohol."

Nor is the desire of a nation or of a corporation merely some additive property of the desires of its constituent members. Anyone who has spent time in an organization can confirm that sometimes, the organization does something that only a tiny minority – or even none – of its members actually agree with. It is as if the organization has a mind of its own. And maybe it does. Each constituent is called into one of various roles, becoming that role in organizational life. While different personalities may be drawn to different roles, the role is prior to the personality, which must fit into it. The fit is of course never perfect; hence the near-universal feeling that the role is not really ones self, the feeling of being a puppet of the institution. This feeling is quite common even among its putative leaders.

Maybe the reason it seems that the organization has a mind of its own, is that it actually *does* have a mind of its own. Not separate from the minds of its constituents, neither is it reducible to them. Nor are the minds of its constituents separable from the group. We are social animals; we are not separate individuals having relationships – we *are* relationship. Beyond the separate self, the smallest unit of collective intelligences is a partnership, and most of us have experienced that in a partnership, who we are changes. We might consider that "who we are" in total is the integration of who we are in each of our social, economic, and ecological relationships. Strip those away, and there is nothing left.

In other words, we cannot say that collective intelligence is secondary to individual intelligence, or a mere epiphenomenon arising out of relationships among individuals. Each level, individual and collective, co-creates the other. To identify the locus of subjectivity in the individual is a cultural conceit – one not shared by other cultures that valued the we above the I, and gave it ontological primacy.

That is not to say that any random subset of socially related people constitute a collective being. There must be some kind of container that defines it; a selective social membrane that distinguishes self from other, formed of the agreements and perceptions of its members and the society that contains it.

If it sounds here like I am advocating something like a "group soul," maybe I am. Most intellectuals would probably be uncomfortable with such concepts, preferring to restrict any discussion of collective intelligence to its measurable dimensions. Intelligence in the strong sense I have invoked eludes the protocols of the Scientific Method, calling instead for a phenomenological approach. For one thing, it defies rigorous definition – how can one define, in more basic concepts, something that is itself elemental? If consciousness, subjectivity, and the 'qualia' of experience are not merely the artefacts of complexity, not mere abbreviations for properties of collections of neural states or, in the case of collective intelligence, interpersonal interactions, they will defy reductive explanation. They cannot be measured in physical units; therefore, following Galileo's distinction of primary and secondary qualities, we accord them a lesser degree of realness, or even deny that they exist at all. To be sceptical of such things as the "desire of the collective" or the "group soul" or "collective unconscious" is to stand securely in the demesne of science.

My purpose here is not to *prove* that there is some dimension of collective intelligence outside the purview of functionalism and reductionism. Even for the 'collective' of the human brain, centuries of furious philosophical debate has failed to come to consensus that such a proof exists. The mind composed of human beings rather than neurons offers no less formidable difficulties. My purpose, rather, is to suggest that we step outside the demesne of science into other ways of knowing, relating, and communicating. We cannot use objective means to prove the subjectivity of another being. But we can use subjective means. What does this look like?

For clarity, consider what it means to relate to another human being as a subject rather than an object. Even if no objective proof exists that other people aren't zombies enacting all the behaviours of a subjective experiencer without the interior content, and even though no one actually believes they are, to some extent most of us act as if we do believe it. We objectify other people, treat them as instruments of our own utility, as if they were less than fully a self. When we treat them as full subjects, however, we engage compassion: we consider *what it is like to be* them.

As Thomas Nagel explained in his influential essay, "What is it like to be a bat?" the essence of consciousness is that it is "like something" to be that other (person, animal, etc.)[10]. Most philosophers (but not indigenous people) agree that it is not like anything to be a brick or a rock – that these things are devoid of the qualities of self. Our reigning ideology claims that we have outgrown the childish perceptions of the indigenous, to see and manipulate the world as object. This condescending, arrogant, and ethnocentric attitude was much more compelling a generation or two ago, before the environmental crisis became impossible to ignore. Today, though, our arrogance is wavering, and we become more open to worldviews that do not arrogate the qualities of self to human beings alone.

Ultimately, our present ecological crisis has come largely because we see nature and everything in it as mere objects. The paradigm shift into an intersubjective world is inseparable from truly deep ecology. Will our ecological salvation come from merely being cleverer in our manipulation of a natural world that we continue to see as a collection of soulless stuff? Perhaps a deeper sort of revolution is necessary.

It is quite natural that, as part of this shift, we begin relating to collectives as beings-in-themselves with a selfhood transcending their constituent parts. As when we relate empathically to another person, the foundational question is, "What is it like to be that being?" What is it like to be that organization? That audience? That corporation? That nation? That is not to say that their experience of being is identical to the human experience; we cannot directly map human emotions and perceptions onto non-humans. What we can do is to relate to that being as a subject.

To the extent that we accept the subjectivity of collectives, that they can be intelligent in more than the problem-solving sense, we are invited to venture beyond analytic methods in studying collective intelligence – just as we must venture beyond neurology in understanding the individual human psyche. We all know that organizations exhibit 'behaviour'; that they can be efficient or inefficient, healthy or dysfunctional. Can they also go insane? Delusional?

Schizophrenic? Paranoid? Can they fall in love? Can they be afraid? Can they experience trauma? Healing? Do they have desires? Do they go through infancy, youth, senescence? Naïve intuition says yes, and while such questions may often defy quantitative study, we should not dismiss them as exercises in anthropomorphic projection. Who knows what avenues of qualitative research and practice might become apparent in asking such questions? Besides, they become quite natural as we expand our conception of selfhood beyond the human individual.

The field called organizational behaviour already accepts, implicitly, the premise of the selfhood of collectives. Interestingly, the concept has also entered politics with the controversial legal concept of the personhood of corporations. The word 'corporation' itself already suggests as much, denoting "that which forms a body (a corpus)." Notwithstanding the heretofore toxic consequences of the doctrine of corporate personhood, if we expanded that concept to "corporate selfhood," we might explore what kind of 'self,' what kind of being, a corporation is. (I speak here of corporations composed of actual people, and not those that exist only on paper.) What are its fears, its motivations, its character? These considerations might lead to insight on what kind of status they should be accorded under law.

It may of course be just as impossible to prove, through objective means, the subjectivity of collectives as it is to prove the subjectivity of another person. Nonetheless, the corporate example suggests that it can be a fruitful operating assumption (just as it is in interpersonal relationships). By accepting the validity of a phenomenology and a psychology of collective beings, we free research, activism, and organizational management to evolve. They cannot be left out of the larger paradigm shift toward a worldview of interconnection, ecology, and interbeing.

[1] Woolley et al, 2010.
[2] Atlee, 2012.
[3] Teilhard de Chardin, 1959.
[4] Nagel, 1974.
[5] Searle, 1980.
[6] Chalmers, 1995.
[7] Walsh, 2005.
[8] Neisser, 2012.
[9] See for example Grof, 1996.
[10] Nagel, 1974.

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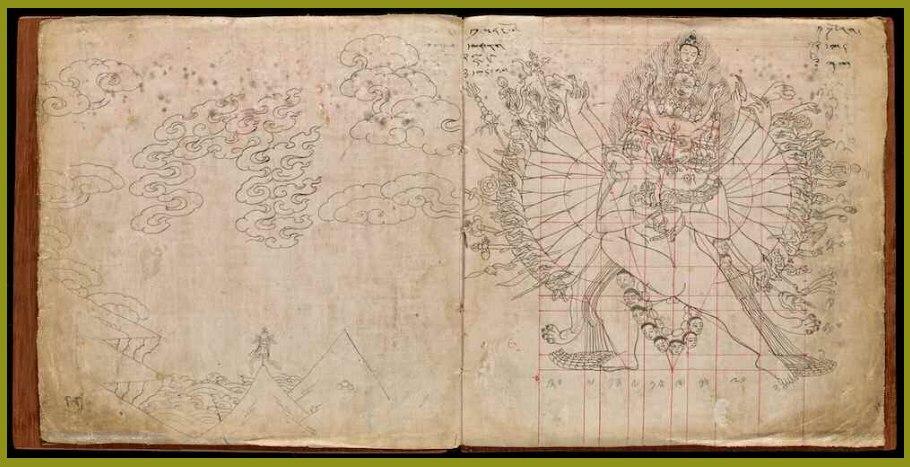

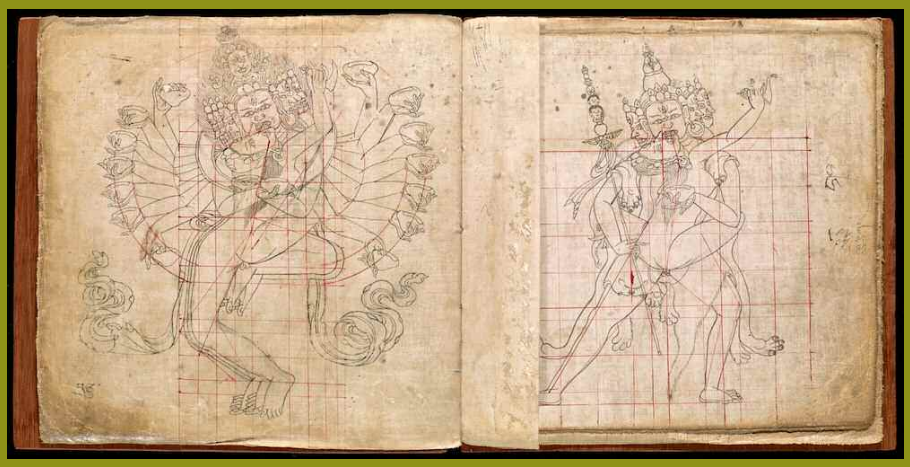

THE TIBETAN BOOK OF PROPORTION ~ SHEET 17-20.

DERRICK DE KERCKHOVE

CONNECTED INTELLIGENCE FOR THE CIVIL SOCIETY:

THE INERNET AS A SOCIAL LIMBIC SYSTEM

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DEFINITION

There are so many definitions of intelligence that it may be wise to return to the term's origin in etymology. From the Wiktionary, we have this proposal: Latin *intellegentia* (the act of choosing between, intelligence), from *intellegō* (understand), from *inter* (between) + *legō* (choose, pick out, read). However, on the Online Etymology Dictionary[1], we can read both intellegentia and intelligentia as the given Latin origins of the contemporary word. The difference is important because the latter version would indicate a different etymology based on "inter" and "ligare", which means to bind, to connect.

There are no strong reasons why "ligare", a more logical term, would not be considered as a possible alternative to "legere". In all modern languages derived from Latin, none have adopted the phonetic radical of <inter-legere>. In any case, even if ligare were not to be part of the true etymology, at least the proximity of the words and the subsequent shifts in the distinguishing phoneme invite the implicit notion of connecting as a connotation of the act of selecting more than a single item. Another word for understanding, "comprehend", reflects even more the notion of connecting things together[2].

All cognitive technologies from the telegraph to the Internet and social media derive their properties from carving specific connecting routines in the Internet to delve into selected modalities of relationships and knowledge. The present trends of information and cognition technologies have been based and guided on connecting people and things in various configurations to improve awareness, intelligence and knowledge. Hence we are back to a core meaning of intelligence: making the right connections mental, social or technological is what gives people improved access of their intellect to pertinent information. The case of Big Data is perhaps the best example of available cognitive potential that is only revealed by collecting and connecting the pertinent data. In Big Data, there is no answer before the question is asked. Big Data simulate a kind of total understanding that requires only the focus of a query to be manifested.

All technologies of data-tracking are presently converging very fast to be absorbed by and into Big Data. The commercial and social pertinence of knowing everything about us – to say nothing about security issues – makes that trend irreversible. Our destiny as a society immersed into digital culture worldwide is to become transparent. This is the exact opposite of the effects of literacy that made people individually opaque by internalizing and privatizing thinking. The ethics of opacity that guaranteed privacy were long in coming from the time of extortion and "question" during the Spanish Inquisition to the separation of Church and State and the rise of the private individual. This long-term trend is being reversed today. A new ethics based on transparency appears inevitable. It will probably give precedence to community over individuality.

CONNECTED INTELLIGENCE

Connected Intelligence is the active personal and collective cognitive environment that electronic technologies have weaved in and around us via the Internet in particular and electricity in general. It functions both as an extended memory and a processing

intelligence for each one of the users of electronic technologies from the telegraph to "cloud computing" and Twitter. It brings people together instead of separating them as alphabetic literacy did and it allows for any number of individual entries in a fluid information space definable for individual as well as collective and connective needs. It can take many forms whether pooling individual resources in services such as Google, Wikipedia and social bookmarking or externalizing and objectifying imagination in fictional but live 3D environments such as Second Life.

What I find intriguing about Second Life and other 3D virtual environments is that they emulate our imaginary processes but outside our heads on a screen. That externalization itself is already a surprising cognitive phenomenon, projecting the fictional universe in front of our eyes, instead of behind them. But, what is more, these simulations are allowing other people to share into them. The reason I call it "Objective Imaginary" is that it occupies a hybrid position between theatre (which is not directly affected by how we interpret it), and participative thinking, the way we actively participate in realizing in our minds the figures, places, sounds and other sensorial features of novels, merely to read them.

Let us consider all the intellectual resources we have learned to process in the intimate isolation of our own mind, such as planning, sorting, classifying, remembering, designing, calculating, most if not all of such cognitive operations are being taken over, expanded, connected, verified and distributed on line and via screens that "objectify" the processes themselves submitting them to our estimation for approval. Imagination is next. What is beginning to happen now is the opposite of what happened at the time Cervantes wrote Don Quixote. In that benchmark novel about a cognitive revolution, what changes the mind of the hero is his excessive reliance on reading medieval romances and his nostalgia for heroic times. Its all in his mind, of course, because it is in his mind that he processes the words of the novels he reads. Virtual Reality for him is in his head not on a screen. The difference is that today most people share their minds with a screen for any duration from 2 to 8 hrs a day.

CYBERSPACE AS A SHARED SPACE

As Pierre Lévy famously said, "Internet is not *in* space, it *is* space".

Concluding on preliminary observations in the introduction of a very influential book, *La production de l'espace,* Henri Lefebvre defines space as constituted by three distinct but interrelated spaces: "physical space : nature, the Cosmos, mental space (including logical and formal abstractions), and finally social space»[3]. Inspired by Lefebvre, sociologist Anna Cicognani adds cyberspace as yet another distinct but complementary kind of space :

> "Online Virtual Communities (VCs), in particular, represent an increasing resource for people using the Internet as a tool for various purposes, among others, information exchange and storing, communication, socialisation. More and more frequently, these communities are populated by a variety of citizens who look for more interactive aspects of online tools. Apart from obtaining information, there is the possibility of interacting with other users and ultimately to "leave a trace" of themselves in the online community"[4].

The "Always-On" generation (by which I mean not just the younger citizens but anyone who carries a cellular phone) is defined by being permanently accessible via mobile contraptions. It is a condition of trust and availability, a kind of incessant dialogue with the world. The "wired" generation of connection junkies circulate and recirculate information from the biological mind to that of the networks. The always-on generation builds its identity on line via social media and become dependent on the reputation its members acquire in such manner. This so-called "reputation capital" is garnered by manicuring profiles and connections. It is quite literally "plugged-in" the cognitive environment available via networks. For this generation the world is both global and geo-localized at the same time. Wherever you are, you are potentially in touch with the whole world.

As Doug Rushkoff already noted, children do not merely watch the television these days, as their grandparents did, they play with it. They multitask, they can handle several "windows" at once. Their intelligence relies on connecting to a perpetually refashioned hypertext of relationships and tag clouds, a hypertext of which they are themselves the central node. Young people are "friends" at 3 to 4 degrees of separation, while their grandparents needed to at least shake a person's hand a few times before considering oneself as a "friend".

Cyberspace is a sort of "computer-supported" social space that bridges the physical and the mental spaces. It is primarily a shared environment. Cyberspace, by definition, is shared via networks. It is entirely dependent on technological connections based on the refined management of electricity[5]. These networks are configured so as to ensure specific connections. The architecture of these networks differs in patterns and complexity depending on the numbers and the kinds of interactions required[6]. Connective intelligence can be assessed both in the creation of such networks and in the effect they foster.

With the exception of mental space, all four kinds of space are shared and up to a point, one could

argue that even mental space can be shared as in a classroom or seminar situation where the course material and the instruction diffuses in the student body a shared intellectual space. On the other hand, mental space is still deemed to be private although that very privacy is being threatened in all manners by digital data collection and cross-referencing, thus, on line at least, even that intimate recess is made public.

SHARED EMOTIONS ON THE INTERNET: THE SOCIAL LIMBIC SYSTEM

In his seminal approach to intelligence, Daniel Goleman[7] has added a critical element, which is its emotional component. This element proves important for social activism more often than not motivated by indignation, anger, fear, or a feeling of social solidarity as in so many examples since the world movements of Indignados, Occupy Wall Street, Anonymous or the Arab Spring. The Internet has a very important emotional dimension. People increasingly feel the need to share more and more personal details about themselves, their thoughts, feelings and ideas with the wider world, as part of their online existence.

This is true not just for the "friends" on Facebook, or for couples using match-making sites, but also for the whole of our lives as lived on this medium. It is true for how we share our politics via Twitter or our viral videos on YouTube. Social media act as the agent for conveying and sharing emotions. The online world works as an integrative system of impulses, desires and frustrations, which is moving at the speed of light. The grassroots activist sites such as Usahidi or Avaaz articulate collective emotions and connectivity amongst peoples across borders and cultures.

We share global emotions all the time, but we don't always realize it. Certainly we share a sense of the horror of crude decapitation, whether we have seen it on Internet or not. But we also share more latent emotions, such as the global dismay regarding the revelations – and subsequent treatment of Edward Snowden – and simultaneously experience a subconscious solidarity with the multitude on this topic. The era of transparency throws light on scandalous practices from trusted institutions. A global unease sets in making people ripe for local flare-ups. Throngs of persons are involved in and with Ukraine or Syria and everybody has an opinion. The scandals attending the Sotchi Games gave mixed feelings about Putin and Russia to many people.

The immediacy of social media enables the individual to get involved on an emotional level with current social and political issues. The readiness to respond emotionally to external public events results from the perception on the part of social media users, that they are connected personally with others sharing their own political views, with whom they are willing to share information and news in real time.

I like to use the organic metaphor of the human limbic system to describe this new system of social interaction. By using this metaphor, I want to explore the conditions surrounding the creation, communication and development of emotions on the Internet in order to throw light on the relationship between technology and psychology. It is important to understand this interplay before trying to analyse the ways in which the media modify our environment and how people are changed by the use of the media they are exposed to on a daily basis. This is especially important when it comes to a technology that transmits language, and which therefore becomes an interface between the technology and the mind of the user. Furthermore, in exploring the relationship between knowledge and the media, we can also examine the ways in which new technologies affect our conscious and unconscious processing of information and our affective responses.

When a medium is connected to the Internet, there are many emotional and cognitive events being transmitted from person to person, which in turn motivate the sharing of experience and also the call to political action. It is clear that today's geopolitical map of the world has been changed by the arrival on the political scene, via the Internet, of a new class of mass political activists, who are no longer the "Silent Majority".

So now that the majority is silent no more, the result is a kind of interactive human 'massification' consisting of the connections between many individuals who respond to some current issue as a significant collective. The Spanish network sociologist Manuel Castells called this the collaboration of many "mass individuals". Castells identified that the relationships that are established between individuals on a personal basis, from one person to another, are much more complex and articulated than those that come out of the reactions of the crowd or the anonymous mass. We can therefore imagine that the result of this endless interaction between individuals on the Internet is equivalent to the infinite multiplication of conversations over a cup of coffee.

These changes in the way we interact and relate to others in a mass social context are directly reflected in how we use contemporary media. In particular we can expect a redefinition of the distinction between public and private in the conversational context of the sites connected to social networks, as well as the emergence of new

forms of intimacy and the expression of emotions that reinforce both individual action and social interaction. This new experience of real-time sharing of information, emotions and opinions by individuals rests on what I call the emotional limbic system.

The limbic system regulates emotions in to the human body (as it does in all mammals). It is a complex set of smaller brain structures which occupy the inner part of the brain and is repeated in the two hemispheres. It was formed hundreds of millions of years ago, and is present in many other animals that are less evolved than man. This region of the brain, which is closely connected to the cerebral cortex, or grey matter, regulates and process information that conditions biological rhythms, and emotive responses such as, for example fear and aggression, or love.

We can more or less correlate the various elements and functions of the emotional network of the Internet's 'central nervous system' to biological organs. The screens and keyboards, and all the technical equipment of PCs, tablets and mobile phones, co-ordinated via the Internet, act like the thalamus transmitting information in order to bring about action. Similarly, data aggregators work like the hippocampus to combine information from different media and sources, and thus enable the system to grow. Social media, like Twitter in particular, can be equated to the amygdala, which plays the role of an accelerator and determines the amount and size of the emotional response to an event. Twitter stimulates its followers to instantly experience a wave of shared feelings with the crowd. Twitter is at once both very individual, touching everyone personally and revealing their inner being, while also extending the influence and impact of the crowd.

Social media, the hippocampus of the Internet, carry and store images and text that stimulate emotions and allow the aggregation of information and the sharing of facts and opinion in real time. Facebook, Twitter, chat rooms and forums, as well as other sites are highly regionalised, like Orkut in Brazil. They make people react in emotional waves that can bring people from different cultures, religions and social backgrounds together.

There is interplay between the personal and the public spheres in the views and arguments posted by anyone about current issues such as the global financial crisis, and the growing call for greater transparency and responsibility by large financial institutions[8]. The collective response via social media to issues such as these raises the growing indignation of the crowd. In the past, people tended to have more tolerance of corrupt governments or firms because there was a lack of accurate information, but now, especially after Wikileaks, there exists via social media a sort of permanent state of alertness that can trigger a collective cognitive response. The Wikileaks case was the start of a new political reality, where transparency *has a value*, information is currency, and where awareness and responsibility have become an ethical concern.

Indignez-vous!, a small book by Stéphane Hessel, published in France in 2010[9] started the international movement called 'Los Indignados'. The 28 pages spread virally via social media first in Spain and then in many other countries, producing over a thousand emotional waves beyond the borders of France. To quote Hessel:

> The real outrage is not borne by hating, but by empathy and solidarity with others, and in this sense it is a natural effect of interconnectivity associated with real political and social unrest. It moves beyond the need of the individual to be communal experience, something more universally human.

The Internet and Web 2.0 tools introduced into civil society a real possibility of unstructured expression, without hierarchies, participatory and collaborative. Through the process of sharing, in a spontaneous and emotional way, a "global village" was enabled.

That said, on the other hand, collective political participation online has also been derided as so-called "clicktivism" (from the contraction of the word 'activism' with the verb 'click'). This means the simple act of clicking on *like,* which can be seen as a lazy way of belonging to the group, and not a real social membership. See Micah White:

> "In promoting the illusion that surfing the web can change the world, clicktivism is to activism as McDonalds is to a slow-cooked meal. It may look like food, but the life-giving nutrients are long gone[10]."

This rather harsh judgement of the political impact of social media based movements ignores the fact that people did get involved through demonstrating in the streets. Emotion on line can readily turn into "e-motion", that is, the tendency to drive people into active and public protest. The Occupy Wall Street movement, for example, clearly goes beyond mere clicking and involves real mobilization of people at the physical level.

From the Arab uprisings to the protests in Iceland, people have progressed from what began online to a street movement that powers and connects heterogeneous communities. The Indignados from all over the world, the aganaktismenoi of Greece, The Anonymous, the M-15 in Spain and all other facets of the Indignez-vous current are clear examples of this new phenomenon.

The American sociologist Zeynep Tufekci, who has thoroughly studied the various stages of the Arab Spring, has called this phenomenon "network effects"[11], by which she means the impact of network communications on the behaviour of the mass in times of crisis.

The Internet changes the structures and forms of social networks, increasing the speed of communication – modifying and restructuring the public sphere.

In my view, the most important thing to understand and study in these examples is the fact that the Internet allows individuals to extend their impact beyond the confines of their own room and go global. As Tufekci pointed out, there had been more than seven street protests in Tunisia before the event that gave the starting signal to the Arab Spring. For example, in Gafsa, a town in the deep south of Tunisia, there were protests in 2008, which were followed by brutal repression[12], not only of individual protestors, but also of information. Tufekci notes that, in 2008, there were only 28,000 Facebook users in Tunisia. But after the self-immolation of Mohammed Bouazizi in 2010, the protest movement was launched that became viral. And by this time there were two million Facebook users in Tunisia. This shows that the impact of the network is so strong that it can challenge even extremely brutal repression.

We must also understand, however, that the phenomenon of social mobilization was not born yesterday or even three years ago. There are precedents that can be interpreted as stages in the technological maturation of the social limbic system. Even before the expansion of the Internet, as early as 1989 Chinese dissidents were able to use faxes to send news and images of repression at Tiananmen Square in Beijing, despite government censorship and control of the press and the mainstream media.

In 1994, when the masked Subcomandante Marcos appeared on the Internet as the face of the rebellion in the Mexican state of Chiappas, this was the start of public opinion evolving from local to global. It was no longer possible for the world to ignore the injustice done by the Government of Mexico against the farmers in that region in the name of multinational food companies.

The special case of the Philippines gives evidence to the differing capacities of the Internet, SMS and Twitter to provoke an emotional response from the people. For a couple of years (1999-2001) it was known that the Estrada government was involved in many corruption scandals. But an initial protest in 2000 on the Internet had not resulted in a mass impact because, although there were a million Filipinos connected in the world, only 50,000 of these were in their own country, the rest living as expatriate workers in other countries. In 2001, perhaps because the use of SMS in the Philippines was still free, it was possible to contact thousands of people with just one message, and those with mobile phones raised enough anger and indignation amongst the populace to bring down the Estrada government.

In Iran in 2009, the use of Twitter raised awareness of electoral fraud, threatening to invalidate the re-election of the government, but was stopped because of repression:

> Twitter, […] especially because of its integration with mobile phones […] is in fact the only channel more or less open or open intermittently, through which news and information can get through about what is happening in the Islamic Republic after the disputed Iranian presidential election that saw the victory of Ahmadinejad[13].

As commented by the *Washington Post:*

> What we are seeing is the flickering flame of freedom. People are willing to risk their lives to protest a system that oppresses them and denies them fundamental human dignity. Those who say none of this matters – that it is a feud between factions of the ruling class and that it has no chance of bringing about real change – are missing the point. The people of Iran are exercising their sovereign right as a people to stand before their rulers and say "no more". They are commanding the attention of a world that seeks to make deals with their oppressors. That Iranians are telling us they yearn to be free[14].

What lessons emerge from these examples? This new phenomenon of bottom-up political activism, not organized by political parties, but by ordinary citizens, has demonstrated that it will be very difficult to suspend democratic constitutions and hand over power to members of the same family or the same "caste" as has been the case before. In that regard, I am particularly impressed by the conclusion that Esther Dyson, chairperson of EDventure Holdings, an active investor in a variety of start-ups around the world, gave to her reflexion on Wikileaks:

> In the long run, WikiLeaks matters for two reasons. The first is that we need a better balance of power between people and power. Information – and specifically the Internet's power to spread it – is our best defense against bad, unaccountable behaviour.
>
> Second, we *do* want to trust our governments and institutions. The point of openness is to make those in power behave better – and to make us trust them more. Rather than viewing them as enemies, we should know what they are up to, and perhaps have a little more say in what they do[15].

Esther Dyson's voice is the voice of Civil Society, not revolutionary, not class bound, not exclusive, just plain common-sense, a view of democracy that Franklin and Jefferson would have shared. Democracy is not only based on equal rights and proper representation of the individual by power and institutions, it also based on sharing a vast mental space, that is, the awareness – at different degrees of intensity – of belonging to a common situation bound neither by physical nor mental space, but including the social in the mental space as a kind of background intuition. Cyberspace adds a global extension to all the other spaces to allow a

'global social being' to emerge at the subconscious level of everybody.

The concept of the social being is not just a new metaphor. It began as part of early tribal culture, but nowadays even in a modern city, where people are part of the connective social being, they are continually subjected to the emotional currents of the moment from the neighbourhood to the globe. The great theorists of the crowd, Gustave Le Bon (*The Crowd: Study of the popular mentality*, 1895), Elias Canetti (*Crowds and Power*, 1960) and Jacques Ellul (*Propaganda: Shaping the attitude of men*, 1973) have all made similar relevant observations about man's social being. Similarly, it is also understood that where people have physical and social needs in common, an emotional exchange also occurs as part of the interaction. The arrival of real-time media, radio, television and now the Internet, magnify this process and speed it up more than ever before. In summary, therefore, we can say that the Internet has mimicked the biological limbic system of the individual body to extend its influence to the social body.

However, as Zeynep Tufekci said in a recent TED conference:

"The problem with social movements today is not that their participants lack heart or that they fail to forge true bonds among themselves, as some have argued. Like startups that grow too quickly movements need to learn to scale beyond the fast participation that's made possible from online networks. All these good intentions and bravery and sacrifice by themselves are not going to be enough"[16].

The political effects arising from the use of networks are evolving rapidly and while the first events caught power structures by surprise, with consequences that have not always been positive (in particular with the Arab Spring that seem to have changed things for the worse in several countries such as Syria and Lybia), government – and businesses – have quickly reacted to the threats and seen the opportunities for increased control on the social body. In a recent paper, Tufekci describes in great detail how Big Data and what she dubbs 'computational politics' are turning things around in favour of the very institutions that were put into question by the Civil Society. As she concludes this important essay:

The methods of computational politics will, and already are, also used in other spheres such as marketing, corporate campaigns, lobbying and more. The six dynamics outlined in this paper – availability of big data, shift to individual targeting, the potential and opacity of modeling, the rise of behavioral science in the service of persuasion, dynamic experimentation, and the growth of new power brokers on the Internet who control the data and algorithms – will affect many aspects of life in this century. More direct research, as well as critical and conceptual analysis, is crucial to increase both our understanding and awareness of this information environment, as well as to consider policy implications and responses. Similar to campaign finance laws, it may be that data use in elections needs regulatory oversight thanks to its effects on campaigning, governance and privacy. Starting an empirically informed, critical discussion of data politics now may be the first important step in asserting our agency with respect to big data that is generated *by* us and *about* us, but is increasingly being used *at* us[17].

CONNECTED INTELLIGENCE TO DEFEND THE CIVIL SOCIETY

The history of the Internet has demonstrated at every turn that all attempts at controlling it have engendered swift countermeasures to protect netizens. In this regard connected intelligence on and off line will prove effective to defend civil society. In activism it is important to know or sufficiently know about the other participants to trust them. That present the obligation to connect in the right way. Many applications exist already to strengthen and sustain activism, but I have no doubt that customised and democratised Big Data mining applications will soon give even more powerful tools than anything invented so far. My general trust (and thrust) is that in the end the Internet and cyberspace will continue to self organize and eventually fashion all of society into a tolerable shape and that the Civil Society extended and respected globally will prove to be the only tolerable shape humanity should strive for in the era of transparency.

APPENDIX

TOOLS FOR ACTIVISM[18]

I have taken the liberty to add a graphic and a few suggestions that I gleaned on the Net of tools for connecting activists safely and intelligently. The graphic presents a very advanced articulation of the different components of collective intelligence. It is a fascinating read and I propose a little exercise to make it even more fun: in perusing the various categories that are proposed, I suggest that wherever you see the word 'collective', substitute it with 'connective' and judge which one reflects better the need for connecting specific configurations and relationships in a social activism project.

CROWDVOICE - Similar to the social media aggregating service Storify, but with an activist bent, CrowdVoice spotlights all content on the web related to campaigns and protests. What's different about it? Founder Esra'a al Shafei says "CrowdVoice is open and anyone is a contributor. For that reason, it ends up having much more diverse information from many

more sources." If one online activist comes across a spare or one-sided post, he can easily supplement information. Furthermore, campaign participants can add anecdotes and first-hand experiences so that others can check in from afar. CrowdVoice makes it easier for far-flung audiences to stay abreast of protests and demonstrations, but it also helps organizers coordinate and stay abreast of other activist movements.

SUKEY – During London's UK Uncut protests this year, police used a tactic called "kettling," or detaining demonstrators inside heavy police barricades for hours on end. In response, UK Uncut activists created a mobile app to help one another avoid getting caught behind the barricades. The tool, Sukey — whose motto is "keeping demonstrators safe, mobile and informed" – helps people steer clear of injuries, trouble spots and violence. Sukey's combination of Google Maps and Swiftriver (the real-time data verifying service from the makers of Ushahidi) also provides a way for armchair protesters to follow the action from afar. Users can use Sukey on a browser-based tool called "Roar," or through SMS service "Growl."

OFF-THE-RECORD MESSAGING (OTR) – A software hat can be added to free open-source instant messaging platforms like Pidgin or Adium. On these platforms, you're able to organize and manage different instant messaging accounts on one interface. When you then install OTR, your chats are encrypted and authenticated, so you can rest assured you're talking to a friend.

CRABGRASS – A free software made by the Riseup tech collective that provides secure tools for social organizing and group collaboration. It includes wikis, task files, file repositories and decision-making tools. On its website, Crabgrass describes the software's ability to create networks or coalitions with other independent groups, to generate customized pages similar to the Facebook events tool, and to manage and schedule meetings, assets, task lists and working documents. The United Nations Development Programme and members from the Camp for Climate Action are Crabgrass users.

PIDDER – A private social network that allows you to remain anonymous, share only encrypted information and keep close track of your online identity – whether that identity is a pseudonym or not. While it's not realistic to expect anyone to use it as his primary social network, Pidder is a helpful tool to manage your information online. The Firefox add-on organizes and encrypts your sensitive data, which you can then choose to share with other online services. It also logs information you've shared with external parties back into to your encrypted Pidder account.

[1] See <http://bit.ly/17l0oRC>.

[2] Another angle on the meaning of intelligence comes from Roy Ascott's suggestion that the brain is not an organ that *produces* consciousness, but one that *perceives* it, just as the eye does not produce vision but perceives the visual object. This bold and interesting hypothesis implies that consciousness is not internal to the body but available everywhere and that different types of bodies are equipped with different types of cognitive apparatuses. Of course there is no scientific proof of that hypothesis and it may not even have an immediate bearing on the nature of intelligence. However it begins to be useful when it is related to technology. Taking the example of the eye, glasses help to refine the precision of vision. In the same way, ICT technologies might be deemed to help improve and share access to matter and awareness.

[3] "De quels champs s'agit-il? D'abord du physique, la nature, le Cosmos – ensuite du mental (y compris la logique et l'abstraction formelle) – enfin du social", Lefebvre Henri. "La production de l'espace", in: *L Homme et la société*, 31-32, 1974. *Sociologie de la connaissance marxisme et anthropolgie*: 15-32. Full text at <http://bit.ly/1DoQhZs>.

[4] Anna Cicognani, *Defining a Design Language in a Text-based Virtual Community* <http://bit.ly/1Av01jw>.

[5] Indeed, it may be relevant to point out that electricity is the true ground of all electronic media. Digital and virtual technologies are but one of the many forms taken by electricity."

[6] Zizi Papacharissi proposes the term Virtual Geography to describe the specifics of network architecture: "Certainly, each social networking site serves a unique purpose, so network architecture is essential to meeting these unique objectives. […]. They gain relevance as they help to declare the situational geography of the network to its members, thus explaining how the network will serve as a social setting for interaction. Because virtual geographies are founded upon a fluid premise of evolving connectivity, they are situational and not static. […] Because the offline and online worlds operate in synergy rather than in isolation, a flexible architecture permits online social systems to form organically and not as colonies of their offline equivalents" <http://bit.ly/1tMBa3i>.

[7] Goleman, Daniel (1995). *Emotional Intelligence: Why It Can Matter More Than IQ* (New York: Bantam Books).

[8] See *Inside Job*, a documentary about the collusion between the US government and the big financial groups.

[9] Indignez-vous! – or translated into English as Time for Outrage!

[20] Micah White, *Clicktivism is ruining leftist activism*, *The Guardian*, August 12, 2010.

[31] Tufekci, Z. *Big Questions for Social Media Big Data: Representativeness, Validity and Other Methodological Pitfalls, Proceedings of the Eighth International AAAI Conference on Weblogs and Social Media* (Palo Alto, CA: The AAAI Press): 505-414 <http://bit.ly/1HScoqG>.

[12] Tufekci calls this brutal instant répression "Wack a protest".

[13] Reported July 25, 2009 by Luke Alagna <http://bit.ly/17n5gpj>.

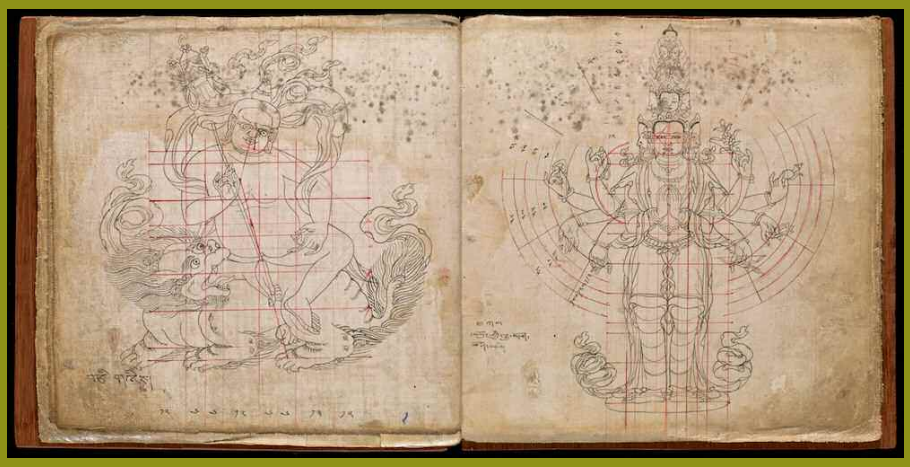
[14] See <http://bit.ly/1x04Aeq>.

[15] Esther Dyson *"WikiLeaks' Flawed Answer To a Flawed World"*. On line comment at <http://bit.ly/1xIGzhf>.

[16] <http://bit.ly/1HScONR>.

[17] Tufekci, Z., *Engineering the public: Big Data, surveillance and computational politics*, First Monday, 19(7), 7 July 2014 <http://bit.ly/1BOz5sk>.

[18] See <http://on.mash.to/1xUECQt> and also <http://slidesha.re/1xU73Li>.



THE TIBETAN BOOK OF PROPORTION ~ SHEET 21-24.

HELENE FINIDORI

COLLECTIVE INTELLIGENCE IS A COMMONS

THAT NEEDS PROTECTION AND A DEDICATED LANGUAGE

Helene Finidori focuses on systemic perspectives and tools for transformative action, mainly interested in connecting dots and building bridges between people, cultures, disciplines, organizations, transitionary stages. Co-founder and coordinator of the Commons Abundance Network, she teaches Management and Leadership of Change in the International Program of Staffordshire University.
Born in Canada and raised in France, Helene lived in many countries including Sweden, the US, Indonesia, Australia, and she currently lives in Spain.
After studying entrepreneurship at HEC in Paris she specialized in small and medium enterprise and created a niche speciality at the intersection of strategy, branding and organizational development. She worked in the waste management and consumer product industry, for business-to-business marketing consultancies, as an independent consultant specializing in innovation, IT and prospective, as well as in education and social development. From brand positioning, culture and strategy she moved to organizational change and cross-cultural collaboration and now focuses on social change, networks and movements.

INTRODUCTION

We speak of collective intelligence as the capacity by which we can achieve more together than we can alone.

There are many definitions and narratives of collective intelligence, many ways collective intelligence is thought to form and manifest, many contexts in which it is invoked. Here are a few, jumbled up.

Collective intelligence arises, as a network of trust, from the empathy, the love and the compassion we have for each other. It is found in the synergy of cognition and skills that enables us to achieve great things when we collaborate. We see it at work in the responsibility we grant ourselves for stewarding the Earth that we have in custody. It manifests when the individual powers that enable us to take our destinies in our own hands aggregate into a collective power to change the world and take part in our shared evolution. We describe it as the global brain formed by the distributed intelligence of our interconnected human minds operating as a neural network, embodied in Chardin's Noosphere. We see it also as the symbiotic connection between all living beings epitomized in Lovelock's Gaia Hypothesis, each of us united through the wider system of things, with a role to play in the greater order of the universe.

COLLECTIVE INTELLIGENCE AUGMENTED BY TECHNOLOGY, A CRESCENDO

There has been a crescendo through time in our capacity to individuate and to interconnect, in the scope of our collective intelligence and in the potential we see in it, augmented by technology.

Internet and digital technologies have given us access to a whole wealth of knowledge and to writing capabilities that we could never have dreamt of just a few decades earlier. New possibilities opened up, to author and share our own stories and the knowledge we produced with the world, and to discuss and make sense of these stories with our peers and beyond. By further multiplying the capacities to learn, produce, share, and dialog remotely we acquired with alphabetical writing and subsequently the printing press, information technology has undoubtedly accelerated our capacity for collaboration and action.

But how fit are we for leveraging our collective transformative potential and generating polycentric coherence at the systemic level? What role can digital technologies and automation play in helping achieve the promise of collective intelligence, and what are the challenges we face?

AN ECOLOGY FOR TRANSFORMATIVE ACTION, THE BEDROCK FOR COLLECTIVE INTELLIGENCE

In 'An ecology for transformative action', article published in the previous issue of the *Spanda Journal*, I described the complementarity of the diverse logics that drive change agents' engagement and actions, and how agency could be leveraged across the board to bring about systemic change, provided we found ways to coalesce rather than dilute the diversity of our efforts, and avoided the temptation to 'fuse' our identities.

We are all different, not only culturally but also cognitively, as illustrated by the varieties of ways in which we perceive and process information, and make decisions. These differences nurture our collective strength because they provide a fertile and diverse ground from which synergetic effects can emerge. They are our weakness too, because of the difficulties we experience to understand each other when we speak different languages and see reality through different lenses.

We gather by affinity in communities of practice around social objects, i.e., the objects we choose to focus our caring attention and our efforts on, which may be people, places, issues, resources, processes, or desired outcomes. Social objects act as attractors and centres of shared values, goals, action and experience.

Collective intelligence has always existed within these centres as an essential outcome and at the same time an enabler of the co-individuation process that occurs as people interact, and as they construct their own representations of reality, shared meaning making schemes, preferred story and process narratives, and associated language, by which they reduce the perceived complexity of their own context. We call this culture.

HOW WE PROCESS THE INFORMATION THAT SHAPES OUR UNDERSTANDING

When individuals learn or interact, what they perceive and remember from their lived experience creates imprints at various levels in their individual and collective minds. Stiegler distinguishes three types of imprints he calls retentions. Primary retentions are the most salient of our perceptions that we select from moment to moment and that combine in the flow of our consciousness. This flow enriches the memories of our experiences, i.e., our secondary retentions that act as the filters or frame of reference through which we select our primary retentions and categorize what we perceive in a feedback loop.

Vocabularies specific to communities of shared practice and experience derive from shared secondary retentions and the practice of shared categorization and interpretation.

Tertiary retentions are the layers of conscious and unconscious sedimentations as externalized tracks of collective knowledge and memory accumulated through shared practice and experience and transmitted across generations.

In addition to differences in what we focus our attention on and the filters we use to process what we retain, differences in how we mentally select and process information also play an important role.

What we perceive is categorized, interpreted and reconstructed in relation to what we know and how we understand. Understanding is the process of perceiving and categorizing. What we know is what we have understood. Interpreting is how we process and make sense of what we have understood, individually and collectively.

As part of his work on psychological types, Jung distinguished the four mental functions of sensation, intuition, thinking and feeling and the two attitude types of introversion and extraversion that differentiate cognitive processing preferences of individuals, and the dynamics by which they operate. We focus our attention and gather information (i.e., select our primary retentions) with a variable propensity for sensing or intuiting (the perceiving functions), and we organize our experiences and make decisions (i.e., categorize via our secondary retentions) with a variable propensity for thinking or feeling (the judging – interpretative functions). These functions plays out predominantly for each of us either in the 'introverted' inner world of our thoughts, feeling, memories and imagination, or in the 'extraverted' outer world of actions, people, tools and organization.

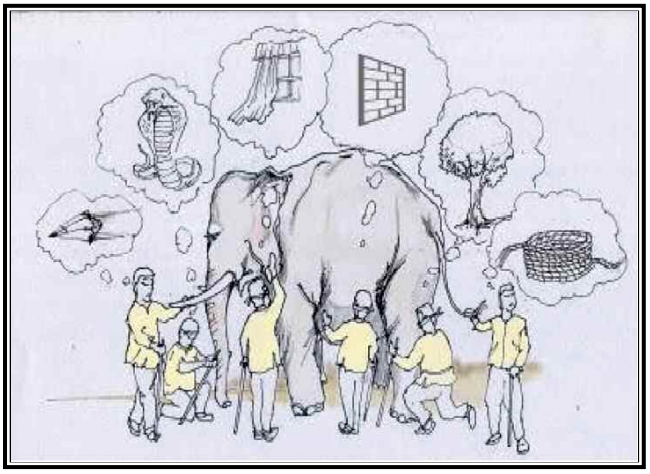
Individuals perceive and interpret experience differently as a result of different combination of mental functions and different individual and collective retentions, with variable inclinations for exploration and ways of integrating the new. New signals that we cannot categorize and interpret because we cannot relate them to anything we know individually or collectively may be left out unseen or perceived as threats. This may hinder our capacity as individuals or groups to understand, recognize and relate to logics that we are not familiar with.

The range of cognitive processing types of a group emerges from a combination of individuals' processes at wider scales. Acknowledging and leveraging the complementarity of individual cognitive processes helps maximize cognitive effectiveness of a group.

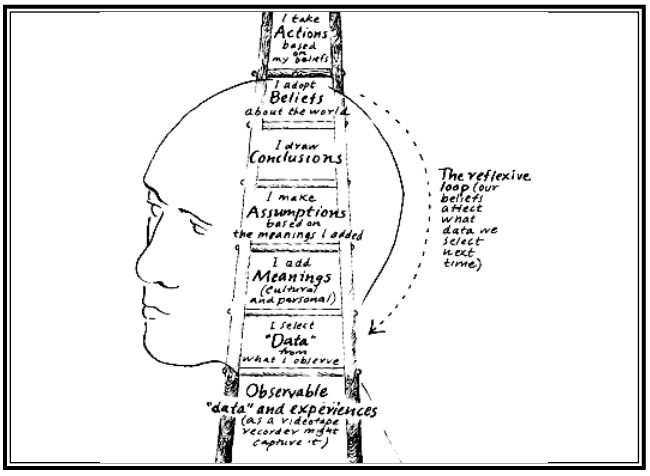
Achieving cognitive understanding within a cohesive group logic is easier than achieving cultural understanding across logics, which Stiegler calls regions of the logos or relational disciplines. These can be perceived as islands, and collective intelligence as the bridges that connect them.

SHARED DISCOVERY AND MUTUAL RECOGNITION

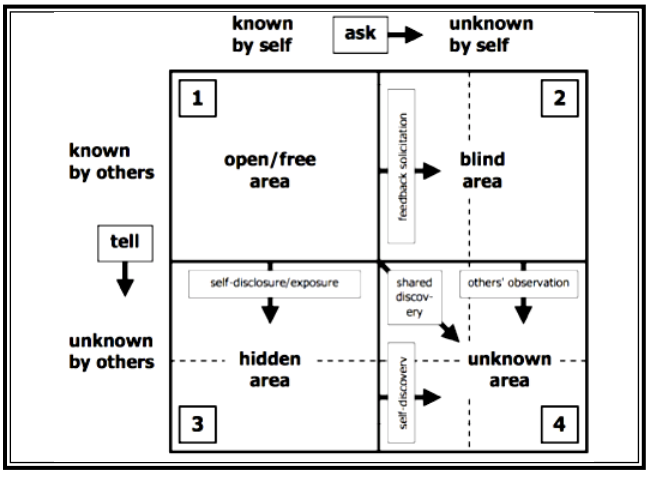
The need for coordination arises because we are different. Disregarding our differences will prevent us from ever perceiving what each of us alone cannot perceive.



The Ancient Indian Fable of the Blind Men and the Elephant [Source: http://blog.practicalsanskrit.com].



The Ladder of Inference [Source: Peter Senge, *The Fifth Discipline*].



The Johari Window - © Alan Chapman 2003 [http://www.businessballs.com].

In the ancient Indian fable of the elephant and the blind men, each blind man senses a different texture and imagines a different object. Individually, the blind men cannot make sense of the whole elephant. It is only when there is effective communication among them, recognizing that they will necessarily perceive different things depending on where they are and what they sense and intuit, that they can begin to realize what that beast really is.

The challenge is to bring the reality or the possibility of the elephant into each part, so that it is the elephant that materializes as a whole when all piece are described, and not a set of unrelated parts. This is what collective intelligence must achieve. This means that we must invoke at the same time what we know, and what we may be individually missing. What it takes to find the complementary shapes one thing can use with others to build new things involves exploration and questioning, a playful mind and approach that helps us let go of our limiting assumptions and open up our minds for the unknown.

Argyris' Ladder of Inference reminds us that our assumptions are formed through the meaning we derive (via our secondary retentions) from the data we select out of real observable data and experiences (our primary retentions), which are our own interpretations of reality. What we infer may be biased by the selection we make and by the reinforcing effect of our assumptions on our beliefs in a feedback loop. Double loop learning and walking each other through our respective thinking, feeling, sensing, intuiting processes and frames of reference can help us discover and connect our respective interpretations and draw a broader picture of reality. The Johari Window opens up on self-awareness and shared discovery of the unknown, to expand the boundaries of what we can perceive and categorize, i.e. understand.

COLLECTIVE INTELLIGENCE BECOMING AWARE OF ITSELF

When we learn and experience new things we discover and integrate new categories that expand our secondary retentions and the range of what we are able to perceive. In

dialog with others, our frames of reference enrich each other, we co-individuate in a more or less convergent way. Trans-individuation occurs when both the individual and the collective are transformed through one another, akin to evolution of collective or group consciousness, all boats rising at once from where they are situated. That's when minds open for sparks to circulate and collide, creating new possibilities and opportunities for the ongoing thrivability and regeneration of the system.

Internet has increased our capacity to reach out or cross over to other groups, it has made easier for the explorers in each group to cross boundaries and cross-pollinate, bringing and weaving the new into their respective groups. It has created opportunities for people and groups to swarm in informal networks, and enabled on-going conversations across groups to allow for multiple-level synchronizations to occur. Change agents and innovators are increasingly aware of the need to coordinate beyond their own perimeters of action, to operate synergies across movements outside of institutional coordination bodies. Calls to create networks of networks, movements of movements, global citizen movements, great transitions, big-shifts are multiplying. This is collective intelligence becoming aware of itself and calling itself to action.

The temptation is great however to think one can easily 'coordinate' global action across movements by building cohesiveness and convergence. "Just develop a shared vision" we hear often, "and build a plan or get self-organized from there". But trying to reduce to a common denominator, to align or to merge deeply imprinted and differentiated frameworks of understanding and interpretation does not work. You cannot deal with multiple centres operating on differentiated logics as you deal with cohesive ones. How can shared visions and roadmaps be developed when the parties do not share similar understandings of reality and projections of the future, when they do not speak the same language and when they may be shaped by their own assumptions? We must deal with a polycentric world. With no systemic centre, no 'central logic', no 'global eminent position' or legitimate vantage point in the system that would allow a global view and a synthesis between approaches, coordination is left to the various groups all acting as individual centres, to find coherence. This difficulty to find coherence was typically a problem brought up by organizers of the Occupy movement for example.

The mobilization of collective intelligence at wider systemic levels beyond the boundaries of our habitual communities to solve wicked interconnected problems involves more complex mechanisms and in particular the capacity to achieve more complex synergies (i.e., systemic coherence) across multiple centres in addition to 'simple' local synthesis (i.e. complexity reductions) within cohesive centres of shared experience.

This requires an expansion of our capacities to meaningfully relate to each other, to understand our position in the bigger picture, to perceive and mutually recognize our respective logics and space for engagement, and to find and interpret the signals and tracks our actions leave in the system and the environment as feedback and feedforward that will inform further interpretation and action.

Achieving coherence involves tools and processes that can facilitate self-coordination of multiple approaches at many levels and scales, in addition to building cohesion through facilitation methodologies within defined contexts.

REVEALED AND AUGMENTED BY TECHNOLOGY

The multitude of pathways humanity engages into to make the world a better place are a manifestation of collective intelligence, not yet aware of itself, as illustrated by this quote of Edgar Morin in *La Voie*: *"On each continent and in each nation one can find creative bubbling, a multitude of political initiatives in the direction of economic, social, political, cognitive, educational, ethical or existential regeneration. But everything that must be connected is yet dispersed, compartmented, separated. These initiatives are not aware of each other, no institution enumerates them, and no one is familiar with them. They are nonetheless the livestock for the future. It is now a matter of recognizing, aggregating, enlisting them in order to open up transformational paths. These multiple paths jointly developing will intermesh to form a new Path which will decompose into the paths each of us will follow and which will guide us toward the still invisible and unconceivable metamorphosis."* (Tr. Finidori).

The tracks are there. How can we find and interpret them? Operationalizing collective intelligence involves being able to see the diversity of transformations at play and evolution in the making, how we contribute to this process, and where it is taking us.

Exponential computation power and visualization tools allow real time presentation of globalized data. Location and behaviour tracking tools, the Internet of things and mobile technology enable the harvesting of the micro-local and the connection of micro and macro levels.

Technology now has the potential to show how each individual action and story contributes to the

global outcome or picture and has an impact; and vice versa, how large transformations, or large outcomes are made of combined individual actions or items. A catalyst for agency.

Tools that can show us the dynamics of our system and the tracks we leave in it, that can help us discern and discuss how our behaviours aggregate and impact the system, technologies that can act as a mirror for our own actions and map out what we chart together in collaborative or self-coordinated ways all have the capacity to bolster collective intelligence because they provide the individual and collective feedback that will impulse our next individual and collective actions. The semantic web and the decentralization of the web offer a promising potential to achieve this through peer-to-peer connections.

THE MEDIUM SHAPES THE AGENT

Our actions shape the tracks we leave in our environment which in return inform our next actions. This is not without implications. A key question is what we want our mirrors to be, how distributed, differentiated and resilient they are, and who is susceptible of controlling them.

In his research on stigmergy and the Global Brain, Francis Heylighen describes how the environment he calls the medium is shaped by agents as their tracks aggregate and consolidate, up to a point where the medium becomes the mediator that directs the agents. The pheromone trace for example, that ants leave on the ground for others to find their way to food sources, attracts growing numbers of ants as the pheromone signal strengthens with traffic. Similarly, cross-country trails that start as barely distinguishable walk-paths make themselves more visible as people travel them. Eventually they become persistent roads and highways that funnel all traffic. The medium develops intelligent management of the communication process, as Heylighen notes, which retains the fittest and most useful pathways , while the others are abandoned.

Heylighen compares this selection process to that of neural connections that continuously develop when exercised, while those who don't are atrophied. This is indeed what determines our various retentions, how our memories discard what no longer is in use, and how specialized capabilities develop. Individuals have the ability however to choose which neural paths they exercise, and they may decide to cultivate fewer or more of their latent potentials. Groups may choose to develop complementary skill sets among their members to anticipate future needs. Collective intelligence is about unleashing humanity's whole latent potential and turning it into action. If some neural pathways become or remain atrophied, possibilities become scarcer… Wouldn't a global brain want to exercise all of its neural pathways to keep the plasticity and alertness necessary for its own long-term adaptability and fitness?

> When the most travelled roads, at a certain point, solidify as the dominant infrastructure, they may become difficult to escape from. This is when, in more general terms, norms and structures take control over agency and choice.
>
> The threat of most travelled routes remaining mechanically the most travelled is a point I raise quite often. In an article in the last issue of the journal, I suggest that our institutions are systemically dysfunctional and our system as a whole at risk because we get trapped in positive feedback mechanisms that keep channelling behaviours towards the same pathways with little consideration for diversity and resilience, and how effects accumulate in time. We see these mechanisms at work for example in the network effect that builds monopolies when critical thresholds of audiences are reached, or in economics when winning strategies over-attract massive monoculture behaviour, generating volatile and brittle situations and outcomes. When a behaviour or a strategy is acknowledged as the fittest it becomes a best practice, a benchmark, a standard, an institutionalized model, embedded in the code, sometimes physically, in the form of an algorithm that remains hidden from view in a black box. The rate of application of such winning or fittest strategy, rather than the outcome it produces, becomes the criterion for performance. And there are no embedded mechanisms to evaluate whether it remains fit for purpose through time.

The difficulty to undo what has become solidified into structure or coded into algorithm is what makes us different from ants. When the food source starts to dry up ants seek new sources and the pheromone track dissipates leaving room for new pathways to emerge. Human tracks are more persistent... As suggested by Heylighen, positive feedback that characterizes goal oriented stigmergy is a great driver for both action and outcome. This however only applies to the point when the continued feedback destroys the function of the medium and endangers the whole system.

> When we add the time factor, we realize it is not only the medium, i.e., the space, that controls the agent but a series of invisible power dynamics that alter the nature of the track and the medium itself, locking the agents in it. These dynamics cannot dissipate if they are not made visible, monitored for fitness and challenged over time.

This situation poses great threat to the system as a whole precisely because it is a threat to collective intelligence. Several risks are accumulating here. First is the control power conferred to those who own and maintain the infrastructure and attraction mechanisms that enable the enclosure and lock in of huge portions of collective intelligence. Second is the surveillance and the mining of collective intelligence for the benefit of the few rather than of collective intelligence itself. Third is the manipulation of collective intelligence into herd behaviour and preselected choice to the detriment of scope and variety, with the risk of nipping collective intelligence 'in the bud' and preventing it to achieve its promises.

OUR COLLECTIVE INTELLIGENCE, PRIVATIZED

Preserving the World Wide Web, the medium or mediator and manager par excellence of our free (i.e., *libre*) peer-to-peer communication processes, from the fate of the traditional media, owned by the few to serve private interests is the challenge we face.

The world wide web was initially built in 1989 to advance the diffusion of knowledge and collective intelligence. And it has unlocked great opportunities and expectations for self-realization and collective accomplishment over the years. In 2005 David de Ugarte envisioned the beginning of a veritable "reconquest of information and the imaginary as collective and de-merchantilised creations". Alongside the fully decentralized blogosphere that would enable the redistribution of informative power among equipotential citizens, he foresaw, albeit with some reservation, the proliferation of pluriarchic, polycentric networks, able to provide abundance thanks to network effects. He called the new kinds of monopolists such as Google Internet Mumis in reference to ancient benevolent social animators of the Solomon Islands who prepared communal feasts for the followers they attracted. These Internet Mumis although centralized in their structure were meant to provide highly decentralized and diversified experiences to their volatile and demanding member base for free, generating new kinds of abundance. This remains the current ultimate promise of the platform model, which prompted PayPal founder Peter Thiel to praise monopolies as drivers of progress because the prospective of years or even decades of monopoly profits free of competition provides a powerful incentive to innovate and offer the best possible experience to their users. Out with competition, blue ocean strategy at its best! Ugarte's conjectures were before the advent of Facebook, and the propulsion of Google at the apex of monetization of our tracks. Now, lock in effects are engineered via massive VC investment that expect no returns before a status of monopoly is attained. Google purchases robotic startups at a blistering pace, half a dozen within a year, most of which involved in defence…

> Many signs show that the web itself is now gradually being controlled by higher national purposes or private interests as Snowden's revelations on NSA surveillance, the threats on net neutrality, and the constant erosion of privacy and Internet freedoms can attest. The web is being owned by what Michel Bauwens calls the netarchy, the giant platforms that both enable and exploit the participatory networks that arise from peer-to-peer activity.
>
> Generating convenience and the illusion of freedom and abundance for free needs funding, and it seems that in their pursuit of enabling the multitude, the giants of the web have sold their souls to the devil, and we, the multitude, have sold our souls to them. We are now trapped within the walled gardens of gigantic platforms to which we contractually abandon our privacy rights and the tracks of our activity, in exchange for free access to the tools that enable us to produce the tracks…

OUR COLLECTIVE INTELLIGENCE, AN OBJECT OF SURVEILLANCE

From agents of collective intelligence, we are becoming objects of the intelligence, through manipulation and surveillance. Our tracks are recorded, collected and aggregated through cookies by each service and application we use. Our individual and collective behaviours are made available to state intelligence, statisticians, marketers, technologists and scientists, while our access to the data we generate is local and limited. How easy is it indeed for us to search elements of our own past and retrieve the content we generated on social networks?

We are told our tracks are disseminated and anonymous, yet so easily reconstructed via correlations, and in our face! When I book an airplane ticket directly from an airline's website, an advertisement appears on Google or Facebook for a car rental or a hotel in my destination city. When I look up an illness on Google I get an advertorial for a treatment or a clinic on Facebook. When my husband watches a sports event on my computer, I receive spams for young chick dates… How difficult is it for any of these platforms and their partners to relate this to my profile or my IP, and identify all my whereabouts, concerns, and potential addictions and contradictions? We saw

recently how Uber employees tracked identified VIP customers in real time on giant screens, and how one of their VPs threatened to 'dig up dirt' on journalists that criticized some tactics. Big Brother is watching us, an omnipresent 'Intelligence system' that caters too much more than national or international security interests.

OUR COLLECTIVE INTELLIGENCE, MANIPULATED

Our traces are analyzed in order to anticipate and affect any of our possible behaviours. The more we use platform services, the more the various algorithms at work learn about us for a 'tailored' experience. Our tracks are used to lure our attention, move us into action, and make the most out of us not only through straight forward advertisement but also through more refined techniques such as clickbaits, pushed selections, or dynamic pricing. This ranges from prices for a given flight increased at each visit, all other things remaining equal, to create some urgency for purchase, to the display of higher price selections based on estimated purchase power, such as Orbitz proposing more expensive hotel rooms to Apple OS users found to spend 30% more on hotels than windows users. Platforms are an excellent playground to test new algorithms. Uber's pricing algorithm has recently been praised by MIT tech review as its best innovation.

Differentiation and self-realization were the promise of the web, but we are manipulated into convergence. Our choices are inspired by algorithms that serve us what our friends, our passed behaviours and possible addictions, or other purchase pattern and popularity statistics would suggest. Statistically generated Amazon book recommendations or Google AdSense generated search suggestions feedback into themselves and skew the statistics, triggering self-generated winner takes all positive feedback loops that impoverish choice even more at each round. Similarly, the reuse of machine-generated language that feeds back into Google Translate's corpus as original material depletes the corpus originating initially from real translators' work. A concern for Google itself, referred to as 'polluting its own drinking water', which caused the shutdown of Google Translate API.

OUR COLLECTIVE INTELLIGENCE, DIVERTED

What was expected to liberate us from all forms of enslavement is now keeping us captive as objects of an experiment. We are lulled in a fishbowl, kept in a bubble that slows our collective evolution…

Are we being bitten back even harder by what we have been trying to get away from for decades? Adam Curtis in his 'Century of the self' BBC documentary series masterfully depicted how psychological techniques had been used throughout the 20th century to read, create and fulfil the desires of the public, and to make products and ideas as attractive as possible to consumers and citizens. In 'All watched over by machines of loving grace' he showed how key strands of thought that shaped the 20th century ethos had caused us to embrace a fatalistic philosophy that sees human beings as cogs in a mechanistic system, as computing machines in their own right, or as biologic organisms driven by their genes, helpless and disillusioned in the face of those in power, with no idea of what comes next or of how to challenge and change the status quo. The web was meant to remedy all this. How far have we drifted away from the promise of what could be unlocked by putting to good use what Clay Shirky called our cognitive surplus: the time that we gained back from watching TV? Stiegler likes to evoke systemic stupidity as time of available brain accessible to those who try and manipulate us. This quote of the CEO of a major French TV channel is indeed memorable.

« There are many ways of talking about television. But in a business context, let's be realistic: basically, TF1's job is to help Coca-cola, for example, to sell its product […]. However, for an advertisement to be perceived, it is necessary that the brain of the spectator should be available. The role of our programs is to make it available: i.e. to entertain it, to relax it in order to prepare it between two messages. What we sell to Coca-cola is some time of available human brain […]. Nothing is more difficult than obtaining this availability. There lies the permanent challenge. It is necessary to seek at all times the programs that will fit, to follow the latest fashions, to surf on the trends of the moment, in a context where information accelerates, multiplies and gets more pervasive ». Patrick Le Lay (Tr. Bruno, C.).

We are caught in a Faustian bind. On the one hand we are seduced by the convenience of the tools that enable us to make our voices heard and to connect and exchange with the world. On the other hand, we are under the microscope, we hardly benefit from the insights this aggregated data could provide us, and we remain at the merci of various forms of stimulations based on projections that keep us captive of our existing habits and anticipated desires, and nudge us towards sameness.

RECLAMING OUR COLLECTIVE INTELLIGENCE

MIT's Center for Collective Intelligence director Tom Malone also is concerned by the conditions

under which collective intelligence can overcome collective stupidity that he defines as herd behaviour or groupthink, with a fine line to draw between the two. He frames the question pertaining to collective intelligence research in the following terms: *How can people and computers be connected so that – collectively – they act more intelligently than any person, group or computer has ever done before?"*

For Stiegler any technology is potentially disruptive and toxic. Digital technologies as automation techniques constitute a *pharmakon*. A pharmakon like any remedy can save a patient or kill him if mishandled or overdosed. It is potentially curative and beneficial, or dangerous if not implemented according to specific requirements. A pharmakon as defined in Plato's *Phaedrus* dialogues is what produces an extension of knowledge and capabilities into an external milieu that can be manipulated.

Collective intelligence is the manipulated matter, and also the safeguard against manipulation. To ensure its own survival and long-term thrivability, collective intelligence must focus above all on preserving and enhancing the opportunities provided by digital technologies and the web for its own coalescence. It must strive to maintain the integrity of its collective perceiving and interpreting functions, and be aware of the risks of its being absorbed and annihilated by all kinds of manipulators often referred to as 'the system' itself because of the systems dynamics they may initiate or perpetuate, through the manipulation of retentions and behaviours.

It is critical that 'we the people' reclaim the ownership of the web and the control of our stigmergetic processes as commons or public goods before it is too late. The capacity for analysis and interpretation of the dynamics that affect our behaviours, and the tracks they leave in the environment must be kept free of all manipulation and protected as an instrument for collective intelligence to help us 'better ourselves' and enhance our collective problem solving capacity.

People increasingly assemble and reassemble ad hoc in networks of networks, around specific projects that are usually issues based. Gated platforms, which enclose their users under leonine terms and conditions are unsuitable to the context of fluid collaboration in variable geometries, whose ground is the web itself.

We need a web that empowers new forms of connections and interactions across boundaries to allow the creation of virtual spaces where projects, people, ideas, and resources distributed in various contexts can be 'pulled' to accomplish specific tasks and generate productive conversations leading to action. This involves a distributed web, with portable identities, privacy protection systems, as well as protection against cyber attacks and fraud. It also requires tools and methodologies to develop understanding and interpretation of systemic phenomena and patterns of behaviours, as well as mutual understanding of the logics under which various community of experience operate, to enable collective interpretations.

Open source communities, the World Wide Web Consortium (W3C), in charge of web standards and protocols, and other organizations are working to build empowering tools. Most resources however are allocated to technologies that are being developed behind closed doors.

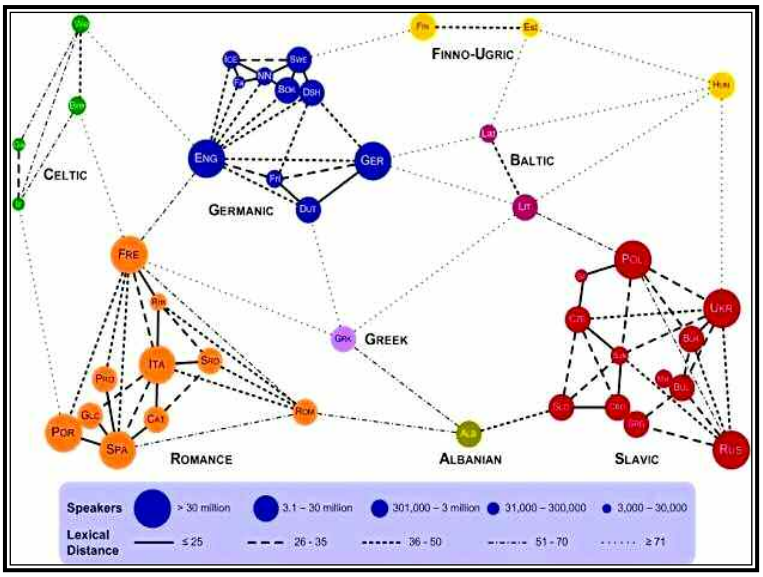
TOOLS FOR STIGMERGETIC VISUALIZATION

Tools and methodologies that enable visualization and interpretation of stigmergetic feedback at various levels and scales, where possibilities can be explored, gaps identified, needs fulfilled, and impacts assessed, enabling agency to apply itself effectively, would be particularly useful. Here are some examples and visions.

At the micro level, Bret Victor suggests the creation of environments that nurture ideas, where we could see what is produced, at work, in its context, while it is produced. As creators we need an immediate connection to what we create, to see the effect of our changes immediately. We need to find new medium that can "listen to our hands as we create", so that we can unlock the pieces that are locked in our heads and nurture the ideas that must be grown, individually and collectively. To illustrate this in practice Victor created a program that shows the immediate rendering of code as it is programmed. In a similar line, Olivier Auber's Poietic Generator aggregates side-by-side drawings from multiple connected users, making the collective picture that continuously emerges visible to all in real time, as it is created.

At the macro-level, Jean François Noubel introduced the concept of holopticism where "each player, thanks to his/her experience and expertise, relates to the whole in order to adjust his/her actions and coordinate them with others' moves. Therefore there is an unceasing round trip, a feedback loop that works like a mirror between the individual level and the collective one."

With anopticism, Olivier Auber brings the nuance that there is also always an invisible architecture, which influences and determines our behavioural choices. Anopticism questions the idea of totality of a space and of objectivity of its representation, insisting instead on the arbitrary and subjectivity of the many points of view of which everyone is potentially an author, and the actor of the rules and codes



Lexical distance among the languages of Europe [http://bit.ly/1lub51l].

they generate. It postulates that the collective intelligence of a group can develop only when each member of the group has access to at least one form of representation of the group's activity, when this representation is considered legitimate by everyone, and when each member can situate him/herself in this representation and can therefore change his/her situation through action.

Both the holoptic and the anoptic systems are a modelled representation of the space in which the actors evolve, which involves dealing with intersubjectivity and the connections between representations, in opposition to Foucault's Panopticon where one agent observes all the others without their knowing (the situation we are increasingly finding ourselves in right now on private platforms).

In a poetic intervention, Bracha Ettinger talks of borderspaces at the junction of things, of borderlinks created via fluctuation of distance in proximity to create relations without relationships, where different Is and non-Is co-emerge, and are transformed, sharing new and old, by imprinting and engraving their traces in shareable threads, creating trans-subjective relationships.

Linked data and the semantic web would enable navigation of this in between possibility space, bringing to life the 'adjacent possible' proposed by Struart Kaufman: *"The strange and beautiful truth about the adjacent possible is that its boundaries grow as you explore them. Each new combination opens up the possibility of other new combinations. Think of it as a house that magically expands with each door you open. You begin in a room with four doors, each leading to a new room that you haven't visited yet. Once you open one of those doors and stroll into that room, three new doors appear, each leading to a brand-new room that you couldn't have reached from your original starting point. Keep opening new doors and eventually you'll have built a palace."* Steve Johnson.

Imagine if our various logics, vocabularies, and narratives, what Stiegler calls the regions of the logos could be mapped by degree of familiarity or closeness with each other, creating an impressionistic map of the possibility domain, where people could explore the unknown from what is familiar, and navigate by successive hops through our traces from one possibility to another to find meaning in the unknown and discover new worlds and broaden horizons, in productive debates and conversations.

DISTRIBUTED SPACES FOR CONVERSATION, CURATION AND ACTION

The generative potential of conversations around social objects and issues that attract individual intentions into collective effort could be leveraged through emergent conversation-to-action spaces that support the harvesting and reprocessing of conversations directed towards argumentation, problem solving and action, i.e. learning by doing. EU funded project Catalyst is developing a suite of collective intelligence tools aimed at increasing the effectiveness of conversations, and support collective ideation, decision and action. Loomio focuses on collective decision making in ways that foster debate. These emergent conversations spaces should support tools to pull, visualize and navigate contextualized data such as described above, analyzed and interpreted with the support of pattern recognition methodologies and pattern languages. They should also be able to attract stakeholders and relevant parties into conversation or debate and action. A direction taken by the French Assemblé Virtuelle with the creation of ecosystems of actors, ideas, projects and resources, based on technologies of the semantic web. This fits John Hagel's definition of the scalable pull platform "where we can draw out the people and resources that we need, when we need them and where we need them".

Such emergent spaces would support the project of the Digital Studies research group working in

cooperation with the Institute for Research and Innovation (IRI) at the Center Georges Pompidou in Paris and the W3C chaired by Tim Berners Lee, founder of the web, to reinstate the web as a distributed space for hermeneutics and controversy with protocols, standards for annotation and new forms of semantic based queries where contributive communities would act as guardians of collective intelligence.

On a similar note Howard Reingold suggests the institution of communities of curators of the web, with variety of roles, to improve our ability to use the web for our own good in particular for determining the validity, legitimacy of information.

THE LANGUAGE OF COLLECTIVE INTELLIGENCE

Gaining more insight on the dynamics at play in the system beyond the evaluation of spatial tracks and status of the system, is critical. In particular we need to acquire capabilities to examine the dynamics that lock us into structures that are unfit and detrimental to the thrivability and renewal of the system through time. A language of collective intelligence could develop in the form of a web of pattern languages that could help make sense of situations and phenomena in various 'regions of the logos' and design appropriate solutions. A meta-pattern language (this denomination is not cast in bronze) could provide abstract elementary components as building blocks, common to 'local' interpretative languages. This meta-pattern language would concentrate on systemic phenomena and their effects in space and time, to help recognize and interpret our systemic tracks in dynamic ways, in connection with the data visualization and discovery tools described above.

A group of us is working to launch such meta-pattern language, as an open source visual language we called PLAST (pattern language for systemic transformation), based on systemic interpretation. The language is made of elementary components that will help decompose and recompose observed or intended patterns of systemic behaviour into 'human computable' sequences that can be probed, to evaluate possibilities. The goal is to design and monitor the dynamics we generate by our activity in a way that is regenerative of commons in their widest definition, as factors of thrivability and renewal of the system.

We envision it as a symbolic code for sharing perceptions and interpretations of relations, effects and potentials, looking for tracks in what we 'observe' in the logic of our own realities and shared experiences, and in relation to higher levels of aggregation and integration. Visuals allow direct representations of sequences and combinatory without the 'baggage', whether discipline-related, ideological, or cultural etc, that words can bring. It is a tool aimed at working across boundaries to generate discussions and debate on systemic phenomena and their effects and what can be done about them. The conception of the PLAST will be based on observations of dynamics and effects in different scenarios by communities of practice, contrasted and integrated with known and documented dynamics and effects from various disciplines such as Complexity theory and complexity economics, network theory, cognitive sciences, Systems Dynamics and Systems Thinking, Natural Systems, Mathematics, and more.

All these tools and applications of technology are ways of operationalizing collective intelligence towards the safeguard of our capacity as humans assisted by machines, but humans nonetheless, to perceive and interpret the tracks that we leave in the medium, and ensure the protection, the nurturing and the reproduction of the distributed factors of opportunity and of ongoing health and thrivability of the system. Let's concentrate on building them in good collective intelligence!

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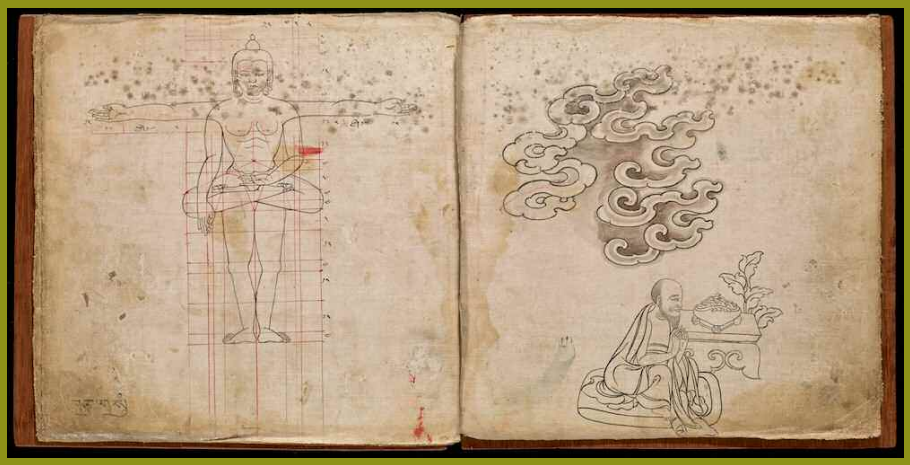

THE TIBETAN BOOK OF PROPORTION ~ SHEET 25-28.

TERRI O'FALLON ~ VENITA RAMIREZ ~ GEOFF FITCH

COLLECTIVE INTELLIGENCE
AS A CAUSAL GROUND

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With Pacific Integral since 2006, Venita was a contributor to the STAGES developmental research, and co-produced Causal Leadership trainings in North America, Africa and the South Pacific. Venita counsels, trains and consults with individuals, groups and organizations worldwide, on-line, and in-person in the areas of adult development, emotional and relational health, and leadership. She brings extensive knowledge in somatic and energetic approaches to psychological well-being and thirty years of experience in transformative education and personal development.

Geoff Fitch is a coach, trainer, and facilitator of growth in individuals and organizations, and a creator of transformative leadership education programs worldwide. He has been exploring diverse approaches to cultivating higher human potentials for over 25 years, including somatic and transpersonal psychology, mystical traditions, innovation and creativity, leadership, integral theory, and collective intelligence. Geoff also has over 30 years experience in leadership in business and is founder and partner of Pacific Integral. He holds a master's degree in Transpersonal Psychology from Sofia University and B.S. in Computer Science, magna cum laude, from Boston University.

INTRODUCTION

PEERING DOWN THROUGH A GLASS BOTTOM boat, we can see a school of fish, each one independent of the other, and yet the school as a whole morphs and changes form as the entire collective moves as one. Likewise, we see birds in flocks flying in the skies, each bird an independent entity but the entire flock seems to have a collective intelligence that operates as a unit. Herds of animals-sheep, wolves, cows, for example, behave in much the same way, each creature having separateness, but flowing along with the collective as if there is intelligence outside of any one creature, even as each creature has its own autonomy.

Collective intelligence seems to be a product of nature itself, arising with the earliest of mobile life then evolving in and through humanity, from tribal and mythic collectives, through contextual and systemic collectives, through causal collectives. These two forms, the individual and the collective, seem to be in a rocking chair relationship. Sometimes the individual sense of self seems to be foregrounded and sometimes the collective appears to be the primary entity. This very rocking back and forth seems to contribute to the energy of individual and collective evolution itself (O'Fallon, 2013).

Because of the evolutionary aspects of collective expression, some definitions are in order. We know that humans are different than a school of fish, a flock of birds or a pack of wolves, our evolutionary predecessors. What we have discovered about collective consciousness in humans is that it has some of the same qualities as our earlier forms, but one that up shifts from concrete, through subtle through causal consciousness and intelligence. We want to highlight the latest form of collective intelligence that we are experimenting with, Collective Causal Consciousness, but it is important to situate this experience within the trajectory of the evolution of consciousness itself.

DEFINITIONS

Concrete Collective Intelligence: In our human world the earliest collectives that form are related to the concrete behaviour of the collective, which takes

precedence over the independence of the individual in what we call concrete collectives. Concrete collective intelligence revolves around shared rules, which are projected outwardly on everyone; and each individual introjects those rules as their unquestioning identity. Thus each person represents a human expression of a bird in a flock for they can move within the collective human flock but not outside of it, and the collective intelligence is concrete, based on strict behavioural rules. Individual behaviour is back-grounded to these collective norms and the result is uniform conformity (O'Fallon, 2008).

Subtle Collective Intelligence: A subtle collective is defined as a context, or a system. Here, one begins to feel the shared subtle energy with and between participants, feeling the effect of that collective energy "forming" them as individuals. Later they realize that they themselves are a part of projecting their own subtle energies and behaviours, beliefs, etc into the collective, even as they are introjecting these very energies, subtle behaviours and beliefs into themselves; they can begin to see how they have an effect on these contexts and systems even as the systems and contexts have an effect on their own individual subtle shape and identity. Subtle collective intelligence is a very advanced and profound, connective and energetic experience in which individual knowing seems sourced from contextual subtle energies, and intuition (O'Fallon, June 2010).

Causal Collective Consciousness: This is a rare form of collective consciousness, which we have been experimenting with for the past ten years at Pacific Integral in our Generating Transformative Change program. To understand causal collective intelligence, we need to define the word "Causal", for it has many different connotations. "Causal" is often defined as an individual attainment, alluding to emptiness, illusion, very subtle, and/or the constructing nature of the individual mind that makes up stories, words and boundaries which are ever changing, and thus are fleeting and illusionary. Each mind-made fabrication is essentially seen as empty, to be replaced later by another one. Thus, the evolutionary thrust is experienced in each moment with the realization that nothing concrete or subtle is permanent, and a flow through time and space is experienced resulting in the empty but fertile potential. Like concrete and subtle intelligence, this is first experienced as a "state" – i.e., it is a temporary realization that can be experienced all along the path of evolution. Thus, anyone can participate in Causal Collective intelligence as a temporary state, which matures into a permanent stage that one can walk around with as an ordinary part of existence. This is the individual expression of causal consciousness (T. O'Fallon, Fitch, G. , & Ramerez, V., 2011).

A stabilized conscious causal collective begins to arise when enough individuals walk around with individual causal recognition and expression and share a collective experience and understanding of how they can source from this infinite causal intelligence, influencing concrete and subtle collective intelligence by collectively accessing the causal field of existence – that is, they begin to "causalize" the former, unbending subtle-contextual-systems and concrete community expressions that they have lived within. These communities tend to release the subtle ceilings that hold people in place and give space for the individuals within them to soar in their individual causal expressions seated in and arising out of this empty creative potential of the infinite causal ground.

CAUSAL COLLECTIVE INTELLIGENCE: PRACTICE AND EXPERIENCE

Imagine sitting in a board meeting or legislative session in which every individual has entered the meeting having released all narrow personal and political agenda, in favour of what is best for the good of the whole of existence. Each person and the whole group remain present, with a clear, vast, and pure openness, empty of bias through the entire meeting, receiving and exchanging information, egos not attached to personal will or agenda. Each and all remain open, bringing forth the best in each, in service to the individuals, the organization and the whole of humanity, of sentience and of existence, past, present and future. Throughout the meeting each person is energized, creative and engaged, offering his or her particular skills and gifts fully. The clear, open, spaciousness of awareness is palpably present, individually and collectively, so that ideas and other subtle forms of contribution flow freely. All individuals move in and out of leadership spontaneously, stepping up when their particular natural skills, knowledge and experience are required (R. Kegan, Lahey, L., 2014). Through a willingness to surrender attachments to specific outcomes while remaining present to the intended results of a collective vision, the individuals simultaneously experience an infusion, distinction and integration of agency and communion, unleashing unique creative potential in service to the whole. Likewise, the collective serves each individual, affirming and supporting each person to bring his or her best skills forward. When conflicts arise they are faced honestly, with an understanding that there is a deeper truth required in order to move forward, usually a truth that considers the wellbeing of a larger

perspective or larger whole. The result is a spacious and open field for collective intelligence and collective causal consciousness to arise and offer up the best that humanity can offer itself in thought, word and deed. (Ramirez, 2013)

After the meeting, each person is energized to contribute their skills and experience toward the next steps of a clarified, collective purpose and vision; aware of the significant role they play in actualizing that vision. This organization is one that effortlessly attracts the highest calibre of professionals who are skilled, conscious, compassionate, and desire to contribute ethically to the future of our planet. The atmosphere is one of mutual respect, mutual care and a desire to work well together to produce original and high quality products and services for the good of all.

A CLOSER LOOK

The willingness to release personal will and agenda into an empty spacious field of awareness (Ramirez, 2013; Scharmer, 2007) is the first and necessary action in this process. Most people can learn how to enter a state of Causal Awareness over time, and some have developed the capacity to live from this level of awareness as a baseline (O'Fallon, 2012). A facilitator who has stabilized this stage of awareness may remind everyone to empty their awareness into a deep, interpenetrating silence that pervades the entire field of individual and collective consciousness. People speak only when moved by a deeper impulse, on behalf of the whole, becoming a clear conduit for the transmission of wisdom, innovation and reason. The words are spoken through the resonance of the heart, from the clarity of vast open awareness, embodied through the uniqueness of the human who is speaking, yet spoken on behalf of all of existence. The words ring true with visionary, inspired realism based on that person's particular gifts and areas of expertise and yet not limited by those constraints. Her words inspire another voice to speak for the whole, and another, until the conversation is alive with engaged potential and excitement, where no one and everyone are responsible for the experience and results, both in the presence of the room and for the emerging outcome. This meeting evokes and invites the best within each individual in terms of personal gifts and resources on all levels, and provides fertile ground for collective expansion, stimulation and wakefulness within the particular team of collaborators.

The collaboration of hearts, minds and consciousness on behalf of the collective well being of existence brings a new sensibility and order to priorities and values. These individuals and collectives can see more clearly global systems, structures, institutions and individuals who are both preventing and creating greater health, well-being and aliveness. From this place of clarity and openness, using all of the resources at their disposal, they begin to create new structures and re-order current, usable structures, systems, and processes that work for all of life, not just for their organization, but for a universal embrace that encompasses as much as awareness can hold. The transcultural human virtues (Ray, 2010) of compassion, generosity, humility, service, gratitude, beauty, truth and justice with universal care (Gilligan, 1993; R. Kegan, 1994) for the largest embrace imaginable (the entire planet and beyond) are foundational assumptions of everyone in this leadership collective.

Through Causal Collective Intelligence, unimagined resources and possibilities seem to appear out of nowhere through the infinite portal that is revealed through this collective consciousness and willingness to receive. Individuals in these collectives are energized, passionate, creative, happy, engaged, efficient and productive; and the collective itself becomes an attractor for others who are awake to this capacity for causal collective consciousness. We have seen these results bear out repeatedly in our causal leadership programs on three continents and among the staff of our own company. Globally engaged individuals in and from Ethiopia, Kenya, Australia, New Zealand, India, Iran, Turkey, Ireland, the United Kingdom, Mexico, Peru, France, Palestine, Kosovo, Norway, Canada and the US have cultivated causal collective consciousness. Because the best in each individual is permitted and called forth in relation to the whole, they are more uniquely themselves, more emotionally and relationally adept, and collectively more creative, productive and aware. They then take this learning and these skills into their own communities, cities and nations, inspired to impart this same innovative potential to as many people as possible.

Imagine a world in which our corporate and political leaders have the willingness, desire and capacity to act on behalf of the whole of existence. Causal collective consciousness offers us this potential.

PRATICAL STEPS TO CREATING CAUSAL COLLECTIVE INTELLIGENCE

In our experience in working with causal collectives and collective intelligence, we have identified several areas of practice that support their development.

To open and build a causal field in a collective, facilitation is needed to build the foundation. To

promote a causal field it is necessary to have individuals in the field who embody the causal awareness of awareness, who identify with and express the causal Self, and who have permission and agency to shape the container. Through a variety of practices, injunctions and expressions the collective is drawn into causal states and eventually into identification with these states and ultimately to a degree of self-generativity with them.

On the surface, this work is similar to an experience one might find in sitting meditation with others, but this is only the beginning. Our work is oriented towards "bringing meditation into life" in the sense that the capacity to embody and hold a causal awareness is sustained not just in mediation practice, but in the midst of all actions of life, as we relate, work, collaborate, communicate, and so on. This requires us to step into the next territory of practice, which involves developing causally grounded facility in the concrete and subtle territories. Causal collectives must be skilled in all forms of collective work, physical, emotional, cognitive in a way that allow the mind and heart to stay open to the deeper, empty ground as we work and play in those dimensions. As an example, in GTC and in our organization, we work deeply with authentic communication and intimacy, with projection and introjection, and emotional intelligence, so that as challenges arise they can be processed skilfully.

As participants gain the capacity to be aware of the empty and still ground in themselves, in each other, and in all of existence while being in community, they begin to work with the concrete, subtle and causal territories dynamically, moving through form to emptiness, to a sense of the empty/full All, that is and includes everything, and from that ground they learn to let come deeper forms of direction and knowing. This process involves a kind of movement through a U Process (Scharmer, 2007), by opening the mind to all concrete experience without judgment, opening the heart to all subtle experience without separation or cynicism, and letting go free of fear into what wants to move us to higher expression. Participants first practice this individually, then as a collective, and eventually learn to continually return to the empty ground together allowing a deeper intelligence to emerge through them. Since conventional images and practices around collaboration are deep habits, no matter how evolved one's awareness is, awareness tends to narrow when the body and mind are in motion. Thus, ongoing practice and learning are important.

One of the essential capacities that supports this movement is working skilfully with habits of separation and identification that arise in the subtle ego. The self and collective are formed in the mind and may go through a variety of re-incarnations, moment to moment, as we construct and re-construct our sense of what is. We can become collectively aware of how we conceive of ourselves in every moment and let go into more fluid, interpenetrative forms of being. Working on multiple levels at once, causal collectives engage in a kind of meta-reflection as needed to identify the stories, constructs, and autopoietic patterns that shape themselves and the collective. Individuals learn to take action and speak in causal collectives with the explicit knowledge that while their words and actions my come from them, they don't own them and that anyone else in the collective might have just as easily spoken them.

Over time, practice supports the deepening of our collective consciousness, action and wisdom. We bring forth in our work an evolutionary developmental perspective that spans birth to enlightenment (T. O'Fallon, 2011) and recognizes the extraordinary diversity of perspective and embodiment that can occur even in the smallest of collectives. We seek to seed this understanding in causal collectives so they can deepen into a wide view of who they are and what their potential is, and to engage in their own evolutionary potential and developmental movement. We work to support the immanent joy that is the human potential in each individual and collective, deepening love, moral sense, ethical action, play, wonder, humour, all of which serve the opening into collective intelligence, as the one consciousness lives in ecstasy and the delight of being, and is each one's birth right. We support the collectives to gain greater and greater autonomy and self-generativity, by allowing them to take greater steps on their own, embody the practices that support their opening to the causal ground and collective development.

Finally, causal collectives, like their participants, engage in collaborative action in the world. We encourage individuals and collectives to step into the world and experiment with the promptings that call them. In doing so, it is necessary to develop collaborative approaches that support the level of complexity that exists at the deeper territories of awareness that arise in the causal states and stages. It is also essential to learn to comfortably act in the emergent, with limited concrete knowledge and foresight. Theory U (Scharmer, 2007) begins to point to this potential, as emergent futures take shape through experiments or prototypes. New organizational frameworks (Robertson, 2013) that allow for the enactments of potential in complex contexts without the need to fully map causes and conditions are useful. In practice, this is acting from

a deep sense of purpose on limited knowledge without a need for a master plan (while building on every other practice we have mentioned). Additionally, we have developed a model of leadership that has become known as Causal Leadership, (Ramirez, 2013) which re-interprets leadership in light of an understanding of individual and collective as deeply interpenetrated, in which leadership can be and is present in each "I" and "We" in any moment. Just like in our endeavour to learn and master any new skill, the development of causal collective consciousness takes trust and a sense of humour, in addition to frameworks and practices that support it.

RESEARCH AND SUMMARY

In support of understanding the levels of collective intelligence, Pacific Integral has ongoing longitudinal research where each person in our cohorts are given a developmental assessment, and then followed up every two years. This research is now in its 10th year, following over 200 people and 17 collectives from various countries and all segments of society. Some of these collectives have been tested and retested 5 times. The results show that with the experience of our Causal Intelligence experiment in our GTC program, individual and collective intelligence continues to grow of its own accord. This supports our premise that causal collective consciousness is a compelling, enlivening, engaging and deeply productive form of awareness. Causal collective consciousness has the potential to transform society and the world as we know it.

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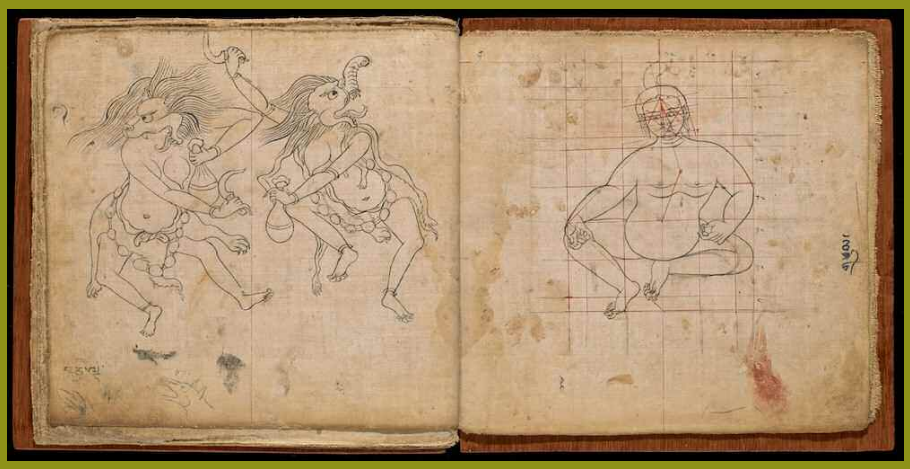

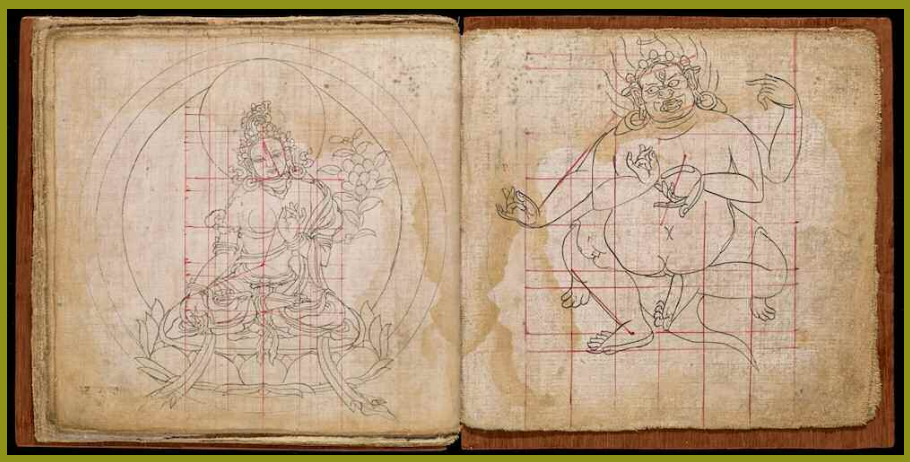

THE TIBETAN BOOK OF PROPORTION ~ SHEET 29-32.

NORMAN LEE JOHNSON

THE APPLIED SCIENCE OF COLLECTIVE INTELLIGENCE:

SOLVING THE GRAND CHALLENGE FACING HUMANITY

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Failure Mode	Solution Method: Single expert	Team lead by an expert	Team of experts	Teams of teams	Advanced collective methods
Isolation	✓✓✓✓✓	✓✓✓✓	✓✓✓	✓	X
Herd thinking	X	✓✓✓✓✓	✓✓✓✓	✓	✓
Group conflict	X	✓	✓✓✓✓✓	✓✓✓	method dependent
Inefficiency	✓	✓✓	✓✓✓✓✓	✓✓✓✓✓	✓✓✓✓✓
Hitting the complexity barrier	varies by problem complexity				
Diversity Level	✓	✓✓	✓✓✓	✓✓✓✓	✓✓✓✓✓

FIGURE 1 - *The frequency of failure modes and diversity levels for different classes of solution methods.*

DO YOU DRIVE THE SOLUTION OR DOES IT DRIVE YOU?

DO YOU SOLVE PROBLEMS THAT YOU WANT TO solve? Or do you solve the problem that you think you can solve? The significance of this inquiry became evident to me during a visit to a US agency responsible for tens of billions of dollars of research for the public good. I was invited to give a talk to about 100 program managers overseeing this research, on the importance of diversity in solving hard problems. To better understand their world, I began with polling them on the perceived problem difficulty of their portfolio, from routinely easy to a grand challenge where experts are in disagreement. What I learned shocked me. None of the program managers believed they were addressing the grand challenges in their research area.

Why is it that we are not taking on the challenges that could really change the world? And if we knew the answer to this question, what are the resources that we are not embracing to address these challenges? These are the questions I will address.

WHY WE DON'T ADDRESS THE GRAND CHALLENGES

While the main goal in this article is to share my revelations on new, possibly radical, approaches to solving the hard problems, we need an understanding of why we've painted ourselves into a corner and possibly feel trapped by our solution methods. What I learned during my visit to the US agency will likely be similar to your experiences.

To understand if the program managers' solution methods were limiting their choice of problems, I polled them on the column headings in FIGURE 1. The first three methods from the left are easily recognizable: a plumber fixing your drain, a plumber overseeing a team fixing your septic system, and a group of experts remodelling your home. The "Teams of experts" method is a common approach to solve high complexity problems or inquiries, for example, a National Academy of Science study. "Teams of teams" method is when teams both compete with each other and share common resources and best practices. The "Advance collective methods" approach is a catchall for the modern collective methods, such as crowdsourcing and prediction markets. The program managers' response was that 95% of them used the first three methods, with the large

majority using the first two. The selection of the methods on the left wasn't because there weren't success stories on the right: one of the portfolios has a "teams of teams" success story that has easily saved 1000s of lives worldwide and benefited millions more.

Listed in the rows of FIGURE 1 are different failure modes of solution methods, with the following descriptions. The failure mode of "Isolation" is from not having access to sufficient information or skills to solve the problem: if you had these resources, then you could solve the problem. "Herd thinking" is when everyone in the group has the same contributions. "Group conflict" is when internal disagreements or conflicts prevent a group from reaching a conclusion, even though all the necessary resources are present to solve the problem. "Group inefficiency" is when a group decision process takes too long, relative to the time required for a solution, even though there are no internal conflicts and all the needed resources are present. Group inefficiency is a common failure mode for the dreaded company meeting. "Hitting the complexity barrier" is when the individuals or group hit a barrier of difficulty that can't be surmounted, where the problem is too difficult for the resources available. The complexity failure mode depends on the problem difficulty and is discussed in more detail shortly. The last row captures their perception on how much the different methods utilize diversity – no surprises here.

I then asked the crowd to select the likely failure modes that caused each solution method to fail, based on their experiences. The darker the box and number of checks indicate the greater the response of the crowd. What stands out in these crowdsourced responses is that some failure modes tend toward the single expert side and others favour the collective side. For example, isolation failures favour the lone expert, but inefficiencies favour the collective methods. And, there are abrupt transitions and peaks: group conflict failure rapidly increases and peaks for the team of experts and then declines.

From the viewpoint that experts are the best resource to solve problems, I found these results surprising. A team of experts should be the optimal resource to solve a hard problem, particularly a grand challenge. Yet, if we sum the failure checkmarks by columns, the team of experts is most likely to fail, despite the preponderance of the expertise present.

What can we conclude from these results? Because this agency isn't solving grand challenges, they are using the solution methods that work best for their types of problems. But if they wanted to solve a grand challenge from the perspective that experts are the best resource, they perceive a failure barrier that limits the likelihood of success. Hence, they solve problems they think they can solve, rather than problems they want to solve. My experience as a citizen aligns with these perceptions: our institutions do not attempt to solve the grand challenges impacting us all, mainly because we think they are unsolvable by the methods available, particularly in the presence of biases and conflicts.

CI: THE WIZARD BEHIND THE CURTAIN

Collective intelligence (CI) is defined as an outcome where a collective solves a problem better (typically more accurately) than the average individual, and often better than any individual (the expert). CI captures the increased intelligence from one level–the individual, to another–a collective. The two levels can be an individual within a group, a group within an organization, an identity group within a society, or even an information technology within an information system.

As defined, CI captures many forms of collective decision-making, both the traditional ones of a century ago, such as the smart outcome of a juried decision or an election in a democracy, to modern examples, such as an accurate outcome in a prediction market or online recommender system. The science of CI studies how diverse information is combined to achieve a collective solution, using abstracted or idealized models. The following summarizes the highlights of mainstream science of CI research in order to establish a foundation to expand the applicability and capability of CI. Readers will find more resources in other articles within this special issue on CI and in the following references: a review of forty years of research on collective processes in organizations (Williams and O'Rielly, 1996) that capture a traditional view of diversity, particularly the challenges; the extensive and self-consistent analysis by Scott Page and his collaborators (Hong and Page, 2001, Page, 2005[1], Page, 2007, Hong and Page, 2011, Shalizi, 2005), a review of modern web-based collective decision methods (Watkins and Rodriguez, 2008); and how the Internet may finally realize the full potential of the collective ideals of the Age of Enlightenment (Rodriguez and Watkins, 2009).

When individuals or groups solve problems, they use different preferences, biases, experiences, or heuristics in their solution to the problem, thereby, introducing a collective diversity of solution approaches and contributions. To be specific, we define collective diversity, or just diversity, because diversity is a property of the collective–not the individual, as an

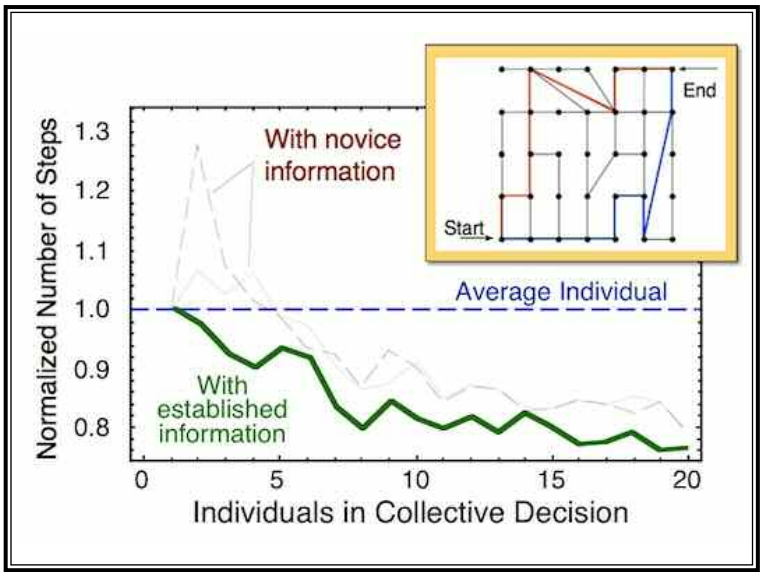

FIGURE 2 ~ *The number of steps in the collective divided by the average individual steps (12.8) for collectives of different sizes. The insert shows the problem being solved.*

aggregation of the expression of unique differences of individuals relative to the group.

Many CI model problems remarkably have in common two conclusions or observations that establish the foundation of the science of CI:

~ *The diversity factor*: The greater the expression of the diversity of the collective, the more accurate the collective solution.

~ *The individual ability factor*: Individuals in the collective must have a minimum degree of ability in solving the problem in order for the collective solution to be accurate.

A major contribution of Scott Page to the science of CI is the proof that these two factors are quantitatively coupled for certain types of problems (Page 2007, Hong and Page 2011), called the *Diversity Prediction theorem*: *Collective error = Average individual error - Collective diversity.*

The following observations illustrate the importance of this theorem. 1) As the diversity increases, the collective error decreases, capturing the importance of diversity in CI. 2) Because the collective error cannot be negative, the contribution of the collective diversity is bounded, or there is a limit to the beneficial effect of diversity. 3) When the average individual becomes an expert or the problem is relatively simple and all individuals solve the problem, then the average individual error and the collective error go to zero, independent of the level of diversity. These qualitative relationships appear to hold for all CI problems and are the foundation for the rest of this article.

To better appreciate the types and sources of diversity, consider the model problem I studied (Johnson, 1998): the solution of a maze (see insert in FIGURE 2) by a group of non-interacting, myopic individuals. Note that the maze has multiple optimal paths – two are shown in FIGURE 2. To study the problem, each individual solves the maze with a set of rules (heuristics) that eliminate unproductive loops and dead ends, but do not explicitly select a short path (they don't count steps or have GPS). Although each individual uses the same heuristics, a diversity of preferences at a node are created, because the myopic individuals have no reason to choose initially one path over another. When an individual uses these learned preferences to solve the maze again, the loops are eliminated and the individual path is shortened. For the collective, the preferences of a group of individuals are combined, and the same individual heuristics provide the collective solution.

FIGURE 2 shows how collectives with larger numbers solve the problem better than the average individual, demonstrating the Diversity Prediction theorem, because diversity increases with the number of individuals, while the average individual error is constant. Note that Hong and Page (2001) examined collectives with diverse heuristics in a different model problem and found the similar conclusions. The reason for the collective improvement in the maze study is found to occur from the closure of unproductive but unclosed loops in the individual solutions[2]. The collective curves with novice information in FIGURE 2 are based on preferences that include the loops in the individual solutions, while the established information results are for preferences without the loops. Because the diversity is lower for the collectives of novice individuals compared to a collective with established individuals, the collective error for the established group is lower, even though the individual error is the same for both groups.

These results illustrate how the quality of information that the individuals contribute to the collective can affect the collective solution: the novice preferences are more "noisy" than the established preferences. The study looked at many different ways that the individual can filter or modify their contributions to the collective, for example, selecting only the dominant preference or providing all preferences with equal weighting, and found that, except for filtering the novice noise, any reduction in an individual's contribution caused a decline in the collective performance. Finally, and the most remarkable, is that the collective always

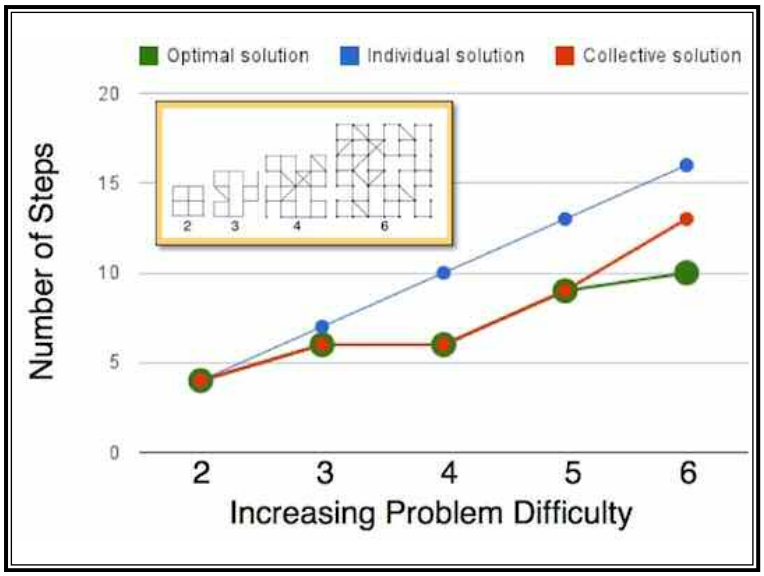

FIGURE 3 ~ *Performance of the average individual and a large collective, compared to the optimal solution. The insert shows the mazes, where #5 is in* FIGURE 2.

finds one of the minimum paths, even though the individual heuristics do not include any concept of a shortest path. This is an example of an emergent solution and is a result of the individual heuristics and the structure of the maze (White and Harary, 2001). The significance of this for CI and grand challenges is discussed in a later section.

While the above results are not controversial or unexpected, there are additional CI model results that are counterintuitive to most beliefs about collective performance. One example is a study on the CI of teams of different individual performance (Hong and Page, 2004, Hong and Page, 2011). Hong and Page studied a hill-climbing problem with many local maxima, and the goal was to find the optimal global maximum. What they found was that diversity trumps ability: "[…] when selecting a problem-solving team from a diverse population of intelligent agents, a team of randomly selected agents outperforms a team comprised of the best-performing agents. This result relies on the intuition that, as the initial pool of problem solvers becomes large, the best-performing agents necessarily become similar in the space of problem solvers. Their relatively greater ability is more than offset by their lack of problem-solving diversity." Hence, in this model problem when experts optimize their methods, they become similar, and therefore, can be "trumped" by a diverse collective. For later reference, we note that this problem doesn't capture our grand challenge definition where experts disagree.

The results of a related study that I did[3] are even more counterintuitive. Similar to Hong and Page (2004), I found that a group of randomly selected individuals of all performance levels did better than a collection of high performers, but this random group only did marginally better than a group of relatively poor performers! Remarkably, the team of poor performers contained a diversity of solutions (paths in the maze) that when combined found a better solution, even though their individual solutions were relatively poor. In a separate study of the same maze problem[4] with individuals using different heuristics, I concluded that as long as the individuals had some ability – they did not solve the maze using a random walk – the diverse collective solution outperformed the average individual, again agreeing with the Diversity Prediction theorem.

Overall, the above results for the science of CI are a powerful statement of the collective's ability to amplify weak "true" signals or diverse structures of the individuals into a robust and accurate collective solution, even in the case when the individuals are poor performers. Unfortunately, this conclusion is weakened by the restrictive assumptions in many of the CI model studies above. For example, assumptions for the minimum performance level of the individual – such as in the Condorcet's Jury Theorem (Dietrich, 2008), the ability of the individuals to accurately communicate with each other (no or minimal miscommunication), the absence of bias (a preferential inaccuracy), a common understanding of the problem, and a common goal. Clearly these assumptions and others like them made in popular CI books (Surowiecki, 2004), while simplifying the model analysis, are not often realized in real problems, particularly the hardest problems. Yet, the above studies suggest that a group of poor performers still can express CI, so these assumptions are likely too restrictive.

BREAKING THE COMPLEXITY BARRIER

In 1998[5], I did a study where I kept the individual heuristics fixed and then challenged the individuals and collective with larger, more difficult mazes. FIGURE 2 shows the results of the study as the difficulty of the maze increased from left to right. Not surprising for the least complex maze in FIGURE 3 (#2), all the individuals and the collective solve the maze optimally. As the maze becomes more complex, the average individual performs more poorly, as captured by the increase in the difference between the number of

steps in the average individual solution and optimal solution. The collective solution continues, though, to find the optimal solution until the most complex maze (#6) is attempted. Not shown are results for even more complex mazes, in which the trend continues: the average individual solution gets worse, followed by the collective solution also getting worse, until both solutions do no better than a random walk solution – the lowest performing heuristic.

These results provide additional insight into the Diversity Prediction theorem when problem difficulty increases. Because the results in FIGURE 3 are for collectives of 500 individuals, the collective diversity is at a maximum for all of the maze solutions. To test this, I increased the number of individuals to 1000, but found the results in FIGURE 3 unchanged. Hence, there is a limit to the difficulty of problem that can be solved by increasing the number of individuals in the collective. And, the collective error remains zero or small as the difficulty increases, even though the average individual error increases. Then, at a certain level of problem difficulty with fixed individual heuristics, the average individual error exceeds the collective diversity, and then the collective error begins to increase – this defines a collective complexity barrier. As the maze becomes more complex, the average individual error exceeds the collective diversity, the collective error is at a maximum, and then the average individual and the collective perform equally poorly.

The main conclusion from the above results is that while a collective can outperform the average individual, there is a limit to what level of difficulty can be solved for a given collective method. We can now fill in the missing row in FIGURE 1, the "Hitting the complexity barrier." If the difficulty of a grand challenge is below the collective complexity barrier, then we can attempt a collective solution. But, if the complexity of the problem is beyond the collective complexity barrier, then we have the following options using the Diversity Prediction Theorem: 1) increase the diversity by increasing the number in the collective, 2) increase the individual capability, or 3) develop a collective solution method that makes better use of diversity. Because increasing the number in the collective is relatively easy with modern information resources such as crowdsourcing and because the collective diversity becomes saturated for a given method, the first option is less interesting here. Because traditional approaches focus on improving individual performance by education, training, experience to get better solutions, the second option is already being addressed. Therefore, the rest of this paper examines the last option of examining methods that make better use of diversity, by extending CI methods to more extreme forms of diversity (biases, different goals, conflicts) or by enabling emergent collective solutions.

BIASED COLLECTIVES: BREAKING THE OBJECTIVITY BARRIER

The first extension of CI methods does have precedence in other areas of research and applications, reflecting the shortcomings of requiring objectivity (a solution without bias) or generality in a complex world. For example, in mathematics, there are two historical geometries based on different starting assumptions about parallel lines: Euclidian where the parallel lines remain parallel and non-Euclidian where parallel lines diverge or intersect at infinity. Both geometries are useful representations of a "reality" such as your desktop and great circles on the surface of the earth, respectively. Yet, an objective and general geometry exists that encompasses both but is too complex to be useful. Hence, each of the biased geometries is useful by being tailored to its environment, yet is fundamentally incompatible with the other. And, the objective representation is too complex to be useful.

Now suppose that an individual uses one of the "biased" geometries to make a conclusion about their local reality. From an objective viewpoint, the individual is using a biased method, yet a collective solution can use the conclusion from the biased reasoning to capture a diversity of realities to obtain a higher truth, similar to the prior examples of CI. Therefore, even though individuals use biased heuristics to obtain a local truth, the collective can amplify the local truths to obtain an objective solution. The only requirement is that the different biases are not correlated in such a way that they corrupt the collective solution, the failure mode of herd thinking.

We can generalize the above observations, restated for the complexity of modern world. A system of beliefs can evolve to be functional and self-consistent, situated within their complex environment, but may not be objective because of biases. Certainly many cultures can be viewed from this perspective as they provide consistency and conformity (Bednar et al., 2010). Furthermore, each evolved belief system may not be compatible with other systems of beliefs. One culture is often not compatible with other cultures at a fundamental level. And – this is the most insightful – in order to extract a piece of the embedded truth, we often attempt to remove the truth from a system of beliefs to make it objective or unbiased, but in the process we may lose the context

Level	Type of Diversity	Source of Bias	Source of Conflict
1	Common social identity	Correlated preferences	Minimal conflicts possible
2	Shared goals and worldview, but without shared social identity	Correlated preferences	Miscommunication, misunderstanding,
3	Shared worldview, different goals	Goals don't represent problem	Opposing goals
4	Unbounded diversity, not associated with social identities	Correlated preferences, goals, ethics, …	Conflicting worldviews, goals, …
5	Unbounded diversity with opposing social identities	Polarization	Conflicts possible in all dimensions

TABLE 1 ~ *Operating guide of managing collective systems: possible levels of diversity, bias and conflicts.*

and meaning of that truth within the system of beliefs. Other fields have arrived at similar conclusions. For example, artificial intelligence in the 1980s achieved a major breakthrough by a situated and embedded approach to robotics, after three decades of failing to develop a general and objective intelligence model (Pfeifer and Scheier, 1999). In this example, a robot with relatively simple rules evolved in a complex yet real environment outperforms a general intelligence applied to the same environment.

These observations about non-objective, biased methods can be aligned with the earlier conclusions about collectives and diversity. When a problem is sufficiently complex, beyond the point where an expert has utility, diverse individuals capture portions of the truth as weak signals or structures that the collective can amplify and bring forth as a strong truth. Within this perspective, we claim that diversity can include biased representations of the problem, even though they may be incompatible with other individuals. Not surprising, this claim is in contradiction to all of the assumptions of the CI model studies cited earlier. Prior CI studies, both abstracted and applied, make the assumption that the individuals in the collective have shared goals and compatibility of shared information. Within this restricted viewpoint, diversity is expressed only by exploring and solving a common problem in the absence of bias and conflicts, but not including diversity as it occurs in more complex domains, for example, by allowing fundamental disagreement on options or miscommunications in understanding.

To advance this argument, an approach is needed to manage biases and conflicts as they occur in social groups. In the following, I prefer to use social group identity instead of culture as the more common way of capturing the dynamics of consistency and conformity in social groups (Bednar et al., 2010). Social group identity is a general concept that includes culture, in addition to the human tendency to develop social group identity from minor or random similarities that may not easily be described as culture (Ben-Ner et al., 2006; Akerlof and Kranton, 2000). A working definition of group identity is if someone does something to a person in your identity group, you feel like it was done to you. For example, if someone attacks a member in your family, you feel attacked.

Groups, organizations, societies with a common social identity have characteristics that are highly relevant for the management of diversity in a collective:

- *A common worldview*, meaning they agree on options, but can have different individual preferences of these options. In the prior maze study, all individuals agree on the connectivity of the maze, but may have different preferences at each decision point.
- *A common understanding and vocabulary of the world*, meaning they can communicate about the world around them without misunderstanding or conflict.
- *Uniform and tacit knowledge* that is not accessible to "others" outside of the identity group. Often tacit behaviour may be incomprehensible to others and seem irrational.
- *A unifying response to uncertainty or threats* that occurs by triggering the expression of social identity and causing individuals in the group to distinguish strongly between "self as a group" and "other." And when triggered, the identity group will coordinate behaviour (herd thinking) and actions, including acting irrationally (Cialdini, 2001, Wooten and Reed, 1998, Tesser, Campbell and Mickler, 1983). When triggered, the messenger is more important than the message.
- *Reinforcing social influence within the group and reactive influence between opposing groups*, particularly when in a triggered state. For example, conflicted identity groups will pick opposing actions, largely without rational choice[6].

From this list, you can see that a social identity group largely satisfies the prior CI assumptions and

restrictions, particularly on compatibility of goals, knowledge, communication, and actions. Therefore, we can use the concept of social identity to guide us when collective methods are likely to work, when and how they fail, and how to create methods that minimize the failure modes of collective processes in FIGURE 1.

Using the concept of social identity, TABLE 1 has levels of possible diversity, bias, and conflicts that can be expressed by individuals within collectives. The qualification of "possible" is added because different methodologies at each level can encourage or discourage the expression of diversity, biases, or conflicts. The table starts from highly aligned individuals at level 1 to individuals that are likely to have biases and conflicts, but may represent the full diversity of the problem.

The main insight from TABLE 1 is that diversity (unique contributions of individuals in a collective) is expressed at all levels, but is more likely to be aligned at the top and in opposition at the bottom. Likewise, biases (features of individuals that do not represent "truths") can potentially occur at all levels, but are more extreme and unchanging in the lower levels. And, the same is true for potential conflicts (features of the individuals that can cause friction in coordination): conflicts occur at all levels, but are more severe in the lower levels. Also note that each level can express the potential diversity, biases and conflicts of the levels above it. For example, level #3 can express biases in correlated preferences from level #1 and #2. In general, biases and conflicts of lower levels are much stronger and detrimental than in upper levels.

At the top level of the list (#1), a social identity group has the characteristics described earlier, so the diversity expressed at this level is largely in different preferences of options, but with no disagreement on those options. Biases and conflicts if they occur at level #1 are limited to preferences. Level #2 removes the restriction of a shared group identity, and consequently there may be biases and conflicts due to incompatibilities of communication, language, etc. Level #2 is expressed, for example, by a smaller organization with uniform activities and common goals, but without a company social identity. Level #3 releases the commonality of goals, but retains the common worldview (agreement on options at a decision point). Level #3 is expressed, for example, by a larger organization with a variety of activities and goals, but which has agreement on options. The last two levels capture types of diversity where the members of the collective have biases (disagreement on options), but without and with opposing social identities, respectively. For example, Level #4 describes when experts "agree to disagree", while Level #5 describes the failure mode of group conflict where experts strongly disagree, as might occur from a history of opposition, expressing opposing social identities in conflict (Ben-Ner and Hill, 2008).

TABLE 1 is an operating guide for managing collective systems and solutions. The type of diversity is largely determined by the problem and system of interest, and thereby indicates which level is active. Once the level is determined, the bias and conflict possible is then identified.

We now consider the evidence that each level in TABLE 1 can express CI. Most abstracted and applied studies of CI assume explicitly or implicitly the first two levels of diversity – capturing the requirement of a collective made up of individuals with common goals and some level of implicit coherence and compatibility in their worldviews.

In the prior studies of diversity and in the consideration of extensions of CI to biased systems, there is one requirement that must guide the following results and discussion: the random contributions of diversity must be uncorrelated, otherwise a correlated contribution may overcome the weak "true" signals or structures contributed by the individuals. Because bias is by definition a correlation in the contribution of an individual toward a certain behaviour, preference, option, or goal, in order for any individual contribution to not appear in the collective solution as bias, the diversity in each level of TABLE 1 must be sampled such that the contribution is uncorrelated. This requirement cannot be over emphasized.

The first evidence for the extension of CI methods comes from an evaluation of the robustness of the collective solution in the maze study[7] where I replaced valid preferences in the individual contribution with random noise, thereby creating false information. For the individual solutions, the addition of random noise was disastrous above a 30% replacement, essentially causing the individuals to relearn the maze. But the collective solution was very robust. At 30% replacement of valid information from the individuals, there was no change in the collective performance, and at 75% replacement, the collective solution recovered the optimal solution, requiring only twice the number of individuals in the collective. Only at a 95% replacement did the collective solution degenerate to a random walk solution (the worst heuristic).

These results are a powerful indicator that the collective solution can tolerate high levels of noise or false information and still retain a high level of performance. The only limitation, as noted above, is that the individual noise must be uncorrelated, in order not to overwhelm the collective "truth." The source of robustness was found to derive from a broad spec-

trum of contingency solutions that eliminate any sensitivity to false information. As the noise study above illustrates, these contingencies are very persistent, surviving high degrees of degradation. These results provide encouraging evidence that the collective solutions can tolerate high degrees of biases and conflicts, as more diverse systems are considered lower in TABLE 1.

Also in 1998, I did a study[8] where 100 individuals in the initial learning phase were divided into three groups, each with a different goal in the maze. Then, a collective used the aggregate information from these three groups to solve for each of the three goals. Hence, this is an example where a collective made up of individuals with experience of three conflicting goals tries to solve the three different problems, based on each of the goals. One might predict that because each subgroup of individuals only make up a third of the total, their contribution to the collective to find their goal would likely be overridden by the other individuals, so therefore the collective should perform poorly. The results are remarkable and contrary to this intuition.

The average individual performance was 39.6 steps when seeking the three different goals as individuals, compared to 12.8 steps when only the individuals were trained on a single goal. The large degradation in the individual performance is because an individual is trying to find the solution for two goals in which they have no experience. Remarkably, the average collective performance for these three goals was 12, compared to the average minimum number of steps to the three goals of 8.3 steps. Although the collective does not robustly find the optimal solution, as for the case when there is only one goal, I concluded "the experience of individuals with different goals still contains information useful to the collective, even though they result from a quite different goal. Said another way, while the goals for learning may differ, the connectivity on the problem domain is common"[9].

This demonstration suggests that individuals with experience from different goals, a source of extreme diversity, can still improve a collective solution, one that can far outperform the average individual. This supports the hypothesis that a collective of individuals having different goals still expresses CI and the Diversity Prediction theorem remains applicable. Hence, we can add collectives with conflicting goals of level #3 in TABLE 1 as a candidate for applied CI systems, greatly increasing the prior understanding of the applicability of CI.

In order to explore the collective performance for diversity level #4 in TABLE 1, I redid the maze simulations for this article using a collective of individuals that did not agree on options, examining the effect of strong local bias – one individual sees a corridor, where another sees a wall. Essentially, each of the individuals are exploring and solving different mazes, which have nodes in common, but have different options at the nodes. From a social identity viewpoint, a node could represent the act of eating, where a type of food is an option for one individual, but is forbidden to another.

In the simulations of conflicting options, I examined different levels of conflict by randomly eliminating options at decision points for each individual. When the level of conflicts in options was below 30% (3 in 10 decision points had conflicts), the individual solutions showed a minimal drop in performance of 5%, indicating that the individuals easily accommodated the changes in the maze. Similarly, the collective solutions still found the optimal path, and only required larger numbers of individuals in the collective for higher levels of conflicting options. Above 30%, both the individual and collective performance dropped, primarily because at 30% closure of options in the maze in FIGURE 2 caused the maze to be much more difficult to solve, as redundant paths are removed.

I also examined when conflicts in options occurred by subgroups rather than in all individuals, by creating 10 groups of 10 individuals, each with the same set of options, as might occur in 10 different identity groups. I observed that there was no difference between the two ways of distributing the conflicts in options. These results suggest that CI in this model problem is not highly sensitive to a poor sampling of biases (only three in this demonstration). Based upon these results, we can conclude that we can add diversity level #4 in TABLE 1 as a possible candidate for applied CI systems.

The final level of diversity, #5, is deeply challenging as conflict negotiators will share, because opposing social identities, when triggered, will act to subvert each other to the point of irrational, self-destructive behaviour. An abstracted model of this level of diversity would require the model to include behaviour, and none of the current computational behaviour models include social identity (Balke and Gilbert, 2014). The applied example of CI in the section after next shows how modern elicitation methods can address the deep conflicts of level #5.

One way to view the above expansion of diversity in CI systems is to observe that each level in TABLE 1 becomes another class of diversity that must be managed in the CI methods. For example, within each group of individuals with a common bias or goal or social identity, there is diversity in how these individuals solve the problem. And, for each of these levels of diversity,

we must be inclusive of all the variations. For example, if only individuals of one biased group are included, then the collective solution will reflect that bias as a failure mode of group thinking. Said another way, the sampling of diversity at each level must include sufficient variations. In CI applications, this requirement may prove challenging, because the different types of variation, such as bias, may not be evident or even knowable.

In the prior section, we concluded that the utility of CI depended on problem difficulty, the level of diversity, level of individual ability, and the how the collective amplifies the individual's weak signals. What we have suggested in this section is that the previous limits on CI are too restrictive, and CI methods can be applied to biased and conflicted individuals. Because the studies of these types of CI systems are still immature, this section is intended to open a new area of research and application that can significantly extend the applicability of CI methods to grand challenges. In the section after next, I provide an applied example of how modern expert elicitation and risk technologies can address all the diversity levels in TABLE 1, primarily by elicitation methods that do not trigger social identities and where everyone feels they are heard and included, even if their contributions are motivated by different goals, highly biased, or in conflict with other contributors.

EMERGENCE: WHERE DOES THE ARROW LAND WHEN THE ARCHER IS BLIND?

Unlike the last section that identifies an extension of CI by removing the assumptions and restrictions on prior CI applications, the extension of CI in this section goes far beyond releasing assumptions to opening fundamental philosophical questions about CI.

The classic example of emergent problem solving is when an ant foraging for food contributes its local solution to a collective solution, thereby enabling the collective of ants to robustly find the shortest path between the food source and the nest. The process by which the shortest path is discovered is not by picking the best performer (an expert selection paradigm), but is found by the synergy of a diversity of contributions (a CI paradigm), similar to the collective performance mechanism in the earlier maze studies. Because high diversity is essential to this collective performance (if all the ants took the same path, the collective can only take the common path) and the ant must have some level of ability to solve the local problem, the Diversity Prediction theorem would appear to be applicable. But a philosophical question arises: how can the average individual error be posed when the individual does not have a perception of the global problem and therefore of its own error. Only a researcher with a global perspective can evaluate the individual or collective error in an emergent problem. And, there is an even deeper quandary to the ant foraging problem: how is the shortest path found when the ants do not have the means or goal of finding a shorter length path in their own solutions?

As described earlier, the individual heuristics for the maze problem that I studied is to eliminate extraneous loops or dead ends, but not to find a shorter path. The discovery of a shortest path by a collective that has no goal to find a shortest path is what I called an emergent problem definition (Johnson, 1998), one step beyond an emergent problem solution. In my maze studies, the emergent problem definition and solution is a result of the structure of the maze in combination with the local individual heuristics (White and Harary, 2001).

Why is an emergent problem definition a philosophical quandary? In all the prior models for CI discussed, except for my maze studies, the goal of the CI problem is stated up front ("how many beans in the jar?" or "Who will win the Academy Awards?") and is understandable by the individual. Even in the situation of recommender systems, the concept that my purchasing history may provide good recommendations to others is stated and a methodology is created to achieve that goal. In an emergent problem definition, the goal is an emergent property of the system and is not understandable or defined from the level of the individual. This lack of connection of goals between levels could be deeply problematic. What if the emergent problem definition is not the "right" one or what if it doesn't have the "right" ethics? For example, individual ant heuristics could have generated, not a shorter path, but a longer path, for a given environment. A collective solution using these individuals would be disastrous to the ant colony. Clearly the ants' heuristics have evolved to provide the best collective outcome. But, in future emergent CI system, how do we create or direct the emergent problem definition or its emergent ethics?

Many researchers and practitioners of CI use collective wisdom in the place of CI, almost interchangeably (Hong and Page, 2011). Many of the aspects that researchers or practitioners attribute to a wise crowd arguably are also associated with an intelligent crowd. By introducing the concepts of emergent problem definition and problem solving to the CI discussion and resources, the possibility arises that collective intelligence and wisdom could provide both solutions and goals that are not expressed or expressible by the individuals in the crowd. This opens CI methods to unimaginable

opportunities. For a full discussion of the issues and opportunities that arise within the context of leadership, see the paper by Jennifer Watkins and myself (Johnson and Watkins, 2009). There are social expressions of emergent problem solving in human history, for instance, the fall of the Berlin wall caught the world and the intelligence community by surprise, mainly because it arose outside the normal power structures (Lohmann, 1994). Another example is the distribution of water in ancient Bali (Lansing, 2006).

Unlike the extension of CI proposed in the last section, the inclusion of emergent problem definition and solution as a resource for CI is barely appreciated, let alone understood or studied. The opportunity is similar to that of developing emergent or generative models that can express features or capabilities that go beyond the model itself, a common area of study in complex adaptive systems (Miller and Page, 2007). Until progress is made in understanding emergent systems, there are no recipes for what environments and local heuristics create the desired emergent functionality. What can be stated is that in the same way that the individual ability is amplified by the collective in traditional CI, likely the same is true for emergent collective problem definition and solution: the ethics and abilities of the individual will determine the emergent collective ethics and abilities. And, based on the discussion in the prior section, there is hope that even with bias and conflicts among the individuals, the emergent collective solution may represent the "best" of the individuals and not their "worst" attributes.

A GRAND CHALLENGE SOLUTION WITH BIASES AND CONFLICTS

The following is an example of the CI extensions discussed above, demonstrating that they can be used to solve a grand challenge. In 2004, President Bush released an Executive order, Biodefense Homeland Security Presidential Directive (HSPD-10), calling for a comprehensive, defensible, and transparent risk assessment to guide biodefense investments across research, development, planning and preparedness, impacting 100s of billions of dollars of US federal funding. While the goal was of national importance, nothing like this had ever been attempted before, largely because it was considered too difficult, partially because of the complexity and scope of the problem, but also because of the special interests of the political and scientific groups in maintaining the status quo. Said another way, while everyone agreed this was a grand challenge worth solving, the scientific and political experts disagreed on all aspects of the problem. In fulfilment of the order, I led one of three national efforts: the high-cost, high-risk, high-payoff option. The following is my account of the lessons learned. This is the first time I've used this as an example of advanced methods of CI.

By the end of the project, the effort required over 40,000 expert elicitations from more than 60 subject matter experts, across all technical and operational domains. And many of these "experts" were in deep disagreement on fundamentals, such as the range of parameters in infectious models, the proper treatment of specific illnesses like Ebola, or proper public intervention strategies during an epidemic.

The technical and operational approach evolved over a four-month period, until the following guidelines were used in the final project during the next 9 months. Interestingly, we were driven by the need to solve the grand challenge, which in turn created the use of CI extensions above, rather than any awareness that the CI extensions were needed to solve the problem. Although no published documentation of the project exists, other researchers have arrived at similar conclusions (Hallin et al., 2013).

1) *Use a methodology that captures the full expression of the problem domain, including possible biases and uncertainties.* The technical approach was a fuzzy-set data capture on a logic or inference tree. An inference tree, similar to the maze model described earlier, captured decision points that are connected logically from beginning to end, creating sequences of actions and decisions, including multiple paths. The fuzzy-set elicitation at the decision nodes allowed for multiple responses, enabling an individual to express uncertainty. Then the fuzzy logic provided risks (probability of a loss) for each decision path (a scenario).

2) *Use a methodology and elicitation that reduced or eliminated conflict between experts.* Because of the fuzzy-set elicitation and the comprehensiveness of the inference tree, each expert could contribute her elicitation independently from other experts.

3) *Use small group elicitation.* By using small group elicitation, conflicts that arise in large groups where individuals feel the need to defend their specific social or expert identities were avoided. Studies show that competition can lead to loss of cooperation even within small group (Barker, et. al., 2012). But, because each expert could express and see their contribution is included, competition generally was eliminated and conflicts were minimized. No attempt was made to filter biases or apparent inaccuracies.

4) *Engage as many stakeholders as possible.* The complexity of the problem required that all stakeholders were included. But a diversity of stakeholders of one expertise was also required in order to overcome technical biases and conflicts. The diversity of input

enabled uncorrelated biases to cancel, so that the "truth" from the biased diversity would arise in the collective aggregation.

5) *Use a methodology that didn't force a solution, but enabled surprise and innovation.* Because the methodology was process and outcome neutral, global solutions could arise, essentially connecting parts of the problem that weren't previously identified, providing solutions that were innovative and often unexpected. These surprises could be considered emergent solutions, although once identified, they were understandable due to the transparency of the method. An example of a surprise outcome was that for a broad class of respiratory infections that require ventilators in treatment, the shortage of ventilators in local health facilities created a major inability to respond to even a minor epidemic.

At the time we did not identify or appreciate how the above approach was an example of CI, and I only recently appreciated that the methodology also enabled biased and conflicted experts to contribute to a collective truth. This is an excellent example of how expediency drives innovation, which is only later appreciated.

We learned the following major lessons. The quality of the outcome was directly a result of the diverse and comprehensive contributions, without selection or elimination of biases. We learned that a process, which included all of stakeholder diversity, led to better solutions (higher performance) and were more robust and resilient (performed well with changes). Had we started by choosing the "best" experts to contribute, we would have replicated our biases, and the results would have suffered, or even been unusable. Also, by using a process where all stakeholders participated from the beginning, the involvement in the process and acceptance of the final outcome was high. The full involvement of stakeholders also had the additional advantage that the deployment benefited from broad support. This is a major lesson in solving grand challenges: a good idea or program can fail by not engaging the diverse stakeholders from the beginning. We found that even if stakeholders didn't agree with the conclusions of the project, they could see how the results were obtained from a transparent process and could identify how their contributions were included. This increased acceptance of the outcome and reduced conflicts, even when the results were contrary to a special interest or a paradigm.

OPTIMISM FOR SOLVING HUMANITIES GRAND CHALLENGES

We began this exploration with reflections on how program managers of a multi-billion dollar federal agency choose not to solve grand challenges, because it apparently perceived that within an expert paradigm, collective expert methods are deeply challenged. Hence, it solves problems that they think they can solve, rather than ones they want to solve. While this generalization is probably unfair for a complex organization that undeniably is serving the public interest, these perceptions of the failure of expert collective systems and of the reluctance of organizations to address grand challenges are our common experience. Juxtaposed with these perceived limitations, the mainstream science of CI, of which I was an integral player, offers attractive alternatives of diverse collectives outperforming experts and collectives of experts, but where the requirements of the abstracted studies and popular CI champions are unlikely to be met in real world grand challenges. Most pointedly, CI methods are not expected to be applicable when the problem domain contains conflicting goals, biases, or conflicts between opposing groups.

We saw that this dismal observation on the state of CI applicability is likely to be inaccurate, after a review of the remarkable fringe CI research on how groups of low performers, noisy individuals, conflicted individuals, and biased individuals can express robust CI. A radical perspective then arises on how collectives of biased and conflicted individuals embedded in their situated environments can be resources for CI, without first extracting their objective or unbiased contributions. Furthermore, in the most difficult grand challenges that are poorly defined in understanding and goals, CI methods that employ emergent problem definition and solution can provide resources that truly solve the most challenging problems facing humanity. Indeed, this emergent resource may be the wizard behind the curtain that has repeatedly saved humanity at many ancient and historical transitions.

In order to better manage this new inclusion of diversity in grand challenges applications, the concept of social identity groups is introduced, both putting into context the mainstream CI research and well as the CI extensions needed to solve grand challenges. In order to show that the ideas presented are achievable with current methodologies, an example is given of a grand challenge project that successfully addressed a national problem where experts deeply disagreed and were often in conflict. All together, the concepts presented and discussed provide reasons to be optimistic that humanity can address our grand challenges, not by relying on our experts, but by fully embracing humanity's full diversity. The more complex problems of our modern times will require new resources that are collectively enhanced, capturing our greater understanding of applied methods of CI in the presence of biases and conflicts.

[1] This is an earlier draft of Scott Page's book "The Difference", and is more technical than the final book.

[2] Johnson, 1998: 22-24.

[3] Johnson, 1998: 32-33.

[4] Johnson, 1998: 26-28.

[5] Johnson, 1998: 34-36.

[6] This is an excellent example of why social identity is a clarifying concept: while many behavioral theories include social influence, the effect can be negative or positive depending on social identity groups.

[7] Johnson, 1998: 28-29.

[8] Johnson, 1998: 33-34.

[9] Johnson, 1998: 34.

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JIM ROUGH

THE CIRCLE:

STRUCTURING FOR COLLECTIVE INTELLIGENCE

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THE STORY

Once upon a time... a continent of people came together as "We the People" to consciously structure a new system of governance. The new structure focused on making individual lives better, but the process of creating it was an exciting example of collective intelligence. We the People were thoughtful together, determining a structure that was best for all. Then, for two hundred plus years, subsequent generations lived by that structure. And, even though the system was oriented to promote individual happiness, collective intelligence improved as well.

Eventually however, as people became more interdependent, the system began breaking down. It was based on competition, the pursuit of self-interest at the expense of others, and adding up individual judgments for voting. Conversation was not its strong suit. The system was left in charge of itself, directing the energies of people toward mindless economic growth and consumption at the expense of the planet, human health, and community values.

What was needed in that dire situation is obvious now. The people needed to talk together. They needed to come together in respect and make intelligent choices, just as their Founders had done. But this seemed impossible to them. The Founders seemed like special people living in a special moment.

The people didn't recognize their collective potential, their capabilities as "We the People." Many acted in service of the whole by fighting to influence legislation or compassionately helping others. But the real need was for all to take "time out," talk, and act together. Social innovations were available to do this.

Generally they did not question the system of which they were a part. Instead they tended to deny the existence of collective problems, or relied on elected officials, the marketplace, experts, or the Founders themselves to address them. Most people thought that the problems arose because society had departed from the original vision of the Founders. But this was wrong. The time of the original Founders had come and gone. These problems required that all become involved, that all work together on a regular basis. This simple step would mean a new system of economics and politics, a new set of Founders and a new "We the People." To shift from collective stupidity to collective intelligence, turning back the clock was not an option. Instead, it was up to a few people to understand how this change could be facilitated, to convene the conversation, and to invite all the people to participate.

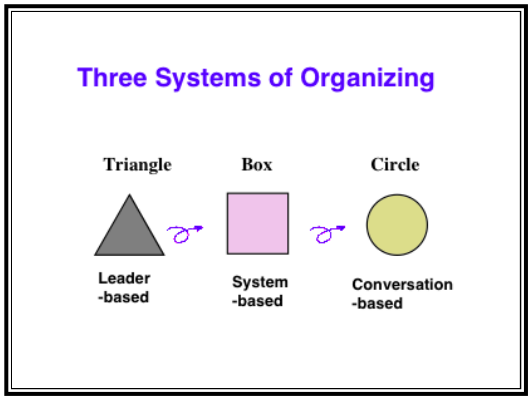
This story is more accurate than most people might think. The main inaccuracy with it is that the first version of "We the People," words that began the US Constitution, wasn't a real "We the People." It didn't include slaves, women, Native Americans and non-property holders. But the rest of the story is pretty accurate. We really do live in a system that is in decline, taking us where no one wants to go. There really is a set of practical social innovations by which the people can be facilitated to come together as "We the People." Just a few people, plus financial resources, can use those social innovations to set the process in motion. And just the addition of this new "We the People" conversation would shift to a new level of collective intelligence, a new system of democracy.

THREE SYSTEMS OF ORGANIZING

For over twenty years I've been teaching seminars on "Dynamic Facilitation," a strategy for helping leaders evoke the best from people. In the seminars participants practice Dynamic Facilitation skills in small

groups helping others address impossible-seeming problems, often issues from society like war, health care, or money-in-politics. In these conversations people often experience breakthroughs in understanding. A frequent breakthrough occurs, no matter what issue people address… *This problem is caused by our system. To address it, we need to change our system.*

There are three fundamental systems of organization whether in a school, corporation, hospital, government agency, or society. The three systems are: 1) Triangle, based on hierarchy, where one leader is ultimately in charge; 2) Box, where a prescribed set of agreements like a constitution is ultimately in charge; and 3) Circle, where the ultimate authority is a creative conversation of everyone seeking what's best for all. Today many people desire the Circle System, where employees, citizens, or organizational members evolve common understandings and shared vision, and where the best talents and skills of everyone are evoked. But the Circle is difficult to achieve.



Each of the three Systems is best in a different setting, has a different structure, promotes a different attitude in people, requires different leadership competencies, generates different results and evokes a different kind of conversation.

The Triangle, with a charismatic leader and a hierarchical structure, works well for organizations in crisis, like in a war or a catastrophe. The collective intelligence of the organization is limited by the capabilities of the leader. People in the organization contribute to the shared effort, but limit their contributions by never questioning the leader or anyone of higher status.

The Box System works well when people are independent and there are plenty of common resources available, like farmers and fishers in North America in the 18th century. Then there can be a clear set of rules that are fairly enforced. People can just go into the world and make their fortune independently. This system encourages innovation through competition rather than cooperative efforts toward what's best for all.

When people are equal and inter-dependent and the issues are complex, the Circle is best. Seemingly this applies to unions, cooperatives, membership organizations, and societies where democracy is the aim. But in practice, these organizations are often rigid Boxes or even Triangles because the Circle has proven so difficult to achieve. Small organizations are most capable of achieving a Circle because everyone can gather and know one another. But as corporations grow to become publicly traded, for example, the organization often reverts to the Box or Triangle.

Western democracies are currently structured as Boxes, where we assume everyone is to operate as a free individual within the law. Voting and the marketplace are structured in place for collective decisions, so there is little need for conversations about the well being of the whole. But as inter-dependence grows we need all the people to engage in this conversation and to become part of the answer. A majority vote is not enough. And it is no longer acceptable for corporations to maximize profits at the expense of the commons.

So naturally today, given that we are embedded in the Box system, we face a growing number of collective problems like an environmental crisis, an L-curve distribution of wealth, rapid depletion of natural resources, mindless consumption, periodic banking crises and wars, etc. From within the Box system these problems all seem impossible to solve. We look to solution strategies like making people aware of the problems, educating them, pressing for legislation, or raising individual consciousness. But these within-system strategies won't make the needed difference. However, if we could facilitate a Circle system into place then we'd all be caring about one another and working together to address these problems. Then many impossible-seeming problems – like racism, partisan gridlock, bullying, and lack of shared purpose – would start going away. And finally we could begin restructuring our institutions to address issues like climate change, the mal-distribution of wealth, and depletion of vital natural resources. Key to achieving a Circle system is to recognize the special kind of conversation that's needed.

CHOICE-CREATING IS THE ESSENTIAL CONVERSATION

Each of the three systems generates a different kind of conversation. In the Triangle people learn to suppress their own ideas and enthusiasm in favour of what the leader thinks and feels. The conversation

revolves around who is speaking and their status rather than the merit of ideas. To make a difference in the organization people look to someone in a position of authority, or to gain authority.

The Box limits our thinking as well. In it people veil their attention to focus on extrinsic goals, rules, and the game-like field of play. Their thinking is directed to their own lives and strategies for getting ahead rather than what they really want, or what the society needs.

In the Box we are directed to use our judging minds more than our creative minds. We call it "decision-making." Voting is the ultimate expression of decision-making and of what we call "democracy," yet we see that the results of elections and our collective decisions can't make that much difference. If any conversation exists in the Box it is likely to be an argument over simplistic strategies that benefit special interests, rather than respectful attempts to determine and implement solutions in the public interest.

Shifting to the Circle system requires a type of conversation that is different than the kinds of conversation used in "decision-making," like debate, agree/disagree discussions, arguing, or power struggle, where one option wins. Even with "deliberation," people thoughtfully weigh different options before choosing one.

There is another kind of conversation needed. It is like what happens sometimes in a crisis, or a "time out." People drop their roles and their blind adherence to rules and norms. They become authentic with one another and face the important issues sharing their feelings. They work collaboratively and creatively together and reach shared perspectives. Unlike collective decision-making, everyone needs to be included in the process and unity is the only possible result. We call this form of conversation "choice-creating."

With choice-creating groups often overcome challenges that seemed impossible beforehand… by redefining the problem, transforming themselves, gaining clarity about what needs to happen, or by inventing new and better solutions that all support. Although people often confuse "decision-making" and "choice-creating," the two are almost opposites because judgment and creativity cannot co-exist. In decision-making judgment is used while in choice-creating people engage one another with heartfelt creativity until the choice comes into view.

The ultimate answer is to convene a new system-wide conversation in the spirit of choice-creating. And if we make this to be ongoing, we restructure our system of thinking so that it's normal to face the collective problems and become empowered as "We the People."

TO RELIABLY EVOKE CHOICE-CREATING

Dynamic Facilitation (DF) is a way to facilitate people to address issues in the spirit of choice-creating. It is guided by the energy of how much they care about the issue, their fears, or the passion of their advocacy, more than by extrinsic factors like guidelines, roles or an agenda. It provides a way people can release their creativity, face impossible-seeming issues, and achieve breakthrough progress and group unity. This natural unity only seems unnatural and difficult to achieve because we live in a decision-making context.

The DF'er invites each person to speak naturally yet holds the space in such a way that they talk and think in the spirit of choice-creating. The DF'er might set up the room with a half-circle of chairs facing four charts – Solutions, Data, Concerns, and Problem-Statements. These charts are used to protect people from judgment and to build a story of group progress from all comments. For example, if one person is describing an idea, the DF'er will be writing that down on the chart of Solutions. Then if someone else starts to disagree, the DF'er might ask the person who is interrupting to direct his comment to her, rather than to the person with whom he is disagreeing. She will then record the comment as a Concern, not as a disagreement, and invite him to offer his Solution as well, "So what might be an even better answer?" This comment is added to the list of Solutions. Then the DF'er can go back to the first person and help him finish articulating his solution.

Using this approach, no one is judged. There is no agreeing or disagreeing. Each comment is valued and added to the charts as an interesting piece of the puzzle. People grow in curiosity and creativity seeking to solve the puzzle. Shifts and breakthroughs naturally result and all come to embrace the final result.

I once had the opportunity to DF a weekly meeting among angry and frustrated employees in a sawmill. Over the course of many meetings they began to work in the spirit of choice-creating. Productivity and quality took off! The energy of frustration became the energy of community. They became more cooperative, curious, informed, and observant. They understood more, trusted more, risked more, and achieved more. Working together in this way these low level employees transformed the management system, culture and performance of the mill.

TRANSFORMING FROM TRIANGLE OR BOX TO CIRCLE

Witnessing this bottom-up transformation helped me to recognize a strategy for how we as a society could transform ourselves from Box to Circle. In 2002 I

wrote *Society's Breakthrough! Releasing Essential Wisdom and Virtue in All the People** about it, describing how a seemingly innocuous US Constitutional Amendment could spark a national and global coming together of "We the People." I called the process within the Amendment the "Wisdom Council." Now, years later there have been many experiments with the Wisdom Council in organizations, communities, cities, conferences and even states. We know that this process can work. It can spark the necessary whole-system choice-creating conversation. And we know it's something a few of us can set in motion at a national and global scale without needing an Amendment.

In the Wisdom Council, every four months or so, twelve people are randomly selected and gathered as a microcosm of all. Each Wisdom Council meets for a couple of days with a dynamic facilitator. They choose an important issue or are given an issue and reach shared conclusions through shifts and breakthroughs. The Wisdom Council then presents this unity and the story of how it was developed back to everyone. Then all the people are invited talk in small groups, face to face, over the telephone, or via the Internet about what they have heard and what they think. Resonance builds. Those who hear directly tend to say, "Yes, I think so too!" ... and they help continue the conversation, taking up where the Wisdom Council left off.

The Wisdom Council process achieves this magic, where large groups create the choice together, because choice-creating is the form of thinking it emphasizes, even among those in the larger audience who were not dynamically facilitated. People in the larger system tend to build on what is happening more than they judge it. For instance, if someone in the audience differs with the Wisdom Council conclusions, they have an unusual perspective. Others are interested to know more about that perspective. They listen and seek ways to incorporate it. This is not how a normal political conversation works, where you go back and forth agreeing and disagreeing and where those with minority views become excluded. In a Circle system, different perspectives are valued.

This level of change might seem unrealistic or scary. But it works and it's safe. One way of looking at it is… we just randomly select a small group of people every few months, who are dynamically facilitated, who give a talk and go away. Another way is to realize that adding the Wisdom Council process to national society or to global society doesn't directly change anything. It just adds a new conversation to what already exists. But in this conversation we finally start talking about the big issues we face, that we have largely been ignoring. And we talk in a way that we can be ourselves, and be heard and respected, and where we start making real headway.

For example, in the heart of Bregenz, a city on Lake Constance at the westernmost edge of Austria, is a parking lot. Over the years it's been difficult to develop any key parcel of land like this because each development proposal generates a political battle. To move the project ahead without the usual battle the mayor convened a "Wisdom Council." The twelve random citizens met briefly to listen to the latest project proposal. Then the door was closed and they were dynamically facilitated. At the end the Wisdom Council expressed their unity, which was powerfully resonant in the community. They said … *People want to be more closely linked to the lake and this project offers a once-in-a-lifetime opportunity to do this. We could take advantage of this opportunity if the centre of gravity for the project were moved to the second floor and there was a wide bridge over the highway and railroad, with a sweeping set of steps to the lake.*

The Wisdom Council presented this perspective to investors, architects, city planners, activists, and citizens. Then each Wisdom Council member spoke how enjoyable and rewarding it was to be on the Council. The audience turned their chairs and met in small groups to consider this perspective. The evening presentation was more like a celebration because everyone was on board, including the developers who proceeded to modify the project plans.

In Ashland, Oregon three citizens organized a Wisdom Council in their county. They arranged for a randomly selected group of registered voters to come together for a day and a half and be dynamically facilitated. The Wisdom Council presented some simple points to the community that resonated widely… "We need to wake up, recognize that our society isn't working, take charge, make politicians more accountable, and we need to start implementing common-sense actions, like adequately funding education." This was just a one-time experiment but it generated a new momentum in the community with many important developments. A number of citizens said the experience was life changing for them. They began a citizens' movement that reshaped the town charter.

In another example, one division of the Department of Agriculture of Washington State initiated a Wisdom Council, which lamented how the Department no longer had the spirit of community it once had. With the Internet and emails people were working more in silos. From that one experience the people of the division found themselves reconnecting with one another in new ways. Later Wisdom Councils were expanded to include the whole Department, state-wide, where employees exclaimed they had finally "bridged the

Cascade Mountain Barrier," which had always kept the department in two separate cultures.

So, more and more we are inter-dependent with others. Yet we are structured as though we are independent. This means we ignore how life really works and assume, for instance, that we can increase our collective intelligence by increasing the individual intelligence of people. No. Not necessarily. And it assumes we can vote on the best decision and ignore the minority, when really we need to create the choice together. The longer we ignore the new reality the more dangerous and stupid our collective actions become, like to threaten the well being of our children with climate change, species extinction, resource depletion, poisons in our diet, etc.

This article presents a safe, practical way to keep our current systems in place but to facilitate the needed shift in collective intelligence so we can deal adequately with our problems. But the ideas expressed here are new, not part of the Box paradigm around which we have structured our identities. So even though this approach proposes a practical safe strategy for change at the collective level, it tends to fade quickly from memory without reinforcement. We hope the reader will continue to develop an understanding of this approach after reading this article and will suggest some possible actions going forward: 1) notice how the game-like structure of our system undermines collective intelligence; 2) notice that the distinction between decision-making and choice-creating is valid and that making it opens doors of possibility for individual and collective intelligence; 3) explore how Dynamic Facilitation can reliably evoke choice-creating in small groups; 4) remember the Wisdom Council process, this out-of-the-box solution strategy, when talking with others about societal problems; 5) look for opportunities to support or get involved with convening a Wisdom Council process.

Oh, and one thing more… the Wisdom Council process is proving to be fun. For people randomly selected to be on Wisdom Councils, many have said, "This the best political conversation I've ever been in." Or, "If you get randomly selected, do it!" It's also fun for the conveners.

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* (Ed's N.) ~ Jim Rough (2002). *Society's Breakthrough! Releasing Essential Wisdom and Virtue in All the People* (Bloomington, IN: AuthorHouse).

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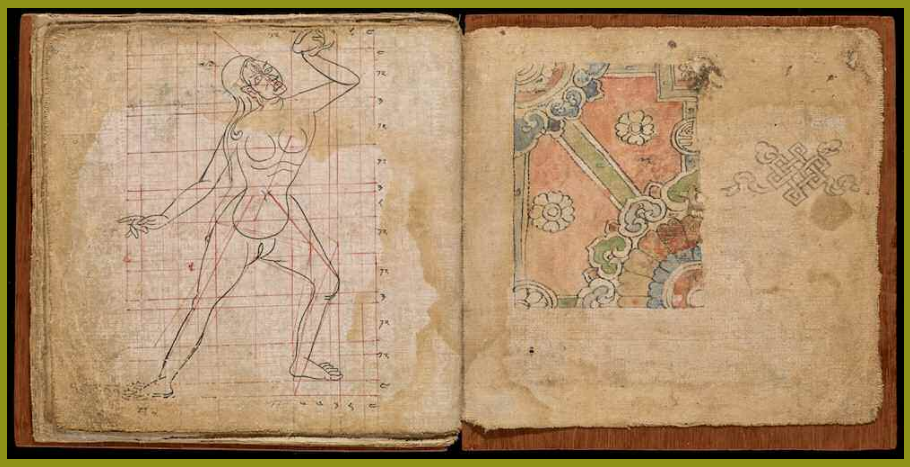

THE TIBETAN BOOK OF PROPORTION ~ SHEET 33-36.

ADEBAYO AKOMOLAFE

THE TREES STILL SPEAK:

THE COLLECTIVE INTELLIGENCE OF THE NATURAL WORLD

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EXPEDITIONS TO THE WILD FRINGES

ACCORDING TO MANY INDIGENOUS PEOPLE AROUND THE world, the cosmos is anything but a dead, mute and silent place. Everything is alive: stones, mountains, the nightly tunes of a croaking army of frogs, the dancing fog that blinds and confuses, the clouds that weep the purging rain. *Everything sings*, swirling in and out of reckoning and usefulness, having seasons of wakefulness and dormancy, but possessing an irrefutable vitality, potency and agency that is not metaphorical or derived from human activity.

The world did not explode in a fury, only to condense into lifeless lumps of matter – awaiting the redemptive arrival of human sentience – as is the generic plot of scientism. Instead, from the Ainu people of Japan, distributed in the Sakhalin Island in the north to the Kuril Islands and the island of Hokkaido and Northern Honshū, to the Efik people of South-eastern Nigeria, *wherever ancient ways of knowing have been preserved,* there is an intimate reckoning with the wondrous vibrancy of all things. Whether it be with giant trouts, people made from corn, golden ropes hanging from a corner of the sky, primal tarantulas, or mountains leaning into a human conversation that interests them, indigenous stories and traditions orient listeners and practitioners towards a cosmos that befuddles, surprises, and invites one to probe deeper. A world that is never the same the second time you look. *A world that returns your curious gaze.*

As an ethno-psychotherapeutic researcher, I embarked on a quest to investigate the shamanic practices and wisdoms of Yoruba traditional healers in two local governments in southwester Nigeria. My concern was to make more explicit their narratives about their interactions with subtle realms and otherworldly beings, and how their engagements with these realms provided real alternatives to the orthodoxies of Western-styled psychotherapy1. My journey took me through unbeaten paths, through remote villages hidden from the asphalted conversations of modernization, and through an inner coming-of-age ritual – one that slowly converted me from my previous loyalty to a static world *of a single overriding truth* to a world that spilled into many other worlds. I met and interviewed six experienced healers who employed divinistic means to understand and offer help to clients that presented a wide range of problems and life challenges to them. Sometimes, while waiting to be granted access to the healer, I would eagerly watch throngs of seekers, their petitions gorily embodied in headless carcasses of bloodied chickens squeezed into earthen calabashes, their steps and rituals gently directed by nodding sub-priests, their tongues unceasingly and prayerfully provoking the gods and clouds and ancestors. Having being raised a Christian of the evangelical stripe, something within found the proceedings fiercely disturbing – and yet, fascinating. There was a feral openness and refreshing intimacy about the way their unshod feet implored the sepia ground beneath, brushing away ashes that had spewed from the hollows of a decorated tree stump nearby.

When I did get the chance to interview the healers, I was transported into restless realms that further dislodged my quaint notions about the *self-evident* separation of things. The journey was turbulent. Their expositions opened up a world in which everything was connected with everything else. Nothing was trivial, trite or tepid. Every object, in the worldview of these men, seemed to have its place, its agreement with an intricate web of things. Items we would normally lose sight of in the modern world, which are largely inconsequential to us – an orphaned eyelash on the floor, a doodle marking out spilled water on parched earth, a drunken bug clawing up the edges of a hot plate of *ofada* rice – were charged with meaning, and spoke in cryptic languages the healers strained to master. Even the wind brought madness. One healer told me: "There's the 'madness of the wind'. There is the one who goes out and gets blown upon by the wind *(atégun)*. The wind touches him; he begins to

[behave in a particular way]. He is incoherent in his speech, and speaks to no one in particular. That's the one of the wind *(wèrè atégùn).*"

Another healer addressed the 'white man's' obliviousness to the vibrancy of the material world around us – hinting that people suffered greatly when they did not see the signs around them, or acknowledge their interdependence with nonhuman forces: "The 'white man' cannot believe it – because over there they do not see that there are hidden forces *(ayé)* that people exploit to disturb others. But now things are changing – people are getting it… Now things are changing. This story of the doctor I told you… if I ran into someone and told them the tale they'd find it hard to believe. But now, on television, these mysteries are becoming very popular. The 'white man' will not see the way we see, because they do not believe people do things to other people. But here, we know that these forces are here – because we have terrible things in our hands. There are some things, for instance, that should not touch you. If I were to put this thing here on your body, you won't even give it any thought. You'd say: "Is this not alligator pepper?" Whereas here, this has powers and we have seen it. That's why we believe in the ways we do."

Making sense of the heaps of interview data slowly freed up hermeneutic plot lines that impelled themes of exclusion, a systematic erosion of cultural identity, and the silencing of the nonhuman world – thanks to the din of modernity. One healer spoke of how the progress of modernization had forced the spirits away from their homes, driving them to the fringes of things. He also said that these homeless, angered spirits sought closure and often pounced on people in order to exact revenge. I asked him what he thought we could do to live well, to thrive as a people, to enjoy the blessings of the world. His response was an invitation to 'get lost', to reanimate our alliances with nonhuman and agentic worlds, to learn to listen to plants and hear the secrets of fields – a hard won access to a poly-vocal cosmos that is fluent in many languages.

In a sense, the healer was beckoning on those willing to hear him to recognize the futility underlying the premise of human sentience as alienated and anomalous. For him, and for an increasing number of teachers, scientists, mystics, and communities around the globe, we inhabit a *living universe* – frothing with playful forms of consciousness – and we imperil ourselves when we do not take this into account. Man is not the sole holder of intelligence, and because we have imagined that he is alone with the burden of awareness, staring out into the blackest night, separate from 'nature' instead of asymptomatic of 'it', lord over the elements, we have summoned a cultural abstraction that is leading to the demise of our species, other species, and the planet.

THE DISENCHANTMENT OF THE WORLD

Nothing feeds our modern superciliousness and civilizational pathology like the myth that the nonhuman world is bereft of agency, of vitality, of story; that we are magisterial anomalies interrupting a dead swirling heap of mute, passive things; and, that at best, the grace of human sentience animates 'objects' with nothing more than a metaphorical vitality they otherwise lack. But this binary view, which divides the world into man and his playthings, has helped catalyze a politics of indifference, an ecosystem of abuse, and a generic culture wherein an economic metric standard – a single notion – is offered as the measure of all value.

In place of a shamanic effulgence, *an enrapturing vision of our interdependence with all things and the über-ubiquity of intelligence, agency and vibrancy,* we have effectively built a passive monolith to concretize our separation from the world around us. We live in quarantine. In order to correct 'nature', we have reified ways of knowing that sidestep the intelligence of rivers, sand and dew, and we are fostering a linearity of thought that is predicated on a static universe, a passive universe open and curiously submissive *only* to the scrutiny of human ratiocination. Whereas, indigenous cultures usually accommodated practices and rituals that nurtured kinship with other species – and this, because there was a recognition of nonhuman powers – 'Western' or globalizing industrial culture produces a discourse of evasion and exploitation, which motivates its citizenry to treat nature as a threat to flee from or as a field of resources that are at best instrumental to our ends.

And this discourse is spreading.

Indigenous wisdoms are succumbing to the sterilizing influences of industrialization – thus creating an epistemological hegemony in which one logic of knowing is treated as exclusively valuable. Children are sent to be students in a school system that is premised on the *a priori* demarcation of living and learning. While in school, they will be educated out of their cultural ties and linguistic richness – an official language impressed upon them. Those that 'succeed' will be granted certificates that offer them access to further discipline by an anonymous, generic sorting mechanism called the job market. Their lands will be transformed, roads built, highways constructed, and houses allocated in urban settlements. They will learn to see the decimation of

trees and the extractive activities of giant corporations as normal, and even necessary for the continued survival of the human race. They might even learn to advocate for deregulated trade policies allowing the free movement of corporations across boundaries. *Growth is necessary*, they will insist.

However, what this cultural fixation with growth and progress tries to repress is the devastation it has wrought on people, on languages, on culture, on planet earth, on imagination. Scientists, alarmed by the level of damage to the earth brought about by human activity, coined the term, 'Anthropocene', to describe a geological timeframe characterized by the violent disruption of the planet's ecological spaces, atmospheric conditions and life systems. What this means is that we "[…] have collectively entered a period marked by increased industrialization – the distressingly potent consequences of which have led to the loss of biodiversity, an increase in carbon dioxide emissions, the loss of critical ecosystems and the concomitant extinction of many species, ocean acidification, air and water pollution, the destruction of coastal areas, ozone depletion, and the sporadic emergence of 'new' pathogenic conditions and crippling ailments. The combined effects of the presence of humans on earth now arguably rivals that of 'nature' itself – so that it is now believed we no longer abide on the same planet that supported life a mere thousand years ago."

Consequently it is now almost taken for granted that we live in a crisis-ridden age. What is probably not as popular is the consideration that our impasses are borne out of the exclusionary dynamics of modern culture, by which I mean the tendency to devalue alternative visions of aliveness, knowing, and reality. Jane Bennett, in her book, *Vibrant Matter**, connects today's crises of ecological devastation, cultural genocide, climate change, and an unparalleled upswing in the number of mental health issues reported, with the failure to see or notice other worlds of being: "Why advocate the vitality of matter? Because my hunch is that the image of dead or thoroughly instrumentalized matter feeds human hubris and our earth-destroying fantasies of conquest and consumption. It does so by preventing us from detecting (seeing, hearing, smelling, tasting, feeling) a fuller range of the nonhuman powers circulating around and within human bodies. These material powers, which can aid or destroy, enrich or disable, ennoble or degrade us, in any case call for our attentiveness, or even 'respect'[…]."

In this sense, we are a poor species today, not because we are not 'growing' fast enough (as the myth of growth would have us believe), but because we have shut away the unthought – the wilds: we have traded our multidimensionality, our ancient trysts with the elements, the wisdom of ossified allies, for a morsel of a curious abstraction: modernity. What would become of politics and economics today if trees, rocks and river were consulted? What would become of consumerism - our use and dump rituals – if we realized that there is no such thing as 'waste', or even 'use' (the former representing a cultural inadequacy to notice the continued vitality of the world around us – even when not fit for our agendas; the latter holding an intrinsic presupposition of human centrality in the otherwise two-way dynamics of utility)?

THIS SHAMANIC TURN

The Cartesian paradigm fostered a vision of *the whole* that can be completely understood from its parts, a view of human rationality as an infallible guide to truth and certainty, and – more impliedly – the centrality of human be-ing to experience. Intelligence, in this conception, is exclusively a human attribute – a tool that we must employ to navigate an unspeaking world. It is not an attribute of stones, caves or spirits. Consequently, we have 'otherized' the world around us, and treated 'it' in a way that does not evince 'respect' or mutuality – and we are worse off for it.

Today, however, we are witnessing the uncoupling and dismantling of this metanarrative of human supremacy. A number of factors is emphasizing the untenability of this vision of the world, and stressing the need to adopt a broader, more ravishing vision of what it means to be a citizen of reality. One of such factors is the anomalies in the 'hard' sciences – reports of which are seeping into public memory and silently influencing our understandings of the real. An anomaly arises when a model or framework or paradigm cannot address an observation, or when the internal logic of a system of thought has no provisions for a 'new' variable. In such instances, the paradigm itself undergoes seismic changes in order to accommodate the errant data – or is eventually replaced. In this case, the deep-seated assumption that the world is dead, that matter is mute, and that awareness is an epiphenomenon of the brain, is being contested – without an effective retort – and is slowly giving way to the idea that awareness, not matter, is fundamental, and that matter is an 'expression' of awareness. David Chalmers, an Australian philosopher of mind and cognitive scientist, first posed the disturbing question in the early 90s – *the hard problem of consciousness* – by asking: 'how could something as material as the brain ever give rise to something as immaterial as awareness?' Recent advances in neurophysiology have attempted to answer that question by emphasizing the way chemical changes in the brain give birth to different forms of

awareness. While correlating states of awareness to certain neural activity has led to remarkable innovations in that field, there is little or no headway gained to resolve Chalmers' *hard problem.* The mystery remains, except – as Peter Russell, a professor of philosophy at the University of Arizona, insists – we let go of the untenable idea that 'intelligence' is an exclusive attribute of man and highly evolved species.

This *shamanic turn* to collective intelligence also coincides with even older observations made about 'reality' at subatomic levels. The quantum world harbours a certain weirdness, a queerness, that does not cohere with our commonsense understandings of how the world works. Perhaps the most bizarre series of interpretation of quantum physics, an elucidation of which this essay cannot even pretend to attempt, is that the physical state of things are determined at the moment of observation – and that what we rudely call 'matter' behaves as if it were actually influenced by the presence of an observer, thus giving matter anthropomorphic features. This suggests that what we call reality is porous, fluid and intersubjective. Does this explain how shamans, by altering their wakeful states (sometimes by the ingestion of psychedelic substances or by less invasive means like 'sonic driving', ritualized drumming, and other forms of auditory stimulation), are reportedly able to traverse multiple worlds, engage with subtle realms and mysterious beings, and bring back wisdom and guidance into 'ordinary' reality?

The cracks in our established ways of knowing the world are paving the way for a more plural, transdimensional notion of intelligence – but so are the deep *psychic* reconfigurations of our *collective unconscious.* Carl Jung posited the idea of the collective unconscious to describe a hive mind operating beneath individuated ego systems and across life forms, which collects and organizes experience (oftentimes in form of archetypes). I submit, provisionally, that today's amorphous and widespread feelings of disenchantment with the status quo are giving birth to different archetypes, different questions, and different orientations towards life. It seems possible to read today's crises as a coming of age – one that is loosening the tight strings of human centrality. It seems that what it means to be 'human' is undergoing an alchemical transmutation of some sort – helped by the escalating cultural crises of certainty and identity.

Jung himself rehabilitated a rich tapestry of alchemical symbolism and texts – the ancient traditions dedicated to finding ways to transform base metals into gold – as an exemplification of psychological evolution. The first stages of this transformation process always began with the *nigredo,* which is a deep blackening of the *metal*, or – translated into psychological terms – a difficult acquaintance with *shadows, hidden* depths and suffering. This suffering is however necessary in order for transformation to occur. I cannot help but think that today's crises is creating deconstructive moments, making it possible for a deeper appreciation of just how much a recalcitrant world 'outside' awaits our *humiliation* – in order to speak new truths to power.

CONCLUSION: A POLITICS OF HUMILITY

We are at our tether's end – and there is a growing recognition that our best efforts to address today's problems are often counterproductive and inhibitory to true and lasting systemic changes. The deeper consequence of affirming nonhuman worlds, porous realities, fluid materialities, agentic and vibrant objects, and subtle forces more compelling than causality, is letting go of cherished onto-theological categories like free will and determinism. Choice and action no longer looks the same in this cosmos-political vision of a more democratic alliance of intelligences. I ask: what would become of activism today if we listened as much as we complained… if we held as justly sacred a refusal to do anything at all – just as much as we valorise conscious effort? If we saw problems as agentic forces we could listen to, instead of blips in the machine we ought to fix? If we are connected to everything else, if agency describes more than just human action in the world, then a *politics of humility* is needed to meet today's challenges – and by a politics of humility I offer the idea of a poetic scheme that recognizes the need to 'slow down' when matters are urgent; one that realizes that to slow down isn't to accept defeat, but to relax the ego's defences enough for other forms of knowing to occur, in order to hear other tunes that seek to be heard. A politics of humility is one that orients us towards the shaman's secret: that the trees still speak.

* (Ed's N.) ~ Jane Bennet (2010). *Vibrant Matter. A Political Ecology of Things* (Durham-London: Duke UP).

CRAIG HAMILTON

COLLECTIVE INTELLIGENCE

AND THE EVOLUTION OF SELF AND CULTURE

Craig Hamilton is a pioneer in the emerging field of evolutionary spirituality and a leading voice in illuminating the vital relationship between individual transformation and collective evolution. Craig offers spiritual guidance and teachings to a growing international community spanning 50 countries around the world. With more than 6,000 graduates, his Integral Enlightenment courses are designed to support the development of people who are committed to evolving themselves and our culture, integrating decades of intensive spiritual practice with insights gleaned during his eight years as Senior Editor of What Is Enlightenment*? magazine. Craig is a founding member of Integral Institute, a part of Deepak Chopra's Evolutionary Leaders Forum, a participant in the Synthesis Dialogues, a 35-person interdisciplinary think tank presided over by His Holiness the Dalai Lama and the founder of Evolving Wisdom. He has also been a contributor to* Shift *magazine and co-authored IONS' 2008 Shift Report. Craig lives with his wife, Claire, in northern California. www.IntegralEnlightenment.com .*

INTERVIEW

BY SUZANNE SHEALY AND GEORGE PÓR

Suzanne Shealy: Craig, you have done some writing on this topic and have been engaged with it in your own work. What is your understanding of the meaning, or perhaps the meanings, of collective intelligence? Can you briefly say something about the significance of this topic and why it really matters?

Craig Hamilton: I like that you used the word meanings in the plural because there are a lot of different kinds of collective intelligence or forms of collective intelligence or ways that this manifests. There was a book written at one time called *The Wisdom of Crowds**. It showed how if you aggregate the intelligence of a group that the aggregated intelligence will be smarter than any individual in the group. Meaning that, if you're trying to get a group to guess the number of jelly beans in a jar, if you average everyone's guess together, the "group guess" will be more accurate than the guess of any individual in that group.

There are levels of collective intelligence that are very much about finding ways to simply harness what we might call the ordinary intelligence of a lot of individuals and combine it to try to get better answers to questions. There is a lot going on in collective intelligence as a field. The particular piece of it that I'm interested in… I've even veered away from the term 'collective intelligence' and more and more find myself talking about collective awakening or collective enlightenment because the particular part of it that I'm interested in is really the spiritual dimension of it.

It is what becomes possible for us when we come together in group spiritual practice, with a conscious endeavour to speak together, to engage together from a deeper, higher, wiser dimension of the self. Higher potentials open up through that kind of practice that I find very significant and exciting for our time.

Traditionally, spirituality and religion was focused on the salvation or enlightenment or liberation of the individual. It has been held as an individual matter. Even if individuals came together to meditate or worship, it was still about each individual's personal liberation, enlightenment, salvation or transformation.

History has shown us a lot of enlightened or transformed individuals, but we haven't seen the emergence of enlightened collectives on this planet, of groups of people who are able to come together beyond ego, to come together and function beyond the conditioned habit patterns of human nature. So the question that has compelled me for a long time is, "What would be possible if a group of people could find a way to come together beyond ego, to find a way to come together in an expression of our higher spiritual and evolutionary potential? What might that give rise to? Might that hold significance beyond just a bunch of enlightened or awakened individuals?"

The world doesn't just need more enlightened individuals, more awakened individuals. That would be a good thing. The more enlightened individuals we can have, the more individuals who have access to a deeper source of wisdom and compassion and creativity, great – but if we are really going to evolve as species and find a way to function together that's different than the way we have up until now, collectives are going to have to awaken to higher potentials and learn how to function in deeper and higher ways.

That's ultimately what I would see as the higher potential and significance of these collective awakening practices.

S. S.: How did you come to be so interested in this? How did your own experience get you so interested and so engaged with this work?

C. H.: I, like a lot of us, started out on my spiritual path very much interested in my own enlightenment and liberation and doing a lot of individual spiritual practice. I came to be part of a spiritual community where we were all focused on our individual enlightenment in that sense. And yet at a certain point, we began holding dialogue groups – not because we necessarily knew that there was some higher collective potential waiting for us, but it just seemed natural as a group of people living together doing spiritual practice to come together and talk about it, so we did.

So we came together, and we talked about spiritual principles and teachings. We would come together and talk about our own struggles on the path, our own awakenings and breakthroughs on the path. So, we had aspects that were more focused on the individual and aspects that were more focused on principles and teachings. At some point over the years of dialogue practice in this way, we started to have collective breakthroughs into profound higher states of consciousness, into enlightened consciousness that would happen to a whole group together at the same time.

Now, when I say at the same time, I don't mean there would be one moment where suddenly everybody in the group would go from an unenlightened state into an enlightened state or there would be just a single collective shift. It would tend to happen a little more gradually. A few people would wake up and then a few others would wake up, and pretty soon the whole group would find itself on the other side of this veil, of this barrier, and in this profoundly opened up place.

This just started to happen naturally in our group. And it seemed significant to us for a couple of reasons. One was that what was previously an inner matter – the domain of spiritual experience, which is usually something happening when we are sitting there with our eyes closed or maybe we are sitting with our eyes open but our focus is within; what was previously in inner matter now started to become an outer matter. Spiritual experience and awakening became something that was alive in the conversation between us. It was something that the frontal self was engaged in. Our personality was now engaged in this process of awakening. It was actually happening out here in the collective.

I think the other reason it captured our attention so much was that for all of us it felt like we were out on the edge of human evolution. It was a sense of new things coming into being between us that perhaps had never happened before, or maybe were happening currently in other places on the planet, but things you couldn't read about in the history books. Things we couldn't find any reference to in the great wisdom traditions of the world: this powerful experience of collective awakening.

And there was also a sense in this that the group would enter into a single higher mind together if you will. There was an experience of a higher being or a higher mind that the group sort of became. We would become one being that had many voices, many faces, but there was one consciousness that was alive between us and that seemed to have a will and agenda of its own that we were all participating in and partaking in.

It didn't delete or do away with our individuality. To the contrary, it amplified the better parts of our selves. In other words, each individual was still very much an individual and perhaps more of an individual because they weren't lost in a stream of conditioned responses from their past. They were being liberated and freed by this group awakening. It seemed to have an accelerating effect on all of the individuals involved, on the evolution and awakening of all the individuals. In a sense, it also became a very powerful form of spiritual practice for the individual to participate in these groups.

That was really what opened the door for me and I began working with a group of people in that context to reverse engineer what was happening in our groups and come up with a set of practices and principles that we could teach to help other people begin to access this field of collective wisdom and awakening in depth. And so we did and started to take it out into the world, to people outside our community and to run experiments where we'd invite in the general public to see if they could have access to it as well. Miraculously, it seemed to work where even if there were just a few of us who had been practicing this, and a large group of say twenty five people who had not practiced it before, there was a way we could seed the group. People would just walk in off the street and have these experiences and say, "I don't know where that came from, what I said tonight. Something came through me. I've never experienced myself this way before."

So we knew we were on to something. We got very excited about it. As you know, I went on to research this field and see where it was happening elsewhere in the world. I wrote an in-depth article about this for *What is Enlightenment* magazine. Then I've gone on in my own teaching work because I left that community

nine years ago and went out and started my own community and began teaching this work. This has been a fundamental part of it the whole time, helping groups learn how to access this depth together.

S. S.: That just sounds like an amazing experience and one that everyone most commonly wouldn't have. But how do you understand the relationship, or the relationships, between individual and collective states of awakening?

C. H.: Very interesting question. So I think there are a couple of ways to look at that. One is that certainly having, I would say having watched people go through a process of spiritual awakening and development in my own teaching work over the years and also having those same individuals be doing a lot of this collective awakening practice that I've been speaking about, it's clear to me that the more evolved, the more developed the individuals are, the greater the potential they have to participate in these collective awakening experiments and practices that we are speaking about.

And we can all see why that would be the case pretty simply because there are a whole set of capacities that one needs to have to be able to be a good – Just like you might say, to be a good meditator, you have to be able to focus your attention to a certain degree. You have to be able to dis-identify with the thoughts that are streaming through your mind so that you're not identified with and just endlessly lost in the stream of thought. We could say there are certain capacities that one's practicing in meditation that you get better and better at. It is really the same with the collective awakening practices. There is a whole host of capacities that one needs to develop to be good at entering into a collective mind, at accessing collective intelligence, at experiencing collective awakening, being able to really do that together. And so you could say that a form of individual development is developing all those capacities that then enable one to really participate at a higher level with a group.

The other interesting side to this, though, is that I have also seen over and over again that individuals who maybe are not all that highly developed can temporarily go into very profound group states of awakening. They can sort of stumble into it because the collective has a momentum to it and a centre of gravity to it that's very powerful. And if an individual steps into that with even a basic, temporary willingness to suspend what they already know and to come into it with a certain innocence and freshness even once, they can sometimes just catch the wind or draft on the peloton of cyclists of that group, they can get carried by the momentum of the group awakening and the group mind and find that they are having access to things that are really beyond their own level of development.

You could say it is like the individual gets access to the developmental stage in that collective. I don't mean in a permanent sense, but temporarily, if one's willing and able to just be receptive and open and just lean into that inwardly. It's like one gets the benefit of all the awakening and development that is going on in that collective and is happening in that moment. One can really have an experience of being propelled far beyond where one's own spiritual work has taken one. That's another interesting phenomenon in relation to the individual and collective piece.

I guess the last thing I would say though is, in addition to that, the other really interesting thing about this is that doing these collective practices over and over again has a profound impact on the individual's development. This is almost the most mysterious part because it seems that there's something about taking our contemplative practice or spiritual practice out of just our interior subjective domain and bringing it out into conversation, bringing it out into the space between us, bringing it out through our voice, our words, our eyes, our personality in a sense. In other words, allowing ourselves to awaken and to be doing awakening practices while we're fully alive and awake, eyes open and engaged. There is something about that that seems to infuse the whole self with higher consciousness in a way that it sticks!

Over and over again, I have heard this from people, and it has been my own experience, that when one has a powerful experience in a collective dialogue practice, of awakening to this one mind, experience that there's one consciousness that we are all partaking in here that's alive in all of us together; when people have this kind of experience, they'll very often say, "And it was with me all week long. There was not a moment of my week where I was not knowing that higher thing that we were together in, in the group." They will also say, "I could feel the whole group with me all week long even though I didn't see any of them for a week," because often people meet once a week. They will describe this experience of how something happened in that one and a half hours of practice that locked something into their self, into their experience of being alive that now did not go away.

And it holds new capacities, a new relationship to the mind, a new inner freedom, a new access to creativity and wisdom – all of these things that seem to come online because they had this experience in a collective. Whereas people who have profound experiences in meditation rarely report that. Somebody

might go and meditate and say, "Oh, I had a big deep experience of oneness and then I got up off the meditation cushion, and within a few hours it was gone. I don't know where it went, but I didn't have any access to it anymore. I guess I need to meditate more to get back to it."

So there's a powerful contrast here between what happens in this collective awakening practice and what happens in our interior contemplative practices that I think is really rich and worth a lot of exploration because it has significant implications for human development as a whole – individual and collective. And, George, I'm curious about your experience of that, what you see in that regard because it's a kind of very unique far out exciting dimension of all this.

George Pór.: I have a living inquiry into the possibility of stabilizing that collective state of consciousness that, Craig, you described as "one mind." There is an interest in this because we all have some images, some ideas, some kind of epiphany of what it is like in awakened state of being – but we have hardly any notion, any experience of *collective* awakening that goes beyond a satori-like collective high, which is only a momentary experience.

I listened with great interest when I heard you saying that people are reporting that after a high collective state, they are riding on that energy and I can share that I have had the same experience, and sometimes I could ride on that energy even for a few months, but then it went away. For the sake of any kind of coherent collective accomplishment that is making a difference, not only for the participating individuals but for a larger system, it would be lovely if we could find out what it will it take to stabilize those states. Any insight on that?

C. H.: Well, I mean, practice, practice, practice, right? I guess maybe there's a couple of ways to come at that. One is, "What does it take for individuals to stabilize in these things?" We were talking about how an individual participating in a group that is really waking up beyond ego – when that is happening in a group, it can start to stabilize something in the individuals involved. And if the group keeps doing it and keeps practicing it, then there's a way that the individuals become stronger and stronger. It is like it's providing the individual with a new sense of identity: "I'm not who I thought I was. I thought I was just this separate individual moving through time and space. Now I'm starting to experience myself as infinite being or as infinite becoming" – because we can have both kinds of group awakenings. We have practices in my work to do both of those things.

If I start to awaken to myself, let's say as the infinite becoming, as this evolutionary impulse or what I call the evolutionary self. We start to awaken to that together. I start to awaken to that in a group. I think the key here is it's not just an inner experience I'm having; I'm actually being that person. I'm speaking from there. I am letting it animate me. I am allowing my old small identity to move to the side, and I am awakening to a new enlightened consciousness that is this profound spiritual process of becoming. I am allowing myself to begin to embody that, to identify with that, to own that, to let that infuse my personality completely, to be the voice of wisdom that's coming out of my mouth. So I'm allowing myself to actually become a different self, and I am identifying with that. I think why that's powerful as a stabilizing factor in an ongoing way is that now I have a different experience of myself in the world, of myself in relationship. I have a new reference point and it's beyond memory, it's beyond the mind. It is like a reference point in the beyond if you will, but it is being brought down. This is what it means to "bring heaven down to Earth." You're bringing the divine into manifestation.

I find that that is a very stabilizing practice. Now, of course, when you talk about stabilizing anything, inevitably, the conversation turns back to practice and what are you doing over and over again. So the practice in this case would be doing more of that – all of these collective awakening practices very consistently with the same group, I would say. Obviously, with different groups can be valuable, as well, to mix it up; but also having a stable group that's going deeper and deeper together, building on what's come before.

And now the individual starts to really have a very concrete new self-structure that is emerging that is really post – it is really beyond what's come before. It's not just the out-flowing of what's come before. And that starts to become a more interesting self to be than the one I used to be, and so there's this total shift in orientation that the person can now hold because they have got enough practice standing there together with others. I think that together part provides an immense support for stabilization.

Now if you are talking about, "How does a group become stabilized in a deeper and higher place?" I would say again, it is about consistency in that group's practice – of really going there again and again. Of course, as we know as spiritual practitioners, going there again and again does not mean trying to get back to any particular state again, but it means doing the practice again. It just means doing the

practice again, and you do it again, and you do it again, and you let the result keep unfolding and evolving and being different each time.

G. P.: That's very inspiring what you are saying. And as I was listening, another question came to my mind: it's about the relationship between a spiritual teacher, a person who is enabling some conditions to emerge, and the *sangha*, the community itself, the inter-subjective field, as a teacher. What do you sense about the relationship between these two kinds of teacher?

C. H.: Well, it is a great inquiry and I will tell you George, I'm on the edge of an experiment with this right now because I have just recently decided to be a bit less directive and a bit less involved in all the things that are going on in the spiritual community that I generated. I feel like there is a level of maturity now among enough of the participants who've been doing the work pretty intensively with me in the last five years that, I'm saying to everybody, "Let's see where you go with this with less input from me." So I will have more information on that a year from now, I think, but to speak to that sense of the kind of dynamic between the teacher as an individual and the teacher as the awakening sangha – ideally, I think ideally – because we are talking about collective intelligence after all, right? – so ideally this is an impersonal process…

Whatever enlightenment is, it's got many dimensions to it. Here we are talking about intelligence, which in an enlightenment context, means we are referring to a deeper kind of knowing, a deeper knowing faculty that becomes available to us when we get out of the way. When we get out of our own way, when we dis-identify with our own mind, when we are able to sit in open innocent interest and meet each moment with that, we find that there's this wisdom faculty or this wisdom capacity that comes through us – and that's the experience – it comes through me.

I don't know where it comes from. It's not my memory, it's not what I learned in school. It's some holistic knowing capacity that starts to get stronger and stronger in the enlightened individual. The same thing happens in a collective. There's a collective wisdom capacity that starts to activate in a group that's able to function in a higher way, in the ways we are describing here.

And if that's for real, meaning that, if the group really is going beyond the ego together, and they really are accessing that collective wisdom capacity, then there is no difference at all between the wisdom of the teacher and the wisdom of the sangha. If they're really doing it, there's no difference because it's one wisdom faculty that's not personal, and it's not my wisdom. As anybody who's awakened knows, "This isn't me." It's not me in any sense I can own it. It's something that I'm making myself available for, and it's showing up. And so I think you could say that the art of spiritual teaching, as I hold it, is how to empower that in people, their own capacity to access that wisdom faculty. I do feel that doing this together in groups is one of the most profound ways.

The good thing about doing it together of course is that it's no longer just my subjective take on things but we are seeing it together. We are discovering it together, so it's automatically getting validation in a sense of, "Oh, we are all knowing this. We are all accessing this, and therefore we can trust the truth in it more powerfully."

We still can't trust it completely because we have to be good 'post-moderns' and know that we might be in some collective distortion, and we might be falling into error all together and making an assumption that we are seeing truth. We have to always be humble and always question everything, but there is a reliability factor to it that I think is quite significant when it's a collective tapping in.

S. S.: You have spoken about how people can develop capacities for inter-subjective practice that helps groups access collectively awakened states. What are some facilitators of the process? What are some of the practices or skilful means for cultivating this?

C. H.: Well, I will throw out a few, and I will be curious what you have observed in your practice of this and then I'm also curious what George would add, since you are a very active practitioner and scholar of this field.

I come back to some basics when I look at, "Well, what is it that makes this possible?" There is this *willingness to suspend our already knowing mind*, this willingness to set it down. To make it very simple, everybody in this group that's going to have this conversation is not going to reference prior knowing. We are not going to refer to things we knew before that are sitting in our memory, so we're leaving memory out. It doesn't mean memory isn't informing us because of course it is, but we are not resting in memory, we are not resting in the mind. I am not just saying, "Well, I learned something interesting about this three years ago when I had this experience. I read this…" or I'm not quoting other people's knowledge that I've read. We are not bringing in the past; we are not bringing in past knowledge. We are coming into the moment innocent, open, interested; meaning we want to know. "I don't know, but I want to know." So I think one kind of capacity is that kind of Beginner's Mind capacity.

Another one would have to do with where we place our attention, learning how to place our attention. And there are different ways to do that. For instance, there's *learning how to place my attention on the flow of wisdom that's emerging between us*. Because we find in a good dialogue, there's a flow of wisdom. One person says something, and then another person adds to it, and then another person adds to it, and it's flowing on. Learning how to pay attention to the flow, how to listen to the flow – that's another capacity.

I guess this whole attention piece I'm talking about could also be described as a listening capacity. There's really a capacity for a deeper kind of listening that has many dimensions to it. As you know, we have practiced a lot of different kinds of listening over the years in our community, but it's all about learning to listen for different things, *learning to listen for the deeper place that the person is speaking from*. You are listening to the deepest part of the speaker. There's learning to listen into this space between us. There's learning to listen to the emerging flow of wisdom. So there are lots of different listening practices that we cultivate and facilitate.

Then there is the "Where am I speaking from?" part of it and learning. It requires real development in one's self to know the difference between, "I'm just speaking from memory. I'm just wanting to say something I already know" versus, "No, something's coming through me in this moment that I'm going to give voice to," or, "Something's here that I want to give voice to that's fresh:" the fresh arising of wisdom and learning how to know the difference in one's self. "What is me just telling a story about my past? What is me just sharing a problem because I feel disconnected and I've now got some story about that that I'm going to share?" What is the kind of speaking that contributes to this emergent flow of wisdom and developing capacity around that?

So we have talked about the open, innocent interest, the deeper listening, and *speaking from a deeper place*. How about you? What other pieces do you notice are the facilitators or the practices that enable this authenticity?

G. P.: One is definitely *having a shared intention*, something that sets the context because depending on the context, both the process and its fruits can be very different. So where the context is, in terms of developmental stages, I can imagine that a basic tone or the context can be simply a human bond – to get closer, to get more intimate with each other and with the collective space, or it can be for the benefit of the individuals experiencing some kind of collective highs. Even some early psychedelic experiments created context for something like this. And there is also possibility for a higher level of context where the evolution of consciousness itself is what is at stake: that we recognize that this experiment, this conversation can actually contribute to create new grooves, new cosmic grooves that didn't exist before. So that's an enabler – to have a shared intention.

C. H.: Absolutely. Of course, all of this can also be applied in particular ways. It could be to deepen our understanding of a spiritual truth. We could come together and say, "So what does oneness really mean?" That could be our intention: to penetrate into that experientially so we could know and understand that more deeply in a holistic way. Or it could be that you actually want to solve a problem in life, in the world for real. You're going to set the intention there but then still do all these practices to access some depth. I love the point that the intention helps set the course for the inquiry, and you might get very different results depending on those different intentions.

When you brought up intention, it made me think of a couple other pieces of the practices required here. Another one is that there is really a requirement for everybody *to take full ownership of what's happening in the collective*. We take the posture that: "This group is me and I am going to take responsibility for the whole group going somewhere together." So I'm no longer going to just do my part, I'm going to take ownership of the whole event that happens here, even though there are six of us in this group. I, of course, can't control what comes out of anybody else's mouth, but I'm going to own the group as though it were myself, and I'm going to drive toward a powerful result for this whole."

There's a way this takes us out of the kind of ambivalence we have about really getting too "in there" with each other if you know what I mean. People tend to be a little hands off but there's a way of, if I'm really owning the whole collective, then I'm naturally leaning in, and I'm noticing somebody's being a little quiet, so I'm interested. "Well, what's happening over there for you? I haven't heard from you in a while," and wanting to pull them in. Somebody else is dominating, and I'm wanting to ease them off a little. Somebody else is being too hyper-intellectual and so I'm asking them questions like, "How is this arising in your experience right now?" because I'm trying to draw them into something more present in the moment. I find there's a kind of natural facilitation that occurs when one owns the whole process and doesn't in any way defer responsibility for the outcome to someone else. I'd say that's a powerful practice as well.

G. P.: Right. And when there is more than one person playing in that register of consciousness – of thinking,

sensing, speaking from the group as me, then there is a leap that becomes possible. You said something interesting that struck me. It was just almost like a thrown-away phrase – that one of the contexts can be solving a real world, or addressing a real world.

C. H.: Problem, yes.

G. P.: That is of interest to me because so far we were talking mostly of the left quadrants in Wilber's terms of the integral matrix when we are looking at the interaction of individual and collective consciousness with systems and structures, and the flaws in systems that are causing unnecessary man-made suffering, then it's interesting to envision the possibility of groups that join together in this higher collective consciousness and from that space address issues that cannot be resolved with just ordinary mind. I would love to see and even more to be part of such experiments.

C. H.: Yes, it's a big thing. I'm including talking about great social challenges or even simply challenges in an organization where you have real questions you have to answer on a daily basis. "What should we do? Should we hire this person or not? Should we develop this new program or not?" And so often, when you start to gain access to these deeper wisdom capacities both individually and collectively, you just see the limits of ordinary thinking and ordinary strategizing. It becomes kind of obvious. Well, clearly, if we are going to come to a good answer, if we are going to feel like we have really considered all the possibilities and we have really solved this problem in the best way, we are going to have to learn to listen in a deeper way and sense into the needs of the field. We are going to have to get multiple perspectives on this – you just know: "I need collective wisdom."

It's so funny because in addition to being a teacher and everything else I'm doing, I'm also an organizational leader now because I have started this company that has grown quite large. I have over forty staff members here now. It's funny. I now have a corporation, so I experience the corporate world, so to speak, in my own organization. And the natural tendency of human beings is to assume that individual thinking and decision-making is how things get done. People will pose really big, important questions to me and just want me to answer them. Like, "What should we do? Should we do A, B or C?" They'll give me this question by email as if I'm going to say, "Oh, very big important decision. I know the answer, let's do option B." I can't even think that way. So I'm training all of my staff to say, "Look, I only think collaboratively," I don't even think by myself. Literally, if I'm alone, I wouldn't even call it thinking. I don't know what I'm doing, but I'm not sitting there solving problems on my own. We need to schedule a meeting and we need to think together and we need to sense together and explore from there.

And more and more people realize that collective intelligence and collaborative intelligence is the way to solve problems. Obviously, it's got its faults too, but if it's properly facilitated and helped, it will. Now the impulse I heard in your voice seemed to be pointing to a very high level of that: of, "Well, what if we could really be taking on major global-scale problems by bringing together people who have the information that would be needed, but then having that whole group suspend their already knowing and go into a facilitated process that's going to bring forth deeper collective wisdom."

G. P.: Yes.

C. H.: I aspire to that too. I am not currently part of that. One of my long-term goals is to create think tanks and things like that, social think tanks that are grappling with big issues from a place of collective wisdom. It's kind of a little beyond my bandwidth at the moment, but a few years down the line I hope to be participating in those things. Let's stay in touch about that.

S. S.: Could I throw in one more question? George, when I was looking at your abstract, one thing that stood out to me was that you spoke about the importance of "an ethical foundation grounded in the common good, as well as an integral evolutionary worldview." Craig, I know that in your courses, you speak a lot to motivation. Is there anything you'd like to say about that, about the way some of your work or some of these practices may help build the context or the motivation, for people to come together to focus on larger issues and problems in a way that could be creative and help move development for the whole.

C. H.: This is a very inspiring and hopeful note to end on because one of the things that these collective awakening practices do is they wake us up out of the dream of narcissism, if you will, or out of the dream of the separate sense of self. And there are many layers of it. We could spend hours talking just about the different kinds of collective awakening experiences. George mentioned the unity consciousness or satori, collective satoris, but there are many different layers of "we" experience. I know we have probably all experienced many different kinds, but even at their most basic, which you could describe as collective sort of higher feeling states where we feel the boundary softening between us, and we start to feel connected. There's just this warm tribal loving connected feeling that many groups have that aren't necessarily awakening in the sense we would mean, but they are having

these deep "we" experiences that are very nurturing and very affirming on a human level.

Even the most basic collective awakenings, like the ones I just described; they have the effect of making me realize that *"It's not about me."* and also that *"I'm not alone*." There's a softening of the ego boundaries that begins to happen even in the most elemental of group practices when done well. And you start to ladder up from that to really profound states of collective enlightenment or even awakening to the evolutionary impulse as ourselves together, which really are radical departures from ego consciousness that begin to take us to a place where we find it harder and harder to go back to the old egoic self because it feels so small, narrow, limited, partial, unreal.

But all of those, at whichever level we are talking about, they all are beginning to reveal that *there's a natural deeper and higher motivation that exists in human beings. Its part of our own true nature and it is a care for the greater good. It's a natural care for the whole*. When I awaken beyond the confines of the separate ego, when I awaken to who and what I really am, I realize, "I'm not Craig, I'm not this guy who was born at a certain time, that's going to die at a certain time, is going to have these life experiences, accumulate what he accumulates, and whatever." It's like, "No, I'm this whole process in motion. I am this whole event of life, of cosmic evolution. That's really what I am, and that's what I care about." My domain of concern now is the whole evolutionary process. When we start to awaken to it, and I feel groups are a powerful way to awaken to that, much more powerful than just individual contemplation which can still end up being quite narcissistic at times. We start to awaken to that, and then there is a natural emergence of, "How do I help this whole process? Where can I be best deployed to contribute to the higher evolution of life, humanity, God?" It starts to get very real and it starts to feel very important. And George spoke to this a few minutes ago. He said groups at a higher level realizing what's at stake; they realize we can contribute to laying down new grooves in consciousness. We can contribute to bringing the future into being.

And I think that this higher motivation is both what brings us into the groups, and it ultimately is a by-product of the group practice that can basically lay the foundation for a totally different kind of human life. If I am rooted in that, I don't care about the same things any more. I am not going to spend my time in the ways I used to. I am now going to be caring about my larger contribution to the whole, and, "What's the greatest leverage I can find and the greatest impact I can have with the gifts and talents and precious life energy that I've got?"

If we can imagine a world populated by people living from that centre, we will solve all of our problems. They are not that vexing. We can do it, but not from the self-centered ego.

S. S.: That's beautiful, thank you, Craig. This may have taken us full circle.

C. H.: Maybe so. Yes, well, I feel like we are just sitting here having a brief chat on something that I know is incredibly meaningful for all of us. Thank you so much for stepping up and facilitating this, Sue. And I want to say, George, how nice to connect again. It's been a long time. You and I met way back at the beginning for me when I was just starting to research collective intelligence. We have had various touch points along the way, too, but it is really nice to spend a few minutes together and hear your voice and feel your spirit and where your thinking's at right now.

G. P.: Yes, I would love to have another opportunity with you to deepen some of our explorations, particularly when you feel that it's time for you to go deeper in the possibility of the social think tank. That's something that I have a great passion to explore with you. I also want to say, Suzanne, that I'm just so grateful to you that you drew us together with Craig. It was a wonderful opportunity to reconnect, and I enjoyed every moment of it.

* *(Ed's n.* James Surowiecki, (2004). *The Wisdom of Crowds: Why the Many Are Smarter Than the Few and How Collective Wisdom Shapes Business, Economies, Societies and Nations*, (New York: Doubleday).

ROBERT DAVID STEELE

APPLIED COLLECTIVE INTELLIGENCE:

HUMAN-CENTRIC HOLISTIC ANALYTICS, TRUE COST ECONOMICS, AND OPEN EVERYTHING

Robert David Steele was born in the USA and raised in South America and Asia as the son of an oil engineer. He returned to the USA for an AB in Political Science (thesis on multinational corporations and home/host country issues) and an MA in International Relations (thesis on predicting revolution). He has also earned an MBA with a thesis in strategic information management, and a Diploma from the Naval War College. His professional service includes four years as a Marine Corps infantry officer, nine years as a Clandestine Operations Officer for the CIA, five years as the second-ranking civilian in Marine Corps Intelligence, sixteen years as a Reserve military intelligence officer, and twenty-one years as a private sector proponent for intelligence reform and open source everything. He seeks financial and institutional sponsors able to embrace and implement these ideas.

INTRODUCTION

I AM A RECOVERING SPY WHO REALIZED IN 1988, AFTER co-founding the Marine Corps Intelligence Activity (MCIA), that the US secret intelligence program, which costs toward USD 100 billion a year, is largely worthless[1]. It is also representative of how other governments approach the craft of intelligence – as something that is secret, expensive, and in service to a few mandarins instead of the general public. Subsequent to my own awakening, General Tony Zinni, USMC (Ret.), then Commanding General of the US Central Command (USCENTCOM), at the time involved in two major wars and over twelve "interventions" elsewhere, went on record with his judgment that US secret intelligence was providing him, as commander of a major regional theatre command, with "at best" 4% of what he needed to know[2].

WHAT'S THE POINT

Our objective is to overturn centuries of top-down elite control focused on value extraction for the 1% to the detriment of humanity at large: the 99%. Hybrid Governance[3] overturns hierarchical governance rooted in corruption enabled by secrecy. Open Source Everything and Open Source Engineering use transparency to drive innovation while eradicating corruption and waste. The end-game is quite clear and is rooted in Truth & Reconciliation: we agree to protect existing concentrated wealth in return for a 1% allocation some call Redemptive or Inclusive Capitalism, others Mutuality Economics[4], so as to empower the 99% to reinvent intelligence, reengineer Earth, and create infinite wealth for all.

WHAT IS INTELLIGENCE

Intelligence is not about secret sources and methods. Intelligence is not about "inputs." Intelligence is decision-support. Intelligence is a process of requirements definition (what do you need to know), collection management (who knows what we need to know), multi-disciplinary and multi-lingual collection, a combination of machine and human processing and analysis, and finally, the production of decision-support. Intelligence must be defined and evaluated on the basis of "outputs" and the utility to the public and to those representing the public. Anything less is a corrupt misdirection of public funds[5].

My own appreciation for Collective Intelligence rooted in public minds and public needs can be traced to Tom Atlee's first book, *The Tao of Democracy*[6]. Tom introduced me to Jim Rough, pioneer of Dynamic Facilitation[7], and to many others. It is from Tom that I clearly understand that my own focus now on Applied Collective Intelligence is part of a much larger mosaic. I share with Tom the view that "wisdom of the crowds" is a perverted mis-representation of what humanity is capable of achieving when engaged in an interactive respectful conversation instead of being treated as small uninformed opinions in isolation[8], and I share with Tom a concern about those who seek to define collective intelligence as something to be achieved artificially, through machine intelligence and automated networks isolated from the spiritual, the cultural, the context of humanity in its day to day life.

Over the years Tom and I have talked about how helpful it is to clarify for those not familiar with intelligence as a craft (a specific process, generally

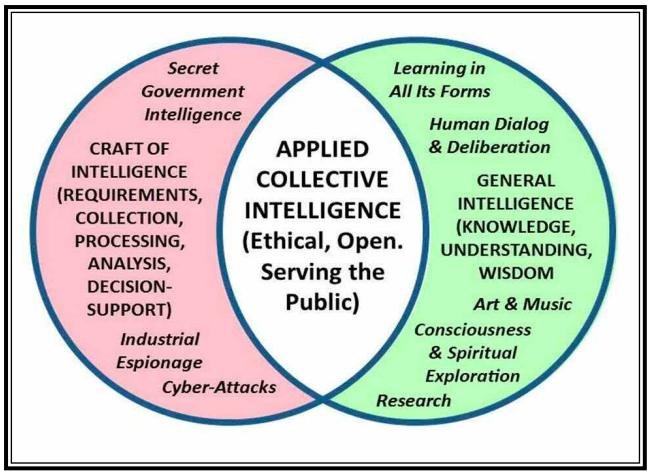

FIGURE 1 ~ *Intelligence as a Craft versus Intelligence as a Human Capacity.*

but not advisedly done in secrecy) how it is different from intelligence as a human capacity for acquiring understanding and wisdom. Ever since I began championing Open Source Intelligence (OSINT) in 1988, I have been operating in the area below Applied Collective Intelligence[9]. It is my on-going conversation with Tom that led to this graphic being created.

My emphasis for the past quarter-century, mis-directed as it turns out, has been on teaching over 66 governments how to better access and leverage open sources, in other words, I have been trying to fix the left or red side of the above duality[10]. I failed, in part because of the corruption endemic to the secret intelligence world, where spending vast amounts of money on secret technical collection – mass surveillance – is profitable for the few while being unaccountable to the taxpayers for any absence of a Return on Investment (ROI). Although I have always understood the value of OSINT to the public, it is only now that I am focused on helping the public devise a capacity to confront and bury all lies on all topics at all levels in real time.

Recently – in the past five years, inspired in part by Herman Daly, father of ecological economics, and by Richard Stallman, the foremost pioneer along with Linux Torvalds of Free, Libre Open Source Software (FLOSS) – I have conceptualized the combination of Holistic Analytics with True Cost Economics[11] and Open Source Everything (as outlined in my latest book, but not noticed until Nafeez Ahmed profiled the idea in *The Guardian*)[12]. With this article I present a brief roadmap for achieving Applied Collective Intelligence.

STATE OF THE WORLD – NEED FOR HOLISTIC ANALYTICS

I want to begin, as an intelligence professional intent on defining the new evolving craft of intelligence[13], with just two points of reference: the ten high-level threats to humanity as identified by the United Nations High-Level Panel on Threats, Challenges and Change[14] and the twenty global problems identified by Jean-Francois Rischard, then Vice President for Europe of the World Bank[15].

TEN HIGH LEVEL THREATS

These are the ten high-level threats to humanity. They are in priority order. They are useful as a means of measuring the degree to which any particular government's policies and programmes are relevant to protecting their respective populations and promoting prosperity.

POVERTY ~ INFECTIOUS DISEASE ~ ENVIRONMENTAL DEGRADATION ~ INTER-STATE CONFLICT ~ CIVIL WAR ~ GENOCIDE ~ OTHER ATROCITIES ~ PROLIFERATION ~ TERRORISM ~ TRANSNATIONAL CRIME

These ten high-level threats are also a helpful starting point for any university, government, or other organizations seeking to be genuinely multidisciplinary in its strategic, operational, tactical, and technical processes and programmes.

These particular threats, in this particular order, are slightly flawed in that they do not reflect the continuation today of unilateral militarism, virtual colonialism, and predatory capitalism. They also do not include the potential threat of technology run amok, both in bio-chemical chain reactions and in computational catastrophes[16].

TWENTY GLOBAL PROBLEMS

Here below are the twenty global challenges in three groups as devised by Jean-Francois Rischard; this set of challenges is noteworthy for its balance among planetary, human, and organizational challenges.

GROUP 1 ~ SHARING OUR PLANET

GLOBAL WARMING ~ BIODIVERSITY & ECOSYSTEM ~ FISHERIES DEPLETION ~ DEFORESTATION ~ WATER DEFICITS ~ MARITIME SAFETY & POLLUTION

GROUP 2 ~ SHARING OUR HUMANITY

POVERTY ~ CONFLICT PREVENTION ~ EDUCATION FOR ALL ~ INFECTIOUS DISEASES ~ DIGITAL DIVIDE ~ NATURAL DISASTERS

GROUP 3 ~ SHARING OUR RULEBOOK

REINVENTING TAXATION ~ BIOTECHNOLOGY ~ GLOBAL FINANCIAL ARCHITECTURE ~ ILLEGAL DRUGS ~ ECONOMIC COMPETITION ~ INTELLIGENCE PROPERTY ~ E-COMMERCE ~ INTERNATIONAL LABOUR & MIGRATION.

There have been other important contributions[17] but for my elementary purposes, these two very informed and widely-accepted summaries of the state of the world and our shared challenges will do as a starting point.

One of the first tasks for any group practicing Applied Collective Intelligence is to devise their own

list of threats, in priority order, for group attention. The threats will differ, especially in priority, from place to place, but three of them – poverty, disease, and environmental degradation – appear to be universal.

HOLISTIC PERSPECTIVES NEEDED

FIGURE 2 illuminates what no university, no government, no corporation, does today in the way of holistic analytics[18].

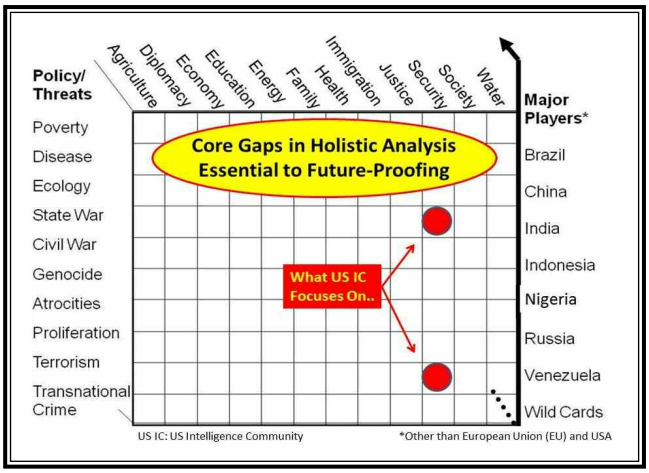

FIGURE 2 ~ *Preliminary Concept for Holistic Analytics.*

END OF THE INDUSTRIAL ERA – EIGHT INFORMATION TRIBES

We are at the end of the Industrial Era in which scientific and technical achievements, and organizational achievements, have been abundant, and at global scale. Unfortunately, these achievements generally have been divorced from ethical foundations as well as the real-world needs of the poorest, consequently being abusive of humanity at large in the long run. Western colonialism, unilateral militarism, and predatory capitalism have been dominant these past two hundred years[19]. Such "analysis" as has been done has favoured the interests of the 1% over the 99%, and neglected a respect for "ground truth" as well as any attempt to establish "true costs" of any given policy, service, product, or behaviour. Without belabouring both the achievements and the shortcomings of the Industrial Era, my focus now is on how best to achieve remediation toward a prosperous world that works for all.

One starting point is recognition of the fact that governments are merely one of eight information "tribes" or networks, and generally the least informed and the least agile. For some time now, since I first conceptualized the "smart nation" in 1996[20], I have been thinking that there are many sectors of society with knowledge that is not shared. Eight groups in particular concern me. They are, in alphabetical order:

ACADEMIC ~ CIVIL SOCIETY ~ COMMERCE ~ GOVERNMENT ~ LAW ENFORCEMENT ~ MEDIA ~ MILITARY ~ NON-GOVERNMENT

Civil Society includes labour unions, religions, and activists who are not organized into non-government non-profits. Media includes bloggers and alternative media. My core point is that we are fragmented across society in a manner that makes it virtually impossible to "do" Applied Collective Intelligence. Completely apart from the reductionism characteristic of the Westerner whose approach to governance and science assures the isolation of each of these tribes from one another – and within the tribes, the separation among organizations, and within and among organizations, the isolation of individuals who lack access to one another and to the information they think is relevant to their varied responsibilities.

Applied Collective Intelligence seeks to leverage open source information and open source information technology specifically, open source engineering generally, to empower all eight of these tribes toward the creation of the World Brain and the ability to work together in a hybrid form respectful of the future – our goal is nothing less than a prosperous world at peace, a world that works for all[21].

TRUE COST ECONOMICS

True Cost Economics, within which I include all possible feed-back loops and all possible aspects of holistic analytics such as political-military, socio-economic, ideo-cultural, techno-demographic, and natural-geographic costing[22], is the essential foundation for assuring that humanity is pursuing sound policies and behaviours in relation to our fragile Earth and its extraordinary ecology of plants, animals, and matter that we are now understanding is not a "solid" *per se*, but rather a particularly dense configuration of energy.

In practical terms, true cost economics demands that we conduct research and document, for any given product, service, behaviour, or policy: the water content; the fuel utilized from creation of the raw materials through processing, transport, sales, and end-use; the degree of child labour, regulatory violations, and tax avoidance inherent; and of course the specific toxins released into the atmosphere, into public water bodies, or into the earth.

Here is just one example: for a single white non-organic cotton T-Shirt, the true costs include 570 gallons of water; 8 kWh in energy used by machines; 11-29 grams

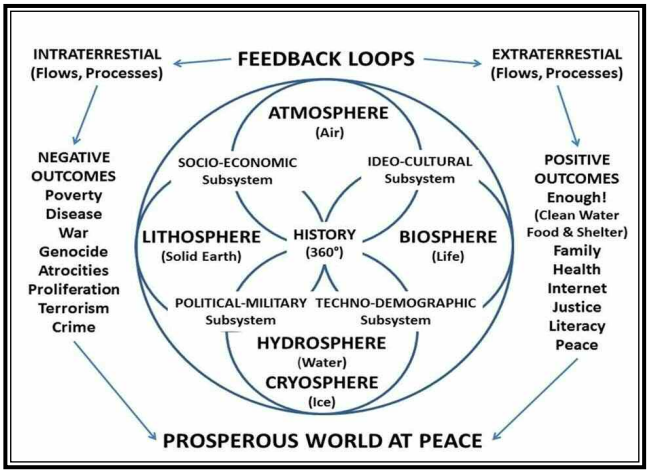

FIGURE 3 ~ *Whole Earth Holistic Thinking – Applied Collective Intelligence.*

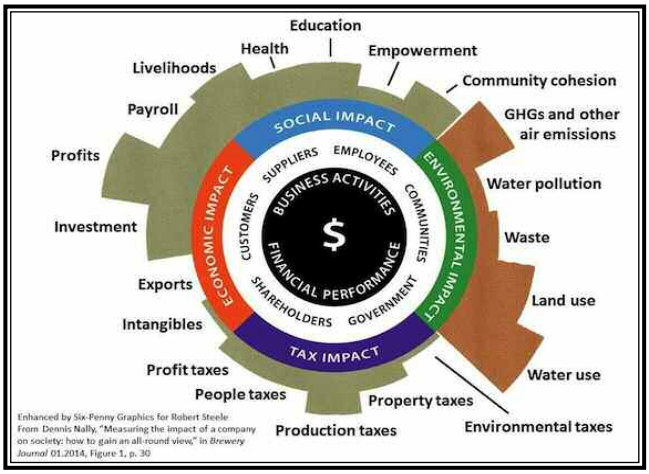

FIGURE 4 ~ *Whole Systems Analytics and Total Impact Measurement.*

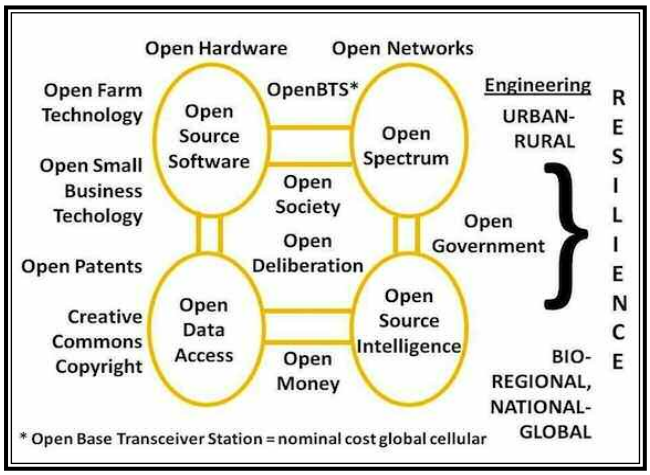

FIGURE 5 ~ *Open Source Everything (Partial Depiction).*

of fuel; varied emissions of Nox, SO_2, CO_2, N_2O, and other volatile compounds; and in toxins, 1-3g of pesticides along with diesel exhaust and heavy metals (in dyes). Child labor across any of seventeen countries, earning 50 cents a day, is also a cost for any given cotton T-Shirt as traditionally produced[23].

WHOLE EARTH HOLISTIC THINKING

Starting with the five major "spheres" defined by others that comprise the Earth, I add the human subsystems (the natural-geographic subsystem is the whole) and then strive to make the point that the feedback loops among all these systems are what we need to understand if we are to reduce the negative outcomes on the left and increase the positive outcomes on the right.

Aside is a complementary and excellent depiction of Total Impact Measurement and Management (TIMM), a signal contribution from PriceWaterhouseCoopers International in the United Kingdom[24]. It is a helpful means of illustrating how any given activity, behaviour, policy, product, or service can be – must be – analyzed in relation to its economic, social, and environmental impacts, among others.

Academia, the economy, government, and society are not structured – nor trained to think – in this fashion. We are at the end of centuries of reductionism dismissive of true costs and obsessed with short-term financial profits that benefit the few at the expense of the many including all generations into the future. The true costs of all this misbehaviour are now converging to threaten all humanity.

OPEN SOURCE EVERYTHING

Open Source is not, as many assume, simply a legal and technical concept referring primarily to software and increasingly also to hardware, denoting that the software or hardware is freely available and open to both redistribution and modification without substantive encumbrance.

Open Source Everything (OSE) is a meme, a mind-set, and a philosophy of education, intelligence (decision-support), and research. The below diagram is representative of the larger ecology.

What really matters about the above partial representation is that we must treat all of them as an ecology and go "all in" across all the opens. Open Data without Open Hardware and Open Source Software is merely gifting all our data to corporations that will continue to impose the wasteful costs of proprietary software licensing fees, training, and maintenance, costs that most local governments and small businesses are now finding impossible to continue paying.

In commercial terms, OSE is a means of harvesting the Cognitive Surplus of a broadly distributed, self-motivated network[25]. Of particular note is that OSE is the only technical approach that is affordable, inter-operable across all boundaries, and scalable toward the 5 billion people whose needs are not responsibly addressed by the academy, economy, government, or society of the present.

OSE is the ethical, intellectual, commercial, and legal underpinning for the emergent new economy that is collaborative, ethical, inclusive, and sharing in nature.

The essence of financial profitability for Applied Collective Intelligence within this new economy lies in a mix of free education combined with licensing, services, and the monetization of transactions. OSE can be licensed in multiple forms using Creative Commons designations, such that the code, to use a software example, is open to modification and redistribution, but cannot be used to collect financial remuneration without engaging the originator.

Creative Commons is a viable legal construct but not yet fully established in law or in technology to the extent that it actually protects social enterprises and their intellectual rights[26].

OSE is the underpinning for local to global information-sharing and sense-making, allowing for the efficient harvesting and harnessing of cultural, historical, and linguistically specific information across all boundaries, human, financial, and technical. The term of art for the human aspect is Multinational, Multiagency, Multidisciplinary, Multidomain Information-Sharing and Sense-Making (M4IS2)[27]. I shorten that, instead of using the acronym, to Multinational Everything. In combination with OSE, a predominantly technical term of art, the two define a virtual World Brain in which all minds eventually are connected to all information in all languages and domains, all the time and – this is really important – all humans have information tools with which to make sense of it all and achieve direct democracy and deliberative dialog across all boundaries.

My book, *The Open Source Everything Manifesto*, and the home page for the topic[28], together offer additional insights into the larger context and potential application of this concept.

OPEN SOURCE INTELLIGENCE

For over a quarter-century others and I have been pointing out that the current approach to government intelligence (emphasizing secrecy and mass technical surveillance) as well as the current approach to commercial intelligence (emphasizing industrial and cyber-espionage) are deficient[29]. In my view, over 90% of what we need to know to be effective stewards of the Earth and productive citizens is not secret, not expensive, and not harvested by governments, corporations, or even universities.

Since I have published so much about Open Source Intelligence (OSINT) I am reluctant to repeat or even summarize that body of work here[30]. Instead I draw the reader's attention to a five points:

1 ~ My experience has shown that there are 33 core languages, including 11 dialects of Arabic, that are required if one is to be comprehensive about exploring human knowledge in any given domain. I know of no government, corporation, or university that is serious about doing multi-disciplinary research across this range of core languages – and even less so across the 150 additional languages I and others have identified as being relevant if one wishes to be competent in understanding all local challenges and emergent solutions.

2 ~ Today, as "big data" is becoming fashionable, I find that no one really understands the obstacles to doing big data at exascale levels, and that no agency – least of all the US National Geospatial Agency – is competent at offering a suitable geospatial platform for machine speed data fusion[31]. Although GoogleEarth and Keyhole Markup Language (KML) are useful, they do not accommodate non-geospatial data. CrisisMappers is of great interest to me, along with OpenStreetMap, but both will have difficulty scaling and neither they nor Google Earth have a sparse matrix unstructured database architecture ready to go to hold all information in all languages and all mediums in relation to the geospatial foundation. A major task for Applied Collective Intelligence, apart from fostering acceptance of Open Source Everything and Multinational Everything, will be to establish new data standards that are, in addition to open, geospatially grounded.

3 ~ Analytic competence across sources, processing, back office and desktop toolkits, and meaningful access to decision-makers, is marginal at best. We still do not have, in one integrated suite of tools, the eighteen functionalities identified in 1989 by the Central Intelligence Agency as necessary for

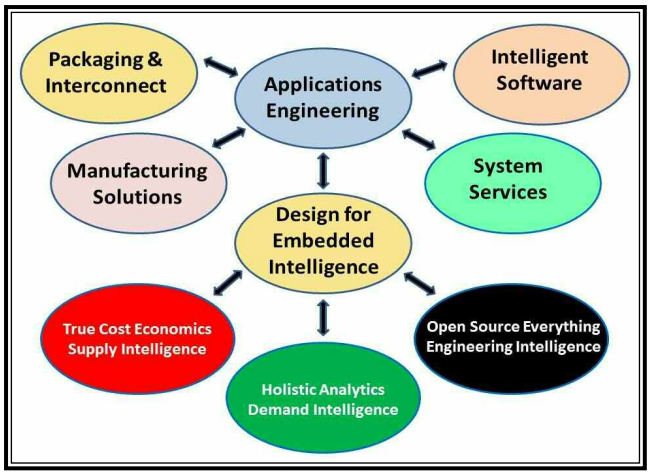

FIGURE 6 ~ *Enhanced Approach to Embedded Intelligence.*

any analyst to make the most of the data assigned to them. I consider all analytic toolkits today to be fraudulent in their claims and ineffective in their performance[32].

4 ~ Even the most prestigious universities fail the smell test when one looks at the degree to which professors cite relevant works from beyond their small established circles – and certainly almost never in other languages. University research is, in two words, incestuous and pedestrian. At the same time, recognizing that some excellent work is being done here and there, the fact is that roughly 1% of scientific research that has been carried out actually gets published[33].

5 ~ OSINT is primarily about human contacts and human conversations and human insights arrived at among humans[34]. It is not, as the American spies have sought to define it, about surfing the Internet with US citizens whose only qualification for being present is that they have a Top Secret clearance. In my view we are at the beginning of a renaissance in the role of the university as a catalyst for education, intelligence (decision-support) and research; the university must again become central to civilization.

OPEN SOURCE ENGINEERING

There are two terms I want to bring forward here, the first is ephemeralism and the second is embedded intelligence.

Ephemeralism, coined by Buckminster Fuller[35], refers to the ability to create more with less. In today's environment of "cost plus" contracting, this is not done. The true cost of any given product or process is not considered. Waste on the order of 50% is documented[36] – but welcomed because profits – and kickbacks to politicians – are calculated on the basis of the total financial cost. Intelligent design integrating biomimicry[37] and deeply appreciative of both true costs of resources and future effects of toxins is not standard. We are now at a point where ephemeralism can be achieved by leveraging OSINT.

Embedded Intelligence is characterized as the ability of a product, process or service to reflect on its own operational performance, usage load, or in relation to the end-user or environment in terms of satisfactory experience. This self-reflection is facilitated by information collected by sensors and processed locally or remotely to derive insight. These aspects must be considered from the design stage such as to enhance product lifetime and performance, increase quality of process or service delivery, or ensure customer satisfaction and market acceptance[38].

The above graphic combines the original concept focused on the manufacturing aspect, with my new concepts focused on the decision-support to design aspect.

The prevailing approach to EI is that of IBM and its "Smart Cities" concept. This is an example of doing the wrong things righter[39]. Doing the right thing would involve adding True Cost Economics as Supply Intelligence, Holistic Analytics as Demand Intelligence, and Open Source Everything as Engineering Intelligence. Taking this approach will, I believe, create a new gold standard for both the emergent discipline of embedded intelligence, and the emerging discipline of integral decision-support. My focus is on a complete re-design of the academy, the economy, government, and society, to embed intelligence in what we build, how we build it, and how we use it.

THE WAY AHEAD

Open Source Everything is how we enable local to national and then international governments, universities, and all others to share data while respecting anonymity, identity, privacy, and rights. This is the only affordable, interoperable, scalable solution. Those that limit themselves to Open Data (retaining proprietary approaches to everything else) are destined for failure, and more rapidly so when corporations refuse to share their own data with the government.

True Cost Economics is how we transform the entire data ecology of any given community – all stakeholders and not only the government – so as to radically reduce waste and achieve design and engineering efficiencies simply not contemplated nor realized beforehand.

Holistic Analytics – transparent, truthful, and inspiring of public trust – is our larger method.

Open Source Engineering is the applied outcome of all of the above. It creates smart safe communities in which waste has been eradicated and corruption is so transparent as to be quickly eradicated.

A NEW KNOWLEDGE PARADIGM

I have concluded that education, intelligence (decision-support), and research are now badly trained, equipped, and organized. Changes must be made. My intent is to make it possible for every government element, every other organization, and individuals, to access information relevant to their mission or interest across all boundaries, while being able to aggregate and exploit that information rooted in geospatial and time-date visualization, aggregated by threat or policy domain, and further separable for consideration at each level of analysis: strategic, operational, tactical, technical.

This depicts my overview of Applied Collective Intelligence as a constructive force for academia, the economy, governance, and society.

I will not belabour the elements, other than to note that the six terms in the inner circle – Ephemeralism, Human Scale, Panarchy, World Brain, Smart Nation, and Global Game – are all central to Applied Collective Intelligence.

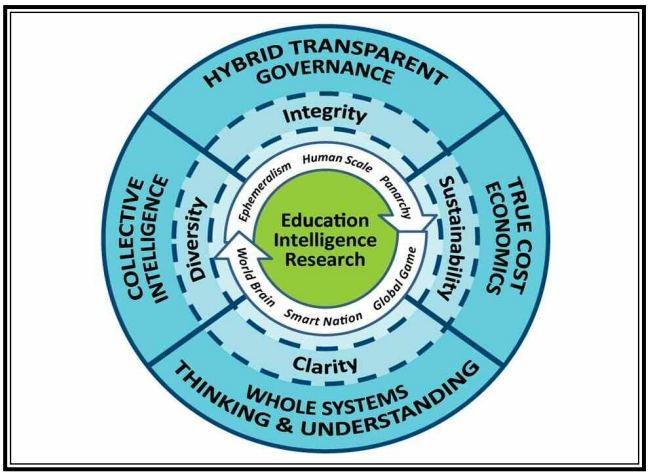

FIGURE 7 ~ *Grand Strategic Design for Integral Education, Intelligence, & Research.*

HUMAN RIGHTS, EARTH'S RIGHTS, AND THE RE-UNIFICATION OF RELIGION, PHILOSOPHY, AND SCIENCE

Despite my continued emphasis on the centrality of the human factor (computers are tools – artefacts – nothing more[40]) I find it helpful to always single out human rights including the rights of anonymity, identity, privacy, and rights generally to one's own labour and intellectual property.

It is also helpful to observe now, as Vampire Capitalism comes face to face with its own demise[41], having destroyed its seed corn, the productivity of the public, that religions and philosophy matter. Although Will Durant has done more than most to address the critical role that integral education and a proper philosophy play in addressing "the social problem[42]," it is E.O. Wilson, in his book *Consilience: The Unity of Knowledge*[43], who answers the question, "What is the relation between science and the humanities, and how is it important for human welfare?" As authors from John Ralston Saul to Matt Taibbi have documented[44], when science and capitalism do great harm to humanity, they are out of control and must be stopped.

Today we see the re-emergence of religion along with consciousness and spiritual exploration and new forms of civic dialog in which the government is recognized as being unable to govern and only one of eight larger human organizational elements that must learn to share. Islamic economics and finance are coming to the fore as being more ethical and respectful of human needs[45], than secular "anything goes" Western capitalism of the Goldman Sachs variant. Similarly The Most Holy Father of the Catholic Church has recently reversed the decades of repression against the Jesuits and Liberation Theology, and sought to make a new compact with the poor[46] – the five billion poor whose annual aggregate income is four times that of the one billion rich[47].

Human Rights are central to the liberation of the inherent intelligence and innovative possibilities that humans, uniquely among all living species, appear capable of. It should also be clear by now that plants and animals are not just alive, but conscious and communicating with one another[48] hence they merit our respect and eventually we must be able to integrate what they know into our larger understanding. Lastly, I would suggest that humanity is on trial and failing the ultimate cosmic test. We have allowed the 1% to fence the commons, criminalize natural behavior[49], and sponsor programs of war and bio-chemical hazard inimical to humanity and to all living creatures[50].

Applied Collective Intelligence re-unifies religion, philosophy, and science. Applied Collective Intelligence restores as our human goal the creation of a prosperous world at peace, a world that works for all. In passing, Applied Collective Intelligence protects the 1% from the

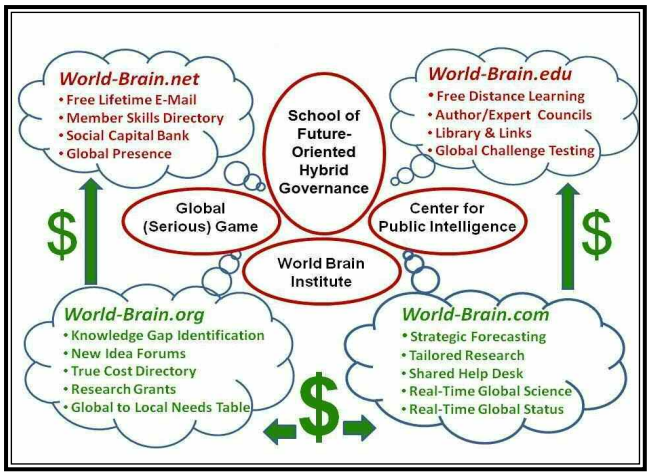

FIGURE 8 ~ *Organizing for Applied Collective Intelligence.*

pitchforks, avoids a blood-bath certain to include the downing of selected Lear Jets here and there, and creates infinite wealth for all while eradicating Western forms of waste, of corruption, and of sacrilege.

FIVE ORGINAZIONAL INITIATIVES

There are five organizational initiatives I would like to see sponsored by any single government, altruistic corporation, or visionary university – or any combination thereof. The below graphic depicts four of the five, with the fifth, an Open Source Everything Innovation Hub, being methodical rather than institutional.

SCHOOL OF FUTURE-ORIENTED HYBRID GOVERNANCE. This is envisioned as a new residential school with an extension program for non-resident students, as well as a very robust program of faculty and student exchange, joint investigations, shared online databases, and other forms of outreach to universities, governments, corporations and non-governmental organizations around the world. While proposed as contingent on earmarked funding, the School could nevertheless be started as a virtual entity from existing human, physical, and financial resources. A new building and green village complex are envisioned with twelve wings – one each for each of the eight information networks or tribes[51] as well as the four Centres shown above.

My intent is to create a model that can be replicated – and adapted – to any local circumstance.

1 ~ Within the School there would be a Provost Centre for Comprehensive Architecture where all of the schools and departments of the larger university might form an intellectual, data-sharing, and methods council – the new high table of academia. This Centre would also take on the vital task of ensuring that anonymity, identity, privacy, and rights are properly protected within all development, while also championing an Autonomous Internet[52] and Liberation Technology[53].

2 ~ The Global (Serious) Game as the interactive manifestation of the Open Source Everything Innovation Hub applied to real world challenges using real world information – this is where all True Cost information can reside in a sparse matrix connected to a local to global digital open source map that allows any citizen to see the specifics and totality of all true costs in relation to anything of interest to them.

3 ~ The World Brain Institute as the local to global proponent for extending the platform to every organization world-wide, while empowering individuals via the four online domains:

A ~ World-Brain.Net strives to register as many as wish to in a manner that both validates their identities when such validation is essential to the process and they opt-in; while also providing them with reliable anonymity & privacy, as well as means of reserving rights related to any knowledge or data they share. This is not a revenue producer, but this captures billions of human minds that can be monetized through the other three online networks.

B ~ World-Brain.Edu strives to be the platform for persistent pervasive free online education for life, while also serving as a foundation for any individuals and organizations who wish to organize localized face to face and both physical and online human to human educational options. This will take testing and tutoring as well as team learning to entirely new levels of excellence and effectiveness.

C ~ World-Brain.org is a revenue-producer and makes the University the hub for M4IS2 world-wide at all levels of practice from local to global. From knowledge gap identification to research funding and new forms of co-investment (including the harnessing of cognitive surplus and crowd-sourcing) to new forms of quality control that eradicate plagiarism and optimize Creative Commons credit and compensation, this aspect seeks to double or triple the return on investment of the existing research base while cleansing it of waste from redundancy and corruption related to plagiarism and poor sources and methods.

D ~ World-Brain.Com is a revenue producer implementing the Herring Triangle[54] of shared monitoring, shared help desk, tailored decision-support, tailored strategic forecasting with its local to global online structured and validate information commons

(displacing the erratic and shallow archipelago of unreliable and biased sources today), its local to global distributed network of help desks (reference librarians without borders augmented by information brokers, private investigators, investigative journalist, citizen activists, and so many others), and of course as a central registry for commercial intelligence with each source having a validated record of past performance.

3 ~ The Centre for Public Intelligence is the model that can be replicated at any level anywhere by anyone using free open source software and hardware that in turn enables localized free open cloud to open spectrum public agency. The value of the whole is found in its clarity, diversity, integrity – and the sustainability it enables[55].

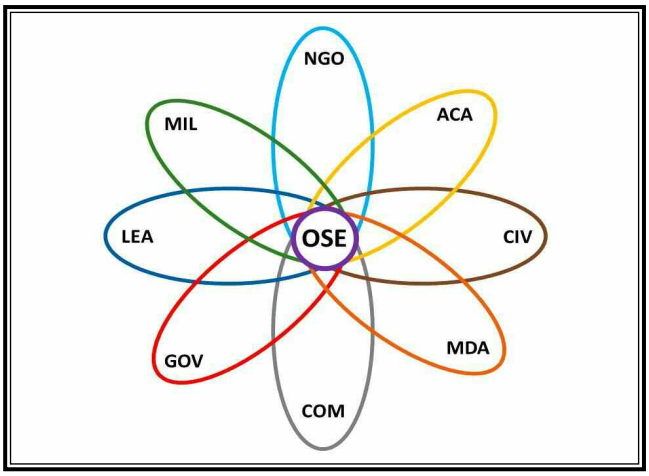

FIGURE 9 ~ *Uniting the Eight Tribes with Open Source Everything.*

The School (or Institute) that I envision would lead the way in creating a new PhD/DBA in Applied Collective Intelligence and Open Source Everything / Engineering. Graduates would master Holistic Analytics including Citation Analytics, Time & Space Analytics, and True Cost Analytics; True Cost Economics; Open Source Everything as engineering and technology management; and Hybrid Governance sources and methods.

The ultimate outcome is the transparent, truthful integration of all information in all languages all the time, such that all individuals and organizations across the eight information tribes are empowered in a manner never before achieved. This final graphic depicts my "atomic" vision in which the above institutional and methodological initiatives create a Whole (Human) Mind favourable to a Whole Earth.

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[1] Academic followers of the secret world who are lacking in actual practitioner experience will be quick to challenge this assertion. My publications, all free online, include two books with forewords by past and then present chairmen of the US Senate Select Committee on Intelligence (SSCI). My motto, "the truth at any cost lowers all other costs," in one that academics with limited real-world experience would do well to embrace. My body of work, including books, articles, chapters, monographs, and lectures, is easily accessed via Phi Beta Iota the Public Intelligence Blog, http://www.phibetaiota.net, hereafter *PBI*.

[2] General Tony Zinni, USMC as relayed to Col G. I. Wilson, USMC (Ret) and in turn cited by Robert Steele, "Open Source Intelligence," in Loch Johnson (ed.), *Strategic Intelligence: The Intelligence Cycle* (Westport, CT: Praeger, 2007), Chapter 6: 96-122. Two graphics with additional information, including a second "fact checking" back to General Zinni via Col Wilson, are at http://www.phibetaiota.net/?s=Graphic+Zinni.

[3] *Cf.* Wolfgang Reinicke, *Global Public Policy: Governing without Government* (Washington, DC: Brookings Institution Press, 1998) and Wolfgang Reinicke et al (eds.), *Critical Choices: The United Nations, Networks, and the Future of Global Governance* (Ottawa, ON: IDRC Books, 2000). An important early work, one earning the author the Nobel Prize, is Elinor Ostrom, *Governing the Commons: The Evolution of Institutions of Collective Action* (Cambridge, MA: Cambridge UP, 1990). Her key point: the best governance demands the complete participation of those being governed, both as rule-makers witting of all relevant local knowledge, and as rule-enforcers, constantly present and in human contact with one another and the commons being governed together.

[4] Redemptive Capitalism is a term used by Bo Riddle (personal communication); Inclusive Capital is a term used by Lady Rothschilds of London, see her Conference on Inclusive Capitalism, 27 May 2014. Since capitalism emphasizes capital over labour and raw materials, I reject the term in favour of Mutuality Economics as championed since 1947 by one very wealthy American family, the Mars Family. *Cf.* Badger II, Stephen M. (2014). "Editorial," *The Brewery* Online PDF (London, UK: Freuds, January 2014), and Bruno Roche, "The Economics of Mutuality," Online PDF (Universite Catholique de Louvain, 2014).

[5] *Cf.* Mark Tovey (ed.), *Collective Intelligence: Creating a Prosperous World at Peace* (Oakton, VA: Earth Intelligence Network, 2008). I funded this book and was originally the senior co-editor, but removed myself from the cover to honour the comprehensive contributions of then PhD candidate Tovey, today Dr. Tovey.

[6] Tom Atlee, *The Tao of Democracy: Using Co-Intelligence to Create a World that World for All* (Cranston, RI: Writer's Collective, 2003).

[7] Jim Rough, "Dynamic Facilitation and Wisdom Council," *ToBe.Net* (undated, accessed 3 September 2014). See also Jim Rough, *Society's Breakthrough!: Releasing Essential Wisdom and Virtue in All the People* (Bloomington, IN: AuthorHouse, 2002).

[8] *Cf.* Tom Atlee, "Tom Atlee: Factors Supporting Collective Stupidity, Collective Guesstimation, Collective Intelligence, and Collective Wisdom," *PBI* (13 August 2014) and also "Tom Atlee: Flawed Wisdom of the Crowds – Neglects Conversation & Role of Interaction," *PBI* (10 August 2014).

[9] *Cf.* Robert Steele, *The New Craft of Intelligence: Personal, Public, & Political* (Oakton, VA: Open Source Solutions, Inc., 2002) and its central chapter, "New Rules for the New Craft of Intelligence," both easily found in full text online at *PBI*.

[10] When the North Atlantic Treaty Organization (NATO) could not afford Alvin Toffler, he recommended me, and I was hired to brief all the leaders of all the NATO and the Partnership

for Peace (PfP). That led to the creation of the *NATO Open Source Intelligence Handbook* and other documents. The effort was a failure in part because the spies have money with which to corrupt third country intelligence leaders, and the common sense of Open Source Everything has no financial champion. All relevant documents are online at http://tinyurl.com/NATO-OSE.

[11] *Cf.* Herman Daly and Joshua Farley, *Ecological Economics: Principles and Applications* (Island Press, 2003); Herman Daly and John Cobb Jr., *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future* (Beacon Press, 1994); and Herman Daly and Kenneth Townsend (eds.), *Valuing the Earth: Economics, Ecology, Ethics* (Cambridge, MA: MIT Press, 1993).

[12] Robert David Steele, *The Open Source Everything Manifesto: Transparency, Truth, & Trust* (Berkeley, CA: North Atlantic Books, 2012); Nafeez Ahmed, "The open source revolution is coming and it will conquer the 1% – ex CIA spy," *The Guardian* (19 June 2014).

[13] *Cf.* Robert David Steele, "The Evolving Craft of Intelligence," in Robert Dover, Michael Goodman, and Claudia Hillebrand (eds.). *Routledge Companion to Intelligence Studies* (Oxford, UK: Routledge, 2013); see also "Intelligence Future – The Third Era of Local to Global Intelligence," *PBI* (15 April 2013).

[14] High-Level Panel on Threats, Challenges, and Change, *A More Secure World: Our Shared Responsibility* (New York, NY: United Nations, 2004).

[15] Jean-Francois Rischard, *High Noon: 20 Global Problems, 20 Years to Solve Them* (New York, NY: Basic Books, 2003).

[16] Tom Atlee provided this comment in his review of the first draft of this article, in e-mail (4 September 2014).

[17] *Cf.* Nafeez Ahmed, *A User's Guide to the Crisis of Civilisation: And How to Save it* (London: Pluto Press, 2010); Lester Brown, *Plan B 4.0: Mobilizing to Save Civilization* (New York, NY: W. W. Norton & Company, 2009); Jerome Glenn et al. *2013-2014 State of the Future* (Washington, DC: The Millennium Project, 2014); and Medard Gabel, *Designing a World that Works For All: Solutions & Strategies for Meeting the World's Needs - 2005-2013 Labs* (Seattle, WA: CreateSpace, 2014).

[18] This graphic stems from my combining the ten high-level threats to humanity with the twelve core policies identified through an examination of various US presidential "Mandate for Change" blueprints. No one is organized to address any one threat or policy as a whole. No one is organized to evaluate and address all threats across all policies all the time. Regardless of what threats and what policies a group decides to embrace for action, they must all be attended to in a holistic manner. I have not included here a graphic I created after viewing Monica Anderson's "Science Beyond Reductionism," Syntience (2010). My additional graphic can be viewed online by searching for < Graphic: Holistic Mind-Shift Toward Hybrid Public Governance of the Whole by the Whole for the Whole >.

[19] I have two master lists of book reviews, both easily found by searching online for each list title: Worth a Look: Book Review Lists (Positive Future-Oriented) and Worth a Look: Book Review Lists (Negative Status-Quo).

[20] Robert David Steele, "Creating a Smart Nation: Strategy, Policy, Intelligence, and Information," *Government Information Quarterly* (13/2, 1996).

[21] This objective is generally as stated by Buckminster Fuller over the course of his life.

[22] One analytic model, created in 1976, remains useful today, see "Graphic: Preconditions of Revolution in the USA Today," *PBI* (16 August 2011), and the underlying graduate thesis also available online.

[23] As researched by J.Z. Liszkiewicz and documented at http://true-cost.re-figure.org.

[24] As included in Dennis Nally, "Measuring the impact of a company on society: how to gain an all-round view," *The Brewery Journal* (January 2014): 29-31.

[25] *Cf.* Yochai Benkler, *The Wealth of Networks: How Social Production Transforms Markets and Freedom* (New Haven, CT: Yale University Press, 2007); and Clay Shirky, *Cognitive Surplus: Creativity and Generosity in a Connected Age* (New York, NY: Penguin, 2010). There are multiple other pioneers including Michael Bauwens (Peer-to-Peer).

[26] Lawrence Lessig, "A message from Larry: A new CEO and a challenge to the CC community," *Creative Commons* (14 May 2014).

[27] I learned the M4 portion of the term from Col Jan-Inge Svensson, Land Forces Sweden (Ret.), and added the IS2. Recent briefings where I have advocated this approach include 2013 Robert Steele on Healing the Americas with an Open Source Agency – and Integrity; Dicho Sobre la Curacion de las Américas con una Agencia de Todo Abierto – y la Integridad; 2010 M4IS2 Briefing for South America – 2010 M4IS2 Presentacion por Sur America (ANEPE Chile); and 2009 The Ultimate Hack: Re-Inventing Intelligence to Re-Engineer Earth (Denmark 27-28 October 2009).

[28] Open Source Everything Home Page, http://www.tinyurl.com/OSE-2014.

[29] *Cf.* Selected articles and chapters at "2014 Intelligence Reform (Robert Steele)," *PBI* (21 January 2014), and "Books By and With Robert Steele," *PBI* (1 July 2013).

[30] For the basics see "As Featured In Selected Publications," *PBI* (19 January 2013).

[31] *Cf.* "Big Data @ Phi Beta Iota," http://bit.ly/1ATKQAr.

[32] *Cf.* "2014 Robert Steele: Appraisal of Analytic Foundations – Email Provided, Feedback Solicited – UPDATED," *PBI* (1 May 2014) and "1989 Webb (US) CATALYST: Computer-Aided Tools for the Analysis of Science & Technology," *PBI* (15 October 1989).

[33] *Cf.* Derek Bok, *Universities in the Marketplace: The Commercialization of Higher Education*, Princeton, NJ: Princeton University Press, 2004); and Stephen E. Arnold, "No Search or Publishing for Science," *Beyond Search* (30 July 2014).

[34] I have made this point for a quarter century but especially so in my briefing, "2007 Amazon as Hub of World Brain," *PBI* (7 July 2007), and my monograph, *Human Intelligence: All Humans, All Minds, All the Time* (Strategic Studies Institute, June 2010). I do not address Reflexive Practice in the article, but do wish to note that I consider it a central tenet of Applied Collective Intelligence.

[35] *Cf.* Buckminster Fuller, *Critical Path* (New York, NY: St.Martin's Griffin, 1982) and also *Synergetics: Explorations in the Geometry of Thinking* (New York, NY: Macmillan, 1982).

[36] Agriculture: Nadia Arumugam, "UN Says Europe Wastes 50% of Fruit and Vegetables – and America Isn't Must Better," *Forbes* (4 October 2012), Dana Gunders, "Wasted: How America is Losing Up to 40 Percent of Its Food from Farm to Fork to Landfill," *National Resources Defense Council* (August 2012); Energy: Barry Fischer, "US Wastes 61-86% Of Its Energy," *CleanTechnica* (26 August 2013); Health: Michael Galper et al, "The price of excess: Identifying waste in healthcare spending," *PriceWaterhouseCoopers* (April 2008); Military: Scot Paltrow, "Behind the Pentagon's doctored ledgers, a running tally of epic waste," *Reuters* (18 November 2013), Stockholm International Peace Research Institute, "The US spends more on defense than the next eight countries combined," *Peter G. Peterson Foundation* (13 April 2014), Perry Chiaramonte, "War on waste:

Pentagon auditor spotlights US billions blown in Afghanistan," *Fox News* (28 July 2014); Water: Robert David Steele, "Water: Soul of the Earth, Mirror of Our Collective Souls," *Huffington Post* (7 January 2011).

[37] There have been books and conferences on bio-mimicry – one current and evolving concept I find especially interesting and holistic is that of PhD candidate Melissa Sterry of the UK, Bionic City. She seeks to answer the question, "how would nature design a city?"

[38] "PhD Studentships," Centre for Doctoral Training in Embedded Intelligence, Loughborough University.

[39] Russell Ackoff, "Transforming the Systems Movement," Conference Paper (26 May 2004).

[40] I disagree with those that consider artificial intelligence to be an "existential" threat. It is human intelligence – for example, in creating and releasing Stuxnet – that is insanely dangerous. Computers are water and energy pigs incapable of matching humans for petaflop speeds and intuitive innovation. At *PBI* see these three posts: "Rick Robinson: 11 Reasons Computers Fail Without Humans" (8 September 2014); "Graphic: When IT Hits the Wall and Only Humans Will Do" (26 March 2013); and "Graphic: Jim Bamford on the Human Brain" (28 December 2009).

[41] The Conference on Inclusive Capitalism held in London on 27 May 2014, sponsored by the City of London and E. L. Rothschild, opening with H.R.H. The Prince of Wales, was a primal scream. What they do not "get" is that for 1% of the money they have under management, we can stop the pitchforks and create infinite wealth for all others.

[42] Will Durant, *Philosophy and the Social Problem: The Annotated Edition* (Frisco, TX: Promethean Press, 2008)

[43] E. O. Wilson, *Consilience: The Unity of Knowledge* (New York, NY: Vintage, 1999)

[44] John Salston Raul, *Voltaire's Bastards: The Dictatorship of Reason in the West* (New York, NY: Vintage, 1993) and Matt Taibbi, *Griftopia: A Story of Bankers, Politicians, and the Most Audacious Power Grab in American History* (New York, NY: Spiegel & Grau, 2011).

[45] *Cf.* "Islamic Finance and economy: Unlocking its true potential," Oxford Analytica Global Horizons Conference Panel, 17-19 September 2014.

[46] *Cf.* Paul Vallely, "A Church for the Poor," *New York Times* (4 September 2014).

[47] *Cf.* C. K. Prahalad, *The Fortune at the Bottom of the Pyramid: Eradicating Poverty Through Profits* (Philadelphia: PA: Wharton School Publishing, 2006).

[48] *Cf.* at *PBI*, "Yoda: Animal Intelligence and Sensing" (21 August 2014) and "SchwartzReport: The Plants are Talking – Intra-Terrestial Intelligence" (8 May 2013).

[49] *Cf.* Paul Linebaugh, *Stop, Thief!: The Commons, Enclosures, and Resistance* (Oakland, CA: PM Press, 2014).

[50] *Cf.* Smedly Butler, *War is a Racket* (Port Townshend, WA: Feral House, 2003); Charles Lewis, *935 Lies: The Future of Truth and the Decline of America's Moral Integrity* (New York, NY: PublicAffairs, 2014); and Charles Perrow, *The Next Catastrophe: Reducing Our Vulnerabilities to Natural, Industrial, and Terrorist Disasters* (Princeton, NJ: Princeton University Press, 2011).

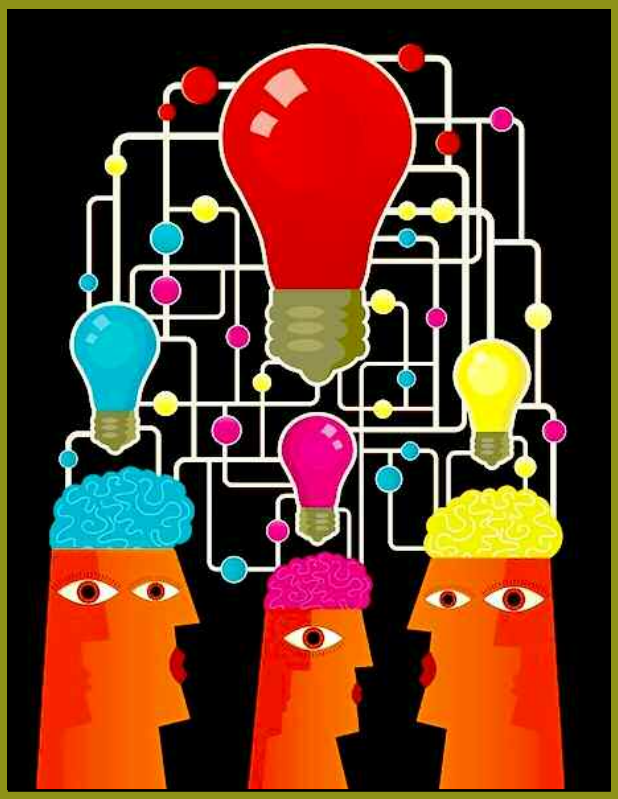
[51] Academic, civil society, commerce, government, law enforcement, media, military, non-government/non-profit.

[52] *Cf.* "Autonomous Internet Road Map at the Peer to Peer Foundation, [accessed 10 September 2014].

[53] *Cf.* Liberation Technology @ Phi Beta Iota, http://www.phibetaiota.net/?s=Liberation+Technology.

[54] Several depictions of the Herring Triangle are easily found at http://www.phibetaiota.net/?s=Graphic+Herring.

[55] I address this at length in *Intelligence for Earth: Clarity, Diversity, Integrity, & Sustainability* (Oakton, VA: Earth Intelligence Network, 2010).



ASHOK K. GANGADEAN

AWAKENING COLLECTIVE GLOBAL INTELLIGENCE:
THE POWER OF DEEP DIALOGUE

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OVERVIEW: EVOLUTIONARY SHIFT TO COLLECTIVE INTELLIGENCE

When we step back from our more localized cultural narratives, perspectives, worldviews and disciplinary orientations and dilate our hearts and minds into the more expansive and inclusive global space whence our diverse worldviews co-originate and co-arise, striking new patterns and insights come into relief that were not accessible before. When we dilate our rational and spiritual intelligence into the ((Source Field)) and gain access to the long emerging ((Logos Code)) that flows through all our diverse worldviews, religions, ideologies and cultures we move from monologue to ((deep dialogue)) and enter this Primal Common Ground of deep consensus, convergence, connectivity and synergy across and between worlds. This evolutionary crossing and maturation from cultures of "monologue" to awakened Cultures of Dialogue is the key to the cultivation of Collective Intelligence.

This Deep Dialogue literacy, technology and intelligence is what empowers us to rise together in ((Collective Intelligence)) across the deeply entrenched borders that divide our cultures and worlds. Gaining access to this ((Primal Logos Code)) through the rational arts of Deep Dialogue is thus key to cultivating genuine ((Collective Intelligence)) in this dilated global light. The ontological medicine of Deep Dialogue across and between worlds is vital for cultivating authentic ((Collective Intelligence)) and tapping the resources of ((Global Wisdom)) for our Global Age.

Source Intelligence, skills of Deep Dialogue and the cultivation of Global Consciousness are essential to the authentic cultivation and embodiment of Collective Intelligence as we face the evolutionary challenges of deep communication and finding consensus and synergy across borders. Thus, we cannot enter ((Collective Intelligence)) within the divisive, fragmented and polarized spaces of monologue cultures, but must mature as mindful and awakened Humans in the arts of Deep Dialogue. We are not egosapiens, but LogoSapiens. And it is in mature dialogue cultures that we humans flourish.

In what follows we shall first take a journey together into the depths of the long emerging ((Source Code)) to experience how and why this collective Global Wisdom of the ages calls upon us with highest urgency to evolve into cultures of deep dialogue. Then we shall go deeper into a meditation on *Seven Stages of Deep Dialogue* – a living blueprint for this Perennial Collective Intelligence as we humans evolve from monologue to Dialogue, from egosapiens to LogoSapiens.

PART I ~ WHY DEEP-DIALOGUE LITERACY IS THE HEART OF COLLECTIVE INTELLIGENCE

My lifework as a Logician and Ontologist has been focused for fifty years on pioneering deeper pathways into the Primal Logic of Logos that has been the moving passion of our most gifted and revered teachers (first philosophers, logicians, ontologists, awakening guides…) across the planet and through the ages. Awakening pioneers such a Buddha, Krishna, Moses, Jesus, Socrates, Lao Tzu… to name a few… have been calling humanity to go deeper into the Primal Code of Logos as our most urgent evolutionary priority in our maturation as Humans, as LogoSapiens. The diverse traditions of First Philosophy across the planet have all been seeking to tap and bring forth

the Primal Code of the Field of Reality – of That Which is Primal and First – as our ultimate concern in our maturation and flourishing as Humans.

The term "First Philosophy" comes from Aristotle as he seeks to tap the Code of Being in recognition that this is First in the highest sense and all other fields, disciplines and aspects of human experience and culture flow from this Code of Primary Being. But this tradition of First Philosophy – the Call to What-is-First – ranges across the planet and through the ages in our highest and best pioneering teachers: The Call of Yahweh to Abraham and Israel = Humanity, the deep meditations on AUM in the founding of the Science of Yoga at the heart of the Vedas, the historic breakthrough of Buddha in breaking the egomental barriers and moving into the Primal Field of Emptiness (Sunyata) which is the Field of Reality and the Space of Dharma (=Honor Code: awakened moral compassion), the encounter of Moses at the Burning Bush (=Presence of Infinite Spirit), the founding of the European tradition of the quest for Logos (the Primal Source of Rational Light, Speech, Word) by Socrates, Plato, Aristotle… in birthing "Philo-Sophia"… Love of Wisdom in the quest to Know Thy Self… In the classic birthing of Chinese First Philosophy by the genius of Lao Tzu in declaring that the Tao that is "named" is Not the TAO.

This relentless quest for What-is-First shows up in Mohamed's historic encounter with Allah – the first authentic name in this tradition of "First Script". And, of course "Islam" means "surrender to what is First". All of Hindu Vedic Thought turns of deepening the meditative intelligence in the authentic encounter with Primal Reality in awakening the true mature Self. All of the classic sacred Text of the *Gita*, for example, is Lord Krishna guiding the fallen egomental "Arjuna" into the transformative pathways of Yoga Science which is Vedic First Philosophy and Technology. And, of course, the breakthrough teachings of Jesus – the Logos in Flesh – passionately suggesting that the Code of Logos must be LIVED in the First Person and not objectified and "written in stone"… is another great moment in First Philosophy deeply in sync with the global quest for our authentic encounter with Reality, with What-is-First.

It is no exaggeration to suggest that this perennial gravitation to get the access Code for What is First is the highest and most urgent concern for our human enterprise – for our survival, sustainability and both individual and collective flourishing as a human family in our awakening evolutionary journey. The relentless quest of our most gifted philosophical minds to get the "Logic"… the Code… of this "Primal Field"… this Logos resonates on a planetary scale through the ages. So, for example, the pioneering first philosopher, Descartes, calls his pivotal work "*Meditations on First Philosophy*" as he focuses his genius on reaching the ultimate foundations of Reality and Consciousness. And in that historic moment when he reached "I am" after stepping back from the cultural spaces: mental lens, ideologies, disciplines, logics, narratives and languages that formed his life, experience and meaning… he crossed into the Source Code, the Source Script of What-is-First. And here he accessed and tapped the same ((Source Code)) of Logos that our revered teachers, enlightened voices, and moral pioneers across the planet embodied in their Lives: Socrates, Moses, Buddha, Krishna, Jesus, Lao Tzu, and Mohamed to select some key global exemplars.

This is the appropriate context to situate my LifeWork over the decades at the College. My quest to find the hitherto missing (eclipsed, displaced, repressed, ignored, denied, dreaded…) Primal Logic of the Source Field that funds all life, issues forth as Reality, the Universe, Cosmos… took unprecedented breakthroughs over the past four decades.

This is the unprecedented "global" turn (breakthrough, evolutionary advance, maturation, development, emergence…) in the quest for the Primal Word (Code, Logic, Field, Ontology…). My lifelong quest to uncover the deeper missing (yet ever present and presiding) *Primal Logic of the Word* across our great philosophical traditions and noble scriptures led me (called me, attracted me, guided me…) to gain deeper Global access to the emergent Code. The discovery that Moses, Socrates, Buddha, Krishna, Jesus, et al… were tapping the same ((Source Code))… the same Global Logic of Logos would be an evolutionary advance (research breakthrough) of the highest order.

I shall not (and cannot) develop these rich themes here on this occasion. These themes have been developed in my several volumes and countless public performances over decades. This has also been a primary focus on my Annual ((Reflection on Activities)) over the past decade and more. I bring this central theme of my research, scholarship, teaching and community development to the fore on this occasion because this breakthrough to the ((Primal Code)) is of supreme importance for our human enterprise, for every aspect of our human condition, and certainly for our rational enterprise and deepening our ((literacy)) and liberal arts cultures.

Let's pause and ((imagine)) for a moment that such diverse revered teachers as Moses, Jesus, Buddha, Socrates, Krishna, Lao Tzu are pioneering pathways

into this ((Primal Code of Logos)). But once we access this ((Code)) it is the most Simple, Evident and Obvious insight imaginable… so super simple and obvious that we cannot (dare not) "see" it. For once we see that the Primal Field is, and must be, Boundless… this ignites a flood of allied Code Insights that have been seen, corroborated, reaffirmed, celebrated… in widely diverse contexts by our great Teachers and Traditions across the planet. The Boundless Primal Field (of Reality) is thus Infinite, hence Infinitely One, hence the Primal Source of all possible worlds, words, scripts, narratives, perspectives, religions, scriptures, cultures, ideologies, disciplines, forms of life. And most of all… must be Infinitely HereNow. This Infinite Primal Field of Being (Primal Word, Code, Origin, Source, Existence…) CANNOT be displaced and pushed aside, even by the mightiest "egosapien". Our Teachers knew and saw that nothing could be or survive apart from this ((Source Field)) that directly holds and funds any and ever iota of existence.

THIS IS THE GLOBAL TURN. When I use the word "global" as in Global Reason, Logic, Literacy, Philosophy, Ethics, Wisdom…as I do in my diverse publications, performances, courses and seminars… this is what I am bringing forth: "global" as in Global Logos: indicates the Primal Source Code of all possible worlds and words and scripts. And the key breakthrough of my career is pioneering deeper pathways into Global Logos, into the Global Source Code of all scripts, narratives, languages, cultures, disciplines and liberal arts. It is self evident that Source Code MUST BE "Global" in this sense. "God" (Tao, AUM, Christ, Allah, Yahweh, Sunyata, Reality, Presence…) must be "Global". Source Word (Language, Literacy, Intelligence, Reason, Logic…) must be "Global".

And here is one key to how I was guided in this monumental discovery. My early research in Logic and Ontology, together with my relentless quest to discern how we cross diverse worldviews (cultures, religions, disciplines, ideologies, logics…) led me into the depths of our diverse great teachings on a global scale. When I encountered one of my great heroes, Socrates, I saw his passionate call to Logos and the urgency of leaving the "caves" (uncritical, un-awakened, everyday cultural life and consciousness) and entering the Rational Light as we sought to "Know Thy Self".

When I encountered Buddha's great teaching – his enlightened noble truths and onto-medical diagnosis of the source of human dysfunction and suffering – I was again deeply moved. When I encountered Jesus and his urgent call to cross into Christ Field- as the Logos in the Flesh… I was deeply stirred. I noticed that Jesus and Socrates were executed for their "radical" Source Code teachings. For they challenged their colleagues at the deepest level- and shook their "foundations": their worldview and privileged "script" processing. I noticed that Jesus, Moses, Buddha, Socrates, Krishna… were Moral R-Evolutionaries calling us to deeper encounter with Moral Law and Awakened Rationality. But there was no "common ground", no *common rational grammar* yet in place to "discover" that they were tapping the "same" Global Logos Source Code. There was no "Global Logos" yet pioneered and brought to Light. My deep quest to discover how we cross worlds, how we move rationally (communicate, translate, dialogue and even chronically violate one another…) across diverse cultures and worlds – diverse philosophical worlds and traditions and logics…led me inexorably to the missing Global Source Logos funding all possible worlds, cultures, religions, narratives, disciplines, and perspectives.

The continued dominance of the "Pre-((Code))" stage of literacy and mentation in our human condition across the planet blocked direct access to the ((Source Code)) hence blocked and neutralized (under-minded) the potent ((Rational Awakening Medicine)) of our Source Code Teachers. We could not ((see)) that Krishna, Buddha, Moses, Socrates, Jesus, Mohamed, et al were, indeed, tapping the same missing Primal Source Code. In fact this is the simplest ((truth)) imaginable… God and Allah, and Yahweh and Brahman… as Holonyms for ((Infinite First)) HAD to "hang out together". That is what it means to be ((Infinite First)). There cannot be multiple "Infinite Firsts".

Only when we truly face and remove these literacy and mentation blocks and barriers encoded in predominant literacy practices could we finally ((discern)) the profound cross-links and common source ground across diverse worlds, religions, scriptures and pioneer teachers. And the essence of my life-long research into the foundations of Logic, Language, Reason… focused here on calling out the chronic barriers and bringing into the ((open)) the long-eclipsed ((Code of Logos)). We shall see in a moment why the nature of pre((Code)) literacy and mental practices inherently fragmented, polarized, shattered our words, our worlds and our lives and lodged us in existential crisis and mal praxis.

The more I investigated our great Code pioneers the more I was led into deeper "global waters". I had to dilate my mental lens and tap deeper rational resources to truly encounter widely diverse first philosophers and evolutionary elders. As I encountered the profound First Philosophy of Hindu Vedic teachings, such as the teachings of Lord Krishna in the great epic *Bhagavadgita* it was strikingly clear that the broken

"Arjuna" in his imploded life crisis turned to Krishna (the embodied Voice of AUM) to help him face his ontological crisis. And Lord Krishna's teaching to Arjuna (and humanity) of the Science and Art of Yoga is precisely the urgent task of facing the medical source of his imploded life and trans-habituating his life into the Integral Technology of Aum Script- AUM Code. Arjuna (the stand-in for the "normal" egomental human) had to learn the higher Literacy of the AUM Script, through meditative intelligence (integral Code literacy) and exit his dysfunctional mental patterns of egomental life and the dysfunctional culture lodged in "samsara", the ontological condition of severance from AUM, the Primal Field of Reality. ((Aum)) and ((Yahweh)) and ((Allah)) and ((Tao)) and ((LogoSophia)) are ((Holonyms)) of ((Infinite Presence)).

What became strikingly clear in my research journey is that our great Code Pioneers across the planet in widely diverse contexts nevertheless concurred in their onto-medical diagnosis of human pathology and dysfunction, and each in diverse ingenious ways opened transformative pathways into the Primal Global Code of awakened moral life. Buddha saw that being lodged in egomental life (taking your "self" to be an entity that is self-sourced) is the medical source of human existential suffering and his breakthrough to the Four Global Truths in simplest terms called on humanity to break the addiction to egomentalism and ego-based cultural life and literacy and advance to The Dharma – to surfing the Primal Field of Reality wherein everything "co-arise" in relational flow. This is being in-the-zone of Awakened Life. Buddha essential medicine (prescription) was the urgency of recognizing the pernicious consequences of /egomentalism/ and the challenging onto-medical rehabilitation of our lives and mental practices into the Buddha Field of Emptiness. This is where we become liberated from the entrapment in mental mal praxis and shift into human flourishing. This was his prescription for all humans lodged in existential suffering.

Whether Socrates calling us to higher Rational Light (Logos) in leaving the caves of un-awakened life ("Know Thy Self"; "the unexamined life is not worth living"), or Jesus calling everyday folk to "die" to the old ways (sin script) in order to be "reborn" in the Christ Life, or Krishna urging and guiding Arjuna (humanity) to leave the "samsara" of pre-awakened consciousness into the Yoga Life in AUM… the deep onto-diagnosis of dysfunctional cultural life in "sin" or "samsara" or "cave ignorance" is striking. These sample Code Teachers recognized that humanity is lodged in mentation patterns that cut us off from Source Code and the highest urgent medicine is our facing this condition and having the courage to shift to awakened and liberated life that comes with conscious access to the Primal Code. Gaining awakened access to the Code of Logos is the ontological medicine for our evolving human condition when encountered in Global Light. Thus, the ((Source Code)) is always already ever-present ((funding)) = ((sourcing)) us in every way, yet we remain self-eclipsed from ((direct access)) by our /mental practices/ and /life worlds/. The pathways to ((access)) ((Source Code)) is to ((awaken to Source)), to evolve to ((I am))...to live ((mindful lives)).

I know this is all highly compressed. But it is of the highest importance that we get the consensus diagnosis and prescription of our most revered global teachers. My breakthrough to the Global Code and finding the common ground across such diverse teachings came through the intersection of my work in deep logic and ontology. The rational tools I gained through logic (the grammar =code of thought) empowered me to see that our diverse Code Pioneers were indeed in a common quest, and HAD to be. For the simple ((truth)) seen through the dilated ((global lens)) is that ((Source Code)) = ((Infinite First)) = ((Infinite Presence)) = ((LogoSphere)) is by its ((Nature)) inherently ((Global)).

The /thought/ that ((God)) = ((Infinite First)), for example, is /Local/ or /Tribal/ or /Ethnic/ is bizarre. The ((Infinite Code)) = ((Infinite Logos)) must be the funding source of all possible /words/ and /worlds/ and /narratives/. We can't push it away or package it or step outside "it" no matter how hard we try. ((Infinite Presence)) Presides HereNow in every detail, in every ((grain of sand)), and every grain of ((man)). To discover and name the "Global Logos", the Global Infinite Word was a key evolutionary advance. And, for me, the de-conflation of the two contrasting though intimately related dimensions of the Word (Language, Mentation, Lens Power, Meaning, Truth, Knowledge, Experience, Learning, Being Human, Community Cultivation…) through the introduction of the two potent "dimensional markers": "/X/" vs "((…/x/…)) was essential: ((…)) marks out the ((Source Script of Presence)) while /…/ brings out the mental-linguistic space and technology of "/talk about it/".

I saw, for example, that the diagnosis of "sin" and "samsara" converged on the same objective human ontological condition: both were focusing on the deep split or severance of everyday life and culture from the Funding Source = The Primal Code. I took a bold step and connected "sin" and "samsara" as different names for the same onto-logical diagnosis- both were lodged in /egomental/ patterns that were severed from ((Honor Code)). And East and West concurred that when

thus severed from ((Source Code))… whether Yahweh, AUM, Tao, Allah, Brahman, Christ, LogoSophia… we humans suffer individually and culturally and live dysfunctional lives. And the highest onto-medial prescription for Human Flourishing is to break these debilitating patterns and evolve to awakened rational life in flow with the Zone of Reality. This comes with a shift from /script/ to ((Script)). Our "script" encodes our "life" and "consciousness".

This is where I found it imperative as Logician and Ontologist to bring into the open an innovative notation to help us recognize and remember when we are lodged within /egomental reason/ and /language patterns/ and when we cross into the ((Code Script)) of the Rationally Awakened Life. My simultaneous introduction of these Code Markers: "/…/" *vs* "((…))" to bring to the fore the *dimensional shift* from /word/ to ((word)), from /code/ to ((code)) is of the utmost importance in finally seeing the ((Global Power)) of the ((Logos Code)). And this vital notational innovation ignited a flood of new ((insights)) into the long dormant ((Common Ground))… the ((Source Code)) of our great ((evolutionary pioneers)). And it is evident how our Teachers insisted that the ((Infinite Word)) cannot be /named/ or rendered within the /script/ of pre-Awakened mental praxis and literacy.

THE MINIMAL CONFLATION OF THESE CONSTRASTING DIMENSIONS OF LIFE AND WORD

It became clear in my evolving research over decades that the *endemic conflation* of the contrasting dimensions of /language/ (script, literacy, word-power, mental practices…) and ((Language)) contributed to the chronic failure over millennia to receive and process the full ((Transformative Code Medicine)) of our Great Teachers. My innovative Notation is meant to de-conflate the contrasting dimensions between /word/ and ((Word)), between /code/ and ((code)) between /logos/ and ((Logos)), between /self/ and ((Self))… Thus, the introduction *of these Onto-Cultural Markers* is of supreme importance for our human enterprise. Our Code Pioneers were making an all-important and urgent call to humanity to ((up Script)) from /word/ to ((Word)), and not to /down-load/ their ((Code Teaching)) to /egomental codes/ and /language games/.

By bringing to the fore the vital shift in a *((Visible Font))* from /culture/ to ((Culture)), from /scripture/ to ((Scripture)), from /Buddha/ to ((Buddha))… for example, opened the way for everyday folks (such as students) to stand back from deeply entrenched mentation (= thought) patterns and ((see)) as never before the urgent ((Code Call)) of our evolutionary Awakening Teachers. The millennial conflation of these two dimensional of life and culture and literacy facilitated and enabled the *continued /default/ mode* of the evolutionary dominance and privileging of /Script/ and the displacement of ((Script)). Humanity has been stuck in this default mode of privileging (alleged) *self-sourced /Script/* as the primary and dominant /literacy regime/ in town. And this is why our evolutionary ((markers)) to expose this fatal fallacy, calling it out for accountability and making it impossible for /Script/ to continue the deception of being /self sourced/ is of highest importance in allowing the ((Source Medicine)) to take effect.

This breakthrough explicitation of the ((inter-dimensional)) shift and contrast between /word/ and ((Word)), /life/ and ((Life)), /ethics/ and ((Ethics)), /reason/ and ((Reason)), /truth/ and ((Truth)), /meaning/ and ((Meaning)), /scripture/ and ((Scripture)) dilates a long emerging evolutionary upgrade (maturation) in our human journey.

We can see across the planet that the pre-Evolved "conflation" of the /language/ and ((Language)) has been a monumental barrier to our Rational Health and Ontological Well Being. This endemic "conflation" made it too easy, perhaps inevitable, to continue to "download" ((Script)) to /script/, the ((Word of God)) to /word of god/. The "default" script invariably collapsed to "/…((…))…/" – swallowing the ((Source Word)) into the /egomental/ language games. When ((Buddha Speaks)) his "speech" is downloaded into our everyday common sense, familiar language, our *lingua franca*: "/…((x))…/", and the ((Source Code Medicine)) is lost. ((God)) becomes down-sized to /god/. Instead we have been called by our ((Code)) pioneers to *((cease and desist))* in this pandemic addiction and called urgently to ((Up-Script)) and rise to ((Code)). And this shift has been seen by our great Teachers as a ((Life)) and /Death/ issue. This is why making the ((dimensional shift)) highly ((visible)) to the public and ((user friendly)) is of highest importance in gaining the ((Literacy)) of being ((Human)). This is why so much of my creative life has been focused here.

TO SUM UP: gaining direct ((access)) to the ((Source Code)) is Life and Death for us, as our ((Teachers)) have insisted. This shift to ((Source Life)) is our maturation as Whole Persons… as ((I===Thou)) beings… as ((LogoSapiens)) and this is the ((literacy)) of Collective Intelligence. This is the literacy and technology of Deep-Dialogue.

Once we truly de-conflate the two dimensions of Literacy and Intelligence astounding new insights abound.

We can see that "/…/" language development is an important stage in human evolutionary development.

This is a vital stage in our evolutionary development: to use language to convey /information/ and use /words/ to describe or represent the /world/ and build /culture/ is a necessary early stage of rational = human development. We ARE as we "script".

This "/…/" stage of evolutionary development is endemic across the planet in all our cultures. It includes the mental or consciousness practices, the level of "lens" development and capacity, the "hermeneutical" or interpretation powers, the stage of "meaning", language capacity, experience capacity, communication practices, mind operating processes, etc. All of these go together and are incorporated into "/…/" language and life development.

This level of "language" and "mentation" development is naturally endemic, pandemic across the planet in the life of the people. It is a *generic /language game/* across cultures and worlds: it is an "equal opportunity" evolutionary Pre-((Code)) stage of development, pervasive in our human condition. Simply put it is the habit of *"talking about"* any given "X". This /informational/ or /representational/ stage of language, literacy and mentation is vital in our early development and survival. But, as our great ((Code)) teachers have taught, we humans must evolve (mature, grow) in our Rational Intelligence (Language Capacity) and gain direct access to the ((Source Code)) that funds and makes it possible to have /words/, /worlds/, and /language/ and /talk about it/. I call this stage of human development: /egomental/ or /monocentric/ life. But it would be a ((fatal mistake)) to remain stuck at this stage which tends to act and live as if /words/ are /self-sustaining/ and not always held, supported and sustained by ((Source Field)).

IN OTHER ((WORDS)): our ((Code)) Pioneers saw clearly that any form of life that, in effect, is severed (alienated, eclipsed, split…) from ((Source Field)) is lodged in dysfunction which matures into human pathologies and patterns of violence. And it invariably inhibits our full maturation as ((Persons)) and inhibits ((Well Being)) and ((Human Flourishing)).

The ((Code Intelligence)) makes clear that no /word/, no /human/, no /event/, no /world/, no /narrative/, no /discipline/, no /language/, no /culture/… could survive for a moment if severed from ((Source Field of Reality)). We cannot "ego" apart from ((Source Code)), we cannot use language, have experience, be alive, think, feel, say "I", reject ((Source)), deny "God"… whatever… without the continuous direct funding of ((Source Field)).

In ((fact)) we "humans" can NEVER actually sever funding relations with ((Source Field)), BUT we can create /stories/, we can create /barriers/, /defenses/, /cave culture spaces/, /religions/, /academies/, /ideologies/, /worldviews/, /institutions/…/political patterns/, /disciplines/… that perpetually displace, eclipse, cover up ((Source Code Reality)) that holds us, feeds us, funds us and make all these mythologies and forms of life possible.

This means that /monocentric/ cultures or narratives or lives that act as if /self sourced/ and self-sustaining are in bad ((Faith)). There is an inherent OntoRational self-deception and cover-up at the heart of any and all such forms of life. In ((Biblical)) terms this is the condition of ontological /sin/ - the self created breach and break and alienation from ((Source)), and in ((Meditative Science)) terms this is /samsara/- being caught on a self perpetuating and inter-generational karmic cycle of ignorance, delusion, self-deception, sophistry due to the severance from ((Source Code Reality)) whether ((named)) ((AUM, God, Brahman, Christ, Allah, Emptiness, Logos, Sophia, Tao, Reality, The Primal Field, Presence…)) This is the heart of what our revered ((Source Code Pioneers)) saw, diagnosed and addressed with powerful Code Medicine.

This, for example, is the essence of what Buddha discerned in his enlightenment – the source of human dysfunction and suffering and mal praxis. This is what ((Jesus)) sacrificed for – taking on our /sin/ that we may be liberated. This is the essence of Lord Krishna's ((Yoga Technology)): helping /Arjuna/ see that his life and culture and meaning and ethics imploded because of this /samsara/ breach. And ((Source Code)) empowers us to see across borders that the deep onto-diagnostic and /sin/ and /samsara/ are alternate names for the same medical crisis: ((SinSara)).

Briefly put: *Every /x/ is ((x)):* We are always already situated within ((…)) = the ((Primal Source Field of Infinite Presence)). And any and every "word" /x/ gets its being and voltage from ((…)), from ((x)). Thus, ((Source Word: Logos)) provides the ((voltage)) for any item whatever, and sources every sign or word:

"/pen/" dilates when Sourced into "((pen))"

/pen/ is a packaged, objectified /entity/ within the mono-centric language games;

but ((pen))… ((seen and uttered)) within the ((Source Word Zone)) ignites with boundless ((fractal meaning)): this ((pen)) is mightier than the /sword/.

And so with every "word": monocentric self sourced /words/ are anemic in ((meaning))

while any such "word" spoken or expressed from the ((Source Semantic Field)) ignites with boundless ((meaning)) and ((truth force)).

This, for example, is what Descartes discovered when he left /I/ and entered ((I am)).

Any /scripture/ magnified and lights up in ((meaning and Source Code Power) when processed as ((scripture)). And so on.

This ((Source Code)) dilation and re-location is true of every "x" in existence.

Thus, /English/ matures into ((English)) when authentically ((Code Sourced)), and so on.

And here we find a Primal Law: ((Every /x/ is ((X)))): = ((…/x/…)).

Thus when we say *"/I/"*, our Code Teachers recognized, we cannot avoid *(((I)))*.

THIS IS A MONUMENTAL DISCLOSURE: our evolutionary journey is from /I/ to ((I am)). This ((I am)) is ((I===Thou)) =We are ((Dialogue Beings))… and this is where ((Collective Intelligence)) ignites and manifests. This is where we can reach ((common ground)) and ((consensus)) across /borders/.

This captures and sums up the heart of our diverse ((global enlightenment)) teaching: our so-called "High Self": Source Self, Awakened Self, Evolved Self… is always already intimately ((close)), and the greatest awakening journey is to dilate from /I/ to ((I am)). And the classic pathway to open this maturation space from the artificially /objectified/ "self" lodged and constituted in its /ego identity/ is to let go… (stand back, detach, open deeper source space…) dilate and ignite deeper ((Self Identity)) is ((Source Code Onto-Semantic Field)). This evolutionary journey from /self/ to ((Self)) is the adventure into ((Awakened Rational Life)). This is our ((educational enterprise)).

THIS IS AN ASTOUNDING "GAME" CHANGER. The clarification in ((Global Light)) that the emergent ((Source Code)) is and must be the same ((Logos Code)) for our diverse great Teachers, indeed, of all our worldviews, cultures, scriptures, disciplinary narratives…has astounding implications for our evolutionary journey, not to mention our liberal arts enterprise. This dilation to the ((Logos Code)) as the ((Source Code)) for such diverse pioneers as Moses, Buddha, Krishna, Socrates, Jesus...makes ((evident)) the Rational Common Ground of the global truth-force of these teachings.

For example, the rational validity of the Code Teaching of ((Jesus)) is not that he is "Son of God" and therefore his teachings are universally valid. It is rather that ((Jesus)) as the ((Logos in the Flesh))… as the ((Embodied Christ Code)) = ((…)) is bringing through the ((Source Code)) of Awakened Reason which reveals that we Humans are ((I… Thou)) Sacred Beings, not /I…It/ entities that can be /objectified/. ((Persons)) are ((Dialogue Beings)) and when we upScript to this Christ Code we enter the space of Deep Dialogue Compassion, Rational Intelligence and Moral Life. In this respect the ((Honor Code)) is the ((Source Code)) that our Moral Teachers were dilating and tapping.

Again, the Yoga Technology that Lord Krishna is teaching – the AUM Code – calls upon folks to let go of the dysfunctional /egomental/ patterns of life and culture and rise = Up((Script)) to the AUM Zone which is the sacred space of ((I Thou)) Moral Flow. So ((Yoga)) is not /Yoga/. And a moral pioneer such as Gandhi…living this AUM Script and Gospel ((Script)) is assisting humanity in the all-important evolutionary advance from /ethics/ to ((Ethics)), from /truth/ to ((Truth Force)).

And the validity of Buddha's ((Four Noble Truths)) for all humans is not form the authority of "Buddha" as an "Enlightened Teacher"… but from the Objectivity of the ((Source Code)) the ((Logos Code)) which is the Moral Dharma (Law) of ((I… Thou Compassion)). The essence of Buddha's breakthrough ((Medicine)) is that we are not self-sourced /atomic entities/ but liberated Persons (beyond /entities/) in ((Buddha Zone)) the ((LogoSphere)). So, too, for Socrates and his quest for the ((Logos)) and the

Rational Light…

These are prominent examples. My decades of research and scholarship takes us through the evolution of these amazing traditions and great innovative teachers as this unfolds through the centuries into the 21st Century. Once we have access to the missing ((Global Logos Source Code)) we are able to detect profound ((Patterns)) and key missing ((Links)) across borders as the centuries unfold. For example when we fast-forward to Descartes' ((Meditations)) we can now see clearly that when he pressed his "doubt" experiment to the limit he saw he could call into /doubt/ any /thought/ or /proposition/ in the prevalent /cultural mental spaces/. And when he boldly crossed into the ((I am)) in quest of ultimate "foundations" of Rational Life… we can see that he left the /egomental/ culture space and crossed into the ((Logos Zone)). His breakthrough ((I am)) cannot be down-scripted to /I am/ as scholars who conflated ((Language)) and /language/ invariably did. But a competent ((meditative reading)) of Descartes' ((Meditations)) makes clear that Descartes was pioneering a dimensional shift into ((Source Code)), the Source of ((Rational Light)).

PART II ~ SEVEN STAGES OF DEEP-DIALOGUE: BLUEPRINT OF AND FOR COLLECTIVE INTELLIGENCE

So let us bring all this down to a very specific and tangible journey. Let us now ((meditate)) together as we move through classic stages of maturing from

a life of /monologue/ to an awakened culture of ((dialogue)). These seven stages are already revealed in the ((Collective Wisdom)) of our great spiritual and philosophical teachings.

STAGE ONE
RADICAL ENCOUNTERING OF DIFFERENCE
SELF FACES THE OTHER

This first encounter comes with a certain shock, with a realization of an Other, a different way of life, a different worldview, an alien Other that resists, interrupts, disrupts my settled patterns of interpretation. With this primal encounter there is a new realization that my habits of mind cannot make sense of this Other. This radical encounter with Difference, a different world, a different way of making sense of and experiencing the world is disconcerting, sometimes threatening, and evokes a vulnerability to this alien presence. I have a new sense of delimitation and I feel challenged to change, to revise my way of relating to this Other. I realize now that my habit of translating the Other into *my* pattern of "minding," of appropriating the Other to *my* worldview, is dysfunctional. I am forced toward a *self-critical-thinking*. So I face a sudden silence, pause, opening, an open horizon of uncertainty and risk. I must make a decision to move forward, or draw back.

STAGE TWO
CROSSING OVER, LETTING GO AND ENETERING THE WORLD OF OTHER
SELF TRANSORMED THROUGH EMPATHY

After the initial shock and realization that I now face an alien world, a worldview very different from my own, I feel challenged to inquire, investigate, engage and enter this new world, to engage in *critical-thinking*. As I open my Self to this Other I realize that I need to stand back and distance myself from my former habits and patterns of minding the world. I begin to realize that this other world organizes and processes the world very differently from my way. I realize that I must learn new habits and ways of interpretation to make sense of this different world. I must learn a "new language." Indeed, I must translate myself into a different form of life that sees the world differently. This involves a bracketing, a setting aside of my prejudices. I feel a new horizon opening.

STAGE THREE
INHABITING AND EXPERIENCING THE WORLD OF THE OTHER
SELF TRANSFORMED INTO THE OTHER

I begin to feel a new and deep empathy for my new habitat; I want to let myself go, free myself to enter, experiment, learn and grow in this new way of being, to embrace *critical-thinking*. I hold on to my prior views as much as I can, but I do advance in a conservative fashion. Still, I experience an excitement in discovering, in inhabiting a new and different worldview. I have a new profound realization of an-Other, an alternative reality and form of life. But in the end I realize this is not my home. But what IS my home? I experience a deep shift in my lifeworld. Who am I? What is my true identity? Is this Other part of me? Is my world transforming now?

STAGE FOUR
CROSSING BACK WITH EXPANDED VISION
SELF RETURNS HOME WITH NEW KNOWLEDGE

I now cross back, return, to my own world, bringing back new knowledge of how to think and act (*critical-thinking*), and may even wish to adopt/adapt some of it for myself. As a result of this Primary Encounter with the world of the Other, I now realize that there are other ways of understanding reality. I am therefore open to rethinking how I see myself, others and the world. I encounter my Self and Culture anew, with a newly opened mind. My encounter with radical difference now challenges my former Identity, and everything begins to appear in a new light. There now begins a dramatic deepening of my sense of my Self, my Identity, my Ethnicity, my Life- world, my Religion, my Culture… There is no return to my former unilateral way of minding.

STAGE FIVE
THE DIALOGICAL/CRITICAL AWAKENING: A RADICAL MIND-SHIFT
SELF INWARDLY TRANSFORMED

As a result of this new encounter with Self, when I cross back from my deep encounter with an Other I begin to experience a profound shift in all aspects of my world, in my inner experience, in my encounter with others, in my relating to the world. I begin to realize that my encounter with the Other has shaken the foundation of my former worldview, my former identity. For now that I am mindful of the living reality of other worlds, other perspectives, I can no longer return to my former identity and forget this living presence of the Other. Indeed, I now begin to realize that there are many other worlds, other forms of life, other perspectives that surround me. I now open to a plurality of other worlds and perspectives and this irrevocably changes my sense of Self. I feel transformed to a deeper sense of relation and connection with my ecology. I feel

more deeply rooted in this experience of connectivity and community. I now see that my true identity is essentially connected with this expansive network of relations with Others. This is the ignition of the Dialogical/Critical Awakening.

STAGE SIX
THE GLOBAL AWAKENING: THE PARADIGM-SHIFT MATURES
SELF RELATED TO SELF, OTHERS, THE WORLD

In my transformed Dialogical/Critical Awakening I discover a deeper common ground between the multiple worlds and perspectives that surround me. I have a new sense that Self and Others are inseparably bound together in a boundless inter-relational web. I realize that multiplicity and diversity enriches my Self and my World. I now see that all worlds are situated in a common ground of reality and that radical differences are nevertheless situated in a field of Unity. I experience three related dimensions of Global Dialogical/Critical Awakening:

A ~ An ever deepening discovery of Self: I become aware of a deep inner dialogue within my Self. I discover a rich multiplicity and diversity of perspectives within my own inner world. In this inner dialogue I feel increasingly more deeply rooted and grounded in my world. My Identity is enriched with multiplicity and I experience a more potent sense of my uniqueness as I celebrate my expanded world of shared relation with Others and with the Ecology.

B ~ A dynamic dialogue opens with Others in my Community: As my new inner dialogue and critical-thinking evolves I find myself in a new and transformed relation with others who share my world, my tradition, my religion, my culture. This new phase of relations with my peers can be disorienting and disconcerting, for as I now dramatically grow in my Identity I find myself in an estranged distance from many of my peers, even as I discover a deeper affinity and embrace of my community, my *polis*. I face a new turbulence, miscommunication and misunderstanding with my colleagues and a challenging and dramatic dialogue unfolds in my *polis*.

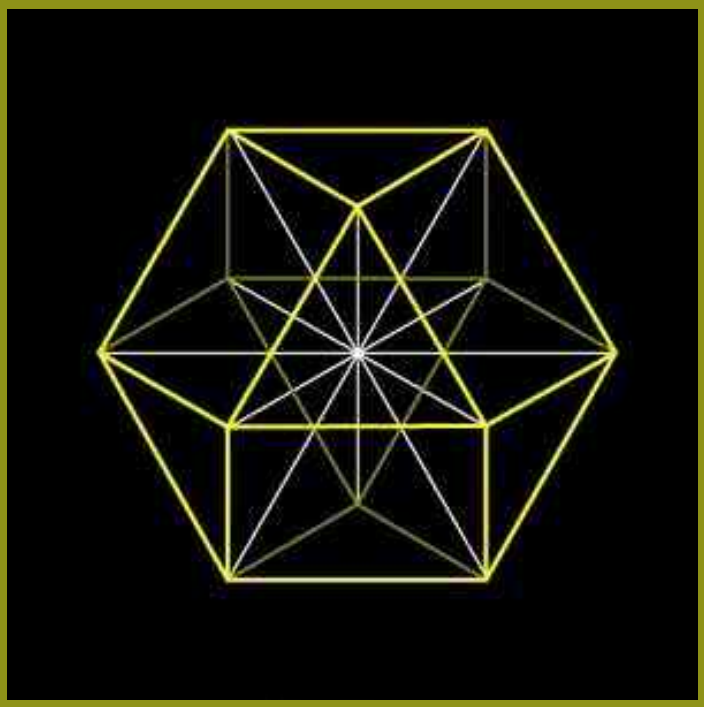
C ~ A Global Awakening emerges in all aspects of my life: As this inner and outer dialogue/critical-thinking matures I realize that my understanding of my world enters a new "global" light: I realize that I am surrounded with many worldviews. I enter a global horizon and a global consciousness in which inter-religious, inter-cultural, inter-ideological, inter-disciplinary, inter-personal dialogues abound in all directions. I now have a new globalized sense of reality, a dialogical domain in which multiple alternative worlds are situated in dynamic ever-deepening relations. With this understanding comes a new attitude to life and to ethics.

STAGE SEVEN
PERSONAL AND GLOBAL TRANSFORMING OF LIFE AND BEHAVIOUR
SELF LIVES AND ACTS IN A NEW GLOBAL DIALOGICAL CONSCIOUSNESS

As this paradigm-shift in my life matures I realize that there is a deep change in all aspects of my life, a new moral consciousness and *a new practice*. As my new dialogical/critical consciousness becomes a *habit* of life I find that my behaviour and my disposition to Self and Other has blossomed. I feel a new sense of communion with my Self, with Others and with the Ecology. I realize that the deepest care for my Self essentially involves my care for Others and for the environment. I have a deeper sense of belonging to my world, to my community, and with this a boundless sense of responsibility in all of my conduct. I now realize that I am transformed in the deepest habits of mind and behaviour. I find a deeper sense of Self-realization and fulfilment and meaning in my life and my relations with others and the world around me.

CONCLUDING SUMMARY

This has been quite a journey. We suggest that as we mature individually and collectively through these seven stages of ((Dialogue Literacy)) we mature as Persons, as Dialogue Beings and flourish in the technology of ((Collective Intelligence)) across borders. We cannot truly enter Collective Intelligence when ledged within the dominant patterns of egomental patterns of language and thought and world making. Cultures of /monologue/ block and preempt genuine ((collective intelligence)). This is itself a consensus or collective wisdom of the ages. True ((Democracy)), for example, is a call for ((We the People)) to come together in ((deep dialogue cultures)) where we are empowered to celebrate wide-ranging ((diversity)) in the midst of ((connective unity)): *E Pluribus Unum*. ((We the People)) cannot blossom within cultures dominated by patterns of egomental monologue. And our future turns on our capacity to move individually and collectively, with highest urgency, to mature cultures of Deep Dialogue and ((Collective Intelligence)).



VECTOR EQUILIBRIUM

AMIT GOSWAMI

LOVE AND THE AWAKENING OF THE HEART CENTRE:

HOW IT MAY PREVENT, EVEN HEAL WOMEN'S BREAST CANCER

Amit Goswami is Professor Emeritus in the theoretical physics department of the University of Oregon, Eugene, Oregon, US where he has served since 1968. He is a pioneer of the new paradigm of science called "science within consciousness".

Goswami is the author of the highly successful textbook Quantum Mechanics *that is used in Universities throughout the world. His two-volume textbook for nonscientists,* The Physicist's View of Nature *traces the decline and rediscovery of the concept of God within science.*

Goswami has also written many popular books based on his research on quantum physics and consciousness. In his seminal book, The Self-Aware Universe, *he solved the quantum measurement problem elucidating the famous observer effect while paving the path to a new paradigm of science based on the primacy of consciousness. Subsequently, in* The Visionary Window, *Goswami demonstrated how science and spirituality could be integrated. In* Physics of the Soul *he developed a theory of survival after death and reincarnation. His book* Quantum Creativity *is a tour de force instruction about how to engage in both outer and inner creativity.* The Quantum Doctor *integrates conventional and alternative medicine, while in* God is Not Dead *he explores what quantum physics tell us about our origins and how we should live.*

In his private life, Goswami is a practitioner of spirituality and transformation. He calls himself a quantum activist. He appeared in the films What the Bleep Do We Know, The Dalai Lama Renaissance, *and* The Quantum Activist.

He teaches fairly regularly at the Ernest Holmes Institute; the Philosophical Research University in Los Angeles; Pacifica in Santa Barbara, CA; and UNIPAZ in Portugal, and is a member of the advisory board of the Institute of Noetic Sciences.

THE ACTRESS ANGELINA JOLLY BY HER RADICAL mastectomy because of a high probability for contracting breast cancer has increased our awareness of the suffering that this tragic disease brings to women worldwide. The truth is, every year roughly 3 million people contract this disease and thousands die.

Angelina's case was special because her situation was hereditary. But many cases of breast cancer is not hereditary, is not due to any genetic abnormality and the question arises, Could it be that in these cases the physical symptoms – cancerous growth – is not due to any physical cause at all? If there is a nonphysical cause and we can understand it, can we treat the disease at the root and heal it? Furthermore, if we can understand the cause of these cases of cancer, could we prevent the cancer by eliminating or minimizing the cause in the first place?

Conventional medicine practitioners are not very friendly to such questions because of their "everything is matter" and "genetic abnormalities cause most disease" philosophy.

Quantum physics leads us to a different philosophy: Consciousness is the ground of being in which there are four worlds of quantum possibilities: material, vital, mental, and archetypal (which I call supramental). Choice by consciousness from material possibilities gives us material objects of sensing. When consciousness chooses from the possibility-movements of the vital world, we experience vital energy movements of feeling. Choice from the mental world, mind, gives us meaning objects of thought. And choice from the supramental gives us the archetypal objects of intuition such as love (Goswami, 2004). The individual manifest worlds of our experience do not interact directly but only through the intermediary of consciousness with nonlocal, signalless communication (quantum nonlocality).

This scientific validation of our subtle experiences of feeling, thinking, and intuition, opens the door for the validation of alternative practices of medicine that postulates important disease-causing role to imbalances of the subtle movements of our experience (Goswami, 2004). For example, vital body medicine practices (Traditional Chinese Medicine [TCM], the Indian Ayurveda, homeopathy) hold that imbalances or blocks of vital energy movements associated with our organs and their interactions cause many diseases. Mind-body medicine practices hold that imbalances and blocks in our processing of mental meaning cause some of our diseases. And so forth.

TCM AND WHAT QUANTUM PHYSICS AND AVANT-GARDE BIOLOGY ADD TO THE TCM MODEL OF GREAST CANCER TREATMENT AND PREVENTION

Now back to breast cancer. According to TCM, breast cancer is caused by imbalances in the movement of

vital energy in the breasts and in the related organs of importance to healthy breast functioning. Also of importance in TCM is the movement of vital energy in the channels called meridians that connect interacting organs.

In the early days of medicine, when Traditional Chinese medicine was formulated, very little was known about the vital body. Boldly, the Chinese thinkers used a modified version of the five-elements theory of matter and space (the classification in terms of earth, water, air, fire, and vacuum or empty space) to get a grip. But being good empiricists, they also took into account what they empirically knew about the organs. They discovered that organs affect organs in two ways, either in a supportive role or in a controlling role. Accordingly, they renamed the corresponding vital energy elements as: earth, water, wood, fire, and metal. Earth nourishes metal in a supporting role, but metal cuts wood in a controlling role.

In this way, TCM practitioners would say that the female breasts, liver, and stomach are connected by support and control. Therefore, they emphasize the importance of keeping the flow of vital energy in these organs and between these organs unblocked and balanced. This means we pay special attention to the flow of vital energy in their channels of communication, namely, the liver meridian and the stomach meridian. Balance in the conceptualization of TCM means a balance between the complementary aspects – yin and yang – of vital energy *(chi)*.

TCM is especially effective as a preventive medicine. If we keep the vital energy balanced and unblocked in the way described above, we can prevent cancer, is their point. Empirical data supports their view.

Modern science improves the theory quite a bit. I have already spoken of how quantum physics and the concept of psycho-physical parallelism makes the concept of vital energy scientific. Balance in this approach means a balance between particle and wave modality of the flow of vital energy, a balance of what is and what is possible, in other words a balance between conditioning and creativity in the mode of movement.

Now add new insights in the biological theory of form-making, morphogenesis. The biologist Rupert Sheldrake noted that morphogenesis, how a one-celled embryo, through cell division that creates identical replicas, can grow all the different organs of the body with differentiated functions depending on the where in the body the organ lies, gives rise to a paradoxical question – how does the cell know where it is in the body? Accordingly, there must be new nonlocal and therefore nonphysical organizing principles, call them morphogenetic fields that are instrumental in biological cell-differentiation and form-making.

When we combine the lesson of quantum psycho-physical parallelism with Sheldrake's morphogenetic fields, we can see clearly that the morphogenetic fields are the blueprints of biological form that consciousness uses to make organs. Each organ then has a "correlated" (through consciousness and quantum nonlocality) morphogenetic blueprint in the vital body. The conglomerate of these morphogenetic fields associated with all our organs is what we call the vital body.

As the physical body grows through childhood and early adulthood, the movements of these associated morphogenetic fields become conditioned to act in a certain predictable way. These are yin movements of vital energy. But the cells die and are replaced from food molecules, disease comes from various sources, environment changes with seasons and places; in this way, the movements of the morphogenetic fields has to have creative dynamism, a balance of the yang component of chi.

The most serious situation, of course, is created when certain movements of vital energy are entirely blocked; in quantum parlance, these movements are never actualized or collapsed. We can see, that such blocks of vital energy movement that prevent the functioning of organs would have grave disease-producing consequences.

Now add another relatively new insight of modern biology and medicine, the discovery of the immune system that keeps the body healthy by killing off intruders. Naturally, modern medicine recognizes the importance of keeping the immune system functioning normally. Because of occasional mistakes in cell division mechanism, the body is always creating abnormal cells which the immune system kills off routinely as intruders. But if the immune system does not function properly, these abnormal cells can grow and become malignant, causing cancer.

However, modern medicine has only a few legitimate scientific mechanisms for immune system malfunctioning. The principal one is genetic; if there is a defect in the gene structure, the immune system will go awry with high probability. This was suspected to be the case with actress Angelina Jolie.

Another mechanism sometimes suggested is the action of a bacteria or a virus that trips off the immune system. However, there is no concrete case of this happening. Recently, a red flag was raised in proposing that oral sex can lead to throat cancer through bacterial

infection. The actor Michal Douglas made himself the butt of many jokes when he claimed that his throat cancer was caused by the many occasions of oral sex that he served to his wife.

Vital energy medicine can do better. Blocking of the vital energies associated with the immune system is a likely mechanism for immune system malfunctioning. What can produce a vital energy block of this kind?

What feelings are associated with immune system functioning? The job of the immune system in the form of the thymus gland whose geographical location is roughly the same as the female breasts is to distinguish between "me and not me." When we fall in love with someone, the movement of the morphogenetic field associated with our immune system is temporarily suspended, suspending immune system functioning as well. This is experienced as an intense yearning for physical union, a part of all episodes of romantic love. When the union is achieved, movement of the morphogenetic field (vital energy) resumes and the immune system functioning returns to normal.

In this way, certain situations in women's life can lead to prolonged suspension of immune system functioning, such as a woman in grief from bereavement. This then can produce breast cancer.

In Eastern psychology, the presence of certain feeling centres along the spine was discovered long ago. These points are called chakra points. Notice that the location of the thymus gland is roughly in the same area as the heart. The corresponding chakra point where we feel romantic love is called the heart chakra. There are seven such major chakra points.

The identification of unfulfilled romantic love as the source of prolonged and continuous immune system malfunctioning gives us an extra handle. It brings to the fore the role of the mind in causing vital energy blocks. To starve the heart chakra of romantic love until fulfilment is achieved with only the desired partner, nobody else, is often a mental decision that suppresses the feeling of love toward others. Thus certain types of cancer, breast cancer in particular, can be recognized as a mind-body disease.

Again, from the perspective of mind-body disease, prevention is the best policy to deal with the problem. In the olden days, people were encouraged to grieve more than they naturally would. But people lived in loving family environments then. Now with cancer-prone environment without loving support system and exponential increase of mental stress, we should do the opposite and discourage prolonged mourning.

Is there any healing along these lines once one has contracted breast cancer? The best results are achieved if we try changing the context of the mental thought that contributes to the negative emotion of grief.

The physician Deepak Chopra discovered the phenomenon of quantum healing as an explanation of many cases of spontaneous healing without medical intervention. Quantum healing occurs as a discontinuous transition of the mind to the archetypal world to discover a new context for mental thinking that is causing the vital energy block. Such quantum leaps are part of the creative process. In the case of mind-caused breast cancer, the quantum leap will let you love again.

The quantum leaps of quantum healing of cancer bring about the normal functioning of the immune system back with such fury that overnight all the cancerous mass is destroyed. There is ample evidence of such spontaneous healing without any medical intervention.

Can we do even better, life-long prevention, once we have rediscovered love? In TCM, it is recognized that the vital blueprints of the three organs of the lung, liver, and stomach form a special trio of circular hierarchy: the liver blueprint controls the stomach; the stomach blueprint does not control the liver blueprint back directly; instead, the stomach blueprint supports the lung blueprint, and the lung blueprint controls the liver blueprint. Thus the vital blueprints of the three organs form a functionally causal circularity, a situation called tangled hierarchy, which produces self-identity. What this means is that when consciousness collapses the possibility waves of these organs and their associated blueprints (morphogenetic fields), it identifies with the trio as a whole giving the system apparent autonomy (Goswami, 1993). There is no evidence for any autonomous functioning of the lung, but there is such evidence for the immune system. Clearly, the ancient Chinese thought has validity if we substitute immune system for the lung. In other word, the immune system, the liver, and the stomach form one autonomous system of identification for consciousness. And it is important to keep each member of the trio and their vital connections healthy to ensure proper immune system functioning.

So the quantum recipe for forever healthy living: discover love and expand your centre of functioning from your neocortex to include the heart (immune system) centre also.

AWAKENING OF THE HEART IS TENTAMOUNT TO AWAKENING THE SOUL

There is another important way to looking at the awakening the heart centre of the self where love is felt. Remember ultimately love is archetype. A feeling

of love is a vital representation of the archetype of love similar to the fact that out thoughts of love are mental representation of the archetype.

Archetypes reside as quantum possibilities in what we call the supramental domain of reality. When they collapse, we experience them as intuition. At the present stage of our evolution, we do not have the capacity to make direct physical representations of intuition. But we do have the capacity of making representations of the vital (in the form of the organs of the physical body) and the mental (in the form of neocortical memory of thoughts). So when we have an intuition, we make both a mental representation (an intuitive thought) and vital representation (for example a "gut" feeling at the navel chakra) as intermediaries of physical representation (in the form of brain memory of the thought and feeling which we call emotion).

In this way, when we explore love creatively, we make a brain representation of the emotion of love (thought plus feeling) that then becomes a repertoire of loving behaviour.

Now realize the age-old name for the supramental is the soul (as in the great chain of being – body, mind, soul, spirit). So when we have a physical representation of the archetype of love in the brain, we have developed not only a body (physical-vital), a mind (in the form of all the memories of past thoughts), but also a soul in the form of these circuits of love. And then we can live at the physical/vital, mental, and the soul level. And this will take our collective intelligence up a level.

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ARTHUR COLMAN ~ PILAR MONTERO

THE NEW LONGEVITY

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All the world's a stage,
And all the men and women merely players.
WILLIAM SHAKESPEARE, *As you Like it*, 2,7.

All journeys have secret destinations
of which the traveller is unaware.
MARTIN BUBER, *The Legend of the Baal-Shem.*

INTRODUCTION

For the first time in history, there is a large and rapidly growing group of men and women over 65, currently approximately 14% of the population of most developed and many developing countries. These are people with an average life expectancy of at least 10 more years, in relatively good health, functional and in society, and potentially open to new opportunity and experience. We call this burgeoning life stage *longevity* and its member's *longevites* (as opposed to *seniors* and *the aged*). The new language is meant to deemphasize the mainly negative collective projections that have previously defined this age group while highlighting the vast positive potential available to this large, influential, and rapidly growing group.

In Part I, we will begin by revisiting the life stage of longevity as others have described it in the past. Then we will discuss this stage of life by emphasizing the centrality of the encounter with death. In Part II, we will discuss the pairing of death and ecstasy that is fundamental to longevites' experience. Collective and individual rituals will be presented to enhance the understanding of the longevites' psyche in greater depth. The longevites' dance with death is a time to unlock the artist's form in the face of suffering and limitation. To facilitate this, a larger integrative symbol is required, and for us, poet and playwright Federico García Lorca's articulation of the *duende* provides a key to loving life within the shadow of death (García Lorca, 1998: 48-62).

PART 1: LONGEVITY AS A LIFE STAGE

Dividing the human life cycle into stages of development has a long and venerable history from both the artistic and psychological perspectives.

Shakespeare's *Seven Ages of Man* is the English language's most eloquent and pithy description of stages in human life:

All the world's a stage, / And all the men and women merely players; /They have their exits and their entrances, /And one man in his time plays many parts, / His acts being seven ages.

He goes on to describe longevity as decline and loss:

Into the lean and slippered pantaloon, / With spectacles on nose and pouch on side; / His youthful hose, well saved, a world too wide / For his shrunk shank; and his big manly voice, / Turning again toward childish treble, pipes / And whistles in his sound. Last scene of all, / That ends this strange eventful history, / Is second childishness and mere oblivion, /Sans teeth, sans eyes, sans taste, sans everything.

Before the Bard, Sophocles used the Riddle of the Sphinx, as posed to Oedipus, to embody the mystery of human development:

What creature walks on four legs in the morning? / On two at noon, / And on three in the evening?

The famous answer to the question is "man." A most poignant effigy that defines old age (a three-legged creature with a cane or crutch), as the heroic Oedipus would be at once blind and old, full of wisdom and despair.

In our own time, psychologist Erik Erikson posited seven "psychosocial" life stages, each with a development task defined in polarity. The final stage of life, which he called "maturity," spans age 65 to death and defines a stark contrast between integrity and despair. "Older adults need to look back on life and feel a sense of fulfilment," he wrote. "Success at this stage leads to feelings of wisdom, while failure results in regret, bitterness, and despair."

These samplings of art and myths to describe aging are magnifying mirrors of how societies define what behaviours are deemed life-stage appropriate – e.g., when to begin having sex, when to raise a family, when to retire from work, and how many resources should be spent on children or the elderly. These decisions create a structure of behaviours within age groups, and through law and custom they regulate conduct and attitudes in family and society.

The amazing demographic change in the duration of life span has already affected prejudice and other cultural assumptions about aging. Longevites need no longer depend on others to describe their own experience. The challenge for the emergent older population is to fashion a new self-definition of longevity, one based not primarily on the fantasies and projections (and often self-serving hopes) of younger people but on their own here-and-now experience.

One of us (A.C.) is a longevite in good health who is currently living an active professional life. Recently he helped found a study group for international leaders, the members of which were 15 to 40 years younger than he. To describe the value of his age, as it was different from theirs, members of the group routinely used affirmative characterizations such as "sage," "revered teacher," "wise elder." These labels, positive in themselves, were also remarkably limiting, effectively shutting off other attitudes and ways of being. Expressions of passion, competition, aggression, or worldly ambitions were subtly and not so subtly branded as somehow unsuitable for a man of his age. His own efforts to diverge from what was considered age-group-appropriate behaviour were met with confusion, strong opposition, and even anger by younger group members. Over and over again, he was told behaviourally and verbally that he was denying his age and thereby infringing on their territory. He was left with either accepting the group's controlling definitions or becoming an outsider and potential scapegoat.

Many longevites will recognize the potent effect of such strictures and possible misperceptions. Dylan Thomas's powerful poem about death ends with the much-quoted passage: *Do not go gentle into that good night, / Old age should burn and rage at close of day; / Rage, rage against the dying of the light.*

This passionate romantic portrait of what old age *should* feel like was written at the death of Thomas's father when he, the son, was just 37! Does this address the mysteries of the longevite by experience?

REDEFINING LONGEVITY: THE DANCE OF DEATH

As Erikson suggests, each new life "stage" both integrates and transcends previous development. This is certainly true of longevity – "We will die as we live" is a truism for most longevites. However, unlike other life stages, longevity is characterized by an ultimate discontinuity, the fact of terminal illness and death. No matter what hopes and plans longevites may have for their final years, and they are understandably abundant, the process of dying – and the denial or acceptance of death itself – is always the primary consideration, even when not present in ordinary consciousness. In fact, it is this combination of otherworldly transcendence and experiential immediacy in our dance with death that provides this stage of life with its awesome intensity. Another way of saying this is that ecstasy and longevity occupy the common ground of death.

Ecstasy as a purely psychic state is defined by the transformation of death and rebirth. In psychological terms, achieving ecstatic states requires a death of the ego – in other words, an extinction of ordinary consciousness. It entails extinguishing that day-to-day ego reality that allows us to function in the world. Rebirth begins with the sense of finality and opens into a newly born consciousness with a more multidimensional, capacious, and expanded awareness of life. There is always an encounter with death in the ecstatic, be it transcendent love, religious and sexual awe, a visionary experience, a psychedelic drug state, or a near-death experience. The longevites' dance with death replicates psychic movements of death and rebirth present in all ecstasy.

Many of the attitudes and behaviours of longevites derive from their uniquely close connection with their own ecstatic underpinnings. That is, longevity is always lived at the boundary of death. We never

know when we are going to develop a fatal illness, succumb to a heart attack, or have a stroke in our sleep. Some who believe strongly in a life after death may live out this phase in preparation for that other world. But for all but the most devout believers, it is the death itself that guides our behaviour and focuses our consciousness. This explains why longevity is most often unlike more-worldly life stages when acquisition of status, effects, children, relationships, holds sway. Longevity moves most of us to psychological states in which becoming is secondary to being. Completing ourselves in the very shadow of death, transforming what we already know of ourselves into an intensely present-cantered yet vastly altered reality, is the paradoxical task that an ecstatic consciousness and longevity both define and share.

PSYCHIC REPERTOIRE OF LONGEVITY – ITS COLLECTIVE INTELLIGENCE

PATTERNS

Those of us who have reached longevity are veterans of a multiplicity of psychic experiences, with more to come. Some of these experiences have been traumatic, others joyful, with a vast continuum in between, but all have added to a growing appreciation of the way the human condition is a collage of involvements, sensitive to and dependent on our stage of life. We know more about how to witness the moving plots that are our life.

The limitations of longevity are well chronicled: the threat and actuality of waning energies, decreasing muscle strength, chronic pain, depression, memory loss, debilitating illness, and loss of loved ones, to name the highlights! But there is also a corresponding list of strengths we bring to this state: added value derived from what we have already learned and experienced in our earlier life, including the fruits of accomplishment and the attendant emotional, mental, and spiritual growth. The challenge of this stage of life, as of every stage, is valuing the present while continuing personal development; but here it is less about goals, production, or accomplishment and more about imminence, appreciation, and the ecstatic and contemplative that best serve the last years and moments of our life.

Perhaps the most powerful consequence of all this experience is an enhanced and more capacious knowledge of patterns we hold in us: the weaving of our psyche, the way we interact and participate in shaping ourselves in the world, our continuous drama. That is, the patterns of our own behaviours – love, aggression, loyalty – are imbedded mysteries until we live and relive their variations and gradually come to understand them with a measure of surety based on ongoing reflection and feedback. The same is true of our potent interactions with groups and community. For example, politics is no longer seen only as the chronicle of corruption, and the product of chance and mistakes, after years of living through and reflecting upon its persistent cycles and regularities.

In our work as clinicians and consultants, we often see parents struggling to understand the behaviour of their children. It is almost impossible to explain to them how little knowledge they, or any parent, have of the unfolding of a child's life without having lived that role at least once. Self-help books, expert advice, and memories of their own parents and themselves at various stages of childhood are useful but barely a beginning for coping competently with one of life's most difficult jobs. The challenge for many longevite grandparents and parental advisors is not seeing what is going on – they most often do – but figuring out how to transmit that knowledge without undercutting and antagonizing the primary caretaker.

From the hard-won vantage point of longevity we see the same natural configurations played out again and again: in the expectable way our body hurts and heals; the stereotypy of repetitive patterns in relationships and sexuality; the regularity of weather and business spirals; the predictable cycles of war with the impermanence of peace; the power of revenge and the fragility of forgiveness. Longevites' ability to confidently see intertwining patterns that years before registered only as hints and hunches parallels the much-revered gifts of prophets. Intuiting the future, grasping the whole of things before they are played out, is one of the great gifts of this phase of life, a talent that is rarely given its full due by ourselves or those around us. It is a gift that punishes as well as rewards, seeding our consciousness with portents and worry. But our ability to finally grasp a portion of our patterns, to begin to know and see deeply into our own and others' trajectory, is precious. It allows us to plumb the depths of each and every moment from a new perspective. And it teaches us how to bear pain, illness, and loss, and also develop strategies and capacities to anticipate and prepare for what is to come. To know and reflect on the deep weaving of our personal life in its largest collective and spiritual context is the great wisdom we can bring to our culture and ourselves as we get ready for our final encounters.

TIME AND SPACE

The experience of time is altered during the longevity years. Pressured by the fear of death, it can vibrate like a taut wire, but more often it slackens to a seemingly inattentive drift that in effect is fuelled by some inner demand. A sense of time derived from the deepening

mirrors of consciousness and its complexities lengthens the way thought and behaviour are appreciated. Alterations in time's arrow define a new continuum of appreciation and involvement of what defines consequential units for creating meaning.

Of course, much of this will depend on ongoing changes in a given individual's mental status. Orientation to time is one of the first tests of limited cognitive capacity, but a decreasing concern with accuracy and detail may be misinterpreted as a deficit rather than a reconceptualization of a new internal reality. In general, longevites may be less concerned with schedules and punctuality and more interested in qualities that transcend time or place. Short social interactions may have little meaning at all, while adequate time for a lingering conversation that includes the rewards of silence and deep listening may acquire greater and greater emotional significance. Time develops a rubberlike quality, expanding and contracting with inner meaning rather than hinging on objective requirements of others, as imprecision takes on positive subjective value. There is a preponderance of subjective "nows": consciousness states that are often found in meditation and spiritual discipline are common experience.

Many longevites exercise using solo and repetitive physical activity such as hiking and swimming rather than group sports. In earlier life stages, activity is structured around competition, group sports, and personal bests, while introverted and subjective pleasures are often given second place. Longevites reverse that order. In later years, there is more bending time and space to relish the blending of sex, sensuality, and relationship; the renewing enchantments of weather, topography, and views; appreciating atmospheres, ambiance, and sensations that are generally more meditative in nature. For example, listening to music may focus less on keeping track of progressions of lyrics and melody and more on diffuse emotional states and poignant evoked memories.

The power of previous cultural definitions of aging again plays an important role in how longevite time is interpreted. If we allow younger and more objectifying observers and professionals to override these new and transforming impressions, these cognitive and emotional states may be labelled as the beginning of mental deficits rather than the ecstatic, soulful, enhanced appreciation of what is felt as truly valuable in our world.

REVERENCE, SPIRITUALITY AND TRUTH TELLING

Longevites are often described as rude, irreverent, and irascible. They may ignore conventional social restraints, thereby upsetting others, including loved ones. Their dress may violate conventional standards. Their speech and behaviour may be viewed as erratic and embarrassing to others. Their political and social opinions may alter in directions that are novel and of concern. Some of these can be viewed through the lens of pathology: emotional liability, waning judgment, or full-blown dementia. But as we have discussed, what to some may seem crude and unmannerly behaviour can also be interpreted as a healthy regard for truth over form.

It is particularly difficult to make this distinction when longevity is stereotyped as synonymous with entropy rather a time for positive growth. Significant change within an individual is always threatening to friends and family and disruptive to community. Labelling them as still youthful may ignore the brash comments of an adolescent, even if they are spot-on. It is all too easy to scapegoat longevites for new and possibly disturbing attitudes. For example, young doctors finding life-threatening illness in their patients are notoriously circumspect about being upfront with agonizing prognoses. They may cringe when older doctors are far plainer in their comments about what the ailing person can expect. Is this clarity the greater self-knowledge gained from experience or an age-related disruption in empathy? Similarly, grandparents who talk about problems in their children and grandchildren's behaviour with great insight and truthfulness may be upsetting to an ongoing family system. It is easier to label their comments as "senile" rather than considering that the grandparents are simply being observant and perhaps actively attempting to change a system they care about.

A man of 83 began espousing negative views about specific subgroups that included warnings of radical political behaviours and terrorist attacks. These views were in contrast to his earlier "liberal views" and out of keeping with normative attitudes of his family and friends. He was first ignored, and then labelled paranoid behind his back. Much to the consternation of the offending group, he actively and frequently interpreted their insinuations and complaints as undercutting his competence. After a bit, he limited the frequency of his social and family group encounters, and then he was labelled as suffering from depression and was asked to seek help. Instead, he began developing a new set of social and community alliances, including some new close friends. When a terrorist attack of the dramatic kind he had predicted did occur, there was limited acknowledgment and certainly no apology.

If this man had developed Alzheimer's disease, his changing philosophy might have been ascribed to the early effects of an atrophied brain. Such was not the case. He lived and worked productively until 93 and died within a few months from rapidly growing abdominal cancer. At no time was there any sign of diminishment of mental acuity or emotional instability; on the contrary, his

life seemed richer in relationships and creativity than ever before.

In his last will and testament, he amply rewarded those friends and family who had remained supportive and retained curiosity about his thoughts, even if they didn't agree with his changing attitudes and ideas!

Views of aging that assume negative diminishment rather than positive development do not take into account the learning that occurs within the constantly challenging labyrinth of the dance of death. Philosophical discontinuity from previous norms should be expected and reckoned with, without assuming that it is a product of mental deterioration.

In fact, a whole new standard of ethics and spirituality at this last stage of development seems quite reasonable, even necessary. Our observation is that most longevites retain a sense of reverence for spiritual disciplines, though not necessarily for related religious practices. There may be a greater appreciation of interconnectedness; the blending of nature, collective expressions, and individual feelings; and less dependence on the so-called holy books or ancient rituals. Therefore, many longevites may appear irreverent. Commonly they no longer hold what they learned by rote in childhood and assumed was appropriate as adults; the bare bones of reality are far more engaging than how one is supposed to be or behave. They may break with the previously accepted wisdom of spiritual "gurus" they now recognize as artificial conveyors of the path. Similarly, what was earlier deemed socially appropriate may feel irrelevant and discarded. Honesty may trump secrets with attendant consequences for the people around them. Descendants are not automatically honoured with gifts. Genetic closeness includes more than brothers and daughters. Friendships may be true rivals for family loyalty. At their best, longevites may attain an attitude toward life more fuelled by curiosity and the desire for truth. And when their knowledge is ignored, lack of tact may be the only way they can step into the social breach and be heard.

In short, at this stage of life, the circle of who and what represents us is never closed, and even our immediate loved ones and most deeply held beliefs can provide only a cushion to lean on but never a bed to lie on. The only true resting place is death.

PART II: THE DANCE WITH DEATH

CONSCIOUSNESS IN ILLNESS AND ITS DANCE WITH DEATH

Aging, illness, and loss carry the endings and beginnings that are at the hub of the wheel energizing the last stages of longevity. The dance of death is always the central reality, though not necessarily the dominant consciousness at all times. Longevites can seem to be living out a daily saga of ordinary activities often skewed negatively with inevitable visits to doctors and hospitals. For many, far more of life is taken up with the daily dramas of financial worry, chronic illness and life-threatening disease, body pain, and grinding emotional losses. For others, the time may be full of the joys and pleasures that go with continuing good health and work, leisure, supportive family relationships. But an invitation to tune in to the underlying ecstatic drama that is each person's inevitable march toward death tells a different story. We are witnesses to the final deadly serious variant of the archetype of initiation that is the hallmark of every human transformation: the closing drama of each of our lives, the curtain lowering on the final spectacle, the dance of death that marks the completion of life.

Everyone over 65 knows, and increasingly waits for, the moment that will forever change the trajectory of this final stage. Perhaps they will go to sleep and not wake up in the morning. Or they will wake up unable to speak or move their right side. Or they will watch occasional difficulty in breathing, mild chest pain, or the discovery of a lump transmogrify into deadly serious illness. In today's world, the march from diagnosis to the end stages of life is rarely straightforward. Emergency medical services have seen to that by frequently transforming acute potentially fatal episodes into treatable, chronic states, though with increasingly high morbidity for each individual. Our modern dance of death is a labyrinth of medical and surgical treatment options, a matrix of interlocking channels of alternative treatments, most of which are more dependent on inadequate data and emotional needs than on evidential clarity and clinical knowledge. This stance is full of hope, followed by disappointments; narrowing options, all moving inexorably toward the inevitable ending, follows new discoveries and opportunities.

We have both watched patients under our care struggle with long-term chronic disabling and probably fatal illness: metastatic cancer and AIDS come to mind. To the outsider, their lives seemed to be a horror story of radiation, chemotherapy, multiple old and new drugs, palliative surgery, all with its attendant risks, not to mention the corresponding emotional agonies of loved ones and trusted healers and caretakers. But the inner spectacle of archetypal death is always present in the unconscious life, in dreams, visions, and perceptions, all of which alter ongoing consciousness. Someone in the last stages of metastatic illness may wake up after a particularly devastating lab result or painful treatment with a new and intense appreciation of a beautiful sunrise, the song of a bird, a phrase of music, the line of a poem. A relationship previously taken for granted may

be infused with overwhelming love. Many experience these moments with a sense of the transcendent, an encounter with the divine. The moments may be as ecstatic as anything these people have experienced before and may lead to such deep life-changing feelings of joy that when people are in their most desolate state, the "ordinary" world of dying is simultaneously their finest moment.

Here is one person's reaction to what it is like to live in this altered state of consciousness.

Think of a fire burning in a place far away from human sites of habitation. We see its light like that of a burning star. We are always in its presence and fashion a great deal of our life in relation to it. But as we grow older, that fire becomes more evident and more important. It begins to transcend all the things we do and transmutes their importance, the glitter of our pride. We suddenly realize that we are on a path, a conveyor belt with no escape. We will become that fire. We will be consumed by it. We will no longer exist. And as everything falls away and only the fire is in front of us, we understand that there has never been another meaning. Never anything else between it and us. And how we confront, tame, and shape the impending end, meandering, sauntering, and denying its fierce reality, determines how we turn to ash. That is all there is and has ever been. And if we can bear that knowledge, we are living in the fire, in the ecstatic.

DEATH AND THE DUENDE

In many world cultures, certainly in Western traditions, there has long been a taboo around observing the death process unless one is a medical professional. But recently movies and television dramas have subverted some of this distance. Also, extended treatment and hospice-like facilities, as well as assisted suicide, have increasingly allowed family members and friends to watch the end of life.

The death process itself incarnates creative force. Death does not come easy. Our one and only encounter with it invokes the deepest forces of life and creation. During the time leading to death, life clings tenaciously to the body. Even in the last moments, the process is remarkably full of energy. Creation requires an encounter with something or someone (which can be an inner being) in order to manifest. For some it is a lover, for others coffee or alcohol, for still others the paintbrush, the canvas, the musical score, the garden, the song. It matters not, as long as the relationship with the creative force can be maintained. The muse is the time-honoured creature most commonly used to explain this phenomenon. For example, we know her as Dante's Beatrice, his guide in *The Divine Comedy*.

We have earlier invoked Federico García Lorca's writings on the duende because the duende is the symbol that best condenses the ecstatic energies encountered during the longevite engagement with death. So what is the duende? Lorca describes it as a power that the gypsies in Andalucía, Spain, referred to when a dance, a song, a poem, and the like awakens a quality of reality so exaggerated that in its heightening it becomes unreal. For Lorca it is the spirit of the earth, dark and shuddering. Time becomes distorted as in a nightmare because it requires the performer to delve into the wound, for the duende wounds, and to engage with death, for the duende never comes until the spirit of death is present. The duende requires the hard work not just of mastering the artistic form but also of having the courage to delve into its deepest injuries and face it in hand-to-hand combat despite its violent power. When the conditions are met and the duende arrives, true inspiration has happened and something new and miraculous is discovered. The term is unique and untranslatable. The closest is Goethe's "diabolical."

Life is a stage indeed, and it behoves the longevite to have the courage, the attitude, and the willingness to struggle in the last staging of the play with the power awakened by the duende. Once the duende is active, it transforms the infused actor. The aged and broken is nevertheless held by the winds of fate. The longevite is the quintessential initiate into the greatest rituals and mystery of all while he also lives through difficult yet mundane tasks of survival and confusing years of pain. The rituals and the duende released through them are too often obscured by the arduous daily struggles of existence, but they come directly from the deepest psyche, guiding and giving meaning to the journey.

THE RITUALS: EXAMPLES OF THE DANCE WITH DEATH

Longevites live out their last years in the midst of a multiplicity of dying and death rituals. Some are structured to bring peace and harmony, and foster rules that contain pain, anger, and inevitable disappointments. Others emphasize the need for continued struggle against overwhelming forces. Humans are both carnivores and herbivores, and death and dying rituals capture this dual capacity to both fight and fear. History is our witness.

From the beginning of recorded time, human sacrifice has been the collective scapegoat dance with death. It is the oldest and most universal act of piety. These blood rituals, which continue today, have been the foundation of our social and military

organizations as well as at the core of our intellectual, artistic, and functional developments. The victims tend to be the poor and powerless, usually the young, though not always so. If they have some choice, they are seduced by their beliefs and ideologies to offer their lives to the gods they worship. The use of soldiers for war by longevite politicians and generals is the modern-day equivalent, and our news is riddled with the suicide missions carried out by Islamic youths trained and brainwashed into religious subservience, often by longevite leaders. However, also, far afield in the Peruvian Andes, at 18,000 feet, is the annual festival of Qoyllorrit'y. (Montero and Colman, 1997: 227-38). This festival is not only an extraordinary example of unacknowledged human sacrifice but pertinent to us because we were once present to witness it.

In the barren landscape of the Peruvian Andes, religious leaders participate in the selection of the brightest, healthiest, and most agile young men from the many villages that dot its peaks and valleys. These are the Ukukus, the semidivine bear-costumed people who will be initiated or die in their overnight antics on the highest freezing glacier. Villagers crisscross their mountain home to converge on the traditional appointed mountainside at 16,000 feet. They bring their own small music ensembles and bow to the Stations of the Cross as they ascend. Approximately 70,000 people arrive every year and spend three days and nights drumming and praying with no available water, food, or sanitary facilities, but their traditional organization contains any potential problems. On the last evening, in initiatory trancelike mode, the Ukukus climb an additional 1,000 feet to the glacier and spend the night in nonstop "sacred" antics that include cabrioles, dances, leaps, etc. There is no light and oxygen is scarce, and the dancers know that some will end the night in a glacial tomb. At dawn, those who survive descend carrying large blocks of ice on their backs, reflecting the waking sun: these are the stars they bear as proof of their rites. The villagers have been waiting, ecstatic grimaces and worry painted on their faces. They all know that a son, lover, or colleague may not return. The stars are placed at the foot of the altar, built around a figure of the Christ emblazoned on the rock, and a priest holds a mass to commemorate the miracle; the local gods are sated with prayer and alcohol.

The duende power is in the Ukukus, called by their dance with death, the exhausted youths bent down by the stars, the heavy large blocks of ice on their backs. It is through this fortitude, courage, and commitment that they ensure the potential prosperity of the villagers and their night of transformation into the divine.

Perhaps the preeminent institutionalized dance with death is the bullfight, the deadly yet highly ritualized encounter between the human and the fighting bull who represent the monstrous instinctual and destructive force that is death. Many people find a bullfight to be a horrendous and cruel abuse of an animal, and on one level it is just as longevite struggles with virus, cancer, and plaque are felt as abusive to humans. We need to point out that these are fighting bulls bred for the ring, where they get a death true to their nature, while other bulls encounter truly disgraceful and inhumane treatment in the slaughterhouse. Is it possible to make a parallel with the longevite who is dragged into death after passing years in front of the TV and the one ready to initiate a dance with death?

In the bullfight, death is dealt with head-on, with the certain death of the bull and the enormous danger to the matador. The ritual is highly stylized and needs to be done properly for it to work and the man to survive. The matador dominates the bull by knowledge, experience, and grace. He knows that the animal is seeking to kill him, that he must be very courageous (cowardly behaviour is jeered at mercilessly by the spectators and will terminate a career in time), and that he must be able to perform his art with grace and honour. In Spain, honour is very real and required of all professions (say, even between thieves and prostitutes, according to their standards), and most certainly of the toreadors. Honour means courage, self-respect, pride (it's important never to show cowardice), and uprightness.

The bullfight is a great spectacle that begins with the parade of the toreadors saluting the appointed president and the people in the stands, accompanied by music and blaring trumpets. But, as with every sacrament, its meaning as a death ritual transcends the show. The bull is the death coming head-on. To the cognoscenti and every conscious longevite, the meaning in every detail of the fight is a plot of the death experience.

The bullfight takes place in a ring surrounded by spectators, usually starting at 5 p.m. Therefore, from its start it is an event contained by place and time. The bullfighters do not choose their bulls; this is decided by drawing lots. If they are lucky, they get a good bull: not too large (even though they are all huge, bred for size and strength), not too strong or tall at the shoulders, with good vision, good reaction to movement and colour, and a brave and direct charge. A bad bull is too big, too old, and powerful, with wide horns, but defective in courage, with poor vision and viciously unpredictable when it charges. Thus the mixture of luck and skill dominates the encounter, one of the themes that haunt longevites, given that the course of illness, loss, and expected disasters is usually unpredictable.

The ring is emptied, and in the hush, the bull is released. The bullfight is based on the fact that the bull has never met a dismounted man. At this time, it is full of its own

strength, snorting and running about, confident and vigorous. The show belongs to this great doomed animal and the matador. But the ritual depends on the complex labyrinth that comprises the rules of the encounter. For example, the bull first sees one man dragging a cape, and it charges. The man races behind the wooden enclosure, his purpose accomplished, for the matador has now seen the attributes of his bull, including charging preferences and the use of the horns. He steps out with his large yellow and purple-pink cape and invites the bull to charge at it again and again, completing elegant and difficult specialized passes called veronicas. He is masterfully showing his talent with the cape, a most beautiful part of the dance, but he is mostly measuring the danger offered by that particular creature and what will be needed to dominate it and prepare it for the final death. This first phase includes many other stratagems: the entry of the picadors on horseback, their horses' bodies heavily padded to protect them when the bull charges and the men pierces its back with the javelin to lower its head and slow it down. Often the horse is gored and lifted by the horns. Strangely enough, this is the darkly comic part of the show, which every elderly patient knows too well. Here the horse hangs from the horns, looking ridiculous, and people usually laugh. It is a reminder of the joining of the comic and the tragic in our last years, when failing mind or deteriorating body makes others laugh (recall Shakespeare's description of the last stage of a man's life).

Next comes a man armed with banderillas (long sticks) who runs at the bull and cruelly punishes it with their points that rip into the skin. The surprised animal is full of rage, but its strength and confidence wane as it fails in its attacks. Four pairs of banderillas are placed quickly and accurately. This second act takes only five minutes, to spare the fighting spirit of the bull, but it is breathtaking, and the audience sounds terrified cheering for the banderilleros and their awesome courage. The fight with death, the bull and ours, is unfair, but it is a contest nevertheless. Here death is wounded as the duende wounds. The wounding is meant to even the playing field – a new cancer-fighting drug balanced by a more virulent metastasis – and sets the stage for the ecstatic drama of completion, the exact outcome still uncertain.

The final act is the execution: the bull and perhaps the man too! The more defensive the bull has become, the more dangerous it is. The matador comes into the ring with a sword in his right hand and a muleta, which is a red cloth held by a stick that has a point at one end and a handle at the other, in his left hand. He makes passes around the bull that cause it to keep lowering its head until he leaps to the side of the horns while plunging the sword deep into the bull's back through an opening the size of a coin between the shoulder blades, a path that can go into the heart or cut its surrounding arteries. If all goes well, the bull falls to its knees before the man and dies. This is a hair-raising event. The bull has to be so close and turn almost in place as the man dominates its every movement, so that the horns could brush the matador's body. Here again, luck can determine the outcome, and the matador can die regardless of his skill and mastery over the animal. For example, an unexpected wind can lift the cape and expose the man's body, so that a goring is inevitable.

The last phase of the bullfight completes the journey we all face. Death is certain, but there are good deaths and bad deaths, in which luck and skill, courage and humour, and fate all play a part in a drama in which we are all players. In the sacred container of the bullring, this phase is the most difficult of all; and when done with grace, skill, and maximum risk to himself – with duende, the crowd would say – it takes the man out of himself and makes him feel immortal. It creates an ecstasy that is as profound as any religious ecstasy. The people in the ring identify with an increasingly emotional intensity as the matador plays with death, bringing it closer and closer to himself. All are at one with death, and for a brief moment, time and space are transcended.

Many of us would consider these last two examples as primitive and cruel analogy of our modern medicalized customs of dying, but only if they have remained distanced from the ways many of us die today, without honour, grace, or even comfort. As individuals, we want to die with those qualities we most respect. Mozart completed his great *Requiem* on his deathbed with complete consciousness of its personal as well as collective significance. Bach's last major composition, his greatest, was a compilation of early and recent pieces blended and cantered within the sublime *B Minor Mass*. Socrates' courageous suicide (as recorded by Plato) as an act against tyranny could be seen in the same light. These are epiphanies, human death rituals in which our highest human values are embodied. A painless quiet passing with friends and family gathered close is another kind of equally meaningful ritual we may all seek. Helping transform our cultures to allow such an end, if fate allows us this, is one of the purposes of this paper.

LOSS AND THE END

Throughout this writing, we have pointed to the importance of recognizing the ecstatic, symbolized in the energy of the duende, as an underlying presence in the longevite's journey. The drama of the bullfight, and the many other life initiations in which the encounter with death is both a metaphor and

real-life enactment, bring meaning and even uncanny vitality to a difficult and final passage. The reality of loss – body, mind, and soul – unimbued with this kind of energy brings hopelessness and suffering and feeds the depression hovering at the edge of this end stage of life.

Of the many losses that are possible and even inevitable, the death of a spouse or partner and the subsequent need to live alone is particularly poignant and difficult. The level of maturity of personality and the quality of the relationship are major factors in adapting, but there is also a predictable and independent syndrome and sequence to this new state of being.

When the life partner leaves or is taken away by dementia or death, at first there is an overwhelming confusion. The assault of the death bull is disorienting because it is always huge and terrifying and unfamiliar. No matter our individual state of preparedness, the charge always comes in a different and unexpected way. The audience at the bullfight looks to the matador's feet for his courageous readiness and noble stance. The feet betray cowardice because they are not in control when faced with this supremely fearful attack – they move, they want to run away, and the crowd jeers. The person grieving a recent loss wants and tries to run away from the reality of the event. Others watch how he/she holds the stands, no matter how authentic and generous they are with their loving accompaniment. It is not about malice; it is about the merging with that person's fear and grief that happens when there are extreme emotions that easily become unmanageable and all recognize that there is no escape. There is only the grace with which it is handled and diverse rituals that are enacted to protect from its violent onslaught.

Most longevites are overwhelmed by the absence of the person they lived with, often the bulk of their adult years. The centre that held two is broken, and the vacuum that takes its place persists for months, even years. This vacuum is accompanied by extreme sorrow and longing for the lost one. Some report the experience as a "lost limb" of the wounded amputee, the reaching for the hand, face, mouth, and embrace of the other, seeking the phantom shape for solace. It is unbearable pain when the upsurge of emotions takes over the whole person and leads him/her down the road of depression. But this darkest of ecstasies can also deliver the beauty that is inherent in life: the magnificent colours of the flower are magnified; the shades of dawn sparkle as never before; the music once shared titillates with the splendour of memories enhanced and idealized; the writings, the readings… However, the ecstasy of life wanes fast, and the challenge of rebuilding a life out of the ordinary everyday can seem barren and to some impossible. Thoughts of suicide may arise. As one woman said, "How can I knit a life with no threads?"

The griever often responds with vexation and irritation to mundane tasks and to the loving attempts to bring solace by those near. An uncontrollable rage at one or more family members and friends may ensue. The projections range from envy of their current well being to accusations based on old injuries now experienced as larger than ever before. Those who are accosted by these emotions inevitably feel that they are largely out of proportion and unjustified. But to the mourner they are real, and they now attack mercilessly like the wounded bull. Also, a need for physical and psychological safety is much enhanced, and since these dependencies are not easily fulfilled, the grieving person becomes even more dangerous and defensive. Again, the bull in the ring comes to mind. All bulls find one or two spots in the arena, the *querencia*, where they can feel secure in the unfamiliar and/or threatening encounter with the toreador. Here the creature is most dangerous because it will not charge but will gore anyone who comes near. It takes enormous patience and skill to slowly move the bull out of its *querencia* so that life and death in the ring can go on. Similarly, the attacked friend or family member has to remember that the thrusting horns of the person they love have to be endured until, in time, the person is capable of weaving his/her fate anew more clearly.

Longevites frequently report that children and friends now treat them as if they were the children, telling them how and what to do, whether or not this is required. This may lead to denial of the actual needs of the mourner by those who truly wish to be of help.

We have seen so many friends and patients who misinterpret the communication of people in the throes of what seems to them to be an ultimate disintegration of personality. It is hard to listen. It is hard to watch previously strong individuals who were good parents, grandparents, or friends now reduced to whining, angry people. Organizing households and providing food and money may be exactly what is needed or be an easy substitute for the hard listening required to fully appreciate the disabling pain of being alone. It is hard to know the extent of the need and the place where a balm of love and caring can be applied and be of real use. One distraught recent widow was happy to receive flowers, condolence notes, and even words of encouragement, gestures seen as loving examples of friendship. But her main need was to get out of her house, the place where she had spent years of marriage,

now a mausoleum of unendurable memories. She had placed her house on the market. To relocate, she needed the cash from the sale, but although she lowered the price, no bidders arrived. Her despair with her surroundings drove her to thoughts of suicide mixed with fury, knowing that some of her friends who offered meals out and feelingful phone calls (and incidentally were always feeling good about themselves) had great wealth and could have, with no impact on them, bought the house and given her time and the opportunity to relocate to a place where memories and feelings were not so acute. This type of denial is commonly based on social convention, and true generosity would require some secrecy to spare the widow a feeling of indebtedness. Of course, this woman never felt able to voice her needs, which is common enough in individuals robbed of their moorings and afraid of revealing their desperate neediness.

We have selected the loss of a partner for the example but could equally well have chosen so many other losses: the consequences of debilitating arthritis, cancer, blindness, or dementia all might have a similar impact. Loss is always a part of the drama of longevity, and the courage to temporarily surmount overwhelming onslaughts of damage and deficit often becomes the central plot – perhaps the only one. Longevites live with this vision even before it becomes a reality. It is the panorama of their particular play and the most common final scene, along with their funerary ceremonies, that they may imagine.

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ABSTRACTS

DRAMATIS PERSONÆ


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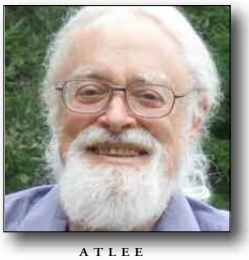
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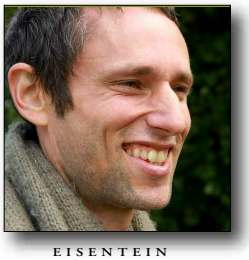
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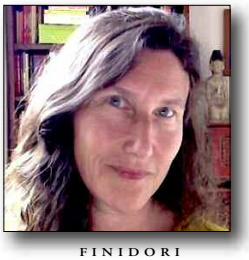
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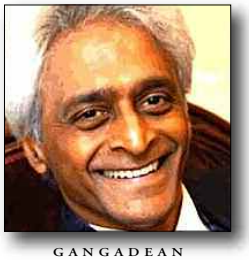
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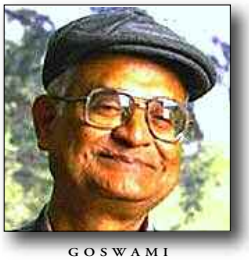
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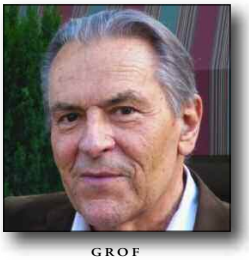
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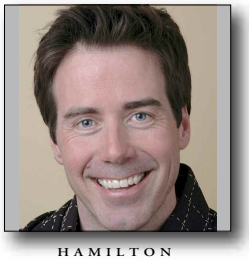
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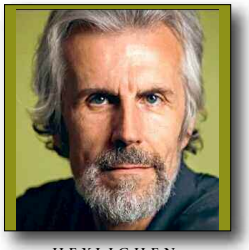
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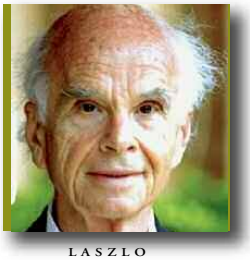
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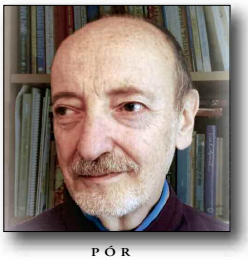
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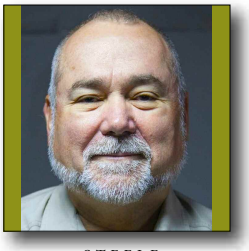
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ADEBAYO AKOMOLAFE

THE TREES SILL SPEAK: THE COLLECTIVE INTELLIGENCE OF THE NATURAL WORLD

The Enlightenment bequeathed to us a dualistic model of the universe, pitting science against superstition, logic against irrationality, order against chaos, civilization against nature, and the glorious sentience of humankind against the dead, mindless motions of a mute cosmos. As such, we have co-developed a social arrangement that thrives on *this* logic of separation – a cultural monoculture that treats the 'natural world', much to our peril, as fodder for the purposes of economic growth and 'development'. However, new insights in scientific research into quantum phenomena and a surging interest in indigenous knowledge systems are changing that narrative – instead suggesting not only that consciousness is fundamental to the way the universe works (and not merely an epiphenomenon of brain physics) but that the cosmos is alive in ways our most advanced sciences cannot yet articulate. It is now increasingly useful to think of trees, people, non-human beings, and even ecosystems as a collective intelligence, a kind of planetary 'brain' acting in ways that may not seem intelligent when understood from a fragmented perspective, but shows intelligence when modeled from a holistic viewpoint.

In this essay, I reflect on the implications of an intelligent cosmos on the subject of human agency, and bring these reflections to bear on contemporary theories of social change – especially in these times of urgent multiconvergent crises. Drawing from an African proverb that states 'the times are urgent, let us slow down', I hope to deepen the conversation about today's civilizational impasses and the possibilities for radical planetary futures by stressing other-than-human intelligences, plural knowledge fields and reality models, and shamanic access to 'subtle realms'.

KEYWORDS ~ Consciousness, natural world, social change. | [115-118].

TOM ATLEE

THE ROLE OF COLLECTIVE INTELLIGENCE IN THE WISE DEMOCRACY NEEDED FOR HUMANITY'S SURVIVAL

This article proposes that the primary function of intelligence is to sustain a dynamic system's balance between environmental control and adaptability. A dynamic system needs to remain in tune with its changing environments so that its actions continue to be successful. It does this through impacting its environment and adapting itself to changing conditions. Both strategies depend on awareness of environmental realities and their relevance to the success and survival of the intelligent system.

Human collective intelligence in technological, economic, and cultural realms has led to the rapid evolution of human civilization's capacity to impact its environment. Humanity's problem-solving capabilities have translated problematic circumstances into new forms of impact, a process known as progress. However, this process has today projected extremes of actual and potential impact into unprecedented scales and realms that challenge not only our ability to respond but the very basis of our responsive capacities – the nature of our intelligence itself. Approaches to collective intelligence attend variously to computerized systems (and their networks); to the quality of information/knowledge systems and conversational methodologies; to human diversity (including diverse cognitive capacities); to spiritual and intuitive practices and collective consciousness; to the dynamics of collaboration, aggregation, and stigmergy; and to social dynamics, especially those related to power.

The most important realm in which collective intelligence is least developed – and, in fact, is actively undermined by ideological and self-interested applications of collective intelligence – is the realm where whole-society decisions are made, namely politics and governance. The integration and application of multiple approaches to collective intelligence to this realm – and the expansion of collective intelligence to manifest as collective wisdom – are necessary to avoid the collapse of civilization through rapidly emerging crises generated by our lopsided collective intelligence-driven powers in technological, economic and cultural realms.

KEYWORDS ~ System's balance, adaptability, dynamic system, multiple approach, collective wisdom. | [5-16].

ARTHUR COLMAN ~ PILAR MONTERO

THE NEW LONGEVITY

For the first time in history, there is a large and rapidly growing subgroup of men and women over 65, currently approximately 14% of the population of most developed and some developing countries who share a great deal in common. We call this life stage longevity and its members longevites (as opposed to seniors and the aged) to emphasize the positive and creative potential inherent in this expanding cohort within the world population. Most literature on the population explosion of the aging has emphasized pragmatic factors, e.g. economic cost, medical services, etc. rather than considering the *intergroup transfer of knowledge that is a consequence of this newly defined entity in our world.*

Longevites are a group bounded by age 65 to the death of its members. It is in continuous, dynamic interrelation and intercourse with the other subsystems in our human culture and peppered with back and forth meaningful and consequential projections. As the group struggles to define itself, it learns and shares the many ways it varies from the earlier stages of life it has already passaged. We give theory and examples of transformations in consciousness, collective intelligence and wisdom within the longevity group. Some of the categories we discuss have to do with attitudes toward time (present and future), spirit, truth telling, and a greater appreciation for psycho-ecstatic states associated with death.

Finally, we propose that in the potential psyche of the longevites is a substrate of rituals and symbols about the dance with death that once brought into awareness will enrich the entire human collective's desire to embrace the sacred drama of life.

KEYWORDS ~ Longevity, aging, demographic shift, transformation, rituals, death. | [153-162].

DERRICK DE KERCKHOVE
CONNECTED INTELLIGENCE FOR THE CIVIL SOCIETY: THE INTERNET AS A SOCIAL LIMBIC SYSTEM

I adopted the term connective as a sub category of collective intelligence to indicate cognitive relationships that include specific configurations and proper attribution to individual participants. The assumption is that all forms of group intelligence are subsumed by the term collective. But it isn't so. At best collective may signify the overall cognitive achievement of a community over a given period of time. Connective, however, reflects the form, duration and outcome of specific cognitive activities performed by groups of individually identifiable persons working together. It applies in particular to social relations and interactions that are carried by networks. The Internet is an emotional as well as cognitive environment. It offers and stimulates different levels of involvement from simple collaborative practices to emotional engagement in social movements. Considering that Civil Society needs and uses intelligent strategies for real time activism, it may be opportune to refine our approach to intelligence.

KEYWORDS ~ Cognitive relationships, connective intelligence, collaborative practices, Big Data. | [71-75].

CHARLES EISENSTEIN
QUALITATIVE DIMESNIONS OF COLLECTIVE INTELLIGENCE: INTENTION, WISDOM AND SOUL

This essay plays with two definitions of collective intelligence, drawing on two meanings of the word "intelligent" that bring to bear relevant arguments from the philosophy of mind, particularly in reference to artificial intelligence (AI) and its distinction between "strong AI" and "weak AI." One definition associates intelligence with the ability to perform tasks involving logic, reasoning, pattern recognition, etc., an ability that can be quantified and measured. Most theory and research on collective intelligence works with this definition. Another sense of the word associates intelligence with some kind of consciousness or awareness, and would distinguish (per Searle) between real intelligence and the mere mechanical solving of problems. It is qualitative and its presence can only be inferred, not measured. I will explore the question of whether this sort of intelligence, as well as the problem-solving variety, is present in collectives. Do groups have a sentience that transcends the sentience of their parts? Do they have, whether in actuality or in potential, a capacity for morality or wisdom that cannot be reduced to mere problem-solving efficiency? Is it meaningful to speak of the desire, the intention, the purposiveness of a group as distinct from that of its members? And if so, how can these qualities be developed in socially desirable ways? I will adopt a transdisciplinary approach to exploring these questions, drawing upon notions of intersubjectivity, the social construction of self, crowd psychology, emergent phenomena, and concepts of group mind from mysticism, indigenous worldviews, and depth psychology.

KEYWORDS ~ Artificial intelligence, consciousness, group sentience, intersubjectivity, group mind. | [65-69].

HELENE FINIDORI
COLLECTIVE INTELLIGENCE IS A COMMON THAT NEEDS PROTECION AND A DEDICATE LANGUAGE

Technology is what boosts the capacity of individuals and communities to become authors of their own stories, and what enables collective intelligence to become aware of itself and to fulfil its long awaited promise. It is also what can lock up potential inside black boxes for just a few to benefit from.

We are facing a paradox. It seems that at the same time as collective intelligence is making itself increasingly palpable and promising as a whole, the possibility of it being actionable locally and effectively, enabling us to get ourselves out of a planetary predicament, is becoming remote.

In this article, I look at how collective intelligence is hindered or being captured as it comes into being, with the threat of leaving us deprived from a significant source of latent agency, and I suggest what it would take to reclaim it back.

I build upon the Ecology for Transformative Action, which I set the stage for in the last issue of this journal, to examine the condition under which technology and systems dynamics can be turned towards the greater good and how collective intelligence can be mobilized as a force for systemic change. In particular, I explore how a pattern language for systemic change regenerative of commons could be the means of expression of operationalized collective intelligence.

KEYWORDS ~ Ecology for transformative action, technology, system dynamics, pattern language, systemic change. | [79-89].

ASHOK GANGADEAN
AWAKENING COLLECTIVE GLOBAL INTELLIGENCE: THE POWER OF DEEP DIALOGUE

When we step back from our more localized cultural narratives, perspectives, worldviews and disciplinary orientations and dilate our hearts and minds into the more expansive and inclusive global space whence our diverse worldviews co-originate and co-arise, striking new patterns and insights come into relief that were not accessible before. When we dilate our rational and spiritual intelligence into the ((Source Field)) and gain access to the long emerging ((Logos Code)) that flows through all our diverse worldviews, religions, ideologies and cultures we move from monologue to ((deep dialogue)) and enter this Primal Common Ground of deep consensus, convergence, connectivity and synergy across and between worlds. This Deep Dialogue literacy, technology and intelligence is what empowers us to rise together in ((Collective Intelligence)) across the deeply entrenched borders that divide our cultures and worlds. Gaining access to this ((Primal Logos Code)) through the rational arts of Deep

Dialogue is thus key to cultivating genuine ((Collective Intelligence)) in this dilated global light. The ontological medicine of Deep Dialogue across and between worlds is vital for cultivating authentic ((Collective Intelligence)) and tapping the resources of ((Global Wisdom)) for our Global Age. Source Intelligence, skills of Deep Dialogue and the cultivation of Global Consciousness are keys to the cultivation and embodiment of Collective Intelligence as we face the evolutionary challenges of deep communication and finding consensus and synergy across borders. Thus, we cannot enter ((Collective Intelligence)) within the divisive, fragmented and polarized spaces of monologue cultures, but must mature as mindful and awakened Humans in the arts of Deep Dialogue. We are not egosapiens, but LogoSapiens. And it is in mature dialogue cultures that we humans flourish.

KEYWORDS ~ Deep dialogue, global consciousness, source intelligence. | [139-147].

AMIT GOSWAMI
LOVE AND THE AWAKENING OF THE HEART CENTRE: HOW IT MAY PREVENT, EVEN HEAL WOMEN'S BREAST CANCER

This is a prime example of new ways to deal with old problems of disease when we invoke the primacy-of-consciousness worldview to medicine. I will first show the connection of the phenomenon of love, love as the basis of collective intelligence, the so-called heart chakra, and the immune system functioning. The exploration of this connection throws new light on the connection of suppression of love and cancer, especially breast cancer. I next explore the question: how best to center oneself in love and the heart and prevent cancer? I will show that the answer lies in awakening the self of the heart and living it.

KEYWORDS ~ Consciousness, love, heart chakra, immune system, cancer. | [149-152].

STANISLAV GROF
ARCHETYPES, MYTHIC IMAGINATION AND MODERN SOCIETY: THE RE-ENCHANTMENT OF THE WORLD

In this paper the Author stresses the importance of mythic imagination and archetypal psychology for modern society with a brief discussion of the nature and dynamics of the archetypes and how the understanding of their significance has changed over the centuries. Following, Grof addresses specifically the implication of archetypal thinking for a variety of disciplines and its relevance for the global crisis we are currently facing.

KEYWORDS ~ mythic imagination, archetypal psychology, archetypes, archetype thinking. | [27-37].

CRAIG HAMILTON
COLLECTIVE INTELLIGENCE AND THE EVOLUTION OF SELF AND CULTURE

In this time of global crisis and opportunity, collective intelligence practices have demonstrated considerable promise in helping organizations and groups access higher-order potentials and synergistic solutions (Hamilton, 2004). However, for many of today's global scale problems, there is often general agreement on needed action, yet great difficulty marshalling individual and collective motivation for change. Open mind, open heart, and open will (Scharmer, 2009) have been identified as facilitators of collective synergy, yet these qualities have yet to be institutionalized and promoted within culture.

After experiencing the impact of collective awakening experiences in a community setting, Craig Hamilton began exploring the potential for collective transformative engagement within a virtual context. Over the past five years, his teachings have reached tens of thousands and have supported the development of a global learning community based in principles of evolutionary culture and practices for a life of awakening to higher purpose and emergent potential – for the sake of the whole. In this interview, Craig Hamilton shares his evolving understanding of collective intelligence practices and their potential for enabling needed transformation of self and culture. Author George Pór also participates in the interview, offering an opportunity for exploration of resonances and contrasts with his concept of collective sentience.

KEYWORDS ~ Collective synergy, transformative engagement, evolutionary culture. | [119-126].

FRANCIS HEYLIGHEN
CHALLENGE PROPAGATION: TOWARDS A THEORY OF DITRIBUTED AND GLOBAL BRAIN

We sketch a foundation for a new theory of distributed intelligence, based on the concept of challenge propagation, which extends the mechanism of spreading activation in neural networks to the collective intelligence emerging from a network of interacting agents. Challenge propagation is a form of self-organizing, distributed processing that allows agents to collectively tackle challenges too complex for a single agent, and that can be mathematically and computationally modelled. The basic idea is to combine the notion of "challenge", which is defined as a phenomenon that elicits action from an agent, with the notion of "propagation", which denotes the process by which such phenomenon is iteratively transmitted from agent to agent. A challenge is a generalization of the notions of problem, opportunity and activation. It can be characterized by valence (positive or negative), prospect, mystery and difficulty. An agent's action on a challenge will typically "relax" the challenge, but not resolve it altogether, so that some degree of challenge remains for further agents to act upon. Propagation occurs either via a shared medium in which challenging traces are left for others (stigmergy), or by via a network of links learned through reinforcement of successful transmission.

KEYWORDS ~ Challenge propagation, distributed intelligence, ontology of action, complex systems, Global Brain, society of mind. | [51-63].

NORMAN LEE JOHNSON
THE APPLIED SCIENCE OF COLLECTIVE INTELLIGENCE: SOLVING THE GRAND CHALLENGES FACING HUMANITY

Almost every generation imagines itself on a precipice, where problems seem too complex to solve and the future is bleak. Yet, society survives each time, often reinventing itself. With global climate change, dying oceans, democide, killer epidemics, and other modern crises, humanity may truly be at the precipice where our actions in the next decade will determine the future of humankind.

In this article, we discuss how proactive collective intelligence is the game-changing resource that offers hope, extending its role beyond the "wizard behind the curtain" in the past. Based on research over the last two decades, the advantages and limitations of collective intelligence can be now understood. When added to the traditional spectrum of problem-solving methodologies and leadership, collective intelligence using diverse groups can extend the complexity of problems that can be solved – defining when and how diverse collectives can outperform experts, while being more robust.

Because expression and compatibility of diversity are required for collective intelligence, we show how managing social identity (us versus other) is the key to enabling diversity, particularly when diverse views are in conflict or contain biases. We conclude that future methodologies may need to embrace biases that have embedded truths captured within situated understandings of the complex problem domain.

Finally, a practical example of a grand challenge project illustrates the implementation of above concepts to solve a problem of international importance. This project used advanced risk assessment methods, similar to Open Spaces and World Café, that efficiently captured diverse knowledge, even when participants were biased and in conflict.

KEYWORDS ~ Collective intelligence, complexity, leadership, diversity, bias, objectivity, social identity, emergent solutions, risk assessment, crowdsourcing, social organization and transformation, cooperation, competition, prediction markets. | [97-107].

ERVIN LASZLO
THE ONE MIND IN THE COSMOS AND ITS MANIFESTATIONS IN OUR CONSCIOUSNESS

In this paper the Author maintains that clear evidence are coming to light about conscious experience beyond the range of sense and beyond the body itself, proving that individual consciousness does not end with the physical death. To the mainstream view on consciousness being a product of the brain, Laszlo propounds a paradigm in which consciousness is neither produced nor linked to a living brain, but is rather transmitted by the brain. This perspective rises the question: transmitted from where and how? To which the holofield theory answers postulating that consciousness might well be the projection of a cosmic coded hologram field – the Akashic field – accessible to the brain and the nervous system. A concept also widely discussed as the "holographic universe" in contemporary physics. We cannot speak of consciousness in the plural as the overall number of minds in the universe is one, our body may be separate, but our minds is not. If we would realize and take to heart this realisation, we could overcome the critical challenges of our time.

KEYWORDS ~ consciousness, brain, Akashic field, holofield theory, holographic univeres. | [1-4].

PIERRE LÉVY
THE PHILOSOPHICAL CONCEPT OF ALGORITHMIC INTELLIGENCE

The paper presents the case for an augmented and reflexive collective intelligence using the ubiquitous recording and computing power of the algorithmic medium.

The first part of the paper tells the research journey of the author since the publication of his book *Collective Intelligence*, twenty years ago. This scientific journey has led to the invention of IEML, an artificial language that self-translates in natural languages and endowed with computable semantics. When data are categorized in IEML, their semantic relationships are automatically computed. Moreover, as IEML provides an algebraic account of linguistic semantics, the modelling of human intelligence, which is precisely based on language, becomes reachable.

The second part of the paper analyses the historical and philosophical implications of this scientific breakthrough. I propose first a description of the reflexive knowledge of Antiquity and the Middle Ages that uses mainly the mirror of an agent intellect. I evoke then a second age of reflexivity, which preserves the universal perspective of the earlier period, but removes the reference to heaven and concentrates on human knowledge. This modern period, characterized by the strengthening of natural sciences and the fragmentation of humanities, reflects its cognitive activity in what Kant baptized a transcendental subject. Finally, I defend the hypothesis that when half the humanity will be connected to the Internet, a third renewal of reflexive knowledge will occur. This version 3.0 will keep the ideals of universality and scientific perfectibility but will rely on an extensive use of technology to increase and systematically reflect our collective minds, and therefore our personal and social learning abilities.

What is at stake is not an artificial intelligence mimicking some individual logical reasoning but the transition from our current typographic intelligence to a collaborative algorithmic intelligence.

KEYWORDS ~ Saugmented and reflexive collective intelligence, IEML, linguistic semantics, age of reflexivity, fragmentation of humanities, internet, collaborative algorithmic intelligence. | [17-25].

TERRI O'FALLON ~ VENITA RAMIREZ ~ GEOFF FITCH
COLLECTIVE INTELLIGENCE FROM THE CASUAL GROUND

Can individuals and collectives benefit one another when they come together through a shared awareness of the ground of being, which we call the causal ground, or

awareness itself? Is it possible for individual consciousness to bend and blend with the consciousness of the collective such that the individual shines even more in the field of the collective holding, while the collective captures the wisdom of the Source itself without burying individual light? From our experiments with collective intelligence and collective consciousness, we have developed an effective approach to support the evolution of this interpenetration of individual and collective consciousness, through a variety of states and stages, while addressing individual and collective shadow.

In this article, we express our experience with this mode of collective/individual intelligence. We will include practical steps that any collective can take to ground themselves in a causal field, the source itself, and to allow creativity to flow through the collective without detracting from any individual. We will offer statistics on the research that we have done to show the results of the evolution of our collective intelligence efforts. We will describe the qualities of conscious collectives that arise at various world-views, and their iterating patterns through the trajectory of collective development, repeating through concrete communities, subtle communities and causal communities, showing how collective intelligence itself is not "one thing" but that it evolves.

The very term "collective intelligence" captures the dream we all have in holding a vision for a better functioning society, globally for all of life. And in the true spirit of the topic, this paper is written from and through the collective intelligence of three people who have been working together in this field for the past ten years.

KEYWORDS ~ Shared awareness, causal ground, individual and collective shadow. | [91-95].

GEORGE PÓR
FROM RIGHT MINDFULNESS TO COLLECTIVE INTELLIGENCE TO COLLECTIVE SENTIENCE: SIGNPOSTS TO THE LATER STAGES OF OUR EVOLUTIONARY JOURNEY

This essay is a wide-ranging exploration into the conditions for realizing the next-level potential of human and social evolution. A starting point for looking at "evolution" is the unending journey resulting from the "dynamic interplay of the passive and the creative polarizations of the Absolute that unfolds itself into the energetic process of differentiation bringing forth the whole of creation." The evolutionary process actually continues through cycles of differentiation, then integration, at a higher level.

We are on the threshold of a new cycle of the spiral, the spiral of consciousness. The previous cycles, archaic, magic, mythic, modern and post-modern consciousness served us well by leading us so far. However, becoming stuck with them is becoming stuck with an existential threat of intertwining global crises that cannot be solved at the currently dominant modern and post-modern levels. The next cycle is the one of an integral, holistic consciousness that enables the integration of the inner and outer technologies and sciences, deep intuition and systems thinking, spirituality and precision of inquiry.

In this essay I explore some of themes that are core to our move into the next cycle, such as, collective intelligence, collective sentience, evolutionary guidance systems, integral and shared mindfulness.

KEYWORDS ~ Mindfulness, ethics, collective sentience, social organism, evolutionary ethos. | [39-49].

JIM ROUGH
THE CIRCLE: STRUCTURING FOR COLLECTIVE INTELLIGENCE

Triangle, Box and Circle are three fundamental ways humans can organize themselves for collective intelligence. The Triangle is where a leader is ultimately in charge; the Box is where a social contract or constitution is ultimately in charge; and the Circle is where the ultimate authority is a living conversation of "We the People." Today as we shift from independence to interdependence, our current Box form of democracy increasingly yields "collective stupidity" instead of "collective intelligence." We must shift to the Circle.

Key to making this shift are three social innovations: 1) choice-creating is the necessary form of whole-system conversation. Distinct from "dialogue," "decision-making," or "brainstorming" it is where people creatively and collaboratively face difficult issues and achieve win/win unity. 2) Dynamic Facilitation can reliably evoke choice-creating in small groups. 3) The Wisdom Council Process uses Dynamic Facilitation and random people to spark the spirit of choice-creating in large systems. Because the Wisdom Council process is safe yet proven, it opens new doors of possibility for leveraging collective intelligence at all levels –the organization, community, state, nation and world.

KEYWORDS ~ living conversation, "We the People", interdependence, whole-system conversation, Dynamic Facilitation, Wisdom Council. | [109-113].

ROBERT D. STEELE
APPLIED COLLECTIVE INTELLIGENCE: HUMAN-CENTRIC HOLISTIC ANALYTICS OF TRUE COST ECONOMICS IN CONTEXT OF OPEN SOURCE EVERYTHING

The emerging discipline of Collective Intelligence (CI) has been badly mis-directed by a combination of the faddish focus on "wisdom of the crowds" without conversation or dynamic facilitation, and an academic ivory tower fascination with artificial intelligence, something I studied deeply in the 1980's for the Central Intelligence Agency. CI must be appreciated in a cosmic and spiritual context as well as an ecological and social context that respects the inherent intelligence and communications skills of plants and animals along with the emerging understanding of how all matter is energy and energy is form of communication, CI in the 21st Century must focus on the true meaning of intelligence as evidence-based decision-support, rooted in holistic analytics, true cost economics, and open source everything. In this article I provide a

roadmap for eradicating corruption and waste in all forms through the creation of a World Brain Institute, a School of Future-Oriented Hybrid Governance, and an Open Source Everything Innovation Hub. My hope is that we can reinvent intelligence to re-engineer the human academy, economy, governance, and society such that the five billion poorest are empowered to create infinite sustainable wealth at the same time that we stop, in a non-violent manner, the pathologies of Western capitalism, colonialism, and militarism.

KEYWORDS ~ "Wisdom of the crowds", dynamic facilitation, artificial intelligence, communication, holistic analytics, true cost economics, open source, corruption, World Brain Institute. | [127-137].

SET
IN EIGHT,
NINE AND TEN POINTS
MONOTYPE ADOBE GARAMOND PRO
TWO POINTS LEADED, ACCORDING TO
SPANDA CREATIVE UNIT'S LAYOUT
AND PRINTED IN THE HAGUE,
JANUARY MMXV.

The next Buddha may take the form of a community,
a community practicing understanding and lovingkindness,
a community practicing mindful living.

THICH NHAT NANH

SPANDA

DISCLOSING
SHARED COGITATIONS

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FROM CONSCIOUSNESS TO SOCIAL CHANGE,
FROM DYNAMIC SYSTEMS TO COLLECTIVE WISDOM,
FROM LONGEVITY TO GROUP SENTIENCE,
FROM TRANSFORMATIVE ACTIONS TO PATTERN LANGUAGE,
FROM SHARED AWARENESS TO COLLECTIVE SHADOW,
FROM WE SPACE TO DISSIPATIVE STRUCTURES,
FROM DEEP DIALOGUE TO SOURCE INTELLIGENCE,
FROM HEART CHAKRA TO IMMUNE SYSTEM,
FROM TRANSFORMATIVE ENGAGEMENT TO DISTRIBUTED INTELLIGENCE,
FROM WISDOM OF THE CROWDS TO COOPERATION,
FROM ONE MIND TO REFLEXIVE INTELLIGENCE,
FROM MINDFULNESS TO MYTHIC IMAGINATION,
FROM EVOLUTIONARY ETHOS TO DYNAMIC FACILITATION,
FROM HOLISTIC ANALYTICS TO OPEN SOURCE,
AND COLLECTIVE SERENDIPEDITY

ARE SOME OF THE VISIONS UNVEILED IN THIS

COLLECTIVE INTELLIGENCE

ENDEAVOUR

BY

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ADEBAYO C. AKOMOLAFE
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