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Are the UN and the International Community both Brain Dead

Given criteria recognizing that NATO is brain dead?

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Introduction

The world has been confronted by the assertion by President Macron of France that NATO is "brain dead" ([Emmanuel Macron warns Europe: NATO is becoming brain-dead. The Economist](#), 7 November 2019; [NATO is suffering 'brain death', argues French president Macron, France24](#), 7 November 2019; [Is NATO really suffering 'brain death' as French president Emmanuel Macron? claims? France24](#), 8 November 2019).

This assertion has been variously and vigorously disputed, although some commentators are accepting that there is a degree of merit to his argument, whether or not its presentation was inappropriate ([Macron Says NATO Is Experiencing 'Brain Death' because of Trump, The New York Times](#), 7 November 2017; [Nato alliance experiencing brain death, says Macron, BBC News](#), 7 November 2017; [Macron's Criticism of 'Brain Dead' NATO Falls Flat With Allies, Bloomberg](#), 7 November 2017; [Merkel rejects Macron warning over Nato 'brain death', Financial Times](#), 7 November 2017; [Stoltenberg to Macron: NATO's Not Dead Yet, Foreign Policy](#), 7 November 2017). The response of President Trump was even more acrimonious ([Trump blasts Macron over 'brain dead' Nato remarks. The Guardian](#), 3 December 2019), despite having previously taken the reverse position (Mark Galeotti, [Trump Was Right: NATO Is Obsolete, Foreign Policy](#), 20 July 2017; Medea Benjamin, [Trump Was Right: NATO should be obsolete, CounterPunch](#), 2 December 2019).

Rather than explore the case made with regard to NATO alone, as most will choose to do, there is a case for arguing that the institutional problem recognized is far more fundamental and general. This is justified by the warnings of many commentators and institutional reports that governance at this time -- whether global, regional or national -- can be readily perceived to be overwhelmed in ways which indeed suggest that "brain dead" is an appropriate diagnosis. [John Laughland](#) goes so far as to argue that: *we have come to understand that political brain death is a contagious disease which has now infected all European leaders including, unfortunately, the current occupant of the Elysee Palace (Macron saying NATO is 'brain dead' may be right, but he didn't exactly break any news here, RT*, 9 November 2019). In the midst of the controversy the argument is pointedly confirmed by the President of Turkey ([Zia Weise, Erdogan to Macron: Get your own 'brain death' checked first, Politico](#), 29 September 2019).

Aspects of this argument are reviewed separately ([Indicators of Political Will, Remedial and Coping Capacity? Ungovernability and indifference to analysis as engendered by increasing population](#), 2019). However controversial, institutional and societal collapse is variously foreseen with respect to the financial system, resources or the environment -- to say nothing of the crises of democratic government, as previously argued ([Ungovernability of Sustainable Global Democracy? 2011](#)).

It is not to be expected that there will be any degree of consensus on the diagnosis or the prognosis since part of the challenge is that any meaningful consensus is increasingly a mirage ([The Consensus Delusion: mysterious attractor undermining global civilization as currently imagined](#), 2011). It has long become evident that the capacity to discuss fruitfully the complex of issues associated with such diagnosis is itself highly questionable, as argued separately ([Coping Capacity of Governance as Dangerously Questionable: recognizing assumptions and unasked questions when facing crisis](#), 2019). The "poisonous" discourse currently recognized between opposing political factions is exemplified within the USA, the UK, France and Germany. It could be said to be as problematic as the environmental degradation that it engenders.

Could it even be said that the governance of France exhibits some of the symptoms that its president attributes to NATO? What of the

EU? What of other previously esteemed sources of insight, such as the Club of Rome or the World Economic Forum?

Given their influence on global strategy, more provocative is the question whether the religions of the world could be meaningfully diagnosed as "brain dead", as each would tend to claim of the others, and as those of secular persuasion would claim of all of them. However their existence frames a more fundamental issue as to whether any global entity is best understood as polycephalous, as with the mythical [hydra](#) -- each head presumably with a brain, one regenerated if cut off ([Stephen Prothero, *God Is Not One: the eight rival religions that run the world -- and why their differences matter*, 2010](#)). This pattern is curiously exemplified in multiparty political systems in which each party would readily claim the others to be "brain dead" -- with functional regeneration a common characteristic following electoral annihilation (Jodok Troy, [More Hydra than Janus: religion and violence in political science and international relations, *Austrian Journal of Political Science*, 44, 2015, 12](#); [Critical Thought in the Face of the Capitalist Hydra](#), Commission of the EZLN, 2016; Sarah Chayes, [Fighting the Hydra: lessons from worldwide protests against corruption](#), Carnegie Endowment for International Peace, 2018).

Symptomatic of institutional "brain death" at this time is the incoherence of the responses to issues framed as priorities, most notably climate change, resource issues, migration and environmental degradation. The primary array of strategic responses is framed by the [Sustainable Development Goals](#) of the UN -- itself a successor to other variously forgotten frameworks which are noteworthy for their ineffectual outcome. These include the [Millennium Development Goals](#) and [Agenda 21](#). As recently noted by the UN Secretary-General, at the present rate the financial means required for the SDGs are very far from being met, as with pledged commitments for the [Green Climate Fund](#) (Thalif Deen, [UN Turns to Global Investors for Billions Needed for its 2030 Development Agenda](#), *Other News*, 29 October 2019). It is also completely unclear whether the funds, if obtained, could be effectively applied as envisaged.

It is of course President Trump who has strongly questioned the efficacy of NATO in the light of the failure of European allies to fulfill their commitments to it in terms of the purchase of arms -- especially from the USA. Given its coincidental timing, the assessment of President Macron could then be readily dismissed as a riposte to the recent formal withdrawal of the US from the [Climate Change Agreement](#) -- with its associated commitment of resources ([Paris climate accords: US notifies UN of intention to withdraw](#), *BBC News*, 5 November 2019). This pattern raises the question as to whether that agreement is itself now to be considered "brain dead" in some way. Ironically it comes in a period in which President Trump is facing impeachment proceedings for behaviour on the part of the American people which has been repeatedly questioned by the mental health professions. As their leader, and commander of what is acclaimed as the most powerful army in the world, is the US itself vulnerable to a diagnosis of being "brain dead"?

Collective intelligence and the challenge of collective "brain death"?

Headlessness? The antithesis of collective "brain death" is presumably to be recognized in terms of [collective intelligence](#). This is the shared or group intelligence that emerges from the collaboration, collective efforts, and competition of many individuals and appears in consensus decision making. In the case of the UN, it is [specifically promoted](#) as an approach to sustainable development ([Governing with Collective Intelligence](#), 2017; Bassey Ekpe, [The United Nations and the Rationale for Collective Intelligence](#), 2016). What indeed might be expected of global collective intelligence at this time, as in times of crisis ([Enabling Collective Intelligence in Response to Emergencies](#), 2010)?

In the case of crisis -- especially when the UN is understood as incapacitated -- appeals are now frequently made to a nebulous entity whose "existence" is itself questionable, namely the so-called [international community](#), as separately discussed ([International Community as God or Sorcerer's Apprentice?](#) 2015). At the same time it is puzzling, if not symptomatic, to note that there exist a variety of uncoordinated strategic frameworks through which agencies may choose to frame their agendas -- whether or not their coherence could potentially be ensured in some way ([Global Coherence by Interrelating Disparate Strategic Patterns Dynamically](#), 2019).

Those reacting to criticism that NATO is "brain dead" are vigorous in their claims that it is alive and active -- as would be the defence of many institutions which could be diagnosed in terms of similar criteria. The difficulty with such reactions is the well-known capacity of a headless chicken to run around, however aimlessly and for an extended period of time ([The chicken that lived for 18 months without a head](#), *BBC News*, 10 September 2015). This is commonly used as a metaphor to describe problematic leadership (Jonas von Hoffmann, [Hawk, Dove, Eagle or Headless Chicken? US Foreign Policy under Trump](#), *Oxpol*, 18 September 2019; [The Guardian view on the Conservatives: the headless chicken party](#), *The Guardian*, 25 April 2019; Elly Brewer, [Art of Headless Chicken Management](#), 1989).

Functioning brain? Do neither the international community nor the UN need a function that could be recognized as a "brain" -- given the activity of which a headless chicken is evident? Is a complementary function to be recognized in the "heart", as the chicken so clearly demonstrates? This would be consistent with the recognition by economist [Paul Collier](#) that development agencies are dominated by people with "headless hearts" ([The Bottom Billion: why the developing countries are failing and what can be done about it](#), 2007). It has been claimed that the Security Council is the brain of the United Nations -- tasked with the challenge to deliver the visions and mission of the United Nations -- peace and security through international cooperation and compromise for the good of humanity.

UNESCO was originally conceived as serving a brain capacity for the UN. The USA withdrew from UNESCO in 1984, rejoined in 2003, and withdrew again in 2018 -- having variously failed to pay its membership dues. Now primarily preoccupied with the "brain drain", despite severe reduction in funding, its original function is recalled in one declaration:

UNESCO is very much the brain, the soul and the heart of the United Nations as a whole. I say "the brain", because what else but education can empower the mind? "The soul", because science lights up the spirit of humankind and gives us, along with religion, a way out of the darkness. Finally we are "the heart", because culture is usually the best way to bring about feelings of goodwill to all ([Summary Records](#), UNESCO Executive Board, 1-17 April 2008)

As confirmation, on the election of [Frederico Mayor](#) as Director-General in 1987, it was reported that:

Mayor believes that the brain and not the body of UNESCO should be its largest part... he will seek to enlarge its intellectual capacity. He wants UNESCO to be a house of thinkers. He wants to remake the organization into a creative, dynamic consulting and coordinating agency. *To mobilize the intellectual power, the teachers and scientists that each country has potentially available, is the major role of UNESCO*, he argues (Eugene Garfield, *F. Mayor's Vision for a Renewed UNESCO*, *The Scientist*, 30 November 1987)

A brain function is however now more clearly evident in the vast array of "[think tanks](#)", whether within or independent of institutions -- potentially to be recognized as the "heartless heads". This very multiplicity, and the contrasting perspectives with which they are associated, suggests that all is not necessarily well with the functioning of the global brain, as argued separately ([Tank Warfare Challenges for Global Governance: extending the "think tank" metaphor to include other cognitive modalities](#), 2019). Alternatively, is such "warfare" to be understood as a new manifestation of the "[great game](#)" ([Playing the Great Game with Intelligence: authority versus the people](#), 2013)?

Whilst frequently unrelated to universities, the "brain function" of the latter is controversially challenged at this time, especially in the USA, by the increasingly influential role of [identity politics](#) (William L. Anderson, *How Identity Politics Is Changing Universities*, *Mises*, 26 May 2018; Eboo Patel, *Some Concerns About Campus Identity Politics*, *Conversations on Diversity*, 19 March 2019; Greg Lukianoff and Jonathan Haidt, *The Coddling of the American Mind: how good intentions and bad ideas are setting up a generation for failure*, 2018).

Despite recognition of emerging global dependence on artificial intelligence, it is far from clear that international institutions have applied insights from [management cybernetics](#) into the design of an appropriate brain (Stafford Beer, *Brain of the Firm: the managerial cybernetics of organization*, 1981), especially given the requisite complexity for a "[viable system](#)" (Giuliana Galli Carminati, *The Planetary Brain: From the Web to the Grid and Beyond*, 2011).

Heartlessness? Beer himself extends use of such metaphors to another organ through which death is more readily associated (*The Heart of Enterprise*, 1980). Give the reference above to "heartless heads" and the dependence on artificial intelligence, there is the readily recognized possibility of "heartless" global initiatives -- with the implication of a distinctive form of death, irrespective of whether "life support" could otherwise be provided for the brain (*Coveney: US decision to pull funding to UN relief agency 'heartless and dangerous'* *Breaking News*, 1 September 2018; *US Resorting to Heartless Tactics in the Middle East*, *DW*, 20 July 2006). This tendency to ever greater heartlessness is evident in the collective [psychic numbing](#) in the face of media depictions of mega-suffering and mega-deaths from starvation and disaster. It is however appropriate to ask whether climate disaster, or massive extinction of species, could trigger a fatal global "heart attack" -- given the reliance on artificial support for the brain function (as variously explored in science fiction and by transhumanists). As currently imagined, **does the international community really need a heart?**

Potentially even more relevant, especially given the foreseen challenge of food resources, is metaphorical reference to the stomach -- notably in relation to the elusive "political will to change" (Phil McDuff, *Ending Climate Change Requires the End of Capitalism: have we got the stomach for it?* *The Guardian*, 18 March 2019; Thomas Gift, *Americans lack the stomach for a protracted trade war with China*, *LSE*, 9 August 2019; Pedro Nicolaci da Costa, *Can the GOP Stomach Trump's Economic Plan?* *Foreign Policy*, 10 January 2017; Emmanuel Olusegun Stober, *Stomach Infrastructure: lessons for democracy and good governance*, *Management Dynamics in the Knowledge Economy*, 4, 2016, 3). Is it appropriate to ask whether the United Nations has the "stomach" for sustainable development -- avoiding the more controversial question of whether society has the "balls" for necessary change? Brainless or not, the US-led NATO coalitions seemingly experience not the slightest "heart" or "stomach" difficulties in engendering collateral damage -- for which it could be claimed that they have both "heart" and "balls".

Global life support? The metaphor through which President Macron has chosen to frame the case of NATO could indeed be used to question whether global governance has become a "basket case" -- the term by which the governance of some countries is deprecated (M. Ron Wahid, et al, *Return of the Basket Case*, *Foreign Policy*, 3 January 2014). To the extent that there is some kind of "[global brain](#)", however vestigial its operation, does that metaphor invite exploration of its vital integrative function -- as exemplified by the *corpus callosum* (*Corpus Callosum of the Global Brain? Locating the integrative function within the world wide web*, 2014). Given the controversy regarding indicators determining "death", as indicated by "brain death", potentially more tragically problematic is the possibility that institutions of global governance are in a "[persistent vegetative state](#)" -- dependent on the "life support" of financial contributions.

In the case of UNESCO, as an institution potentially close to brain death according to the Macron criteria, there is then the strangest of ironies to its primary role in enabling production of the *Encyclopedia of Life Support Systems* (EOLSS) on the science of sustainable development and conservation of [life support systems](#) on earth. This [online dynamic library](#) of some 600 volumes -- an integration of 21 encyclopedias -- is compiled through [crowdsourcing](#), whereby thousands of intellectuals from all over the world and across various academic institutions contribute.

Uncertainty of brain death: Science is currently puzzled by the existence of brainwaves long after the moment when death is more readily assumed (Bec Crew, *Brain Activity Has Been Recorded as Much as 10 Minutes After Death*, *Science Alert*, October 2018; Andrew Griffin, *Brain activity appears to continue after people are dead, according to new study*, *The Independent*, 9 March 2017; Rafi Letzter, *Dying Brains Silence Themselves in a Dark Wave of 'Spreading Depression'*, *LiveScience*, 27 February 2018).

The challenge is helpfully clarified in the extensive discussion by Faisal Qazi, et al (*The degree of certainty in brain death: probability in clinical and Islamic legal discourse*, *Theoretical Medicine and Bioethics*, 34, 2013):

While ample criticism of the scientific criteria of brain death (Harvard criteria) by traditional legal sources now exists, an analysis of the legal process in assessing brain death, geared toward informing the clinician's perspective on the issue, is lacking... As a medically and scientifically oriented community, our understanding of personhood as a physical phenomenon continues to evolve parallel to our understanding of physiological science. A clinical understanding of personhood, however, is nowhere more controversial than in the topic of brain death... Confounding the issue are numerous factors, not the least of which is the absence of international or even national consensuses on the very definition of brain death...

To understand what is meant by the term "brain death", it may be of value to clarify what is not meant. Brain death is a social construct of clinical criteria that has been defined more recently as a means of distinguishing irreversible loss of personhood from human organismal death, while maintaining that the two are functionally but not physiologically equal

The uncertainty is confirmed by a subsequent survey and further debate (Torrey Boland, *Worldwide Variations in Brain Death Declaration*, *World Neurology*, 5 August 2015; European Society of Anaesthesiology, *International variation on definition of brain death must be cleared up to restore public confidence*, *MedicalXPress*, 3 June 2017).

Zombie metaphor: Such considerations are clearly of value in informing discussion of the "brain death" of global institutions, metaphoricly understood. A relevant provocation is the extraordinary level of recognition of "zombies" -- namely the "walking dead" in the case of individuals (*Preponderance of references to the eradication of zombies*, 2014; Andreu Domingo, *Analyzing Zombie Dystopia as Neoliberal Scenario: an exercise in emancipatory catastrophism*, *Frontiers in Sociology*, 26 July 2018). As a metaphor, this has now been applied to institutions (Richard Lakeman and Luke Molloy, *Rise of the zombie institution, the failure of mental health nursing leadership, and mental health nursing as a zombie category*, *International Journal of Mental Health Nursing*, 27, 2017, 3; Elizabeth Sepper, *Zombie Religious Institutions*, *Northwestern University Law Review*, 112, 2018, 5; Xinfeng Jiang, et al, *The mystery of zombie enterprises -- "stiff but deathless"*, *China Journal of Accounting Research*, 10, 2017, 4).

Zombie has featured as the **hypothetical theme** of a model UN debate. Does the UN lend itself to recognition as a "zombie" -- or the international community? The question has been variously raised with respect to NATO (Douglas Macgregor, *NATO Is Not Dying: It's a Zombie*, *The National Interest*, 31 March 2019; Daniel Larison, *Zombie NATO Expansion Stumbles On*, *The American Conservative*, 23 October 2019; Joel Hillison, *A Zombie Alliance or Alliance against Zombie? NATO at 70 Years*, *War Room: United States Army War College*, 4 April 2019).

With regard to NATO, the case has been argued for the Dansk Institut for Internationale Studier with respect to NATO by Vibeke Schou Tjalve (*Zombie NATO*, *DIIS Policy Brief*, 17 May 2017), Three pivotal points are noted:

Will: NATO is a multi-national not a supra-national organization and as such, perpetual struggles over how to build member state consensus is part of its DNA...In qualitative terms, the gulf between how a Trump Pentagon and a Germany-heavy Europe thinks about military power is wide. Unless NATO addresses that gulf -- honestly and with grit -- all talk of collective will or resolve is bound to be an illusion.

Pulse: NATO, as any collective organization, needs fuel or pulse: the drive that comes with a shared sense of purpose. Turning NATO into little more than a cost-benefit transactional institution -- ignorant of the UN values that its preamble pays tribute to, and based on little but quid-pro-quo deals around common interests or enemies -- installs a dangerous logic. An alliance held together by nothing but mutual foes makes crisis its only dynamic. That is a dangerous fuel.

Soul: A product of the second world war, NATO was born not only as a shield against external foes, but against the destructive potential that is state power as such... The question is though, whether the very soul of NATO identity does not depend upon that historical memory of trauma. If so, will it survive making performative militarism NATO's key uniting doctrine?

Global brain?

The global brain is a conceptualization of the worldwide network formed by all the people on this planet together with the information and communication technologies that connect them into an intelligent, self-organizing system. The term was coined by Peter Russell (*The Global Brain: speculations on the evolutionary leap to planetary consciousness*, 1982).

The original metaphor was first presented as a model by Francis Heylighen and Johan Bollen (*The World-Wide Web as a Super-Brain: from metaphor to model*, 1996). Heylighen reviewed the history of the underlying ideas in terms of four perspectives "organicism", "encyclopedism", "emergentism" and "evolutionary cybernetics" (*Conceptions of a Global Brain: an historical review*, 2011). A basis for simulating the operation of the brain in terms of the connectivity of its elements has been suggested in terms of the thousands of interlinked online profiles of the *Yearbook of International Organizations* and the *Encyclopedia of World Problems and Human Potential* (*Simulating a Global Brain: using networks of international organizations, world problems, strategies, and values*, 2001).

Exploiting the metaphor, rather than the model, the concern here is the nature and location of the integrative function within the world wide web. This follows from questions raised with regard to integration of the right and left hemispheres of that brain, however these are to be understood (*Engendering Viable Global Futures through Hemispheric Integration: a radical challenge to individual imagination*, 2014)

It is appropriate to ask whether the current challenges to global governance, and any requisite integration of the global brain, could not be fruitfully explored with respect to **split-brain** pathology, any form of split consciousness, **hemispheric specialization**, or **bipolar disorder**. "Hemisphere" is also a reminder of its metaphorical appropriation from the potentially complex patterns of geometry -- rarely explored in relation to globality (*Metaphorical Geometry in Quest of Globality -- in response to global governance challenges*, 2009). Ironically, with

respect to the argument here, "hemispheric disassociation" is only too evident between the cybernetic preoccupation with the global brain (as modelled by the internet) and its use as a metaphor for emergence of planetary consciousness.

Detectable "brainwaves"? As potentially associated with the global functions of the internet, it is also appropriate to ask whether the retreat of policy-makers into short-termism in response to [information overload](#) constitutes a pathological symptom of another kind. Rather than "brain death", is the progressive "[information death](#)" to be compared to the effects of collective senility -- even a form of Alzheimer syndrome? (*Information death of the global brain*, 2018; *Imminent Collective Communication "Info-death"? Collapse of global civilization understood otherwise*, 2018; *Pointers to the Pathology of Collective Memory*, 1980). Has global civilization engaged unconsciously in a form of self-harm potentially comparable with the role of [corpus callosotomy](#) in a remedial effort to respond to so-called "epileptic governance" and spastic coordination, or possibly [spastic hemiplegia](#)?

More fundamental to any understanding of collective "brain death" is however the existence of "brainwaves" and the capacity to detect them prior to a terminal "[flatline](#)" condition. Those commonly recognized in the human brain include: [Alpha wave](#), [Beta wave](#), [Gamma wave](#), [Delta wave](#), [Theta wave](#), and [Mu wave](#). Curiously "brainwave" is readily used metaphorically to describe a moment of creativity. More intriguing is the discovery that the ability to comprehend metaphors (whether associated with creativity or not) is specifically associated with brainwaves (Alexis Blue, *How the Brain Finds Meaning in Metaphor*, *University Communications*, 2 April 2019). Reference to fruitful communication as being "on the same wavelength" is also recognized in such terms (Ephrat Livni, *Being on the same wavelength isn't just a figure of speech: it's proven neuroscience*, *Quartz*, 5 May 2017).

Macron's provocative metaphorical reference to "brain death" is therefore helpful in focusing attention on whether global institutions can be said to exhibit any detectable form of "brainwave" by which their collective intelligence is characterized. Understood in terms of creativity, can it be said that such organizations have "brainwaves"? In this respect, despite periodic calls for "new thinking", it is unclear whether this engenders detectable "brainwaves" -- especially if its existence is rendered undetectable by secrecy (as in the case of NATO).

Where is the evidence of "new thinking" by the United Nations, for example? Is "sustainable development" to be understood as the "Last Brainwave" of the UN? On the other hand, **could the mysterious sense in which 12-, 14-, 15-, 16- and 17-fold global strategic patterns "feel right" to many, be understood in terms of the cyclic periodicity of brainwaves?** Would this also be true of the 21-fold organization of UNESCO's *Encyclopedia of Life Support Systems*? Do such examples suggest that there is a fundamental pattern of coherence to be recognized in wave terms (*Requisite 20-fold Articulation of Operative Insights?* 2018; *Memetic Analogue to the 20 Amino Acids as vital to Psychosocial Life?* 2015).

Given the enthusiasm for collective "[brainstorming](#)" as a group creativity technique, this merits greater articulation in terms of "brain waves" -- especially given the possibility of a "perfect storm", and the disasters with which that might potentially be associated: confusion versus cognitive fusion?

Relevance of the wave metaphor? Can nations be said to be "on the same wavelength" with respect to climate change and environmental degradation at this critical time? If not, is there a case for exploring the wave patterns characteristic of collective intelligence -- some analogue to alpha, beta, etc? Is the incapacity of institutions to frame such issues through more fruitful metaphors itself an indication that such waves have already "flatlined"? (Rupinder Mangat and Simon Dalby, *Climate and Wartalk: metaphors, imagination, transformation, Elementa*, 6, 2018, 1; Anne K. Armstrong, et al, *Using Metaphor and Analogy in Climate Change Communication*, 2018; Alice Deignan, et al, *Metaphors of Climate Science in Three Genres: research articles, educational texts, and secondary school student talk*, *Applied Linguistics*, 40, 2019, 2).

It could be considered extraordinary that global society is equipping itself with a vast array of technology dependent on wave functions -- in support of collective intelligence or its artificial surrogates -- whilst ignoring the nature of the wave functions which may be fundamental to the operation of the intelligence of its institutions. Thinking in regard to electromagnetic waves now extends to quantum mechanics with implications for [quantum psychology](#). Yet to be addressed are the issues raised from the perspective of international relations by [Alexander Wendt](#) (*Quantum Mind and Social Science: unifying physical and social ontology*, 2015).

Is this failure itself a characteristic of institutional "brain death"? Of further relevance is his argument that individuals merit recognition as "walking wave functions", as discussed separately (*On being "walking wave functions" in terms of quantum consciousness?* 2017). This could then be understood as applicable to collective entities -- institutions -- with the implication that their "brain death" could be explored in terms of "[collapse of the wave function](#)", especially given the relation to consciousness in the light of the [Von Neumann-Wigner interpretation](#) (*Emerging Memetic Singularity in the Global Knowledge Society*, 2009). Now that importance is attached to an ultimate singularity, the manner in which this might be associated with collapse of a global function calls for attention (Cadell Last, *Global Brain Singularity: universal history, future evolution and humanity's dialectical horizon*. Vrije Universiteit Brussel, 2018).

Whether the challenges international institutions claim to face are embodied in other institutions, or whether they take the form of environmental and resource issues, in the light of Wendt's argument, there is a case for framing the engagement in wave terms (*Encountering Otherness as a Waveform*, 2013).

Wendt could however presumably argue that global institutions are now in effect "ghosts" in an electromechanical machine, following earlier introduction of such a frame by [Gilbert Ryle](#) ([Arthur Koestler](#), *The Ghost in the Machine*, 1967; Alexander Wendt, *The mind-body problem and social science: motivating a quantum social theory*, *Journal for the Theory of Social Behaviour*, 48, 2018, 2). The metaphor is readily applicable to the "international community" -- but comprehensible in the case of the United Nations and many other global bodies.

Integrative function? With respect to strategic vision, the requirement for separate hemispheres to achieve stereoscopic depth could also be understood as a challenge to implicit assumptions regarding any "cyclopean" form of globality (*Cyclopean Vision versus Poly-sensual Engagement*, 2006). Such integrative implications are also evoked with respect to political economy (Diego Sánchez-Ancochea

and Kenneth C. Shadlen, *The Political Economy of Hemispheric Integration: responding to globalization in the Americas*, 2008; Maxwell Cameron, *The Future of Hemispheric Integration, The Mark*, 7 March 2012). These currently play out with respect to the [Trans-Pacific Partnership](#) (TPP) and the [Transatlantic Trade and Investment Partnership](#) (TTIP).

In the following, **the earlier quest for such an integrative function is reproduced** (from 2014). However, given the problematic division of the world into "hemispheres", it is appropriate to further exploit the relevance of the metaphor to such integration -- especially given the nebulous "transcendent" ("God-like") role attributed to the "international community". One source of insight, for example, might then be the argument of [Iain McGilchrist](#) (*Divine Understanding and the Divided Brain*, In: *Handbook of Neuroethics*, 2015):

Interaction with the world requires the right hemisphere's broad attention, which is inclusive and opens up into possibility, coupled with the left hemisphere's narrow attention, which collapses the world we experience into specificity. If the left hemisphere collapses the world too quickly into what is specific, however, it precludes the possibility of knowledge that transcends what is already familiar, notably purported knowledge of the divine. By contrast, the right hemisphere is more sensitive to image, metaphor, and narratives by which theological knowledge may be capable of expression that would be ambiguous or apparently contradictory if expressed simply as a set of propositions.

Corpus callosum of the global brain?

Literature on the global brain as a model tends to avoid reference to the hemispheric integration, better framed through the metaphor of a global brain. Chris Woodford, for example, makes only the briefest of reference to the role of the *corpus callosum* (*The Internet and the Brain, Explain that Stuff*, 2014). As noted by *Wikipedia*:

The *corpus callosum* (from Latin: "tough body"), also known as the callosal **commissure**, is a wide, flat bundle of neural fibers beneath the **cortex** in the **eutherian brain** at the **longitudinal fissure**. It connects the left and right **cerebral hemispheres** and facilitates interhemispheric communication. It is the largest **white matter** structure in the brain, consisting of 200-250 million **contralateral axonal** projections.

Each hemisphere is divided into regions called lobes, understood to play different roles with respect to human behaviour. With respect to **hemispheric specialization**, the **lobes of the brain** are variously distinguished as numbering four, six and eight. The cerebral cortex is divided up into four lobes, however, more specifically, each lobe has a right and left side, making eight. They include:

- **Frontal lobe**: conscious thought; damage can result in mood changes, social differences, etc. The frontal lobes are the most uniquely human of all the brain structures.
- **Parietal lobe**: plays important roles in integrating sensory information from various senses, and in the manipulation of objects; portions of the parietal lobe are involved with **visuospatial processing**
- **Occipital lobe**: sense of sight; lesions can produce hallucinations
- **Temporal lobe**: senses of smell and sound, as well as processing of complex stimuli like faces and scenes.
- **Limbic lobe**: emotion, memory
- **Insular cortex**: pain, some other senses.

It might be asked what "lobes" are distinguished from a cybernetic understanding of the operation of the world wide web -- given the importance of the above functions with respect to collective consciousness. Some specific consideration of an analogue to the *corpus callosum* is given by Takeshi Utsumi (*Quest for Global Peace, International Journal of Humanities and Peace*, 17, 2001, 1) in terms of a "Rainbow Bridge Across the Pacific".

What seems to be extraordinary, given the problematic integrative function of the world wide web, is the lack of attention to the extensive work by neuroscience on any dysfunction of the *corpus callosum* or indeed to its absence (J. Michael Tyszka1, et al, *Intact Bilateral Resting-State Networks in the Absence of the Corpus Callosum, The Journal of Neuroscience*, 2011; Audrey Benezit, *Organising white matter in a brain without corpus callosum fibres, Cortex*, 09/2014). Such absence, known as **corpus callosum dysgenesis** (CCD), might well characterize global civilization at this time.

A valuable question is raised by [Michael S. Gazzaniga](#) (*Cerebral specialization and interhemispheric communication: does the corpus callosum enable the human condition?* *Brain*, 2000,; reviewed by Patricia Ann Reuter-Lorenz, *The Cognitive Neuroscience of Mind: a tribute to Michael S. Gazzaniga*, 2010). He frames the question as follows:

When this is considered in the light of new studies on the lateralization of functions, it becomes reasonable to suppose that the *corpus callosum* has enabled the development of the many specialized systems by allowing the reworking of existing cortical areas while preserving existing functions. Thus, while language emerged in the left hemisphere at the cost of pre-existing perceptual systems, the critical features of the bilaterally present perceptual system were spared in the opposite half-brain. By having the callosum serve as the great communication link between redundant systems, a pre-existing system could be jettisoned as new functions as new functions developed in one hemisphere, while the other hemisphere could continue to perform the previous functions for both perceptual and cognitive processes, the lateralization of half-brains.

If global civilization is vulnerable to crisis, as seems only too evident, what effort is made to learn from the neurosciences as a consequences of any injury? This is explored, in the case of the brain, by David J. Sharp, Gregory Scott and Robert Leech (*Network Dysfunction after Traumatic Brain Injury, Nature Reviews Neurology*, 2014). Arguably their perspective with regard to **traumatic brain**

[injury](#) (TBI) is highly relevant to any understanding of the consciousness of global civilization at this time:

Damage to the structural connectivity of these networks produces predictable abnormalities of network function and cognitive control. For example, the brain normally shows a 'small-world architecture' that is optimized for information processing, but TBI shifts network function away from this organization. The effects of TBI on network function are likely to be complex, and we discuss how advanced approaches to modelling brain dynamics can provide insights into the network dysfunction.

Given the much-challenged present capacity to learn from history, any form of collective TBI could be related to effects on collective memory, as separately argued (*Societal Learning and the Erosion of Collective Memory*, 1980; *Pointers to the Pathology of Collective Memory*, 1980).

Imagining an integrative function within the world wide web

From the perspective of cybernetics and connectivity basic to any model of information transfers within the world wide web, various ways of understanding "integration" can be envisaged with respect to the internet:

- [Submarine communication cables between continents](#), as the first level of connectivity between continents
- [Internet backbone](#), understood as the principal data routes between large, strategically interconnected computer networks and core routers on the Internet.
- [Root name servers](#) of the Internet, namely the set of name servers for the [root zone](#) of the [Domain Name System](#) of the Internet. These respond to requests for records in the root zone and answer other requests by returning a list of the [authoritative name servers](#) for the appropriate [top-level domain](#) (TLD). It might be asked whether the TLDs distinguished correspond to any degree, in functional terms, to the lobes of the brain -- possibly indicative of belief systems.
- [Dominant search engines](#), especially those such as Google providing access to the world wide web.
- Emergence of a [semantic web](#), currently understood as a collaborative movement led by the World Wide Web Consortium. This promotes common data formats by encouraging inclusion of semantic content in web pages. The intention is to convert the current web, dominated by unstructured and semi-structured documents, into a "web of data".
- Server complexes registering all internet transactions, as with the NSA [Intelligence Community Comprehensive National Cybersecurity Initiative Data Center](#) Bluffdale, Utah)
- Simulations of an integrative function, as with:
 - the [Sentient World Simulation](#) (SWS), intended as a "synthetic mirror of the real world with automated continuous calibration with respect to current real-world information" with a node representing "every man, woman and child"
 - the [FuturICT Knowledge Accelerator](#), a multidisciplinary international scientific endeavour with focus on techno-socio-economic-environmental systems.
- Initiatives such as the [Global Futures Intelligence System](#) (of the [Millennium Project](#)), the [Global Brain Institute](#), the [Global Consciousness Project](#), or the [Global Sensemaking](#) network

Clearly these variously perform, or imply, a vital integrative function which provides a focus for particular kinds of studies of integration, most notably from the perspective of control systems and cybernetics. It is according to such understanding that forms of artificial intelligence, embedded within such systems, that planetary consciousness can be held to emerge

Readily held to correspond to only one of the hemispheres of the human brain according to current understandings of [lateralization of brain function](#). the question is how this set of functions relates to integration as a whole -- more "integratively" understood. Whilst the subject of nuance and controversy, the functions distinguished are:

- Language functions such as grammar, vocabulary and literal meaning are typically lateralized to the left hemisphere
- Visual and auditory stimuli, spatial manipulation, facial perception, and artistic ability are represented bilaterally, but may show a right hemisphere superiority.

With respect to information on the world wide web, clearly both forms of information are currently transferred to various degrees. This can be understood as a "plumbing" function. There is far greater ease to the transfer of those associated with language. Clearly transfer of the second is also represented to a degree within some contexts but -- most notably -- not with respect to academic discourse regarding the world wide web itself. Academic journals are unable to handle information of the second kind, for example.

Of concern is the manner in which reflection governed by each hemisphere tends to appropriate the integrative insights of the other. Whilst deprecating the incapacities of the other, there is a degree of failure to recognize its particular capacities. In this process, the nature of any potentially emergent integration gets obscured, as variously discussed (*From Information Highways to Songlines of the Nosophere: global configuration of hypertext pathways as a prerequisite for meaningful collective transformation*, 1996).

Nature of meaningful integration within the global brain

Depth perception? More significant to the argument here is then the question of what constitutes "integration". There is no question that a significant degree of integration occurs with respect to the "plumbing" of the internet (and the tangibles it conveys). This can be represented on remarkable maps -- possibly even featuring the transactions dynamically. Far less clear is any form of integration relating to the intangibles of meaning and semantic content, however the integration of this might be understood. How might constraints on such integration inhibit depth perception vital to collective human survival, as variously suggested (A. Ptito, et al, *Localization and lateralization of stereoscopic processing in the human brain*, *Neuroreport*, 10, 1993, pp. 1155-8; Ian P. Howard and Brian J. Rogers, *Perceiving in Depth*, 2012)

Mapping? It is significant, for example, that Google only offers a list of search results in response to queries. This can only be understood as an integrative response to the extent that a succession of queries may suggest an integrative perspective -- but only to be inferred from what is actually provided. The answers provided to a search query are not in themselves integrative, and no claim is made in that regard. There is no effort to integrate the results into a map of any kind: a [semantic map](#), a [concept map](#), a [conceptual graph](#), a [cognitive map](#), a [mind map](#), a [knowledge integration map](#), or a [topic map](#). Integration might however be reframed by considering processes such as [profiling for marketing and security purposes](#), and trend analysis (as with [Google Trends](#)). Do these constitute what can be best understood as integration within the global brain at this time?

Although isolated explorations of such mapping are made, these must necessarily be understood as precursors of the integration required of a global brain -- as explored more systematically in the above-mentioned online simulation (*Simulating a Global Brain: using networks of international organizations, world problems, strategies, and values*, 2001). Given the implied dependence on computerization and artificial intelligence, the nature of integration might also be explored in terms of the capacity to respond to the more fundamental questions of a global civilization in crisis (*Superquestions for Supercomputers: avoiding terra flops from misguided dependence on teraflops?* 2010).

Relevance to a global civilization in crisis? Missing from such understanding, and the associated endeavours, is any sense of the kind of emergent integrative function that might be expected as a consequence of hemispheric integration. Describing and redesigning the "plumbing" may well be the remarkable role of one hemisphere. Envisioning the nature of [planetary consciousness](#), or [global consciousness](#), through the arts and otherwise, may be the function of the other. How any viable integration of relevance to a global civilization in crisis is to emerge is a matter of a quite different order.

Given the distinction made between the lobes of the human brain and their functions, how might this be reflected in the future integration of the global brain? Are the disparate understandings of global brain distinguished above by Heylighen ("*organicism*", "*encyclopediaism*", "*emergentism*" and "*evolutionary cybernetics*") to be understood as associated with different lobes?

Objectivity & Subjectivity? More challenging is the sense in which lateralization of the brain could be understood as related to the processing of objectivity relative to that of subjectivity -- with the latter associated with imagining, dreaming and reframing in ways which are antithetical to the former. There is clearly a degree of paradox to this process and to the manner in which they might then be integrated, as discussed separately (*Defining the objective ∞ Refining the subjective ?!: Explaining reality ∞ Embodying realization*, 2011).

Use of the infinity symbol offers a sense of a form of "cognitive twist" required in order to achieve integration between the subjective and the objective -- through which the world is effectively turned "inside out", as separately discussed (*Sphere eversion as guide to the cognitive twist of global introversion?* 2013). The symbol, in the form of the [Möbius strip](#) is fundamental to a related argument by [Steven M. Rosen](#) (*The Moebius Seed: a visionary novel of planetary transformation*, 1985). The latter concludes by exploring the integrative potential of a global computer conference (a "Creative Visions Conference"). This depicts how the cumulative cyber-input of various holistic ideas, images, and sounds -- originating from both the sciences and arts -- finally triggers a radically non-linear shift resulting in the emergence of forms of harmony that herald the birth of a "planetary organism".

Meta-pattern of connectivity? One approach to the nature of such an integrative function is to recognize it as associated with a connecting meta-pattern. This would follow from the argument of biologist [Gregory Bateson](#) (*Mind and Nature; a necessary unity*, 1979, pp. 8-11).

The pattern which connects is a meta-pattern. It is a pattern of patterns. It is that meta-pattern which defines the vast generalization that, indeed, it is patterns which connect. And it is in this from this perspective that he warns: Break the pattern which connects the items of learning and you necessarily destroy all quality.

With respect to the role of aesthetics and the arts, in explaining why "we are our own metaphor", Bateson pointed out to a conference on the effects of conscious purpose on human adaptation that:

One reason why poetry is important for finding out about the world is because in poetry a set of relationships get mapped onto a level of diversity in us that we don't ordinarily have access to. We bring it out in poetry. We can give to each other in poetry the access to a set of relationships in the other person and in the world that we're not usually conscious of in ourselves. So we need poetry as knowledge about the world and about ourselves, because of this mapping from complexity to complexity. (Mary Catherine Bateson. *Our Own Metaphor*, 1972, pp. 288-289).

It is ironic to note that the elusive sense of the requisite integration is associated with the proverbial elephant in the living room (*Strategic Challenge of Polysensorial Knowledge: bringing the "elephant" into "focus"*, 2008). The challenge is variously recognized and argued:

- Paul Bailey: *Think of an Elephant: combining science and spirituality for a better life* (2007)
- George Lakoff: *Don't Think of an Elephant!: Know Your Values and Frame the Debate* (2014)
- Donald N. Michael: *In Search of the Missing Elephant: Selected essays* (2010)

Metaphor as the integrative function of the global brain?

The argument above frames the question as to what kind of information would perform an integrative function within the global brain -- understood as relating the forms of information characteristic of each hemisphere.

Inter-, Trans-, And? A prime candidate could have been what might have emerged from preoccupation with [interdisciplinarity](#) or [transdisciplinarity](#) -- on the assumption that the disciplines so related would include those characteristic of both hemispheres, namely the arts and the sciences. There is little trace of a viable integrative function resulting from such preoccupation. More concretely might have been initiatives deliberately combining the arts and sciences. Examples include the [American Academy of Arts and Sciences](#) (AAAS) and the [World Academy of Art and Science](#) (WAAS). Again, few would claim that such exclusive bodies perform a vital integrative function.

In practice, use of "inter", "multi", "cross" or "trans" tends to be meaningful only with respect to declared intentional and public relations. There is indeed a degree of cross-fertilization resulting from juxtaposition. Hence the use of "and" in relating art and science. It is a matter of debate as to whether this constitutes fruitful integration, especially when the arts are used only to "decorate" the activities of the sciences and offer symbols of their elegance and appeal. Juxtaposition is not sufficient for integration -- as delightfully implied by the German compound term *Buchbindersynthese* with respect to interdisciplinary volumes. The contrast is evident in the acclaimed initiatives of [György Kepes](#) through the [Center for Advanced Visual Studies](#) in integrating art and technology (*Structure in Art and in Science*, 1965). That between science and religion is less evident.

It would seem that some such possibility is being explored otherwise as "[joined-up thinking](#)" (Rick Lewis, *Joined-up Thinking, Philosophy Now*, Nov/Dec 2014; Chris Frith, *Neuroscience: Joined-up thinking, Nature*, 2014; Philip Delves Broughton, *Joined-up thinking, Financial Times*, 8 June 2011; *Joined-up Thinking, Lloyd's News*, 1 December 2014; *EU development policy needs joined-up thinking, say MEPs, European Parliament News*, 25 October 2012). How is this form of integrative thinking enabled within the world wide web?

Metaphor: The question is what is the special form of language that enables movement between the cognitive functions performed by the hemispheres of the global brain? Following Bateson, one interesting candidate is metaphor, given the manner in which it can reframe the preoccupations of each for the other -- offering a degree of comprehensibility, communicability and credibility where other devices fail, with the additional advantage of memorability.

The argument has been developed from another perspective (*Metaphors as Transdisciplinary Vehicles of the Future*, 1991). With respect to the focus of WAAS, for example, and following the argument of Bateson with regard to poetry, metaphor can be used to reframe strategic preoccupations (*Ensuring Strategic Resilience through Haiku Patterns: reframing the scope of the "martial arts" in response to strategic threats*, 2006).

Cognitive psychology and bioculture: A more powerful case has been made from the perspective of cognitive psychology by [George Lakoff](#) and [Mark Johnson](#) (*Metaphors We Live By*, 1980/2003). In the light of the distinction between Eastern and Western hemispheres, it is useful to note how this was extended by those authors in a manner which raises useful questions as to the nature of the "flesh" of the global brain and any embodiment of the global mind (*Philosophy In The Flesh: the embodied mind and its challenge to western thought*, 1999) -- and separately discussed (*Enhancing the Quality of Knowing through Integration of East-West metaphors*, 2000).

Also of relevance, in the light of neuroanatomy and neuropsychology, is the association of the development of the various lobes of the brain with emergence of particular cultures and intelligence systems (Maria M. Colavito, *Why Study Humanities? The Biocultural Mandate*, 1999; Antonio de Nicolas, *The Biocultural Paradigm: the neural connection between science and mysticism, Journal of Experimental Gerontology*, 33, 1998, 1/2). This paradigm shows that biology and culture act on one another as the conditioning parameters of neurocultural information. Through mutual interaction biology in humans becomes culture, and vice versa, culture opens and stimulates the neural passages of the brains, accounting thus for the varieties of brains in humans, and for cultural diversity.

What is the number of the global brain? In her consideration of the insights of mathematician [Georg Cantor](#) with respect to [transfinite sets](#), Sarah Voss framed a question which could be asked of the integrity of the global brain (*What Number is God?, Metaphysics, metamathematics, and the nature of things*, 1995). Rather than any simple understanding of the oneness of the global brain, such a question could highlight other ways of understanding its nature and that of any integrative function. Voss considers the use of transfinite numbers as a way of understanding the infinity with which God is frequently associated. Such an association was an early inspiration for Cantor (Joseph W. Dauben, *Georg Cantor and Pope Leo XIII: mathematics, theology, and the infinite, Journal of the History of Ideas*, 1977).

Contrasting understandings of number, potentially relevant to a more appropriate understanding of the integrity of the global brain, include: [zero](#), [negative numbers](#), [rational numbers](#), [real numbers](#), [complex numbers](#), [hypercomplex numbers](#), [hyperreal numbers](#), [transfinite numbers](#), and [transcendental numbers](#). With respect to that integrative function, such possibilities suggest another way of considering the alleged assertion of Pythagoras: *All is number*. If the all-encompassing global brain is to be considered a form of surrogate for deity by some, use can also be made of the argument of [Stephen Prothero](#) (*God Is Not One: the eight rival religions that run the world -- and why their differences matter*, 2011). If the global brain is not singular, what indeed are the "eight" rival functions to be held as ruling the world -- and why might their differences matter?

Given the characteristic association of mathematics with one hemisphere, of further interest is the role of metaphor in mathematics ([George Lakoff](#) and [Rafael Núñez](#), *Where Mathematics Comes From: how the embodied mind brings mathematics into being*, 2000). The authors aim to lay the foundations for a truly scientific understanding of mathematics, one grounded in processes common to all human cognition. They find that four distinct but related processes structure basic arithmetic metaphorically: object collection, object construction, using a measuring stick, and moving along a path. Criticism of their endeavour could be fruitfully explored as consistent with bias characteristic of particular lobes. Part of the difficulty for mathematics is that it is itself highly fragmented -- it is "not one" -- despite the efforts of [meta-mathematics](#). Nor does it benefit from much effort to elicit a degree of overarching order commensurate with the richness of its parts, as tentatively explored (*Is the House of Mathematics in Order? Are there vital insights from its design*, 2000).

With respect to the quest for the integrative function of the global brain, there is some irony to the manner in which such distinctions are recognized -- in the light of distinctions made with regard to the number of lobes of the brain. As noted above, these are variously

distinguished as 2 (hemispheres), 4, 6 and 8. This recalls the cheerleader chant: 2, 4, 6, 8; *who do we appreciate?* Missing from such denumeration is the linking function provided by the corpus callosum -- as the third, the fifth, the seventh, or the ninth?. This recalls the much-cited study by [George Miller](#) (*The Magical Number Seven, Plus or Minus Two: some limits on our capacity for processing information*, *Psychological Review*, 1956).

Lobotomy and corpus callostomy of the global brain? Cutting the connection between lobes and hemispheres constitute forms of [psychosurgery](#) to alleviate mental disorder. Between the frontal lobes, this is the controversial practice termed [lobotomy](#). Cutting the *corpus callosum*, through [corpus callostomy](#), endeavours to prevent the spread of interhemispheric epileptic seizures along that pathway. In addition to seizure reduction, behavior and quality of life may improve.

The arguments for these procedures in response to severe mental disorder suggest valuable questions with respect to disorders of the global brain and its integrative functions. It is not difficult to recognize analogues to the tragic behavioural crises of global civilization, readily to be compared to occasional epileptic seizure. The argument can be taken further through exploring the possibility that civilization is already a victim of a form of self-inflicted lobotomisation -- potentially indicated by the dysfunctionality of the "and" process in any token juxtaposition of art and science, for example. The point was strongly made by [C. P. Snow](#) (*The Two Cultures and the Scientific Revolution*, 1961). Does the global brain have a propensity to extreme [self-harm](#)?

Is the very activity of the sciences or the humanities, as formally recognized, dependent on a process of cognitive disassociation which could be framed metaphorically as corpus callostomy? Can the political slogan, [There Is No Alternative](#) (TINA), as framed by Margaret Thatcher, be understood as a form of lobotomy through which hemispheres are separated? The TINA mindset is frequently cited as an inherently dysfunctional symptom by social change advocates.

Of related relevance as a metaphor is agenesis of the *corpus callosum*, namely the condition in which that structure is partly or completely missing, severely limiting integration of left-brain and right-brain function.

Metaphorical capacity and the corpus callosum: Citing L. B. N. Hinkley (*The Role of Corpus Callosum Development in Functional Connectivity and Cognitive Processing*, *PLoS ONE*, 2012), the argument is supported otherwise by brain science, as presented by Cittoor Girija Navaneethan and T. J. Kamalanabhan (*Metaphorical Thinking and Information Processing Ability*, *Journal of Behavioral and Brain Science*, 2014), arguing that:

Practice of metaphorical thinking in understanding given information promotes the communication of the two hemispheres by a bundle of connecting fibres, the corpus callosum at neo cortex level and through hippocampus at the level of limbic system. Hence, metaphorical thinking helps learners to make connections and develop patterns and relationships in parallel to the language as well as symbols relevant to the given information.

War and metaphor: Warfare, whether metaphorical or otherwise, could be understood as eliciting a curious form of integrative function between the hemispheres -- possibly framed by enabling metaphor, as variously argued by [George Lakoff](#) (*Metaphor and War, Again*, *AlterNet*, 17 March 2003; *Obama Reframes Syria: Metaphor and War Revisited*, *The Huffington Post*, 9 June 2013) and by others ([Noriko Iwamoto](#), *Constructing Reality through Metaphorizing Processes in Wartime Reporting*, 1996). The recognized relevance of metaphor to national security is made apparent by the launch of a major new programme -- [The Metaphor Program](#) of the US [Intelligence Advanced Research Projects Activity](#) ([Alexis Madrigal](#), *Why Are Spy Researchers Building a 'Metaphor Program'?*, *The Atlantic*, 25 May 2011). A significant participant is the [US Army Research Laboratory](#) -- slogan: *Technology Driven - Warfighter Focused*.

Alternation? How then to imagine the sustaining metaphors of a global brain? Given the requisite degree of communication between the hemispheres implied by any integrating function, one approach is in terms of alternation, as separately discussed (*Metaphors of Alternation: an exploration of their significance for development policy-making*, 1984).

Whether such integration is associated with an analogue to the *corpus callosum*, or is to be understood otherwise, there is clearly a case for the exploration of the meaning of integration in that respect. Given issues of [non-locality](#), where and how it might be understood to be "located" also merits consideration.

NB: This theme is developed otherwise in a subsequent document with other animations:

*Envisaging a Comprehensible Global Brain -- as a Playful Organ
Patterns connecting the dots between hemispheres, epicycles and quavers* (2019)

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