



Complimentary Dualism as *Metaphor* for Sustainability, Progress and Reality



Edmond Byrne

Professor of Process & Chemical Engineering, School of Engineering, UCC



Niels Bohr
(1885-1962)

Nobel Prize for Physics (1922):
"for his services in the investigation of the structure of atoms and of the radiation emanating from them"

Devised 'Principle of Complementarity' in quantum physics e.g. wave/particle and position/momentum – each are inherent functions of an observer

Recipient of The Order of the Elephant (Denmark's highest-ranked honour) 1947

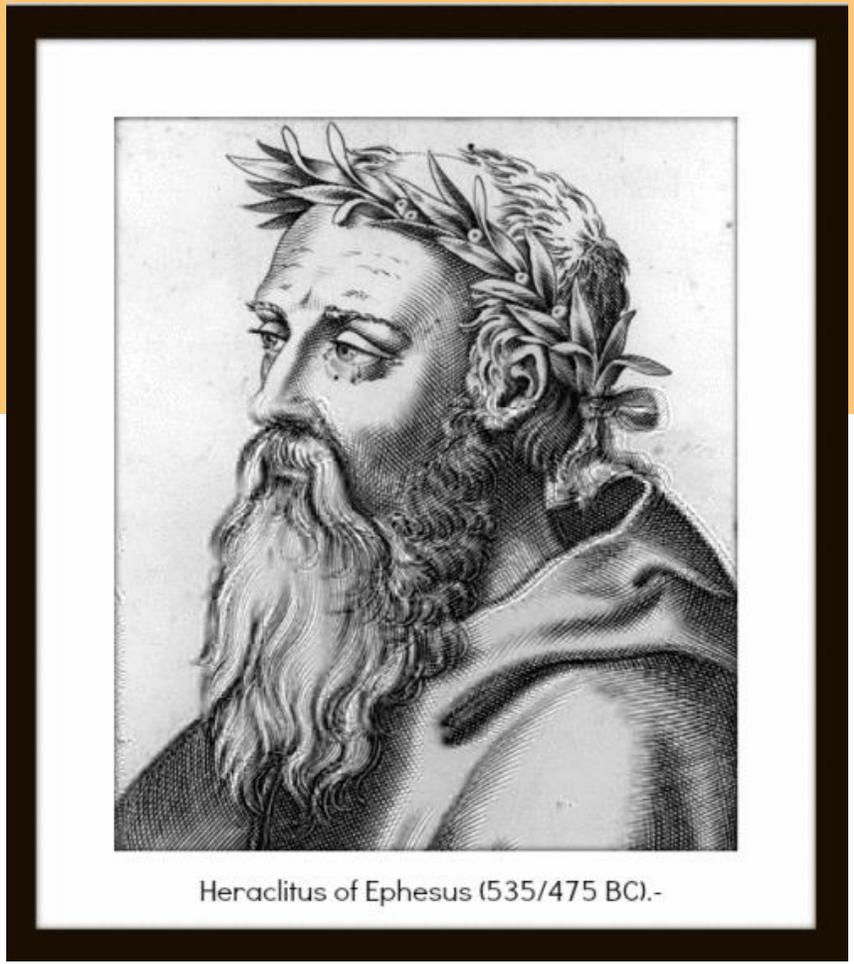
Yin and yang are opposites, though interdependent; One cannot exist without the other.





Fragments of Heraclitus (Fragment 51*):

*“Men do not know how that which is drawn in different directions harmonises with itself. The **harmonious** structure of the world depends upon **opposite tension** like that of **the bow** and **the lyre.**”*



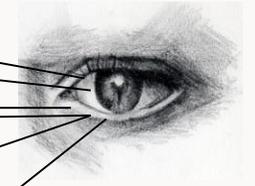
Heraclitus of Ephesus (535/475 BC).-

*Heraclitus, translated by John Burnet (1912)

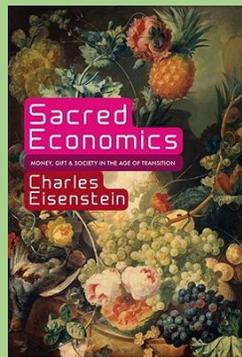


René Descartes (1596-1650) sought **Certainty**:
“Deal only with ideas that are distinct, precise, beyond any reasonable doubt.”

Cartesian rationality; based on an **antagonistic dualism** between the **‘objective’ physical mechanical body** & the entirely **separate ‘subjective’ mind/soul**. Seeks ‘objective’ truth as ‘detached’ observer. Therefore no relational role in for human mind in seeking truth.



‘It is possible to reach a kind of knowledge ..and thereby make ourselves the lords and possessors of nature’.



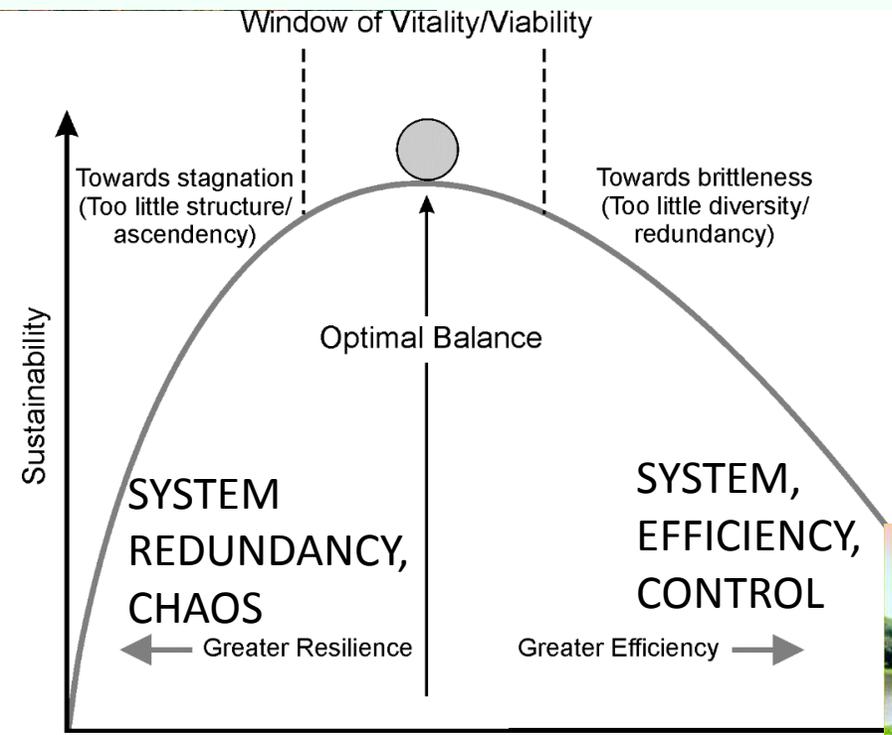
The **‘Story of Separation’** vs. the **‘New Story of Interbeing’**.
*‘If you’re a **separate self**, and there’s other separate selves out there, other species out there, the **universe** is fundamentally **indifferent** to you or even **hostile**. Then you want to **control**. You want to be able to have **power** over other beings and these whimsical, arbitrary forces of nature that could extinguish you any time.’*

(Charles Eisenstein, Sacred Economics, 2011)



The concept of **'Sustainability'** may "posited within a (dialectical and process) Heraclitan framework, whereby **contingency**, **change** and **evolution** are enduring system characteristics. It fits in with broader conceptions of sustainability as an **evolving** and **contingent** quality, rather than as some ultimate point destination entailing optimisation around a unique endpoint located at the (right hand) extreme of Ulanowicz's **RAINBOW**, a sort of **crook of gold** exemplified by the **mirage of 100% efficiency**."

(Byrne, 2016, p.49¹)



Ulanowicz's ecological systems model:

$$[h_i = k p_i \log(p_i)]^1$$



SEARCHING FOR POTATOES IN A STUBBLE FIELD.

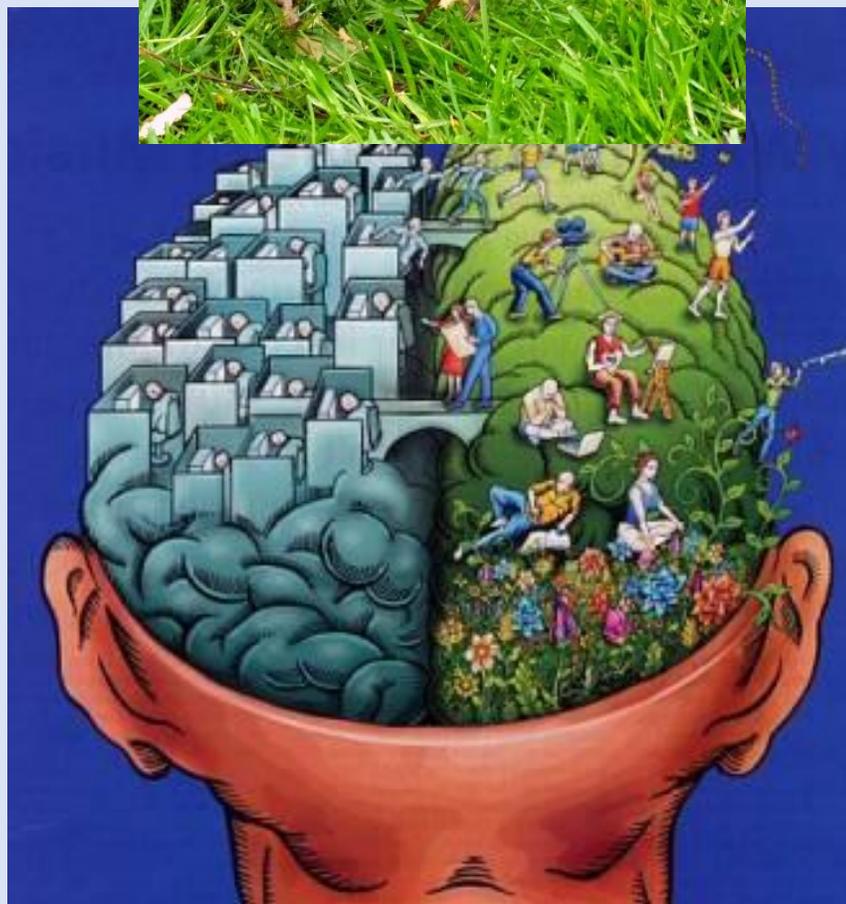


Analysis, Categorization

Whole picture ('Gestalt')

Left Hemisphere

Right Hemisphere



Neuroscience: BRAIN lateralization

Asymmetrical > **Doesn't Recognise** Right side thinking ('**Either-or**' hemisphere)

Asymmetrical > **Accommodates** Left side thinking (**Integrative** hemisphere)

Analysis, Categorization

Whole picture ('Gestalt')

CONTROL, CERTAINTY

CONTINGENT UNCERTAINTY

Individualistic, Competitive

Relationships/Collective, Cooperative

Reduction of Whole into Separate Discretized Parts

Technocratic

Technosceptic

Interconnectedness – Interactions
'In betweenness'

Mechanistic/Deterministic
Cause and Effect

'Law of excluded middle'
(Plato/Aristotle)

'Logic of the included middle'

System Emergence;
Propensities

Knowledge as Fixed: Obtained from Facts

EXTERNAL
'VIEW FROM NOWHERE'

RELATIONAL
'VIEW FROM SOMEWHERE'

Knowledge as Contextual: (Unique) Personal Experience Required

'Objective' and 'value-free' (though value laden)

Recognises values explicitly

Utilitarian (ev)

Ever Optimistic

SYMBOLS, MODELS, MUSICAL NOTES, (denotive) LANGUAGE

MUSIC, SPIRITUALITY/RELIGION, (connotative & emotive) LANGUAGE: METAPHOR, IRONY, HUMOUR, POETRY

Decontextualisation

Closed system in discretized time (Zeitraff)

'Only the right hemisphere has the capacity to understand Metaphor'
(McGilchrist, p.115*)

Dogmatic

Utility & Predictability

NOVELTY & CREATIVITY

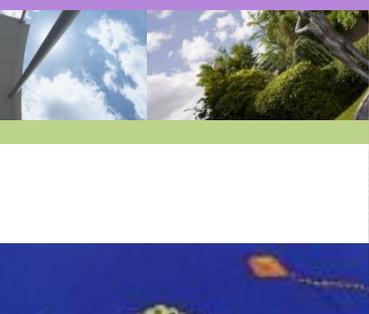
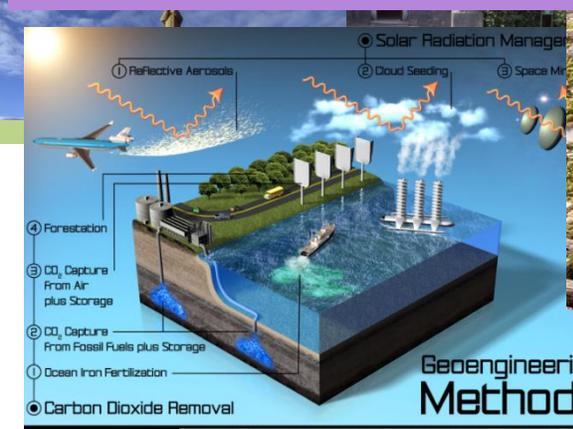
Pragmatic

Informative Change Conquering

September 2017

*McGilchrist, The Master And His Emissary (Yale, 2009)

Perception of Reality informs Societal Worldviews and conceptions of 'Progress' & 'Sustainability'



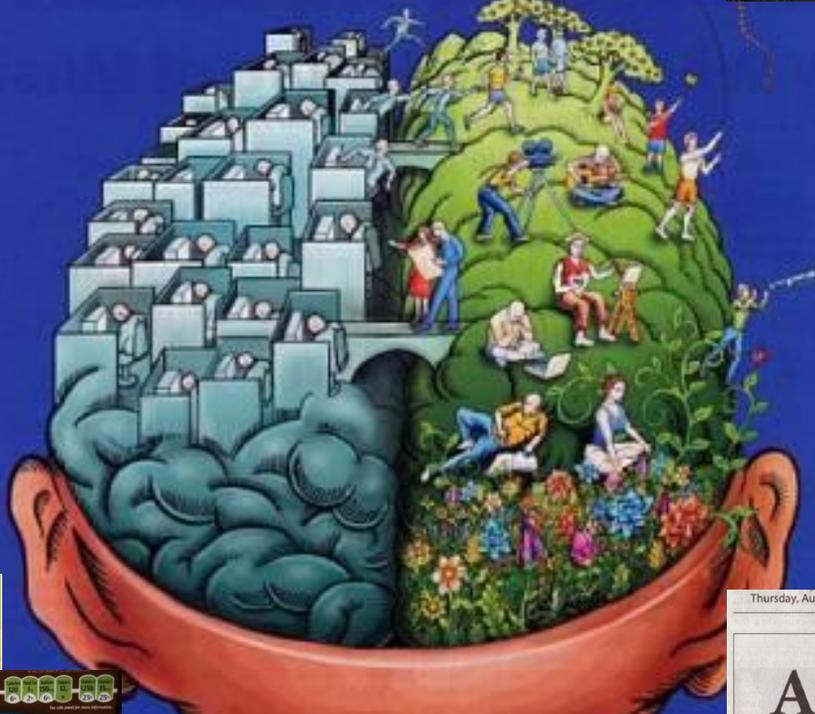
1% have half of global wealth

ADVANCES IN SMART TECHNOLOGY MEAN THERE WILL BE NO MORE TRAFFIC JAMS AND FAR FEWER ACCIDENTS

Smart World by IOT

Intelligent Systems for a More Connected World

GOVERNMENT 3.0



Irish Examiner

Property: HIT THE GLASS CEILING
Weekend: Who's hot in 2014
SPORT: THE BIGGER PICTURE

THIS IS GLOBAL WARMING

Severe weather

Thursday, August 24 2017

WEATHER CHAOS

An inconvenient truth: This

Alone they [the two hemispheres] are destructive. ...right now they may be bringing us close to forfeiting the civilisation they helped us create.' (McGilchrist (2009, p.93)

TESCO Free FROM GLUTEN, WHEAT

Kellogg's

Food Nanotechnology

25% NOW HELPS SUPPORT YOUR CHILD'S IMMUNITY

University College Cork, 15th Septe

Caroline O'Doherty and Stephen Maguire

The country will have to brace itself for more extreme weather events as the effects of climate change hit home with potentially devastating effects on prop...

have just d's wealth. yrne



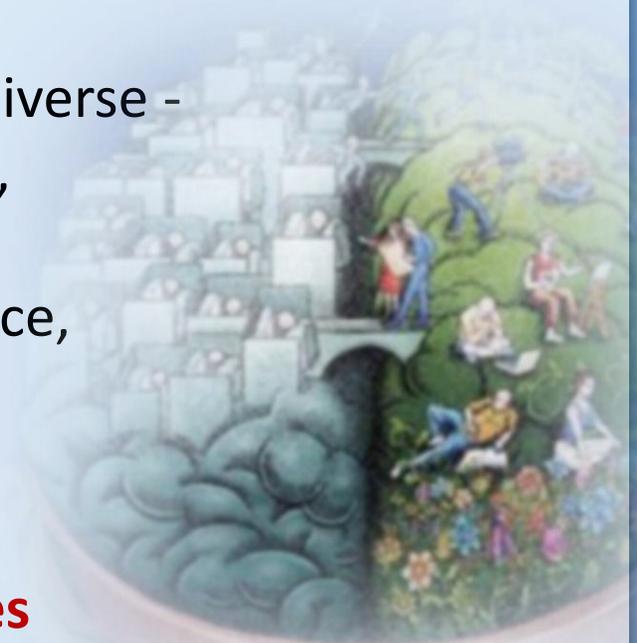
“The relationship between the hemispheres is not straightforward. **Difference** can be **creative**: harmony is an example. Here differences cohere to make **something greater than either or any of the constituents alone**. ..Before there can be harmony there must be difference.

The most fundamental observation one can make about the observable universe - is that there are **at all levels forces** that tend to **coherence and unification**, and **forces** that tend to **incoherence and separation**.

The tension between them seems to be an inalienable condition of existence, regardless of the level at which one contemplates it.

The hemispheres of the human brain, I believe, are an expression of this necessary tension. And the two hemispheres adopt **different stances** about their **differences**: the right hemisphere towards **cohesion** of the two dispositions, the left hemisphere towards **competition** between them.”

(McGilchrist, pp. 128-129*)





“As Petersen (2013, p.2) puts it, **sustainability** in light of constant (internal and environmental) **change** and **evolution** can more accurately be conceived of in a broader sense as:

*‘a heterogeneous and contested set of perspectives that are continually defined and redefined through social, cultural, and political practices. A central implication of this perspective is that sustainability cannot be viewed as a finite goal or destination we can work towards as a global community. Like the **pot of gold** at the end of the **rainbow**, sustainability is more of a moving target never quite to be reached. Using a **navigational metaphor** thus captures the concept more comfortably: **sustainability discourses** help us **steer in a sea of future challenges** and **navigate around the rocky patches of undesirable solutions.**’”*



Byrne (2016, p.49)





Complimentary Dualism as *Metaphor* for Sustainability, Progress and Reality



Edmond Byrne

Professor of Process & Chemical Engineering, School of Engineering, UCC