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WHERE**

Philosophers dispute, Poets proclaim, Musicians perform, and Football fans debate

Science-based Global Enlightenment in the Quantum-Digital Age

(or how to prevent the earth becoming a dead planet)

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Download from: <http://pcwww.liv.ac.uk/~dhookes/GEMoscow1.pdf>

“The appearance of the human being marks the beginning of the Age of Intellect, when the leading force of development becomes conscious human creativity and the highest level of organization is the culture of human society. Thus, science is the highest level of the hierarchy in the organization of cosmic matter. It is the highest growth point of a growing tree, the leading shoot in the evolution of the universe. This is the significance of the cosmic phenomenon of science as a part of the phenomenon of man.”

Valentin Turchin in ‘The Phenomenon of Science’

The meaning of the title

‘Science-based’ means NOT religious or other mystical forms of so-called ‘enlightenment

‘Global’ means that most of the world’s people can become enlightened

‘Enlightenment’ means something very similar to that of the 18th century in that it says that problems of the world can be understood and solved by scientific reasoning and gathering empirical evidence about the world

‘Quantum’ has several meanings:

- **An alternative paradigm**, a local/non-local dialectical paradigm in contrast to the Descartes-Newton local, positivist, mechanistic paradigm which separates consciousness from social being in the material world
- **Binary Digital Systems (bDS) technology**, that is, the technology that can implement the Global Enlightenment is based on quantum physics
- **Solar energy technologies** needed to power the bDS technology and the new sustainable alternative production processes are mostly based on quantum physics

Digital also has several meanings:

- **The universe** as a quantum binary **digital** system (**Q-bDS**) as a processor of information stored in quantum fields on the boundary in areas of the size of (Planck dimension)² [$=Gh/c^3$] that is, 10^{-70} m^2 or $10^{70} \text{ bits m}^{-2}$
- **Life** as based on a molecular quaternary **digital** system (**qDS**), that is, the 4-letter genetic code
- **Modern Information and Communications Technology (ICT)** is based on 'artificial' binary **digital** systems (**bDS**) based on micro- and nano-engineered devices

One of the first tasks of the **Quantum-Digital Age** is to use the technologies of **bDS** and **qDS** to help solve the crisis of the socio-economic system and the climate-environmental crisis that it has produced, which threatens to create a dead planet.

This means using the **Quantum paradigm** implemented with **bDS**.

Drivers for science-based Global Enlightenment

- ***Climate crisis:*** There is a real possibility of becoming a dead planet and thus it will also mean the end of our planet's 'Big History and Global Evolution' and, alas, its Big Historians. This needs an increased awareness of the science of climate change amongst broad layers of the world population
- ***Environmental Crisis in general:*** The pollution of the air, sea, and land, and loss of biodiversity.
- ***The present unstable socio-economic system of Capital:*** The disastrous instability of the present growth-for-growth's-sake socio-economic system of Capital is closely connected to the climate and environmental crisis [Naomi Klein, "This changes everything"] which are treated as external costs and ignored.

Climate change and broader environmental crisis

- **Runaway global warming**
- **Poisoning of air, water, and soil**

Leading to

Possibility of creating a Dead Planet

Then no more 'Big History and Global Evolution'

This is a consequence of present **HE** socio-economic system
[**HE** = **H**yper-**E**xpansionist]

We must change to a **SHE** socio-economic system
[**SHE** = **S**ane, **H**umane, **E**cological]

To achieve this we will need a **science-based Global Enlightenment**, so that a majority of world's people understand the danger of the earth becoming a dead planet.

This requires:

A new socio-economic system that enables an equilibrium to be established with the rest of nature and based on the social principles of **equality, mutuality, cooperation, and sharing**. Perhaps it can be called:

‘A Cooperative Pluralist Commonwealth’

(Gar Alperovitz)

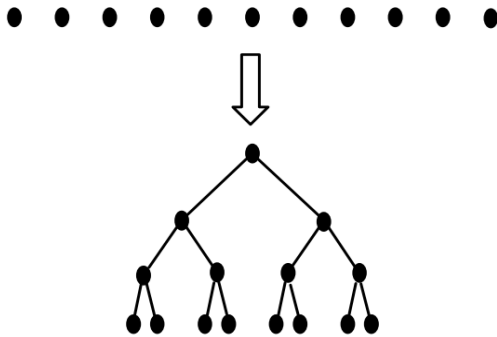
It can be created using the Quantum local/non-local paradigm implemented with bDS greatly assisted by an emerging global enlightenment.

ICT and Enlightenment

Printing ICT  **18th Century Enlightenment**
(after several centuries)

Digital ICT  **Global Enlightenment**
(after several decades ?)

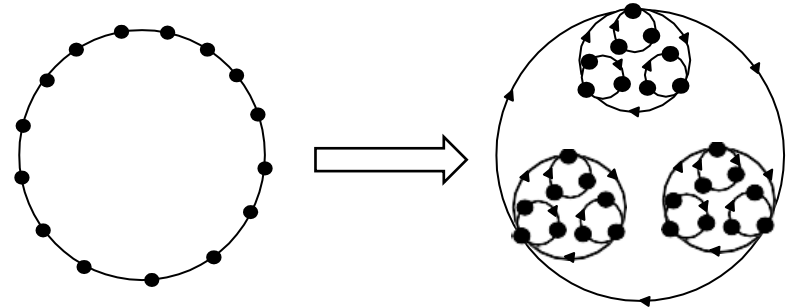
The need for a change of *Paradigm*



The Cartesian-Newtonian Paradigm

- *Nodes are only localised
- *Hierarchical
- *Bureaucratic
- * Alienating
- * Undemocratic

The paradigm for the 18C Enlightenment within a capital or bureaucratic state system



Properties of the Quantum-Digital Paradigm:

- * ‘quantum’ local/non-local
- * Non-hierarchical
- * Democratic
- * Non-alienated
- * Fractal

The paradigm for a Global Enlightenment leading to a new socio-economic system

The concept of ‘**The General Intellect**’

*“Nature builds no machines, no locomotives, railways, electric telegraphs, self-acting mules etc. These are products of human industry: natural material transformed into organs of the human will over nature, or of human participation in nature. They are organs of the human brain, created by the human hand: the power of knowledge, objectified. The development of fixed capital indicates to what degree general social knowledge has become a direct force of production, and to what degree, hence, the conditions of the process of social life itself have come under the control of **the General Intellect** and have been transformed in accordance with it.”*

From Grundrisse: ‘Fragment on machines’ [Marx, K (1973)]

Thus **bDS technology**, created by the capitalist economic system, can be thought of as the technology that can fully implement **the General Intellect** anticipated by Marx.

Binary Digital Systems and the major developments of modern science

1. The code for Life – quaternary Digital Systems (qDS).

Digital computers were vital for analysing diffraction patterns of proteins and DNA molecular structures, and to log and analyse the data from the various genome studies culminating in the human genome project.

2. The Origin of the Universe – The Big Bang model Modern astronomy at all wavebands is now inconceivable without bDS. Computers log and analyse the data. So our understanding of the history of the universe from the Big Bang is closely linked to the emergence of bDS. Thus 'Big History and Global Evolution' as a subject is itself dependent on bDS.

3. The Standard Model of particle physics The operation of, and analysis of the results from the Large Hadron Collider at CERN is inconceivable without bDS. LHC generates about 6 petabytes (6×10^{15} bytes) of data every second which is logged and analysed by a global grid of computers and which led to discovery of the Higgs Boson, the final building block of the Standard Model.

Solar Energy and Global Enlightenment

For Planet to survive 80% of fossil energy must remain in the ground

We have a choice, according to 'The Burning Answer'(Barnham 2015):

Planck-Einstein Equation: $E = hf$



Solar Power

- Cheap as fossil fuel
- Renewable
- Safe
- Clean
- distributed

or The Einstein equation $E=mc^2$



Nuclear Power

- Very expensive
- Non-renewable
- Very dangerous
- Very dirty
- Concentrated

Solar Energy, Development and Global Enlightenment

Most villages in developing countries could be rapidly electrified with this technology. Here is an example of creative thinking by German engineers at ILK (Dresden):



A Solar-powered shipping container

- * Water pumping for drinking and irrigation
- * Internet- linked Classroom
- * Medical cool-room and facility
- * Field laboratory for agro-ecology

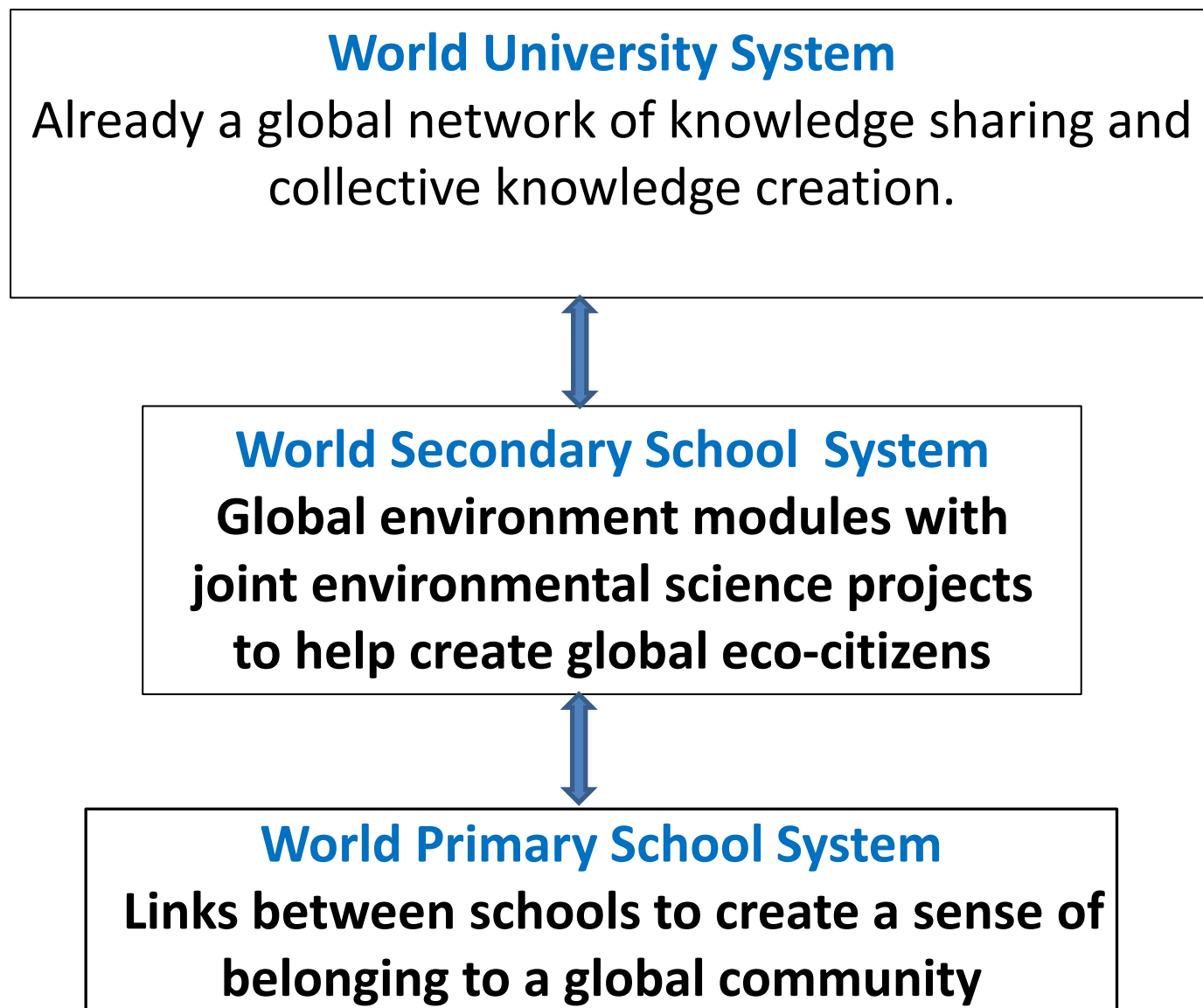
To summarise:

**Solar Energy+ Binary Digital Systems
= Global Enlightenment = a stable planet**

Science as a Universal Discourse

Science provides both the technology for creating Global Enlightenment but also its method of critical thinking and empirical enquiry can help solve the environmental and socio-economic problems confronting our species. It can become a **universal discourse for all humanity.**

How to create a science-based Global Enlightenment?



bDS Computer-linked educational technology

The Physics Workstation

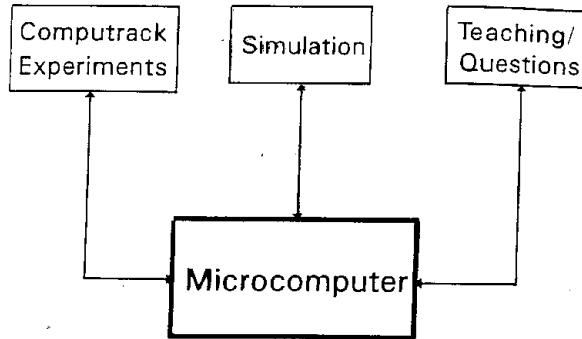


Figure 2

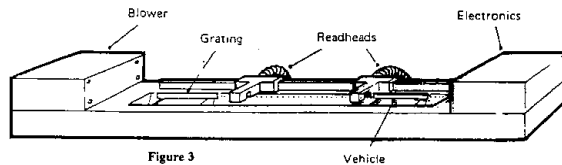
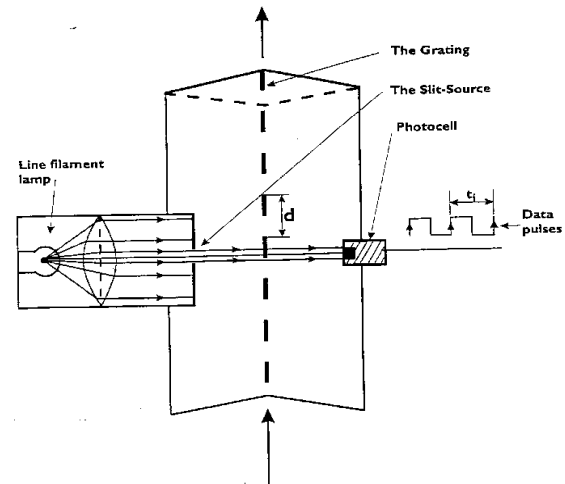


Figure 3

The principle of the Slit-source, Grating and Photocell method (SGP)



$$v_i = \frac{d}{t_i}$$

$$TV_i = \sum_{j=1}^{i-1} t_j + \frac{1}{2} t_i$$

$$s_i = \sum_{j=1}^i d_j$$

$$Ts_i = \sum_{j=1}^i t_j$$

v_i - the average velocity for t_i

TV_i - the total time to the middle of t_i

s_i - the total displacement up to d

Ts_i - the total time for s_i

v_i, TV_i Are the coordinates for v-t curve

s_i, Ts_i Are the coordinates for s-t curve

Figure 4

The Physics-is-fun Workstation (PFW)

Students can understand the relationship between their sensuous experience and its representation by graphs and equations

How to fund the solar energy for science-based Global Enlightenment?

- **Use the funds created under Copenhagen Climate Change Accord:** These funds are to help developing countries mitigate the effects of climate change. They are expected to reach \$100bn per annum by 2020. Installing solar technology in every village is a major step in helping countries to develop in a sustainable manner. It would also help in making scientific understanding accessible to all.
- **Create a Global Enlightenment Trust – GET:** The IPR of software and hardware created for implementing Global Enlightenment can be assigned to GET under a ‘creative commons’ license, e.g. **PFW**
- **Individual donations to GET:** If the GET is successful in promoting Global Enlightenment then it would inspire say 1% of the Golden Billion to give say \$10 per month, that is \$1.2bn per annum, which would fund solar installations in 20,000 villages per annum.
- **Convert half of world’s arms budget to Global Enlightenment**

We are one species

The spread of science and the scientific method of critical thinking and testing, that is, a **Global Enlightenment** will help us to realise in practice that we are one species. It will also show us how to resolve the critical problems of the environment and the socio-economic system of capital that has created these problems.

Some words of Wisdom from one of the greatest scientists:

“A human being is part of the whole called by us the Universe, a part limited in space and time. She experiences herself, her thoughts and feelings, as something separated from the rest, a kind of optical delusion of her consciousness. This delusion is like a prison for us, restricting us to our personal desires, and to affection for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole of nature and its beauty.”

Albert Einstein

Perhaps we can also agree with the words of a popular song from my Liverpool school contemporary:

Imagine by John Lennon

Imagine there's no heaven
It's easy if you try
No hell below us
Above us only sky
Imagine all the people living for today

Imagine there's no countries
It isn't hard to do
Nothing to kill or die for
And no religion too
Imagine all the people living life in peace, you

You may say I'm a dreamer
But I'm not the only one
I hope someday you'll join us
And the world will be as one

Imagine no possessions
I wonder if you can
No need for greed or hunger
A brotherhood of man
Imagine all the people sharing
all the world, you

You may say I'm a dreamer
But I'm not the only one
I hope someday you'll join us
And the world will be as one





Another, Globally Enlightened World is Possible!

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