

Nature's Code

A New Emerging Theory Developed
By Dr Vanessa Hill and Dr Peter Rowlands.

A precis by Dr Vanessa Hill (2007) ©

Nature's code is an exciting new theory which uncovers the underlying process of our universe. During a unique collaboration between the Physicist Dr Peter Rowlands and the Biologist Dr Vanessa Hill the discovery was made by making comparisons between fundamental concepts of quantum physics and the genetic code of DNA. Remarkable similarities became obvious, hitherto unrealised until these two scientists applied new ways of thinking-how and why? Firstly, Peter Rowlands (Dept Physics, Liverpool University) had made an algebraic breakthrough in quantum mechanics that resolved all the anomalies found using the old system. These anomalies are holding up the progression of quantum theory at present. Peter Rowlands had resolved them by mapping the Dirac equation (the main fundamental equation of quantum mechanics) onto a 3D matrix. This is instead of the old 2D matrix used by the mainstream academics. This was a very logical step as the Dirac equation relates to the fundamentals of a 3D universe not a 2D one and this new procedure has allowed a deep insight into the fundamental processes of the creation of matter within our universe. As part of this work Peter Rowlands had just begun to show aspects of the symmetry of his equations that related to the simple geometric shapes, the tetrahedron and cube. Secondly, Peter Rowlands had developed with a computer scientist (R.Diaz) a brilliant piece of algebra showing how something can be created from nothing called the Universal Rewrite System. Thirdly, Vanessa Hill (formerly Dept Biological Sciences RHUL) realised that this rewrite system was similar to the famous Fibonacci series and the associated Golden section so prevalent within nature's growth patterns. Fourthly, Vanessa had spent many years applying 3 dimensional geometric shapes, namely the 5 Platonic solids (Fig 1) and the star tetrahedron to aspects of the genetic code and had developed a visual mathematical

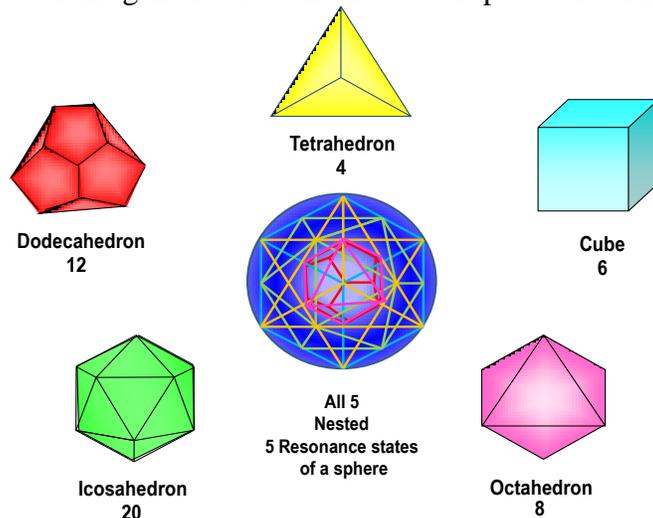


Fig 1. The 5 Platonic Solids

description of the fundamental process of translation of DNA into proteins that make up all living organisms.

The new collaboration then revealed that Vanessa's geometric descriptions could be applied to the Universal Rewrite System and has lead to a full geometric representation of the algebra and the processes of the creation of the fundamental particles of matter (Fig. 2 and 3), the fundamental biological processes of DNA, the DNA

The infinite series of quaternion systems can be seen as produced by successive processes of conjugation (A), complexification (B) and dimensionalization (C) :-

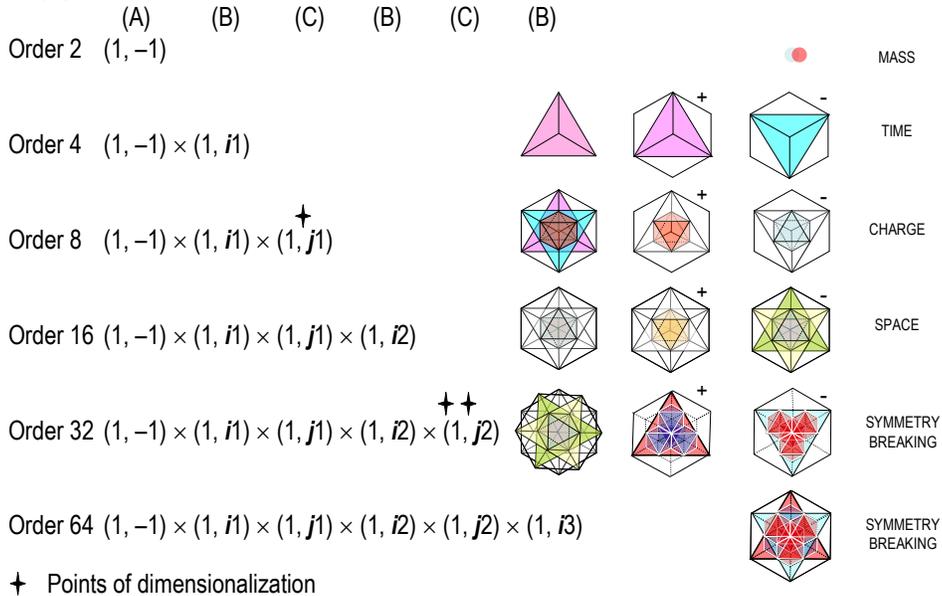
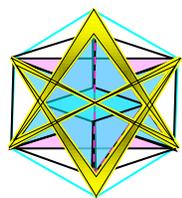


Fig. 2. The Universal Rewrite system : Geometry

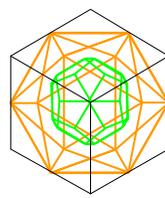
The 64 elements of algebra reduce to 20 :-

5 Dirac components:
+ and -, real and complex
ie 4 groups.

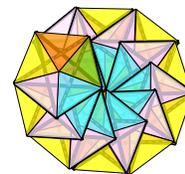
$+\bar{n}$	$+ij$	$+ik$	$+ik$	$+j$
$+\bar{n}i$	$+\bar{n}j$	$+\bar{n}k$	$+ik$	$+j$
$-\bar{n}$	$-ij$	$-ik$	$-ik$	$-j$
$-\bar{n}i$	$-\bar{n}j$	$-\bar{n}k$	$-ik$	$-j$



Harmonic oscillator
Spinning cube



Icosahedron+Dodecahedron
The 20 faces/
near tetrahedra
(60)



Helix formation
1 cycle = 10 pentameric discs
of 5 tetrahedra
(or 5 dodecahedra = 60 faces)

Fig 3. Breaking Symmetry : The Emergence of Matter

helix and the expression of the genetic code into protein (Figs 4 and 5). This work has revealed that the underlying process for both quantum mechanics and DNA expression appear to be identical (Summarised in Fig 6).

An added advantage was that this new process can be understood using pictures that describe exactly, the algebra and thus the new knowledge becomes accessible to the general public in a visually attractive and stimulating manner. Many have been struck by the simple beauty of the theory when presented in this way. The use of this 3 dimensional geometry has also lead to further discoveries within both fields so has now become an important mathematical tool for further discovery.

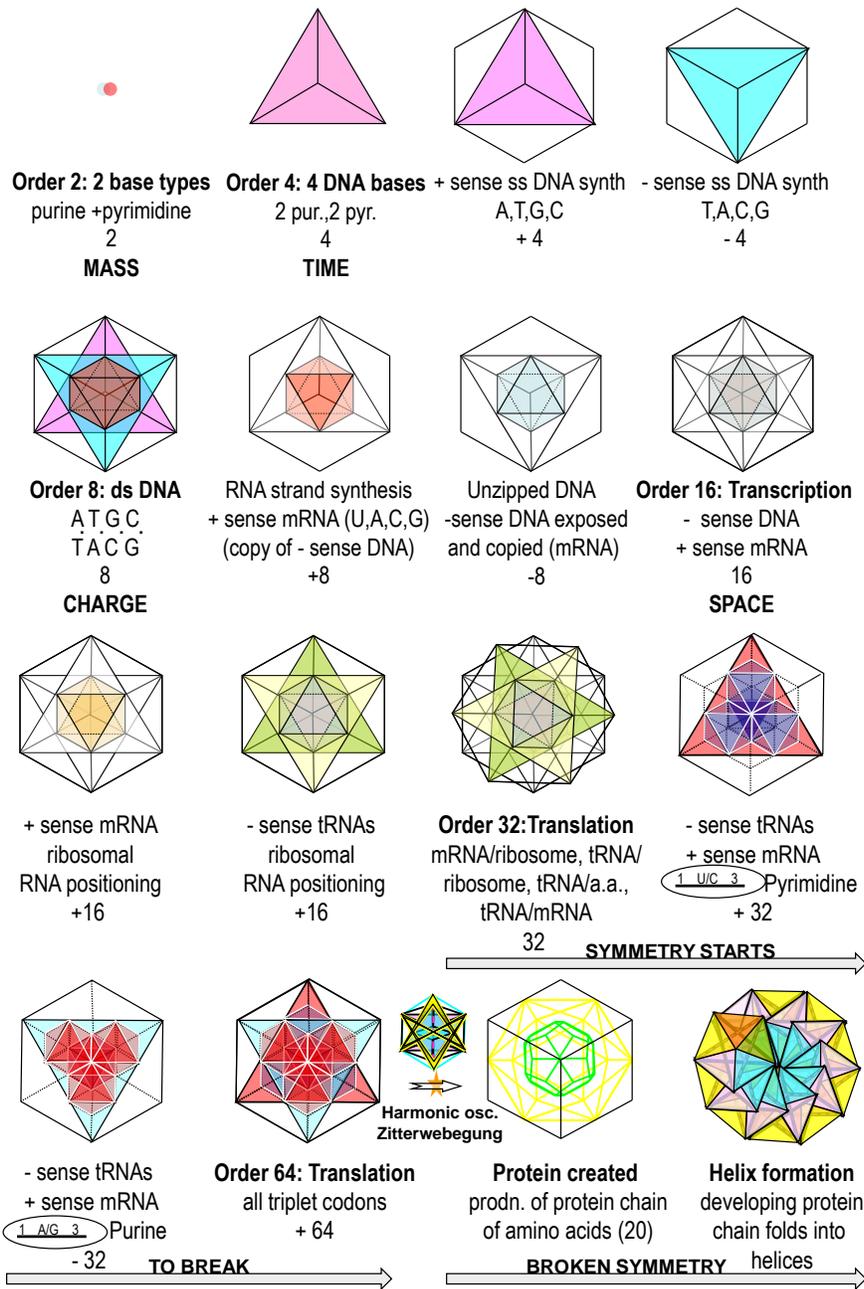


Fig 4 and 5. The Process : DNA, transcription, translation; Part 1 and 2

During this collaboration it became apparent that this new theory may be applicable to all faculties of science and that in fact, it relates to a re-iterated process for everything within our universe ie it is the key to unlocking the workings of the universe itself. The system has a fractal structure in that it shows the same form at all levels. You can begin at any point in the hierarchy and it will look the same and shows that the semantic code for the whole of nature is holistic. To describe what is happening to any part of the system, we must describe what is happening in the rest of the universe as well. We only comprehend the part by connecting it instantly to the whole.

Biological systems, though operating at the edge of chaos, are extremely ordered, whereas the tendency for nature is to become more disordered. Biology is, in effect, a race between order and disorder (entropy) with the odds stacked in favour of entropy. So biological systems must create order, i.e. process information, with as much efficiency as possible. The new theory has uncovered how this information is processed with optimal efficiency. This is Nature's code and applies to everything within the Universe - from the very small to the very large An example of this re-iteration is the way fermions (fundamental quantum particles) spin with their partners in a double helical fashion, DNA is composed of a double helix and a recently discovered nebula near the center of the Milky Way is also a double helix (Nature, March 2006)!

Interestingly, DNA also has a perfect pentagonal geometry re-iterated again within its helical structure (Fig 4). The introduction of the 5-fold within geometry introduces the Golden section proportion or Phi so important within growth patterns of plants and animals. Popular early work that applied proportions governed by the Golden section by Renaissance art masters gives support to the idea that the mind finds certain proportions satisfying along with the mathematically derived compositions by Bach and

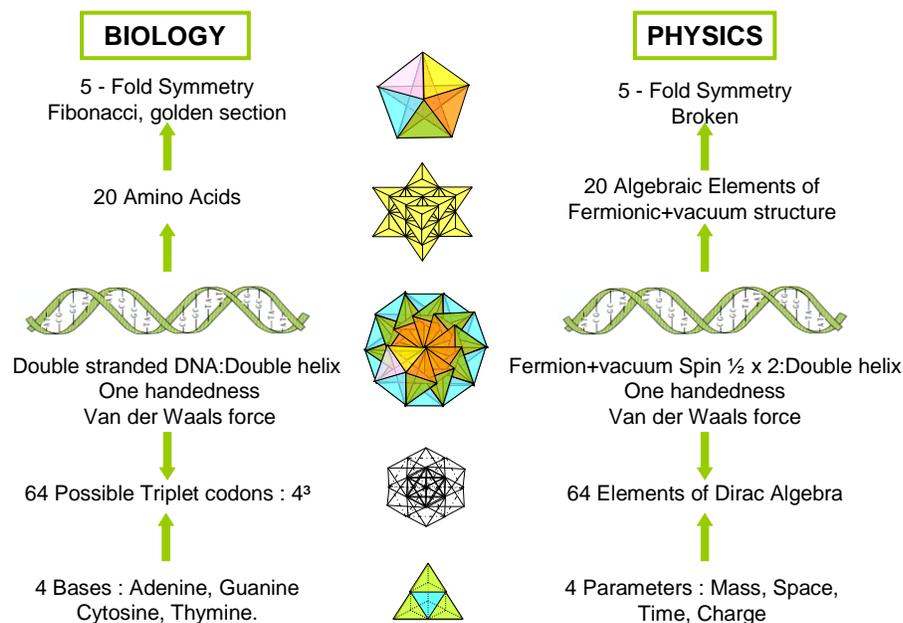


Fig 6. Similarity of The Fundamental Processes of Physics and Biology

Bartok. However, with the more complete picture of Nature's process now to hand, the two collaborators hope to develop a pure form of musical structure and application of colour, form and movement that aligns with Nature's code with the help of talented artists, architects, musicians and dancers (these collaborations are underway).

The work to date suggests that the human body is also working within these same principles as is the mind itself and that the Human mind may experience enhanced aesthetic pleasure from music and art that conforms to the same process. It has already been noted that in the ancient Chinese and Indian musical systems, importance is also placed upon the 64, 60, 20 divisions and the 'spiral of 5ths' that conforms to the new process discovered. The double helical spiral forms as a consequence of breaking the symmetry from an 8 fold (the equivalent of the musical octave) to a 5 fold one (the equivalent of the musical spiral of 5ths) and the double helix can be seen to form as a natural consequence of the stacking of these units of 5 (Fig 3); matter emerges in this universe at this point of broken symmetry and the DNA code is translated into the building blocks (proteins) of all the cells that make up our bodies.

Plato and Pythagoras understood the importance of the right type of music in the structuring of healthy societies via the ears and minds of its people. Art and architecture that conform to similar principles would obviously have similar beneficial affects. The new form of dance, Eurhythmly can already be seen to be conforming to certain geometric shapes and gives performers a sense of well being. It would certainly be interesting to see the effects of bringing the Human faculties fully in line with Nature's own true underlying process through music, dance, shape and form. It is possible that these new artistic expressions will have a great affect upon the mind and as a consequence, the health of the body with which it is inextricably linked.

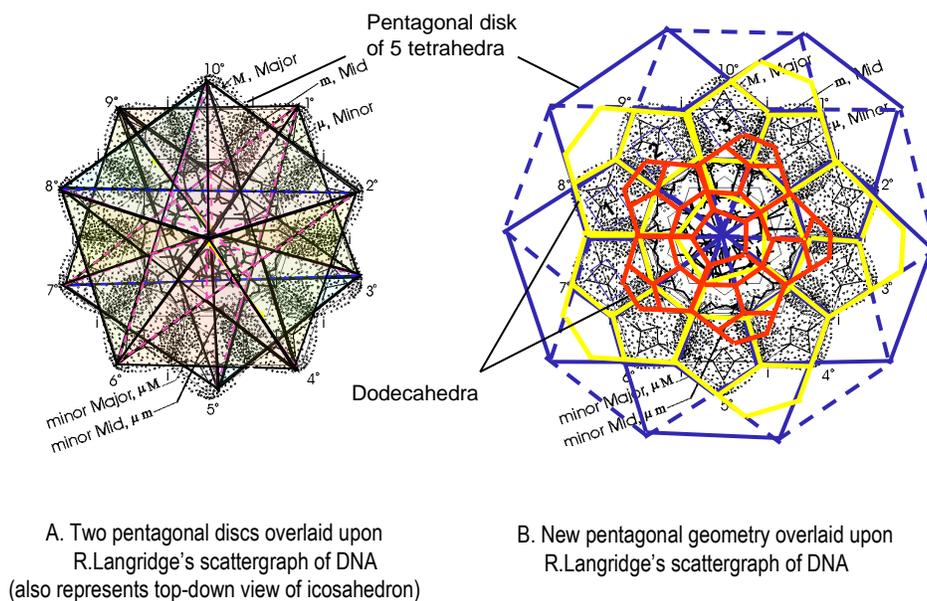
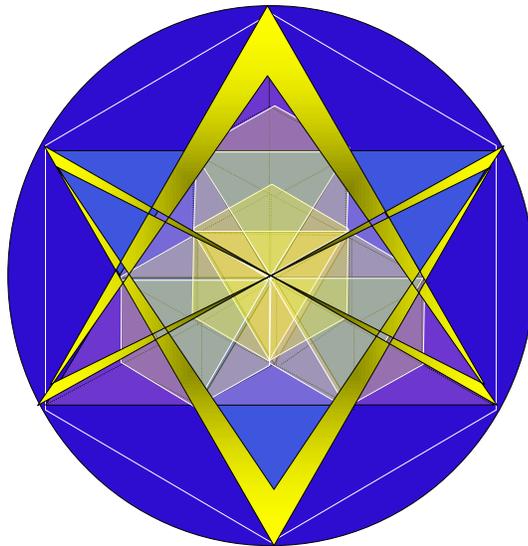


Fig 7. Breaking Symmetry and the DNA Double Helix : Pentagonal Geometry

This work is considered to be important because it deals with fundamental questions in nature using novel universal principles that appear to have a wide relevance. From just a biological point of view, it already explains the data in a number of recently published scientific papers, specifically several regarding protein structure-function relationships within cells, bacteria and viruses, and we are already able to make functional predictions about unidentified newly-discovered proteins. The relevance to biomedical applications is immediately apparent, especially concerning viral cellular interactions and possible disruption of such interactions to prevent disease. However, it is also believed that the work will have a great impact upon society and global thinking as a whole and can perhaps, shed our society of the ‘selfish gene’ or ‘man as a biochemical machine’ attitude and into a more comprehensive view of collective collaboration so important in our present time.

It is hoped that the enduring impact of this work will include the steps taken towards understanding how life happens at all, and interpretations of the ongoing processes of emergence, complexity and evolution, consciousness and the understanding of aesthetics relating to individual and social well-being.



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