Journal of Physical Chemistry & Biophysics
ISSN: 2161-0398
Deans, J Phys Chem Biophys 2016, 6:3
DOI: 10.4172/2161-0398.1000223
Short Communication Open Access

Basic Things are Simple

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Abstract

During a primordial ice age, ice crystallized in pools of liquid nitrogen on its poles, forming diamond-like crystals creating order from chaos. Models made from matchsticks and Plastacine™ or criss-crossed strips of cardboard stapled together are surprisingly strong (Figures 1 and 2). Random temperature fluctuations drove a ferroelectric phase transition at 72 degrees Kelvin, accommodating water molecules' irregular tetrahedral shape and releasing latent energy as infrared laser light, *ice light* with wavelength λ ~ 4 μ. When such light was tried for de-icing aircraft wings, it was reflected. Likewise, it would have been reflected by surface ice and ice in clouds, just as Marconi's first trans-Atlantic radio signals were. Lightning created nucleotides in the warm tropical waters Charles Darwin described, they absorbed ice light which photophosphorylated them. Reflection polarized the light, so only left or right-handed, *chiral* nucleotides were chosen (remember the thalidomide disaster!) and a *noodle soup* of chiral DNA emerged (Figure 3).

Keywords: DNA; Pharmaceutical; Veterinary; Resonance

DNA Pumps Concentrate Substrates in Primitive Cells

Alexander Oparin proposed primitive cells, *coacervates*, surrounded by a detergent-like film of surfactants. The first bio-active molecules were analogues of the transfer RNAs, tRNAs involved in protein synthesis, *transport DNAs*, tDNAs. They form H-bond lined pores through cell membranes. Lightning strikes created an electric field within them and ice light drove a ratchet mechanism, transporting electrically charged carrier-substrate complexes. tDNAs concentrated all life's molecular ingredients in coacervates, promoting chemical reactions within (Figures 4 and 5). 64 tDNA variants constitute life's atomic alphabet, their substrate complexes its molecular vocabulary. The rules they follow are inviolable, predating protein synthesis and enzyme catalysis. Medical, veterinary and pharmaceutical data are consistent with nine independent metabolic pathways.

Differentiation DNAs Select tDNAs at Cell Division

Differentiation DNAs, dDNAs selecting tDNAs controls substrate uptake, analogous to messenger RNAs, mRNAs selecting tRNAs for protein synthesis (Figure 6). At cell division, tDNAs feeding from blastocysts and gastrocysts are starved of nutrients and overheat, displacing adenylcyclase, allowing guanylcyclase to synthesize *hook proteins* (Figure 7). 1 hook enables gamete pairing, spirogyra, sponges and simple worms use 2, 3, and 4 hooks respectively. Our tissues use 5 hooks, 6 allows tumours and cancers to grow. 1-hook immune cells binding to the extra hook prevent proliferation. Barrels of α-helices supplement tDNAs in modern life, extracting DNA for sequencing studies eliminates tDNAs. Their non-Mendelian inheritance is manifest in familial metabolic disorders.

Minion Structure and Function

Another protein function is to form anti-parallel β-pleated sheet hairpins with alternate neutral [A, L, I or V] and basic [K or R] residues and P forming an asymmetric U-bend. These bind to uncoiled the DNA B-helix, it retains its base-spacing and overlap. Twenty-one nine base-pair units form a coil and nine coils complete a *minion* (Figure 8). DNA is more stable than RNA, favouring it as life's precursor. The extra hydroxyl group on RNA sterically hinders minion formation. Extracting DNA for sequencing loses tDNAs, obscuring their persistence in modern lifeforms. Minions enable 1,701 base pairs to replicate with minimal uncoiling and recoiling. They pack DNA on chromosomes better than *nucleosome core particles* (Figure 9).

Minion Replicates, a 21-Unit Coil and Stacked Minions Forming Chromosome

The proton ordered H-bonds connecting minions' Lys/Arg ω-amines to DNA phosphates form 189 × 18 arrays: (Figure 10). They're eighteen-handed biological clocks with time unit determined by that light take to travel thrice around the fastest coil:

$$\tau = 3 \times 189 \times 7.37 \times 10^{-10} / 3 \times 10^{8} \approx 1.39 \text{ femtoseconds}$$

Where, the initial 3 reflects Dekatron™ logic, there are 189 base pairs per coil, β-sheet spacing=7.37 Å̊ngström, velocity of light=3×10^8 and a femtosecond=10^{-15} seconds.

Minions as *chips in the brain*

Minions also serve as *chips in the brain*, each coil stores one letter of an eighteen letter word using a 64-character alphabet, analogous to the RNA code for protein synthesis. Those in a single cell nucleus could remember the Bible, Koran and works of Shakespeare. Memory recall involves resonance between minions, whether in the same nucleus or via nerve fibres serving as optic cables. This model has greater capacity than the *neural network* approach. Synaptic junctions serve as filters, distinguishing differentiated brain regions. Storage is holographic, destroying part of the brain doesn't necessarily cause amnesia (Table 1). where each track stores a different quality of data, negative and positive track numbers signify the introvert and extravert personalities of specialists in the associated discipline, m_e and m_p=electron and proton masses, f=10^{-15}, p=10^{-12}, n=10^{-9}, μ=10^{-6}, m=10^{-3}, k=10^{3}, M=10^{6}, G=10^{9}, P=10^{15} and asterisks connote approximation. The *Tyger* equation allows for relativity between perception and conception using polar coordinates Θ and Φ, $\beta = 63^{-9} = 1.39 \times 10^{-15}$ and e=base of natural logarithms. It warps our perception, rendering plane surfaces as spheres, justifies Einstein's doubts about quantum mechanics and offers new axioms for physics, explaining gravitation.

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Received August 05, 2016; **Accepted** August 19, 2016; **Published** August 26, 2016

Citation: Deans MT (2016) Basic Things are Simple. J Phys Chem Biophys 6: 223. doi:10.4172/2161-0398.1000223

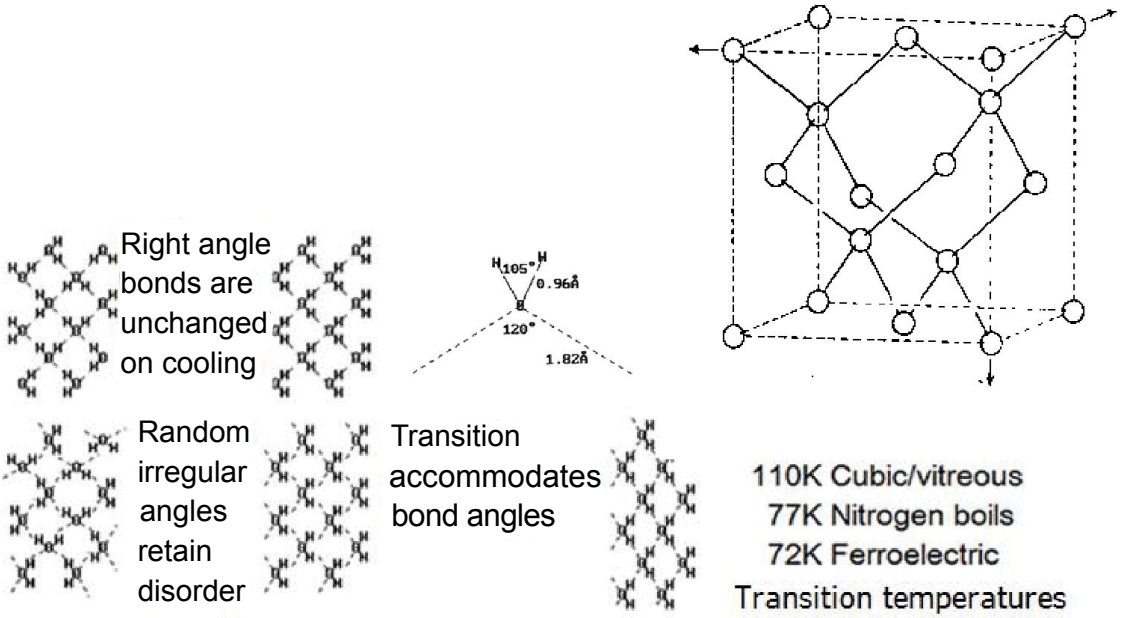

Figure 1: Structure of diamond. 2D version of the phase transition showing the 105° | 120° angles and 0.96 | 1.82 Ångström bond lengths and transition temperatures.

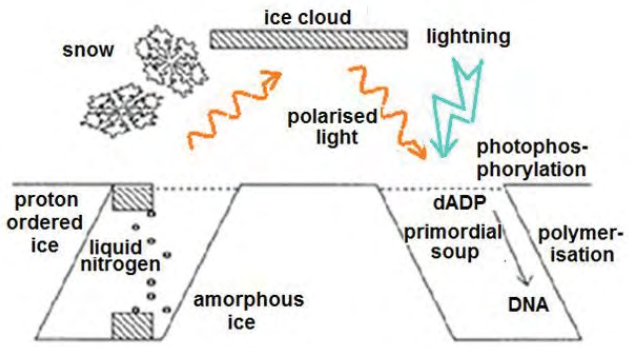

Figure 2: Ice light created DNA.

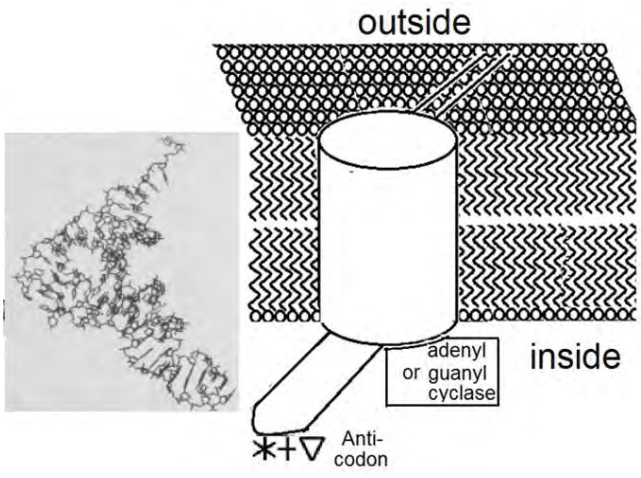

Figure 3: $tRNA_{Phe}$ showing the 'hole' and a tDNA embedded in a unit membrane.

Tyger relativity equation:

$$\frac{d^2\Theta}{dt^2} = \frac{\pi\beta^2}{2\sqrt{e\left([1+\beta]^{t/\tau} + [1+\beta]^{-t/\tau}\right)}}$$

$$\frac{d^2\Theta}{dt^2} = \frac{\pi\beta^2}{2\sqrt{e\left([1+\beta]^{t/\tau} - [1+\beta]^{-t/\tau}\right)}}$$

Computers and data-bases modelled on minions promise human-friendly artificial intelligence satisfying Turing's criteria with potential to assist diplomats seeking peace treaties. Controversially, protons accelerated along the tunnels marked **T** above drive molecular scale nuclear fusion. If the γ-rays released could be trapped at source, the global warming problem might be resolved. An infants' first breath burns a reference datum on his or her minions determining their personality traits, justifying astrology.

Nine Orthogonal Metabolic Pathways Reinterpret Endocrinology and Pathology

Nine metabolic pathways reflect minions' nine-fold symmetry. In each case, adequate trace element nutrition protects against mental and physical disorders. The non-Mendelian inheritance of tDNA mutants accounts for familial conditions, a minion-based data base would facilitate their diagnosis. Trace element supplements would prevent heart attacks, strokes, cancers, diabetes, Alzheimer's dementia and rarer conditions, improve health and reduce NHS expenditure (Figure 11 and Table 2).

Motility

Biological systems deploy resonant cavities to couple chemical to mechanical energy. Sulphite, $SO_3^{=}$ exchanges calcium, Ca^{++} for magnesium, Mg^{++} controlling the hydrolysis of ATP's phosphodiester

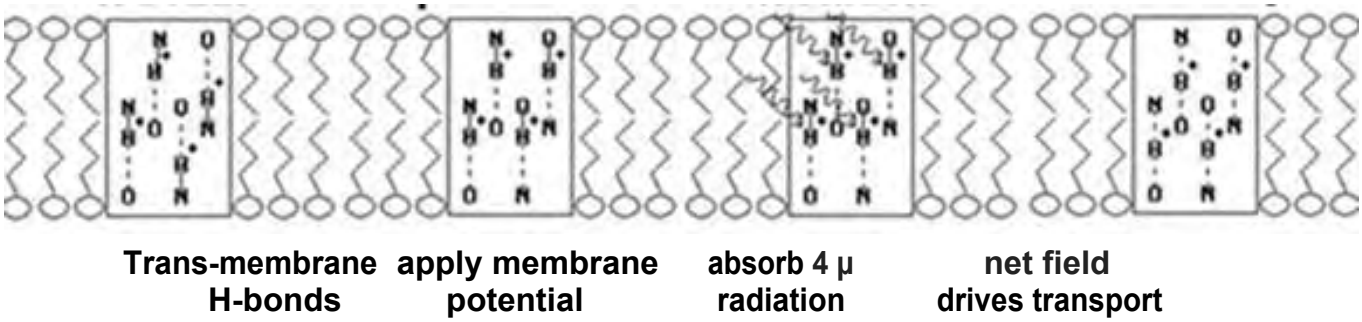

Figure 4: Trans-membrane H-bonds, apply membrane potential, absorb 4 μ radiation, net field drives transport.

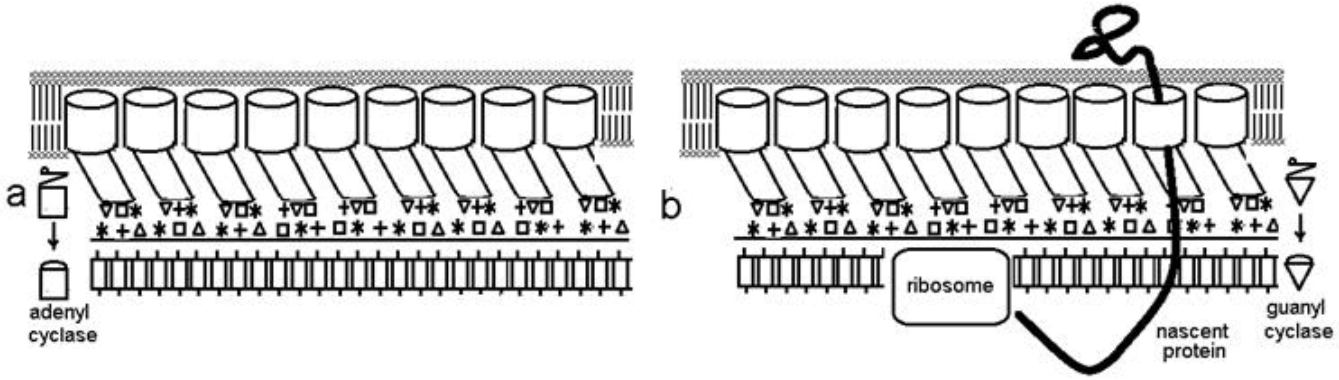

Figure 5: (a) Adenylcyclase driving transport and **(b)** guanylcyclase driving protein synthesis.

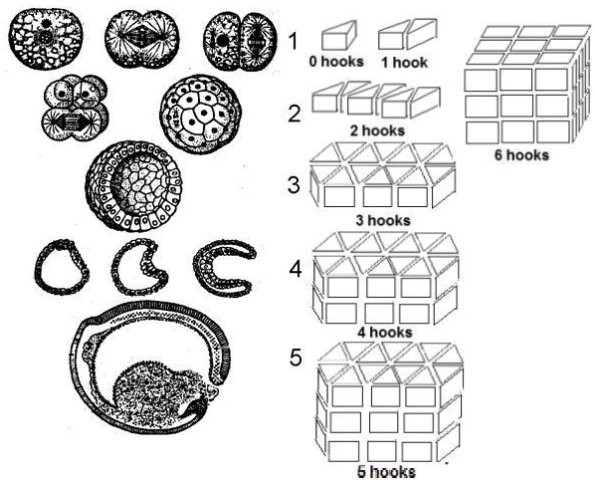

Figure 6: Five stages of differentiation create hook proteins, a 6th allows unlimited growth.

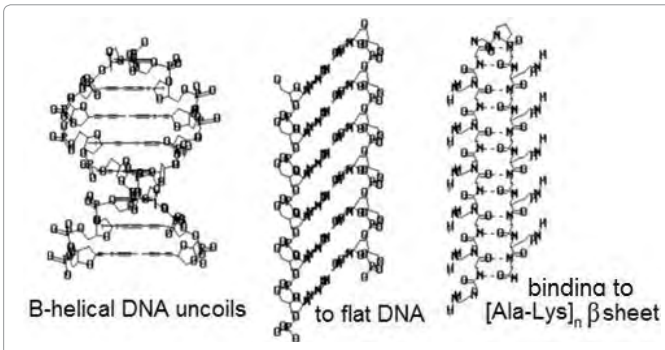

Figure 7: Uncoiled DNA binds to a flat protein hairpin.

bonds. Occurring in striated muscle sarcomeres, they resonate with the ~4 μ infrared released and contract to form ½-wave cavities. Mitochondria, being commensurate with ~4 μ infrared generated by oxidative phosphorylation, store it for conversion to chemical energy by the cytochrome chain. Likewise, chloroplast grana accommodate the light wavelengths they use for photosynthesis (Figure 12).

Sensitivity

Adrenaline, noradrenaline and dopamine exchange 3 sodium ions, Na^+ for 2 potassium ions, K^+. The larger complexes morphine forms block tDNAs, accounting for addiction (Figure 13).

Excretion

Manganese tetra-chloride, $MnCl_4^=$ excretes salt, subject to aldosterone, angiotensin, rennin, histamine and aspirin. Carbonic anhydrase manages the *chloride shift*, exchanging bicarbonate, HCO_3^- for Cl^-. Carbon dioxide, CO_2 excretion controls acidity, pH (Figure 14).

$$CO_2+H_2O \leftrightarrow HCO_3^-+H^+$$

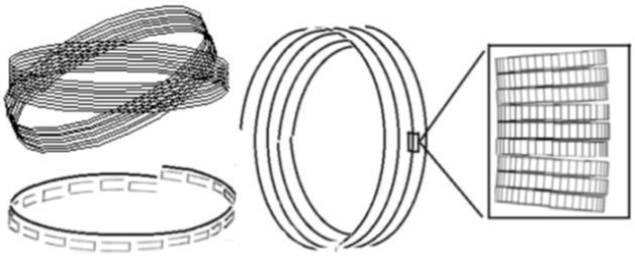

Figure 8: Minion replicates, a 21-unit coil and stacked minions forming chromosome.

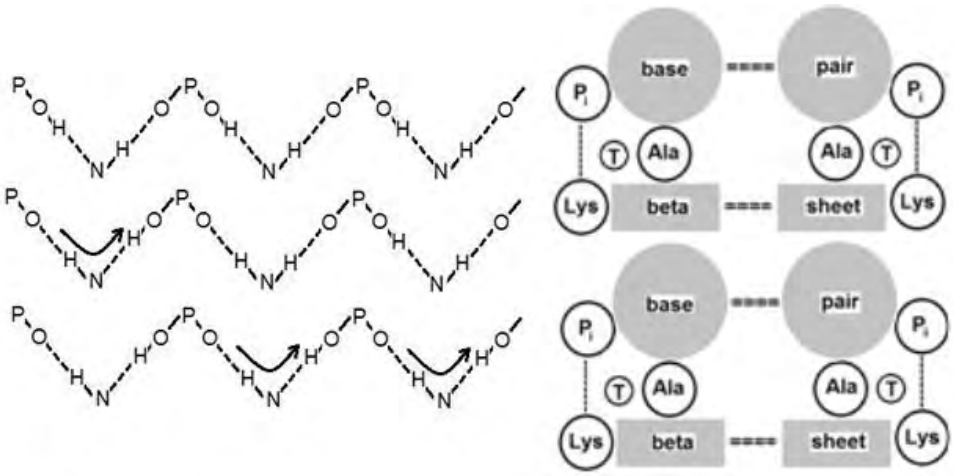

Figure 9: Protons progress along amine-phosphate End view of minion showing H-bonds H-bond chains.

H																	He
Li	Be											B	C	N	O	F	Ne
Na	Mg											Al	Si	P	S	Cl	Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn
Fr	Rh	Ac	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn						
				Ess	Tox	n/u											

Figure 10: Periodic table showing essential, toxic and unused elements.

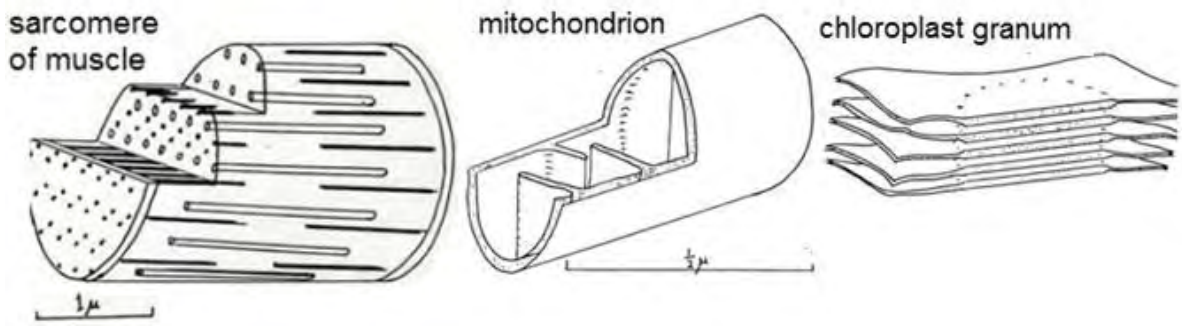

Figure 11: Resonant cavities involve in bioenergetics.

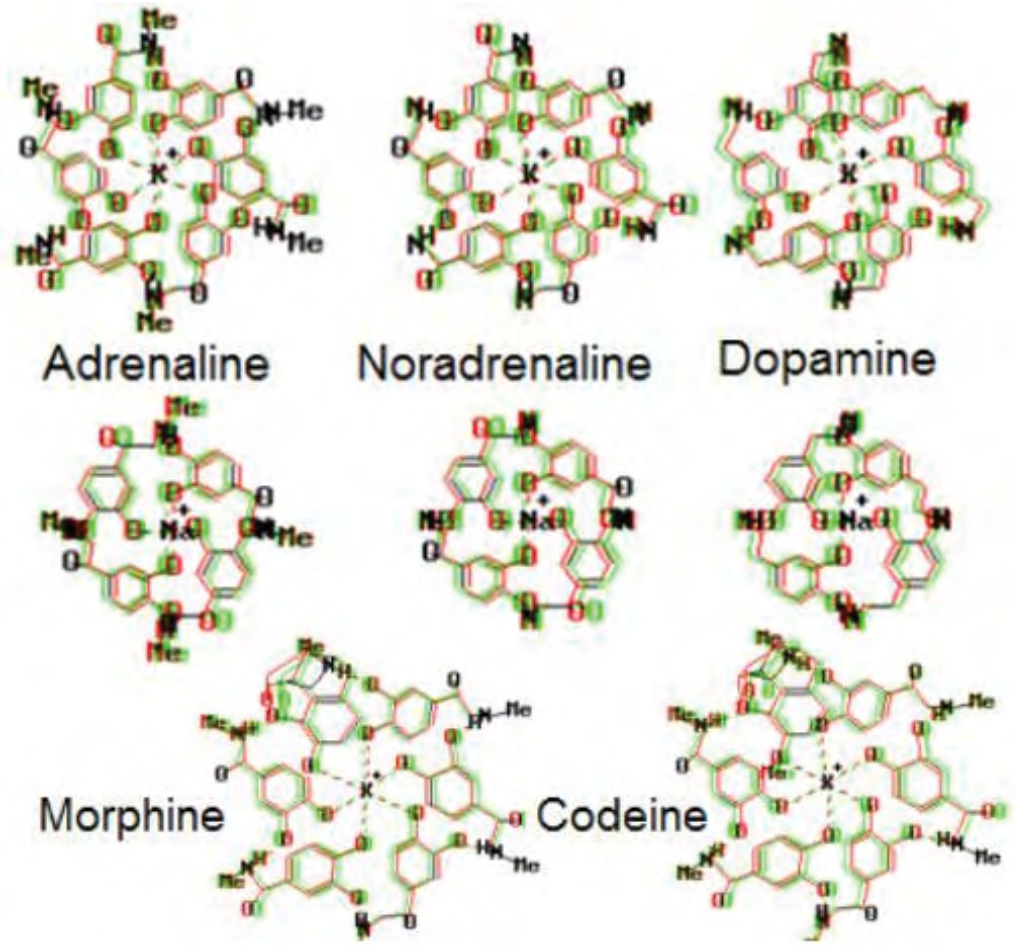

Figure 12: Catecholamines form 4 and 6 member rings around Na^+ and K^+, morphinans create larger complexes.

#	Quality	Period	Colour	Mass	Discipline
-9	Unity	8.7 f sec	Red	$m_e/7$	Quantum Mechanics
-8	Justice	5.5 p sec	Silver	$m_p/7$	Physics
-7	Stability	350 p sec	Blue	2 × base pairs	Chemistry
-6	Progress	22 n sec	Violet	8.3 n gram	Computer Processing
-5	Love	1.4 μ sec	Bronze	0.033 p gram	Biochemistry
-4	Peace	87 μ sec	Yellow	130 p gram	Genetics
-3	Beauty	5.5 m sec	Pied	0.51 μ gram	Biology
-2	Truth	350 m sec	Gold	2 m gram	Engineering
-1	Goodness	22 secs	Green	8.1 gram	Psychology
+1	Goodness	23 mins	Green	32 k gram	Psychiatry
+2	Truth	1 day*	Gold	130 ton	Head Hunting
+3	Beauty	9 weeks	Pied	0.5 M ton	Sociology
+4	Peace	11 y*	Yellow	2000 M ton	Politics
+5	Love	685 y	Bronze	8 G ton	History
+6	Progress	43 k y	Violet	31 P ton	Archaeology
+7	Stability	2.7 M y	Blue	1.8 Moons	Palaeontology
+8	Justice	170 M y	Silver	84 Earths	Astronomy
+9	Unity	11 B y*	Red	Sun	Cosmology

Table 1: Qualities associated with minion coils.

Respiration

Metallic iodine, iodinium, I^+ binds oxygen hydrate, $O_2.H_2O$. Iodine deficiency causes goitre, iodide accumulating in the eyes causes exopthalmos and mutant tDNAs cause bipolar disorder, mania and depression corresponding to excess and deficient oxygen, treated with lithium, Li. The colours of littoral seaweeds match those of I^+ and I^-, protecting them from tidal oxygen fluctuations. tDNAs and nicotinamide in NAD attach protons to nitrogen, oxygen and nitric oxide, N_2, O_2 and NO, fixing nitrogen more efficiently than the Haber process, explaining our oxygen-rich atmosphere and nitric oxide controlling vasodilation. Cyanide and carbon monoxide block this tDNA (Figures 15 and 16).

Growth

Copper, Cu^{++} transports amino acids through gut and liver cell membranes and transfers them across the endoplasmic reticulum for protein synthesis, controlling growth.

Rigidity

Vitamin D stores UV sunlight energy for incorporating fluoride, F^- to $SiF_6^=$, carrier for apatite, it maintains bones and teeth.

Assimilation

Zinc, Zn^{++} complexes with β-$_D$glucose, controlling carbohydrate metabolism.

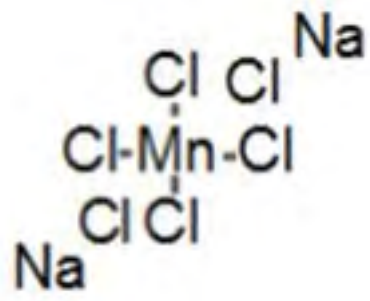

Figure 13: $MnCl_4$ transports NaCl.

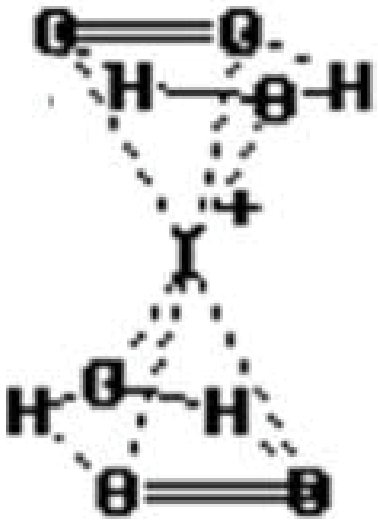

Figure 14: Iodine transports oxygen.

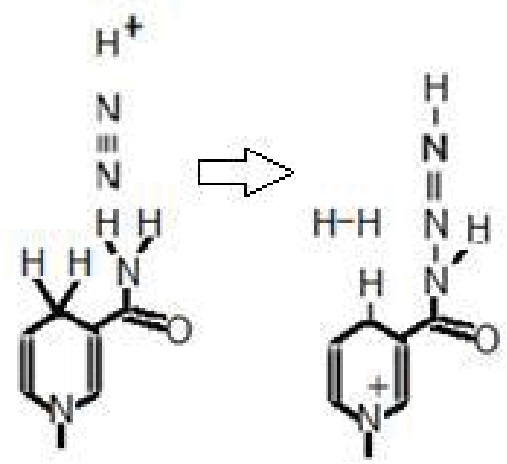

Figure 15: Nitrogen fixation.

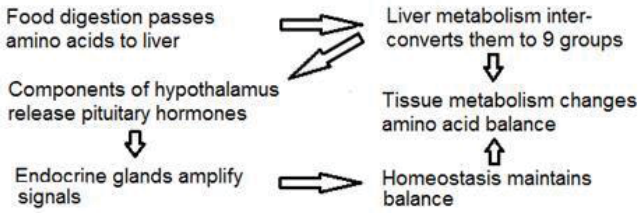

Figure 16: A balancing act controls growth.

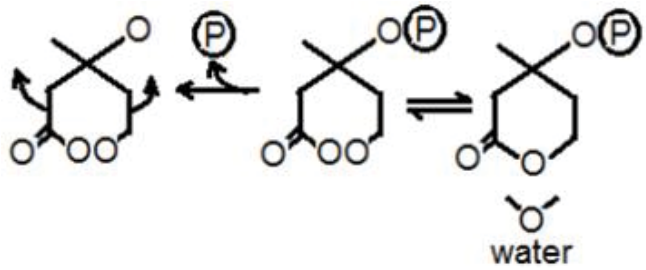

Figure 17: 1. Video of diamond crystal showing square and hexagonal tunnels. 2. Video of water and ice showing irregular tetrahedral shape, cubic and hexagonal crystals and phase transition.

#	System	Tissue	Carrier	Substrate	Pathology
1	Motility	Muscle	Ca^{++} | Mg^{++}	$SO_3^=$	Spasticity
2	Sensitivity	Nerve	Na^+ | K^+	Catecholamines	Depression
3	Excretion	Kidney	Mn^{++}	Salt	Kidney Failure
4	Respiration	Lung	I^+	$O_2.H_2O$	Bipolar
5	Metabolism	Liver	Cu^{++}	Amino-Acids	Growth Defects
6	Rigidity	Bone	$SiF_6^=$ |$AlF_6^=$	Apatite	Alzheimer's
7	Assimilation	Gut	Zn^{++}	β-$_D$glucose	Diabetes
8	Reproduction	Gonads	Ag^+ and arginine	Pyrophosphate	Cancer
9	Water-Pumping	Heart	Mn^{++} and $SeO_3^=$	Water	Heart Disease

Table 2: Nine independent biological pathways.

Reproduction

Silver, Ag^+ replenishes ATP and mediates pyrophosphate, PP_i synthesis for transport bound to arginine, they supply the atomic ingredients for reproducing DNA.

Osmoregulation

My account of water transport contradicts Peter Mitchell's chemiosmotic hypothesis. Saturated fat breakdown yields mevalonic acid. Exchanging phosphomevalonate for phosphomevalonolactone transports water, controlling osmotic pressure (Figure 17).