Genetic Perspectives on the Origin of Life

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Samevatting

In 1952 maak twee jong wetenskaplikes, by name Watson en Crick, een van die belangrikste wetenskaplike deurbrake in die mens se geskiedenis. Hulle beskryf vir die eerste keer die struktuur van genetiese materiaal, oftewel die kode van lewe. Basies bestaan die kode uit 4 molekules (nukleïensure) wat met waterstofbindings in pare aanmekaar verbind is. Die rangskikking van die vier molekules bepaal al die eienskappe van 'n organisme, asook die uniekheid van 'n organisme. Vandag is wetenskaplikes dit eens, dat die genetiese kode, die mees effektiewe manier is om inligting te stoor. Die 1 meter lange genetiese kode, in elkeen van ons biljoene selle, bevat 3000-miljoen van hierdie nukleïensure pare. Daar bestaan tans geen sisteem wat meer inligtingsintensief is as die genetiese kode van die mens nie. Geen rekenaar, tot op hede, het byvoorbeeld gevoeg geheue-kapasiteit om die inligting in een sel van die mens te kan stoor nie. Microsoft en Hulett Packard het beide multimiljoendollar navorsingsprojekte aan die gang, om die moontlikheid te ondersoek, om rekenaars se kapasiteit te verhoog, deur inligting te stoor, soos dit in die genetiese kode gestoor word.Dit opsigself is bewys daarvan dat die genetiese kode 'n inligtingsisteem is. As ons dus konsekwent wil wees, as wetenskaplikes, kan ons nie anders nie, as om hieruit af te lei, dat die mens nie maar toevallig ontstaan het nie, maar dat die mens en alle ander lewe 'n intellektuele oorsprong het, waarvan die wysheid, soos weerspieël in die kompleksiteit van die genetiese kode, alle ander wysheid (intellek) met ordegroottes oortref.

1. Introduction

Could life have evolved spontaneously? This is an age old question, which has often been debated, much speculated and said about.

Often adaptation and evolution are considered to be one and the same thing. In order to avoid any confusion, I would like to define evolution and adaptation for the sake of the perspective presented in this paper:

1 This lecture was presented at the second Creation Seminar, September 1999.

Evolution: *The spontaneous origin of life out of dead matter without any interference of a creator (Coppedge, 1976).*

Adaptation: *Survival of life through adaptation (This implies, that we already have life, for it to adapt).*

Many scientists will argue about the correctness of the above definitions. Instead of getting into an argument about this, let us rather consider what the different hypotheses are:

- Spontaneous origin of life out of dead matter, without any interference of a creator (step 1-4 Fig. 1).

Note: *This will be considered evolution in this paper, since it is the most common definition of evolution in text books.*

- Creation of simple life forms which then through adaptation became more complex eventually forming new species (step 1-4 Fig. 1).
- Creation of many different species with the ability to adapt within the kind (step I followed by step 4).

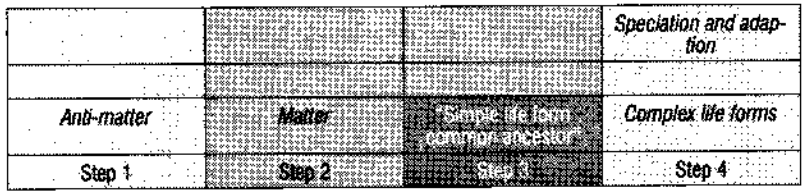

Figure 1 *Simplistic representation of steps required for the origins of life.*

Of course if you believe that life was created, none of the latter two hypothesis are mutually exclusive, since the Creator could use any sort of system. Who would mankind be to prescribe to the Creator what system to use. Based on what we know today, we can merely conclude, that the one hypothesis was more likely to have happened than the other. There might even be many more ways in which we could try and explain our origins. For the moment we will stay with the above three possibilities.

In this paper, some views will be presented, to merely consider which of the above hypothesis presented are the most likely to have happened. The views are based on what we know of different kinds of life as they exist today.

In the study of evolution theory and the quest to the origins of life, author has learnt that:

- *Uncertainty* exists about the age of our planet (4500 million years?)
- Uncertainty exists about the time when the first life forms appeared.

- Conventional taxonomy based on the end products (je. morphology etc.) rather than the source of these characteristics (jc. DNA) has played an important role in evolutionary theory, despite the many limitations of these methods.
- Dating methods for fossil material are suspect and often inaccurate. The exact time that the human appeared on the scene is uncertain.
- Museums often depict humankind as a descendant of the 'ape-man' as fact, without due consideration of the lack of evidence.
- Arbitrary conclusions are made from single examples of fossil material (statistically of course this would not be considered science).
- Many modern biology textbooks present evolution theory as if it were factual information.
- Non-factual information (hypothesis)is frequenfly construed as fact. This is a gross injustice to the non-scientist, scholars and the public at large. It is as if there is conspiracy to ignore important scientific facts. Charles Darwin (1859) himself stated that "A fair result can be obtained only by fully stating and balancing the facts and arguments on both sides of each question."
- Science teachers very often show a bias towards only the one or the other theory, instead of enlightening the student to all possibilities. Davies & Solomon (1974) stated, "if you limit a teacher to only one side of anything the whole country will eventually have only one thought ... I believe in teaching every aspect of every problem or theory." In some countries it is prohibited to teach or even mention the possibility of creation (Bird, 1989). Author has always thought, that science should explore every avenue in the search of knowledge. Competing theory is best vindicated if it survives the most stringent tests.
- Pro-evolutionists often argue, that no scientific proof will ever be able to prove them wrong, because it would simply be impossible to obtain the facts. Unfortunately, any theory which insures itself against falsification, and which is therefore inviolable, is scientific trivial and untenable. It only provides a philosophical viewpoint (Popper, 1959).

Considering the above, author has to conclude that there is a lot of confusion and misrepresentation going on in the debate on evolution.

The discovery of the genetic code (DNA structure) by Watson and Crick in 1952 and subsequent voluminous published research has given me some new insights with regards to evolution theory and the origin of life. In this paper some of these insights will be discussed, by indicating that:

- DNA is an information system.
- The difference amongst different life forms as they exist today lies in their DNA.

- Different kinds of life as they exist today cannot exchange genetic information.
- Organisms as they exist today do not take up new (foreign) genetic information by nature.

This knowledge has major implications for conventional evolution theory as defined above. This will now be discussed in more detail.

2. DNA as an information system

For evolution to have taken place, a set of random events would have to have been responsible for the formation of life, without any specific purpose or reason.

Pro-evolutionists often cite the experiments of Miller (1955), who indicated, that passing an electrical charge through a gaseous atmosphere, resulted in the formation of amino acids (the building blocks of life). They then conclude, that this constitutes life. *The mere existence* of *amino acids of course does not constitute life, no more than do the elements in the* periodic table. These amino acids have to be arranged in a purposeful way in order to form proteins. The only way that this can be done, is by transcription and translation of the genetic code (information) in each living organism. Also important to realize is, that the DNA is not responsible for the formation of the amino acids, it merely contains the information to arrange these amino acids in a way that it will constitute life. Amino acids *without information, would therefore be like having bricks to build a house without a* design. To believe that amino acids could arrange themselves randomly to form life would require a considerable amount of faith. Author says this because we know that when an organism (containing all the amino acids required for life and more) dies, the amino acids do not form new life forms, but rather mineralize into the basic elements which are again the building blocks of amino acids. Protein rich food has to be digested, broken down into amino acids, which are then again transformed to new proteins in our body. Some mysterious unexplained event or force must therefore have been responsible for building proteins (combining the amino acids) without information to do so. Considering the probability, for even the simplest of proteins (100 amino acids) to have formed spontaneously (Bird, 1989), author must admit, that as a scientist he does not have the faith to believe that this was possible.

Well, what then made it possible for amino acids to be arranged in such a way as to form proteins and ultimately life? We know, that it is the information contained in the DNA structure.

Let us therefore consider the importance of DNA as an information system in relation to evolution theory. In order to say that DNA is an information system, we must know what *constitutes information systems. The following are examples of information systems:*

languages, sign languages, chemical symbols, computer programmes, building and construction plans, circuit diagrams, text books etc. In studying what constitutes information scientists have concluded that all information systems must conform to certain requirements *to be considered information (Fig. 1) (Gin, 1982):*

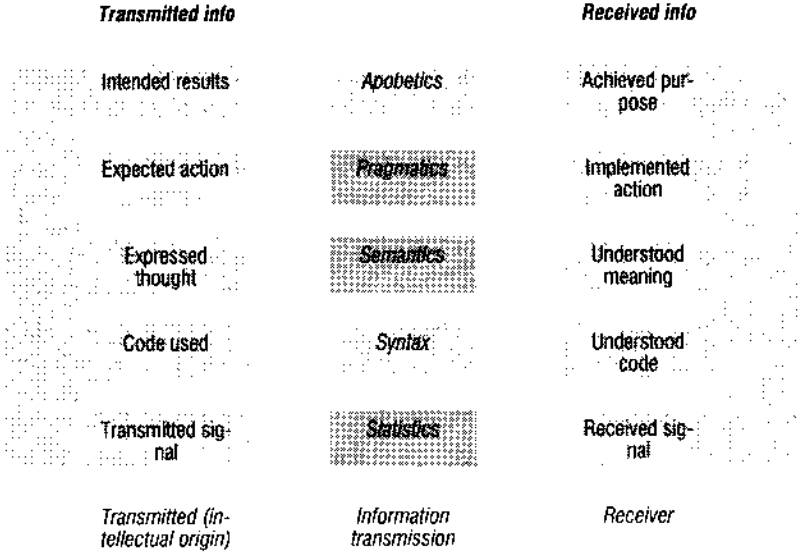

Figure 2 *Information requirements*.

Information systems must conform to all of five basic levels of organisation (Fig. 2). The following gives an example:

- The most basic level of information is statistics. Using the alphabet as an example – the letters would comprise the statistics element.
- The next level of information is syntax – this would comprise arrangement of the letters in the alphabet to form an understood word (code).
- Then we move on to semantics – understood meaning (recognition) of the word (code).
- This is finally followed by function (pragmatics = implemented action and apobetics = achieved purpose). In terms of the alphabet, it would be oral and or written communication.

Studying all of these information systems, we can conclude that, common to all meaningful (purposeful) information is an intellectual origin (sender/creator) and an intellectual receiver. This can be considered the 'natural law' of information, since it has survived a barrage of testing leading to substantiation in every instance. Other 'natural laws' used in

science (i.e. law of conservation of energy) were derived in exactly the same way.

It can therefore be concluded that:

- information cannot exist without a code
- purposeful information is *not self generated* and/or does not exist as a result of chance (probability)
- all information known to humankind has an intellectual origin and intellectual *receiver*
- information is *independent from the storage system (CD, book, microchip, floppy disc* etc). The intellectual source of the information is therefore not part of the storage system.
- information is independent of the actual transmission system (computer monitor, radio, symphony orchestra etc)
- the invariance of information is the result of it being non-material.

All communications between 'senders' and 'recipients' entail the formulation of the symbols (codes) of a certain language and their subsequent comprehension. Meaning (purpose) are therefore internal lingual allocations agreed upon both by sender and recipient.

The key question now is whether DNA conforms to the requirements of what comprises information? (See Table 1)

TABLE 1 DNA as an information system

Information requirement	*DNA characteristics*
Statistics	Adenine, Guanine, Cytosine and Thymine('Alphabet of life')
Syntax	Genes encoding for specific proteins
Semantics (recognition)	mRNA which is transcribed from the DNA code
Pragmatics (Implemented Action)	tRNA which recognizes and translates, specific kodons (codes/words) on mRNA and adds a specific amino acid to the polypeptide (protein) chain
Apobetics (Achieved purpose)	Life

Table 1 indicates, that DNA meets all the requirements of what constitutes an information system.

However, since we know of no information system which did not have an intellectual origin, we can conclude that information contained in the DNA molecule must have had an intellectual source. Molecular biologists today of course have the ability to synthesise DNA sequences. For these to be functional, they rely on already existing information and not on random events. The bottom line is that it requires intellectual input and a lot of it.

3. The difference in different life forms lies in their DNA uniqueness and complexity and ability to pass this on within a 'kind'

What constitutes the difference amongst different life forms? Many taxonomic systems (irrespective of the classification system) rely on the end products (phenotype) of the information contained in DNA.

Life forms essentially differ from each other as a result of genetic uniqueness and complexity. It is for example possible to distinguish different "kinds" of life by DNA analysis. DNA analysis of a spec of blood was recently used to link OJ Simpson to the murder scene of his former wife. Parenthood is determined in the same way. Due consideration should therefore be given to the origin of the characteristics (phenotype) used in classification systems, since all the answers lie within the DNA *information system*. Ultimately taxonomy therefore has to be based on DNA structure and function.

Furthermore life forms vary from 'kinds', which contain small quantities of information (eg. virus) to kinds with extremely large quantities of information (eg. humans). The complexity of the information also varies from very low to extremely high complexity. One would expect a large degree of similarity with regards to the information in the DNA of different life forms. Indeed this is the case and not surprising, since many of the cellular functions are exactly the same. Using this similarity to conclude that all life forms has a common ancestor may however be erroneous. One can of course from such DNA homology conclude that some life forms are closer to each other than others. This does not necessarily imply common ancestry. However we also know that there are unique differences which distinguish different life forms. It is quite obvious that not all life forms are the same. The key concept here is that of uniqueness expressed as the S-value (S sequence complexity). S-value measures the amount of unique sequence complexity (this is what distinguishes one type of organism from another) of the DNA molecule (Prescott, 1988. Pääbo, 1995).

It can therefore be concluded that different life forms ('kinds') differ from each other as a result of the uniqueness of the information contained in the genetic code (DNA).

For evolution to be possible, different 'kinds' of life would have to possess the ability to exchange genetic information.

The only way for life to continue through time is to replicate and pass on genetic information. The most important driving force of each 'kind' is to maintain the integrity of its own genetic information system. The information contained in the DNA molecule is passed on to successive generations for millions of years with only small changes. Thus, DNA molecules

must have great stability (Freifelder, 1987). If this gene flow is stopped for whatever reason, the 'kind' will disappear. Within a 'kind' there are therefore no impermeable barriers to gene flow through time. However, barriers to gene flow do exist amongst different 'kinds' (Mayr, 1992). If genetic information cannot be exchanged between two organisms, we can rightfully consider them to be different 'kinds' (this forms the basis of speciation). It is important to realise that at no time in the chain of parents and their offspring is there a gross discontinuity in gene flow (Freifelder, 1987). Speciation can therefore not take place by gross changes in the genetic information system. Therefore there is no sharp boundary between characteristics of ancestors and descendants. Therefore classifying a fossil, which is taxonomically significantly different from the human, as an ancestor is an arbitrary decision (Wood, 1993). Therefore, a fossil specimen to be identified as a possible human ancestor, cannot be too different from extant humans. If it differs as much as we differ from living apes it cannot be identified as ancestral only to ourselves. Since we identify our fossil ancestors by similarity to ourselves the variation within the hominid assemblage cannot be too great (Henneberg & Thackeray, 1995). Unless we can extract genetic material from the fossils and determine the relationship with humankind, we will have to keep on guessing.

Hence, we can conclude that the difference amongst different life forms lies in their DNA uniqueness and complexity and the ability to pass this on within the same kind.

4. Organisms do not take up new (foreign) genetic information by nature

An important prerequisite for evolution would be acquisition of foreign genetic material in order to increase the complexity of life forms (from simplistic life forms to humankind).

For new kinds of life to have evolved (out of already existing kinds) it would imply that rather non-complex (simple) DNA information systems would have to accumulate vast quantities of new genetic information in order to result into more complex life forms (as measured by their DNA information content and complexity). For example, if all life stemmed from simple life forms (as is proposed by evolutionists) it would mean that the number of base pairs (bp) would have to increase from $1,65 \times 10^5$ (number of bp in bacteriophage T4) to 3×10^9 bp, or 1000 bp to 1000 million bp (the number of bp in the human DNA information system) (Prescott, 1988). Bear in mind, that one misplaced base pair could lead to the malfunctioning of the information system (Freifelder, 1987). If a failure occurs at any one or more of the levels which constitute information, the intended purpose cannot be attained. Syntax errors in computer programming is a well known example. This is true for DNA and all other information systems. One can therefore see the value of the double helix. The base sequence of the one strand is complementary to that of the other strand. 'Mistakes' can therefore be corrected by reading the sequence on the complementary strand, to replace the misplaced base (Freifelder, 1987)

Fact of the matter is, that we know of no organism which voluntarily takes up new genetic information (unless through the process of conjugation, transduction or transformation). Contrary to pro-evolutionistic propagation, fact of the matter is that, the latter type of genetic exchange only happens amongst closely related bacteria (Young, 1992).

Many mechanisms exist by which genetic changes in the DNA molecule can take place. These will be mentioned and their consequences will be highlighted briefly.

Both prokaryotes and eukaryotes contain DNA sequences that appear to move from one part of the genome to another. These 'jumping genes' are called transposons. This implies genetic change, without the necessity of 'uptake of genetic material'. The exact mechanism is not clear (Freifelder, 1987). Organisms could be preprogrammed to allow this to happen. One reason given is that this might be a mechanism by which an organism ensures that important genetic information is not lost. If the number of transposable elements were allowed to increase indefinitely, it would be deleterious to the element, since ultimately the genome would be damaged beyond its ability to carry out essential cellular functions (Freifelder, 1987). Transposition is therefore always limited, by as yet an unknown mechanism. At this stage no firm conclusions can be made with regards to the role of transposons, except that it is a process which is limited.

Retrospons is a direct way in which 'foreign' genetic material is incorporated into the host DNA. The Rous sarcoma virus is the best understood. As part of the viral reproductive process, the DNA circularises and inserts into the host cell chromosome. This is part of the life cycle of the virus since only integrated virus DNA can be a source of progeny virus. Completed virions are extruded continuously from the infected cell by budding without any harm to the cell. Some retro-viruses do however cause tumors, which of course normally results in the death of the host. The only positive effect of retrospons is the replication of more viruses, without any negative effect on the host cell. The host therefore gains nothing, also not in terms of functional 'new genetic information', The other effect of retrospons *(oncogenes)* is negative (tumor formation) and hence devastating to the host (Freifelder, 1987). *With* oncogenes, integration is usually accompanied by the loss of genetic information.

Another mechanism by which 'foreign' genetic material can be introduced into a cell is via phage DNA/RNA. Freifelder (1987) discusses the

possible consequences of integration of phage genetic information into a host genome. In every case it results in a negative effect for the host, and often loss of host DNA. The most extreme case of loss of genetic information that has been observed occurs with adenovirus.

Plasmids are circular DNA molecules which exist separately from the 'host' DNA molecule and can be exchanged amongst very closely related bacteria. They are dispensable to the host, although may offer a competitive advantage to host cells in certain environments. Like phages, plasmids are dependent on the metabolic functions of the host cell for their reproduction. Plasmids are limited to prokaryotic cells, with the exception of the killer plasmids in some yeasts. Plasmids are transferred from one cell to another by the process of conjugation. The sex plasmid F has the ability to integrate into the bacterial chromosome. However, cells must already be pre-programmed to allow this. Only cells that harbor the F factor (called F) are capable of high frequency recombination (Hfr) (Stanier et al,1976).

Plasmid transfer is hence very specific. The F sex plasmid is the only plasmid which integrates into bacterial chromosomes. All other plasmids exist as extrachromosomal DNA and therefore does not alter the parent DNA.

All genomes can mutate in various ways. One of the main mechanisms of mutation is the chemical alteration of the base that gives it new hydrogen bonding properties and causes a new base to be present in a newly replicated daughter molecule. However an alteration in the chemical structure of a base definitely means loss of genetic information (Freifelder, 1987). Mutational changes are furthermore on the average deleterious and/or leads to cell death (Freifelder, 1987). Thus the mutation rate must be low and controlled so that parental information is not lost. Various systems exist which repair the damage caused by mutations (Wellington & Van Elsas, 1992). Friedberg *et al* (1995) in their book, "DNA repair and mutagenesis" cites no less than 8 major DNA repair systems constituting 47 DNA repair mechanisms, which ensure that the possible negative effects of mutagenesis is eliminated.

We know now that organisms do not acquire (or take up) new (foreign) genetic information The effect of foreign genetic material entering an organism, normally has a negative effect. Our whole immune system is geared to eliminate, amongst others, foreign genetic material and if this falls, it may lead to death. The HIV virus, associated with AIDS, is an example of foreign genetic material becoming an integral part of the human genetic material, which leads to the death of the invaded organism.

This does not imply that adaptation does not take place through time within 'kind'.

Adaptation does take place, given that an organism already possesses the genetic information to make the necessary adaptation. Adaptation therefore does not happen by the recruitment or uptake of new genetic information. So we can conclude, that whatever the mechanism of adaptation (ie substitution of certain alleles by mutated new versions, the reproductive success of certain alleles at the expense of others or whatever mechanism) an organism already contains the genetic information to allow for these changes.

5. Organisms 'lose' genetic complexity during the process of adaptation

For evolution to be possible, or to have happened, organisms would have to increase their genetic complexity during the process of adaptation.

However, we know that as organisms adapt 'specialized' genetic complexity 'potential' decreases. For example, let us consider the breeding of dogs, because it has been well documented. All the different types of dogs we know today had a common ancestor i.e. *Carnis lupus* (so-called wild dog), however we cannot breed a so-called wild dog by mating different types of dogs. This implies that the gene pool in the bred dogs has been limited, as one would find in any inbred situation, which leads to the loss of genetic complexity ('potential'). This loss of genetic complexity can today be determined through relatively simple experimentation used to determine the S-value. Hence, to use the above parallel – if we *as* humans were to have evolved out of the socalled 'ape-man', we would therefore be the equivalent of the 'specialised dog' and the 'ape-man' the equivalent of the wild dog. This would mean, that we as humans would have less genetic complexity (lower S-value) than the ape-man. On the contrary we have determined through experimentation, that the human has the most complex DNA information system of all life forms.

So if anything, the ape could have evolved out of human kind, but never the other way around, since this would imply acquisition of vast quantities of foreign genetic material and we know that this does not happen without devastating effects.

6. Conclusions

Judging from what we knew about different life forms as they exist today we can conclude that:

- DNA is a purposeful information system and must have had an intellectual source as indicated by the requirements of all known information systems.
- All 'kinds' of organisms are different, as is reflected in their genetic uniqueness and complexity, exchange of genetic information within 'a kind' and lack of genetic exchange over 'kind' borders.

- Organisms do adapt to their environment, given that they already have the genetic information to do so and may even develop into new 'kinds' over long periods of time.
- Organisms do not take up genetic information as part of the adaptation process and must therefore have had the genetic information to do so right from the outset.

This suggests that the first hypothesis put forward (spontaneous origin of life without the interference of a creator: step 1-5 Fig. 1) is not possible.

The evidence furthermore suggests that the development of new species over time from a common ancestor (step 1-4 Fig. 1) could have been possible, but unlikely.

The evidence presented above best supports the third hypothesis i.e. creation of different 'kinds' of life with the ability to adapt within a kind (step 1 followed by step 4 Fig. 1).

Pro-evolutionists would have to disregard the above facts, to believe (since scientific experimentation has proved the opposite) that:

- Meaningful information systems are self generating and a result of chance (random probability events). Remember, that we know of no such information systems.
- Organisms are capable of acquiring *new* (foreign) genetic material in order to increase complexity and or to adapt. We know that acquisition of foreign genetic material has devastating effects on the cell.
- New 'kinds' of organisms is the result of gross genetic changes 'kinds' being separated by the lack of their ability to transfer and exchange genetic information. One would also have to believe, that exactly the same change happened in the male and female organism, at exactly the same time, otherwise no sexual reproduction would be possible and no progeny (offspring) would be produced and therefore no continuation of the 'kind' would be possible. We have no evidence that even one species came about in this way.
- Apes have a more complex DNA structure (higher S-value) than human kind. Remember that scientific evidence has indicated the opposite (Freifelder, 1987; Bird, 1989).
- To get from a state of no-life (dead matter) to life, was a matter of chance (probability), or something we can only speculate about. Even with all our knowledge about life (DNA information) we have not been able to create even the simplest form of life.
- The most complex information system (DNA) known to mankind did not have an intellectual origin.

- DNA is not unique for every organism. You therefore have to disregard DNA analysis as a diagnostic tool.

The answers to lots of speculation about evolution can be found in genetics. Genetics offers us the opportunity to study the very essence of what constitutes life and especially different 'kinds' of life. It also affords us the opportunity to gather scientific, factual information here and now, eliminating the necessity to present contradicting hypothesis of what constituted the past. All characteristics used to classify organisms (taxonomy), originate in the DNA code. Should evolution theory therefore not rest its case at where it all starts and ends – the information system of life?

It is astonishing however to come to the realisation that we as humans have the ability to create information (we are the only organisms for example which change our environment to suite us and which do not adapt to the natural environment). This is a characteristic, which sets humans apart from nonhuman life forms. The magnitude of the difference makes it a difference in kind and not one of degree.

7. The Intellectual Source behind life

You might now ask, well where do I find information about the intellectual origin of the information constituting life? In fact, this 'intellect' has given us an impressive source of information, in which origins are described (The Bible). Having studied this source of information, I believe that God created life because He, himself tells us this and knowledge (note that knowledge also has an experience component) can verify this, what the origin of the 'blueprint' for all creatures was.

The Bible, Genesis. 1:1:

> *In the beginning God created the heavens and the earth.*

Note, that the author does not waste time in communicating the origin of our world. It is indicated in the very first sentence of The Bible.

The Bible, John 1:14:

> *In the beginning was the Word and the Word was with God and the Word was God. He was with God in the beginning. Through Him all things were made; without him nothing was made that has been made. In Him was life, and that we was the light of men. The light shines in the darkness, but the darkness has not understood it.*

To the author's knowledge, neither John nor David were scientists, yet they had the insight to conclude, that life had an intellectual origin. The use of the term "Word" (John 1 1-4) indicates that the information was 'non-material'. This has subsequently been substantiated by scientific experimentation.

The Bible, Psalm 104:24:

How many are your works, 0 Lord? In wisdom you made them all: the earth is full or your creatures.

The word "wisdom" (Psalm 104:24) indicates that 'intellect' and not probability was involved in the origin of the creatures which were made. The intellectual origin of all information has subsequently been proved through scientific experimentation.

The Bible, 1 Corinthiens 15:39:

> *All flesh is not the same: Men have one kind of flesh, animals another, birds another and fish another.*

Paul made the above statement. Remember that Paul was not a taxonomist or molecular biologist. Science has indicated that different 'kinds' of organisms can be distinguished based on DNA uniqueness and complexity.

The Bible, Psalm 138:14:

> *I praise you because I am fearfully and wonderfully made: your works are wonderful, I know that full well.*

Without knowledge of the extreme complexity of DNA, the Psalmist new that man-kind was uniquely made.

The Bible, Romans 1:20:

> *For since the creation of the world God's invisible qualities – his eternal power and divine nature – have been clearly seen, being understood from what has been made, so that men are without any excuse.*

God reveals himself through nature and what he has created. Today we are, more than ever before, capable of proving God's existence, through information science and the origin of the information (DNA) which constitutes life, Hence, we can clearly see and understand that God was the creator, from what he has made.

The Bible, Proverbs 3:19

> *By wisdom the Lord laid the earth's foundations, by understanding He set the heavens in place.*

The Bible, Revelations 4:11:

> *For you created all things, and by your will they were created and have their being.*

Some more proof of the intellectual (understanding) origin of the world we live in and also that it was purposeful is that there was a will involved (Revelations). I also believe that Jesus Christ is the Son of God, for the very simple reason, that he had power over life and death and that we find

this information in the same source (Bible) which reveals God as the intellectual origin of everything.

The substantiation of what we read in the Word of God, by scientific experimentation is amazing. Unfortunately, not everyone is a scientist to truly appreciate this or do not have the scientific knowledge or inclination to understand all the complexity. God knows this, and therefore He only calls for faith in Jesus Christ. That, He also gives, if you communicate and ask for it. This constitutes true salvation.

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