Opinion and Perspectives

Could The Human Mind Be a Product of Mental Genes: A Nonbiological Component of Brain Genes?

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Abstract

This paper explores the possibility of a hitherto undiscovered process within brain genes which could be responsible for the making of mental processes. The main proposition of this paper is that a brain gene, in addition to the protein template, might also contain a nonbiological mental template (mental gene) made of pre-atomic (which also excludes the known heavier constituent particles of the atom) light quantum energy forms, which programmes the brain cells to produce mental processes. Mental genes were added to the human brain genes when the need for a faster and more complex mental system arose both for integrating the growing perceptual, observation, problem solving and execution processes and for planning in terms of the body and its growing needs and not the genes. Apart from the proposed involvement of nonbiological processes in the formation and functioning of mental processes, we are also speculating their involvement, in tandem with the biological processes, in the genetic functioning related to the body. To give some examples, the overall design of the biological body contained in the gene could be existing in terms of a nonbiological process; they could be involved in the process of genetic mutations, signaling processes of non-coding RNA, which regulate protein synthesis and epigenetic inheritance systems in cells. In fact in our view it was probably a nonbiological (pre-atomic light quantum energy process) process which combined with the complex pre-gene organic molecule mix to give birth to the gene itself as a stable process which then went on to make the initial stable cellular structures in evolution.

Key Words: mind, human mind, genes, mental gene, nonbiological, evolution, brain

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Introduction

The mainstream scientific disciplines engaged in genetic research and its applications are heavily focused on exploring the structure and functions of genes as a biological process. Whether its functions like protein synthesis, transcription, replication, or genes responsible for the making of various body organs and their functions, or for diseases like AIDS, cancer, Alzheimer or correlations between certain genes and certain mental functions, the underlying assumption is that genes are nothing more than a biological process.

The mechanics of the making and functioning of the brain processes by the genetic process have been explained to a large extent but the making and functioning

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of the mental processes by the genes is still an unexplained process. The consequences of the ignorance about this process is that either we try to forcefully fit the mental processes within the biological framework or come up with supernatural explanations for it which leads to all kinds of perversities within and outside of ourselves.

In our opinion, the problem is that the existing biology based genetic framework of explaining mental processes has not yet enabled us to sufficiently and clearly grasp the structure and functional mechanics of mental processes so we need to come up with a new framework of understanding and application. Especially when the need for answers is imperative and binding on us if we want to resolve the ever-increasing mental and physical problems that we have created for ourselves. To look for a new framework for explaining our problem generating mental constructs and ideas we need to first and foremost unravel the details of the existing connection between our genes and minds. It is only through a deeper and three-dimensional understanding of this connection that we will be able to intelligently intervene and make some serious changes in our mental processes, which are fundamentally responsible for creating internal and external crises in the lives of contemporary man.

1. Genes and human mind: current conceptions and their inadequacy

Is human mind a product of an individual's genetic constitution or his/her environment, i.e., nature or nurture? Majority of scientists, philosophers, and even common educated people today are no longer staunch adherents of the two extreme positions in this age-old debate. The continuously increasing knowledge about the brain, mind, genes and evolution is revealing that the human mind is a complex evolved product of a dynamic interaction between both these processes. Current theories, debates and disputes are therefore primarily concerned with the general and specific details of how our genes and environment together produce the human mind in all its complexity and why, to what extent and in what respects is the role of one process more or less than the other.

The sequencing of the human genome and the ever-increasing knowledge about the detailed functioning of the genetic process has provided us with a wealth of information about how genes make the brain and also influence its functioning. We are beginning to identify the genes[2] which are responsible for the construction, evolution and functioning of the various areas of the human brain. Increasing evidence is indicating that there are thousands of genes that are involved in making complex proteins (including regulatory proteins) for making the elaborate and many-layered brain structure and for guiding its functioning and evolution. We have also started identifying and zeroing in on genes responsible for various brain diseases like dyslexia, Parkinson disease, Alzheimer disease, etc.

Alongside an understanding of the genetic formation of our brains, we have also been identifying the role of genes in the formation and functioning of our mental functions. We have been, for quite some time now, associating specific mental traits, capabilities (memory, intelligence, etc) and behavior with *a* particular gene or groups of genes. This association however, is neither linear nor simple. In fact, the one-gene-one trait concept is now an obsolete and discarded concept that only surfaces in newspapers or some popular science magazines. Where the sequencing of the human genome has imparted to us the conceptual and technical capability to correlate[3] stretches of DNA with certain mental traits and behaviors or their disorders which breed mental diseases like schizophrenia, multiple personality disorder, etc, at the same time it has also revealed that behavior, along with other complex mental traits involves not single genes but complex networks of thousands of genes and their complex system of regulation. Most of our mental traits and disorders are therefore a product of many genes having small effects

[2]These include genes that produce those brain and mental processes which we share with other species and those which are unique to the human species, *i.e.,* language related areas of the brain and their mental counterparts.

[3] A note of caution! Correlation does not imply causation. We need to keep this in mind when we associate stretches of DNA with physical and mental traits.

that are modulated by other genes (Pinker, 2002). Due to the immense complexities and interconnections involved in the gene based mental formation of human beings, the entire pathway from genes to proteins and then development of particular mental traits, capabilities and behavior is still largely an unknown area.

However, despite the huge area of our ignorance in this matter, there is one clear consensus among behavioral geneticists, neuroscientists, cognitive scientists and philosophers and that is that genes do not determine the mind in every detail firstly because their effects are probabilistic and secondly they can vary depending on the environment (Pinker, 2002). It is based on the consensus that work in all these disciplines is being carried out to unravel the relationship between genes and the mind.

There is no dispute today among researchers that the basic[4] (or we can say simple) and initial mental processes both of an animal and a human being are determined by the genetic process. In animals, we find no language and verbal ideas but voluntary acts, which can only be explained in terms of mental processes that have not been thought out verbally. When animals exhibit a particular temperament or a particular behavior pattern or mental skills and capabilities then they can only be understood and explained in terms of the functioning of their genes, which they are born[5] with, and not ideas. And the variation in the temperamental and mental behaviors of two animal specimens of the same specie sharing the same environment can again be traced back to their genes.

Similarly, the non-verbal and non-idea based mental capabilities displayed by human newborns can again be attributed only to their genetic process. Child psychologists now do not believe that:

> *"... The world of an infant is a blooming, buzzing confusion, because they have found signs of the basic categories of mind (such as those for objects, people, and tools) in young babies..."* (Pinker, 2002; p.55).

The fact that newborns can:

> *"... imitate facial gestures, connect what they hear with what they see, distinguish the rhythms of Dutch from the rhythms of Japanese, and tell the difference between someone who is looking at them and someone who isn't, [is again] suggesting that even with relatively little experience, newborns are ready to start observing the world..."* (Marcus, 2004; p.4).

These mental capabilities in infants and newborns clearly show that there is some kind of pre-experience (which arises in interaction with the environment) design in the genes which in the absence of dominant environmental stimulation makes these capabilities. Their growth and development then takes place through an adaptive (in the case of humans but rigid and almost fixed in the case of animals) developmental programme (made up of sub-programmes at both the physical and mental levels) during the course of the infant's lifetime.

To counter and undermine a dominant role of genes in the case of infant mental behavior there have been suggestions that there is also learning in the womb, which could be responsible for the making of those initial mental processes. But the question arises that normally sensory perception is considered as a prerequisite for any mental activity or processing so in the womb in the absence of sensory stimulus or perception how does that learning take place which then goes on to construct the mental faculties of human infants or newborns? What are its mechanics? One does not find any consensual explanation of this in current scientific and philosophical literature. Detailed studies and experiments in behavioral genetics are also revealing that the human potential for thinking, feeling and learning lies in the "*...DNA of the fertilized ovum...*" (Pinker, 2002; p.45). And genes are responsible for variation in "*...ability and temperament...*" (Pinker, 2002; p.46). In our view therefore there has to be some in-built (organized before experience and learning) mechanism in the genes which is responsible

[4] In the case of higher mental functions there is no clear consensus of researchers on the involvement of the genetic process so we are deliberately not mentioning them here.

[5] *"... Animal studies have shown that aspects of behavior and personality can be genetically transmitted (as ... in studies in which mouse geneticists have bred rodents to be as anxious as Woody Allen)..."* (Marcus, 2004, p.3)

for the immediately manifest mental capabilities and inclinations of newborns or infants.

Most importantly, as Steven Pinker (2002) says and we fully agree:

> *"... Nothing comes out of nothing, and the complexity of the brain has to come from somewhere. It cannot come from the environment alone, because the whole point of having a brain is to accomplish certain goals, and the environment has no idea what those goals are...Information in the world doesn't tell you what to do with it."* (Pinker, 2002; p.75).

What has been happening for quite some time now is that after the settling of the dust on strict genetic determinism most scientists and philosophers have largely been occupied with discovering the details of neuronal organization and development in interaction with the environment and how that gives rise to the numerous human mental faculties and functions and their development. The role of the genes in this process has largely been sidelined and has in fact receded into the background[6]. It is referred to occasionally as we refer to our long gone ancestors, who have no operational connection with the lives that we are living in the present. Their role in supplying the basic design (not a blue print but a recipe) for the formation and functioning of our brain processes and mental faculties is acknowledged (conceptually and experimentally) but the current complexity of brain structure and functioning and the complex mental feats it can perform and the problems and conflicts it has created are not traced back to genes. In fact any suggestion of such a connection is normally branded as bad version of reductionism, and viewed as an infringement upon and an insult to human autonomy and the act of free will.

What has reinforced the above thinking and led us further away from going deeper into the connection of genes with the mind was the discovery of the estimated figure of human genes by the Human Genome Project. The intellectual camp (which includes scientists and some scholars of social sciences) which connects human mental complexity to the human gene count consider the figure, around 34.000 genes (Pinker, 2002), as too small to count for the dynamic and complex mental life of a human being. This according to them vindicates their theories and concepts about free Will and the dominant role of the environment in shaping the human mind.

At the same time however, a lot of biologists are also countering this argument and the implications drawn from it. The fact that the structure of what counts as one gene is made up of stretches of DNA which code for proteins (exons) interspersed with those stretches which do not (introns), from which exons are spliced together in multiple ways to give rise to not one but different proteins means that there is no linear correlation between a gene and its protein product. And hence between the complexity of the genome and the number of genes (Pinker, 2002). Moreover this structure also makes gene counting a problem; it is difficult to demarcate where one gene ends and the next begins. Then the fact that multiple splicing happens much more in higher organisms especially human beings is again indicating that linear correlations cannot be drawn. Most importantly, the figure 34.000 only makes up *"...3 percent..."* (Pinker, 2002; p.78) of the human genome and the rest is classified as 'junk DNA', whose function we do not yet know in detail although there is speculation of its involvement in gene regulation. These arguments are used for countering the 'blank slate' arguments and proposing that the human genome with its existing gene count is capable of making a complex brain and its mental faculties.

There is no doubt today that human mental behavior, faculties and functions, especially higher order and more complex mental processes, need to be analyzed,

[6] It is only a few disciplines like behavioral genetics that are focusing on discovering the details of the relationship between genes and mental behavior. The problem is that they are concerned with observing the functioning, changes and disorders in overt mental behavior which result from the functioning, changes and disorders of certain genes or groups of genes and primarily for the purpose of identifying the causes of and improving the treatment of certain mental disorders and diseases. They are not working to understand in detail the mechanics of how genes make the mind and indirectly influence its functioning and how we can become intelligent about these mechanics and intervene in them to change the current functioning of the mind and address its problems. So there is a difference between their approach and what we are proposing.

accounted for and understood at multiple levels that means through various disciplines and the interconnections, interdependence and relationships between the different levels and consequently the respective disciplines have to be discerned. A word of caution here is that our focus of attention on one level must not be at the expense of the neglect of some other level that might be just as crucial and indispensible for a more holistic understanding of the human mental phenomenon as all the other levels are.

In our opinion it would be a misconception to sideline the genetic process due to the disconnect between the number of genes discovered by the Human Genome Project and the complexity of the human biological and mental life. Because as Steven Pinker (2002) says that would imply that if the number had turned out to be what we expected, say a 100.000 then it would have been correct to equate the complexity of the human mind with the genetic process. When the fact is that it is not logical to reduce the structural and functional complexity of the human mind to the gene count because if you do that then you would also need to explain the roundworm having 18000 genes (Pinker, 2002). And some other animals having more genes than us on the same plane. The issue is that the complex formation of the mind and its numerous departments and its many-sided and many-layered functioning cannot be explained merely by the number of genes.

Similarly mental traits like thrill seeking and anxiety cannot just be linked to longer or shorter versions of stretches of DNA, as proposed by some geneticists (Pinker, 2002). We are not saying that the number of genes and the lengths of stretches of DNA have nothing to do with the human mental behavior and traits but only that we must not remain at that level of explanation but dig further and deeper into the genetic process and look for a more fundamental process that could account for the many-sided and many-layered complexity of the human mind.

After all when the post- big bang complexity of the universe and certain phenomena within it could not be explained by classical reality; its laws and its methods of inquiry, then didn't we go deeper to a more fundamental level and discover quantum processes/energy forms which today we see as the progenitors of the innumerable layers of phenomena and complexity in nature. So why are we scared of conducting a deeper inquiry into the genetic process and its integral connection with the mind.

In our view (to be elaborated in the forthcoming parts of this paper) maybe the gene also has a subtle but complex quantum energy process within it which is responsible for the basic (not a complete blueprint) design of the mind and also has a dynamic mechanism in place of how that design will unfold or concretize in interaction with the environmental specifics of the individual specimen and also develop and modify. The dynamic of such a mechanism could be capable of generating the many-sided and many-layered complexity of the human mind, which we are proposing is also a quantum energy process and not a biochemical process.[7]

It is on this note that we feel that an in-depth inquiry into the connection between genes and the human mind has not yet been undertaken. We have and are continuing to acquire very sophisticated and detailed knowledge of the genetic process and how it constructs the human body and the brain. However, when it comes to the mind and its complex faculties we only pay lip service to the genetic process and are completely focused on trying to explain human mental structure, functioning and complexity only in terms of and through the

[7] The detailed explanation of this proposition and its rationale is a separate part of our work and is at present beyond the scope of this paper. So here we would like to just give a brief quote of where the current scientific inquiry into the structural constituents of the mind has reached, which in our view clearly shows the need for further explanation beyond the existing biology based explanation and an incorporation of a possible quantum level explanation. According to the distinguished Neurologist Antonio Damasio (2003) *"… There is a major gap in our current understanding of how neural patterns become mental images… We can describe neural patterns---with the tools of neuroanatomy, neurophysiology and neurochemistry---and we can describe images with the tools of introspection. How we get from the former to the latter is known only in part,…"* (Damasio, 2003; p.198). According to him therefore *"… current neuroscientific descriptions of neural-map activities do not provide enough detail to tell us about the biophysical composition of mental images…."*(Damasio, 2003; p.208). If we accept this then a quantum level explanation of the mind's energy processes is certainly a strong contender.

brain processes with minimum of genetic involvement.

This trend needs to be revisited, it cannot and should not be eliminated but a horizontal and vertical inquiry into the gene-mind complex should become incorporated in it as an integral part of it which would enable a more holistic and three-dimensional view of this whole issue. As a first step in this inquiry, we would like to reexamine the existing concept of 'gene' as a biological phenomenon only. This reexamination is a necessary prerequisite for acquiring a deeper and holistic understanding of the relationship between the genes and the mind.

2. Why the gene is not merely a biological phenomenon but a composite of biological and nonbiological processes

If we carefully chart the journey of the changing concept of gene we will discern an interesting cycle. In the beginning, say before the inception of sophisticated tools for observing genes and the inception of molecular biology and Genetics we can say that the concept of gene existed only at the abstract level within our minds and was used as a concept of convenience to explain the process of the transmission of hereditary traits from one generation to the next. With the inception of tools like electron microscope, and then *x*-ray crystallography, this concept became concrete and tangible at the level of our sensory perception, when we were able to identify the genetic material and its location. Nevertheless, as we advanced further and inquired into the details of the physical location and operation of genes and started making computer simulations of the different genetic functions we made some new discoveries which overturned our existing understanding of the gene only as a DNA molecule and once again made the gene an abstract entity. An overview of the journey of this concept is as follows.

The earliest theory of heredity can be traced back to fifth century B.C. when philosopher Hippocrates proposed that the reason why children possess qualities of their fathers is because "*... the semen contains tiny samples from all parts of the paternal body...*" Chambers, 1995; p.25). Since then classical geneticists mostly subscribed to a 'functional' concept of genes, which defined genes in the context of the role they played in heredity. For Mendel 'gene' was nothing more than an algebraic unit which he used for the calculation of trait combinations, so:

> "*... Aside from their functions of producing patterns of inheritance, genes were black boxes whose substantive contents were beyond the reach or interest of geneticists...*" (Auyang, 2010; p.11).

After 1944, the '*substantive*' concept of genes emerged "*... which describes genes by their materials, properties, and interactions...*" (Auyang, 2010; p.10). This concept was based on two very important approaches (one at the theoretical level and the other at the practical level) which emerged in the 1920s in the inquiry into the structure of DNA. First was quantum mechanics which enabled us to understand the subtle characteristics or properties of the chemical bonds between atoms within a molecule. Second, the discovery of X-ray crystallography and its application to "*...compute the three-dimensional spatial arrangements of molecules in the crystal...*" (Auyang, 2010; p.14).

In 1944, Schrödinger in his book '*What is Life*': "*... speculated that the aperiodic arrangements of atoms in chromosomes contained some kind of "code-script" for the organism...*" (Auyang, 2010; p.18). And In 1953 both Watson and Crick suggested that "*... the precise sequence of the bases is the code which carries the genetic information...*" (p.19).

Thus, since 1953, we have been describing genes as bits or segments of DNA which can be "*... defined and manipulated as chemical entities...*" (Chambers, 1995; p.187). This classical molecular gene concept according to which stretches of DNA code for polypeptide chains which go on to make proteins is still the reigning concept in all the disciplines which are studying the structure and functioning of genes.

Ever since the equation of genes with DNA molecules and the gradual development of tools and techniques for observing DNA structure and functioning over a period of time, our concept of them as a biological process has been strengthening and is by now largely entrenched in our

minds. With the result that research and experimentation in genetics, molecular biology, molecular genetics, etc, is solely focused on accumulating specific and precise knowledge of this biological functioning of genes.

This work in the biological domain is no doubt very sophisticated and elaborate and has enabled us to more deeply and comprehensively understand a range of biological processes taking place within the human body. We are beginning to understand how genes determine the color of our skins, the shapes of our noses, eyes, hands and so on. We are also acquiring a more detailed understanding of how they trigger the ageing process. Studying the genomes of viruses, bacteria and RNA mutations[8] in human beings has enhanced our grasp of how diseases like cancer, AIDS, liver or heart diseases afflict the human body. This understanding is enabling more precise diagnosis and development of more effective tools, techniques and medicines for treating these diseases. These are but a few among the numerous examples of how the growing understanding of genes as a biological process is enhancing our understanding of the various biological processes taking place inside the human body. We also acknowledge that due to the tangibility of their biological functioning there is more scope for intervention and conventional experimentation and consequently production of new knowledge in that area.

The sequencing, synthesis, manipulation and processing of DNA and RNA through more and more advanced techniques and methods led to an exponential increase in scientific progress. In the 1970s, this progress led to the emergence of genetic engineering which became a stimulus for the growth of the biotechnology industry.

With the formal beginning of the Human Genome project in 1990 the above mentioned process of understanding the biological functioning of the human body got a major boost. This multi-billion dollar project to map and sequence all the genes of the human genome which was completed in 2004 has opened up for human beings a completely new phase of understanding and changing themselves at the biological level.

Apart from the *Human Genome Project*, the main driving force behind contemporary genetic research is the nature of research funding in the genetic sciences. Today the main motivation and force behind the continuously expanding genetics research are the numerous biotech companies, pharmaceutical corporations and other private companies. The commercial interests of these companies is leading to the patenting of commercially useful genes and creation of private databases of information on genetic diseases, genes and their location, mutations, etc, which is enabling more productive exchange amongst researchers and accelerating the pace of further research in genetics (Marks & Steinberg, 2002).

Alongside the growth and promotion of the above trend of focusing on the biological structure and functioning of genes we have made some important discoveries (laboratory and conceptual) in recent years, both in relation to the existing molecular concept of gene and their functioning related to the body, which in our opinion are challenging the existing 'biology only' based view of genes. These discoveries are pushing us to revise the existing concept of gene and to add to the existing biological explanation of some genetic functions in relation to the body.

Conceptual shift in the understanding of a gene

According to the historian of Genetics Raphael Falk, a gene is:

> "...a *'concept in tension' (Falk, 2000) --- an idea pulled this way and that by the differing demands of different kinds of biological work. Several authors have suggested that in the light of contemporary molecular biology 'gene' is no more than a handy term which acquires a specific meaning only in a specific scientific context in which it occurs...*" (Griffiths & Stotz, 2007; pp.1-2).

In the last decade we have discovered that:

> *"... Any 'single' gene, in the sense of a single continuously read passage of DNA text, is not all stored in one place. If you actually read the code letters as they*

[8] A growing understanding of the different types of RNA and their functions is revealing that *"... the genetic cause for some, and perhaps many, diseases may be associated with mutations within ncRNAs..."* (Mattick & Makunin, 2006, p.21).

> *occur along the chromosome...you find fragments of 'sense', called exons, separated by portions of 'nonsense' called introns. Any one 'gene' in the functional sense, is in fact split up into a sequence of fragments (exons) separated by meaningless introns...A complete gene is then made up of a whole series of exons, which are actually strung together only when they are eventually read by the 'official' operating system that translates them into proteins."* (Dawkins, 1987; p.174).

This implies that 'a' gene, as a stretch of DNA does not already exist as a fixed entity with a clear boundary and in a specific location, which is what the classical molecular definition of gene proposes. There is a gap between the genetic information contained in a stretch of DNA and its biological 'meaning' (Stotz *et al.,* 2006) which can only be derived from the stringing together of exons by the translating system. In addition, that process of stringing together depends on the elements and factors of the larger environment within the cell. Which in turn is connected with the environment between cells, and then the environment within the body and the mind and then the environment outside the body.

Thus:

> *"... the information for a product is not simply encoded in the DNA sequence but has to be read into that sequence by mechanisms that go beyond the sequence itself..."* (Griffiths & Stotz, 2006; p.18).

Therefore, we can see that the gene is a flexible entity which cannot be confined to a protein coding stretch of DNA and it acquires a concrete identity only within a certain context, which consists of various factors, elements and relationships beyond the DNA sequence. Connected with the above insight has been the demise of the other part of this linear reduction—the one-gene-one-protein or one-gene-one-enzyme hypothesis[9] — which went a step further and reduced the gene as a particular stretch of DNA to a particular protein product, i.e. it proposed a linear correspondence between one gene and *a* particular protein. Today we find that the linear concept of the gene as a particular stretch of DNA that codes for a particular protein no longer spearheads or defines the thinking about genes and has in fact receded into the background.

In the light of this already revised picture of the concept of gene and its growing acknowledgement and acceptance in the scientific community we would like to propose another addition to this concept. In our view the gene (of the body) in addition to containing the biological template (the manifest layer of DNA sequence) might also be hosting a nonbiological process within its regulatory[10] region (the introns), which would be involved not only in the regulation of protein synthesis but also other processes in the body.

Before moving on lets quickly clarify what we mean by biological and nonbiological functioning of genes. By 'biological' we mean the known protein-coding and making function of genes and by 'nonbiological' we mean an additional pre-atomic light particle quantum process lying within genes, which would be involved in the biological making and functioning of the body and the brain. This nonbiological process in our view is continuously interacting with and influencing the biological functioning of genes but is not currently detectable at the level of existing biological processes. Maybe due to the process of decoherence as suggested by McFadden (2002). In his view the quantum level of reality cannot be detected within classical objects because of the decoherence resulting from incoherent motion of their constituents. A similar process could be happening in the gene, which acts like a veil beneath which the quantum processes lie. It is possible that within the nonprotein coding region of the gene a template of these

[9] We need to note that this hypothesis was derived from experimentation on simpler microorganisms like bacteria where you could zero in on important factors and processes without getting bogged down by complex details. And since a lot of famous physicists started focusing on genes and inheritance so this method was adopted in the biological sciences also (Auyang, pp. 9-10). But discoveries like overlapping genes, split genes and alternative splicing complicated this linear correspondence and forced biologists to rethink what made "a gene… a gene." (Darden & Tabery, 2005).

[10] *"…Each gene actually has two parts: the protein template, which is widely known, and a second part that provides regulatory information about when that template should be used."* (Marcus, 2004; p.59).

nonbiological quantum energy processes would be existing but not observable due to the process of decoherence (caused by the presence and motion of a large number of other DNA molecules, RNA, proteins and other processes within the cell) which wipes out any evidence of quantum processes. Conversely these templates could be made up of those quantum energy forms like neutrinos which do not get entangled with the known energy processes within the cell and consequently cannot be detected.

Today a number of scientists and researchers are suggesting the involvement of quantum processes and other nonbiological processes like electromagnetic radiation in genes. McFadden (2002) has even suggested that the existing genetic code (which codes for proteins) is actually a quantum code due to the laws of quantum mechanics governing the subatomic particles within the hydrogen atom bonds between the nucleotide bases.

On the other hand, the Manfred Eigen (Davies, 1998) questions the suitability of the original nucleic acid bases as carriers of genetic information when he states that the primitive nucleic acid sequence did not have the capacity to accommodate the information required by the replication machinery of a gene. This seems to make sense if we recall Bruce Lipton's explanation of how:

> "*...In physical molecules, the information that can be carried is directly linked to a molecule's available energy...Because thermo-chemical coupling wastes most of the molecule's energy, the small amount of energy that remains limits the amount of information that can be carried as the signal.*" (Lipton, 2005; p.112).

If we accept this information then non-biological quantum processes in genes would have been needed to store more information and enable faster processing of that information. (We know today of the increased storing capacity of *qubits* and the speed of quantum computation or processing. Our genes might have harnessed this quantum capability for performing their innumerable tasks related to the body, brain and the mind).

In view of the above we believe it would be "*bad reductionism*" (Pinker, 2002; p.69) to just reduce the gene to the DNA molecule and rule out the possibility of other nonbiological interconnected layers and processes within the gene whose understanding might be vital for a holistic and a seriously workable understanding of the human body and the mind. An understanding that will lead to better application both at the biological level and at the level of the individual as a whole. Because we must keep in mind, that man is not only biology. If he has within him more layers than simple biology then why should we reduce the genetic process which has made him and his mind to just a linear and mechanical biological process.

Involvement of nonbiological processes in the body

We are suggesting that while making the human body the genes have to undertake a very complex and precise designing and engineering process because they have to not only produce proteins but also deal with hundreds of aspects with respect to every component and part of a body. All this requires some sort of a design, especially when it is being done at an unconscious level. If we do not attribute to genes a conscious autonomy in the sense that they can go on to make say any kind of nose or any other organ for that matter, then there has to be a design in accordance with which every gene has to perform a complex construction job. Moreover, that design has to take into account not only all the variations of that construction job but also the exact proportion and timing of every process, i.e. it has to also include a plan for execution.

In current scientific thinking the development process (from genes to the body), is viewed as a highly flexible process acting through local effects and not some centralized process controlling the whole. The question that arises here is that in the absence of some kind of an overall plan (not a completely rigid plan) which would include a coordinating mechanism how would the innumerable local effects coordinate amongst their various layers and levels together with the timing of each process? If

each gene acts as an autonomous entity having a protein template and its own regulatory process and operates through local effects only then why did groups of genes and cells gradually become incorporated into cooperative networks and eventually a developed regulatory system was evolved in higher animals. Which in human beings has become a proper management system (for coordinating and managing all their biological and mental layers) occupying the bulk of their genome. Each gene should have kept on operating repetitively and the need for phenomenon like master control genes, which can trigger the expression of thousands of genes should not have arisen.

In our view an overall design or plan (evolved over the species life span) of an organism might be stored in the gene in the form of a quantum hologram kind of process in the non-protein coding or regulatory part of the gene. It has been suggested that:

> *"... genes have a holographic history of the organism's development—a sort of 3-D biography from the moment of conception... As you grow, your chromosomes slowly build up data through the 3-D information carried and stored as waves."* (Mc Taggart, 2006; p.51).

There are several characteristics of holograms which in our view make them the most appropriate candidates for this purpose:

> *"...The pattern holds the form. [They] contain all the information needed to reconstruct a whole image. They contain many dimensions of information in far less space, like a compressed file. They hold that information in a subtle network of interacting frequencies..."* (Miller & Miller, 2003; p.3).

Most importantly they inform us of an invisible fundamental reality which is not made up of parts but an "inseparable interconnectedness" (Miller & Miller, 2003; p.3).

Thus each gene would be holding the form (basic design) of the organism in a quantum pattern (a holographic image) existing at an invisible fundamental level. This quantum holographic image would contain many dimensions of information in a compressed form (occupying far less space) and would be connected to the holograms of other genes through a process of quantum wave entanglement. This entanglement would create a kind of subtle network in which the local effects (which would include RNA signals) generated by single or groups of genes will become synchronized and coordinated through this process. During the development process, this holographic image would be converted or transformed into physical matter guided by more fundamental and lighter quantum signals in addition to the light and sound signals as currently proposed.

A crucial process integral to the execution of the design process in genes is the many-layered process of regulation that regulates gene expression across three diverse time spans; evolution which operates from tens to millions of years, development from hours to tens of years and physiology from milliseconds to weeks. (Hood & Galas, 2003). In our view this regulatory system of genes would also be involving non-biological processes. Considering the enormous challenges it has to confront like coordinating the numerous tasks carried out by cells, interpreting different chemical and physical signals, modulating the expression of hundreds of genes in response to cellular needs and environmental stimuli. This would have required the capability:

> *"...to respond precisely to specific signals...' and also a '...sufficient dynamic character to fine-tune the level of expression for hundreds of different genes..."* (Stotz, 2006; p.12).

In addition, that can only come from a more subtle and efficient process existing at the non-biological level within the gene.

It has been proposed by some scientists that this regulatory function is being performed by regulatory proteins while others think it is a mechanism involving an elaborate system of Digital signaling and communication through ncRNAs.[11] Even if we accept the idea of

[11] Mattick and Makunin (2006) have shared important information which in our opinion is suggesting the involvement of non-biological processes in the regulatory system of living things. In their view the increased complexity of eukaryotes, which went on

regulatory proteins the question arises that why would a specific set of proteins instead of making cells and other components of the body become solely catered towards managing and regulating the protein-making genes. We still do not have an answer to that. The latter suggestion seems more plausible but it does give rise to a further question that what is the energy composition of the digital signals emanating from ncRNA molecules, which regulate the on/off function of protein making genes. Logically it cannot be the same as the composition of a digital signal in a transistor based electronic equipment or a computer.

It cannot be chemical because as Pitkanen (2002) says:

> *"...chemical expression is very slow, the translation rate being twenty amino acids per second, and one can wonder whether life might have invented faster modes of gene expression and control of gene expression."*

We know that energy signals are much more efficient than physical signals so there must be some signals composed of non-biological pre-atomic light quantum energy processes which would be guiding this complex process. More so in the case of human beings where the regulatory system has to manage and regulate the most complex living species that exists in Nature.

Let us assume if there was neither a design nor an effective regulatory system had evolved then there would have been no concept of a particular shape or size of a particular organ as there would be no instructions for terminating the replication of DNA strands, eventually resulting in an unstoppable chaos and destruction. The entire process would have proceeded randomly and would not have resulted in the formation of a meaningful biological form.

Fortunately, for us, reality operates otherwise. We did not only evolve one simple instruction for designing and regulating this process but a whole complex of instructions, like the design documents of a skyscraper, which is responsible for the design and execution functions of genes. In addition, this complex, as mentioned above, compared to the protein-coding regions occupies a greater area of the genome.

Up to now, we have been under the impression that the main function of genes has been protein-making whereas in reality that is a small part of what the poor gene has to do. It would have been the most important thing before that capability emerged. But afterwards just the making of proteins no longer remained important. Because the most important thing then became the making of different kinds of proteins in a designed way and for a specific purpose. This is why we have been emphasizing that in complex living things and especially in human beings the primary function of genes became to carry the detailed design of the whole biological body including all its components and parts (in the form of a quantum hologram) and execute that design in a specific manner and in a certain time period through a complex non-biological system of regulation.

The reason why we have not yet been able to detect these non-biological processes involved in the design and regulation functions of genes is that our positive knowledge about a phenomenon cannot go beyond the capability of the tools we use for examining that phenomenon. Physicist Brian Greene (2000) says:

> *"... one way that we learn about the structure of an object is by hurling other things at it and observing the precise way in which they are deflected ..."* Then he adds *"... As a general rule, the size of the probe particle that we use sets a lower limit to the length scale to which we are sensitive... Useful probe particles cannot be substantially larger than the physical features being examined; otherwise, they will be insensitive to the*

to make multi-cellular organisms and human beings, led to a change in the physical basis of the regulatory mechanism. Instead of remaining protein-based (analog), it became a digital mechanism operating through non-coding RNA (ncRNA) digital signaling. They explain this transition in the physical basis of the regulatory system very appropriately in the following quote: *"... prokaryotes have been limited in their complexity by their reliance on a protein-based regulatory architecture, probably for most of their evolutionary history…Conversely, it appears that the eukaryotes breached this limit by the co-option of RNA as a digital regulatory solution, in concert with the evolution of the necessary protein infrastructure to recognize and act on these signals…both logic and evidence suggest that both developmental programming and the phenotypic difference between species and individuals is heavily influenced, if not fundamentally controlled, by the repertoire of regulatory ncRNAs,…, which are only now being recognized and beginning to be studied in any systematic way."* (Mattick and Makunin, 2006; p.18).

structures of interest." (Greene, 2000; pp.152-154).

It seems the current scientific instruments like electron microscope or x-ray crystallography and other techniques and methods used for probing the structure and functioning of a gene are, to use Brian Greene's words, "*insensitive to the structures of interest*" due to the massive difference between their own size and the size of what they are trying to probe. To discover and perceive them we would probably need more sensitive and complex tools of observation and perception.

Another very crucial area that would be involving non-biological processes is the process of mutations. According to Mattick and Makunin (2006):

> "*... most mutations in regulatory sequences may be both subtle and difficult to track, particularly given the expectational and practical bias to date in genome scanning projects on exonic lamp-posts of protein-coding genes, and the fact that the relevant mutations may be quite distal to these lamp-posts, hidden in the dark of the vast tracts of intergenic and intronic sequences...*" (Mattick and Makunin, 2006; p.24).

At the biological level we are able to detect mutations in the base pairing sequences of the genes so the question is that why aren't we able to detect these 'subtle' mutations in these intronic sequences? Maybe these mutations could be happening at an as yet undetected quantum level, and sometimes manifesting in the form of "modified chemical structures" (McFadden, 2002; p.66), which are detectable.

McFadden (p.66) also talks of "*naturally occurring mutations*" whose source is quantum mechanical. According to him, these mutations escape the enzyme based correction machinery that removes incorrectly inserted bases during DNA replication. The fact that these mutations escape the molecular correction machinery is also an indication that these mutations might be taking place at a more fundamental level of quantum processes and not the manifest molecular level of nucleotide bases. The phenomenon of adaptive mutations is also explained at the quantum level by McFadden (2002).

Epigenetic inheritance is another such phenomenon that needs a further level of explanation beyond the biological framework. Its basic concept is that specialization in cells, i.e. the difference between kidney and liver cells, is not passed on to the next generation via the genetic process but through a process of non-genetic transmission of information. It has been proposed that:

> "*Epigenetic inheritance mechanisms "transmit interpretations of the information in DNA" and therefore phenotypes rather than genotypes...*" (Stotz, 2006; p.13).

Concretely this interpretation exists in the form of specific patterns of a gene's on/off switches (which determine its expression) induced by some environmental factors, which are passed on to the next generation and not the actual DNA sequence. The issue is that the mechanics of how and in what form this pattern is passed on and in what form is the pattern itself existing are questions we feel have not been fully and clearly addressed and explained within the current framework of biological explanations. Which raises the question that maybe this process could also be happening at the non-biological quantum level.

According to Jablonka and Lamb (2005) epigenetic inheritance systems originally evolved to enable early cells to survive the constantly changing environmental conditions. There were three reasons why they provided that advantage to cells. One, the rate at which epigenetic variations are produced is much greater than the normal DNA mutations so in a rapidly changing environment which required fast adjustments and adaptations this was a significant advantage. Two, the fact that epigenetic variations are often reversible while the DNA mutations are usually not. Three, the production and reversal of epigenetic variations is functionally linked to the changing environment, which is not considered to be the case with DNA

mutations[12] (Jablonka and Lamb, 2005). These characteristics of epigenetic systems reveal the functioning of a parallel (but connected) process alongside the DNA mutations which is more flexible and dynamic and probably operating at a more fundamental level which cannot be adequately explained in terms of the observable biological processes. Hence the need for further inquiry into these processes beyond the biological framework of genetic functioning.

3. Some thoughts on the origin of gene and its nonbiological functioning

The existing concepts and theories of the origin of life and the gene from non-living processes fall into two main camps (Shapiro, 2007). One, the accidental or chance emergence of a self-replicating large organic molecule (earlier a rudimentary form of DNA was a likely candidate and after the 1980s some earlier form of RNA molecule became a more probable contender) from random interactions among non-biological chemical processes. The other called "*metabolism first*" (Shapiro, 2007) theory proposes the chance emergence (from the primeval chemical mix) of small molecules which started forming into growing and evolving networks of reactions driven by some energy source and gradually when they became more complicated and capable of storing information in polymers then a living process was evolved. Both these intellectual camps have strong adherents and critics, and we appreciate that there are innumerable micro details and factors which have been gone into and many-sided analyses conducted with the help of serious imagination and reasoning to step by step construct and critique these theories. In this context, we would prefer not to either favor or analyze these theories and instead propose our own version of how life and genes would have evolved from pre-living Nature.

Before we do so we would like to voice our concern on a very important matter relevant to this area of inquiry; the concept of chance or accidental nature of the emergence of life and genes. One can understand chance or accident to the extent that there are trillions and zillions of pre-living energy particles and quanta interacting with each other so it is not important that exactly which particular energy particles interacted with which other particular particles. What is important is the ways in which they interacted because certain interactions would produce certain consequences and another set of interactions would produce another set of consequences and so on. Our issue is with the underlying assumption behind the word 'accident', which is that there is no logic to it and it is beyond our capacity to inquire. It would not be a problem if we said that at present we do not know why and how exactly that process would have happened, as there is so much that we do not yet know. The other issue is that when we say it was an accident we are in fact conceding ground to all kinds of supra-natural and dogmatic explanations of that process. So we feel we should neither say it was an accident nor that it is beyond logic only because it is presently beyond our theoretical and experimental knowledge.

Coming back to the era of pre-living Nature, before the emergence of the genetic molecule, the already existing energy and particle processes, atoms, inorganic molecules and organic molecules, at that stage would be entering into all kinds of open ended and reactive (short-lived) interactions[13], with each other and with substances like light and temperature[14], with no barriers and regardless of the consequences. And out of this growing mix of interactions through a process of permutation and combination new logical but unstable states and forms would have emerged. Actually, it would have unleashed

[12] Although in our view there is an environmentally induced production and reversal process even in the case of DNA mutations, which we will be elaborating in the forthcoming parts of the paper.

[13] Here it would be pertinent to mention that space alone does not determine the existence or absence of interaction. It is a necessary condition but not the only condition. There are two kinds of interactions; theoretical and practical. Theoretical is when space is diminished and things come together and they may interact. Practical interaction will depend on the properties of the things which have come together. As a matter of interest in our case it could be our emotional or cognitive fund or any other state of inquiry existing within us which requires us to interact with other individuals or things.

[14] The *"replicator first"* (Shapiro, 2007) theory also proposes such an interaction between organic molecules and solar ultraviolet radiation and volcanic heat.

an on-going process of emergence and disintegration of different varieties of unstable organic matter structures or compartments in that dynamic energy-particle and chemical soup. Gradually larger sizes of those unstable structures would also have arisen with more functions and capabilities which would have organized into larger networks. At that stage then there would have been a shift from simple production of those organic matter forms to their reproduction but not yet as a stable process.

To integrate the functions of these developed but unstable organic matter forms a kind of a guideline process would have evolved within it at that stage. Because to pull its functions together there was needed a process similar to the already known processes of attraction and repulsion occurring in pre-living processes (magnetism, salt having an attraction for moisture, etc.), a kind of an emotional process if we may say so. If we think a little more deeply we will realize that our existing mental 'emotional process' (its likes and dislikes, pain and pleasure) is nothing more than the cellular (living) form of that widespread process of attraction and repulsion existing in pre-living Nature. It is through these guidelines of attraction and repulsion that those developed organic matter forms probably began to get organized and integrated. It was therefore the first mental process in its basic sense that began to manipulate and handle the organic matter processes in a specific directed way.

In our view, it was the need of this guideline process within those forms to put the entire process of reproduction on a stable and more efficient footing that was responsible for the formation of the first gene, as a process of another quality in Nature. That was the stage when those developed but unstable[15] organic matter forms became ripe (they had become so dynamic, their functions had multiplied and they had acquired properties of potential interaction) and ready for another order of interconnection and interaction which would enable them to develop to qualitatively new and stable states. Here we are unable to avoid the inference and reasoning that these ripe organic matter forms must have come across some other states in Nature which were neither chemical nor molecular but some lighter pre-atomic quantum states, properties of which happened to be ready for interaction with their own dynamic properties.

There are two reasons why we think this would have happened. One, any new state or form emerging out of logical but reactive interactions between the ripe organic matter forms and other post-atomic quantum energy and particle processes around them would have been just a different category or variety or a higher form of those very organic forms having slightly different properties but fundamentally the same. Therefore, the result would have been more of the same. Two, the complex capabilities and properties of the gene are clearly far beyond those of these organic and post-atomic energy and particle processes and cannot be accounted for through just these interactions. The gene is a comprehensive designing factory/ complex that not only has a programme for its own functioning during its life span but for its own reproduction. With the gene, the development of the organic matter forms and states becomes a programmed process, no longer left to the vagaries of the random process. Apart from achieving a stable programmed state having a repetitive designing capability and a capability to reproduce itself it also has the capability to interact with the environment as a whole in the light of the operation of its programme and consequently modify itself (what we call mutations) during the process of its reproduction. Now the dynamism of these functions and their complexity cannot be explained within the framework of the pre-gene random interactivity and logical reactions of those earlier forms. None of the properties of the post-atomic energy and matter forms are known to have these properties and capabilities. None of them on their own are known to be capable of moving beyond the parameters of the random process to a complex, comprehensive programme for their own functioning and reproduction. It is only the gene that begins to deal with random processes from the programmed standpoint. Which is why we

[15] What we mean by unstable here is that they do not have a capability of repetitive designing and reproduction.

think it is actually proactive and not simply a reactive process?

In the gene one finds complexities of a different order which are inconceivable within the known parameters of the ingredients of the reactive organic molecule mix. The dynamism of that mix is really in terms of mass, and predictability is to that extent. However, in the gene one finds a complexity that virtually operates in three hundred and sixty degrees and their dynamism is of mass-less interactions which are capable of influencing mass forms and setting them into programmed motion.

In the gene, therefore we find a combination of the early universe pre-atomic light energy forms, in which the mass and energy ratio was far more in favor of energy and upon which its programming capability is based[16] and other post-atomic energy and matter forms (having mass) whose interaction and reaction would have pulled in these mass-less forms and incorporated them within their own structure. It is only in the gene that we find dynamics of two different orders becoming interactive and capable of influencing each other. In the developed organic molecule mix there was the dynamic of mass and a lot of electromagnetic energy while in the case of light pre-atomic forms there is the dynamic of speed, mass-less interactivity and relatively much more universality. In addition, it is only when these unobservable energy processes interact with mass species that their actual role becomes manifest. Moreover, that role is not to directly change the chemistry of the organic matter form but the capability of that chemistry.

When the complex but unstable ripe organic forms start taking steps towards becoming stable life forms then alongside the observable chemical functions and changes one finds non-molecular and non-chemical functions which cannot be observed but logically those functions are changing the capability of chemical processes and are able to direct them vis-a-vis the environment from the standpoint of the emerging programmed life form. These are the first mental functions which go on to constitute the inception of the programmed living process in Nature. In our view there can be no evolution of life or biological evolution without mental processes, howsoever rudimentary they are.

Thus, all biological and mental evolution ensued from this complex and dynamic interaction of the interactive organic molecule mix with the light pre-atomic quantum energy forms. One type of interaction between them produced the protein making templates or codes (the observable manifest layer of the gene) for the various types of proteins used in the making of biological structures. A process which would have been regulated by the pre-atomic quantum energy process programming layer of the gene.[17] The other type of interaction went on to produce first elementary pre-brain mental templates or mental genes responsible for the rudimentary mental feats and functions found in earlier life forms like amoeba or paramecium and then mature mental templates or mental genes (the term we will be using in the rest of the paper) which became a part of the brain genes and programmed them to produce the various mental formations and processes in advanced living organisms including humans. So in living things, as they climb up the ladder of complexity we see a continuously interactive and developing form of this necessary connection between the body and the mental processes well established through the gene, of course for a functional and limited purpose of adjusting with the environment and ensuring the continuity of biological existence.

In addition, whenever the genes reproduce they reproduce incorporating within them the character of their natal cord,

[16] The programming capability of the gene and the programme functions it produces are a process in which the role of the light pre-atomic quantum energy processes is dominant and decisive. The reason being the non-random level of complexity of operation and interaction that these processes involve. It stands to reason that heavier particles or mass processes would not be able to handle the quantity and quality of functions involved at the programmed level and the speed required to perform them. The protein making code in terms of genetic sentences made up of the four bases is a result of the interaction between these pre-atomic quantum processes and the developed organic chemical mix. It is the manifest layer of the gene while the nonbiological programming layer is the hidden layer.

[17] Just an aside! The regulatory template in every gene might not be a simple protein function which it is commonly believed to be. In our view it could be that pre-atomic quantum energy programming layer of the gene, which is not yet visible to our tools of observation.

i.e. the cellular guideline or emotional process (mentioned earlier), which in fact was responsible for their birth. In addition, this natal cord remains operative throughout the existence of the gene and we find the most advanced and developed form of this process in the human mind's emotional process. The following is an account of how part of the cellular guidelines got transferred to the mental processes via brain cells and how due to this fundamental connection between our mental emotional process and genetic emotional process we say that the human mind is still largely dominated by that connection. Because it is the emotional[18] process of every living thing which integrates and directs all its mental (also some physiological processes which are not reflex processes) processes including intelligence processes, which evolved as supplements or tools to be used by the emotional process for ensuring its biological survival and efficient functioning.

4. Why and how mental genes became a part of brain genes for the evolution of mental processes

The continuous and dynamic interaction between the biological and nonbiological processes in the primeval organic molecule soup gave rise to not one gene but a variety of early genes. Then there was a process of selection and rejection between them and the ones that were successful[19] were selected. By successful we mean those genes whose capabilities began to increase and they became more efficient. Richard Dawkins (1989) has suggested that it was a cumulative process of improvement that became quite elaborate and efficient and the genes gradually discovered more efficient ways of increasing their own stability and decreasing the stability of their rivals (Dawkins, 1989). This growing efficiency of the genes, in our opinion, was due to their having a response system. A system which could respond to the status of their interaction with the environment as being a more efficient and competitive one, and was able to translate that response internally to modifying and mutating their internal system in quantity and quality, in size as well as in capability. It is through this system that the genes were able to ensure their survival and the emergence of variety within them during reproduction and eventually form more stable and growing biological structures, which were again a means for them to ensure their own survival.

The survival of the gene on its own would have no meaning unless it was able to make developed and complex "*survival machines*", as Dawkins (1989; p.19) says, which would acquire the capacity and the capabilities to match the growing capabilities and needs of the gene with the dynamic and continuously changing outside environment and its requirements. The gene must have physically experienced a mismatch between its own size and the size required for fulfilling its growing needs (as advanced organic chemistry infected with dynamic pre-atomic quantum processes) and coping with the outside world as it had to be interactive on a variable scale, in different forms, in different ways and in different times. To cope with this it needed functions and mechanisms of a different dimension and these it could not produce within its existing size.

At this point we are reminded of Bruce Lipton's (2005) example that when the cell membrane reached a critical size in evolution which became a ceiling for the size of the living cell then in order to enhance its survival chances, and to cope more efficiently and smartly with the environment the cell began to band together with other cells to make multi-cellular communities, a process which increased their awareness of and capacity for coping more efficiently with the changing environment.

Similarly the gene when it reached a critical size could not survive on its own by just continuing to make copies of itself without evolving a more stable and developed process of a larger dimension, so it had to evolve specialized cells which went on to make the body as a supplement and a tool-kit for it to interact more successfully with the environment. The body became a kind of a vehicle within which the genetic complex could grow and develop and explore its potential for dynamic interactivity.

[18] Simple like- dislike and satisfaction process in animals and a developed and many-layered emotional system in humans.

[19] The commonly accepted criteria of successful selection are genes which can make more copies of themselves, replicate fast and more accurately.

Therefore, we find the beginning and development of a very complex and subtle relationship of interdependence and two-way interaction between the genes and the biological body.

Once the biological body and innumerable forms of it began to evolve, a need for a correspondingly extended range of guidelines arose to direct the body in its multifaceted interactions within itself between its growing components and functions and then with its external environment which started becoming complex. This meant a more advance management system, with separate specialization with respect to each component of the system, was needed to cope with the dynamic and changing environment within the body and outside of it. The simple management modes based on reflex stimulus-response[20] process available to the cells at that time were simply not enough to handle the quantitatively more and many-sided data arising from interaction of the body with its environment.

At this stage then the gene could no longer remain a mere proactive response system but also had to evolve a proper management and coordinating system to handle the rapidly growing inputs, outputs and feedback loops both at the micro and macro levels. So the gene confronted with this new kind of complexity and its own inadequacy and insufficiency in the face of it must have started making complex proteins for the making of brain processes.

The brain evolved as a more systematized and efficient intermediary between the biological body and the environment. In order to act in this capacity it has both innate and acquired knowledge of what is happening in the entire body, including its own self and about the interaction of the body and brain with the outside environment, in the form of these "*dispositional representations*" (Damasio, 1994; p.94) which are like comprehensive maps about the entire body-brain-environment complex residing in different areas of the brain.

The increasingly elaborate interaction between the body and the brain and their many-sided interaction with the outside world made the perceptual, cognitive and processing capabilities and mechanisms of the post-brain species highly complex. With this the need arose for elaborate planning in terms of the body and its needs and functions and an integrated, efficient, coordinated and uninterrupted management of the growing capability complex of the body. Hence the need for a faster, more complex and proper mental system generated by the brain (instead of the reactive and unstable pre-brain mental functions) which would integrate the growing perceptual, observation, problem solving, decision making and execution processes of the developing body and simultaneously plan[21] in terms of the body and its needs and not the genes.

It is at that stage that in the brain genes through modification another department was added of mental templates or mental genes which programmed the brain cells to generate a repeatable variety of mental processes on a continuous basis, which would constitute an overall management system. With the emergence and development of brain made mental processes the cellular guideline or emotional process (mentioned earlier) got transferred to these mental processes. The genes now delegated to them the authority that existed at the pre-body reactive cellular level. The guidelines coming from the genes now began to operate through the mental emotional process produced by the brain cells as an advanced stage of the cellular emotional

[20] According to Bruce Lipton (2005) the cell membrane is supposed to have this *"receptor-effector"* (Lipton, 2005; pp.83-84) (which perceive environmental signals and generate appropriate life-sustaining responses) protein complex which acts as a switch, translating environmental signals into cellular behavior. And in his view this complex can not only read detected physical fields but also other undetected vibrational energy fields like thought.

[21] Planning which could not be done by the brain cells. The evolutionary agenda of the living body was to neutralize the failure to survive and the brain cells on their own could not pursue that agenda. The primary task of the brain was to provide the software for the stable and repetitive functioning and required modification of the body's various systems like reflexes, glands, organs, etc. And the basic character of these processes regulated by the brain was either neutral, as in the case of glands and organs which were supposed to perform certain functions in a certain way repeatedly. Or negative in the case of reflex processes because they were about what not to do. To address the problem of failure to survive however, more dynamic, creative, and a larger variety of mental processes were needed which could be repeatedly produced so that a proper developed structure of the mind could be made for addressing the problem of survival and of sustaining that survival on a more efficient basis.

process. Therefore, the mental emotional process became the focal point or the primary residence of the guideline process.

The contemporary brain cells of advanced animals and humans have, therefore, two software built into them by the genes. One, the software for the production of brain cells. Two, a nonbiological software for the making of mental programmes and processes, in accordance with genetic guidelines, which now start operating through the mental emotional process. It is the presence of this latter mental software in brain cells that distinguishes them from other cells in the body and connects the mental emotional process with the genetic emotional process (the guideline process in genes).

Now a word on how the brain cells would have started making mental processes through their nonbiological software. It could be that mental genes in some specific brain genes (involved in the making of microtubules) would have provided nonbiological guidelines to the microtubules (which are already being cited as a probable structure for quantum activity in the brain cells) whereby they could then through different ways harness and organize the nonbiological light quantum energy processes in their environment into different dynamic geometrical structures which would constitute a range of mental processes and functions.

The microtubules through evolution would have discovered how to separate the required building blocks of mental processes (pre-atomic light quantum energy forms) from other heavier energy forms[22] existing at that time and through evolutionary experience learned how to put them together to perform a certain mental function, which increased the capability of the specimen vis-à-vis the environment and improved its functioning. Then they would have begun to accumulate that experience and build on it. They must have started putting together those nonbiological building blocks in different formations to make more types of functions and then they learned how to insulate the different functions so that they do not become incoherent and diffused. Gradually some mental process formations would have acquired the capability to elaborate themselves and harness the stray quantum energy building blocks themselves instead of going back to microtubules every time a certain mental function or act had to be performed. That is how gradually a range of mental functions and processes would have evolved to neutralize the threat and failure of survival of the living form, the problem that the genes started out with.

So when we come to human beings then the entire gene-brain-mind complex reaches the peak of its structural and functional complexity. We find more than half of the total human genes being expressed in the brain and then the fact that there are 100.000 different kinds of neurons in the brain each of which contributes "*... to a different aspect of mental life.*" (Marcus, 2004; pp.71-72). These facts point to a growing quantity and variety of both brain and mental genes and their mental products in human beings over the course of their evolutionary history, especially after the evolution and maturing of language.

Conclusion

The proposition of the existence of mental genes as a nonbiological process within brain genes is a preliminary product of our inquiry and needs to be further explored and elaborated. In our view, a further exploration of this line of inquiry might provide some more clues for piecing together our understanding of the role of the genetic process in the formation of mental processes and the integral and complex connection between them. It would also enable us to see why mental processes have not yet been detected by our existing laboratory tools and methods, which currently assist us only in observing some correlations between brain areas and mental functions. Our mental processes probably operate in terms of

[22] Electron energy, gravity and magnetism would be existing at that time as possible candidates for building blocks of mental processes but in our view these were not harnessed for this purpose because of the unsuitability of their own intrinsic properties, especially the property of more mass (read more inertia). Considering that, there was a need for an even faster mechanism than the brain. In addition, in the brain we know that electron energy has already been harnessed in the form of small quantities of electrical voltages carried by ions for performing limited specific functions in cellular signaling. The involvement of the latter two energy forms (in the form of electromagnetic waves and quantum gravity processes) in the brain, mind and consciousness processes is being speculated but is not yet factually confirmed.

similar light pre-atomic quantum energy processes as the physically undetectable mental templates, which are responsible for their formation.

In the sequel to this paper we discuss how a variety of mental genes are responsible for making the highly developed human mental complex with its layers of programmes and processes. Moreover, how this connection dominates our mental processes and has created this conflict and contradiction within the mind between the gene based and dominated mental processes and those higher order mental processes which have gone beyond the confines or parameters of the genetic programmes. Some suggestions for resolving this conflict will also be shared towards the end of the paper.

We are fully aware that these papers do not encompass all the layers of complexity that are associated with this inquiry and are probably only touching the tip of the iceberg but they are at least an attempt to go into deep waters and should be viewed as such.

If some individuals decide to look into these ideas and concepts and develop them through a process of rigorous critique and disciplined intellectual and emotional inputs then in our humble opinion it will open up further areas of knowledge and inquiry both in philosophy and the sciences (natural and social).

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