Original Article

How Mental Genes Make the Human Mental Complex and Control Its Functioning: Transition From The Genetic Mind to the Intelligent Mind

Sadia Tariq*, Raza Kazim†, Iram Tauqir‡

Abstract

This paper aims to explore in detail the formation and functioning of the many-layered contemporary human mind by mental genes and the complex and elaborate problems the human mind has created both within and outside of itself due to the logic of its genetic formation. The existing mind of an individual is essentially an unconsciously formed gene-based mental complex whose formation and functioning is largely controlled and dominated by a two-way connection between his mental genes and mental processes. There seem to be two main varieties of mental templates or mental genes in human beings and numerous specific sub-types within each variety. One, which contain the template for lower order mental functions (habits, temperament, basic emotional positions, motivations and agendas, and self-centered intelligence) which we share with animals and other living things. The other which do not contain the template for a specific function but only the template for a higher order mental capability (say of complex reasoning and intellectual processing, and developed sensitivities) unique to human beings and which is concretized through a highly developed and on-going learning process. The existing gene-based mind of man is an evolved product of the dynamic and interconnected functioning of all the varieties and sub-varieties of mental genes and brain processes, in a many-sided interaction with the environment. In addition, in our view our mental processes and their experiences have a communication process in place with our mental genes (at the nonverbal and unaware level) and the capability to modify them. The primary motivation behind our inquiry is to incrementally replace the existing unintelligent mental software and programme in our mental genes, with an intelligent process/system (for the making of mental processes) not controlled by the genes but by our advanced intellectual and emotional processes so that we can intelligently cope with and find long-term solutions to our problems.

Key Words: human mind, mental gene, intelligence, genetic mental programme, mental experience, evolution

NeuroQuantology 2010; 2: 237-259

Introduction

Today, more than ever, one needs to cut through the many-sided and many-layered complexity of contemporary human life and get down to the bare bones so as to get a more clear picture of the current human state. This paper is one such attempt. Its aim is not to provide definite answers or solutions but to raise more questions, issues and maybe new lines of inquiry, which can enable us to, as Theodore Zeldin (1996) says,

Corresponding author: Sadia Tariq
Address: Sanjannagar Institute of Philosophy and Arts, 13, Gulberg 5, Off Zafar Ali Road, Lahore, Pakistan
Phone: +92 42 35712193, Fax: +92 42 35711528
e-mail: sadiatariq16@hotmail.com

change the spectacles through which we look at the world and ourselves. The main proposition of this paper is that the fundamental causation of contemporary conflicts, contradictions and problems within an individual and in his outer life lies in the existing mechanics of the working of his mind, based on a deep-rooted and very complex two-way connection between his genetic process and his mind. The innumerable causes that are currently in vogue are in our view the secondary causes which emanate from this fundamental cause. It is the ignorance, neglect or half-baked knowledge of this that adds to these current conflicts in our lives and also breeds the illusion of mental autonomy and free Will.

Contemporary man has so far been looking for the roots of his problems and conflicts primarily outside of him[2]. Sometimes in the innumerable social (political, cultural, religious and economic) formations which have evolved during the period of civilization. At other times in the malfunctioning of the minds of other individuals. In the breakdown of morals, ethics, rules, regulations and laws. Then in material and technological progress which has made man's interaction with the environment exponentially complex, volatile and beyond his control.

We are not denying the involvement of any of these factors and their interconnections in our search for the roots of our problems. In fact the current complexity of human conflicts and problems and the numerous shapes and forms it has acquired today would not have existed without these factors and the innumerable permutations and combinations ensuing from each one of them (which we are not mentioning here). However, our plea is that entangling and occupying ourselves totally with these factors is not going to provide a long-term and serious resolution of the problems which plague us today. We need to emotionally and intellectually grasp the urgency and logical necessity of exploring another indispensable and fundamental factor that we have so far neglected—the role of the genetic process in the formation and functioning of our highly sophisticated and apparently autonomous mental complex and in making us what we are.

Today there is no dispute that man's genetic network in a complex interaction with the environment has given birth to his mind and we are continuing to unravel the details of how this process actually takes place in its specifics. However, most of the reigning ideas and concepts about the connection and relationship between the genes and the mind of human beings propose an indirect and somewhat vague connection between the two processes. The vagueness in our opinion could be the result of two factors. One, the fear that if we accept a significant role of genes in our mental life then we will need to say farewell to our cherished notions and concepts of mental autonomy and free will, which are what make us human. Two, the tons and tons of major and minor facts that we are continuously discovering about the complex structure and functioning of the genetic process, especially the human genetic process and how it makes the human body and mind, which challenge any simple and linear causations and correlations between our genes and mental processes.

The drawback of this situation is that we keep looking for causes and solutions to our problems only at the level of our mental behavior[3] i.e., in terms of ideas, instead of going down to the fundamental mechanics of how these ideas are produced, what are the limitations and constraints on them, which today are obstructing us from seriously addressing our problems on a long-term basis. There is a jungle of ideas today pertaining to all our problems ranging from simple and crude ideas (related to ones day to day strivings) to extremely complex,

[2] Distortions, disorders and conflicts within the mind, personality and body are viewed as consequences of external influences and complexity

[3] The problem is that we tend to stay at the manifest or as Steven pinker says the *"proximate"* (Pinker, 2002, p. 54) causes of mental behavior instead of going down to the fundamental or 'ultimate' causation. According to Steven Pinker the proximate cause is the *"… mechanism that pushes behavior buttons in real time,…"*(Pinker, 2002, p. 54), while the ultimate cause is the *"mechanism that shapes the design of the organism over evolutionary time"* (Pinker, 2002, p. 54). In this view of the matter the proximate causes of our aggregate mental state could be the complexities and perversities of our ideas and the innumerable environmental/circumstantial factors but the ultimate cause has to be internal, in terms of the design of our mental complex and its numerous departments as it has evolved over the course of human biological and mental evolution. To understand this design we need to zero in on the genetic process.

sophisticated and esoteric ones (which constitute schools of thought like idealism, existentialism, etc), which are in turn intermingled with and driven by our false (half-baked) ideas about ourselves, our experiences, human life and Nature. In this flood of conflicting ideas, there is no clear direction of how to proceed towards real and long-term solutions. Up to now man's predominant response to this situation has been of reconciling and resorting to micro level piece meal doing to resolve his problems in the short-run. This in turn has been creating more emotional confusion and conflict because that doing is both short-lived and has unpredictable backlashes due to man's failure to fully anticipate and grasp its larger consequences, repercussions and interconnections with other issues. So this situation is taking man further away from the doing that is required for actually resolving his problems.

In this scenario, we are suggesting another way of looking at this problem which is of dealing with it at the fundamental level. Mere ideas about Economics, Politics, society, arts, culture, etc and debating, contending and confronting each other at the level of ideas will not lead to a real and long-lasting change. The human problem has become so mature that it needs to be tackled at the root level where it is an issue of achieving a different mental mechanics within ourselves. At present our basic emotional process, our intelligence processes (tool of the emotional process) and their products in the form of our ideas, feelings, habits, temperaments, etc are corollaries of our unconsciously evolved genetic mental software and programme and their functioning is still dominated by them. Here we would like to dispel the impression that we are propounding strict genetic determinism and hence a kind of fatalism in relation to our genes and minds. No! we are not. We are only saying that the role of the genome in the making and functioning of our minds needs to be unraveled further so that we can understand our existing mental processes and their problems more deeply and are able to redesign and restructure our genetic mental patterns and their products under the guidance of our higher order emotional and intellectual processes. So that we may gradually, through quantitative steps and stages, replace the genetic foundations of our mental processes with intellectual foundations.

1. The general nature of contemporary human mental problem

During the four million years[4] of human history right before man created a variety of complex social formations, which marked the beginning of the period of civilization in human history, he only experienced the problem of his relationship with the external environment as a consumer. His time was divided between two main activities. One, trying to fulfill his basic biological needs of consumption from the environment. Two, avoid becoming an object of consumption himself. The making of tools and weapons in that period was mainly driven by these two activities. Given the clear and limited scope of his two-fold agenda and the relative (compared to the post-civilization period) simplicity of his needs and external environment his emotional and mental make-up was also simple and straightforward. Consequently, he did not experience any deep or serious problems of his inner mental make-up; there were no internal conflicts and contradictions so to speak. Gradually however, we know that his life and problems became much more complex due to his growing needs, intelligence, tool making capabilities and the development of language but their fundamental character remained the same.

After man went beyond the stage of hunting and food gathering and entered the period of settled farming, agriculture and then cities the human problem no longer remained simply of taking directly from Nature through one's own physical (hand, mouth, legs, arm, etc.) capabilities but acquired another dimension. Man became dependent on man-made means (a product of his knowledge and its application) for taking from Nature. A process which gradually required him to construct elaborate social relations and structures of cooperation and competition to support, nourish and strengthen this process of dependence. Apart from a dynamic and fast transforming external environment, a major

[4] Around four million years ago, in Africa, *"… our apelike ancestors ventured onto savanna landscapes…"* (McNeill, 2003, p. 9).

consequence of this shift to mental means of taking from the mere physical means, was the evolution of a complex and many-layered emotional and mental life of man. Which meant a growing list of emotional and mental needs in addition to simple physical needs of food, shelter, etc.

In the pre-civilization period, man's failure to take enough from Nature was primarily due to the inadequacy and limitations of his nature made (physical) capabilities of taking. However, in the period of civilization there arose two levels of failure. One which he shares with early man and animals; the problem of physical consumption (this includes all basic physical needs) of the majority. Although the causation for it has become different in our case. It is no longer the physical incapability of man to take enough from Nature but the structure of human society and the human relations within it which obstruct an optimum utilization of man-made means for solving human problems and instead promote their limited and irrational[5] use. The second level is shared neither with early man nor animals. And that is his failure to meet the exponentially grown mental list of desires and requirements which results in his experiencing myriad forms of emotional and mental deprivation, for example, numerous shades of frustrations, jealousies, greed, gratification, subtle forms of enmities, confusions, ad infinitum.

As the complex and unclear emotional and mental experience of failure to meet ones growing emotional and mental needs became a dominant experience in the human mind over and above the clear-cut and simple physical experience in the case of basic physical needs man began to create elaborate thought systems like morality, ethics, value systems and religious dogmas[6]. These were a manifestation of his submission, resignation and acceptance of his deprivation and at the same time a tool for him to cope with the life he had created both within and outside of him. During this period he began to construct completely new forms of relationships with other people, which were essentially adversarial in nature. Any cooperation and harmony was for a limited purpose and only the surface layer. A fall-out of this adversarial relationship with other individuals was the perversion of his relationship with his own self; between his emotional, intellectual and physical structures, which became colored in the dye of the complexities, complications and perversities he had achieved in his ideas.

To sum up, man has travelled a long way and has made tremendous progress both on the positive and the negative side. Observing the exploded growth of his mental and emotional life and its manifestations in terms of an extremely complex external life, one can say that man's contemporary problems are principally those of his ideas and understanding (about himself, life, Nature, his experience of his problems and their solutions) and not of outside Nature. But unfortunately a long-term and rational solution to these problems cannot be found merely at the idea level. For that one needs to get down to unraveling and comprehensively grasping the mechanics of one's mental complex and discovering how to change these mechanics. This is where the genetic process needs to be zeroed in on. The reason is simple.

While man continues to be what he is so far, it is his genetic process which has largely shaped him. We propose that most of his ideas are a product of thousands of years of genetic domination of his mental processes and even his intellectual and other higher order mental processes have also been operating mainly (although they have ventured beyond the genetic confines or parameters) as tools of the genetically dominated mental processes. Everything he does is traceable back to the logic of the mental functions and capabilities he was genetically programmed to produce coupled with the specifics of his circumstances. His idea and mental processes as they have been and are operating (having produced his history, its facts, his problems and their solutions) are nothing more than the manifestation of the logic of the genetic programming of his brain cells to produce the required mental processes needed at every stage of his life in order to ensure the

[5] When they can be used optimally and one stays below that level due to the resistance and inertia of existing individual and collective patterns of their existing usage.

[6] With time he also began to discover how to systematically violate these moral, ethical and religious constraints on his mind and body, which added further to the complexity of human existence.

survival and continuity of his existing biological form. Even the creative record of man should also not be ascribed to his developed and apparently autonomous emotions and ideas only, because the tendencies of those creative emotions and ideas are a product initially of his mental genes coupled with the specifics of his environment.

2. The types and layers of mental genes and their role in the making of the different layers of the human mind

There are two main types of mental genes that we are proposing in this paper---lower order mental genes and higher order mental genes. The mental gene of each type is itself in three layers. The upper or top layer contains the template of ideas (in both post-language and pre-language human mental processes). The middle layer contains templates of temperament, habits, habitual preferences and lists of likes and dislikes. The lowest or deepest layer contains the template of survival.

The first type contains the function code for producing specific and basic lower order mental functions like simple and clear-cut perceptions of specific objects, processing (*includes problem solving*), memory, habits, basic emotions and responses related to survival. The functioning of these lower order mental processes is like a reflex response mechanism based on a relatively rigid genetic programme constituting reflex type mental response patterns to stimuli made and modified over a period of time. In animals this programme coupled with a biological clock is sufficient for their entire life. In our case this programme becomes very elaborate and gets modified especially in interaction with our post-language intelligence and other mental processes. Our ideas, emotions, temperamental responses and habit patterns, evolved to deal with and survive in a complex man-made environment and although they may seem very complex compared to the ones present in animals but they operate very much like reflex processes. That is why we are connecting them with lower order genes.

The higher order mental capabilities and processes (intellectual process and developed sensitivities) in human beings are not encoded in the same way as the lower order mental functions (which are more dependent on the programme). In their case the mental genes (in the neurons which make the frontal lobe or the prefrontal cortex) contain instead of a linear and limited function code a flexible capability code (only their capability is coded and not their application) in accordance with which the software for their functioning is made and modified during the real time learning process in human beings. This capability code does not include mental processing paradigms. Those we learn as we grow up; how to reason, how to correlate cause and effect, how to manage that correlation from one mental item to another.

The lower order mental genes in human beings, we can say, make our modified genetic mental program (a developed form of the animal genetic mental program) and the higher order genes make our semi-intelligent mental process which has gone beyond the genetic programme framework but is not yet a mature intelligent process and only gives us the illusion of mental autonomy.

In the case of simple lower order mental functions and processes there is no need for a stable or continuous mental function. Neurons capture quantum phenomena and put them together in the form required for performing that function and afterwards that structure is dissipated. So one is left with just the mental template. So these functions arise from time to time and from occasion to occasion and as long as the biological structure stays intact the function template can be used again and again to generate the same function as and when required. This is why probably these simple functions do not require an elaborate storage system or memory. These functions belong more to the animal kingdom and have their human counterparts also in the form of those mental functions which we share with animals

To illustrate the functioning of these lower order mental functions let us take the basic emotion of fear. The template of this emotion lies in the mental gene but the specific emotion of fear as a mental function (a particular organization of quantum

energy) arises on a specific occasion and time and then dissipates because the animal or the individual does not experience that emotion all the time.

In the case of higher order mental processes when their developed capabilities operate at a complex level then the mental products they generate have to be stored because they have to be reprocessed during the individual's learning process and one keeps coming back to them. For instance a developed emotion say of love or respect or concern or subtle enmity or suspicion or higher order sensitivity towards the human state would not dissipate but would remain operative at some level and continue to grow and develop. So that would be stored for continuous reprocessing because one would keep coming back to it. Moreover its development and elaboration would not be in accordance with any programme so there won't be any fixed or repetitive functioning in its case. That emotion will keep becoming different with time as one's experience and learning process develops and one acquires an increased memory[7] fund of abstracted knowledge.

So these higher order mental processes are clearly not a simple reflex-response process as their software is made and modified in real time through the learning process. The learning process is also a capability whose basic code is in the genes but one goes on developing it. So in a sense one is modifying the mental gene, the template which codes for this capability. One is carrying out genetic engineering so to speak depending on what one chooses to learn and do for better or for worse. This modification is not at present physically visible within the gene but is manifest at the level of physical changes in the synaptic connections and other physical changes in the brain. The genetic programme for these higher mental processes is only the initial programme so it has a lot of flexibility and one can go on adding to it, supplementing and developing it, one can teach oneself new capabilities.

However, what actually happens within an individual is that the genetic mental programmes remain dominant and the higher mental processes remain an appendix of it. When an individual is growing up he just builds upon his in-built or programmed mental capabilities and functions. His growing and developing responses are largely determined on the basis of the preponderance of his genetic mental outline and are not deliberated. This is how he discovers his life agenda, ambitions, priorities and preferences.

Some of our mental genes carry outlines of emotional tendencies and inclinations and some our mental or thinking outlines and these are all filled up through our responses, where the basic logic of those responses is coming from our programmed emotional makeup as a part of our mental genes. Once our emotional and other mental modules are made then the whole plan of our life is made. Then our time and energy resources all get connected to them and when we are able to verbally integrate them and identify them with ourselves then that completes the picture of the human being within us. That is the personality which we know and through which we are identified by others. It is primarily a product of our genetic mental programme and not the higher order mental processes.

At this point we would like to clarify and elaborate the concept of a genetic mental programme as distinct from the known concept of a genetic programme in current scientific literature. The genetic programme is considered to be a part of genetic information, i.e., it is viewed as a set of instructions written in the alphabet of nucleotides (A, C, T, G). In addition, it is supposed to sequence genetic activity. This is illustrated in the Evelyn Keller's (2002) book 'The century of the gene' through an example of the genetic programme of a plant. There is a 'master' programme (plant as a whole) which is made up of subprogrammes (bud development, leaf development, stem development, etc). And each subprogramme

[7] In human beings we find different types of memories distributed in different areas of the brain. We know today that memory is in layers and every specialized learning process has its own specific *"memory store"* (Marcus, 2004, p. 103). And in our view the memory store of higher mental processes is capable of storing quantum information. The possibility of this exists if we take into account in an important insight shared by Psychologist Randy Gallistel. According to her *"… a mechanism suited to store or convey one kind of information is equally well suited to store or convey any other kind…"* (Marcus, 2004, p. 101). If that is so then in addition to biological information there can be storage of quantum information in our higher order mental memory store.

specifies a special task to be performed, i.e. it contains a list of cellular instructions or commands (divide tangentially with growth and so on). This genetic programme (encoded in the genetic material) is also different from the developmental programme which might be located elsewhere outside of the genome and which is increasingly being viewed as more complex than a set of instructions written in terms of nucleotides (Keller, 2002). We find a variety of views and theories on how the two programmes interact in a dynamic manner to give rise to the biological body and mind of animals and human beings.

The mental programmes of animals and human beings are considered a corollary of this main genetic programme and its innumerable sub-programmes made up of infinite nucleotide combinations and permutations. The issue is that we are not denying that mental programmes of living forms are a part of the overall genetic programme but in our opinion they are specifically a product of a variety of genetic mental templates lying within brain genes which are not written in the form of nucleotide bases but the different sequences and combinations of light quantum energy building blocks.

Let us try and explain the broad structure of this genetic mental programme of an animal. There would be a 'master genetic mental programme' (which would have the template for the mind of an animal as a whole) just as there was one in the above example of a plant. This would be an aggregate or composite programme (not existing on its own and in some particular part of the brain) to ensure the continuous and smooth functioning of the mind as a whole. Then it would have sub-programmes which would contain the templates for the different mental functions and processes like perception, cognition, data processing, emotions, execution, etc. Each sub-programme would specify in the form of specific instructions a special task to be performed (either on a proactive basis or as a reactive response). And these specific instructions keep becoming complex in developed animals and in human beings as more programmes within the sub-programmes are evolved (for example, within the programme of perception there would be separate programmes for all the five perceptual senses and then a separate programme for non-sensory perceptions and so on). In many instances, these instructions no longer remain specific or clear-cut, especially when we come to the modified genetic mental programmes of post-language man.

The genetic mental programmes are made over a long period through accumulation of specific perceptions correlated with specific needs, specific conclusions/results of processing (problem solving and emotional processing) and then specific responses. Genes would have made these programmes first through evolving a micro cognition and response capability at the genetic level and then after accumulating a sufficient number of relevant cognitions and gathering bits and pieces of responses over tens of thousands of years they would have proceeded to work out a programme to express those responses in the light of the problem of replication. That is when programming for templates and templates for programmes arose. After that the genes went on developing and adding more packets and bundles of functions with division of labour and gradually a multi-layered genetic complex was created which today makes and runs innumerable genetic, biological and mental programmes which constitute a proper management system for coordinating the entire biological, neurological and mental complex of animals and human beings.

Incidentally in advanced animals and human beings we find most of their genes involved in making software and programmes for this sophisticated management system which was evolved to manage their huge biological and mental complex. Probably that is why one finds the human genome consisting largely of non-protein coding regulatory architecture and only three percent (Pinker, 2002) of protein coding genes.

3. The basic character of the genetic mental programmes and the emergence of an intelligence based mental mechanism in human beings

Following are some necessary characteristics of the genetic mental programme. It operates at the level of the specimen, which means that it looks at the world from the standpoint of the specimen so it is at the outset an adversarial programme of that specimen versus the rest of the world. Its parameters are that of the physical being. It operates in terms of specifics and was evolved to address the specific biological needs and problems of a specimen of a particular species. So its main purpose was and still is to ensure the biological survival and efficient functioning of the life-form. It only operates in terms of those realities that are repeated or recurrent. Any variation leads to the inadequacy of the pre-existing design of the programme, which then becomes incapable of handling that variation and breaks down. So then, there is set into motion a process of modification of that programme through the evolutionary process. Successful modification leads to selection and a failure to modify leads to rejection.

In the case of developed animals and then human beings, we find these genetic mental programmes and the mental processes and functions they produce becoming more elaborate, complicated and at the same time more efficient in terms of coping with their dynamic external and internal environment.

In human beings with the emergence of post-language intelligence and other higher order mental processes, and the corresponding layer of higher mental genes another phase of going beyond the programmed process begins in Nature. In addition to the programmed mental mechanics we find the emergence of intelligence based mental mechanics.

Before the inception of higher mental genes 'capability mechanics[8]' had developed through evolution and in fact it was these mechanics which made the emergence of higher mental genes possible. After the beginning of language higher mental genes would have started developing and they must have played a vital role in the maturing of language. With language developed the capability of reasoning i.e., correlating cause and effect, which could not function on the same perception-response basis as mental programmes. In the case of mental programmes perception and response was in terms of specifics; there was specific perception of a specific object which was correlated with a specific internal need and then through processing a specific response was generated; a programme works in terms of specifics. In the case of reasoning one needed a much greater perceptual fund and that too of generalizations and not just specifics, so then the capability of abstraction had to be evolved. These growing abstractions then enlarged both quantitatively and qualitatively the fund of perceptions. So language based abstractions became a tool for semi-intelligent (not sensory) perception, for which reasoning became a tool. These became the new mechanics apart from programme mechanics. But as is always the case, before the maturing of the new the old and new remain side by side in a tug of war.

The maturing of mechanics means that a set of mechanics matures its design and construction, wherein its components are functioning properly, additional components are being added where required and the design of some components which are found to be inadequate is modified while the designs of other components are also improved. This is the process through which a given set of mechanics mature.

It is through the above process that the maturing of the new higher order (non-biological) mental mechanics of mental genes has to take place. Actually non-biological or non-molecular mechanics were employed when the mental genes were made but in the lower order mental genes their separate identity is not yet crystallized. They are very strongly tied to the biological processes. It is only in the higher order mental genes and the mental capabilities they generate that we see these post-biological mechanics acquiring a separate existence and emancipation from the constraints of biology.

When we come to advanced mental genes and higher mental capabilities then biology has fulfilled its role in evolution; the role of biology is exhausted. Which means that the further development of these

[8] The specific non-molecular process and mechanics through which flexible mental capabilities could be encoded.

capabilities and their modification will not have to go through a biological process. Now we are in the realm of post-biological process and mechanics. So instead of using the biological mechanics of neurons (in the cerebrum or the frontal lobe) we will be using their post-biological capability to produce and harness those energy forms which are the constituents of advanced mental processes. And then make mechanics out of them for the further development of these advanced mental processes in the form of advance cognition, execution, a qualitatively advanced capability of handling complexity. We must keep in mind that biological mechanics have a lesser capability of coping with increasing complexity because they are dependent on heavier and cruder mechanics. Just as in computer chips we gradually learnt to use more efficient and lighter mechanics when we began to put thousands of circuits or transistors on a chip and make modern ICs, similarly we can see the greater capability of the post-biological processes to handle complexity compared to the biological processes.

These higher order mental processes emerge with the beginning of civilization and developed language. That is why the origins of all religions are dated to that period. At that time a lot of changes took place not only in mental genes but also in mental capabilities and functions.

To sum up, mental processes and their respective mental genes must not be seen as one phenomenon. They have to be broken down into compartments or layers where each layer corresponds to a particular stage of the evolutionary process in living things. The evolution of the modern human mind has gone through many stages and a thorough examination will reveal the continuity of logic and the discontinuity of form. We have not just inherited one layer of mental genes but the entire evolutionary framework or history of the mental genes. Just as we share our biological genes and their products like neural signals and other molecules with living organisms a billion years old, even with bacteria (Marcus, 2004). So we have within us the mental genes of animals, cave man, third century B.C. and tenth century A.D. man and then modern man. And if we look deeper within ourselves we will also find the pre-big bang energy forms within us. This is how we can see a continuity of the process and a discontinuity of forms.

Our focus is on higher order mental functions and processes because they are not only the most advanced processes in Nature but the full potential of their capabilities of perception, cognition, data capturing and execution in evolutionary terms is also not yet known. It is the intelligent understanding and knowledge of this area, which will enable us to change our mental genes and their programmes and to go beyond them into post-genetic territory.

Before being able to intelligently intervene and make changes in our genetic mental programmes made by mental genes we need to understand the existing steps and stages of how at an unintelligent or unconscious level, experience (physiological and mental) has been modifying the mental genes, the genetic mental programme and consequently the mental processes of advanced animals and human beings.

4. The unconscious and unobservable process of evolutionary changes in the design of mental genes and their products through mental experience

According to neo-Darwinian theorists genetic mutations are the main source and raw material for evolutionary change as it is the accumulation of advantageous mutations (that lead to more reproduction of those offspring which are fitter than their parents) which result in the evolution of new species with a changed physical structure and new functions and capabilities. The main cause cited for these mutations is the random occurrence of errors during DNA replication which in turn are attributed to radiation or other harmful chemicals.

We agree that the manifest physical changes, whether through a gradual process of change as proposed by the Darwinists or the punctuated pattern proposed by some paleontologists, are caused by changes at the gene level but in our view random mutations cannot explain the entire process or mechanics of evolutionary change. There has to be the involvement of another source with its own mechanics along with the currently

known sources that generate physical mutations in the DNA.

Quantum fluctuations or the quantum nature of the genetic code is considered a possible source by some researchers and scientists. In fact, Johnjoe McFadden (2002) also elaborates the process through which quantum processes at the level of hydrogen bonding between protons and electrons in the DNA bases would be modifying the chemical structure of the DNA molecule. And then he goes on to propose that living cells and even organisms like bacteria would have learnt to exploit these quantum processes to perform directed actions. This brings to light in our view the age-old debate between random and adaptive mutations. We agree with professor McFadden when he says:

> *"…Whatever their mechanisms, adaptive mutations appear to be able to bias the mutational process to favour certain genetic changes."* (Mc Fadden, 2001, p. 78).

All mutations which are responsible for evolutionary changes cannot be assigned to a random process. Along with random mutations there would have been some adaptive mutations, which would have been responsible for some genetic changes. Otherwise how do you explain Cairn Smiths E.Coli cells experiment in which *"…a starving cell could sense that it was starving and somehow choose the gene it needed to mutate to save itself from starvation …"* (McFadden, 2001, p. 78). Or the capability of a fish to change its gender *"… according to the presence or absence of a large dominant male…"* (Marcus, 2004; p. 166-167).

The above underscores the need for bringing into the evolution debate the role of the organism and its mental processes, which has so far been ignored and branded as 'Lamarckism'. We have so far been rejecting the evidence of this role in the form of adaptive mutations because it challenges the central dogma of genetics and because we have not been able to discover and understand the mechanism through which this process takes place. So instead, we try to somehow explain it within the neo-Darwinian framework of random mutations and natural selection. While in reality because we cannot as yet grasp this process through our existing conceptual and laboratory means and methods so we call it a product of random mutation processes and consequently shut the doors of any further inquiry into it.

While acknowledging and humbly accepting how much more we need to know in this area we would like to share another possible explanation of this process, which will not only explain the phenomenon of adaptive mutations but also trace the probable mechanics of how evolutionary (qualitative) changes have been taking place both at the physical and mental levels in living things.

For purposes of convenience we have divided the explanation of these mechanics of evolutionary changes into three broad compartments because of slight differences in detail although the basic steps are the same in all the three cases. One, the evolutionary changes in pre-brain living things. Two, post-brain species. Three, evolutionary changes in human beings which since the Neolithic period are happening primarily at the mental level and not physically.

The process of evolutionary changes in all living things is triggered in consequence of a mismatch between the changed external environment and the pre-existing body design, and capabilities produced by the genetic process of a living thing. The changing external reality requires that the living thing changes its design in order to cope with and survive that changed reality. While the living thing due to the in-built inertia in it wants to preserve its existing form and its pre-existing design. This tug of war at some point of time reaches a crisis situation which is a do or die situation. The living thing has to either adapt to the changing environment by modifying or changing itself or disintegrate.

At that stage the pre-existing body and its rudimentary mental functions begin to experience the difficulties, stress and pain of this situation. This pain is derived by the mental component of the gene which actually experiences the need to change. The body has no 'concept' of changing itself, it is only this mental component within the gene

which experiences the need to change the body so that it can cope better with the changing environment. Thus the template of change (of the body) is designed within the mental component of the gene channelized by the cellular guideline process, which does not suggest a design but leaves that process to the selection and rejection of the different permutations and combinations of experience and their intensity which determines the design changes that are required. The design constructed through this process within the gene is then implemented by other biological genes which make the different proteins for making the body. So the physical changes that we see in evolution are a manifestation of this internal process which originates within the gene and then interacts with the biological process to produce these changes[9].

Actually this internal process is a distinct general characteristic of all living phenomena. Unstable actions and reactions take place internally within a phenomenon as a result of its on-going interaction with its environment which generate the need to resolve those imbalances, arising out of those reactions, by being proactive vis-à-vis the environment. It is this inherent capability of being proactive which then leads to the formation of a growing response system in living things (which gradually develops capabilities of perception, cognition, problems solving and then responding at various levels) to enable the living thing to keep pace with its continuous and dynamic interaction with its environment.

With the making of the brain process in advanced animals and human beings and then the evolution of mental genes to make and manage their growing mental functions and capabilities we find the above explained process of evolutionary change becoming more complex and elaborate. Now the steps of evolutionary change become something like this. As the mental processes and capabilities of advanced animals and human beings develop and interact in a dynamic and complex manner with the biological processes, the mental experience becomes of vital importance for the genes because it becomes a part of the environment within which they have to survive. The experience of pain or dissatisfaction in the intelligence and emotional processes is transferred via the already existing connection (there is a kind of quantum entanglement between the emotional processes at both levels) to the mental gene which registers that pain and dissatisfaction and then retransfers it to the mental emotional process, where the guidelines now function at the operational level.

The mental emotional process then communicates back to the gene its evaluation and judgment on the relevance, intensity and nature of that experience and then also gives directions on how to cope with it through employing the problem solving and other mental processes, which then give inputs for making the appropriate changes at the design level. This entire process does not take place at the same level of our verbal consciousness wherein we do problem solving and planning regarding a certain task or achieving a certain goal but largely at the level of non-verbal mental processes, which operate at the unconscious level where the concrete mechanics of design changes in genes are carried out.

As mentioned before at the stage of simpler living organisms when mental and emotional processes were not so developed this step of their inputs guiding the genes could not take place. There it was largely the cellular reactive process which signaled to the gene what was suitable and unsuitable at the level of simple experience but did not give input in the design process. In this case the emotional and other mental processes give the gene its conclusions and the mental gene then modifies accordingly its genetic mental programmes and also instructs the biological genes to change their biological programmes and templates. Which eventually leads to physiological changes that we observe.

Now these modifications in the mental genes, mental processes, biological genes and then consequently biological processes depending upon the mechanism available in a particular case can either be implemented in the process of reproduction

[9] In our view, the time factor in the manifestation of physical changes is variable. The changes can manifest in the next generation(s) or in cases like E. Coli or the fish which can change its gender, within a specific period of time depending on the intensity of experience and also the nature of change required.

and manifest in the next generation, or they can be applied within that same specimen during its lifetime. It is the intensity of mental experience of pain, failure, dissatisfaction or unhappiness (in the case of human beings) which determines the extent, level and type of modification. There could be one type of experience with a certain intensity which would modify the mental template but is not able to change the DNA template so one cannot detect that modification. Another type of experience might be of a magnitude that it is able to not only modify the mental template or gene but also interfere with the existing DNA code or protein template and change it so we are able to observe the changes at the physical level and call it evolution. Then there might be some modifications which might not affect any template and are therefore of no consequence. These might be those 'neutral mutations' which are neither beneficial nor harmful. There can be some mental traumas or stresses that may affect the genetic mental programmes and consequently modify the functioning of certain mental processes while others might also affect physical functions. The discovery of links between certain types of mental stresses and cancers is an example of the latter case in which mental pain, stress or unhappiness results in a harmful modification of the DNA template which in consonance with other factors becomes responsible for a certain type of cancer.

The purpose of the above was to make a distinction between evolutionary changes or modifications which through accumulation change the genetic design and physical structure/architecture of a living form, and insignificant modifications which do not result in a qualitative change of genetic design and consequently physical structure/architecture. In both cases the process of evolutionary modifications is a consequence of the many-sided interaction between the external environment, mental processes, brain process, mental genes, biological genes and biological processes. There is a kind of a larger feedback loop of all these processes and then smaller feed-back loops among the different processes within that larger loop which pool into it their inputs. This whole process is what is responsible for what we call evolution in living things.

So by now one will also be able to see the integral and indispensable connection between mental genes, mental processes and biological evolution. An area which was neither explored by Darwin nor is it the focus of attention of the present day neo-Darwinists, who today have far more knowledge of the genetic process and biological evolution and also consciousness and mental processes. The knowledge from both these areas needs to be combined and used for reconstructing the picture of biological and mental evolution of living things, especially of human beings and their mental processes, which are a link in the earlier evolutionary history of living things and also a break from it.

The post-language intellect and the emotions and sensitivities that have interacted with it and consequently developed have added another dimension to human evolution. With evolution of human beings, especially post-civilization man the evolutionary changes are no longer at the manifest physical level but have acquired a mental form. When the human body and brain reached an optimum biological design in human evolution then from there onward human evolution took another route, i.e., of mental evolution. Thereafter human history is a story of the evolution of mental genes and mental processes. So unlike the Darwinian concept, evolution cannot be confined to the observation of physical changes and limited by that. Now evolutionary changes and modifications, specifically in human beings, have to be observed in mental genes, genetic mental programmes and mental processes.

In human beings, these programmes have been evolving in layers through growing mental inputs of the developing mental processes of human beings. Gradually leading to the emergence of a layer of genetic mental programmes (made by one layer of mental genes) for reading the inputs from perceptual organs and making equations out of them with reference to the characteristics and needs of the existing response system that reflect our inner contradictions. Then there arises another layer of programmes-those which evaluate the mental reading of these perceptual inputs to draw conclusion about whether they are relevant or not. Then

the programme of how to go about it if they are relevant or to discard them if they are irrelevant. At this stage one will note that these programmes are being developed on the basis of mental inputs and not just one's internal biological contradictions, which produced the response system in the first place. So one finds a very dynamic two-way relationship emerging between one's mental genes, the programmes written in them and one's mental processes. As one keeps getting mental inputs one produces corresponding programmes and incorporates them either in new mental genes or modifications of existing mental genes. These then generate further layers of mental processes, whose inputs again go into developing and modifying the mental genes and genetic mental programmes. So again a kind of an interactive loop emerges in which both levels of processes develop and modify each other.

The human temperament is a by-product of these mental processes, which are generated through this interactive loop between mental inputs, genetic programmes and mental processes. It consists of those mental processes, which are not directly related to one's original response programmes, which are about resolving biological contradictions. So it is a kind of a secondary layer of one's mental response system which also gets incorporated in one's mental genes (the second layer of mental genes mentioned earlier).

Thus human beings develop this dynamic mental capability of making new mental templates or genes for the stable functioning of new mental processes, functions and capabilities and modifying existing mental genes (at the unconscious level). This process at a parallel level is also constantly in a state of interaction with your external environment and your biology. On the face of it, it seems that these modifications have totally changed these mental processes but actually their basic character or initial logic remains the same because the mechanics through which they are emerging is still connected to the unconscious and reactive response mechanism of mental genes (lying in brain cells) and brain genes (which produce brain cells). Which at some stage or another leads to a major inadequacy of the existing genetic mental design to cope with life. So human specimens have to then go through a lot of pain, unhappiness, stress and rejection to make a transition to a new mental architecture.

At this stage, the process of forming a new architecture goes something like this. We had mentioned earlier the three layers of the mental gene---top layer that has the code for ideas and other mental processes, middle layer for temperament and habits and a list of likes and dislikes and the lower layer for survival. When the developed human mental processes begin to experience the pain, unhappiness, frustration and dissatisfaction of the inadequacy of their pre-existing genetic mental design to cope with the exponentially changed external and internal reality of human life then gradually that experience begins to accumulate until it reaches a stage where it begins to threaten the genetic system as a whole. At this stage this experience of failure and crisis is first communicated to the top layer of the mental gene, which then gets modified in the sense that it incorporates that experience as its own and not as something alien or external. Because at this stage within the mental gene the two layers of survival and temperament[10] become opposing forces, and depending on the intensity of the experience of the crisis if the motion of the survival force is stronger than the force of temperament then the mental gene incorporates the ideas and suggestions of change coming from the mental processes in its top layer. This top layer then teams up with the survival layer against the layer of temperament and habit. And together they are able to succeed and the pre-existing temperament and habits fail. Then a new template is made in the mental gene which then produces a new mental process and architecture, which is able to successfully adapt and cope with the changed reality.

The problem with this unintelligent or unconscious process of modification and evolution is that the individual has to wait until the shortcomings of that design in the fullness of time and experience result in a crisis of the general genetic process. And

[10] Before the threat of the disintegration of the genetic system both these forces are not in opposition but promote inertia and stability of the individual.

then the above process is unleashed. Before that the ideas about change are only seen by the mental gene as alien and external. So it resists them, and those ideas just remain at the idea level because they cannot become applicable at the fundamental level as the mental genes do not let that happen. So at the idea level one can change or modify ones ideas, adopt new ones, discard some but when it comes to the application of those ideas in terms of changing oneself at the operational level then we find an insurmountable gap between our ideas and our doing. We are only able to bridge that gap when the experience of pain and unhappiness due to its intensity and accumulation is able to be communicated to lower layers where the roots of our genetic mental process lie. Then those ideas are not resisted by the mental gene. So through these mechanics the human mental processes are able to induce modifications in the design template of mental genes.

Hitherto this process has been happening at an unconscious and unintelligent level with the trigger provided by the crisis of survival. While we are suggesting that this process can become intelligent and for that we have to employ the same mechanics but at an intelligent level and this time without the trigger of the crisis of survival. This trigger has to be replaced by an intelligent understanding of the hitherto costs and losses (wastage of individuals and generations) that we have been bearing in our existing survival and the projection of the profits (of more pleasure and less pain) and gains in our survival if we move on to a qualitatively better mental design and capabilities. This has to get communicated to the survival layer which will then make a united front with the suggestions coming from our new intellectual concepts and understanding via our mental genes and then the balance of power will shift against the middle layers of temperament and habits. This is how the failure of the old concepts and the pre-existing mental design will take place. And then the new changed mental template will form which will produce a new design of the human mental complex which will include new mental processes and capabilities, this time at an intelligent level.

5. The evolution of the contemporary human mental complex and its crisis in terms of the evolution of mental genes over the course of human history

To draw an analogy, the relationship between human mental genes and mental processes is somewhat like the relationship between a seed and a tree. We know that the tree is not just a mechanical replication of the seed but also a product of it, which is formed through a process of the unfolding of the various programmes within the seed in interaction with its environment. Then we observe those phenomena coming out of it, which we do not observe in the seed, for instance, leaves, branches, fruit, flowers and then new seeds. Similarly, human mental processes in all their complexity are a product of the unfolding of the different layers of programmes in mental genes. And just as one cannot find the leaves, flowers, etc in the seed so the numerous variety and levels of mental processes which have arisen out of the interaction of those genetic mental programmes with the environment cannot be seen or found in the mental genes. Which also generates the illusion that they are completely separate phenomena. One more similarity is that just as the tree, apart from producing flowers, fruits, etc can also produce more seeds, and mental processes can also produce more mental genes and in fact have been doing so at an unconscious level over the course of human history.

Human history and evolution is clearly a consequence of the many-sided interaction between mental genes and mental processes of human beings that has modified and changed both the processes. Although on a comparative scale, a lot more changes have occurred in mental processes (the products of mental genes) than mental genes themselves.

During the growth of human civilization and the process of maturing of language the relationship between mental genes and mental processes acquired a new magnitude of interactive growth and development. It was in this period that the layer of the second variety (which codes the mental capability) of mental genes was added to the previous layers. And these

mental genes then generated a colossal amount of new mental capabilities in man.

With the quantitative accumulation of biological perceptions (based on the data from the five sensory organs) and observations (not of one individual but of many people) and their many stage processing and storage within the mind in terms of systematized and classified word based abstractions, the capability of mental perception or theoretical perception arose within the human mind. With that the reasoning process of man went far beyond the reflex stage: it now had to process large amounts of data (draw inferences, correlate them to experience for verification, sift them, classify them as being valid or invalid, possible, probable or proven, etc) not only in terms of things but also in terms of variable aspects, qualities and situations associated with those things. So we needed more mental processes and capabilities and consequently more mental genes for sustained generation of those capabilities, their modifications and the designing of new capabilities.

A significant fallout of the above was that these continuously increasing capabilities of mental perception and reasoning started operating beyond the territory of genetic mental programmes and their products. The simple lower order mental functions whose specific programmes are installed in the genetic software cannot operate beyond the parameters of the programme because a programme is made up of stored (through accumulated experience) perceptions, processed conclusions and responses and can only handle a certain amount of simple or linear data about specific things for which it has previous referents. So when the programmed mental process of man was confronted with the extremely dynamic inputs from reason, it was not able to modify its software in real time to process and respond to them, and was not able to fit them within its existing programme parameters and paradigms. The capability of reasoning therefore kept operating and growing outside the parameters of the programmed mental process and started to venture regularly into new territories far beyond its existing genetic paradigms of perception, processing and response. This process eventually led to the emergence of developed intelligence as another quality of mental process. After that it is the story of how man has used his intelligence not only to radically transform his outer life but at the same time mutate his inner life, especially of his emotional processes.

The crisis that man faces in this recent phase of his evolution is actually a product of two different processes happening at the same time---the perverted growth of the emotional process and its destabilization in interaction with intelligence which is keeping us tied to programmed mental processes and mental genes and the emergence of intellect as another category of intelligence which is pushing us beyond the programmed mental processes to higher levels of quality and human existence.

The growing use of intelligence to generate social formations, political formations, financial structures, theological structures and also psychological warfare has created a degree of complexity, opportunity and material abundance on a massive scale but it is all based on the adversarial[11] relationship installed by the mental genes in our mental emotional programme. This elaborate adversarial relationship in everything an individual undertakes soaks up his emotional potential, sensitivities and motivation and in fact distorts his emotional process. The exponential growth in idea based desires, situation based desires and wish based desires, which basically operate in a competitive environment seriously destabilize the emotional process and create all kinds of perversions in it.

Another factor which has contributed to this destabilization is that man's response system as a result of the heavy modifications in the last three centuries in his mental processes and the external environment has become overloaded. He has to respond to every aspect of the changing reality, so enormous amount of processing has to be carried out. This has created a completely new mental and emotional culture. Man has started insulating himself and artificially narrowing down the application of his

[11] By adversarial we mean that which creates more conflicts and contradictions instead of harmony. We can see this within an individual, amongst individuals and even in social institutions where people are collectively working towards certain goals.

mental processes to the micro dimension of life, and is avoiding extending their application to those phenomena which are logically connected to the micro area that he is focusing on. This is the general human personality that one sees in contemporary times.

In this time of material abundance and potential abundance due to the increased growth of his intelligence process and its applications leading to extremely sophisticated technological developments, survival is no longer an issue. It has been replaced with satisfaction and more recently with instant gratification, which is product of our modified genetic mental processes and therefore not an intelligent or rational category. Today we are not actually threatened by survival but our installed adversarial emotional makeup because it has become irrational and illogical. While we are continuously blaming everything else (environment, terrorism, populations, poverty, and so on) accept that. Therefore, at this stage one sees an odd mixture of the highest level of intelligence at the most fundamental level of irrationality.

A very important consequence of this interactive overdevelopment of the emotional and intellectual processes was, as mentioned above, an accidental spillover or a leakage occurring in the subordination of intelligence to the mental emotional process[12]. So that it started functioning beyond the parameters of mental genes and their software (as mentioned earlier). This led to the emergence of intellect as another category of intelligence. The extent to which intelligence gets disconnected from the programmed emotional process and its trigger becomes objective inquiry and not the dictates of this emotional process then to that extent, it becomes the intellect. So now, we see a new mature phenomenon beginning to take shape- the human intellect.

With the evolution of the intellect, we see a new form of uneven capabilities emerging between the genetic mental processes and the intellectual process. Perhaps the aggregate capability of genetic mental processes for handling complexity is greater than that of the intellect but the analytical capability of the intellect or its ability to go deeper into complexity is much greater than that of the genetic mental processes. Actually, the genetic mental processes as we know occupy a greater part of our mind and are older and deep-rooted and they have experience of handling a different level and kind of complexity which is more quantitative in nature and has a larger share of nonverbal processes than verbal processes. This complexity requires a relatively mechanical kind of capability to handle it and the genetic mental processes with their programmes are therefore appropriate for the task. But when the complexity within and outside acquires another dimension and quality then the genetic mental processes become incapable of coping with it. Then it is only the intellect, which has the capability and the discipline to handle it by going deeper into it.

The core crisis or issue of our time is that our genetically programmed mental processes are pushing us in one direction, which is of physical and mental destruction via the increasing distortions and instability in the emotional processes and their increasing inability to cope with internal and external complexity. On the other hand, our developing intelligence and intellect which is discovering more truths and getting closer to reality and its logic and interconnections is trying to emancipate us from our current state of existence so that we can move onto a higher state of existence. So a huge functional disparity has arisen between the two and the conflicts and tensions between the two processes have grown to such an extent that this whole situation has today acquired the proportion of malfunctioning of our entire mental complex.

A pressure is silently building up within us to move on towards harmony in all that we are doing whereas we are persisting like never before with adversarial processes that are at the peak of contradiction. This is where we are standing today. To sum up we are living in a period of great unevenness between the intellect and the genetic mind. Both are experiencing growing disorder.

[12] We know that intelligence evolved as a tool for the emotional process and its original purpose was to ensure the survival and a more efficient functioning of the biological life-form. So its capabilities of reasoning and problem solving were not supposed to exceed or go beyond the requirements and parameters of the genetically programmed mental emotional process. But a study of human history reveals that this did not remain so.

Although both of them have been working separately but they have also been interacting and the genetic mind has been indirectly influencing and constraining the existing working and the increased potential of the intellect, via the quantitatively overgrown and perverted emotional processes, which has resulted in producing more confusion and irrationalities. We are totally entangled in our overgrown unintelligent subjectivity, which uses intelligence for its own agendas. Almost ninety percent of our knowledge, ideas, and thinking are poisoned by our unintelligent genetic mental processes, in a way that we think we are becoming intelligent and honest with ourselves while at the core level we are unintelligent because we are ignorant of the subtle and covert ways in which the genetic mental processes hijack our intellectual processes and use them for their own agendas.

We find quite a number of examples in human history in which the products of our intellectual processes have been used to promote the adversarial agendas of our genetic mental processes. Nuclear and biological weapons are one such example. A more subtle and internal example would be of a cutting edge scientist whose intellectual processes are working at the optimum level in the field of say particle physics and he is coming up with extremely important insights and knowledge in his field. But among the numerous motivations which drive him in his work a dominant motivation could be of getting the Nobel prize for his work or to come up with those novel insights or knowledge which none of his colleagues are able to. So there his desire or wish based genetic emotional process, whose fundamental character is adversarial or vis-a-vis other individuals takes over and might also affect his intellectual work. He might give in to the tendency of coming quickly to conclusions in his work and not going through all the steps that intellectual labor requires. This tendency at the intellectual level is a translation of the urge for instant gratification in his genetic emotional processes. Now this is one simple example but in reality this process of intervention would be happening at various levels within an individual and in relation to numerous things, situations, interactions within him and outside of him and would be in terms of numerous shades, colors and layers.

Contemporary man is therefore experiencing a vicious circle of growing disorder in human behavior, a product of the misuse of the individual's growing intellectual processes, thoughts, ideas, feelings and actions, which is also leading to growing physical genetic disorders in the form of various genetic diseases and also growing mental disorders which are not intellectual but genetic. This is in turn is impacting on his social life and creating new perversities in it which are again feeding back into the individual's mind.

The above situation requires an intelligent collaboration between the genetic mind and the intellect for a gradual replacement of the existing unintelligent genetic mental programme which presently makes and controls our mental processes to an intelligence based composite mental programme for the making of our mental processes which also incorporates within it the genetic mental programme as a subsidiary which has to operate in accordance with the agenda of the intelligent composite mental programme.

6. Transition from the genetic mind to the intelligent mind

The term 'transition' that we are using in this part of the paper is clearly indicating that any solution to address the above explained crisis within contemporary man and in the external environment that he has created will have to be a process made up of steps and stages and not a one-time act. Most importantly these steps and stages will not just consist of more 'knowing'[13] but also concrete 'doing' that man will have to undertake within his mind.

There will be two main steps of doing that he will have to undertake within his mind. One, he will have to install a many-layered monitoring system within his mind to observe the various layers of his mental processes and to track down his ideas and feelings to the roots from which they are sprouting, i.e., genetic or intellectual. This

[13] Theoretical knowledge of the numerous factors, details, aspects and levels of the relationship between the genes, body, mental genes, brain and mental processes.

process of monitoring will enable him to separate and see in detail the layers of his genetic mental processes and the new advanced mental processes; how they have been interacting and influencing each other and clashing with each other. Only then, he will be able to selectively dismantle the irrational, adversarial and destructive genetic mental patterns and promote a quantitative and qualitative development of intelligent mental patterns. Two, his intellectual (advanced knowing) processes will have to step by step develop and install a complex and intelligent process of communication with mental genes via the gene based emotional and other mental processes for the actual making of the new intelligent composite software. It is in the process of going through these steps and their sub-steps that the transition from the genetic mind (produced by the unintelligent genetic mental programme) to the intelligent mind (produced by the intelligence based composite mental programme) will become a tangible reality for the individual himself who is undertaking the transition and also for others who are observing and interacting with him.

6.1 Developing a monitoring system within the mind

According to Daniel Dennett:

> *"... In most of the species that have ever lived, "mental" causation has no need for, and hence does not evolve, any elaborate capacity for self-monitoring".* (Dennett, 2003, pp. 246-247).

It is only in human beings that we find the emergence of this awareness of one's own ideas, thoughts, feelings, and other mental functions. Although that awareness is now increasingly being viewed as the tip of the iceberg. Today there is a growing consensus that consciousness is an exception that emerges out of a vast pool of unconscious processes, which are the rule. One can estimate the dominance of unconscious processes from the information that the human cognitive capacity processes a total of 11million bits per second out of which only 40 to 60 bits of information per second are processed consciously (Cohen and Farley, 2008). The fact that the bulk of our brain and mind function at an unconscious level was a discovery made during a century of *"psychological theorizing and experimentation"*. (Dennett, 2003; p.246).

Over a period of time researchers and experimenters inquiring into the working of the conscious and unconscious mental processes have come up with various psychological techniques, concepts and methods to unravel their working. Among these a very important tool and method has been of 'introspection'. So when we talk of monitoring our mental patterns or processes one can get the impression that we are referring to this known and used process of 'introspection' for this purpose. But actually we are not! We are not undermining or rejecting the usefulness of this psychological tool which has provided us with ample data on how we become aware of our existing unconscious and conscious thoughts, ideas, feelings, habits, etc, and their generation or activation by different environmental stimuli but that is not what we are proposing. The reason is that our current monitoring or awareness of our mental processes through introspection is not based upon a deep and systematic cognition or perception of our mental processes. That is because our perceptual and cognitive abilities evolved for interaction with the outside world and for the specific purpose of our biological survival and consequently did not need to develop specialized perception of mental phenomena.

In this view of the matter when we try to perceive, observe, monitor or think about our mental processes, our genetic mental processes with their in-built assumptions and paradigms about perception and cognition take over and determine what we can perceive and cognize and what we cannot and therefore what we can think about and what we cannot think about. We can only think in terms of abstractions derived from what we have perceived and observed. So the utmost we can do is to observe at a behavioral level our thoughts and feelings and reach some conclusions about them or pass value judgments on them which is nothing other than hearkening back to some other genetic patterns which pre-exist within us. It therefore becomes a reflexive monitoring of which genetic patterns are presently functioning and which

other genetic patterns we would like to replace them with. So when we try to apply the results of our monitoring to improve or upgrade the functioning of some of our mental functions then in reality we are only trying to become genetically a better person.

As opposed to this the monitoring that we are proposing will be based on a developed process of nonsensory (read mental) perception and cognition of our mental processes in all their layers of complexity. We already have a nonsensory process of perception, observation and functioning within the mind through which we perceived strings, quantum states, or the big bang and solved complex problems of mathematics, physics, etc. It's only that we now have to focus this process on the mental processes; to abstract their various facets, aspects, behavior and start all kinds of experimenting[14] which would enhance one's observation of them. This is how we will develop a specialized perceptual process within the mind, which will only cater to perceiving the mental processes. Once that becomes operational within the mind then the processing of those perceptions and their execution will also follow suite in becoming specialized functions, which together will provide us with specialized knowledge about our minds.

The first task which this monitoring will enable us to perform is to track down the roots of our existing thoughts, ideas, imagination, etc; whether they are genetic or intelligent. We will be able to specifically see to what extent and at what level is some particular thought or idea of ours colored and dominated by our genetic mental programmes and by the same token which ones are not in the control of these programmed processes by virtue of having purely intellectual roots. This process of practical classification will enable us to reject and stop the intervention of those ideas, motivations and feelings that are emanating from our genetic mental programmes and consequently free our intelligent mental processes to play the dominant role in our existing decision-making. In addition, simultaneously proceed unhampered in making the new composite mental software for the making of our mental processes.

This process as an on-going exercise will gradually weaken the intervention of the genetic mental programmes and their adversarial logic, which means that we will no longer remain prisoners of our short-term genetic reality. Fallout of this will be that we will acquire relative freedom and autonomy to strengthen our advanced mental processes and their capabilities for a further qualitative growth of our mental processes. It is this process of intelligent monitoring and its results and conclusions, which will then become the basis for the next step of communication with mental genes for constructing the new intelligent mental software and transitional programme for the making of our mental processes.

6.2 Intelligent communication with mental genes for creating mental processes

The communication process with mental genes will entail a modification in the existing mechanics of the construction of our mental processes wherein the mental genes dominate this process. And this modification need not manifest in our next generation but can also take place in the lifetime of an individual. The exact nature of this modification is that the best (unadulterated by the existing mental programmes) part of our knowing (a product of our advanced intellectual process) will need to communicate with our mental genes via the mental emotional process that they should stop giving their existing guidelines to the brain cells to produce mental processes according to the programme and instead

[14] We are not referring to empirical experiments set up in controlled conditions to observe certain mental functions and correlate them with specific brain areas and alter their functioning either through drugs or direct tinkering with some brain processes. These experiments have to be set up by the individual within himself through using tools of his advanced intellect and developed sensitivities to perceive in detail his mental processes; their source, interconnections, influences on each other, mechanics and energy processes. The conclusions and results of these experiments have to be applied to minimize the conflicts and contradictions within the mind and to integrate its functioning and remove obstacles in the way of its upgraded functioning. And the verification of this process has to be obtained both at the mental level and at the level of the body. At the mental level one will experience the freedom from the excessive domination of one's mental processes by the programmes and hence a diminishing feeling of insidious hopelessness and depression and the emotional climate within oneself will begin to change. As regards the body, the various bodily disorders associated with the conflicting and disintegrated functioning of our mental processes will begin to diminish and one will be able to experience good bodily health.

coordinate with and work under the instructions of the new higher order mental processes to construct a new intelligent software for our mental processes. The issue we are confronting is that the control of the process of the mind must not remain in the hands of the mental genes but comes into the hands of our advanced mental processes (intellect and intelligent emotional process or developed sensitivities). Which means that the formation of the new composite intelligent mental software for the making of our mental processes should no longer be controlled by the mental genes. Under the influence of the advanced or higher order mental processes it would be a software whose paradigms and data access processes are made in real time and are dynamic and not rigid and keep modifying and changing under their guidance.

The advanced mental processes here will play the same function that the mental gene does. Except that their design criterion will be different from the mental genes criterion, which was of survival and efficiency according to which they evolved their programmes through trial and error. This time the criterion will be a combination of the knowledge of how our emotional, intellectual and sensitivity processes are in reality a part of the progression of macro Nature and its logic and quality of life. In the case of our existing mental processes, the design criterion in the mental genes is a micro criterion of the evolution of our particular species. While the new criterion for the making of mental processes is a macro criterion of the evolution of Nature itself, which will encompass the micro criterion of the evolution of our species within it.

If the mental emotional process and our Will (which represents the whole of our response capability for all its layers) buy this new criterion through understanding that failure to adopt this criterion and persist with the old one will disintegrate the human biological and mental complex, then they will communicate this first to the top layer of the mental gene. Which will then join hands with the survival layer and turn against the middle layer, which encodes our temperament, habits and Will patterns, etc, which are for reinforcing and perpetuating the existing mental programmes and processes. That is how the existing template of mental genes which instructs brain cells to make mental processes in accordance with its individual centric criteria will get modified or reprogrammed and will now instruct the brain cells to construct the new composite intelligent mental software or programme under the guidance of the higher order or advanced mental processes and their criteria.

The products of this new software, that is, our intelligent mental processes by virtue of being disconnected from the mental genes, will be able to explore and develop further the non-molecular (higher order) mental mechanics and will develop a new mental tool-kit made up of weak quantum energy particles and states. The dynamic of these tools will be far greater than that of molecules and their requirements will also be more complex and much more. Most importantly, their applications will be of another dimension in the sense that they will produce advanced capabilities of cognition, processing, execution and handling new kinds of complexity.

7. Concluding remarks

Some broad but indispensable characteristics of this transition will be:

a. It will not be a mechanical change of tracks but an organic and real life process. So it won't be a black and white situation but will involve shades of grey, since the composite intelligence based software and its products are in the future and have to be built bit by bit.

b. The transition from the gene-based mental processes to composite intelligent mental processes does not mean that one has to completely get rid of the former but they need to be sorted out on the basis of the new happiness criteria of the advanced mental processes and not the criteria of our gene-based mental processes, which make one pursue gratification and survival in the course of contradiction, conflict and aggression. While happiness is found in harmony, cooperation and bilateral intelligence.

c. Due to the uneven development between the genetic mind and the intelligent

mind, and the many-sided resistance which the former will put up the shift has to be in terms of growing circles of consensus within a hostile environment with varying degrees of hostility.

d. One will need to dismantle one's overgrown and perverted emotional response system which has today become like a dinosaur and reduce it to countable intelligent elements of happiness. And then evolve a new emotional structure of human happiness for the period of this transition.

e. One will need to strictly and consistently monitor the quality of one's intellectual machinery which has been adversely affected by one's emotional processes. Two such effects are: one, a heavy empirical commitment that prevents one from inquiring beyond the micro, which has resulted in a strong intellectual bias against thinking on a larger dimension. Two, a constant urge for gratification which intellectually translates into a strong tendency to come to conclusions quickly or to respond quickly. While actually the criterion for intellectual labor on the intelligent plane should be approximation to logic and not time-based. So it requires a change of intellectual temperament.

The main obstacle in this process of intelligent modification or reprogramming of mental genes will not be the mental genes themselves. The reason being that on their own they are actually passive devises made up of energy building blocks arranged and organized in a certain way over a period of time. Any reprogramming or modification will only amount to a realigning of their building blocks, which will not resist change. The main resistance will come from the pre-existing strong (due to factors like time-span and repetitiveness) and many-sided relationship between our existing mental operating system, spearheaded by the Will process[15] and the mental genes.

There will be resistance at the idea level also but that will be superficial and can be overcome. At the idea level we can relegate the existing genetic programme and the biological process to a secondary position and acknowledge intelligent mental processes as primary but that is only a mental trick. In reality we associate our identity with the existing genetically programmed mental processes and our intelligent or advanced mental processes are a part of that; an appendix of that. So the main resistance will come from the 'mental gene-Will' complex which, in total disregard of the conflicts and contradictions that we experience and comprehend, wants to preserve the status quo in our mental processes because that is what is and has been operating.

Today the problem of rewriting or reprogramming of mental genes is not due to the absence of the capability in mental processes to do so. Mental processes have been rewriting genetic programmes and making new mental genes at an unconscious level. The problem lies in the opposition to it by our existing Will which today has acquired a very complex form and its relationship with the mental genes has also become very intricate and is like a spider's web in which man is entangled today.

Therefore, what the 'mental gene-Will' complex does is that it creates both direct and indirect obstructions in the way of intelligent rewriting of genetic mental software. An example of indirect obstruction is that we might want to do it intellectually and emotionally but the emotional drive or desire disappears very quickly or is neutralized by the operation of other dominant drives and we are unable to pinpoint the exact cause or reason for it. A

[15] The Will occupies a critical and a leading role in the whole gamut of our mental processes and is the means by which we express our emotional and other mental programmes. It is the intermediary between the mental and the biological. Its origin is mental but its functioning is at a biological level in the sense that it has become a reflex or automatic process, i.e., a kind of habit.

direct obstruction just ties us to existing crystallized emotional priorities that simply prevent us from moving in a contrary manner or direction.

Another problem we confront when we try to employ the highest level of our mental processes (our knowing and intellectual process) for intelligent reprogramming of our mental genes is our existing pattern of intellectual processing which is presently targeted and agenda oriented due to being infected at subtle levels by the individual centric emotional processes. The intellectual process due to being tied up in its own agendas and priorities is unable to focus on or give time to this issue. So it considers it a non-issue which does not require any inquiry or investigation into it. Our intellect needs to first get rid of this pattern and then move on to another quality of functioning (which is not shackled or fettered by the older, more entrenched and dominant lower order mental mechanics and the prices it is paying for the immaturity of its own new mechanics) so that it can play its required role in this process of intelligent reprogramming of mental genes for creating the new intelligent composite program for the making of mental processes.

Once the process of transition begins within an individual he will be set on the path of becoming a different human being. Because we know from our observation of human history that the process of change in the human personality is primarily an internal process. It can be stimulated by something external or channelized by external factors but the process itself is internal or we can say mental, to be more precise. If man is able to concretely take the above-mentioned steps within him then he will in fact be opening the doors of qualitative changes (in terms of his intellectual and emotional capabilities and capabilities of executing his developing understanding) in him as a human being. It would be something similar to what must have happened when language emerged and unleashed a qualitatively new and different process and capabilities of another order within his mind.

Another implication will be that now man will be able to become rational about the whole of him and not just one or two dimensions or aspects. This transition will encompass all the dimensions and layers of his existence; his individual self, his social interactions at all levels and most importantly his relationship with the process of Nature as a whole, from which he will derive the criteria for his rationality at the other two levels. That is how it has to logically be considering the level of functioning his mind has reached both in the macro dimension and the micro dimension. He has to now revive afresh at a more informed and rational level the integral relationship between the micro and the macro. There is no question of either or because he has had experience of that and he has seen what has come out of it; both in positive and negative terms. Today it has to be a more intelligent and rational integration of both the levels and not like the earlier attempts at integration that we have been making during the period of civilization.

The most important implication of the inception of this process within man is that he will be able to move beyond the stage of limiting his understanding of mental processes to inferences. He will be able to observe them now, not through the perceptual tools that he has so far been employing, but through his new mental tools of perception. Then he will seriously enter the world of science and engineering in relation to his mental processes. Proceeding with that he will finally be able to see the center of gravity within the phenomenon known as man shift from the biological to the mental. His mental life form will in the concrete become the center of gravity and the physical life form will stay connected to it but will orbit around that center. This means that his biological functions and mechanics and their mental and emotional appendages will now be organized on a more rational basis so that they do not only become a tool but also the raw material for the further evolution of his new higher order intellectual and pleasure processes.

Keeping in view these implications man can now put the negative implications of being dominated by his genetic programmes and the positive implications and potential of making the shift to an intelligent composite mental process side by

side and then come back to the living individual and focus on the question of his Will and choices. We know that man's Will has been changing albeit on an unconscious plane but it has changed when confronted with an emotional crisis and new knowledge. This time we need to change it intelligently through disconnecting it from its existing foundations and connecting it to the intelligent mental process.

References

Cohen D and Farley TA. Eating as an Automatic Behavior. Preventing Chronic Disease: Public Health Research, Practice And Policy 2008; 5(1). http://www.cdc.gov/pcd/issues/2008/jan/07_0046.htm Accessed date: June 5, 2010.

Dennett D. C. Freedom Evolves. Viking Penguin, 2003.

Keller E. F. The century of the gene. Harvard University Press, 2002.

Marcus G. The birth of the mind. Basic Books, 2004.

McFadden J. Quantum Evolution: How physics' weirdest theory explains life's biggest mystery. Norton & Company, 2002.

McNeill JR and McNeill WH. The human web: A bird's eye view of world history. W.W. Norton & Company, Inc, 2003.

Pinker S. The Blank Slate. Viking, 2002.

Zeldin T. An Intimate history of humanity. Harper Perennial, 1996.