HUMAN BIODIVERSIFICATION

Human beings vary widely in their phenomes both physically and mentally. Some of the easily observable variations include morphological (e.g., body shape and size, height, bone structure, obesity), gender, race, ethnicity, class (rich/poor), physical abilities, color (e.g., skin, eyes and hair), blood type, mental abilities (e.g., intelligence, aptitude, creativity, etc.), disabilities (e.g., deafness, dumbness, blindness, color blindness, allergies, phobias, etc.), temperament (e.g., extroversion, intellectual curiosity, impulsiveness, risk-taking, etc.), habit, vulnerability to specific diseases, sensitivity to specific chemicals, cultural differences (e.g., language, religion, food preferences and spatial preferences), etc. For each phenotypic character there is a potential range in its expression. In spite of these variations, the entire humanity belongs to a single species. The Quranic revelation that human species is created from a single *nafs* (microbioprogram of Adam) is a confirmation of this fact and a categorical negation of the probability of evolution of any new species from it. De-speciation of human beings remains a challenge to Darwin's model of evolution. Humanity worldwide over the entire span of its existence on this planet *will* remain as one species. The Quranic verses (Q. 4:1; 39:6) are a proclamation of this certainty.

In human beings, not only are the phenomic attributes more numerous, their variation is also much larger than in other species. This is expected because if there is no variability among human individuals there is no need for testing by God. God has to test just one human being and done with it. But Allah's intention is to test varying biomemomes and to select the obedient ones from them.

The phenotypic diversity that can arise in human population is within the limits set by the microbioprogram (Adam's *nafs*) of the species. The package that is responsible for biodiversification in the microbioprogram may be termed intraspecific biodiversification software (IBS). Human species is also programmed to have distinct diversity groups such as ethnic, racial, cultural, linguistic, etc. The IBS must therefore cover wide-ranging operational complexities. Obviously, the IBS package of human species assumes strategic importance in the history of the species.

> "O mankind! We created you from a male and female, and made you into nations and tribes, that you may know each other. Verily the most honored of you in the sight of Allah is the one who is most deeply conscious of Him. And Allah has full knowledge and is well acquainted (with all things)." (Q. 49:13)
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> "If your Lord had so willed, He could have made mankind one people: but they will not cease to dispute." (Q. 11:118)
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> "And among His Signs is the creation of the heavens and the earth, and the variations in your languages and your colors; verily in that are Signs for those who know." (Q. 30:22)

With wide-ranging characters, skills and talents, human biodiversity profile is unwieldy and overwhelming to say the least. No two individuals including the so-called

monozygotic twins are identical. Ours is the only species whose members can be identified by face. Each human being is unique in each phenotypic attribute and is not repeated in creation in time and space. This holds true for the past, present and future human populations. Such is the magnitude of variability existing in human race. And the source of biological information responsible for this scale of biodiversity is Adam's *nafs* – the microbioprogram of human species.

Phenomenon of human biodiversification

Evolution of distinct civilizations, cultures and societies is a hallmark of human history. There are numerous distinct ethnic groups, languages, colours, cultures, etc. in human species. The Quran tells us that Allah would have made human beings as one nation, but His idea is to create different nations, civilizations and heritages so that they can be identified from one another. How does the variability arise? Modern science attributes the variability among human individuals to genetic and environmental differences. The former includes mutations, allelic differences (i.e., any one of a number of alternative forms of a gene occupying a given position on a chromosome), genetic drift (i.e., changes in gene frequencies in isolated populations over time), natural selection and cultural selection [1]. Although these factors are considered the cause of the variability, no explanation has been advanced to account for the source of biological information to create the phenotypic variations. The Quran is the sole source that provides information on this issue. Human biodiversification is a programmed phenomenon that began with the creation of the first member of the human race, Adam (Fig. 1). The biological information needed to produce variability in human population generation after generation is right there stored in our body cells. We have to turn to the Quran to get at its roots. The Quran reveals the source of human biological information as originating from Adam. Human biodiversification is going on even now. It is implemented by Allah biomemetically through the germ line. It is also a demonstration of how new human phenotypes can be created. The phenomenon also offers supporting evidence to the theory of programmed organic evolution as it is the demonstration of the creation of biomemetic changes in a programmed manner over generations. All the changes we refer to as cultural, linguistic, ethnic, etc., occur in accordance with Allah's human biodiversification software provided in Adam's *nafs*. Human beings inherit their colour, develop language and culture, and exist as distinct races as stipulated in the divine program. We cannot develop a language (or even a word) that is not given in the human microbioprogram. The language included in the program will come 'naturally' to us, every word of it! Conversely we will 'naturally' reject a word if it is not included in human microbioprogram. We are programmed that way. Since biodiversification is an ongoing process it is not possible to say whether *Homo sapiens* has attained the maximum potentials physically and mentally; perhaps still more wonderful show of human potential in both physical and mental abilities is yet to come. What we observe now is the scale of human biodiversity created so far.

Appropriate natural software engineering mechanisms during gametogenesis (gamete formation through meiosis followed by mitosis) would have played a major role in shuffling and re-distributing the biomemetic package of the offspring along the Adam-Eve lineage to create diverse ethnic groups, races, cultures, etc. along the prescribed timeline. It is through meiosis germ cells, both egg (female gamete) and sperm (male

gamete), are produced. Natural biosoftware engineering mechanisms play an important role in bringing about biodiversification generation after generation. For instance, during meiosis biomemetic changes occur through a process called "crossing over" during which the segments of non-sister chromatids of a homologous pair of homologous dyads are exchanged. This swapping of portions leads to alteration of biomemetic information content in the resulting chromosomes. Huge biomemetic differences observed between siblings are the result of this crossover. The exchange is not carried out in a random fashion as is believed now; it is a programmed function executed in accordance with the IBS to prepare the next generation biomemome. Another possible mechanism of biodiversification is inactivation/activation (switching off/switching on) of biomemes during meiosis so that the next generation zygotes will operate in accordance with the software constituted by the active biomemes (operamome) in that generation. This phenomenon will not however leave any tell-tale physical change in the chromosome or biomemogram. These mechanisms may be thought of as responsible for sorting out Adam's *nafs* as programmed and to bring about phenomic variability along a pre-determined direction over generations.

Mere production of gametes slated for next generation is not enough. The sperms and female ova (eggs) so produced must also meet their right counterparts and fuse to form the zygotes for subsequent development into the intended phenotypes. To that end Allah informs us:

> "Allah knows what every female (womb) bears, by how much the wombs fall short (of their time or number) or do exceed. Every single thing is before His sight, in (due) proportion." (Q. 13:8)

The message relates to programmed fertilization in human wombs. We do not have much data on human fertilization to understand the mechanism involved in bringing together 'biomemetically labelled' complementary pair (male and female) of gametes for their eventual union. Studies conducted with human beings in this area are scanty. Nevertheless available information including that based on experiments with model animals does throw some light on the intricacy of the fertilization process. The fertilization of female egg with male sperm is a highly controlled phenomenon when we realize that only one sperm out of millions in the ejaculate is capable of fertilizing the egg. "Sperms have the opportunity to interact with many other kinds of cells in the female," says Jerry Hedrick, a biochemist in the Division of Biological Sciences, UC Davis. "How egg and sperm recognize one another is a fundamental question in reproductive biology." [2]. Further once fertilized by a sperm, the zygote (fertilized egg) is inaccessible to another sperm. Evidently there is a mechanism to guide a specific sperm to fertilize a certain egg (Fig. 2). In other words, a sperm is programmed to fuse with a certain egg and not at random. The sequence of events in which fertilization of an ovum takes place would clarify the phenomenon better [3].

- The sperm passes through the corona radiata, the outermost cell layer of the egg.
- The sperm breaks through the zona pellucida. When the sperm penetrates the zona pellucida, the acrosome reaction occurs. This makes the egg impermeable to any other sperms and prevents fertilization by more than one sperm.
- The cell membranes of the egg and sperm fuse together.

- The female egg, also called a secondary oocyte at this stage, completes its second meiotic division. This results in a mature ovum.
- The sperm's tail and mitochondria degenerate with the formation of the male pronucleus.
- The male and female pronuclei fuse to form a new nucleus that carries the biomemome of the offspring.

Spermatozoa normally encounter the egg at the fertilization site (in the Fallopian tube) within 24 hours after ovulation. A considerable fraction of the spermatozoa ejaculated into the female reproductive tract remains motionless in storage sites until ovulation, when the spermatozoa resume maximal motility and reach the fertilization site within minutes. Although the nature of the signal for sperm movement is not known, a study conducted by Ralt *et al.* suggests that attraction of spermatozoa to a factor(s) released from the egg may be a key event in the fertilization process and may give insight into the mechanism underlying early egg-sperm communication [4]. In other words, which sperm must fuse with which ovum is determined by the biodiversification software.

> "It is He Who shapes you in the womb as He likes."
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> (Q. 3:6)

The Quranic revelation is a clear indication of the programmed biodiversification process in human beings. Each human being represents a link in the biodiversification chain and carries a specific set of biomemetic instructions transmitted down through programmed differentiation of the original *nafs* of Adam. The differentiation process preserves the continuity and timeline of a common descent like the diverse tissues generated during development of the human body. The differentiation will go on till the end of the world bringing about all types of variability like differences among individuals, ethnic groups, cultures, linguistic groups, nations, tribes, etc., in human population at prescribed times of the human history.

An exception to this rule is Jesus Christ (A.S.). His case represents an independent creation. He was created by a special biomemome and not the one which descended from Adam (Q. 3:59). The process of creation of Jesus (A.S.) was discussed in chapter 5. His biomemome does not belong to Adam's lineage.

Biomemetic Vector

The Quranic messages on human biodiversification also imply it is Allah who decides our familial descent. These are stipulated by Him in the biodiversification software package. Besides the verse (Q. 3:6) already mentioned, this aspect is also hinted at in the following verse relating to inheritance of properties.

> "Believe in Allah and His Apostle, and spend (in charity) out of the (property) whereof He has made you heirs. For those of you who believe and spend (in charity), for them is a great reward." (Q. 57:7)

It may be deduced from these messages that every one of us is carrying biomemes of hitherto unexpressed attribute or potential in the biodiversification software package for transmission to the next generation. It is according to that program, the software engineering processes come into play during gametogenesis (meiosis). As each individual carries biomemetic information over and above what is expressed (operamome) by him for transmission to the next generation, it is obvious that each human being plays the role

of "biomemetic vector" in the lineage (Fig. 1). Who will express what and in which generation is prescribed by the program. This would not only hold good for the phenotypic characters but also for such events as the appearance of hereditary disorders, diseases, etc. In this way the evolution of human biological diversity can be explained as a programmed phenomenon beginning with Adam.

The essence of human biodiversification from a single (Adam's) *nafs* (Q. 4:1) is that the entire human attributes are biomemetically controlled by Allah. If you have the talent (the meme) to sing, you become a singer; if you don't have, you are not a singer. You cannot make yourself a singer. No individual is responsible for his abilities and disabilities. The pluses and minuses are bestowed on him by Allah through the biomemome he inherits. It is therefore foolish to boast of one's superiority over the other.

> "Nay, but man does exceed all bounds. In that he looks upon himself as self-sufficient. Verily, to your Lord is the return (of all)." (Q. 96:6-8)
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> "Verily We have created man into toil and struggle. Does he thinks none has power over him? He may say (boastfully) I have squandered wealth in abundance! Does he think none watches him?" (Q. 90:4-7)

In another verse, Allah points out human arrogance in a different way.

> "Is it such a Message (the Quran) that you would hold in light esteem? And have you made it your livelihood that you should declare it false? Then why do you not (intervene) when (the soul of the dying man) reaches the throat? And while you look on. But We are nearer to him than you, and yet you see not. Then why do you not , if you are exempt from (future) account(i.e., if you are not under Allah's control), get it (the soul) back if you are true?" (Q. 56:81-87)

We (our phenomes) are what Allah decides us to be. We (our phenomes) are not what we wish to be. We also cannot choose our parents, place of birth, time of birth, year of birth, our children, our career, etc. But still we boast about our abilities (but hide our deficiencies) to bolster our ego. Incidentally it may also be mentioned here that when we say a person is a good singer, it implies that it is human microbioprogram that makes his rendering pleasing or not. This is also the case with everything else. If a flower is beautiful it is our program that makes it beautiful. The natural things are intrinsically neither good nor bad, neither beautiful nor ugly, neither sweet nor bitter; it is our program that distinguishes them in different categories based on the incoming signals. Allah designed the human software (Adam's *nafs*) that way.

References

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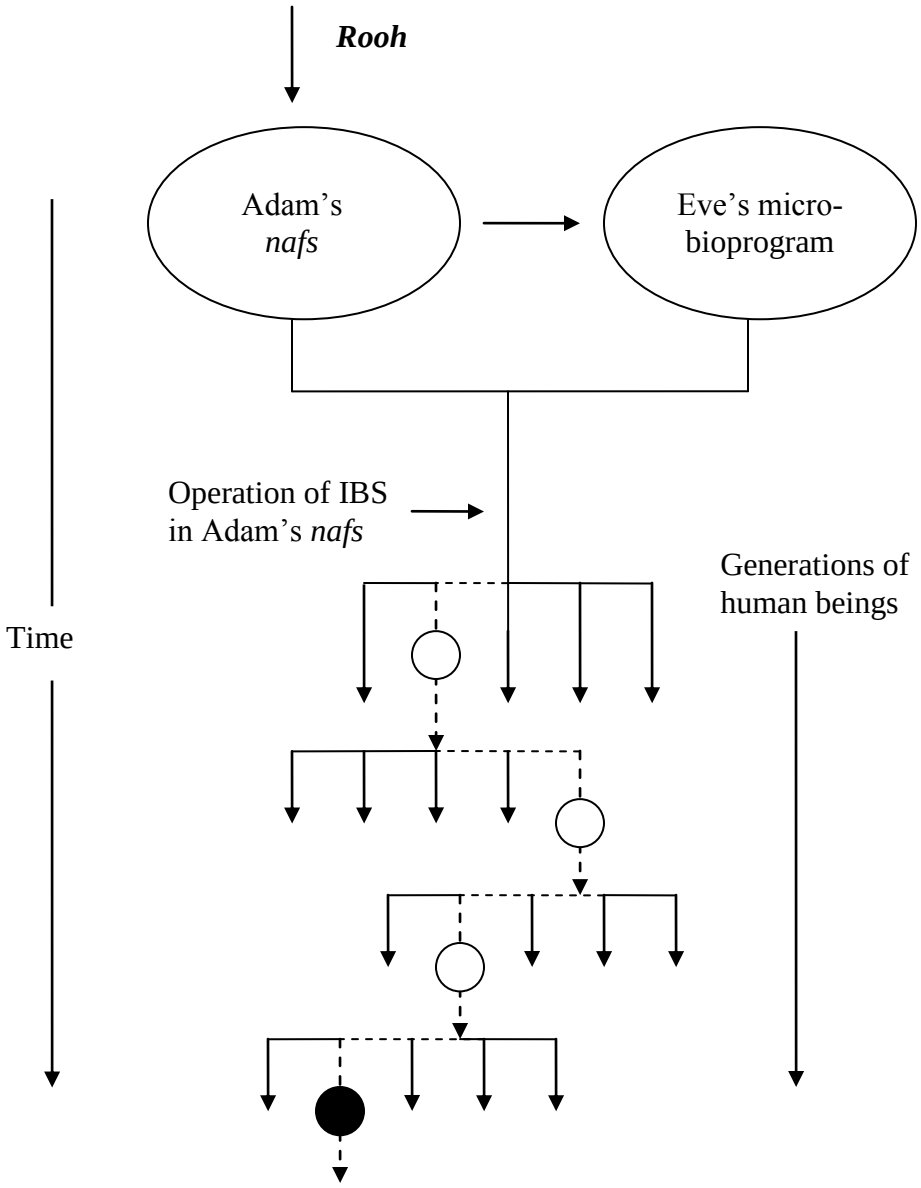

Fig. 1. Illustration of human biodiversification process as memetically programmed phenomenon. IBS is intraspecific biodiversification software. Note: A hypothetical memetic pathway of a biomeme is shown in the diagram by dashed line. Adam's *nafs* representing the microbioprogram of human species is the sole memetic source for human biodiversification. Downward arrows indicate diverse lineages. Filled circle represents the population in which the biomeme is expressed. Unfilled circles represent generations of biomemetic vector populations. Racial, ethnic, linguistic, geographic, cultural and other types of phenomic diversity may be supposed to have been created this way.

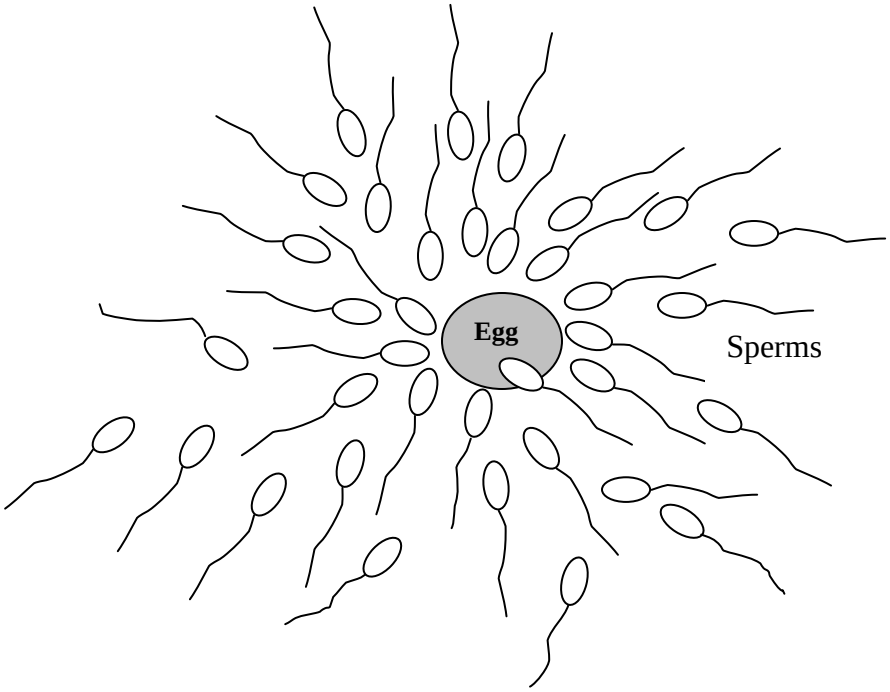

Fig. 2. Fertilization of human female egg.
Note: Diagram shows a swarm of sperms surrounding the egg. Only one sperm among the millions present will be able to enter the egg and fuse with it.