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MAN THE UNFORTUNATE**

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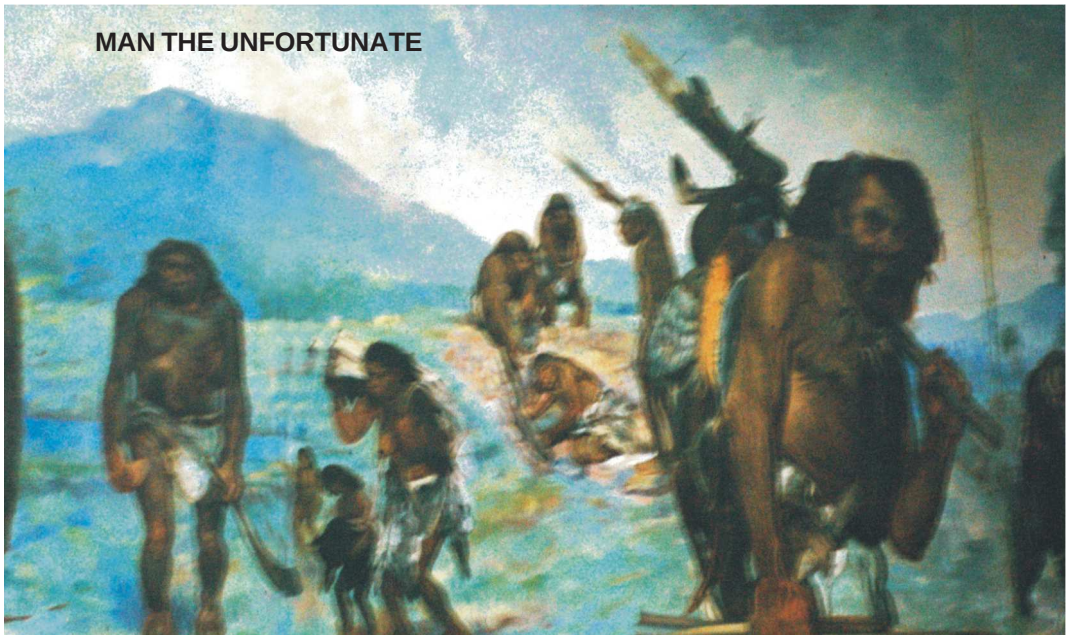
(This series of articles is based on Lectures delivered during past three decades and will constitute the major contents of the proposed book," Man the Unfortunate")

Past and Present Affiliations

Ancient Indian gospels written 5000 BC and earlier, have had categorically mentioned that the man, and other creatures owe everything to nature and if mutual care and respect were not practiced, the Water, Air and the Soil will take "revenge" and repercussions will be intolerable defacing the entire achievements. *Rigveda* in particular (3000 BC) has considered water to be the form of a "god" and compelled all religious human beings to worship. Water is the primary requisite of all around us, the so called environment where life and life forms can sustain; water maintains life and life forms. This is an established scientific truth. Environment in the broadest term is "All around us on the earth, water and in the space". Practically however when we say environment we mean the general conditions of external and internal factors which influence lives of all living plants and animals including humans. In order to understand complex impact of network of the environment we can simply classify in to two modes of functioning; external environment and internal environment. External environment principally includes those factors which are around us and are of physical nature; for example, soil, water, air, temperature etc. The Internal environmental



factors include complex of living individuals, species and their biological struggle. To be more clear, for the first type we call as Physical Environment and to the second one as Biological environment. However, one must understand that these are only temporary designations because as we analyze in detail we find that the environment can not be classified by any one approach because there is always an interplay of many factors. For example when we take "**AIR**" as a physical factor we also find a large number of microorganisms in the air which make the "air " as good or bad; but when we take constituents of the air in gaseous forms only (like proportion of nitrogen, carbon dioxide and sulphur dioxide), the air becomes a physical factor only. So is a case with **Water and Soil.** Obviously, environment becomes a network of interrelated problems concerned with the living of all kinds of organisms. For this reason, environment or better environmental factors (air, water, soil etc) can never be separated with the activities of all organisms. Environment also can be understood to be active in various other forms. There are other faces of environment becoming globally prominent because of universal impact of temperature humidity etc on one side and composition of biodiversity (flora and fauna) on the other side. The zest of past 50 years' Environmental -awakening is that all life forms will always need balanced ecosystems for balanced survivals !!.

The man has made progress, but what for?. As estimations work, many countries may not have drinking water in next 50 years or so. So the man, who had conquered nature to a great extent in the past ten thousand years and particularly, more speedily in the past two hundred years, will fall victim to natural disasters in due course." Biologically the man owes all his virtues to all other species as well. Modern molecular studies have proved beyond doubt that we have inherited copies of genes from different organisms over several hundred millions of years. Humans in the mirage of progress on the other hand have struggled for modernization by creating excessively nasty problems making "own lives" miserable. Lately, man-made global warming situations have arisen in such a way that future is becoming illusive every day. "The Man is digging his own trap for elimination?. Everyone, must have been convinced that gaseous emission- forms have harmed our biology and environment particularly over 40 years. Water level in seas has risen; temperature fluctuations are too common, migratory birds are changing schedules and natural weather timetable has shifted. This is nearing last time to recover and scientifically enrich forest and aquatic ecosystems along with monitoring our sea water resources.

The modern technological advancements are becoming essential for everybody. In a very simplified semi technical ways the pages of this book will take a reader like passing through a stream enlightening every one on some basic tenets of life. As to how the life might have originated on the Earth, How and why are all living forms : Microorganisms, small and big Plants-Animals including Apes, hominids and Man, basically resemble, yet differ in many (hundreds) ways ??. Why should we know about organisms that existed millions of years ago (fossils) ? Why should we know about blood groups ,about genetic defects/ features/ certain diseases /good or bad characteristics and above all,"ins and outs " of a Man ? The Pioneering Research work of Stanely Miller ,Horowitz and others has explicitly proved that Carbon played a "vital" role in forming organic compounds with the help of Hydrogen , Oxygen, Phosphorous and Nitrogen and generated gases (methane, ethane etc.) under high temperatures, prevalent on the earth. Hundreds

and thousands of compounds were produced, and also water, which filled the earth on all possible sites.

Adhering to Indian Scientific philosophy the *life consists* of *"kshitiz*" (carbon), *ja*l (Hydrogen+oxygen*), pavak* (fire, phosphorus) *gagan* (sky, oxygen), *sameera* (air, nitrogen). The **mother earth**, rightly called so, beacame a very big reactor-laboratory emanating thousands of organic compounds during 400 billion years ago later releasing a wonderful combination , known as nucleic acids, first , the single stranded R N A and later as D N A, a wizard molecule bestowed with a "facility" of template formation.

According to Russian biologist Oparin and later lucidly elaborated by J.B.S.Haldane (A british statitiscian and one of the most celebrated geneticist of 20th century who died as Indian citizen on 1st Dec.1964 at Bhubaneswar) the life arose as a soup (colloidal) and floated on the seas world over. The architectural structure / geometry of the DNA molecule, also of RNA,facilitated Free swimming. This **swim** might have lasted for several billion years !!

RULES OF LIFE

When the life originated , it arose as a cell: one cell. An apparently fragile membrane engulfing the soup (soul or "sole") of life as tiny molecules wrapped meticulously so as to abide with basic commands of life : exact multiplication, it will have to replicate to produce its own kind (life begets life); the contents have to be imbibed in water in order to practice physiology, intracellular molecular activities must go on ;

The living has an inherent perception (sense), it spontaneously reacts; it responds to stimulus, heat, light, cold, (variables) and opposite instincts. This has been the grandest acquisition that form and function of "male" has to be motile and the mother female will have to be stagnant/stationary bearing remaining biological responsibility. So, biologically, males turn out to be far less responsible than counterparts. In a unicellular organism, say in a bacterium , one cell comes closer ,touches and sends a tube to carry its contents (male) in to the other bacterial cell; guest and host contents fuse (become one) and later reduce and produce there own strains.

The inherent perception of opposite strains (sex) originated with the evolution of double helix (DNA) being complimentary to the other; one becoming a template for the origin of another, pairing partner. In fact the philosophy and rule of the game, that,"it takes two to make a life", gave birth to the discovery of double helical structure of DNA , more than fifty years ago.

One fine morning, way back in Cavendish laboratory in Cambridge Francis Crick and James Watson were discussing on whether the master molecule DNA should have two, or three helices ? To begin with, both of them were highly impressed by three dimensional concept of molecules propounded by Linus Pauling, therefore like Pauling, these workers also argued in favour of three helices. Then, suddenly,James remarked, "it takes two to make a life" (a very general but biological truth) and the ice sheets melted. Both, Crick and Watson smiled for life, they prepared a model of DNA taking two opposite helices on the basis of stereochemistry and the noble prize discovery

The enormous diversity, which organisms viz. bacteria many other microorganisms, planktons, small and big plants and animals, in other words, organisms living and fossils of all categories and kinds

including hominids, and man fundamentally are one in many ways (unity), that is, every individual is a cell or has been a cell; every cell has cytoplasm, a colloidal medium to fill it, and nucleic acids (RNA-DNA). Organisms which do not have an organized nucleus are known as prokaryotes and those organisms whose cells have a nucleus are termed as eukaryotes. Eukaryote cell has organized chromosomes.

TWO parents "make" an individual (offspring) because each parent contributes equally, 50 : 50 (heredity units; *the genes*) through gametes. This is of paramount importance that modes of inheritance and transmission of characters from one generation to the another, were theoretically known to Indian scholars dating back to 2ooo years and more , but scientific data based on hybridization experiments were conducted and known to us only in 19th century. But of the greatest relevance is Gregor Johannes Mendel, an Austrian Monk who was born in BRUN (now in Czech Republic). Mendel was the First person who, with the help of very well planned hybridizations proved beyond doubts that a character is controlled by gene (s), each gene consists of two alleles, one coming from one and the other from another parent through respective gametes. Mendel demonstrated this SEGREGATION to be due to equal probability (50:50 chance) for each allele and this segregation was explained by the binomial expression; (a+b)2=a2+b2+2ab

So, this is the truth that Mendel surpassed all previous experimenters of this area by applying principles of probability and binomial expression for a very clear, unalterable concept of HEREDITY and VARIATION. Mendelism is presented in the gallery with a view to enlighten every viewer which ought to be known by a modern citizen of any background.

CHROMOSOMAL ROLE

We know that our cells contain 46 chromosomes, a human female possesses 44 + two XX chromosomes; while a human male has 44 + X and Y chromosomes.

This is important to know here that the mother of the child " gives" one X chromosome to her male and so also, one X to the female child. BUT the father , gives Y chromosome to the male child and X chromosome to the female child.

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GENES AND CHROMOSOMES

"Home" of genes is within a chromosome. Each chromosome has genes (alleles) proved to have been linearly arranged; precisely, a chromosome may have 10 to 10000 genes and is essentially a unit structure for function (s). A chromosome consists of two chromatids Each chromatid is a coiled structure full with chromatin (loaded with DNA+ RNA+ PROTEINS, etc.) now known to be assemblage of "beads" (nucleosomes).

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Dispersal of Genes

A large number of DNA sequences are being reported to have been conserved in various divergent animal phyla, many of the genes retaining the same function (Gianfrancesco and Musumeci, 2004) in humans. There are also a large number of DNA sequences known to have strict homology, but for quite different functions. For example in *Drosophila melanogaster patched* mutations are known to cause faulty winged veins and the human version of this PTC gene results in defective ribs as well as skin cancer. This gene is mapped on the long arm of human chromosome 9, very near the site where genetic linkage studies have shown the presence of gene for basal cell nevus syndrome. Another such example where a normal gene in fruit fly causes cancer in other organisms is *wntl* gene which in fruit fly, functions as wingless gene, while it causes mammary tumour in human on becoming overactive. Also a human GLI gene which was discovered as an oncogene in a rare human brain tumour is now known to be the counterpart of the *Cubitus interruptus* gene of the fly. Lately, this is becoming clear that humans, other mammals and lot many other organisms also have their own versions of the same genes found in other organisms. For example, vertebrate homologues of ***hh*** and ***ptc*** have been identified in mice, chicken and Zebra fish. In humans, these genes have important roles in organizing many tissues including neural tube, skeleton, limbs, cranofacial structures and skin. We have strong evidences to assume that conserved sequences can be found in diversified and apparently unrelated phyla but the functions performed in that organism by that very gene need not be the same.

Recently,our results on genomic DNA sequences from a lower vascular plant taxon, *Isoetes pantii* , compared with human genomic DNA by NCBI Blast Gene Bank public data base have opened up a new line of thinking. The most remarkable point of argument is that a DNA sequence stretch of a gene may be, very rarely though, found in a totally unrelated species without any evolutionary significance .Comparisons with genomic DNA of different species of plants and a few animals has shown that no species of even *Isoetes* shows so many homologies with different loci –based human DNA sequences, as has been shown by *Isoetes pantii*. This taxon has been believed to have been arisen by natural hybridization and has had genomic reshuffle (published elsewhere). So briefly, certain rare plants may possess stretches of DNA sequences akin to those found in human genome, obviously by sheer chance.

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Hereunder, we have selected another rare plant species which is of great evolutionary importance, *Ginkgo biloba* , which has more than 200 genes already sequenced. The intention of computer homology search for 25 genes (Table-1) was to find out whether known genes with their functions can be traced in human genome (?) Except homology for 20 to 30 identical nucleotides at a stretch, no *Ginkgo* gene with complete sequence, out of studied ones, has been found by blast studies. Table-2 presents a homology of 89 % of a *Ginkgo* gene L 23107 controlling chlorophyll a/b binding protein, a kind of function cannot be found in humans.

Indisputably this is a matter of chance with no evolutionary obligation on lineage/ evolutionary relationship. But here we want to hypothesize that higher percentage of concordance in DNA sequence of a gene (say 80 % at a stretch) may account for geological persistence of the version of that gene sequences (conserved through billions of years) which by sheer chance, become "rejuvenated" due to extremely rare combinations. Obviously then, modified versions of genes may be found in totally unrelated species. These DNA sequences must have been lodged as integral part of sub gene pools much before the divergence of plants and animals (in the Pre-Cambrian to Cambrian 500 to 600 billion yrs ago. So, the genomes are elastic phylogenetically and can traverse through geological distances.

RANDOM DISTRIBUTION OF GENES

(A) Several conserved genes present on X chromosomes of Eutherians are located on autosomes of Marsupials

(B) DXYS1 sequences are present on both the X and Y chromosomes in man but in apes these have been identified only on X chromosome not on Y.

(C) Highly conserved sequence family (GATA) n is present in Yeast, mouse and man. We have lately found them in plants too.

(D) We have also well proven record of distribution of identical gene sequences on different human chromosomes and on dog, pig, rat and crate (snake) etc.

This can be emphasized here that higher percentage of concordance in the DNA sequences of a few genes among some plants and animals including man, may account for geological persistence of certain DNA stretches/versions of genes (? conserved through billions of years probably due to random distribution). These DNA sequences must have been lodged as integral part of subgene pools much before the divergence of plants and animals (in the Pre-Cambrian to Cambrian 500 to 600 billion yrs ago; [7].

The genomes are elastic from evolutionary point of view and have phylogenetically traveled through millions of years and spread over among diversified organisms world over at all times since the advent of life on the earth. Certainly therefore, a gene, present in one organism at one chromosome domain may be present for the different or related similar function at a different domain in another organism, and thus in no way is an exclusive, "bonafide resident" within/ of that organism.

The man evolved as a masterpiece mammal having enormous vigour, intelligence and ever increasing physical and mental strengths. Electric sparks and loud thunderous activities tearing skies apart were early trainers for survival. Big and

small caves offered protections against some calamities however, the men and women have to move on, in search of food and more food. Instinct to migrate must have evolved with the bipedal uplift of *Homo* in the usual course of evolution. Precisely, evolution and speciation within the genus *Homo* was necessitated by large size migrations offering favourable chances for random mating among so called sub species over a few million years .The Man as a species must reproduce to survive and must survive to reproduce. The man alone wandered from continents to continents made ways through oceans and valleys and settled as and when food and reproductive awareness evolved with a natural concept of sense of owning; the sociobiological instincts prevailed and gave, several thousand years ago an idea of settlements. So the man settled meaning thereby that the man learnt to stay and so evolved the concept of family-society and agriculture. Indisputably, migrations have tested and enhanced adaptive elasticity of the human genome and the enormous variables at many a gene loci might be the inherent results of natural hybridizations, diversified selection pressures and series of mutations. So practically, migrations of small and larger groups are the natural vehicles of genetic drift and gene flow among populations of the world.

ADVANCED PRIMITIVE MAN

Central India, territorially redefined as Madhya Pradesh in late 50s of the past century has been a symbolic state of this country exhibiting remarkable progress, yet maintaining rural and tribal cultures of the state. This is a remarkable phenomenon for a civilization as rich and as complex as that of Madhya Pradesh, since one might well have expected collapse of age old traditions to paralyse in vogue of modern development dependent-hurried progress to become ultramodern or be called backward.! Madhya Pradesh as a state has preferred to remain "backward" and she has been politically driven with slow pace. This slow pace at which changes of all kinds have taken place in Madhya Pradesh is the necessary accompaniment of this continuity and reflects accurately the rhythm of rural life-the tribal life- which has always provided the essential framework of the state.

The character of the tribal civilization of Madhya Pradesh, especially of the earliest stages of its formation can be understood only when we objectively assess whole diversity of ethno-cultural components which largely have determined true character of one of the oldest cultures of mankind. These efforts relate to identification of the Indo-Aryan and aboriginal elements which have been so intricately interwoven so as to form a cultural mosaic existing even today. Modern approaches have made the use of computers and related mathematics even to linguists. Such studies have shown that the languages of the population of Harappan civilization was, in all probability proto-Dravidian. This indicates that proto-Dravidian languages were spread in large territories even outside the central zones of Harappan culture (proto-Hinduism, Shukla. Loc.cit) not only at the time of its golden period but also much earlier.

The fall of the proto-Dravidian linguistic community is assigned by Dravidologists to the 4th mill B.C.when the Dravidian speaking tribes moved towards South and South-East (Andronov, 1979). The separation of the ancestors of Br~ahui is conventionally dated to the boundary of 4th and 3rd mill.B.C.or even at the very beginning of the 4th mill. B.C. This was followed by separation from the general stock of ancestors of other modern Dravidian languages of Madhya Pradesh. According to

glotto-chronological calculations, the proto-Dravidians were in the Indus valley roughly in the middle of 3rd mill.B.C. (in Madhya Pradesh in 2500 B.C.). This helps us in formulating a theory that the Dravidian speaking population of Central India were the creators of the Chalcholithic cultures of the region which developed in the successive states with elements of proto-Hinduism

Proto_Hinduism: The Harappan Culture

Bra'hui
(3000 BC)

North-Eastern Group (2500 BC)	Gondaw'ana'-Group (2000 BC)	Central Group (1500 BC)
Kurux	Gondi- Dialects	Parji'

Judging from the vocabulary of the Dravidian languages of Madhya Pradesh, this becomes apparent that the Dravidian languages were penetrated by Indo-Aryan words at an early date in the post vedic approach. This also reflected the influence of the Indo-Aryans on the Dravidian speaking ethnos.

Munda Languages

The Munda languages of Madhya Pradesh have not been studied in detail and the Munda ethnicity in Sanskrit is a complex question. The proto-Mundas, were in the contact with the Harappan population which also resulted in some similarity in individual traits of their material culture. On the basis of myths and legends of the people of Munda group, it is possible to believe that their migration into Madhya Pradesh was due to the pressure of the vedic tribes. The archaeological data testify that the contacts of the Indo Aryans with proto-Mundas were quite long. From the time of Atharveda, the word "la`ngalam" (plough) and also other Munda terms (words) relating to agriculture are met with more frequently, which shows the influence of local elements in the culture of Indo Aryans in the first millennium BC.

In the Atharveda we do find words and terms reflecting Munda substratum of precisely sacred-ritual character. It can be assumed that that proto-Munda words were included in these vedic texts as a result of contacts of vedic texts as a result of contacts of vedic tribes with the proto-Mundas during the period of dispersion of Indo-Aryans in Madhya Pradesh during 1000 B C.

These linguistic data, showing the growing influence of Munda substratum of Sanskrit in the 1st mill.BC (testified by S'utras, epics and Sa'stras) accord well with the materials of Sanskrit works on mutual relations of the Indo-Aryans with the local tribes of Madhya Pradesh with the successive branching of the Munda languages as mentioned below

Proto-Hinduism

Proto- Munda
(1500 B C)

Proto-North Munda (1000 B C)		Proto- South Munda (900 B C)
Korku	Proto-Kherwarian	Gadba Kharia
Mouasi Nihali	Korwa Birhor	
	Nagesia Turi	Kherwari
	Majhi	Majhwar

As evident from the Flow diagram above the contribution of the Mundas to the Central Indian legacy was very significant and multiform being traceable both to the material and to the spiritual culture.

The Aryans

The Aryans were nomadic tribes of pastoral raiders, though militarily much more advanced than the Harappans; the idea of

living in permanent settlements, urban or agricultural was inimical to their way of life; they evidently possessed no script, were not obviously interested in building, ———— and were culturally inferior to the indigenes. Aryan energies were manifested in in other ways; the plastic art went in to a millennial hibernation, to emerge in the Mauryan period, their Harappan motifs and and forms were still distinctive. These tribes who spoke Sanskrit and were conscious of being Aryans in an ethnic sense, were representatives of a distinctive new way of life and speech. It is widely assumed that these horse riders also spoke a distinctive language.

The Aryans appear to have entered the piece of land, now known as Madhya Pradesh From the Iranian plateau both to north and south in several distinct migratory waves, the earliest being around 1500 B C and last probably the last during 1000 B C. As per vedic literature many non Aryan tribes were "Aryanyzed" by gradual change in their linguistic behaviour.

Linguistically therefore following classification assumes significance:

Proto-Hinduism

Vedic Sanskrit
(1000 BC)

Proto-Prakrit
(600 BC)

Bhatri Halbi Kamari Chhatigarhi Bagheli Bundeli Malvi Nimari Bhili Bhilali

The overwhelming majority of Sanskrit borrowing in the Dravidian and Munda languages of Madhya Pradesh shows the mutual relations of the Indo Aryans and the local tribes of this area (? Does this mean that MUNDA spoken areas do not have mixing of words ?)

Linguistic diversity

The linguistic diversity currently demonstrated by the tribal communities merely reflects the tip of the proverbial iceberg. This picture will need anthromorphic attestation though this is apparent that the earliest human inhabitants of Madhya Pradesh may have been so called pre-Dravidians, or Veddids, who entered from the Malwa region in two or more waves. The first entry appears to have consisted of food gatheres and hunters without clans or clan-totemism, the second wave might have of localized clan and when population grew with the time, assisted with additional migrations the clan concept showed dispersal. They seem to have enjoyed group totemism in Chhatisgarh where the only case of strongly formed patrilineal totemism survives among the Bihor tribe.

The Veddid element which is allied to the aborigines of Australia and Indonesia is found in certain tribes of Chhatisgarh.

The next group to enter Madhya Pradesh were probably the Palaeomongoloid Austroasiatics from the North-East, who are still concentrated in Chhatisgarh. These are Munda speaking tribal groups of today, who probably developed their relatively strong totemism on central Indian soil from their earlier proto-totemic organization. With all probability, their period of entry may have coincided with the creation of the Indus valley civilization by Harrapans wherein evidence of totemism is almost non existent.

The Harrapans who had developed the city – states, were perhaps Veddid peoples.

The use of the Aryan Dravidian dichotomy in the analysis of modern ethnic composition has no specific basis except in a linguistic sense. The Aryanistion in Madhya Pradesh was a very gradual process which

did not get underway until the Mauryan period and was facilitated by the *Satavahana* colonization in the last century before B.C. The epics reflect the process of socio –cultural assimilation.

In the Vedic period people were tribally organized, regardless of their ethnic origin and they acknowledged the sacred authority of the Vedas. With the rise of kingdoms during and after the Epic period (c.900 BC) and the development of urbanism, the process of de-tribalization began in in earnest. At this point the social order and the cast system were extremely fluid ; Aryanisation included the assimilation of peoples of diverse ethnic origin. The social evolution of the caste system is a long process of de-tribalization in the history of Hinduism. No sharp distinction can now be drawn between tribal religion and Hinduism and among many such branchlets of Hinduism taking shapes of distinct religions; culturally, religions are process in continuum of human existence modifications and adoptions.

The best evidence comes from the rise and subsequent dispersal of Buddhism. In Korea and China, the Buddhism has had taken shapes in four or five kinds. In practice, there were five kinds of Buddhist sects, but in the —century a Buddhist saint emerged who pleaded for “Unity” among Buddhists and declared “Buddhism is one”. The working concept of people is unpredictable

As the matter could shape by the end of ————, the sixth Buddhist branch emerged as “ONE BUDDHISM”. In other words, “human being can not unite without diversions”

Biolinguistic Approach

Centuries of misunderstanding, strife and bloodshed have resulted from the foreign rulers not knowing what primitive peoples were really saying and thinking. We too have isolated them by calling them “savages” and tribes. Undoubtedly, there are basic differences in ways of thinking between civilized and primitive people but that would not have allowed their exploitation to try or in attempting to understand them. In fact we have made erroneous approaches both in anthropological as well as in linguistic studies that we have had analyzed data from a Western point of view.

However, my entry in to life patterns of these primitive people has involved a basic component of biology and through this, I have ventured understanding language component their thinking and culture lineages.

Gender Usage

Our languages feature a system of classification of nouns based on distinction of sex (masculine, feminine and rarely though, neutral). In primitive languages, however, sex distinction is not the usual aspect of classification.

The Central Dravidian language Gondi, for example features a system of gender based on “animate” and “inanimate” genders. Linguists say that Gondi-animate includes all living objects, persons, animals, plants, birds etc , and such objects which are exclusively used by men-women as part and parcel of their life. Probably thus, feathers of birds, smoke-pipes and dried tobacco like things were termed as “animate”.

Such categorization of genders was not reflecting “primitiveness”, on the contrary, each pair of Indo-Aryan designations of Gondi gender reflects polarity of positive and negative sense in usages of genders.

We classify things as per our ways of looking at them. Our civilization is artificially transformed world of nature and we have been using for several centuries now, words like “in nature” people living in the natural state , world of nature meaning thereby that we live in some other world and “in nature” would mean wild, unknown perhaps a hostile land with unknown people, or entering to a backward phase, a retreat to modern civilization ?.

Taking a positive view is that we have been progressing in such a way that we are depending on our own mechanized products, automobiles trucks and taxis and our generated fuels, fires and smoke all around. To begin with the entire land mass had plants, animals all sorts, small and big; water resources , mountains, rivers and huge forest areas as well as broad dense grass lands. So all was one nature. Then we increased in number, migrated, devised ways of life, formed territories to conquer and be conquered, and over several thousand years have removed all major constituents of nature by ceaselessly designing new world of civilization, obviously bisecting human inhabitations to civilized and non civilized or better primitive world.

We honestly admit that “primitive” people are in “nature” while a major bulk population tends to go away from nature to “ non-nature”.

The tribe was completely involved in nature: nature was his life and life itself was nature, for him. The tribe was “out doors” person, “in doors” for him was usually only a small temporary shelter for sleeping or against inclement weather and was not primarily a store house for material objects. Since a tribe was very active all other phenomena seemed more active as well, and this inertia was reflected in his language. The tribes could not place emphasis on material phenomena, his inner nature was activistic not materialistic.

An Abhujmaria replies to self imposed question, What is life ?, he says “It is the flash of a firefly in the night, it is the breath of a buffalo in the winter time, it is the little shadow which runs across the grass and loses itself in the sunset (Shukla, 1982). Even the death was not the end of life but another phase of existence! Instead of saying “He is dead” which is a final verdict, a tribe, Bhatra and Dhurva would say “He is decayed” conveying thereby that he is undergoing a dynamic organic process, not a static material phase.

Another great quality of a primitive man’s thinking is “no separation or difference between living and nonliving objects or activities”. Rather, he saw the activity, inter activity and interrelationships among all natural phenomenon of a whole living organismic universe in which he was also completely involved and was an integral part. Among Bhils, clouds, air, mountains, rocks, animals, rivers and stars and almost all objects small or big are believed to be as alive and conversant as the mankind is.

Foot races determined whose strength was greater than that of the wind; a mountain was climbed to conquer its spirit, forests were challenged for wilderness and deeper dangers, caves were inhabited since the very onset of human race or probably even earlier. So, the so called primitive men even now are desirous to be more closer to nature and natural instincts.

Nature is early schooling of Humans

Tribes have always been active, pragmatic and relativistic as they also have to move from one to another site; are often required to reorient themselves to completely changed conditions. The only stationary companions for them have been “trees” wherever they moved or found abode, they found trees to be there for help and supply. So naturally, a

tribe considers, “tree” as a human being, a real person in so many shapes and sizes of leaves, flowers and fruits. He has learnt differences among them and identifies each one of them with respect, love and appreciates “tree-ness” in them.

To a tribe or better a primitive man of several thousand year old human groups wandering in nature, flowing rhythmical rivers, noisy musical waterfalls and omnipresent trees peace, silence, wisdom, struggle, and quest for survival.

Stones are gods !!

Stones were next affiliations of wandering humans because, when they rolled down from above, from high sliding rocks or mountains;(from the sky as the gods were angry !) they killed other humans and animals, and when stones were carried and thrown on animals, many animals were killed. They must have fought among themselves for one or the other reasons and in hostility must have thrown stones, and sticks (portable branches or trees, even). Stones too became immediate associates of early humans (HOMINIDS).

With the help of stones the rivers move on, huge trees are supported by rocks and stones are in various shapes and sizes. Yet stones are “silent”. Stones have a very unique character, silence is an inbuilt in a stone. Silence is the absolute balance of body, mind and spirit as the old Gadba ( ) belief revealed. Kurux ( ) saying is “ silence is the corner stone of character, stones must be very wise indeed”. A stone must be God then, does so much for us, saves our life; we live in stone caves and stones support trees.

Stones occupied place in dreams of many thinkers among primitive men.

Muria (a tribe in south Bastar in particular, ————————————) says “in my dream one of these small round stones appeared and said that the maker of all was Lingo Pen”. A stone is the altar of human sacrifice to god; a very spiritual phenomena tagged with the earliest memory of human race.

A stone continues to be very special to the tribes and majority of tribal languages refer stones to be grouped as “animate”.

Stones and Immediate problems facing Primitive men Ten Thousand Years Ago.

Stones are progenitors of Religion

A primitive man looked at heavens from where he saw great electric shines and thunders arise; massive uninterrupted rains originate and natural disasters emanate wiping out everything he and his fellow men saw and were living with. Big and small caves offered protections but they have to move on, in search of food and more food.

II. POLICING IS LIFE !!

Every living individual is inherently conscious of the other one. The older individual often looks younger one with a caring instinct. Too young ones are under excessive vigil of mothers and this is true for all species, may be reptiles, birds, and mammals. The mother snake never allows any one to approach even nearer when eggs are cracking to expose a new life; so does the mother bird. She takes “vigilant rounds” around the nest. In order to feed, there is an honest sharing of such rounds between male and female parents when either one goes for gathering food. Any one can see the behaviour of house sparrows (*Passer domesticus*) in his/her household. Not only the place of overnight stay in your corridor is fixed, the male bird takes a round before landing at the

point. Recent ecological and behavioural biological studies in African safaris have proved beyond doubt that be it a tiger, panther, a herd of any animal species, there are internally "agreed upon" monitors whose job is also to take vigilant rounds and make sounds or cries cautioning other individuals of their group. And above all, there are hawks flying on our heads, far away though, who take extra care of informing about required food for their flock. Often vultures reach animal earlier than the death.

Prevalence of such humane instincts among animals is only a proof that all our basic instincts have been animate in origin. I have stood almost motionless on many occasions in the wild, on the road side or in the garden to see the extra caring and vigilant behaviour of small animals.

One such immediately striking incidence is of a wounded big rat (In Bhopal we have big rats resembling a small cat in size, living underground, technically called Bandycoot (*Bandycoota bengalense*). This big rat was trying to run sluggishly in the Arera colony road side garden around 9.30 AM when I was just riding my bicycle to go to the university. As a natural observer, I stopped and looked on that slow moving limping bandycoot. With in a minute, a black crow attacked on its face by piercing beak, fell like an arrow; and before the big rat could even scream in pain, the same crow again attacked like a jet plane on the neck. This was almost an end for the rat, neck was bleeding and it lay in blood. I looked above on the trees where many crows made inviting calls; to my surprise, the only attacking warrior crow tried to lift the big rat catching it on the tail and attempted flying. Hardly the crow could take it to the height of 4 feet above the ground but fell on account of rat's weight. In about ten seconds a street dog which was by now, probably behind the bushes, jumped on the crow.

Hey!! as I could not even pause, in another 2or 3 seconds, flying-waiting crows above the scene, near the middle of the tree, fell on the dog like rockets and the poor dog started typical crying, bleeding on the eyes and ran away.

"What a grand display of love for own creed", I realized, but then a few crows flew away while a few sat near the kill and started sharing the feast with the first one (I think so?)."

"I must witness the whole episode which was not over," I thought.

Yes, I was right. Within two minutes, one crow (probably, the original hunter) lifted the big rat holding the tail and flew comfortably to the next building side across the road. "How can one alone go away with his own prey without sharing"!! I thought.

Soon then, I noticed about two or three crows were still taking rounds and with a different noise (probably sending message——that's all, its over—) they went away. Temperamentally a behavioural biologist, I must have witnessed in the past fifty years, a dozens of natural episodes on (natural sites) many grasshoppers, mantids, moths, wasps, bees, snakes, lizards, Varanus (a rare reptile), birds, rats, kittens and monkeys which had exhibited superior intelligence, collaboration and cooperation, hatred as well as love and fight, but never had had such a glimpse of "team work of supervising protection, sharing and legalized distribution" among crows. House rats *(Rattus rattus)* are well known for stealing and eating with full cooperation. Many such incidences become unforgettable.

A curious mind is like a wet soil, everything leaves an impression on it.

I have often thought of inherent biological philosophy inside many such natural instincts and community response therein. To keep carefully vigilant is the prime attribute of intelligence. But why be carefully vigilant, and what for? Because there is always action dependent counteraction at all levels of living and even in the non- living systems. While teaching various science subjects at schools, college and university levels I have had realized that the concept of "watching for protection" is inherent everywhere guided by uncontrolled missionary instincts; even inside the cells of our body; all biological activities are efficiently controlled, monitored and adequately reported to the superior "boss".

For example, there are certain normal functions with a definite route, point to point accurate and timely operative mechanisms underlying the simplest form of action at the level of molecular actions inside a living cell, inside tissues, organs and organisms; behaviour of organisms and their social organizational patterns. One of the most glaring examples of sensory regulation and signals' role is observed when we see, sense, or touch a thing. Within a fraction of a second nerve impulse informs the brain which according to individual's basic understanding identifies the thing. An object seen, information passes through optic nerve finally reading the object; all this action and dependent reaction involve chemical actions, signaling pathways and release of compounds with used up energy molecules. An interesting story is that a frog's eye does not pass all information to the brain. This has a capacity to selectively transmit the message and biophysicists and physical scientists have made this as a model and developed the radar system; helicopter models were developed with the help of grasshopper flight mechanisms.

Ants, birds, lions and monkeys have code of conduct to be faithfully followed; violations are often wild and volatile. Plants themselves are governed by natural inner and external factors controlling many of these events triggered inside their cells. The concept of careful vigil and regulatory mechanisms prevail everywhere and are under strict control. Defaulters and out laws are punished by policing mechanisms inside the cells and tissues. The apparent truth emerging out of deeper studies does point out that vigilant actions, taking rounds to keep supervision on ongoing process, getting ready for help and repairing mechanisms are inherent in the biological system. Age old scholars, several centuries ago must have perceived and conceptualized the scientific philosophy in to social practice.

Social relevance

In ancient India, we had several kings and rulers of the states who considered "going on rounds" as their prime duty to their civilians. Doing so, they often changed identity (dresses etc) with one or two trusted personnel during nights, mid days and also at the time of festive occasions in order to find out problems and day to day obstacles their citizens were facing and about which, the administrative machinery was ignorant or deliberately silent. These kings wanted first hand information and believed in rather hearing from the horses' mouth; by such courageous efforts they also could gather unbiased public opinion and find out if there be any kind of oppressive activity of high state officials. This activity, in olden days was an ethical-moral duty of every head of the state or organization and was never the expression of lack of trust or faith on lower order.

Even in educational institutions world over we have had a tradition for head of the institutions to go on "rounds with a vigilant eye", what for ?, to take care of students, teachers, teaching schedules and "face the unforeseen problems first". No breeze

even, should venture disturbing the ongoing disciplined activities. And above all, one who goes on "round", realizes his identity in depth and attaches it as a part and parcel of his way of life. Higher the position, greater was the load share of responsibility, and both by heed or deeds, this was never underestimated.

To be more descriptive, even in outer space, there is "vigil activity going on to "watch and see" among orbiting planets. There are numerous stars and earths, according to astronomers whose very presence is just to "watch and see" the orbiting routes. But this can not be termed as "policing". Taking rounds or orbiting is not policing any way!! For several decades now, we have installed numerous orbiting satellites which are serving multipurpose observations. These man made machines are capable of commands and be commanded but the natural space system has only one concept, revolve or die. Hundreds of stars die and many of them get sublimated in the space above, never reaching the area where their demise could have been known.

Polcing in the Living System !

Philosophy of Biological- Policing is to "keep watch on ongoing natural or monitored activity, help or offer instant support, nurture the right and weed out the interfering". Watch and see is the first dogma of a functioning system !! And the first modus operandi is taking "rounds"

Taking "rounds" is not only space bound truth but a practical dogma of life. Many shortcomings or lapses are corrected before causing severe losses. I will again venture in bringing this ideal dogma more at the levels of molecular mechanisms.

We all know that the structural unit is a cell; all organisms are made up of cells. A pin head tissue may have ten thousand cells. Each cell has an outer membrane and within this bag "life fluid' is filled up. Each cell has a nucleus which contains mainly Chromosomes and each chromosome has genes. A gene is essentially a part of DNA molecule and each chromosome has many to many thousand genes. How does a foreign body or an infecting agent enter a cell ? This is not a joke, to begin with. A fungal or a bacterial cell or any foreign material at the smallest level for entry has to face the defense mechanism of the cell membrane; a big fight goes on and a cell undergoes a tough test. Even it enters the gateway, the cytoplasmic structures send small tubules which encircle (round up) the attacking material and transport the culprit to the outer boundary, and throw it out, still encircled by a trap. In humans what we call infection is the best way to understand entire machinery of policing and defense. There are molecules which take rounds inside the boundary line of the cell membrane. As a bacterial cell approaches numerous chemicals are secreted which bacterium may tolerate; somehow "infecting" toxins go ahead making a pathway, blood cells have white corpuscles as "soldiers" which exchange chemical war with the infecting cell. This is like, any ship can be sunk in a war. If the bacterium dies out, the debris is very efficiently dumped off by engulfing tubules. In order to fight the enemy within the cell there are "suicidal" bags (lysosomes) which arrive on signaling and are loaded with enzymes. The cell membrane of lysosome is self dissolving, enzymes are released on the enemy and infecting object may be demolished. White blood cells in the human blood are particularly rich in lysosomes; but when the infecting bacterium wins, it disrupts the cell synthesizing machinery, and uses cell reserves for its multiplication. White blood cells turn out to be pus cells then. When an antibiotic is administered, the molecules are carried by transporting elements which finally

overpower the infecting population and released toxins there of. Very efficient transporting system is one of the greatest acquisition of immunogenetic system in side the cell.

Efficient information system, vigilant survey of competent molecules, proper signaling through coded language and very powerful defense artillery are built in the cell system in order to maintain big factories, energy reservoirs, energy producing power stations (respiratory mechanisms) and replicating molecular mechanisms inside a living cell. Is this not the modern concept of policing?

Not only the vigilant supervision system is installed but also even very efficient guards are recruited to take care of genes and their activities in the cell. Most pertinent examples in this context are molecules designated as "gate keepers" which act as inhibitors for certain compounds and their dependent reactions. The p 53 tumour suppressor protein is a cell's principal guardian against cancer . Obviously so, most cancers eliminate p53. Among many genes there are proteins (each protein produced by one gene) whose job is policing to keep protein synthesis going in order.

At all levels of an organism, we have a mechanism of policing for protection and support(help).

Vigillance is Intelligence

As the number of people are on enormous increase, all dimensions of the problems have also multiplied and such a multidimensional load on human population progresses at the cost of decency, truth, rules-regulations and so called honest love and unity. Might is right becomes a working practice. This competition, present also in world of animal and plants, is a natural phenomenon. During last one thousand years or so, another effective tools "manipulation and money" have been appended in the ill-support of natural competition; so, now modus operandi has become "might, manipulation and money". None of these singly or in combination recognize truth, honesty and faithfulness; all such words are meaningless therefore, are now redundant.

Go to a graveyard, there may be dozens of people but all sound silent and sorrowful silence. Then, go to a novel school and see that all children are in class rooms, no noise out side, there is none to talk to, yet you experience the rhythm of noise, a buzzing sound like a bee buzzing around its nest. To the earlier silence, you took it as heavy or unpleasant, to the silence in a school, you took as pleasant and most welcome. And while experiencing the difference, you come across a principal coming towards you, and then you realize that "he is on round". Sense of duty involves anticipatory care, he is careful enough because he is dutiful !! Taking "rounds" as often termed in social practice, generates force of attraction/ force of adherence by reviving faith in the system; compels one to adhere to the functional orbit and feel secure. Everyone wants to feel secure; has to be vigilant, despite the fact that "other species on hunt needs a prey" this is a biological truth.

But we as human beings belong to the same species; why are we then hunting own species? This is unlike a living rule; hence, meaning of policing have changed in the context of modern humans. For us "policing" is assuming as an indication of unpleasant otherwise obligatory duty crisis. But the hard truth is that policing is an integral part of our qualitative behaviour; a natural way of elderly life style and is one of the residuary powers

of an honestly civilized and unselfish citizen since antiquity.

I remember a silent lesson of policing concept probably from the innermost fold of childhood memories. My grandmother was in her 80s during 1952 and I was around 11. Though she was blind but was extraordinarily conscious of foot steps and used to pronounce incomer by name. My father then was a magistrate and use to attend judicial court even up to the late evening. When too late, one day I witnessed that my father took out his shoes in the verandah and came in gentle barefoot inside the room, but alas !! my grandmother shouted "Hey Lakshman you are again late ?" and we all including the peon carrying the court box laughed with big noise. This kind of elderly policing happens with everyone and the echoes of the past guide us conveying immense love and care.

Must not we ransack our human memory for peaceful survival, rather than recalling stupid faults encountering unpleasant memories?.

III ENDANGERED - CITIZENSHIP

We the world citizens are breathing in a very much insecure society with the increasing dimensions of newer techniques of creating nuisance, terror and ever increasing distrust among citizens world over. Bombs in the bus, train, cinema theatre, open market areas, aero planes and also lying on the garbage tins are only few exhibits of a few peoples' hatred towards the progressive nations; innocent lives are becoming items of rampage. These inhuman acts are the outcome of free breeding corruption of excessively selfish, narrowly greedy and anti social persons widely distributed throughout the globe. Our irresponsible political leadership has fathered and faithfully nurtured these values for quite sometime, well above four decades. Even In India, we are now only preachers of peace but have always supported criminals and masked their inhuman acts as part and parcel of democracy. We were theoretically known as symbols of tolerance but as a national character now, we display complaints and dissatisfaction on every issue; we are said to believe in "forget and forgive", but our instinct of taking revenge never calms down. This dualism of Indian practices has been most vividly viable for more than Fifty years; though said to be prevalent in all periods of human civilization. And this dualism or even pluralism of split personalities is rampant world over among all politicians, everywhere thus a common man is becoming an easy victim. This is principally on account of ever increasing economy at any and every cost and this global feature is the motive dogma of modern progress. To be honest in approach, economic progress is friendly to ethical values only in the beginning but soon becomes a bookish conjecture.

The new format of the society is non palatable to millions of simple, honest and humble citizens who believe in brotherhood, love to all human beings and duty as the foremost human religion: those who believe in second religion is an option of thoughts and way of life !!. I have counted heart beats of such people spread world over by way of personal talk, involving and sharing mutual respect.

Exhibition of hatred in the form of terrorism is the latest edition of quelling human values, feelings and ambitions of being a human being. Variable techniques of generating terror are continuously questioning our technological progress dependent-perversions. And the bitter truth is that we can never achieve perfect, clean and honest society. Not because such a society never existed anywhere but because,

biologically, this is improbable, impossible and definitely imaginative. Perverts are always born, socially transformed /made, nurtured, and have always been "domesticated" by power.

I intend to enlighten on all these points on the basis of my own studies accumulated as by products of my principal focus in areas of Genetics, focusing principally on reproduction, survival strategies and adaptive behavior in plants and animals including humans dispersed in many countries. Studies conducted during last fifty years suggest that humans are more amenable, susceptible and also most adaptive.

First of all, I concentrate on impact of social turmoil on biological aspects of human behaviour and reproductive performance.

(1) Prevalence of Excessive Social stress

There are many problems existing in our society which have become synonym with the region; the one I had known about was, or rather has been, the "Dacoit problem". A dacoit word was first heard on All India Radio in 1955 which we remember " Daku Mansingh mara gaya"; I was a student of 10th class and my father was then posted at Nowgong (Chhatarpur) as a Magistrate. During teen age we came across many instances and the drama popularly played on stages about "Sultana Daku" was an item of festive recreation in Northern India for several decades. Stories of both terrorizing and social services were commonly heard and people had labeled " Good Daku" and bad/ cruel Daku" (outlaws) in the Bundelkhand region mostly in the belt extending around Chambal river and further going ahead to the villages around Jaulon in Uttar Pradesh. Dacoits have laid an inbuilt terror among masses and I remember that whenever I visited my relatives in Jaulon area during 1950s-1960s every one cautioned that I must return home by sun set and at any rate, I must never be alone. I always have had desire to go to natural forests, river beds and explore unseen places but was often loaded by a very unnatural tension. Further to this, we always heard some or the other news of killings, kidnappings in a nearby area thus giving enough support to my temporary care takers. The worst was that a gun man went with me in early morning for a walk . The story does not stop here , there are several pouring instances coming to mind but a relevant one is more important.

You need Police Protection for your normal duty:

Even as a lecturer in Botany at Government science college Gwalior, I use to request for a police guard to accompany our M.Sc.boys and girls and the guard were lifted in our hired government bus to the forest area around Tigrha dam , sometime on Shivpuri road (1967-1973) and we also took help of Ghatigaon Police station. In every walk of life we have people who live with joy and enjoy their duties, crack jokes, make people laugh and keep a congenial environ. I remember a few policemen who went many times with me and one of them once remarked "Goswami saab you have been self centred in your studies but never cared for us; you have collected dozens of plants but we could not collect a single daku in this area, help us in collection." I gave him an advice, go in civil dress like a student, collect plants, learn few technical things and be of course armed by pistols etc in a botanical tool box , you never know it may work !.

One may not believe, I showed them signs of their (? dakus') earlier presence. They "always" leave signs by unnatural placement of twigs, branches which no shepherd would do that way, nor even a

villager and by these non monitored code the dacoits send cautions/ messages to their colleagues. This was my conjecture !!

An Hypothesis

These are some of the instances which installed a "faith" in my approaches of the problem that a society under permanent stress must have, in greater majority of people, an instinct of insecurity. Insecurity, suspicion under stress cause the pituitary gland excitement thereby secreting more hormones than needed. We talk of bravery but the moment we see a snake in the vicinity, eyes alarm message to the brain which is translated and within a small fraction of second pituitary functions, we have involuntary rise in blood pressure, fear becomes operative and voice becomes shaky. Human physiological responses are so interdependent on neurological responses and are so sensitive that fraction of a second can change the whole personality. In our old Indian Vedic literature we rate control of Anger, Fear, and Greed as testaments of a noble soul.

So, obviously, the society with percolated insecurity causing behavioural tension must be having visible impacts on human reproductive performances at the population levels; this hypothesis was tested on the hospital data collected from the records of maternity centers, primary health centers and hospitals in Gwalior region. The birth statistics from 1950-to1995 gave very alarming results. Also, we conducted family surveys mainly with the help of female students studying post graduate courses at our and many other University centers who offered help for this, apparently secretive but, otherwise very important work. This is worth mentioning here that these investigations were compared with very many kinds of population samples (In biological context, we call a population sample constituting a breeding group, which in India varies with the caste system, sometimes also differing in languages; non tribals, tribals, communities living at high altitudes, sea shore area dwellers in south and also on moving chariots of Rajasthan) A very patient personalized project accumulated data, generated from MP (with Cgarh) Bihar(old), Himachal, Punjab, Srinagar, Andhra Pradesh and some sporadic samples has turned out to be a very genuine consolidated information, some of which have already been published in national and International Journals.

Twinning is influenced

A mother gives birth to more than one child with a difference of a few minutes to few hours. The phenomenon is known is "Twinning'' which ordinarily includes birth of triplets, quadruplets and more. Every population has a range of say 8 to 15 per thousand twin frequency (means that out of 1000 births there are 8 or more twin births which also includes multiple births). Scientifically, we want to know how many triplets and multiple births have taken place in a population, and these are very well recorded in each village. Twinning never goes unrecorded because this is, as ever, a matter of social curiosity, worry and tension of the mother and attending persons on the health of both, the new born and the mother. Taken as a whole proportion of twin births in one year in one area, and comparing another population in the same way, doing this for many years makes a difference. Biologically, we derive many inferences and offer very valuable comments on the intra and inter population differences and impact of environmental hazards. My studies published during 1970 and thereafter opined for the first time the role of age of mothers, their genetic background, which was upheld by Scandanavian workers. Twinning by and large is dependent on heredity, mother's predisposition to environmental factors as well as her higher age (mothers

conceiving at 35 and more have great chances for a twin maternity).This was intriguing that frequency of triplets in particular, showed rise in Morena-Gwalior belt during 1960-1975 which alarmingly declined during 1975-1980. Our total data based on about 6 million births suggested that average frequency of triplets was 1 in 880 births (only triplet frequency) which had declined in 1975-1980 to be 1 in 1700 births. Presenting this work in Rome Conference in 1989 on Twins, I had presented this data causing dismay to many and curiosity to hundreds. As a possible explanation, I had expressed hormonal imbalance influenced by fear, anxiety, socially prevalent long term tension to be responsible for increased tendency of ovulation among women inhabiting this area. A very strong support to this hypothesis was cited from the published results of twinning in Europe during and after the first world war and more extensive data during and after the Second World war. The German and central European territory revealed maximum twinning rates during war-period decade which declined in late fifties. What a grand biological phenomenon to compensate the loss of human lives !!

(3) Over medication is the pseudo outlet of insecurity

A species under great biological stress reproduces faster than, under reluctance.

Twinning is also known to be influenced by drug abuse, extra dosage of oral contraceptives and too much alcohol or other addictions. These all are under a physiological monitoring principle of three ranges, minimum, optimum and maximum. Not all individuals respond exactly in the same way, even twins are like “two peas in a pod”, so we can never assign any one causative factor for any biological phenomenon.

This is a dogmatic truth that there is nothing which can be taken “final” in biology. But still we try to offer explanation and on matters such as the present one, collecting population data (epidemiological study) and using statistical comparisons with many relevant studies are very reliably applications.

A very unfortunate biological problem is regarding congenital malformations which are directly correlated with over medication, drug abuse and newer addictions (not all congenital malformations are hereditary in nature). The most famous example is the thalidomide tragedy in Germany. During 1940s the women used extra dosage of sleeping drugs which included this organic compound, thalidomide.

Based on chromosome studies on plant cells under the influence of the chemical thalidomide, then, extending it to epidemiological studies and also subjecting it to tissue culture observations, biologists came out with recommendations to ban thalidomide dependent drugs. This also revealed for the first time that drugs in molecular forms are not detained by placental barriers and can harm the developing embryo. Pregnant women are very much prone to such hazards !!

Scientifically also, as we pronounce ethically, motherhood is the greatest virtue of being a woman and a mother.

Lack of Sociability

We have made extensive studies on twins and twinning from different parts of the country (now, more than 14 million births) during 1964-2004, keeping in view the ecological variables and marriage patterns (because, marrying with in the family, as in practice in many communities in India, brings common genes among their children). There are many

instances that I intervened in some marriages of muslim families in Bhopal and tried to convince both parties of possible dangers of genic combinations. I did so because they had asked my advice as a scientist, so how can I be unfair to them. Duty as a biologist always demands truthful discussion with any one, and oily tongue can please the persons but not serve the science.

These all honest approaches in a society can sustain longevity only when there is a mutual trust; now in modern progress we face the greatest scarcity of mutual faith.

The great Shakspeare wrote " who is to be trusted in this world when one's own right hand is opposite to the bossom". We are experiencing every where only distrust because we feel insecure. What for??

In my lectures I have mentioned "violence" to be a natural, original and universal instinct in biological systems. Insecure-society facilitates expression of violence, non-violence is suppression of egos, which has a minimal occupancy in a perturbed atmosphere. No one likes suppression of desires; even, no one wants to take heed of precautions.

This is a very surprising fact in behavioural biology that the factors which enhance distress can be associated with twinning as well as result in increment of abortion rates in human population. There are more than dozen biological and non biological factors for causing recurrent abortions and too early termination of pregnancies (just in 4-6 weeks of gestation; before noticing pregnancy) but among environmental factors, induced long term social unrest is one of the well known parameters. Natural disasters and calamities have their own way of destruction. Struggle for survival as a species always goes on in the biological scenario.

What we ought to do is to make our demands having some end, egos need to be fenced by our sense of duties. Very honestly, our country shall never be able to get back to real Indian values of tolerance, acceptability of knowledge and mutual faith with respect. This is now impossible rather than difficult to revert back !!

Is this pessimism ? no, not at all. The time lost can never be regained, gone - age can be replayed on a stage or drama not in real life, damage on humanity goes in the space of time ! Best examples are from Indian history dating back to 3000B.C.

Lord Rama, could never live happily after *Sita's* "uncalled for" exile. The great *Karm Yogi, Krishna* ultimately tells the true strength of "Time" *Arjuna* was convinced to do his job, *Duryodhan* did his job and above all *Bhisma* and *Dhrithrastra* were understood to continue to their jobs despite the fact that everyone was becoming aware of drastic consequences. I often feel amazed at the deeper extent of hatred in *Dhrithrastra's* mind that he wanted to crush and mutilate *Bhimsen* even when he had lost each and every son, his empire and the total purpose of his life. Frustration or "hatred in finite" or both, are inseparable ! The lust of power and hunger of revenge are immortal, these never die, they breed truly in masses for several social generations.

Hurt remnants of hatred transform their beliefs in ethos of their isolated religion. Human mind is the most evil mind in the biological world. So we will always have wars, man made disasters and self aimed destructions.

(to continue in Next Chapter------)