Ethnobiological Analysis From Myth to Science:
II. Samudra Manthana, A Symbolic Chronological Process for Re-establishment of the Human Ecology

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INTRODUCTION

The science of Ethnobiology has a multidimensional approach to understand the human relationship directly with the biological world, interacting through multidisciplinary subjects like Anthropology, History, Sociology, Economics, Commerce, Medicines, Pharmacology, Animal husbandry, Archaeology, Religion, Social customs and culture, Defence and survival, Food and Nutrition, Art and literature, Mythology, Forestry and Agriculture etc (Manilal, 1989). In this context, study of ancient literature is considered as a new dimension in ethnobiological research techniques and a rich source of informations pertaining to Indian heritage (Padhy, 1999). Moreover, the analysis of various mythological facts and religious arts requires serious research (Dhasam, 1977) to discover the scientific theories resting upon them in hidden symbolic forms. Recently we have analysed the mythological picture of Panchamukhee Hanuman, as an empirical representation of ancient animal classification (Padhy et al., 1999). In the present communication an endeavour is made to discover the scientific thoughts concealed within the mythological process of Samudra Manthana (Churning of Cosmic Ocean) which is depicted in Kurma Purana. This myth is considered to be of vedic or pre-vedic period, which has occurred when Bhagawana Vishnu took the Avatara (incarnation) of a Kurma - the Gigantic tertoise (Vitasaxis, 1977).

THE MYTH AND SCIENCE OF SAMUDRA MANTHANA

The ocean is recognised as the residence of Lord Vishnu in Hindu mythology. Out of one thousand names of the Lord, Naaraayana is one which means ‘one, who abodes in water’ (Naaraah = water + Aayana = Residence) (Padhy et al., 1996). The ocean is otherwise named Ratnaakara (source of wealth); its Lord Varuna is the father of Goddess Lakshmi, the authority of wealth.

As per the myth, Samudra Manthana, in order to retrieve certain divine treasures lost during dissolution, was proposed by Lord Vishnu to churn the cosmic ocean. The Gods on one side and the Demons on the other, wound the snake Ananta as the rope around the mountain Mandana as the stick to churn the cosmic ocean (Fig. 1). The process yielded twelve precious objects along with a huge quantity of poison (Visha), which would have destroyed the then biota; but rescued by Lord Siva by consuming that:

The precious objects enlisted alphabetically were as follows:
1. Airavata (Seven tusked flying elephant),
2. Chandra (Moon),
3. Dhanus (Bow),
4. Dhanvantari with Amrit (The Lord physician of Gods with elixir of immortality),
5. Kousuva (Priceless gem),
6. Paaryaja (Wish fulfilling tree),
7. Rambho (Heavenly nymph),
8. Surabhi (Mother Cow),
9. Sura (The wine),
10. Shree (Goddess of health and beauty),
11. Ssankha (The white conch shell) and
12. Uchshaisraba (White stallion with seven heads).

The occurrence of Pralaya (dissolution- ecologically denudation) is a usual phenomenon as stated in Hindu scriptures, that during the transition of one Yuga to another, great flood occurs that totally devastates the ecology. Similarly, at the end of one Mahaayuga (i.e. sum of four yugas: Kretaa (1728,000 earthy years) + Tretaa (1296,000) + Dwaapara (864,000) + Kali (432,000) = 4320,000 earthly years) cataclysm takes place and at the end of one Kalpa (i.e. 4320,000,000 earthly years equivalent to twelve
hours of Brahma - the creation power), the creation is squeezed up. In this regard the most authoritative scripture, Manusmrti (the first ethical law book for human beings, formulated more than 2000 BC (?)) says:

Manvantaraanya sankhyaani sargah samhaara aeba cha,
Kreedannibaitai kurute parameshthee punah
Meaning: The Manvantaras*, the creations and destructions (of the world, are) numberless; sporting, as it were Brahman (the creator) repeats this again and again (Buhler, 1886).

These mythological predictions of Pralaya were not figments of imagination, rather supported by geological evidences. The geologists have identified great ice ages when very thick sheets of ice covered the earth almost to its full extent, led to dissolution. The first of such was expected in the Pre-Cambrian period of Azoic era, 700 million years back; the second one was in late Palaeozoic times i.e. nearly 250 million years back and the latest one occurred in Pliocene period more than half a million years back. An American scientist, Walter Alwares, has proposed that after every twenty six million years, a great cataclysm takes place on the earth, completely eradicating some animal and plant species (Mohan, 1996). Moreover, the recent attempt to explore the submerged Dwaraikaa Nagar, the kingdom of Bhagwaan Sri Krishna and to discover the Noah’s Ark, used during dissolution as described in Bible (Marr, 1998) is a positive attempt to realise the truth behind the myth of Pralaya. But, an attempt to churn the cosmic ocean after dissolution, to search the divine treasures which were lost (means they were pre-existing), seems to be symbolic representation of the natural occurrence (mythologically presented as divine endeavour) to recover the ecological objects and factors which were destroyed. The whole process can be summarised as per following steps:

**Step – I. Science:** Dissolution has occurred, as a natural phenomenon, which involved destruction of ecology and created imbalance in nature (environment); **Myth:** Divine treasure (i.e. creation of Brahama) was lost in Pralaya - immersed in (cosmic) ocean - (as it is impossible to churn the physical ocean), the prefix cosmic is added to explain the whole system as more meaningful and scientific (Vitasaxis, 1977).

**Step – II. Science:** The recovery of the ecology has occurred in course of time; **Myth:** The snake Ananta (Na = No + Ania = end i.e. endless) which was used as churning rope, represents the universal time factor. No one knows when the time has started as is the abstract principle of the universe and when it will end too. The other way of co-ordination is that the snake moves fast as that of the time.

**Step – III. Science:** The progress of the recovery was slow and systematic. **Myth:** The mountain Mandala (Manda = slow and steady) which was used as the churning stick, represents the natural, slow and systematic evolution of ecological process, as the movement of churning stick never very slow nor fast.

**Step – IV. Science:** The nature got re-established subsequently. **Myth:** The fact is represented by the release of precious objects, which on deep analysis corroborates with various ecological factors discussed later.

**Step – V. Science:** The bio-diversity along with the basic factors and the principles of the environment spread up all throughout. **Myth:** As the process was initiated and mediated by Lord Vishnu (means Sarvavyaapi or Vissvavyaapi i.e. spread all through) who carried the churning system on his back as gigantic tortoise and acted as supporting substratum. Lord Vishnu is characterised as the power of maintenance (Sthiti) contemporary to Lord Brahama (Power of creation i.e. Srushti) and Lord Siva (Power of destruction i.e. Pralaya) and these three combine represent the three ecological principles - creation, maintenance and destruction.

**Step – VI. Science:** The developing trend was a resultant of interacting progressive and regressive forces of the nature. **Myth:** Suras (Gods-positive powers) and Asuras (Demons - negative powers), carried out the churning. Conversely the entire mythic events can be scientifically summed up as:

"Dissolution has occurred as a natural phenomenon followed by loss of ecology and imbalance (in nature) which in course of time slowly and systematically got re-established all throughout as a resultant of interacting progressive and regressive forces of nature."

**THE PRECIOUS OBJECTS**

The twelve precious objects described above,
which emerged out of the cosmic ocean after churning, were of diversified origin and their existence of integrity seems to be ambiguous. But an introspective analysis of their meaning; their categorisation into different groups indicate that these are the various objects and factors of ecology; represented in symbolic forms, keeping pace with the mythological event of Samudra Manthana. Ecologically, there are three prime functional components: (i) Inorganic constituents as air, water and mineral salts termed as abiotic factors, (ii) Organisms such as plants, animals and microbes – the biotic factors and (iii) the energy inputs which enters from the outside (i.e. the sun). The flow of energy in the ecosystem and circulation of the mineral salts in the bio-geo-chemical cycles tagged with the hydrological cycle keeps the ecosystem functional. Keeping the facts in view, the precious objects so emerged during the event of churning can be interpreted as follows:

A. The Biological Wealth: It is the assimilation of plant and animal world that represents the biotic factor of the environment, as:

i) Paarajata: The tree that fulfills every desire (which God Indra subsequently planted in his garden), signifies the plant world which fulfills all the basic needs of mankind such as food, clothing, shelter, medicines etc.

ii) Surabhi: The cow of plenty i.e. the mother cow of all cows represents the animal world (Chordates). The animal world is worshiped through the cow in the Indian scenario.

iii) Svanaka: The white conch shell (presented to Lord Vishnu) blown to herald his victory over demons- signifies the non-chordate animal groups in which evolution is culminated with molluscs.

B. The Geological Wealth: It constitutes the edaphic abiotic factors, represented by the Koustava: the priceless stone or gem (Mani) ornamented to Lord Vishnu (Saravvayaapee = spread all over) symbolically represents the geological resources either in micro or in macro form spread all over, as the hidden treasure of the earth.

C. The Flow of Cosmic Energy: (As per the principle of thermodynamics, energy is the capacity to do work, flows continuously and unidirectional in an ecosystem). It symbolises Uchchaisraba: the white stallion with its seven heads (as existence of a horse with seven heads is mythical) scientifically represents the integrated seven colours of the cosmic energy (white light). In Hindu mythology, the chariot of the Sun God (Soorya) is pulled by seven horses, which are often attributed to seven colours of light. Biologically the horse never sleeps on the ground and ever ready to run, symbolises the continuous (spontaneous) generation of the solar radiation. Moreover energy is measured in terms of horsepower (HP). All these indicate that grievousness of dissolution, such as continuous heavy rain and flood disappeared and the solar radiation reappeared on the earth as the source of energy for the ecosystem for its revival.

D. The Hydrological Cycle: (Flow of solar energy triggered the normal hydrological cycle, which drives the other bio-geochemical cycles) depicts:

Aiiravata: The winged elephant with seven tusks, whom the God Indra used as his mount. Indra, in Hindu mythology is known as the king of Gods, who controls the rain, i.e. the Hydrological cycle. The winged elephant (which can fly, never like an earthly one) comparable with the black cloud, which carries the rain and move in all eight directions such as 1. Poorba (East), 2. Dakshina (South), 3. Paschima (West), 4. Uttar (North), and their respective corners like 5. Aissaanya (North-East), 6. Agni (East-South), 7. Nairuta (South-West) and 8. Vaayavya (West-North) in the sky.

But as the lore (fact personally collected from gray hairs through interrogations) if clouds arise from the southwest i.e. Nairuta corner it seldom rains and a prospective agriculture is not expected. In this context, the seven directions of the clouds other than Nairuta can be compared with seven tusks of the elephant Aiiravata. Moreover none other than the elephant has a tusk that can suck huge amount of water and sprinkle it like rain. Scientifically the solar energy makes the water evaporated and/or transpired from the earth’s surface and precipitates rain there by re-establishing the Hydrological cycle in the environment.

E. The Growth of Nature and Biodiversity:

Shree: - She is known as Lakshmi, the Goddess of beauty, pleasure and wealth, whom Lord
Vishnu married. Lakshmi is often attributed to
the mother earth bloomed with natural beauty,
flora and fauna. The marriage of mother Lakshmi
with Lord Vishnu (Sarvayaapee = spread all
over) symbolises the fact that nature spread all
over after recovery of biodiversity and hydro-
logical cycle, along with flow of energy in eco-
system.

F. The Other Human Ecological and Psy-
chological Needs:

i) Self Protection: Dhanus (The most
powerful bow, which was with the Gods and given
to the Avatara (incarnation) Sri Ram (of Lord
Vishnu) to fight against: Raavana (the demon
king in Tretaa Yuga). The bow represents the
self-protection character of biological system,
even though it is only used by human beings.
As identified by Hindu sages all the living be-
ings have four essential characters, namely 1.
Aashaara (to take food), 2. Nidraa (to sleep), 3.
Bhaya (fear psychosis out of which one tries to
self protect either by avoiding the reason of fear
or by fighting and conquering over it) and 4.
Maithuna (sex, for enjoyment and reproduction).
Out of the above four-foods, sleep and sex are
biological and fear is a psychological character.
Unless one overcomes the fear psychosis as a
means of self-protection, life may be impossible
for him.

ii) The Power of Perception: Chandra (the
moon as a unit of coolness was placed on the
head of Lord Siva after He consumed the huge
quantity of poison, released during the Manthana
process). The moon is known as the God of mind
(Mana). Moon also controls the artistic charac-
ter, affinity for music, art, beauty, marriage, love
aspects, and mental ability of a person as per
Astrological Science (Mahapatra, 1968). A per-
son with an unstable mind is known as lunatic
and the disease aggravates during the full moon
period. As the growth and development of plant
world is controlled by solar radiation, the me-
dicinal property in them gets developed by the
rays of moon (Tripathy, 1953). Most of the medi-
cines as per Aayurveda are collected on a full
moon day (Poornamee) or Pushyaa Nakshatra
(Dash, 1991), the scientific basis of this time co-
ordination is under investigation by the authors.
Moreover sleeping under direct moonlight is
prohibited in Aayurveda as it deteriorates the
mental capability.

Man is considered as the supreme creation
due to presence of a mental abstract factor
‘Mana’ in him, which is not available with any
other animal. The feeling of love and compas-
sion expressed by animals, is a behavioral char-
acter due to central nervous system and brain,
but not Mana.

There are also astrophysical evidences that
moon is created from earth, but it might have
occurred many million years before any life ap-
peared on earth. From mythological point of
view, moon is known as the common maternal
uncle (Chaandaamaumaa) in Indian scenario as
brother of mother Lakshmi (earth). As a coinci-
dence, both Moon God and Goddess Lakshmi
are worshiped by Hindus on the full moon day
of Aasswina month (Kumaar Poornima) as their
birthday. In the present analysis Moon
symbolises the mind (mana) of man essential to
make the life full-fledged.

iii) The Objects of Enjoyment (Wine and
woman are the top ranking worldly Enjoyment,
which induce craveness in human beings):

a. Suraa: The wine, which is often considered
as an object of enjoyment. If one gets
immersed in enjoyment of any sort, he is
identified as Madamatta (lubidinous, lustful).
Wine is a symbol of worldly enjoyment from
vedic period till date (Dash & Padhy, 1998).

b. Rambhaa: The heavenly nymph, who be-
came the ancestors of all the celestial danc-
ers (Ap Sarasas). She is a symbol of creative
art, music and dance, represent sex for en-
joyment.

iv) Good Health and Dream of Immortality:

Dhanwantari: The Lord Physician of Gods with
his container of medicines along with Amrita (a +
mrita, a is the negative aspect used as prefix
before mrita means dead, so amrita is the elixir
of immortality) emerged out of the cosmic ocean.
It is the wish of every human to live healthy with
a psychological urge of immortality. In this con-
text, an event of Mahaabhaarata depicting the
question and answer between Yudhishthira and
Yaksha may be referred, which states:

Q. (Yaksha) Kim Aasscharyam? (What is the
wonder?)

A. (Yudhishthira) Day and night men witness
the death of living creatures; yet he survives
with the psychological basis (hope) that he will not die, this is the wonder.

As Lord Dhanvantari is the authority of Aayurveda, the search for medicaments for good health and longevity is as old as that of vedic age.

**CONCLUSION**

The mythological event of Samudra Manthana conveys the message that cataclysm takes place periodically (mythologically and
geographically) as a universal phenomenon, which is followed by slow and steady recovery of the nature. A hypothetical picture showing the scientific introspection of the event is depicted in figure 2. It is beyond the imagination as, how the ancient great saints of India, could establish the facts in symbolic forms (icons) through mythology. The basis of their such comprehension and the scientific ethics behind such, are yet to be explored. In this context, instead of undermining or under-valuing on the basis of considering the ancient science as myth, it should be studied with its scientific perspective, revealing the truth in them and establishing facts coupling with modern thoughts and scientific evaluations. Metaphysically the churning process as jointly performed by Gods (positive forces) and demons (negative forces), to regain the coveted nectar, is a process of their endless struggle that is fundamental principle of the universal equilibrium.

It is beyond doubt that the ocean is a huge storehouse (paradise) of wealth, covers 70 percent of earth’s surface, enriched with unique biodiversity. In other words the release of fiery poison during the churning of the ocean, spreads the message that any violent or untoward action (churning being meant as exploitation) against the nature may bring some immediate benefits (as emergence of precious objects); but may lead to serious consequences (like emergence of poison) that questions on the state of ecological homeostasis. The exploitation of the nature is essential but not its exploitation as modern science has already been taken a trend. The emergence of poison is certainly a mythological caution against the non-sustainable use of nature, to whom it may concern- God, Demon or Human.

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ABSTRACT The mythic event of Samudra Manthana, which is depicted in Kurma Parvana, was a process of churning of cosmic ocean in order to retrieve certain divine treasures lost during Pralaya (dissolution). The myth says, the Gods on one side and the demons on the other, wound the snake Ananta as rope around the mountain Mandhata as the churning stick to carry out the process, which did Lord Visnua in His Kurma Avatara (cosmic tortoise) support. There was emergence of twelve precious objects such as: 1. Aitchana- the winged elephant with seven tusks; 2. Chandra- the Moon, 3. Dhuras- the bow; 4. Dhanvantari with Amrit- the physian Gods with elixir of immortality; 5. Koustava- the priceless gem; 6. Paurijanta- the wish fulfilling tree; 7. Rambhata- the heavenly nymph; 8. Sarabhi- the mother cow; 9. Sura- the wine; 10. Shree- the Goddess of wealth and beauty; 11. Shanaka- the white conch shell and 12. Udechaisvaca- the white stallion with seven heads) with huge amount of Vishe- the fiery poison. The scientific introspection of the myth reveals that the whole process and the precious objects emerged out of it, are symbolic representation to explain the whole event such that: “Dissolution has occurred as a natural phenomenon followed by loss of ecological homeostasis; in course of time slowly and systematically (due to interaction of progressive and retrogressive forces) the nature got re-established; the release of poison is attributed as a caution not to opt any violent or untoward action against nature and for non-sustainable use of it.”

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