

Traditional Indian Scientific Knowledge and Modern World of Science

R B Singhⁱ

Abstract: It can be said that India is the only country in the world where all knowledge had been scientific from time immemorial. History of Indian Scientific Knowledge goes back not just too a few hundred years or centuries but it goes back to many Yugas where each Yuga was of several thousand years. India has also inherited the largest number of manuscripts which contain many facts of human responses to the complexities of life. There are many thinkers and philosophers who used to say all knowledge is in the Vedas. The contributions of AryaBhatta, Bhaskaracharya, MaharshiKanad, Sushrut and many other Rishis of India are well known and which were much later positively supported by so called Modern Science or Western Science. The traditional Indian scientific knowledge systems are intertwined with their distinct ancient cultures. Owing to colonialism of many centuries, the Indian contributions in almost all fields were ignored. Europeans could never accept the Indians as the most systematic, scientific and civilized society about more than 5000 years back when they were still in barbarian stage. Many traditional knowledge systems are relevant to modern economic planning because they are not capital intensive but labour intensive, sustainable and eco-friendly. In India, the traditional Indian Scientific Knowledge remains neglected during past few centuries. There is the need to reinvent and redevelop our past performance to do the better service of the humanity.

All the scientific achievements which have been done in the west after the renaissance may be termed as western science or modern science. Traditional Indian Scientific knowledge means the science evolved in India prior to its colonial period. Many of us have heard from our elders and preachers that Vedas are the sources of all knowledge. Each and every shloka of most of the Hindu manuscripts can be explained in different ways having many meanings. Some explanations are very close to the scientific facts like a shloka of Rigveda is praising Lord Indra

and its technical translation gives the value of pi up to 28 digits accurately. Even today it is very difficult to get such value of pi with the help of fastest computers. In ancient India, there were many inventions of great importance in the field of science and technology. Some of them are discussed in this article which has enriched the modern world of science.

Texts of AryaBhatta and Bhaskaracharya contain calculus were written many centuries before Newton who is the inventor of calculus according to the western books. Most of the Traditional Indian Scientific knowledge was written in Sanskrit like Vedas, Upanishads etc. Texts written in some other languages like Pali, Tamil etc are also treasure-house of our Ancient Science. Some of the most discussed examples of our rich scientific legacy are mentioned first and consequently, an attempt of brief comparison with modern world of science has been done. The details of Atomic Theory are in the Vaisheshika Sutras of MaharshiKanaad which was written in 3rd century BC. Earth, water, air, fire & Akash are the five elements of Nature as described in our Upanishadas. We can easily correlate the different states of matter as in modern science with these five elements.[Earth-Solid, Water-Liquid, Air-Gas, Fire—Plasma & Akash-Nuclear]. The velocity of light can be easily calculated by a shloka of Rigveda. The description of weaving and spinning is found in Puranas. Pushpaka Vimana, which is mentioned in the Ramayana, was one of the 32 models of aircrafts used in Tetrayug. Aeronautical Engineering was highly developed in Ancient India and it was described in the Yantra Sarvaswa of Maharshi Bharadwaja, Vimaana Chandrika of Maharshi Narayan, Vyoma Yaana Tantra of Sounaka and a few other Vedic texts. Rust free steel was an Indian invention. The proof of the advance metallurgy technology of our country is the Iron pillar in Delhi and the Statue of Lord Buddha at Kushinagar in Uttar Pradesh.

Not only physical sciences were having advance techniques and knowledge but our ancient texts are also full of biological & medical knowledge. Susruta Samhita by Maharshi Susruta has the description of plastic surgery. Charak, the famous Ayurvedic physician authored the Charak Samhita which along with Susruta Samhita, Ashtang Sangrah and Ashtang Hrudayam forms the roots of Ayurveda. Many handwritten texts of Jivak are still preserved in India which has the specialized knowledge of Panchakarma, marma and Surgery.

All mathematical calculations and theories of modern science are based on two fundamental discoveries of ancient science of India. These are the concept of Zero and the

principle of place value in powers of the radix. Use of Arabic numerals has almost replaced the use of Roman numbers of western science. It is the fact that Arabic numerals were not invented in Arab but because European had got it from India through Arabian countries.

In modern Physics, Unified Theories have got only partial success in unifying some forces of nature. But the study of Indian Philosophy gives us the clear vision of life and nature as a whole, leading to a more coherent theoretical knowledge and harmonious practical living. Vedanta is the culmination of Indian philosophy which has reached such a high state of unification of nature beyond which no further unification is possible.

Biochemical theory of origin of life explains that life was originated on Earth by Chemical evolution under the influence of various forms of energy like UV radiations, lightening discharges in the primitive atmosphere etc. According to ancient Indian thoughts, every material system is at some level of consciousness. The non-living matter occupies the lowest level. The direction of evolution is towards higher and higher freedom. The modern science is still struggling to explain the higher freedom of living system.

In the field of modern medical sciences like allopathy, there is no cure of certain diseases instead these are controlled by the modern drugs. According to Ayurveda, healthy state can be achieved by maintaining the equilibrium with Kapha, Pitta & Vatta. Modern Surgery has become highly developed due to the evolution of the sophisticated tools and equipments. The surgery process described by Susruta has become obsolete because no further progress has been made in this direction by his successors.

The weapons of ancient India can be broadly classified into three main categories: Conventional weapons like bows & arrows, Explosive weapons like Agniban and Super weapons like Brahmastras. Modern day powerful missiles have still to go a long way to match the power of Mantra-abhisikt weapons of Ramayana and Mahabharat.

With all the instances and logics, we can say that although traditional Indian scientific knowledge was highly developed but due to ignorance and its negligence of its successors, it has reduced its relevance in the modern world. On the other hand, modern science is contemporary with modern world. It has addressed directly the problems of today. The highest achievement of science will be the unification of ancient Indian science with modern science. According to Werner Heisenberg, "it is probably true quite generally that, in the history of human thinking, the

most fruitful developments frequently take place at those points where two different lines of thought meet. These lines may have their roots in quite different religious traditions; hence if they actually meet, that is, if they are at least so much related to each other that a real interaction can take place, then one may hope that new and interesting development will follow.”

ⁱ Associate Professor, Department of Zoology, K M Agarwal Collge, Kalya (W)