

# Ayurveda research: Ontological challenges

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## ABSTRACT

Collaborative research involving Ayurveda and the current sciences is undoubtedly an imperative and is emerging as an exciting horizon, particularly in basic sciences. Some work in this direction is already going on and outcomes are awaited with bated breath. For instance the 'ASIIA (A Science Initiative In Ayurveda)' projects of Dept of Science and Technology, Govt of India, which include studies such as Ayurvedic *Prakriti* and Genetics. Further intense and sustained collaborative research needs to overcome a subtle and fundamental challenge—the ontologic divide between Ayurveda and all the current sciences. Ontology, fundamentally, means existence; elaborated, ontology is a particular perspective of an object of existence and the vocabulary developed to share that perspective. The same object of existence is susceptible to several ontologies. Ayurveda and modern biomedical as well as other sciences belong to different ontologies, and as such, collaborative research cannot be carried out at required levels until a mutually acceptable vocabulary is developed.

**Key words:** Ayurveda, biomedicine, ontology, pre and post-Galilean, postmodern

## ONTOLOGY: DEFINITIONS AND SCOPE

Ontology is a widely described term. "Ontology is an explicit specification of a conceptualization. The term is borrowed from philosophy, where Ontology is a systematic account of Existence."<sup>[1]</sup> It "defines the terms used to describe and represent an area of knowledge."<sup>[2]</sup> "The subject of ontology is the study of categories of things that exist or may exist in some domain. The product of such a study, called Ontology, is a catalog of the types of things assumed to exist in a domain of interest D, from the perspective of a person who uses language L for the purpose of talking about D."<sup>[3]</sup> Chandrasekaran and colleagues state that "without ontologies, or conceptualizations that underlie knowledge, there cannot be a vocabulary for representing knowledge"<sup>[4]</sup>

Three aspects can be discerned emerging from these

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descriptions, forming what may be termed the Ontology Flowchart. Initial assumptions/concepts, which may collectively called premises, leading to knowledge and finally a vocabulary. This flowchart provides the template for the study of any object or phenomenon in existence. The starting, and most crucial, point is the conceptual or assumptive part. These initial premises of the study may be influenced by religious, cultural, social, intellectual backgrounds of the inquirer.

For instance, for a prolonged period before Copernicus and Galileo, religious premises determined the Western world's models about the cosmos. Those premises gave rise to a knowledge and vocabulary, which complemented them. There was a sea change in the premises, knowledge, and vocabulary regarding the same, after Galileo. In other words, the same domain of existence, our planet and its surroundings, gave rise to two different ontologies—pre-Galilean and post-Galilean.

## Ontology of modern biomedicine

Current biomedical or modern medical ontology is post-Galilean. Galileo introduced experimentation and observation.<sup>[5]</sup> The ontologic first base was thus laid—premise—that faith was not to be relied upon for gaining knowledge, but that human reason and senses were the sole reliable sources of knowledge; demonstrable, verifiable, and quantifiable phenomena alone should be accepted as true knowledge. The next premise was provided by Rene Descartes, who proposed mind and body as distinct and independent phenomena co-existing in humans.<sup>[5]</sup> He also

proposed the Method of Reductionism, which proved to be most efficient in understanding complex phenomena. These premises gave rise to the next step of the ontology flow chart—knowledge generation. Galilean and Cartesian premises became the very *norms* of gaining knowledge.

Biologists of the time applied Galilean and Cartesian concepts to study nature and humans Newton's successful laws of physics, Harvey's dynamics of blood circulation, Rudolf Virchow's cell, Pasteur's microbe and its links with human disease, Lavoisier's establishment of gaseous exchange in respiration were prominent among many other discoveries based on the premise of human senses as the best source of knowledge, and that experimentation and quantification were the only reliable sources for true knowledge. Chemistry made great strides with the discovery of atoms and molecules. The knowledge thus generated finally led to the coining of the term "homeostasis" by Walter Cannon.<sup>[6]</sup>

The success of these discoveries of physics, mechanics, and chemistry immensely strengthened ontologic concepts of Galilean quantification and Cartesian mind–body duality, along with reinforcing the mechanistic view of humans. The vocabulary, the last step in the flow chart, is best reflected in Francis Crick's words in his book *Of Molecules and Men*. "The ultimate aim of the modern movement in biology is in fact to explain *all* biology in terms of physics and chemistry."<sup>[7]</sup> The goal of Physiology is to explain the physical and chemical factors that are responsible for the origin, development, and progression of life.<sup>[8]</sup> A related term homeostasis, is the "maintenance of nearly constant conditions in the internal environment."<sup>[9]</sup> The mind and related higher functions are dealt with independently of the body, both in Physiology and Pathology. "Psychosomatic" is not a formal, or official, biomedical term.

### Ontology of Ayurveda

Ayurveda is pre-Galilean; as such, its Ontology Flowchart is significantly different at all 3 phases—the initial assumptions about Nature, the methods of gaining knowledge and final vocabulary.

### Initial assumptions/conceptualization

The first principle, the ontologic first base, is provided by the Vedas. Humans are intertwined with, and eternally in debt of Nature—a strong ecologic basis for human life and consequently health.<sup>[10]</sup> The culmination of the Vedas, the Upanishads, next provide the consensus viewpoint of human relationship with other life forms. Mankind forms an intricate interactive link with all life forms; all living beings are one.<sup>[11]</sup> Further in the chronology of early Indian texts is the Bhagavad Geeta, where, narrowing down the focus to human composition, humans are projected as

fundamentally souls, which have bodies and minds.<sup>[12]</sup> The ontologic first base was set—study of nature and humans must proceed in complementary manner and not in isolation; life and nature, including humans, are governed by subtle interactions, at multiple levels; humans were soul centric, with body and mind as appendages, and the 3 were dynamically interactive in the phenomenon called "life."

### The methods of gaining knowledge

The concepts having been established, different methods of gaining information and processing it were then developed and documented.

Pratyaksha,<sup>[13]</sup> the method of direct sensory verification (the sole acceptable method of post-Galilean ontologies) is one among many. For early Indian thinkers, Pratyaksha was inadequate as the sole method of validity, as it would enforce a hard boundary. It would necessitate the assumption that all natural and living phenomena are definitely constructed of mechanisms accessible to the human senses, and verifiable by experimental models designed and limited by human reason. Humans would be required to force nature into a model confined to their sensory capabilities, if they were to feel they have understood it. Pratyaksha alone, as a tool of knowledge, would rule out intuitive, perceptive, and experiential understanding of the numerous subtle and complex pathways of nature and life. For this early Indian line of thinking, intuition, perception, and experience were not the same as blind faith, which has been and is the anathema of scientific inquiry both in the East and the West down the ages.

The ontologic premises and limitations of pratyaksha made it imperative that other methods of gaining knowledge be employed. Principal among them, along with Pratyaksha, are Aptopadesha (knowledge imparted by experts who have transcended material needs), Anumana (inference based on observation) and Yukti (to draw logical conclusions from a set of observed phenomena).<sup>[14]</sup>

The methods of Pratyaksha, Aptopadesha, Anumana, and Yukti were employed in various fields of human endeavor, which gave rise to traditional Indian agriculture, metallurgy, architecture, classical fine arts, healthy cuisine, ecofriendly, and weather-compatible traditional apparel and healthcare. Ayurveda was born of this background.

### The vocabulary thereof

Ayurveda vocabulary, consequently, reflects the premises and methods used to formulate it. With words, such as Atma (soul), prana (life), manas (mind), indriya (senses), shareera (body), buddhi (intellect), panchamahabhootas (nature's homologues of human tissues), rutus (seasons), ahara (food), aushadha (medicine), vihara (lifestyle), swasthya ("Health"

defined), prakriti (nature, individual constitution), doshas (regulators of biological functions), dhatus (tissues and their dynamics), malas (waste products), saamya (harmony/balance) as health, vishamatva (disharmony/imbalance) as disease, hita–ahita (wholesome/unwholesome), and many other terms, which depict interactive processes. Any two words picked at random from the above list would have direct interrelations. Current biomedical terms describe processes, and the processes themselves are strongly compartmentalized. Terms, such as digestion, respiration, and mutations, describe precise processes, with little or no descriptions of how one process interacts with the other. Their interaction is by implication.

**Some principal terms of Ayurveda**

Some fundamental terms of Ayurveda can be seen to reveal the ontologic, and thereby terminologic, variance from current Medicine’s views and corresponding terms. Ayurveda has for its object “a knowledge of wholesome–unwholesome, peaceful–disturbed lifespans, the causes behind this quadruple, and the evaluation of the quadruple.”<sup>[15]</sup> The fundamental *locus standi* of a healthcare system is thus established. To, at the very outset, define lifespan, enumerate, and classify lifespans, and design parameters to recognize each class. One among the different classes of lifespans is the healthy lifespan. Thus, Swasthya (Health) is defined, as “a state of physical wellbeing and psychospiritual contentment.”<sup>[16]</sup>

The principal end user of Ayurveda, the Human Organism, is “organized in a mutually interactive triad comprising mind, soul, and body.”<sup>[17]</sup> This human, functionally called the Shareera, “is composed of a blending of sentience with the material human body.”<sup>[18]</sup> Ayurveda’s humans, so to speak, are therefore, sentient *phenomena*, an interactive blend of supracorporal functions and gross structure composed

of matter. The Shareera of Ayurveda is better translated as human *being*, rather than human *body*.

The practice of Ayurveda is “to maintain health in the already healthy, and remove disease from the diseased”.<sup>[19]</sup> In the context of disease “mind and body are the two loci of disease; diseases can be physical, mental, or psychosomatic.”<sup>[20]</sup>

As regards environment, Ayurveda links environment to individual health, on basis of the individual’s constitution (prakriti), external and internal circadian rhythms (dina), and climate patterns (rutu); with individualized day-to-day and seasonal diet–lifestyle prescription charts (dinacharya and rutucharya, respectively).

It now becomes possible to summarize the differences between the 2 ontology languages, as presented in Table 1.

**The fault lines emerge**

Direct interactions among Modern Scientists and Ayurvedic practitioners have revealed a great challenge. A lack of a mutually acceptable vocabulary. For instance, dosha as the fundamental process of biological organization, in health and in disease, cannot be accurately represented by any formal term of Modern Biology or Biomedical Physiology. The Ayurvedic term Shodhana (literally “purification”), a fundamental Ayurvedic process of “cleansing” the body for maintenance of health and removing “harmful accumulants,” has no biochemical or pharmacologic equivalent.

Conversely, classical botanical terms such as alkaloids and active ingredients are inapplicable for study of herbs from an Ayurvedic perspective, since Ayurveda prescribes whole plants and polyherbal formulations. The list of

**Table 1: A comparative chart of the ontologic premises, which have determined Biomedicine’s and Ayurveda’s understanding of humans**

Ontological premises of the understanding of the human being	Ayurveda’s model of Humans
Modern Biomedicine’s model of Humans	Pre-Galilean—Vedic—“hard–soft” science (evidence and perception-intuition)
Post-Galilean: “hard” science (evidence)	Qualitative, process based
Quantitative, structure based	Systems, multilevel networks
Reductionist, study of components in isolation	Functioning is not limited to physicochemical pathways alone
Functioning can be explained in terms of physicochemical pathways	There exist multilevel interactions and supracorporal components, which contribute to physiology
Anthropocentric	Ecocentric
Humans link with environment is at community level—with environment’s role implicated in community health and disease	Humans are individually, intimately linked to environment—environment has direct role in individual health and disease
Psyche and soma are distinct and independent	Psychosomatic, interactive
Health is a stable status of Physicochemical norms	Health is a multilevel process of psychosomatic harmony
Health is an external declaration by the Consultant that “you are healthy”	Health has also an internal experience of wellbeing by the subject
Physical health is health	There is an equally important psychospiritual component in health

incompatible terms can be long.

The road ahead: The imperatives are compelling. A mutually compatible vocabulary is urgently required to put on firm tracks Collaborative Research in Ayurveda.

### Collaborative research potential: markers and pathways

In spite of the ontologic difficulties, current sciences can contribute in a large way to Ayurveda, in providing highly sensitive *markers* for evaluating Ayurvedic phenomena. It is in the area of *pathways* that the ontologic divide is going to be a challenging crossing.

### Postmodern developments in current sciences

New and startling concepts are beginning to emerge in the fundamental sciences, and the approach to science as a whole. Life sciences are being seen as more important than material sciences; classical laws of physics and chemistry are being revisited; and a whole new perspective of the world, environment, and humans is emerging, being described in a new vocabulary. Dissipative structures, autopoietic networks, self-organizing systems, systems view, biological form and organization, the ecologic human being, probabilities as laws, nondeterministic phenomena, and many other terms. This new group of thoughts, which may be termed postmodern developments, can play a crucial role in the future Ayu-Scientific vocabulary.

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