

## Foreword

This Survey was conceived in order to fill a need for a survey course in Āyurvedic herbology for our students at the Ayurvedic Institute in Albuquerque, NM. At the time this writer was charged with designing and teaching the course. When I began to think about what scope and content would be appropriate for an introductory course in herbology I began brainstorming a listing of topics I deemed appropriate. Prior personal experience as a student and as a teacher of Āyurvedic theory led me to think that two criteria were important: 1) A broad, but somewhat, superficial treatment of many topics relevant to herbalism, in general, and to Āyurvedic herbology in particular, would be desirable; 2) when and where ever possible the authoritative classical literature could be cited, it should be.

On the first point, it seems to me that Westerner's approach a topic, indeed, need a picture of the whole field or subject. This need contrasts with the traditional teaching method of India, which is sutra-oriented. Sutras are threads of wisdom which are intended, only when many are learned, to present the detail and the big picture. The fact that one must learn all of the sutras before one can confidently say that he has the whole picture of a given topic is somewhat of a drawback for Westerners, who want to learn everything right away, or at least want to know where all this study is going. Thus this Survey was designed to present as many relevant topics as practical, within the time allotted as given by administrative constraints. It starts with a discussion of our historical roots and concludes with such practical issues of law, ethics, and resources.

On the second point, the tradition of Āyurveda is largely an oral one. While it's impossible to know exactly how much is written and how much is oral, one thing is constant—the need to have, to learn from, and to quote accepted authorities. In this light much of the material in the Survey quotes translations of the Āyurvedic classics: Caraka Saṃhitā, Suśruta Saṃhitā, Vāgbhāṭa's Aṣṭāṅga Hṛdayam & Saṅgraha, Mādhava Nidānāma, Śarṅgadhāra Saṃhitā, Bhāvaprakāśa of Bhāva Mīśra, Bhela Saṃhitā, and Kāśyapa Saṃhitā. I am indebted to their translators: PV Sharma for Caraka and Suśruta Saṃhitās (sometimes Bhishagraṭna), Tewari for Kāśyapa and to Śrī Kantha Murthy for translations of the rest. On this point it must be acknowledged that the English renderings of a given Sanskrit text by different experts often yield significant differences of meaning. The consciousness of the translator is often an important element in the final rendering. There is a significant difference between technical Sanskrit and literary Sanskrit. One must be familiar with both and with the scientific discipline at hand. Further, a clinical and scholarly appreciation of the science is valuable as well. Nonetheless, for the purposes of this Survey, this area of controversy has been ignored mostly; at times it has been dealt with by including alternative meanings at this author's discretion.

Another point is that for the compilation of such a wide-ranging book, many books, sources, and authors were consulted. At the outset of this task, requested on short notice, and fulfilled in equally short time, a legacy of the original version may persist--some lack of strict attribution of sources. With subsequent versions we have tried to give proper credit. In this light, however, it may be that some of those contributing to this Survey have been acknowledged in the Bibliography only generally without page citations. This work rests solidly on the work of others. My opinions and ideas are evident enough so as to see the line between my thoughts and those of others. Along these lines since my reading is often far a field, sometimes I have taken ideas from other writers and contexts and adapted them to this field and context.

Another point on the content of this Survey—because of the initial constraints of time, etc., I felt that a mere presentation of ideas would be sufficient for this Survey to be useful. Specifically, many quotations and statements contained herein may be inscrutable to the novice. Thus this text was

## A Topical Survey of Āyurvedic Herbology

deemed to be more a guide for the teacher than a textbook for the student. The latter typically has much explanatory material and in many respects is capable of standing alone, without a teacher to explain and elaborate. As time and resources become available, however, I continue to make this work more self-sufficient—a textbook. Thus one should be aware of the version printed on the cover and to revision dates recorded at the bottom of every page in each section.

One important element of this presentation is the use of Sanskrit (in its transliterated form). This feature helps maintain the tradition, as translations may vary but the Sanskrit is forever fixed. There is another value in including and studying the Sanskrit—as a mantric language its meaning is easily comprehended by our own inner Consciousness. As a mantric language it structures coherence in the reader, speaker, or listener. It is hoped that the student will attempt to learn many of the terms of this science.

This Survey has been written with diacritical marks consistent with the International Congress of Orientalist's guidelines for transliterating Sanskrit. This will enable the student to reconstruct the Devanagari of the original word.

Some final remarks--The Table of Contents has been created to be both a listing of topics and an index, crude as it is. Please note that page numbering is limited and specific to one section only. With only two exceptions, each module or section has a concluding page of questions, which, when correctly answered, are intended to be a review of the material (**now available only in the home study course version**). Only in rare cases are these questions of the thought provoking character. As a teaching device certain sections also include a page of individual or group exercises / activities.

Michael Dick November 20, 2007

## Āyurvedic Herbology Survey Table of Contents

### The Survey Sections at a Glance:

1. [History](#)
2. [Disease](#)
3. [Treatment](#)
4. [Medicine](#)
5. [Theory of Drug Action --Dravya Guna](#)
6. [Classification](#)
7. [Identification](#)
8. [Pharmacology](#)
9. [Pharmacognosy](#)
10. [Interactions](#)
11. [Toxicology](#)
12. [Forms of Āyurvedic Preparations](#)
13. [Compounding](#)
14. [GMP's--Handling, Processing, Storage](#)
15. [Technology--Apparatuses](#)
16. [Ethics](#)
17. [Legal Issues](#)
18. [Resources](#)
19. [Applied Herbology – The 24 Herbs](#)
20. [Appendices](#)

[Ganeśa Gayatri, Sarasvati Gayatri, Sūrya Gayatri, & Dhanvantari Gayatri](#)

[Useful Abbreviations and Their Combinations \(following in this section\)](#)

[Transliteration Scheme](#)

[Bibliography for the Entire Survey](#)

[Introduction](#)

### Index of Main Topics for Individual Chapters

1. History, Āyurveda, and Herbalism ([ToC](#))
  - a. Introduction p. 1
  - b. Importance of the Study of History p. 2
  - c. The Ancient World and Āyurveda p. 8
  - d. Indus Valley Civilization p. 9
  - e. The Mauryan Empire p. 10
  - f. Gupta Empire of Ancient India p. 11
  - g. Regional Kingdoms after 500 AD p. 12
  - h. Mughal Empire of Ancient India p. 13
  - i. The British Period p. 14
  - j. Discussion on the Political Conditions p. 15
  - k. Medieval Period -- World Personalities in Medicine p. 17
  - l. Modern Medicine: US—Revolution in Medicine p. 20
  - m. Modern Period: US--Revolution in Medicine p. 17
  - n. Vedic Literature -- Āyurveda's Cultural Connection p. 22
  - o. The Treatises & Compendia (Nighantu's) of Āyurveda p. 24
  - p. Hymn to the Plants p. 27
  - q. The Written Records of Herbal Medicine, Herbal, and other Compendia--World p. 33
  - r. Genealogy of the Teachers of Medicine p. 34
  - s. Major Personages--The Names p. 35
  - t. Āyurveda--Three Traditions p. 38
  - u. Concluding Remarks for Section p. 41
  - v. Bibliography p. 42

2. The Āyurvedic Concepts of Health and Disease ([ToC](#))
  - a. Introduction p. 1
  - b. The Concept of Health – From Caraka and Suśruta p. 3
  - c. Bīja Kṣetra Siddhānta p. 3
  - d. The Āyurvedic Concept of a Healthy Individual p. 6
  - e. Modern Disease Nomenclature p. 7
  - f. The Mechanism for Disease p. 8
  - g. Resistance to Disease p. 8
  - h. Synonymy of Pathology p. 9
  - i. Distinction between Disease and Symptom p. 9
  - j. Signs and Symptoms of Decreased Vāta, Pitta, Kapha p. 9
  - k. General Signs and Symptoms of Increased Vāta, Pitta, Kapha p. 10
  - l. Signs and Symptoms of Affliction of Srotāmsi p. 12
  - m. Discussion on Symptoms & Signs as Indicators of Health or Disease p. 13
  - n. Discussion on the Relationship of Disease to Signs & Symptoms, Syndrome p. 13
  - o. Discussion on the Significance of Classifying p. 15
  - p. Disease Naming Conventions in Āyurveda p. 15
  - q. Entities to be Examined – the patient, the disease, the cause p. 19
  - r. Nidana Pañcakam – Cause p. 21
  - s. Examining Cause -- Etiology p. 23
  - t. Doctrine of Triple Cause p. 24
  - u. Flow Chart of Doctrine of Triple Cause p. 24
  - v. Āyurvedic Terminology of Etiology (Nidāna) p. 25
  - w. Law of Cause and Effect p. 26
  - x. Types of Cause p. 25
  - y. Chart -- Suśruta's Scheme of Disease p. 29
  - z. Vitiating of the Doṣas--Link with Behavior p. 30
  - aa. Pitta Pushing Kapha p. 31
  - bb. Spiritual Law as a Theory of Causation: p. 32
  - cc. Nidana Pañcakam - Purva Rupa p. 36
  - dd. Nidana Pañcakam - Rupa p. 36
  - ee. Mechanism of localization of Pathology – Khavaigunya p. 36
  - ff. Upaśaya p. 37
  - gg. Table Showing Upaśaya p. 37
  - hh. Samprāpti--The Development of Disease p. 38
  - ii. Samprāpti Features p. 39
  - jj. Discussion on Pathogenesis of Non-Doṣic Disorders p. 40
  - kk. Āma and Physiology p. 41
  - ll. Digression Concept of Waste p. 42
  - mm. Signs & Symptoms of Āma p. 43
  - nn. Causes of Āma p. 43
  - oo. Pathogenesis of Āma p. 43
  - pp. Discussion on Disease Modeling Traditions p. 45
    - a. Greek / Western p. 45
    - b. Homeopathy p. 49
    - c. Chinese p. 51
    - d. The Herbalist Healers p. 52
    - e. Native Americans p. 52
  - qq. Five Āyurvedic Concepts / Models of Disease p. 53

- rr. Doṣic Character of Pain p. 60
- ss. Bibliography p. 63

3. Āyurvedic Concept of Treatment ([ToC](#))

- a. Introduction and Discussion of Topic p. 1
- b. Table 1 Tools of the Āyurvedic Lifestyle Educator p. 3
- c. Prevention Treatment p. 5
- d. Table 1 Methods of Treatment p. 9
- e. Chart 1 Therapeutics Overview p. 10
- f. Synonyms of Treatment p. 11
- g. Definition of Treatment p. 11
- h. Effects of Treatment p. 12
- i. Two Kinds of Treatment p. 12
- j. Three Kinds of Treatment p. 12
- k. Three Kinds of Treatment p. 13
- l. Three Kinds of Treatment p. 13
- m. Four Kinds of Treatment p. 13
- n. Three Kinds of Treatment of Internal Medicine Overview p. 13
- o. Treating Doṣic Imbalance p. 16
- p. 6 Actions of the Pañcakarma Protocol p. 17
  - Langhanam p. 18
  - Bṛhmanam p. 19
  - Rukṣanam p. 19
  - Snehanam p. 20
  - Svedanam p. 21
  - Stambhanam p. 22
- q. Behavioral or Non-Medicinal Rasāyanas p. 23
- r. Treatment of Āma p. 26
- s. Treatment of Parasites p. 27
- t. Treatment of Mental Diseases p. 28
- u. Spiritual Therapy p. 29
- v. Surgical Therapy p. 31
- w. Treatment of Poisoning p. 32
- x. Specializations within Treatment p. 33
- y. Limbs of Treatment p. 33
- z. Timing and Treatment p. 33
- aa. Treatment of all Three Times p. 33
- bb. Contra-indications of Treatment p. 34
- cc. Location of Origin of Disease and Treatment p. 34
- dd. Selection Criteria—Location of Origin and Doṣic Movement p. 34
- ee. Doṣic Movement and Treatment p. 34
- ff. Treatment and Samprāpti p. 35
- gg. Treatment in Cases of Bleeding p. 35
- hh. Dhātu-specific Treatment p. 35
- ii. Treatment of Blood p. 36
- jj. Preparations for Treatment p. 36
- kk. Treatment of doṣas and their sub-types Involving more than one doṣa p. 37
- ll. Water Treatment -- Uṣasi jala pānam p. 37
- mm. Treatment of Non-disease Conditions p. 38
- nn. Treatment with Likes or Similarars p. 38

- oo. Discussion on Doctrine of Signatures p. 38
- pp. Treatment and the ability to Pay p. 38
- qq. Duration of Treatment p. 39
- rr. Local versus General Treatment p. 39
- ss. Treatment of those Debilitated by Cleansing Therapy p. 40
- tt. Treatment with Respect to Same / Different Diseases and Symptoms p. 40
- uu. Treatment as Intervention vs. Supporting Nature p. 40
- vv. The Value of Reasoning in Treatment p. 40
- ww. Treatment as Micro-managing versus Macro-managing p. 41
- xx. A Brief Discussion of Modern Findings p. 41
- yy. The Placebo as Treatment p. 41
- zz. Concluding Remarks p. 43
- aaa. Bibliography p. 44
- 4. Medicine– Overview (cure, maintenance, prevention) ([ToC](#))
  - a. Introduction p.1
  - b. Qualities of the Physician, etc. p. 1
  - c. Importance of Intuition / Inner Vision p. 2
  - d. Qualities of Attendant, Drug, Patient p. 3
  - e. Definition--Āyurvedic Concept of Medicine p. 4
  - f. Synonyms for Medicine p. 4
  - g. Attributes / Functions of Medicine p. 6
  - h. Chart – The Dravya Schema According to Source p. 8
  - i. Other Classification Schemes of Medicinal Drugs p. 9
  - j. Medicinal Nomenclature of Taxonomy p. 10
  - k. Definition of “Herb” p.11
  - l. Forms of Medicine p. 13
  - m. Food as Medicine p. 13
  - n. Factors to Consider Prior to Treatment – Action, Drug Features, Suitability p. 14
  - o. The Suśruta Factors to Consider in Treatment—Detail p. 16
  - p. Miscellany of Clinical Chemistry p. 18
  - q. Orphaned Drugs p. 19
  - r. Bibliography p. 20
- 5. Theory of Drug Action -- Dravya Guṇa ([ToC](#))
  - a. Introduction p. 1
  - b. The Underlying Premises p. 2
  - c. How to Use / Relate to the Material in this Section p. 3
  - d. Definitions of Terms: Dravya, Guṇa, Karma, Elements, Doṣa, Dhātu, Malas p.3
  - e. Chart 1 -- Substance p. 3
  - f. Chart 2--Relationship of Fields Studying Substance p. 4
  - g. **The Pañcabhautika Siddhānta Dravyāni p. 5**
  - h. The 5 Principles as Basis of Study of Drug Action p. 6
    - 1. Rasa p. 6
    - 2. Guṇas p. 11
    - 3. Vipāka p. 21
    - 4. Vīrya p. 23
    - 5. Prabhāva p. 25
  - i. Miscellany p. 25
  - j. Concluding Remarks p. 26
  - k. Bibliography p. 28

6. Taxonomic Classification: ([ToC](#))
  - a. Introduction p. 1
  - b. Classification Schemes-
    1. Alphabetical p. 2
    2. Morphological p. 2
    3. Therapeutic p. 2 (Classification According to Action—See Appendix #5)
    4. Biochemical p. 2 (Classification According to Constituent—See Appendix #5)
    5. Biogenetic p. 2
    6. Geographical p. 3
    7. Latin Botanical p. 3
  - c. ICBN Overview p. 5
  - d. Some Considerations with Naming
  - e. Detail of the plant Kingdom
  - f. Detailed view of CLASS 1. Monocotyledoneae p. 8
  - g. Some Examples p. 10
  - h. Table showing full taxonomy of ICBN for 13 herbs studied in the Survey p. 19
  - i. Pronunciation Guide & Key pp. 26, 27
  - j. Plant Parts in Latin and their Meaning and Use in the Binomial Classification Scheme p. 28
  - k. Bibliography p. 29
7. Identification – plant features, spectroscopy, adulteration, etc. ([ToC](#))
  - a. Introduction p. 1
  - b. Methods of Examination p. 2
    1. Macroscopic examination p. 2
    2. Microscopic examination p. 2
    3. Chemical Analysis p. 2
    4. Chromatography p. 2
    5. Quantitative Methods p. 3
  - c. Adulteration p. 4
  - d. Physical Identification Nomenclature – with Meanings p. 6
  - e. Leaf, Root, Flower Forms p. 8
  - f. Discussion p. 14
  - g. Certificates of Analysis p. 15, 16
  - h. The Problem of Identity in the Āyurvedic Pharmacopeia p. 17
  - i. Some Controversial Drugs in Indian Medicine – See Appendix #4
  - j. Bibliography p. 19
8. Pharmacological action--study of modes of action--Ayurveda/Sanskrit & Modern equivalents ([ToC](#))
  - a. Introduction p. 1
  - b. Definition of Action p. 3
  - c. Importance of Action p. 3
  - d. Important Distinctions in the Field of Action p. 4
  - e. Importance of Mode of Action p. 4
  - f. Āyurvedic Categories of Drug Action p. 5
  - g. How to Use and Relate to the Listing p. 5
  - h. General Theories Regarding Drug Action p. 7
  - i. Āyurvedic Pharmacological Terms & Definitions p. 10
  - j. Miscellany—categories of action p. 9
  - k. Useful Sanskrit Suffixes with Implied Therapeutic Aspects p. 12

- l. Modern Western Pharmacological Terms p. 13
  - m. Miscellaneous Related Terms of Interest p. 26
  - n. Bibliography p. 28
9. Pharmacognosy—lignans, saponins, alkaloids, etc. ([ToC](#))
- a. Introduction, p. 1
  - b. Historical Background p. 1
  - c. The Vedic classical notion of substance p. 2
  - d. Action is of 2 Types pp. 2-3
  - e. Importance of studying drug chemical constituents p. 3
  - f. Definition of Pharmacognosy p. 3
  - g. Etymology of term “Pharmacognosy” p. 3
  - h. Primary Metabolites – Defined p. 3
  - i. Secondary Metabolite – Defined p. 4
  - j. Definitions and examples of primary categories of plant chemicals
    1. Acids, Aromatic Acids, Tannins, Alcohol’s & Esters p. 4 (See Appendix 6)
    2. Discussion p. 6
    3. Carbohydrates p. 7
    4. Discussion p. 8
    5. Glycosides p. 8
    6. Discussion p. 9
    7. Flavones and Flavonoids p. 10
    8. Discussion p. 10
    9. Volatile Oils and Resins p. 12
    10. Discussion p. 13
    11. Alkaloids p. 14
    12. Discussion p. 14
    13. Notes on Basic Chemistry p. 15
    14. Concluding Remarks p. 15
  - k. Bibliography p. 17
10. Interactions – ([ToC](#))
- a. Introduction p. 1
  - b. Food / Food Interactions – favorable p. 2
  - c. Food / Food Interactions- unfavorable p.3
  - d. Food / Drug Interactions p. 7
  - e. Supplements, Minerals / Drug Interactions p. 9 (Deadly Interactions See Appendix #8) p. 11
  - f. Herb / Drug Interactions p. 13
  - g. Bibliography p. 18
11. Toxicology --The Concept of Poison ([ToC](#))
- a. Introduction p. 1
  - b. Historical Background p. 2
  - c. The Evil Uses of Poison p. 2
  - d. Concept of Poison Discussed p. 3
  - e. Sources of Poisons p. 3
  - f. 10 Guṇas as Vehicles for the Effects of Poisons p. 4
  - g. Effects of Poisons p. 4
  - h. Use of Poisons as Medicines p. 6
  - i. Methods of Purification of Poisonous Substances p. 7



- j. Iatrogenic Disorder p. 10
  - k. Discussion on Side-effects p.12
  - l. Listing of Poisonous Plants p.13
  - m. Bibliography p. 16
  - n. The Poisonous Plants of the Āyurvedic Literature (See Appendix 7)
12. Āyurvedic Preparations (standardized forms) ([ToC](#))
- a. Introduction p. 1
  - b. Definitions of Āyurvedic Preparations p. 3
  - c. Miscellany of Preparations p. 1
  - d. Pharmaceutical Processing p. 1
    - 1. Benefits p. 1
    - 2. Forms – Scheme I p. 1
    - 3. Forms – Scheme II p. 1
    - 4. Menstruum p. 2
    - 5. Misc. p. 2
    - 6. Solubility p. 2
    - 7. Toxicity p. 2
    - 8. Potency Considerations p. 2
  - e. Anupāna -- Media of Intake / After-drinks / Vehicles p. 26
  - f. Bibliography p. 28
13. Compounding: Drug Formulation, Preparation, Nomenclature, Concepts, & Miscellany ([ToC](#))
- a. Introduction p. 1
  - b. Drug Formulation & Preparation—
    - 1. Types p. 2
    - 2. Benefits p. 2
    - 3. Naming conventions p. 2
  - c. Basic Definitions p. 2
  - d. Principles of Formulation p. 3
  - e. Miscellany p. 5
  - f. Strategies of Use p. 6
    - 1. Specific Targeting
    - 2. Dr. Lad's Scheme
    - 3. Western Schemes
    - 4. Āyurvedic
    - 5. Discussion p. 7
  - g. Intellectual Property in Āyurveda p. 8
  - h. Phyto-Therapeutic Selection Criteria – David Hoffman p. 9
  - i. Dosage and Formulation Criteria – David Hoffman p. 10
  - j. Miscellany p. 11
  - k. Discussion on Some Issues of Dosing p. 12
  - l. Dosing Schemes According to Age p. 13
  - m. Some Classical Dosing Schemes p. 14
  - n. Miscellaneous Considerations for Dosing p. 15
  - o. Timing of Medications p. 16
  - p. Miscellaneous Guidelines for Interpreting Classical Recipes p. 17
  - q. Formulations/Compounds – A Sampling p. 18
  - r. Concluding Remarks p. 19
  - s. Bibliography p. 20

14. GPM's -- Handling, Processing, & Storage ([ToC](#))

- a. Introduction p. 1
- b. GMP's p. 2
- c. The Safe Drinking Water and Toxic Enforcement Act of 1986 p. 5
- d. ANSI Data p. 7
- e. Handling Considerations—p. 9
  1. Drying p. 9
  2. Pest Control p. 9
  3. Collection--What is CITES? p. 10
- f. Processing Considerations—p. 12
  1. Overview p. 12
  2. Final Form p. 12
  3. Pulverization p. 12
    - a. Disintegrator p.13
    - b. Cutter Mill p. 13
    - c. Roller Mill p. 14
    - d. Hammer Mill p. 14
  4. Extraction Techniques p. 15
    - i. Important Terms p. 15
    - ii. Extraction Process p. 15
    - iii. Quantity Extracted p. 15
    - iv. Extraction Methods p. 15
    - v. Cost Considerations p. 15
    - vi. Purification p. 15
    - vii. Sterilization p. 15
    - viii. Concentration p. 15
    - ix. Discussion and Final Remarks p. 15
- g. Storage Techniques and Materials p. 17
  1. Properties of Packaging Miscellany p. 17
  2. Commission E Findings p. 17
  3. Dioxins and Other Dangers p. 17
- h. Good Manufacturing Practices p. 17
- i. Classical Dicta (Quotations) p. 18
- j. Collection Times of Plant Materials p. 19
- k. Bibliography p. 21

15. Technology--Medical Devices—Yantra's ([ToC](#))

- a. Introduction p. 1
- b. Medical Apparatuses p. 1
- c. 24 Functions of Apparatuses p. 1
- d. Surgical Devices Used by Ancient Surgeons pp. 2-3
- e. Kharal pp. 4-7
- f. Antique Seed Masher p. 7
- g. Scale p. 7
- h. Dolā Yantra p. 8
- i. Tapta Khalva Yantra p. 8
- j. Patala Yantra p. 9

- k. Śarāva / Puta Yantra p. 9
- l. Nādika Yantra p. 10
- m. Svedana Yantra p. 10
- n. Vālukā / Laavaṇa Yantra p. 11
- o. Kacchapa Yantra p. 11
- p. Ḍamaru Yantra p. 12
- q. Adhaḥ Pātana Yantra p. 12
- r. Ūrdhva Pātana Yantra p. 13
- s. Bhāṇḍa Puta p. 13
- t. Bhūdara Yantra p. 14
- u. Tiryak Yantra p. 14
- v. Soxhlet Apparatus p. 15
- w. Simple Distillation Apparatus p. 15
- x. Śiro Dhara Yantra p. 16
- y. Massage Table p. 17
- z. Steam Table and Apparatuses p. 18
- aa. Vomiting Apparatus p. 19
- bb. Enema Bag p. 19
- cc. Classical Dicta p. 20
- dd. Concluding Remarks p. 20
- ee. Bibliography p. 21

16. Ethics – Defined, Historical Guidelines, Modern Issues ([ToC](#))

- a. Introduction p. 1
- b. Natural Law p. 2
- c. Ethics p. 4
- d. Meta-ethics p. 4
- e. Normative Ethics p. 5
- f. Applied Ethics p. 5
- g. Classical Code of Conduct for the Practitioner p. 7
- h. Code of Conduct for the Individual p. 7
- i. Concluding Remarks p. 10
- j. Hippocratic Oath p. 11
- k. Hippocratic Oath—Classical Version p. 12
- l. Code of Ethics ACA – See Appendix #15
- m. Applied Ethics—Informed Consent / Assent – See Appendix #16

17. Legal Components—Safe Food and Drug Act in its various stages, Gras, etc. Herbs: are they drugs / medicines or food / supplements? ([ToC](#))

- a. Introduction p. 1
- b. Historical Background p. 2
- c. Survey of the concept of law—Law Terms p. 3
- d. Regulating the Scope of Practice p. 6
- e. Regulating the Scope of Practice--In India p. 6
- f. Regulating the Scope of Practice—In Europe p. 7
- g. Regulating the Scope of Practice—In US p. 8
- h. Milestones in US Food and Drug Law History p. 9
- i. Warnings and Safety Information Bulletins p. 17
- j. Herbs—Drugs/Medicines or Foods? P. 17
- k. Legal Issues – An Application p. 19

- l. Contracts p. 20
- m. Orphan Drugs p. 20
- n. Standard of Care p. 21
- o. Learned Intermediary p. 21
- p. Concluding Remarks p. 23
- q. Bibliography p. 24
- r. Gras List – See Appendix 9
- s. 16 Steps Necessary For A Drug To Gain FDA Approval – See Appendix #21
- t. DSHEA 1994 – See Appendix #11
- u. FDA--Warnings and Safety Information See Appendix 14
- v. FDA—Listing of Botanical Ingredients of Concern See Appendix 14

18. Resources-Traditional, Western, USP & NF; suppliers—Banyan, Bazaar of India, Lotus, Tri-Health, etc.; Databases—See Appendices: ([ToC](#))

- a. Introduction p. 1
- b. Discussion of the USP and NF p. 2
- c. Discussion of the AFI and API p. 2
- d. Herbal Database Bibliography p. 3
- e. A few Words on the Book Resource Appendices p. 3
- f. Remarks on GRAS p. 3
- g. Herbal Suppliers p. 5
- h. Review Questions and Exercises p. 7
- i. Herbology Resource List #17
- j. US Pharmacopeia #18
- k. An Herbal Bibliography—David Hoffmann # 23
- l. Āyurvedic Books # 22

19. Applied herbology ([ToC](#))

- a. Listing of Herbs for this section p. 1
- b. Table --The 24 Common Herbs in Brief p. 2
- c. Table -- Systems Affected by Herb p. 3
- d. Herbs for Organs p. 52
- e. Herbs for Dhātus, & Malas According to Doṣa p. 53
- f. Herbs for Srotāmsi p. 56
- g. Rasāyanas p. 57
- h. Herbs That Support or Mitigate Unwanted Effects of Western Drug Therapies p. 58
- i. The Kitchen as Your Medicine Cabinet p. 60
- j. Bibliography p. 65
- k. Empty Worksheet for The 24 Herbs in Brief Table
- l. Individual Data Sheets for each of the 24 Herbs

- |                |                  |                |
|----------------|------------------|----------------|
| 1. Āmalakī     | 9. Guḍūci        | 17. Pippalī    |
| 2. Aśvagandhā  | 10. Guggulu      | 18. Punarṇavā  |
| 3. Balā        | 11. Harītakī     | 19. Śaṅkhaṣpī  |
| 4. Bhr̥ṅgarāja | 12. Kaṭukā       | 20. Śatāvarī   |
| 5. Bhibītaka   | 13. Jatāmāmsī    | 21. Tagara     |
| 6. Candana     | 14. Maṇḍūkaparṇi | 22. Viḍaṅga    |
| 7. Citrak      | 15. Mañjiṣṭhā    | 23. Vidārī     |
| 8. Gokṣura     | 16. Nimba        | 24. Yaṣṭīmadhu |

20. Appendices ([ToC](#))

Appendix 1 – Glossary of Botanical Terms

Appendix 2 – Controversial Plants in Ayurvedic Medicine

Appendix 3 – Classification According to Action

Appendix 4 – Classification According to Constituent

Appendix 5 – Āyurvedic Classification Schemes

Appendix 6 – Tannins and a Review of Their Actions - Pengally

Appendix 7 – The Poisonous Plants of the Ayurvedic Literature

Appendix 8 – Drug Supplements Table

Appendix 9 – GRAS List

Appendix 10 – Herbal Sources of Vitamins & Minerals

Appendix 11 – Dietary Supplement Health and Education Act 1994

Appendix 12 – Contraindications of Selected Herbs

Appendix 13 – Indications for use of Commission E Herbs & Contraindications for Unapproved herbs

Appendix 14 – Warnings Bulletin and Botanical Ingredients of Concern

Appendix 15 -- More Verses on Ethics From the Classical Āyurvedic Texts

Appendix 16 – American Chiropractic Association Code of Conduct

Appendix 17 – Informed Consent – An Issue of Applied Ethics

Appendix 18 – Herbology Resource List / Herbal links / More on CITES

Appendix 19 – US Pharmacopeia

Appendix 20 – Weights and Measures

Appendix 21 – Āyurvedic / Sanskrit Units of Weight with Metric Equivalents

Appendix 22 – 16 Steps Necessary For A Drug To Gain FDA Approval

Appendix 23 -- Āyurvedic Books

Appendix 24 – An Herbal Bibliography—David Hoffmann

The Vedic tradition of learning – teaching requires both student and teacher to pay homage to the tradition. Traditionally, this is done by recitation of prayers. The following are a good sampling of those that may be recited before the teaching - learning begins. Ganeṣa protects all things and people associated with the event; Sarasvati gives knowledge and wisdom; The Sun makes for illumination and brilliance; Dhanvantari is the patron of Āyurveda.

### **Ganeśa Gayatri**

Om ekadantāya vidmahe  
Vakratundaya dhīmahi  
Tanno danti pracodayāt

By your single tooth we know Thee  
We meditate upon that curved trunk  
May that toothed one awaken supreme Consciousness in our minds

### **Sarasvati Gayatri**

Om vāgdevyai ca vidmahe  
Kāmapradāyai dhīmahi  
Tanno devi pracodayāt

We know the goddess of speech  
We meditate upon the fulfiller of all wishes  
May that divine mother illuminate our minds with supreme Consciousness

### **Sūrya Gayatri**

Om prabhākarāya vidmahe  
Divākarāya dhīmahi  
Tannaḥ sūrya pracodayāt

By your making illumination we know Thee  
We meditate upon the maker of the light of day  
May this maker of the light awaken the supreme Consciousness in our minds

**Dhanvantari Gayatri**

Om amṛthastāya vidmahe  
Roganaśāya dhīmahi  
Tanno dhavantari pracodayāt

By your promoting eternal life we know Thee  
We meditate upon the destroyer of disease  
May this Dhanvantari awaken our minds with supreme Consciousness

[\(ToC\)](#)

## USEFUL ABBREVIATIONS & THEIR COMBINATIONS

The following abbreviations are commonly used in referring to the Classical writers and texts.

Ca. = refers to Caraka Samhitā  
Su. = refers to Suśruta Samhitā  
Vāg. = refers to Vābhāṣa  
A.S. = refers to Aṣṭaṅga Saṅgraha  
A.H. = refers to Aṣṭaṅga Hṛdayam  
Śarṅg = refers to Śarṅgadhara Samhitā  
Mā. Nī. = refers to Mādhava Nīdānam Samhitā  
B.P = Bhāvaprakāśa of Bhāva Mīśra Samhitā  
Kaś = Kāśyapa Samhitā

Su. = Sutrasthānam  
Nī. = Nīdānasthānam  
Vi. = Vimanasthānam  
Sā. = Śārīrasthānam  
In. = Indriyasthānam  
Ci. = Cikitsāsthānam  
Si. = Siddhisthānam  
Ka. = Kalpasthānam  
Ut. = Uttarasthānam

Ca. Su. = Caraka Samhitā Sutrasthānam  
Ca. Nī. = Caraka Samhitā Nīdānasthānam  
Ca. Vi. = Caraka Samhitā Vimanasthānam  
Ca. Sā. = Caraka Samhitā Śārīrasthānam  
Ca. In. = Caraka Samhitā Indriyasthānam  
Ca. Ci. = Caraka Samhitā Cikitsāsthānam  
Ca. Si. = Caraka Samhitā Siddhisthānam  
Ca. Ka. = Caraka Samhitā Kalpasthānam

Su. Su. = Suśruta Samhitā Sutrasthānam  
Su. Nī. = Suśruta Samhitā Nīdānasthānam  
Su. Vi. = Suśruta Samhitā Vimanasthānam  
Su. Sā. = Suśruta Samhitā Śārīrasthānam  
Su. Ci. = Suśruta Samhitā Cikitsāsthānam  
Su. Ka. = Suśruta Samhitā Kalpasthānam

ETC. – Putting them together

Ca. Su. V.23 = Caraka Samhitā Sutrasthānam, Chapter 5, verse 23  
Ca. Su. 5.23 = Caraka Samhitā Sutrasthānam, Chapter 5, verse 23

[\(ToC\)](#)



### Scheme of Transliteration

A a A- ā i ī ũ u ̄ ū ̄ r ̄ r̄

<sup>a</sup> ı E e Ewai Awo AWau A'am A" aḥ

k ka % kha g ga ` gha ; ña

C ca ^ cha j ja & jha Å ñ

\$ ṭa # ṭha @ ḍa ! ḍha , ṇ

t ta q tha d da / dha n na

p pa f pha b ba . bha m ma

y ya r ra l la v va S sa

x ś z ṣ h ha D jña = kṣa

[\(ToC\)](#)

### Bibliography for the Entire Survey

1. Anirvan , Shrimat, Vedic Exegesis, printed in The Cultural Heritage on India, The Ramakrishna Mission Institute of Culture, Calcutta, India, 1993, pp. 311-332
2. Ayurvedic Formulary of India, The, © Government of India, 1976
3. “Āyurveda--Mantra of Nirāmaya Pharmaceuticals” interactive software © 2001 Invis Multimedia
4. Batmanghelidj, M.D., F., You're Not Sick, You're Thirsty!—Water for Health, for Healing, for Life, Warner Books, NY, NY, 2003
5. Bapalal, Vaidya, Some Controversial Drugs in Indian Medicine, Chaukhamba, Varanasi, 1982
6. Barker, Jason, ND, Meletis, Chris, ND, “Natural Pain Modulation,” printed in Townsend Letter for Doctors and Patients, January 2005, p. 24
7. Bauer, Dr. Johann A, “Fibromyalgia: A Clear Diagnosis is Possible,” appearing in Frontier Perspectives, Fall/Winter 2008, VOL 16 Number 2, pp. 11-18
8. Berman, Alex, Flannery, Michael A., America's Botanico-Medical Movements—Vox Populi, Pharmaceutical Products Press, NY, 2000
9. Bhisagratna, Kaviraj Kunjalal, Suśruta Samhitā 3 Vol, Chaukhamba, Varanasi, India, 1998
10. Blumenthal, Mark, Ed., The Complete German Commission E Monographs—Therapeutic Guide to Herbal Medicines, American Botanical Council, Austin, Texas, 1998
11. Blumenthal, Mark, “Industry Alert: Plantain Adulterated with Digitalis”, printed in Whole Foods, 9-1997, pp. 73-75
12. Bosh, Tatyana, MD, Bioregulatory Medicine: New Medical Paradigm, Townsend Letter, January 2011
13. Bone, Kerry, FNIMH, “Summer Cleaning? What About Intestinal Parasites?” Townsend Letter, July 2006, pp. 75-78
14. Buehler, Georg, Translator (see Frowde below), The Sacred Laws of the Aryas as taught in the schools of Apastamba, Gautama, Vasishtha, and Baudhayana, Part I, Apastamba and Gautama
15. Buehler, Georg, Translator (see Frowde below), The Laws of Manu (Manu Smriti)
16. Buehler, Georg, Translator, (see Frowde below), (Vishnu Smriti), Ch V, 175, p. 39
17. Cannell, John, MD, Article: The Vitamin D Newsletter, printed in Townsend Letter for Doctors and Patients, Oct. 2008, p. 68
18. Cherken, Linda Carol, “Family Circle Bonus” 1996
19. Cohen, MD, Jay Sylvan, Make Your Medicine Safe – How to Prevent Side Effects from the Drugs You Take
20. Campbell, T. Colin & Campbell, Thomas M., The China Study, Benbella Books, Dallas, Tx, 2004
21. Chatterji, Suniti Jumar; Dutt, Nalinaksha; Pusalker, AD; Bose, Nirmal Kumar; editors of Volume I, The Cultural Heritage of India, The Ramakrishna Mission Institute of Culture, 1993 edition
22. The Complete German Commission E Monographs, Therapeutic Guide To Herbal Medicines, Copyright 1999 American Botanical Council, Software
23. Cowan, Eliot, Plant Spirit Healing, Swan-Raven & Co., and imprint of Blue Water Publishing, Inc, Newberg, Oregon, 1995
24. Crow, David, “Frankincense and Myrrh—The Botany, Culture, and Therapeutic Uses of the World's Two Most Important Resins,” in Natural Awakenings, November 2005, pp. 30-35
25. Crow, David, In Search of the Medicine Buddha, Penguin Putnam, NY, 2000
26. Dahanukar, Sharadini & Thatte Urmila, Ayurveda Revisited—Ayurveda in the Light of Contemporary Medicine, Popular Prakashan Private Ltd., Bombay, India, 1989, pp.10-25, 26-36
27. Dash, Bhagvan, Alchemy and Metallic Medicines in Ayurveda, Chaukhamba, Appendix II, 1986 pp. 192 - 212
28. Dash, Bhagwan, PhD, Encyclopedia of Tibetan Medicine, Sri Satguru Publications, Delhi, India, 1994, First Edition

29. Dash, Bhagwan, PhD, Kashyap, Lalitesh, PhD, Diagnosis and Treatment of Diseases in Ayurveda, Part I, based upon: Āyurveda Saukhyam of Tadarānanda, Concept Publishing Co. New Delhi, India, 2<sup>nd</sup> printing 2000
30. Dash, Bhagvan, Materia Medica of Ayurveda. B. Jain Publishers, Pvt. Ltd., 1994
31. Dhyani ,Dr. S. C., Rasa-Panchaka (Ayurvedic Principles of Drug Action), Krishnadas Academy, Varanasi, India, 1994
32. Dremer, Heinrich, MD, The Concept of Cell Symbiosis Therapy, in Townsend Letter, August/September 2008, pp. 113-116
33. Dvarakanath, C, Lectures on Tanmātras and Pañcamahābhūtas, Chaukhambha, Varanasi, India, 1996, pp. 6, 7
34. Egert, Sarah, Rimbach Gerald, “Which Source of Flavonoids—Complex Diets or Dietary Supplements?” ©2011 American Society for Nutrition. *Adv. Nutr.* 2: 8–14, 2011; doi:10.3945/an.110.000026
35. Emmerick, R E, "Epilepsy according to the Rgyud-bz'I," reprinted in Meulenbeld, Jan G, Wujastyk, Dominik, editors, Studies on Indian Medical History, Motilal Banarsidass, Delhi, India, Reprint Edition, 2001, Ch. 4
36. Erasmus, Udo, Fats that Heal Fats that Kill, Alive Books, Burnaby, BC, Canada, 1986, 1999 6<sup>th</sup> printing
37. European Medicines Agency: London, 22 February 2007 Doc.Ref.: EMEA/COMP/2247/02 Rev.1
38. Fern, Merritt Lydom, Ed., Gray’s Manual of Botany, Dioscorides Press, Portland, Oregon, 1950
39. Finley, John W., Ah-Ng Kong, Korry J. Hintze, Elizabeth H. Jeffery, Li Li Ji, and Xin Gen Lei, Antioxidants in Foods: State of the Science Important to the Food Industry, *J. Agric. Food Chem.* 2011, 59, 6837–6846
40. Foxx, Teralene S. & Hoard, Dorothy, Flowering Plants of the South West Woodlands, , Otowi Crossing Press, Los Alamos, NM, 1995, pp. 196-197
41. Friedman, Milton, PhD, “The Methodology of Positive Economics,” Macmillen & Co., 1941, pp. 23-47
42. Frowde, Henry, The Sacred Books of the East, Oxford University Press Warehouse, Translated by various oriental scholars and edited by F. Max Mueller, Vol. II, 1879, XXV, 1886, (Digitized by Microsoft)
43. Gaby, Alan R. MD, Literature Review & Commentary in Townsend Letter for Doctors & Patients, Nov. 2004
44. Geleijnse, Johanna M and Hollman, Peter CH, Flavonoids And Cardiovascular Health: Which Compounds, What Mechanisms?, *Am J Clin Nutr* 2008;88:12–3. Printed in USA. © 2008 American Society for Nutrition
45. Gogte, Vd. VM, Ayurvedic Pharmacology & Therapeutic Uses of Medicinal Plants, Bharatiya Vidya Bhavan, Mumbai, India, 2000, ch. 3 – 10, pp 55-207
46. Crayhon, Robert, Cancer, Pancreatic Enzymes, and Politics: An Interview with Nicholas Gonzalez, MD, printed in Townsend Letter, August/September 2008, pp. 79-89
47. Gove, Philip Babcock, PhD, Editor in Chief, Webster’s Third New International Dictionary of the English Language, Unabridged, Springfield, Mass., 1976
48. Graedon, Joe , MS and Graedon, Teresa, PhD., Deadly Drug Interactions – The People’s Pharmacy Guide, St. Martin’s Press, NY, NY, 1997
49. Gray, Robert, The Colon Health Handbook, Emerald Publishing, 2002
50. Griggs, Barbara, Green Pharmacy—The History and Evolution of Western Herbal Medicine, Healing Arts Press, 1997 (2<sup>nd</sup> ed.)
51. Haller Jr., John S., Medical Protestants—The Eclectics in American Medicine 1825-1939, So. Ill. Univ. Press, 9994
52. Haywood, V.H, Ed., Flowering Plants of the World, Oxford University Press, NY, 1993
53. Heinrich, Clark, Magic Mushrooms In Religion and Alchemy, Park street Press, 2002

54. Hoare, E. Wallace, Veterinary Materia Medica and Therapeutics, Periodical Expert Book Agency, Delhi, India, 1930, p. 1
55. Hoffman, David, The Complete Illustrated Holistic Herbal—A Safe and Practical Guide to Making and Using Herbal Remedies, Elements Books Limited, Shaftesbury, Dorset, England, 1996
56. Hoffman, David, Therapeutic Herbalism—The Foundations of Modern Phytotherapy, Viriditas Press, Sebastopol, England 1991
57. Hoffman, David, lecture notes from general topic of herbology presented in Albuquerque, NM around 1999— Phytotherapeutic Selection Criteria & Dosage and Formulation Criteria
58. Houston, Reagan, MS, PE, “Cancer and Vitamin C Therapy for Patients,” printed in Townsend Letter, Aug/Sept, 2007. pp. 92-95
59. Hume, Ethel, [http://arizonaenergy.org/BodyEnergy/antoine\\_bechamp.htm](http://arizonaenergy.org/BodyEnergy/antoine_bechamp.htm)
60. Huxley, Prof. Julian, Evolution in Action, Mentor Book, pp. 9-10; quoted by Dwarakanath, C., Lectures on Tanmātras and Pancamahābhūtas, Chaukhambha, Varanasi, India 1996, Ch. 3, 4
61. Internet Encyclopedia of Philosophy
62. Iyer, TG Ramamurti, The Handbook of Indian Medicine or The Gems of Siddha System, Chaukhambha, Delhi, India, 2005
63. Jayaraman, K S, “Break with tradition --Traditional medicine has spent decades in the wings of pharmacology now India is pushing it to centre stage,” Nature, Vol 442|27 July 2006
64. Jolly, Julius, Translator, (see Frowde below), The Minor Law Books – Narada, Brihaspati, 1889, Vol 1
65. Joshi, Dr. Damodar, translator, Rasāmṛtam, Chaukhambha, Varanasi, India, 1998
66. Kalokerinos, A. & Dettman, G., “Second Thoughts About Disease—A controversy and Be champ Revisited,” Committee of the Biological Research Institute, Warburton, Victoria, 1977
67. Kamat, Dr. S.D., Studies on Medicinal Plants & Drugs in Dhanvantari Nighantu, Chaukhambha, Varanasi, India, 2002
68. Kapoor, LD, Handbook of Ayurvedic Medicine, CRC Press, Boca Raton, FL, 1990
69. Kaptchuk, T, OMD, The Web That Has No Weaver—Understanding Chinese Medicine, Congdon and Weed, NY, 1983
70. Karambelkar, Dr. V W, The Atharva-Veda and The Āyur-Veda, Chaukhambha, Varanasi, India, 2003
71. Kathi Keville, Herbs—An Illustrated Encyclopedia, Barnes and Noble, 1997
72. **Kennedy, David**, Wightman, Emma, “Herbal Extracts and Phytochemicals: Plant Secondary Metabolites and the Enhancement of Human Brain Function” © 2011 American Society for Nutrition. Adv. Nutr. 2: 32–50, 2011; doi:10.3945/an.110.000117
73. Hendry, Andrew P., “Speciation,” printed in Nature, Vol 458|12 March 2009
74. Klotter, Jule, Article: Short, Townsend Letter for Doctors and Patients, Dec. 2003, p. 25
75. Kotecha, Meeta, Concept of Lekhana in Ayurveda, Publication Scheme, Jaipur, India, 2000, p. ix
76. Krishnamurthy, K H, translator, Sharma, PV, editor, Bhela Samhitā, Chaukhambha, Varanasi, India, 2000
77. Lad, Dr. Vasant, and Frawley, David, Yoga of Herbs and its derivative herbal chart, Lotus Press, Santa Fe, NM, 1986
78. Lad, Dr. Vasant, Seminars @ The Ayurvedic Institute over various years, esp. 1995, 1996, 1997
79. Lakshmi pathi, Dr. A., A Textbook of Ayurveda Historical Background, Chaukhambha, Delhi, India, 2004
80. Lansky, Amy L. PhD., Impossible Cure—The Promise of Homeopathy, R. L. Ranch Press, Portola Valley, Ca., 2003
81. Lauren, "Ghost Molecules," pp. 73-74 (quoted in CD Homeopathy Resource)
82. Lele, Dr. Avinash, Ranade, Dr. Subhash, Frawley, Dr. David, Secrets of Marma, International Academy of Ayurveda, Pune, India, 1999

83. Liberty Hyde Bailey Hortorium of Cornell University, Hortus Third—A Concise Dictionary of Plants Cultivated in the United States and Canada, Macmillan Pub. Co., NY, 1976
84. Lieber, Michael M. PhD, Correspondence, Frontier Perspectives, Fall, 1999, p. 6
85. MacAdam, Donald, book review in Townsend Letter, Aug/Sept 2007, Spontaneous Regression: Cancer and the Immune System, p130
86. MacGregor, Hilary E., “Indian Food a Path to Better Health?” LA Times, 3/22/06
87. Manoharlal, Girindranath Mukhopadhyaya Munshiram, History of Indian Medicine Publishers Pvt. Ltd., Calcutta, 1994
88. Marino, Andrew A. PhD, “In the Eye of the Beholder: The Role of Style of Thought in the Determination of Health Risks from Electromagnetic Fields,” in Frontier Perspectives, Fall 2000, pp. 22-27
89. Mayor, Adrienne, Greek Fire, Poison Arrows, & Scorpion Bombs—Biological and Chemical Warfare in the Ancient World, Overlook Duckworth, NY, London, 2003
90. Medzhitov, Rusian, Schneider, David S, Soares, Miquel P, **Disease Tolerance as a Defense Strategy**, Science 24 February 2012:Vol. 335 no. 6071 pp. 936-941 DOI: 10.1126/science.1214935
91. Mehta, Pranjiwandas M. "History of Indian Medicine" in Realms of Ayurveda, Sharma, Pandit Shiv, Arnold\_Heinemann, 1979
92. Metcalf, Barbara, Metcalf, Thomas, A Concise History of India, Cambridge University Press, Cambridge, UK, 2002
93. Meulenbeld, Jan G, Wujastyk, Dominik, Studies on Indian Medical History, Motilal Banarsidass, Delhi, India, Reprint Edition, 2001
94. Microsoft® Encarta® Encyclopedia 2002. © 1993-2001 Microsoft Corporation.
95. Mlot, Christine, Antibiotics in Nature—Beyond Biological Warfare, www.sciencemag.org SCIENCE VOL 324 26 JUNE 2009
96. Mookerji, Kaviraj Bhudeb, Rasa Jala Nidhi, Parimal Publications, Delhi, India, New Rev. Ed. 2001
97. Moss, Ralph, Article: The War on Cancer, Townsend Letter for Doctors and Patients, Dec. 2003, p. 28
98. Mowery PhD, Daniel B, , The Scientific Validation of Herbal Medicine, Cormorant Books, 1986, pp. x - xii
99. Mukhopadyaya, Girindranath, History of Indian Medicine, Vol 1-3, Munshiram Manoharlal Publishers Pvt. Ltd. , 1994
100. Murthy, Shrikantha, Doctrines of Pathology in Āyurveda, Chaukhambha, Varanasi, India, 1998
101. Murthy, Shrikantha, translator, Bhāvaprakāśa (Madhyakhaṇḍa, Ch. 67), Krishnadas Academy, Varanasi, India, 2000
102. Murthy, Shrikantha, Bhela Samhitā, Chaukhambha, Varanasi, India, 2002
103. Murthy, Shrikantha, translator, Śārṅgadhara Samhitā, Chaukhambha, Varanasi, India, 1986
104. Murthy, Srikantha, translator, Aṣṭāṅga Samgraha of Vāgbhata, Chaukhambha Orientalia, Varanasi, India, 1997
105. Murthy, Shri Kantha, translator, Vāgbhata's Aṣṭāṅga Hridayam, Krishnadas Academy, Varanasi, India, 1991
106. Murthy, Shri Kantha, translator, Bhāva Prakāśa of Bhāva Mīśra, Krishnadas Academy, Varanasi, 1998, 2 vol.
107. Murthy, Shrikantha, Biographical History of Indian Medicine, Chaukhambha Orientalia, Varanasi, India, 2005
108. Nadkarni, Dr. K.M. and Nadkarni, A.K., Indian Materia Medica, Popular Prakashan Private, Ltd. Reprinted 1994, 2 vol.
109. Nick, Gina L. PhD, ND, “Artemesia and Micronutrient Therapy in the Treatment of Malaria,” Townsend Lewtter, July 2006, pp. 62-64

110. Palsalker, A.D., PhD, Cultural Interrelation Between India and The Outside World Before Ashoka, printed in *The Cultural Heritage on India*, The Ramakrishna Mission Institute of Culture, Calcutta, India, 1993,
111. Pandey, Dr. Gyanendra, Dravyaguna Vijñāna, Krishnadas Academy, Chaukhambha, Varanasi, 1998
112. Pandey, Dr. Gyanendra, System of Plant Nomenclature In Ayurveda, Chaukhambha, Varanasi, 1997
113. Paramahansa Yogananda, God Talks With Arjuna The Bhadavad Gita, Yogada Satsanga Society of India, 1999Kolkutta, India
114. Paranjpe, Dr. Prakash, Indian Medicinal Plants—Forgotten Healers, A Guide to Ayurvedic Herbal Medicines, Chaukhambha, Varanasi, India, 2001, pp. xxviii – xxix
115. Paul, Stephen M., Ph.D., *Phytosterols—A Natural Approach to Cholesterol Control*, appearing in: Whole Foods Magazine, pp. 37-38, October 1986
116. Pengally, Andrew, The Constituents of Medicinal Plants, 1996
117. Pert, Candace, Ph.D., *Molecules of Emotion—The Science behind Mind-Body Medicine*, Touchstone/Simon & Schuster, NY, NY, 1999
118. Physician’s Desk Reference for Herbal Medicines 1st ed. Medical Economics Co. Montvale, NJ, 1998
119. Pennisi, Elizabeth, Tending the Global Garden, *SCIENCE* VOL 329 10 SEPTEMBER 2010 1277
120. Pribram, Karl, “Quantum Information Processing in Brain Systems and The Spiritual Nature of Mankind,” reprinted from the proceedings of the United Nations University meeting in Tokyo (1996) in *Frontier Perspectives – Vol 16 No. 1*, The Center for Frontier Sciences at Temple University, 2007, pp. 4-12
121. Reddy, Chandra KR, Bhaisajya Kalpanā Vijñānam, Chaukhambha, Varanasi, India, 1998
122. Riotte, Louise, *Carrots Love Tomatoes*, The Alpine Press, 26th printing 1989, pp. 205-210
123. Rodriguez-Fragoso, Lourdes, Jose Luis Martinez-Arismendi, Danae Orozco-Bustos, Jorge Reyes-Esparza, Eliseo Torres, and Scott W. Burchiel, “Potential Risks Resulting from Fruit/Vegetable–Drug Interactions: Effects on Drug-Metabolizing Enzymes and Drug Transporters,” *Journal of Food Science* Vol. 76, Nr. 4, 2011
124. Rossiter, Clinton, editor, The Federalist Papers, Hamilton, Madison, Jay, Signet Classics, 2003, p. 189
125. Rowen, Robert Jay, MD, :”Artemisinin: From Malaria to Cancer Treatment” *Townsend Letter*, July 2006, pp. 68-70
126. Rudin, Donald, “The Nature of Truth,” in The Destiny of Man, Core Books, Annapolis, Md., 2003
127. Rudin, Donald, MD, Felix, Clara, Schrader, Constance, The Omega 3 Phenomenon, Sidgwick & Jackson, London, 1987
128. Rubin, Harry, PhD, Alternatives to Molecular Mechanistic Thinking in Biology and Cancer Research, in *Frontier Perspectives*, Spring, 1995, pp. 9-16
129. Sakurai, Masatoma, *Herbal Dangers*, *Nature*, 22 / 29 December, 2011, Vol, 480, p. 597, Maximillian Publishers Ltd., 2011
130. Sapolsky, Robert M. PhD., “Biology and Human Behavior,” “(9 Lectures on 3 VHS tapes) produced by The Teaching Company, 1996
131. Saper, Robert B. MD, MPH, Stefanos, N Kales, MD, MPH; Janet Paquin, PhD; Michael J. Burns, MD; David M. Eisenberg, MD; Roger B. Davis, ScD; Russell S. Phillips, MD, *JAMA*. 2004;292:2868-2873.
132. Śastry, J L N, Dravyaguna Vijñāna, Chaukhambha, Varanasi, India, 2002, pp. 83-84
133. Savnur, H V, Ayurvedic Materia Medica, Sri Satguru Publicatins, Indological & Oriental Publishers, Delhi, India, reprinted ed. 1988, pp. 182-183

134. Schumpeter, Joseph, PhD, *History of Economic Analysis*, Oxford University Press, NY, 1954
135. Seifrieda, Harold E. 4, Darrell E. Andersonb, Evan I. Fishera, John A. Milnera, A review of the interaction among dietary antioxidants and reactive oxygen species, *Journal of Nutritional Biochemistry* 18 (2007) 567–579, a Division of Cancer Prevention, National Cancer Institute, Rockville, MD 20862, USA b The Scientific Consulting Group, Inc. Gaithersburg, MD 20878, USA
136. Sharma, Hari, Md., Freedom From Disease—How to control free radicals, a major cause of aging and disease, Veda Publishing, Toronto, Canada, 1993
137. Sharma, PV, Ayurveda Darshana, Chaukhambha, Varanasi, India, 1994, pp. 33, 125
138. Sharma, PV, Dalhana and his Comments on Drugs, Munshiram Manoharlal Publisher Pvt. Ltd. New Delhi, India, 1982 p. 22
139. Sharma, P V, Introduction to Dravyaguna, Chaukhambha, Varanasi, India, 1995 pp. 83-86
140. Sharma, PV, Introduction and Critical Notes to Caraka Samhita, Chaukhambha, Varanasi, 1981
141. Sharma, PV. Translator, Caraka Samhitā, Chowkhambha, Varanasi, India, 1992
142. Sharma, PV, Sodaśāṅghardayam, Essentials of Ayurveda, Motilal Banarsidass, Delhi, India, 1993,p. 38
143. Sharma, PV, Translator, Suśruta Samhitā With English Translation Of Text And Dalhana's Commentary Along With Critical Notes, Vol I,II,III. Chaukhambha Visvabharati, Varanasi, India, 1999
144. Sharma, RK, "GMP and Quality Control of Phytomedicines," reprinted in *GMP for Botanicals--Regulatory and Quality Issues on Phytomedicines*, ed. Mukherjee, PK, Verpoorte, Robert, Business Horizons, New Delhi, India, first edition 2003
145. Shelldrake, Rupert, *The Presence of the Past--Morphic Resonance and The Habits of Nature*, Park Street Press, Rochester, VT, 1995
146. Shukla, CP, "Principles of Treatment," in *Realms of Ayurveda*, Arnold-Heinemann, New Delhi, India, 1979, pp. 172-180
147. Singh, Dr. LB, *Poisonous Plants in Ayurveda*, Chaukhambha, 1996, p. vii-xi.
148. Singh, R H, *Panca Karma Therapy* Chaukhambha, Varanasi, India, 1992, p. 23
149. Singh, RH, *Introduction to Poisonous Plants in Ayurveda*, by Dr. LB Singh, Chaukhambha, 1997, p. iv.
150. Singh, Thakur Balwant, *Glossary of Vegetable Drugs in Bṛhatrayi*, Chaukhambha, Varanasi, 1999
151. Srinivasulu, Dr. M, Concept of Āma in Āyurveda, Chaukhambha, Varanasi, India 2005
152. Stansbury, Jill N.D. "The Use of Botanical Medicines in Antidepressant Withdrawal" Presented at the Southwest Conference on Botanical Medicine 1999
153. Stewart, David PhD, Chemistry of Essential Oils Made Simple, Care Pub. Marble Hill, MO, 2005
154. Svoboda, Dr. Robert E, Prakruti, Lotus Light Pub., Wilmot, WI, 1988
155. Svoboda, Dr. Robert and Lade, Arnie, Tao and Dharma Chinese Medicine and Ayurveda, 1995, Lotus Press, Twin Lakes, WI
156. The Ayurvedic Formulary of India, Part I © Government of India, 1976
157. The IBIS Guide to Drug-Herb and Drug-Nutrient Interactions Software
158. Thomas, Clayton M.D. M.P.H., Ed. Tabor's Cyclopedic Medical Dictionary 16<sup>th</sup> Edition, F. A. Davis, Philadelphia, Pa. 1989
159. Tiarona Low Dog (Seminars)
160. Tierra, Michael, Planetary Herbology, Lotus Press, Twin Lakes, WI, 1988
161. Thomas, Frederick, Poulin, R, Guegan, JF, Michalakakis, Y, Renaud, F, "*Are there Pros as well as Cons to Being Parasitized?*" *Parasitology Today*, Volume 16, number 12, 2000, pp 533-535
162. Tyler, PhD Varro E., The Honest Herbal—A Sensible Guide to the Use of Herbs and Related Remedies, Pharmaceuticals Products Press, NY, NY, 1982

163. Tyler, PhD, Varro E., Herbs of Choice—The Therapeutic Use of Phytomedicinals, Pharmaceuticals Products Press, NY, NY, 1994
164. Udupa, KN & Singh RH, ed. Science and Philosophy of Indian Medicine, Shri Baidynath Ayurved Bhawan, Ltd., Nagpur India, 1990 pp.11-17
165. US FDA web site: <http://www.fda.gov/opacom/backgrounders/miles.html>
166. Valiathan, M.S., The Legacy of Caraka, Orient Longman Private Ltd., Hyderabad, India, 2003
167. Vidyanath, Dr. R., Nishteswar, Dr. K., A Handbook of History of Ayurveda, Chaukhambha, Varanasi, India, Reprint 2006
168. Vissers, Margreet CM, Bozonet, Stephanie M, Pearson, John F, and Braithwaite, Lewis J, “Dietary ascorbate intake affects steady state tissue concentrations in vitamin C–deficient mice: tissue deficiency after suboptimal intake and superior bioavailability from a food source (kiwifruit)” *Am J Clin Nutr* 2011;93:292–301. Printed in USA. \_ 2011 American Society for Nutrition
169. Vithoulkas, George, The Homeopath: The Journal of the Society of Homeopaths N 69 Spring 1998 Acceptance Speech to the Swedish Parliament; quoted in *Townsend Letter for Doctors and Patients*, August/September 2004, p. 94
170. Warrior, PK, Indian Medicinal Plants, Orient Longman: 5 vol., Hyderabad, India, 1996 reprinted ver.
171. Webster’s Third New International Dictionary of the English Language, Unabridged, Gove, Philo Babcock, PhD editor in chief, G & C Merriam Company, Springfield, Mass, 1971
172. Weeks, John, AMA SOPP Escalates Campaign Against Nurses, Chiropractors, Naturopaths, Midwives, and Others; Published first in *The Integrator Blog*, June 32, 2008 and printed in *Townsend Letter*, November 2008, pp. 40-43
173. Weil, Elaine, Quincy, Cheri, Faass, Nancy, “Treating Prostate Cancer at the Amitabha Medical Clinic: Integrating Ancient Wisdom with Modern Science;” *Townsend Letter*, December 2010
174. Weiner, Michael, PhD., Goss, Kathleen, The Complete Book of Homeopathy, Avery Publishing Group, Inc. Garden City Park, NY, 1989
175. Wichtl, Max, / Bisset, Norman Grainer, Eds., Herbal Drugs and Phytopharmaceuticals, CRC Press, Boca Raton, Fla. 1994
176. Willard, Terry, PhD. Textbook of Advanced Herbology, Wild Rose College of Natural Healing, Ltd. Calgary, Alberta 1992
177. Winston, David AHG, Herbal Therapeutics: Specific Indications for Herbs & Herbal Formulas, Herbal Therapeutics Research Library, 2000
178. Wolff, Milo, and Haselhurst, Geoff, “The Wave Structure of Matter (WSM) and the origin of the Natural Laws,” printed in Frontier Perspectives, Fall/Winter 2008, pp. 32-37
179. Wolpert, Stanley, India, University of California Press, Berkeley, CA, 1999 edition
180. Yance, Donald R, Tabachnik, Ben, "Breakthrough Solutions in Herbal Medicine Adaptogenic Formulas: The Way to Vitality," printed in *Townsend Letter*, January 2007, *Townsend Letter for Doctors and Patients*, Pt. Townsend, Wash. Pp. 86-89
181. Donald R. Yance, Jr, MH, and Stephen M. Sagar, MD, Targeting Angiogenesis With Integrative Cancer Therapies, *INTEGRATIVE CANCER THERAPIES* 5(1); 2006
182. Yanich Jr., Paul, PhD, “Strengthening Innate Immunological Weaponry Against Carcinogenesis,” printed in *Townsend Letter*, Aug/Sept 2007, pp. 151-154



# A Topical Survey of Āyurvedic Herbology

[\(ToC\)](#)

## Introduction

This Survey has taken, now, several years to come to this stage. Its numerous versions are in many respects a trail of the experience of the growth in my own knowledge and understanding of the subject of Āyurveda, generally, and with its herbal tradition, specifically.

This Survey is not a work on the principles of Āyurveda—it's a survey of the ideas, concepts, and aspects of the field of Āyurvedic herbology. This Survey is directed at those with understanding of the principles so they—vāta, pitta, and kapha--are not presented. An effort has been made to present such detail of the written record on this matter that would be digestible for the beginning student. This topic is too broad to be limited to theory exclusively--in an introductory work/course. Hence, the theory of drug action is nearly all the theory to be found here. On the other hand, it's important, we believe, to convey some understanding about the philosophy (epistemology) of science (or we could say its methodology) generally, and how this theme relates to Āyurveda, specifically.

I shall define science as a formalized endeavor aimed at discovery--becoming aware of, becoming familiar with, and gaining understanding of the objects of our senses, i.e. that which we call experience. This experience may be of things grossly phenomenal or subtly mental or emotional, even conceptual.

I am reminded of a central element of the history of a related topic (science--generally, physics--specifically) with Einstein's tribute to Isaac Newton, appearing in the Smithsonian Annual Report for 1927, on the occasion of the second centenary of Newton's death:

“...He is, however, a yet more significant figure than his own mastery makes him, since he was placed by fate at a turning point in the world's intellectual development. This is brought home vividly to us when we recall that before Newton there was no comprehensive system of physical causality which could in any way render the deeper characters of the world of concrete experience.

“The great materialists of ancient Greek civilization had indeed postulated the reference of all material phenomena to a process of atomic movements controlled by rigid laws, without appealing to the will of living creatures as an independent cause. Descartes, in his own fashion, had revived this ultimate conception. But it remained a bold postulate, the problematic ideal of a school of philosophy. In the way of actual justification of our confidence in the existence of an entirely physical causality, virtually nothing had been achieved before Newton....”

Here Albert Einstein points to the whole thrust of philosophy, generally, and to western science, specifically—namely that our task is to find rules or laws of Nature that explain how and why things work as they are observed. Huxley described this process as two motives in action: comprehension and control. The first precedes, necessarily, the second. This tradition is both reductionistic and decidedly materialistic. On the point of reductionism we can say that the salient thrust of science is to reduce masses of data to a simple construct or understanding. Pribram (see bibliography) describes the process thusly:

“A(n) ... analysis shows that descriptors ...are derived from an analysis of experience into components. The components are organismic and environmental (biological and physical or social), and each component can be subdivided further into subcomponents until the quantum and nuclear levels of analysis are reached. This procedure of analysis downward in a hierarchy of systems is the ordinary way of descriptive science. Within systems, causes and effects are faced. When discrepancies are found, statistical principles are adduced and probabilities invoked. Scientists have become adept and comfortable with such procedures.”

As for modern medicine, its detractors opine that Western scientific medicine has gone too far--an over-simplification has occurred and this has resulted in omission of key elements in the causal chain--rendering it at least partially invalid. For example, there is still no formal effort in modern scientific medicine to incorporate mind and spirit into its construct of life. This position will render its theoretic

approach ineffective in cases of mental or spiritual dysfunction--should there be one. With respect to materialism, though not in an all-pervading, purely mechanistic, sense (disdaining free will, etc.), nearly all medical paradigms are seen as materialistic. And this label is also applicable to our venerable science--Āyurveda. Its philosophical underpinnings are clearly affirmed by sutras in the Caraka Saṃhitā and elsewhere--Āyurveda is decidedly materialistic but asserts that the nature of this materialism may exceed sensory experience. This materialism, according to Āyurvedists, takes on unique expressions as seen in the inclusion of time, mind, direction, and soul as atoms of causality, in addition to atoms of space, air, fire, water, and earth. Indeed, nothing occurs but by the force of material objects (atoms) and their various interactions. Thus it is that a conception of “matter,” substance, and materialism may vary according to one’s particular system but in the end, it seems to this writer, we are all “materialists.” While traditional western philosophers adduce a mechanistic or deterministic universe from their materialism, we Āyurvedists do not. Quite simply because mind and spirit are part of the causal scheme and we all know how fickle mind can be and the soul has free will.

It has long been a vexing issue for me that the jargon and rules of science, in a general way, are not formally taught in our educational institutions. While working for a Master of Economics degree I asked one of my professors for guidance about reading in this topic. He said he knew of no such source for this quest. In light of this void in education I have decided to attempt to fill this need with the following discussion; even though this Survey is not about theory exclusively or even predominantly. I shall call this material the philosophy of science. I would like to acknowledge at this time one important source for my understandings on this topic—Milton Friedman, PhD. (see bibliography).

The philosophy of science is a broad topic that embraces discussions about modeling, theorizing, testing, verifying, and so on. Its jargon includes some other terms as well—axiom, assumption, proof, maxim, facts, postulate, dictum, data, and so on. Its beginning is unknown as written history is both sketchy and fragmented before about 3500 BCE. But it has two elements--experiential and conceptual; i.e. knowledge is based upon experiences and upon thinking about things that we could experience but need not have an experience with (for an interesting summary, see: Shelldrake). Allegory was undoubtedly an early form of this effort (see Paramahansa Yogananda’s translation and commentary on the Bhagavad Gita for an example of this point).

We must take into account the historical perspective of ancient scientists. We need to ask ourselves how seers and philosophers thought about their thoughts. Did they construe their views as accurate depictions of reality or merely as rough approximations? We think that the fundamental tool of science--modeling as we call it--has evolved over time. But it's important that we are aware of this evolution of science and formal thought. It gives us an unique advantage in one way of thinking--we don't have to be worried over the subjective nature of our experiences and of their interpretations which we render as science.

The basis of any science rests in two related but distinct fields: ontology and epistemology. The former is about the field of what exists and the latter is about the nature, methods, scope, and limits of knowledge. Both fields, taken together, consist of necessary foundational ideas and methods that every science assumes. Science is about how we think--the way we agree to think—in other words it’s an epistemology and a grammar. The modern concept of science exists within this field in a very special way. It affirms the supremacy of sensory data--of observations in nature of nature, with controlled experimental, clinical, and laboratory investigations coming later (see Crayhon). Its ontological stance derives from the notion that sensory data are the only basis of knowing. It’s the foundation of “evidence-based” medicine as opposed to “faith-based” medicine. Evidence or data or facts arise out of repeatable observations and experiments; however, as we Āyurvedists believe, sensory-derived data may be limited—ask the yogi’s and psychics. On the other hand, faith-based data may lack the

evidence of experiments (think scientific method) yet be valid. However, we want to avoid “science by consensus” which merely affirms facts without validation / testing just because a large number of people hold something to be true or factual. Some would argue that faith-based science is science by consensus. Āyurveda’s reliance upon its herbal tradition for over 3,500 years poses a special challenge to modern Āyurvedists.

Science is more than logical thinking, however, it’s guided or directional thinking. It may be compared to the term grammar—science is a set of rules applied to a class of data that governs the way the data shall be analyzed. With respect to Āyurveda, grammar means that rules of structure and function are being described, explained, and applied to living entities. As scientists we agree to be selectively attentive to data relating to the principles of the model and to ignore most else. We agree to consider related things first (dictated by the principles) and others later, or not at all. We agree to follow the conceptual / physical transformations according to the way the model guides--logically. Scientific thinking is disciplined thinking, orderly, consistent, and accurate. It is a system of reasoning. The syllogism is one form, among many, of logical devices (made popular by Aristotle).

From the modern perspective, one thing modern science is not--intuition or inspiration. Although, many scientists will say that these account for important leaps in understanding and in the theory, itself. This simply means that intuitive thinking is non-linear or non-inferential. One might say that epiphany arises not from deductive or inductive thinking but from somewhere or something that can’t be explained. It just happens. Having said this, we must equivocate somewhat by adding that for the ancient seers science does include those understandings gained in meditation and through the ability to see finer states of reality. Thus it is that the "science" of Āyurveda includes the anatomy, physiology, chemistry, botany and so on but even more importantly the inner experience of the field of Being, Itself. That is to say, the field of knowledge about the Creator is just as real for the seers as the things of the physical creation, which are perceived through the 5 senses. There is a science of Being, which formally describes and discusses the fundamental nature of existence as spiritual. But in the final analysis Āyurveda is an applied technology of the prior existing science of Being.

It is useful however, in order to understand any science, one has an idea of what a model, paradigm, doctrine, or theory is. One definition of these synonyms is that they are *a representation of an idealized version of an imaginable universe*—or simply a thought experiment. A theory will establish explicitly or implicitly a realm of relationships—things closely related (explicitly), things marginally related, things unrelated (implicitly by omission). From the Vedic perspective the term, śāstra seems apt. This conveys the idea of science as theorizing. Science is more than a collection of empirical data, of experiences. Folk medicine, for example, is devoid of theorizing but full of experiences with herbs, etc.

One expert has given the criteria for a viable theory (Wolff, see bibliography): “1) raises much less questions than the answers it provides, 2) introduces many fewer new constants than the natural constants it explains, and 3) the number of assumptions required should be much less than the properties of Nature it reveals; in short simplicity is the goal. But often the zeal to publish overrules logic so eternal hope has given almost eternal life to many useless theories.” With respect to #2 we can see that Sāṅkhya and Vaiśeṣika have differing views of the causative substance(s) in Nature. Puruṣa-Prakṛti (with its 24 qualities) contrasts to the 9 causative substance of Vaiśeṣika, e.g.

Theory can be practical or conceptual. For example, there’s an experimentally affirmed theory that states and confirms that a 35% deprivation of cell respiration replaced by fermentation of sugar (anaerobic metabolism) is a necessary and sufficient condition for cancer cells to form—called the Warburg Phenomenon. Researchers can, without exception, show that this scenario always leads to the formation of cancer cells. The problem with this theory was that there was no way to prevent this

condition in practice because it couldn't point to a way of avoiding the process.; thus it languished for decades in the doldrums of esoteric intellectual science. We Āyurvedists want to make sure that Āyurveda is a practical / clinical science, not just a conceptually elegant model.

We'd like to take each of the words of our definition of model in turn beginning with representation. The use above of the term **representation** is important here because we do not want to convey the idea that a model is in any sense a description of or a depiction of reality. Representation means that it serves as a representative or surrogate for (as if) but not as an exact replica of. It may be useful to think of a map—think of the map as representing the 3-dimensional territory. On the other hand, terms such as replica and description convey that idea of exact equivalency, same in identity, etc. . It may be useful to think of this relationship of representation vs. description as similar to the Realists vs. the Impressionists in art. Thus we affirm that models give a sense of something (the mapping) but are not that “something” (the territory) actually. There are many kinds of maps—road, terrain, climate, wind speed, and so on. Each is suited to a specific purpose and can not convey or explain all the data about the “terrain—the reality.” We can say directly that scientists are map-makers. In terms of epistemology and ontology the term representation is used to denote how we hold this knowledge whereas description is used to denote an ontological state of existence. The 6 systems of Indian philosophy (upangas) are given as an example of the usefulness of this representational approach. Each has a limited view of reality and for its own purpose; each is a useful representation of reality. All, taken together, give a better view of the whole even though they hold contradictory positions on many details. Thus none is a description of reality but a partial representation of it. None is a belief system describing reality; none requires a faith. The correctness on descriptive terms is irrelevant to the usefulness of each system. Sometimes models are limited in scope, i.e. are about limited range of events or phenomena, and sometimes they are quite complicated. Taken as a science Āyurveda is really a system with numerous models folded together to explain many closely related ideas embodied in the notions of life, health, disease, treatment, drug theory and so on. This feature will distinguish early medical practices of folk medicine and herbal medicine from later system-building efforts of the classical Āyurvedists.

**Idealized** means pure, simple, fundamental, abstract, ideal, etc. We are trying to convey the notion that underlying laws of Nature are being represented in abstract and fundamental ways. Mostly, models are intended to represent narrow perspectives, not broad, sweeping, generalizations of Nature. The theory of light can be represented by a particle model or a wave model. One is not trying to explain many features of Nature, just one, in this case--light. It just so happens, in this case, two models (wave and particle) are required at the same time to explain different phenomena of light. Taken together they explain all phenomena associated with light. The science of Āyurveda, however, is a very big model. It encompasses almost everything about life and living beings. It even connects the living and non-living in its guṇa theory—rasapañcakam.

**Imaginable universe** is a term that implies existence, if not only in one's imagination. If one can think of something then it can be said to “exist” in this sense. For scientists, however, it's not enough to have imaginings, one must have relevant imaginings—such thoughts are of real experiences or about real data. The term universe might be a very narrow concept or a very broad one--such as the field of experience around light (narrow) or about the cosmic universe on the other hand. The science of Āyurveda is a very broad field or notion, for example.

The term (first) **principles** generally includes those ideas within a theory or model or paradigm that constitute or define the causal entities—those things that interact and produce effects. Some regard them as postulated truths or laws, while others call them "organizing principles" or ideas. Alexander Hamilton said in The Federalist Papers, #31 that they are truths “upon which all subsequent reasonings

must depend...” “Of this nature are the maxims of geometry that the whole is greater than its parts... Of the same nature are these other maxims of ethics and politics, that there cannot be an effect without a cause; that the means ought to be proportional to the end...” Rudin (pp. 21-24) refers to such terms as belonging to the meta-analytical codomain. This means simply that principles are a codomain of objective things and are the product of analytical processes. They are not objective, necessarily, themselves. Principles are also those things referred to above as: “closely related.” For Āyurveda its first principles are vāta, pitta, and kapha—they come first in discussion of the science. Each connotes substance in the classical sense and in modern view they connote force or ability to effect or to bring change and when they are seen together many effects can be explained—physiology and pathophysiology among the living and functioning of non-living entities. These principles may not have a real existence, but this is not a limitation of the model. They may have “unrealistic” attributes—means they are hypothesized to act in some way that may be unrealistic. But this is not a limitation of the model. We are only trying to explain and understand Nature; we are not trying to describe it.

Principles often need **assumptions**, which might help to set a context or framework for analysis to take place in. For example, a popular one is to hold all other things static while we mentally work through a reasoning process. When we ask a student to describe the effects of a cold drink, we are implicitly holding all other factors constant. This allows for one to work through the exact and exclusive effects of only the cold liquid. (There is also an analytic methodology that sounds similar, called *static analysis*, which introduces one change at a time, as contrasted with *dynamic analysis*, which allows many variables to change simultaneously.) Another example might be the classical explanation of jvara (fever), viz.—“a doṣa increased by diet, lifestyle, etc. upon entering the stomach, the seat of fire, mixes with rasa, blocks rasa and medas srotāmsi, affects agni and takes it out of the stomach, spreading it throughout the body to produce fever.” The assumption is that doṣa behaves in this particular way and produces the observed effect. Another important one affects Āyurveda: Sāṅkhyā and (advaita) Vedānta are dualistic and monistic, respectively. Each holds a view (assumes) the fundamental reality to be radically different. Both can’t be right in a descriptive sense. But from the perspective of what each is trying to explain each assumption base is valid. Assumptions of a model might be descriptively unrealistic but this lack of realism does not invalidate the model itself. Only the ability of the model to explain is at stake here. Its assumptions are not at stake. Assumptions need never even approximate describing reality, they must just operate to give the model the right predictions.

**Maxim** (sometimes called axiom, postulate, or aphorism) is another interesting term. Sometimes it serves in the role of assumption by default but more often it is held, in declarative form, to be a truism. This truism may be a first principle, in fact although in this context we feel it may be useful to think of maxim as a secondary principle. In Āyurveda one fundamental maxim of our science is the Law of Similarity and Dissimilarity (Samānya Viśeṣa Siddhānta): “It is always the case for all substances that similarity is the cause of increase and that dissimilarity is the cause of decrease.” This statement is not subject to debate or verification. It is just purely and simply true—according to Caraka. This axiom plays such a pivotal role in Āyurveda that one might argue that its demise would be fatal for this paradigm. Another rather tacit assumption, not exclusive to Āyurveda by the way but certainly important because of its unchanging description of physiology, is the notion of nature’s enduring and unchanging functioning—human (or any other created entity’s) physiology works on the basis of permanent laws of nature. Life operates the same everywhere and will function and always has functioned the same. Without this assumption there would be no reason to try to learn about or to understand Nature, period. Āyurveda asserts that the guṇas are eternal, ubiquitous, and universal properties of substance. This statement sounds consistent with  $E = MC^2$  (law affirming the conservation of matter and energy) but how far are we willing to go? Can we really say that there are guṇas of an electron or a photon? (Note: This problem is rather nicely resolved by Wolff’s discussion of a wave theory of matter as really “a wave structure in a quantum space medium” and disposes of the

two-fold theory of light in current vogue.) Another maxim of Āyurveda is the doctrine of three-fold cause (Trividha Siddhānta). Āyurveda holds that changes in substances due to interactions must inhere in the substances involved in the interactions; the interactions can not manifest effects that are not (subtly) inherent (satkāryavāda). Cold effects result from cold causes only, etc. At other times, Āyurveda will reject this particular doctrine of cause and effect in favor of another. When this happens it may assert prabhāva (inexplicable reality) is the cause, or yet another model of cause and effect that allows for transformations of the causal entity to manifest (vivartavāda and pariṇāmavāda). On certain occasions it will suit us to hold on to one view of cause and effect and on other occasions it will suit us to assert another doctrine.

Data and facts are the raw stuff of any science. Rudin (pp. 21-24) states these terms relate to the object domain—things that exist. One type of fact is that which is measured—it's 75<sup>0</sup> F outside right now according to my thermometer, for example. A collection of facts, or data, might tell us the high tide schedule for Boston harbor during the last decade. Discoveries are also facts—olive oil never existed in India and so it was never described in the classical literature but now that it's known a description has been given. Other kinds of data might be inferential—either deduced or induced. Light energy is converted to biological energy in plants via photosynthesis is a deductive fact. The principles of a science are examples of inductive facts—vāta, pitta, and kapha are inferential facts of Āyurveda, for example. She is feeling cold, dry and nervous—the conclusion that vāta must be the cause is an induced fact (See Marino for more detail on this discussion). We must be clear what is fact and what is not. Often conclusions are facts but not meaningful data. That fact that everyone felt the world was flat does not grant this fact of consensus the status of truth.

We build data banks and particularly we build categories of data. Friedman (p. 26) states this codification serves as a filing system for organizing experiences and meets certain criteria, viz. categories are clearly and precisely defined, exhaustive, unambiguous, searchable, unique, and practically useful. Principles are part of the codification that is inherent to science. In this sense Friedman places them in codex of the science as part of the language of the science. Principles are the tautologies of the science that constitute the language of the science. The way they interact is the grammar—set of rules of analysis, etc. When one discusses vāta, e.g., one understands this category of structure and function as unambiguously different from the categories of pitta or kapha things and actions. There is little doubt about Parkinson's disease being a vāta disorder, for example, because all of its symptoms are traceable to the nature and function of the class of things called vāta. This confirms that the scheme of classifying is unambiguous, precisely defined, etc. Further, Friedman notes that this system of codex guides one to perform an important initial, if not obvious step in the analysis—to file the relevant factors into their respective categories. As a first step of analysis it performs the function of helping us to declare the things that we know about an event or problem. Once this has been done confusion is prevented. From this first step causal interactions or relationships may be inferred.

Rudin (pp. 21-24) brings to our attention that the terms: truth, true, and valid (validity) bear on this matter, too. For example, truth is a condition of statements about the objective domain or facts. Whether one can know the truth is independent of the fact that a statement is true or not. Statements about the facts are true or not, which truth may be subject to verification by examination. Further, when we are examining our theory it is better to use the term “valid” when relating to the various propositions concerning statements about facts; e.g. vāta contains substances that are cold, dry, light, rough, etc. is a valid statement, not a true statement, according to proper scientific grammar. “Āyurveda is a science” is a valid statement. However, Caraka said that vāta is cold, dry, light, rough, subtle, etc. is a true statement because the text affirms it. Whether there's validity to this statement we shall have to find out. The truth is we believe that Caraka said it but we are not sure it's valid.

The search for truth is really the search for things and knowledge (their relations) that are eternal, ubiquitous, universal, and unchanging—in other words it is the search for that which exists and for the laws of functioning and causation. Truth can be regarded as the body of knowledge called the laws of nature, for example. A law is a notion expressing a universal truth and is characterized by a lack of exceptions—e.g., we only and always see terrestrial or celestial objects fall down, according to the law of gravity. As intellectual constructs, laws are opposed to chance or random happenings. They yield determinism, understanding, predictability, and certainty. Rudin indicates that the universe is a lawful domain—it can be understood. Even the concept of atom implies as much for Rudin—it means that at the very minimum of existence there is still something that can not be fragmented, can not be infinitely variable. The concept of atom suggests determinism, that there is a limit to the variation in creation. Thus the search for truth can be seen to have a natural limit and be feasible, in principle. Since the field of action is the field of temporality it is not the case that one can know all actions in the creation, but one can know all the players and the results of their interactions. This statement is suggested in the term—evolution. It implies a deterministic process. While advocates for this notion are divided among the gradualists and the catastrophists and centrists of both extremes, nonetheless, causation is still at the root of the matter, not chance. In the field of biology the terms of interest that express this idea of evolution are: genetic variation and natural selection (survival of the fittest). Among Āyurvedists evolution is more narrowly viewed as expressed in the philosophical system of Saṅkhyā. The law of similarity (Sāmānya Siddhānta) is an example of an important statement of relationships between interacting fields, e.g., in Āyurveda.

The history of man is replete with writings about our efforts to conceptualize and understand Nature. Early thinkers did not confine thinking to sensory data alone, they thought about ethical themes, even what constitutes **knowledge**, itself. Today we study these themes separately under the rubric of science / natural science / natural philosophy as opposed to philosophy or metaphysics. Early thinkers would have grouped all knowledge under the term science—śāstra would be a good Sanskrit word. In this sense, we can say that Āyurveda is more than a science, as defined contemporaneously. It's philosophy, natural science, and art. It embraces knowledge of both the mystical as well as of the experiential or empirical. All the areas of philosophy are included in a traditional study of Āyurveda—ethics, cosmology, epistemology, ontology, aesthetics, logic, metaphysics, etc. And, of course, Āyurveda studies anatomy, physiology, chemistry, botany, physics, chemistry, and so on. It's also about the art of medicine—rules for maintaining life. It should be understood that the science of Āyurveda is much more than science in the modern definition.

The classical literature of Āyurveda affirms there are 4 valid ways to know—4 types of valid knowledge (pramānas). They are: observation, inference, analogy, and authority. Empirical knowledge has become the realm of science and science (knowledge) is much limited to experience. If one could not sense (hear, taste, touch, see, smell) then there is nothing to talk about. These objective data have become the supreme objects of study. Inference connects with experience, too—if one sees smoke or feels heat there must be fire or pitta. These two are sensory-based means of knowing. The area of analogy or comparison permits one to know more about things experienced or understood without direct experience. For example, this writer studies many fields of modern scholarship just to learn more about Āyurveda. “How?” You ask. One thing, by studying other sciences one learns of new distinctions and ways of viewing things that are useful for understanding our own methodology. Language, itself, has become very specialized. Authoritative knowledge embraces the oral and written sources and even the traditions of a culture. The value of these sources has been much eroded over time with the increasing acceptance of the empirical method. Philosophers could speculate but scientists would know for certain, through their sensory-based investigations. (We will not tackle the



issue whether Āyurveda is a science in the strict modern sense or whether it more aptly fits into the category of philosophy.)

As man arose from the depths of the Dark Ages a method of investigation or of natural inquiry arose. It's been called the “**scientific method**” and has become the standard for knowing. This method starts with data or experiences and then proceeds to try to understand relationships among them—a hypothesis is formed. The hypothesis or understanding about the (hypothesized) relationships is put to test and results of experiments either support or reject the hypothesis (or fail to do either). Scientists are quick to point out that any thing posing as theory must, in fact, present a testable hypothesis. Further, it should point to new tests of the hypothesis as well as to potential areas among old data. The hypothesis that a God exists, sadly seems impossible to test. Thus, a scientist would argue that this issue is the realm of speculative thinking—metaphysics or philosophy. As Friedman (p. 24) says: “Its (the hypothesis) performance is to be judged by the precision, scope, and conformity with experience of the predictions it yields.” Good methodology requires that only one variable among many be changed at a time. This method helps guarantee correct conclusions about the causative agent because only one thing has been allowed to be changed. Cause and effect are therefore very clear. When we can establish cause we can exclude all other factors—they become the unrelated factors referred to above. The most valued form of testing or “Gold Standard” is the procedure that invokes double-blind (neither subject nor technician knows who is getting what, when), crossover (both control and test subjects get both sets of test/placebo media), randomized (assignment of test media is randomly assigned), with placebo (an inert substance is introduced as well as an active substance). The intent of this procedure is to identify only pharmacologically active substances and to identify those working outside this framework—placebo, e.g. However, we should be careful not to conclude that because a controlled experiment is not possible the conclusions are invalid. Astronomy and economics are two notable examples where this is seen to apply (See Friedman, p. 28).

Since the Renaissance Western thought has rejected the mystical, spiritual aspects of knowledge and focused upon studying and explaining our sensory experiences. In this sense the Renaissance can be seen as a conscious effort towards redefining the limits of knowledge. For one thing, **authoritative knowledge** was increasingly severely castigated, if not rejected altogether, and its influence increasingly waned over the decades and centuries. Remember that in the Western world that immense political and religious power rested with the Roman Catholic Church and its pope; its officialdom held that geo-centricity was proof of a God and of a divine order and this controverted empirical findings that heliocentricity was the nature of “the universe.” Authoritative knowledge embraces the oral and written sources and even the traditions of a culture. The value of these sources has been much eroded over time with the increasing acceptance of the empirical method. Empirical knowledge became the realm of science and science (knowledge) was limited to experience. If one could not sense (hear, taste, touch, see, smell) then there was nothing to talk about. These objective data became the supreme objects of study. Philosophers could speculate but scientists would know for certain, through their sensory-based investigations. Since my early days as a student I have thought this to be evidence of a methodological dualism—we study physical data differently than mental ones, for example. There are in a way two worlds and we treat them differently. Recent investigations have shown that feelings in one person manifest in another and that there is an activation of neurons coupled with this empathy. The two worlds are merging.

There are schools of thought or doctrines in this regard and an important modern one that comes to mind is the **logical positivist** school. This is the main school of thinking in modern science throughout the world. Webster, p. 1330, defines it as “a movement holding that meaningful statements are either a priori and analytic or a posteriori and synthetic and that metaphysical theories are strictly meaningless and have strictly emotive force.” Further Webster defines positivism (p. 1770) as “a system of

philosophy holding that theology and metaphysics belong to earlier or imperfect modes of knowledge whereas positive knowledge is based on natural phenomena and their spatiotemporal properties and invariant relations or upon facts as elaborated and verified by the methods of the empirical sciences.” “The basic principle maintained by the logical positivists is the verifiability theory of meaning. According to this theory a sentence has factual meaning only if it meets the test of observation. Logical positivists argue that metaphysical expressions such as “Nothing exists except material particles” and “Everything is part of one all-encompassing spirit” cannot be tested empirically. Therefore, according to the verifiability theory of meaning, these expressions have no factual cognitive meaning, although they can have an emotive meaning relevant to human hopes and feelings.” (Microsoft® Encarta® Encyclopedia 2002). One modern theorist in this school characterizes it in the following way: logical reasoning is its method and “all our knowledge is of invariant relations between given phenomena on whose nature or causation there is no sense in speculating.” (See Schumpeter, p. 54) “A *priori* is marked by reasoning or deducing consequences from definitions formed or principles assumed (Webster, p. 107);” in other words it’s deductive reasoning and it starts with general propositions and attempts to arrive at particular examples. “A *posteriori* is of or relating to the kind of reasoning that derives propositions from the observation of facts or that by generalizations from facts arrives at principles (Webster, p. 102);” in other words it is inductive thinking and starts with special cases and attempts to arrive at general propositions.

Another writer (Marino, p. 22) adds abductive reasoning. Notably, abductive thinking actually is not a form of correct reasoning at all but serves as a descriptor of how reasoning (of scientists or of non-scientists) can fall victim to believing before proving and is characterized by the use of the term “suggests” in a concluding statement—well we haven’t proved how such and such came to be but it’s very existence is evidence of a causal relation and because we have seen it arise before with regard to something we already understand this is enough **to suggest** that we know how to explain it, even though we haven’t shown it in our experiments. Marino adds that this kind of reasoning is the norm for the biological sciences—we rarely observe chemical laws playing out in an exact way, and we are careless about making generalizations from research data involving them in living systems. An example of this is provided by the modern nutritional theory on bone-forming calcium. While it’s widely assumed that bones take calcium from the blood supply and use it directly there are those who state that there is no empirical evidence for this assumption. Nay-sayers, such as the biogenesis advocates aver that the body/bones make their calcium from lighter elements of the periodic table (pairs whose atomic number add to the magical 40 of calcium). The abduction is the thinking that since we only believe that galactic/stellar dynamics lead to the formation of heavy elements that this is the only way they form. The biogenesis advocates label this astro-physics-ridden model as abductive. And finally, those who take solace from “empirical data” in animal or in vitro studies should keep this statement in mind before acceding to the conclusions the status of fact or truth.

There is yet another distinction which is important: Āyurveda is a normative science as well. It gives clear statements about the way things should be. All manner of conduct of the physician is described in terms of what is correct. Even the behavior of the individual in society has been abundantly described by the classical writers—all in terms of what is proper conduct. This contrasts sharply with positive science, which is about what is, not the “should be.”

### A Point of Related History

There is a term formerly widely used in the West that reminds us of our Āyurveda--physic—its meanings below are taken from Webster (p. 1076). The etymology of the word derives from Latin—*physica*, meaning of or relating to natural science and from Greek *physikos*, meaning natural. Its middle English form—*physiks*—is still seen from time to time. The word, itself, means: medical or

medicinal, the art or practice of healing diseases, the science of therapeutics, the practice or profession of medicine, medical science, the theory of diseases and their treatment, medical treatment, a health giving or curative practice or regimen, a remedy for disease, a medicinal agent or preparation; natural, physical, of or relating to natural philosophy; a science that deals with matter and energy and their interaction in the fields of mechanics, acoustics, optics, heat, electricity, magnetism, radiation, atomic structure, and nuclear phenomena, etc.

This word—*physic*—was used to describe the science of life—meaning that at one time it was considered to be the study of life, in all its perspectives. But note that the angle of health is prominent in early usage, too. So for many centuries *physic* was equivalent to Āyurveda. Both included the study of philosophy and of the natural world. It's the guess of this writer that the modification of meaning probably occurred mostly in the 18<sup>th</sup>-19<sup>th</sup> centuries, well into the Renaissance period. The use of the term “positivism” was becoming prominent among scientists/philosophers. With this we can say that the science of life was studied in its more material/ physico-chemical aspects. Scientists of the period were more emphatic about studying theological and meta-physical issues separately and distinctly from the physico-chemical ones. (It's no coincidence that the root of the word doctor is *docere*—L. for to teach. A doctor, historically was supposed to teach the science of life to his patients. An Āyurvedic doctor is called a *vaidya*—one who knows—highlighting the fact that a broad base of knowledge has been mastered and that educating the patient is important prevention and cure.) Again in this regard a reflection upon our roots shows a more catholic view of knowledge was apparent among early thinkers and the tendencies for reductionistic thinking gradually emerged in the wake of the developments of the physical sciences. Here reductionistic means to be made simple(r). There is a certain irony in this trend as we are seeing a revival in India of Āyurveda and a dramatic new interest in it around the world. And remember, although this Survey reflects the more physico-chemical aspects of our science, Āyurveda is being represented emphatically as a holistic science—inclusive of mind, body, and spirit.

It is with this foreknowledge that the student should study this Survey. This is a vibrant, practical, and wise tradition of knowledge, techniques, practices, and more. We Āyurvedists do not affirm an exclusive position nor a superior one. Indeed, it seems that the concept of disease and therapeutics is still growing in scope and depth. Many modalities are emerging and they are showing benefits. We opine, however, that any investigation of life that omits an examination of Āyurveda is incomplete.

And on another theme, something must be said about another ancient controversy that affects students and practitioners alike: “Which is more important—knowledge or the medicine?” This writer had as one of his teachers, Vd. Vinayak Mhaskar, a president of an Āyurvedic college in India. While discussing matters of education he offered the following opinion: “The most radical strategy in medicine today is education.” Compare this statement with the words of Thomas Edison: “The doctor of the future will give no medicine but will interest his patients in the care of the human frame, in diet, and in the cause and prevention of disease.” Further, during a class meeting with Vd. Brihaspati Triguna, former president of the All India Congress of Āyurvedic Physicians, this writer asked him: “Which is more important—the drug or education.” He answered” The drug.” Immediately he changed his mind and said: “Knowledge.” Then he changed his answer again and said: “Both.” His response underscores the reality that sometimes one is more useful than the other. Caraka (Su. XXIV.42) says that a drug is mandatory in case of coma. But in more normal cases in order to gain the trust or faith of a client the practitioner may have to show that she has powerful medicine/knowledge. Following the remission of a symptom or disease the patient can be attentive to knowledge explaining the cause of his disease—diet and lifestyle, for example. On the other hand for some patients counseling about cause and effect will be empowering and permit the patient to take responsibility for his own improvement. For some, change comes at the hand of desperation and for others it comes from

inspiration. Thus we must conclude that both are important but the long term of health in the individual and in society rests with knowledge through education.

The tradition of training practitioners has always been rich in theory and experience. Depending upon where, when, and availability of formal educators, one or the other might have been emphasized. Content of the curriculum and the philosophy driving the variations are important. During the 17<sup>th</sup> – 19<sup>th</sup> centuries the Europeans bitterly contested rivaling philosophies in medical schools as represented by the German School and the French School. The Germans wanted their students to master theory, while the French wanted their students to master beside manner and trial and error experience—what really works. Both sides were paying homage to the greatest dictum in science today: Knowledge is organizing power.

Nobody studies for very long unless that study has the promise of some benefit. We are eminently practical in this regard. We don't go on endlessly cataloging events for the sake of cataloging them. We study them for their interrelationships—causal relations to be revealed. We want to better our lot or to avoid our pain associated with mistakes. For the science of life this means that one must study theory and learn to be a good observer, listener, and counselor. For that student who is reading this Survey with the goal to becoming a first rate chemo-therapist, he or she has, sadly, missed the point of the Survey—it's an overview intended to awaken one to the fact that this science is immense in scope and depth and emphatically more than about the secrets of Indian medicinal herbs and compounds. Recall that Suśruta opined that one can not master any science by the study of one science alone. Knowledge inevitably brings one to the conclusion that there is an awful lot to learn and the more one learns the more one knows that there is even more to know than one imagined at the start. This is the paradox of knowledge and learning—the more you learn the more you know that you don't know. But this is still of benefit for the wise person can take solace from her/his successes but remain humble with ignorance.

Why is it that the only data we can accept are those that we can experience with our senses or extensions thereof? Why is it that knowledge can not include mystical experience and intuition? There is an interesting quote that explains the Vedic position (Anirvan, p. 321): “The preservation of the (Vedic) texts for thousands of years through an oral tradition, which has continued even to the present day, is a wonderful feat of memory sustained by a spiritual fervour unparalleled in its tenacity. The whole thing has created an atmosphere of faith in which a supersensuous realism has been born, where a truth is rather felt by intuition than grasped by reason.” It is difficult for the empiricists to accept these kinds of data since they have no palpable causal validity—no cause and effect relation can be studied. One classical text—Caraka--says knowing is not complete until one enters the patient with inner vision. But one implication of this definition of science is that many presenting illnesses will not have correct diagnosis and treatment, unless intuition is brought to bear. A colleague, Ingrid Naiman, once wrote that “the unconditioned mind is not merely unfettered but assumed to be privy to universal insights and understanding rather than historic learning.”

Those who deny the existence of spirit and mind and of spiritual and mental diseases will never be able to diagnose or treat them properly. If the parameters of your model are limited then its use will be limited. For this reason we can say that Āyurveda, especially, is in a unique position among medical systems—it posits the existence of spirit and mind as causal entities and offers specific therapeutics for their pathological manifestations. The fundamental difference between our allopathic friends and ourselves is that we model cause and effect differently—differences in our views of the causal substances (i.e. 5 elements, time, direction, mind and soul) give rise to substantial differences in how the world works and therefore how we treat. We accept these notions on the basis of textual authority, traditions, oral tradition, and from testimony of our elders in the spiritual traditions.

Modern science has bowed to the gods of direct experience and inference. These are sensory based means of knowing. The area of analogy or comparison permits one to know more about things experienced or understood without more direct experience. Recall that Suśruta declared the study of many sciences an essential undertaking. This writer studies many fields of modern scholarship just to learn more about Āyurveda. How? You ask. By studying other sciences one learns of new distinctions and ways of viewing things that are useful for understanding our own methodology. One learns little about the nature of karma from the Āyurvedic literature yet a study of Jyotiṣa brings one to this subject front and center. In the chapter on Disease in this Survey there are many ways to think about this subject and each has some merit. So if everyone can accept direct experience, inference, and analogy why is the traditional authority invalid?

It seems to this writer that the field of science, of knowledge, should re-examine its roots and re-affirm the validity and importance of the 4 pramānas (means of knowing) of Āyurveda. The notion of “authority” should be cleansed and be re-elevated to its proper role. Just because the Roman Catholic Church got it wrong in the Dark Ages should not invalidate the value of its authority for all time or for this stature of others in other traditions. Authority elevates the notion of knowledge to the status of wisdom. Wisdom is the ultimate practical knowledge. Authority adds a stabilizing element to a tradition and for this we can be comforted, too. Those studying Āyurveda quickly come to these conclusions and easily affirm its importance, which makes it honorable among all traditions of knowledge, not just medicine.

For this writer it seems that the material presented above is under-represented in our science curriculae at many levels of learning. Listening to the public discourse on any topic leads one to the conclusion that most people are ignorant of modeling reality through non-real assumptions. It’s tough to be disciplined about our thinking—modeling is important but how we relate to models/theories is equally important. Further, models don’t deserve the appellation of a faith—as descriptors of reality. As for the subjective means of knowing – intuition --it’s easy to be dismissive of experiences we don’t understand but the time to model these experiences is nigh. As stated above we do not need to invoke faith in this matter, we only need to ask whether there is another way of looking at things that improves outcomes of clinical interventions then these should be invoked.

And finally, with regard to esoteric knowledge, Maharīṣhi Mahesh Yogi once declared: “The most important goal a doctor can have is to get to enlightenment as fast a possible.” This means mastery of knowledge as Self-knowledge. The aspiring doctor gets to accomplish “Heal Thyself” and be highly successful with the care of others. For those studying this Science of Life and this Survey we believe this is your most significant knowledge challenge—Know Thyself as God or the God in you. This is surely knowledge of what is and the most practical knowledge, indeed. Om śāntī, śāntī, śāntīḥ.

This Survey is dedicated to the authoritative tradition, a tradition of wisdom, and to all those who have served in this role for this writer. I’d like to give special mention to Dr. Vasant Lad for his guidance and wisdom he generously shared with me.

Michael Dick  
May, 2007