THE CHOWKHAMBHA SANSKRIT STUDIES
VOL. LXXXI

CONCEPT OF AGNI IN ĀYURVEDA
WITH SPECIAL REFERENCE TO
AGNIBALA PARĪKṢĀ

52259

BY
Vd. BHAGWAN DASH

THE CHOWKHAMBHA SANSKRIT SERIES OFFICE
VARANASI-1 (India)
1971
PREFACE

The thesis on the Concept of Agni in Āyurveda with Special Reference to Agnibala-pariksā was one of the nine I had to personally guide and direct when I was working as the Professor of Kāyakīrti at the Post Graduate Training Centre in Āyurveda, Jamnagar. This thesis was ranked first by the eminent adjudicators to whom it was referred. The present publication of it in the form of a book involving some minor changes is meant to provide carefully assessed and critically evaluated data gathered by Shri Bhagwan Dash for the benefit of teachers, Post-Graduate students and Research workers in the field of Āyurveda.

Recent researches in the history of the evolution of medicine in India have shown that by about the third millennium B.C., the medical knowledge had reached its apogee and crystallised into broad based generalizations, positive concepts and principles. There is evidence to show that these concepts and principles represented a high stage of development of medicine at that time. It is recognized today that Āyurveda itself was the outcome of changes of an evolving society. Accordingly, many practices were susceptible to modifications or changes in keeping with the needs of growing urban community. However, the savants of Āyurveda took care to enunciate some of the basic concepts and principles in such a manner as to enable their application at all times, regardless of the changes in the social, environmental and other conditions. It is thus seen that, both Agnivesa and Vāgbhaṭa laid emphasis on ten important factors that may have to be examined before arriving at a diagnosis and the determination of the line of treatment in any given disease, regardless of whether they have been described in the classical text or not. The ten factors referred to above are: prakṛti,
vikṛti, sōra, samūhanā, pramāṇa, sūtmya, sattva, āhāraśakti, vyāyāmaśakti and vayas—cf. Caraka: Vimāna 8: 94. (According to Vāgbhaṭa, these ten factors are dūṣya, deṣa, bala, kāla, anala, prakṛti, vayas, sattva, sūtmya and āhāra—cf. Aṣṭāṅgaḥṛdaya: Sūtra 12: 67–68). It is seen from the discussion recorded in the texts that these factors should invariably be examined both subjectively and objectively. It is, however, seen that the extant editions of the Sanhitā-granthas have neither described nor indicated the methods and techniques for carrying out critical investigations of these factors, except for stating, for example, that the status of the agni should be examined with reference to its power to digest and metabolise foods ingested (agnīm jaraṇaśaktyā pariṣkṛta) and the strength by ones ability to work, i.e. exercise (balaṃ vyāyāmaśaktyā pariṣkṛta). It is difficult to believe that the authors of the classical texts would have deliberately ignored the methods and techniques of the examination of these ten factors. The only inference that could be drawn is that either the methods and techniques were imparted by the teacher to the taught orally or, at some point, in the History of Medicine in India, writings on the methodology and technique were irretrievably lost. In the result, critical examination of the ten factors which included agni also became a matter of academic interest and hardly of any practical significance.

This is a grave shortcoming which has to be rectified sooner or later, better sooner than later, if the practice of Āyurveda is to be meaningful, fruitful and rational. It was with a view to remedying this short-coming that Shri Bhagwan Dash selected the Concept of Agni in Āyurveda with Special Reference to Agnibala-parikṣā for study. His intention in doing so was to bring together all the material relating to the concept of agni from different sources, critically evaluate them in the light of advances made by biochemistry in the related fields, and work out methods and techniques for determining the agni-śakti and bala which can be standardised and applied in practice. His approach has been refreshingly novel, bold and imaginative. In doing so, he built up his hypothesis
exclusively on the basis of references gathered from the classical Ayurvedic texts and commentaries on them. He has put his hypothesis to experimental tests, adopting some of the modern biochemical parameters. As a humble student of science, he has not dogmatized his findings but has shown a way and indicated an approach to the problem and suggested that the methods he has worked out may have to be standardised in a large number of cases. This is indeed a valuable contribution and my own share in this work was to guide and bless him in his endeavour which were carefully planned and executed.

I have only to add by the way of a compliment to Shri Bhagwan Dash that he was one of my most exacting students which I believe is one of the best qualifications one can think of a good student.

Dated 22nd May, 1970.  

C. Dwarkanath
INTRODUCTION

In the progressive days of Āyurveda, Physicians in this country were the foremost exponents and all round practitioners of their time, teaching and practicing all the eight branches of the Science of Medicine. There is a recorded history that students from all parts of the Globe came to have their under-graduate as well as post-graduate studies in the Medical Faculties of some of the famous Universities of ancient India, namely, Taxila and Nalanda. Due to various reasons State patronage was withdrawn from Āyurveda and transferred to those systems of medicine which were of choice of the then rulers of the country. This led to stagnation, obstructed progress, stunted growth and partial functioning from the affects of which Āyurveda is still suffering.

This period of decadence which can safely be said as the dark age for Āyurveda, has given birth to many misconceptions and often these are incorporated into the texts in various ways. Because of this confusion, one often overlooks the genuine concepts having scientific value and considers them as either wrong or commonsense and this deters him to find out the scientific validity of these statements.

There are many scientific concepts in Āyurveda which need detailed scrutiny to assess their utility in the field of science. The concept of agni is one such factor, a study on which is attempted here.

Agni is one of the ten factors which are required to be examined before initiating the treatment of a patient. The role of agni in the animal body is very much emphasised. It is stated that all internal diseases are caused by the vitiation of this agni. This is the pivot round which the remaining factors responsible for the maintenance of health and causation of diseases as well as decay revolve.

Human body is considered in ancient Indian scriptures as a replica of the universe; whatever is available in the universe
they are all represented in the human body, may be in a
modified form. The physical agni (fire) is directly linked
up with the biological agni inside the human body.

Sāmkhya, Nyāya-Vaiśeṣika and other systems of natural
philosophy deal with the fundamental principles of Āyurveda.
It is, impossible to explain or comprehend the biological
phenomena described in Āyurveda without having a good
background of the material objects enunciated in these ancient
philosophical works. In fact a rational explanation of various
aspects of agni can better be provided if its relation with
physical agni is elucidated. It is with this in view that in the
section-I, agni as conceived in the Sāmkhya system of philo-
sophy is explained. The Pariṇāma-vāda which is a logical
corolary of Sātkārā-vāda explaining the theory of evolu-
tion of the universe provides a rational explanation for the evolu-
tion of rūpadamnātra in which rajas is patent, tamaś is latent
and sattva is sub-latent. It has been shown in the first section
that the phenomena of rajas or agni represented in the forces
or motion, radiation, heat, electricity and magnetism are
implicit in the concept of and potential in the rajoguṇa of
Mūlaprakṛti.

In the section-II of this work the concept of agni as deve-
loped in Nyāya-Vaiśeṣika system of philosophy is explained.
There is striking similarity in the concept of physical agni as
expounded in this system of philosophy and biological agni
described in Caraka. Agni according to Nyāya-Vaiśeṣika is
divided into three categories, namely:

(i) Bhauma or the physical fire;
(ii) Divya or the celestial fire like the lightening, rays of
the Sun, Moon and the Stars;
(iii) Aduṛya or the abdominal fire which is responsible
for the digestion as well as metabolism and,
(iv) Ākaraja which is present in the metals such as gold
and silver.

Combination of agni with a material object results in
various types of transformations. In the Nyāya-vaiśeṣika, there
is a rational explanation about the various types of changes, the material objects undergo when they come into contact with agni or physical fire. This concept is very relevant inasmuch as it provides some lead about the transformation which the food ingredients undergo in the human body by the reaction of the digestive enzymes which represent the biological agni. It has been shown in this section that the matter and energy are separable only up to a certain level beyond which they are inter-changeable and inseparable from each other.

In Section-III the concept of agni as developed in Āyurveda is explained. The concept of agni is implicit in the concept of pitta described in Āyurveda. The roots from which the term pitta is derived connote three important aspects of this, namely, it produces heat, it helps in the burning of food and it controls the various psychic factors which facilitate the individual to achieve siddhis or spiritual perfection. The relation between pitta and agni is fully explained in this Section. The physical characteristics and chemical composition of pitta, and its mode of formation in the human body are explained with special reference to the data available in the modern biological sciences. The importance of grahaṇi as the site of pittadharākalā has been elaborated. The term grahaṇi is generally translated as duodenum, but from the functions, attributed to it in Āyurveda, it can be safely said that the part of the alimentary tract extending from the lower part of stomach to the end of the small intestine should be taken as grahaṇi. With a view to illustrate the function of this part of the body, the knowledge available in modern biology is incorporated in this work. Several other organs which help in the function of this grahaṇi and linked up by ducts and channels with the duodenum and small intestine, are also described along with their functions. Different states of agni are described in Āyurveda. They are manda or mild, tiksṇa or aggravated, viśama or irregular and sama or balanced. The signs and symptoms of these states of agni are described in Āyurveda and during modern times there are certain diseases or disease-syndromes which simulate these states of agni. The gastro-intestinal tract has been divided into different
physiological as well as anatomical components. To a person not acquainted with this concept, they may appear to be a contradiction. This point has been elucidated in this section. Kōṣṭha which represents the gastro-intestinal tract and its various appendages including the organs which are developed from the ectoderm during the process of embryonic development are fully explained.

The process of digestion of food described in āyurveda is based on a slightly different approach inasmuch as the physical state of food after different stages of digestion is taken into consideration and not the chemical transformations. A detailed description of madhura-bhāva, amla-bhāva and katu-bhāva, along with the various important factors which regulate these three stages of digestion are described. Changes which occur in the body because of its coming into contact with various types of digestive enzymes are explained. Apart from the explanation of the digestion in the gastro-intestinal tract, processes of bhūtāgni-pāka by which the heterogenous material which come in the form of food to human body becomes homogenous is explained.

Channels which carry the food after digestion have a very important role to play in the physiology of the human body, and the concept of srotas specially the role of the liver in the process of digestion has been fully explained. After the food ingredients are made homogenous, the process of synthesis of various types of tissue elements takes place, and for this type of synthesis, a unique concept is envisaged in āyurveda. The role of various types of enzymes which take part in the synthesis of various products and the process by which metabolic equilibrium is maintained are also explained. Different states of agni (digestive enzymes) directly influence the various events in the human body. A correlation of these two factors incorporating the known knowledge available in modern biology has been brought out.

The product of digestion has to be carried to the stable tissue elements through specific channels. Any obstruction in the channels produces disease and decay in the individual.
Efforts have been made to corroborate the concept of capillary system with that of dhātu-vaha-srotānāsi described in āyurveda. The role of agni in the maintenance of metabolic equilibrium and the production of āma or the uncooked material in the event of any derangement in this agni or metabolic enzymes have been explained. Several psychic events also regulate the production of these enzymes. Āmadoṣa is considered in āyurveda to be responsible for the production of all types of internal diseases. Even diseases caused by external agents are actually manifested only when there is production of āmadoṣa and subsequent vitiation of agni which is present in that locality. The role of krimis or germs in the manifestation of diseases has been fully recognized in āyurveda. It has also been described that some of these germs are helpful for the maintenance of human body. This concept appears to be mundane in its outlook. The role of germs in the production of diseases, specially with reference to āmadoṣa has been explained. Āma or uncooked material may be produced in the gastro-intestinal tract if the local enzymes are deranged. Similarly, āma can be produced at the level of the tissues if the enzymes responsible for the synthesis of a particular type of tissue element are deranged. The process by which different types of āma are formed both in the gastro-intestinal tract as well as at the level of tissue elements is explained in greater detail.

Agni, apart from the digestive function, is also responsible for the production of strength which has two aspects, namely, (1) strength to resist the occurrence of disease and decay in the human body and (2) strength to perform physical exercises. Bala or strength is in fact a direct product of the tissue metabolism which produces energy and heat. In Section-IV different methods and different factors from which the strength of agni of the individual body can be ascertained are explained and the data available in āyurvedic literature for ascertaining the state of agni in the individual's body from outside symptoms with special reference to the constitution of the individual, season, age and other physical signs and symptoms are des-
cribed. Stool or ṣakṛt, is one of the important products of digestion and metabolism. Apart from the refuse of the food ingredients, certain endogenous elements come out through the stool. Any change in the process of metabolism affects the endogenous fraction of the stool resulting in a change in its physical as well as chemical characteristics. An effort has been made to ascertain the state of agni inside the human body from various characteristic features of the stool. Some other symptoms which indicate the function of āmāsaya and pakvāsaya have been described. Other symptoms indicating the impairment of the functions of gastro-intestinal tract and dhātvagni are also described.

The material and method actually followed to ascertain the strength of agni, digestion and metabolism, and mūṁsabala (physical strength) are then described. Various criteria fixed in determining these factors and parameters decided for drawing of conclusions are also described.

Special emphasis is then laid upon the determination of the agni of different dhātus. Diseases produced by the derangement of agni of these dhātus are then explained specially with reference to those described in modern medicine.

In the discussion that follows, the data collected by experiments on volunteers and patients have been described and the criteria of demarcating an individual as of pravara-bala, madhya-bala and avara-bala are also described.

Because of the centuries of accretions, the theories and concepts we find at present in the works of ancient medicine, are interpreted to be commonsense and not scientific knowledge. It is perhaps necessary to examine the difference between the scientific knowledge, the knowledge of commonsense before the statements including theories and concepts of āyurveda could be put in one or the other category. Very generally described, commonsense is theaggregate of views commonly held by a group of people without seriously questioning their bonafide. In other words, commonsense knowledge is the knowledge of the first look, knowledge which is
self evident or obvious to any one who is possessed of normal intellectual powers. Science is designated as trained and organized commonsense. Here lies the subtle difference of profound importance. The essence of science lies in the critical technique which is lacking in commonsense. The scientific knowledge is much more rigorously controlled. It is more penetrating in its analysis, more far-reaching in its scope and more carefully guarded in its evaluations and interpretations.

Examined with the above parameters, concepts and theories of āyurveda are scientific except of course those which were interpolated into the texts by people who are not entitled to do so during the period of decadence of the science. It is perhaps necessary in this connection to quote the views of Capt. G. Srinivasa Murti expressed in his memorable monograph on "The Science and Art of Indian Medicine" (1923). According to him "The Indian systems 'of' medicine (italics mine) are undoubtedly scientific; their general principles and theories (both in subjects of preliminary scientific study like Physics, Physiology and the like, as also in the subjects of medical science proper, like Pathology, Medicine, and so on) are quite rational and scientific." What is, therefore, now required is to provide the missing links in this field. Concepts and theories are required to be verified with a view to ascertain that they are not the unscientific interpolations made during the period of decadence, and then through scientifically planned experiments, data should be collected to improve upon these scientific concepts and theories. Simultaneously there should be an attempt to demonstrate their applied aspects in the field of diagnosis and treatment of diseases. The present work is an attempt on this line.

Dated 30-7-70.

Bhagwan Dash
## CONTENTS

1. PREFACE ........................................ iii
2. INTRODUCTION ............................... vii

### SECTION I

3. AGNI AND THE SĀMKHYA SYSTEM ....... 3

### SECTION II

4. AGNI IN NYĀYA—VAIśEŚIKA ............... 9

### SECTION III

5. CONCEPT OF AGNI IN ĀYURVEDA ....... 23
6. AVASTHĀ PĀKA ................................. 55
7. JĀTHRĀGNI PĀKA (VIPĀKA) ............... 66
8. BHŪTĀGNI PĀKA ............................... 72
9. ANNAVAHA SROTĀMŚI ....................... 77
10. DHĀTVAGNI PĀKA ......................... 81
11. METABOLIC EQUILIBRIUM ............... 91
12. DIFFERENT STATES OF JĀTHRĀGNI ...... 91
13. INFLUENCE OF DIFFERENT STATES OF JĀTHA-
       RĀGNI UPON DHĀTUS ..................... 96
14. DHĀTUVAHA SROTĀMŚI .................... 97
15. ĀMADOŚA ..................................... 109
16. ĀMA FORMATION DUE TO DHĀTVAGNI
       MĀNDYA ................................... 117
17. ŠARĪRABALA .................................. 120

### SECTION IV

18. AGNIBALA PARĪKŚA ......................... 122
19. ŚAKRT OR STOOL IN RELATION TO AGNIBALA 129
20. AGNIBALAPARĪKŚA—PRACTICAL STUDY .... 143
21. PROCEDURE ADOPTED FOR THE EXAMINATION OF VYĀYĀMASAKTI AND ÜŚMOTPATTI 149
22. PROCEDURE ADOPTED FOR AGNIBALA PARĪKṢĀ 150
23. SIGNS AND SYMPTOMS RELATING TO THE STATES OF AGNI 154
24. DISCUSSION 171
25. CONCLUSION 175
26. APPENDIX 177
27. INDEX 193
CONCEPT OF AGNI IN ĀYURVEDA
WITH SPECIAL REFERENCE TO AGNIBALA PARĪKṢĀ
SECTION I
AGNI AND THE SĀMKHYA SYSTEM

Agni, in the Sāṃkhya view, is potentially present in the rajoguna of the mūlaprakṛti—the other two guṇas being, sattva and tamas. The triguṇas, in the Sāṃkhya view, are considered to be the ultimate reals (tattvas). An enquiry into the ultimate factors of creation, according to this system, was based on:

(a) Satkāryavāda—the doctrine of quantitative permanence and indestructibility of matter—corresponding to the law of conservation of energy (mass), which is basic to modern physical and chemical sciences;

(b) the doctrine of paripāma—the theory of evolution—a logical corollary of satkāryavāda;

(c) the doctrine of ‘Kāraṇa and kārya’—the law of causality;

(d) the doctrine of ‘Kūla and dīk’—the theory of time and space; among others, leading to the conclusion that the phenomenon of the universe one observes, is the outcome of the evolution of the primordial-matter-stuff or ‘mūlaprakṛti’ which is represented by three components of its pattern—spoken of as triguṇas viz., sattva², rajas³ and tamas.⁴ Sattva, rajas and tamas represent the essence or intelligence, the energy or motion and the inertia or mass respectively at the material and physical (including biological) planes and pleasure, pain and delusion respectively, at the psychological plane. According to the Sāṃkhya Kārikā, the guṇas are of the nature

1. The rajasīka component of prakṛti is also described as tañjasā-meaning, related to agni.

2. Sattva is signified by whatever is pure, fine and illuminating (Fundamental Principles of Ayurveda by Dr. C. Dwarakanath Part II, p. 36).

3. Rajas is signified by, whatever, is active and energetic (Ibid.).

4. Tamas is signified by whatever is passive and whatever offers resistance and restraint (Ibid.).
of pleasure, pain and delusion and, they are adopted to illuminate, activate and restrain. They mutually suppress, support, produce, concert and exist. ¹

The guṇas are stated to be in an equilibrated quiescent state, in the sāmyāvasthā of mūlaprakṛti. When possessed by puruṣa, a non-physical factor of consciousness and intelligence—the sāmya of the mūlaprakṛti is stated to be disturbed, and the trīguṇas collocate with one another, in an unequal distribution, within the mūlaprakṛti itself. They unite, separate and reunite. The things of the universe are evolved due to the peculiar property of trīguṇas, mentioned above viz., their capacity to combine, separate and recombine, in various modes of groupings. Even though, they react and interact with one another, they are, none-the-less, independent. The evolution of the definite from the indefinite and qualitatively determinate ² from the indeterminate takes place, due to this peculiar feature of trīguṇas and the diversity of effects, observed at the phenomenal level, which characterise the things—physical, material, biological and mental are also due to this peculiarity.

It has been stated that “In the evolution of mūlaprakṛti, sattva and tamas by themselves, are incapable of performing any work. The various functions attributed to them are, in this view, due to rajas (energy) only, which on the one hand overcomes resistance and supplies energy on the other. Even so, sattva, also, needs the help of rajas (energy) to enable conscious adaption.” ³ Thus, it would seem that, the energy present in the multiplicity of diverse things in the phenomenal ⁴ universe is entirely due to rajas; resistance and

1. प्रत्यप्राणितिविद्यार्थकाः प्रकाशप्रकृतिपनित्यायांः
अन्योन्याश्वास्वश्यांजनान्मिथुनकुच्चवधुः
गुणःः॥ (Karikā xii).
2. यें गुणः दृष्टेन श्वस्तांश्य द्वारतिमुक्तोऽविमिन्तः
व्यासाबह्यायां योगसूत्रः ॥ २ : १५।
3. अन्योन्याचिन्तम आङ्ग्कार्थायां सवकायोपजनो राजसाध्यां
सहकारीं भवति ।
(Lokeśvara; Ttvtatraya, Acit prakaraṇa).
4. Phenomenon stands for the term svakta and is the “form through which, it (the thing) becomes known to the senses or under-
stability to *tamas*; and every conscious manifestation to *sattva*. In any phenomenon, therefore, the particular pattern i.e., *guna*, which happens to preponderate over the rest (the remaining two *gunas*), become manifest and others are sublatent. The presence of the latter is to be deduced from their observed effects. This aspect has been very ably summed up by Seal as: “In any material system at rest, mass is patent, energy is latent and conscious manifestation is sub-latent.” In the case of an active dynamic system, on the other hand, *rajas* (energy) is a dominant feature and the resistance to *tamas* (mass or inertia) is overcome. The transformation of *rajas* or energy is stated to proceed, hand in glove, with the preponderance of *sattva* and, in such cases, volitional consciousness accompanies the movement of *rajas* (energy) in phenomena, where, the former is predominant. In this instance, resistance to *tamas* (mass or inertia) is deduced to be overcome.

Keeping the foregoing principles in view, it may not be difficult to follow the *Sāṃkhya* theory of evolution of the macrocosm and microcosm—the evolutionary steps of moving in consecutive phases, until the state of *Tamasika ahamkāra*, known also as *bhūtādi* from which *kāraṇākāsa* has been reacted. It is at this point, metaphysics merges into physics. *Kāraṇākāsa* corresponds to quiescent energy in the continuum, which constitutes the “sole physical constituent of

standing.” It is the opposite of noumenon which means “the unknown, and unknowable substance or thing in itself.” (Fundamental Principles of Ayurveda by Dr. C. Dwarakanath : Part I. p. 5).

1. अन्योन्नान्त श्रेष्ठ भाषितं उपाधिदेवि द्रव्येऽप्रकाशे गुणारुप: सत्त्वेऽव, कियवानुि रजसुपुि, रिघिदुरुषमतसमस्तव । (Yogavrātika on Vyāsabhāṣya on Yogasūtra 2:18)
3. प्राणादेवादन्त गुणवेदि व श्वारामयभेण प्राणादन्तानि श्वारामयभेण प्राणादन्तानि निरतिरतिरत
4. By macro-cosm is meant the physical universe or human society as opposed to micro-cosm, the human individual.
5. The term micro-cosm means small universe used figuratively of the human being; also sometimes of the world revolved by the microscope. (A Dictionary of Psychology by James Drever).
the universe,” spoken of variously by modern-physics, as the “field-property,” “electro-magnetic-field,” “undulatory ether” and so forth. From out of Kāraṇākāśa, is stated to evolve the kāryākāśa, the former having been activated or disturbed by rajas or energy—an idea reminiscent of some of the current physical doctrines, viz., the existence of energy in the continuum in two states—quiescent and active, which passes from one state into another. The activation by rajas of the kāraṇākāśa, leading to the evolution of kāryākāśa has a parallel in the modern view, which accounts for the activation of the quiescent energy—Plank’s constant ‘h’—being suggested as the measure of least impact, that changes quiescent energy. Vijñānabhikṣu has already stated in Yogavārtika that ākāśa has two aspects—the original and the derivative. The former, in his view, is a continuum (Vibhu) non-atomic and that it represents the all-pervasive vehicle or substrate of the ubiquitous energy i.e., rajas or tejas. The latter is atomic.

At this point, matter is stated not to admit of either addition or substruction, neither can it be created nor destroyed. The evolution of tannātrās, is stated to follow, soon after—kāraṇākāśa, represented by uncharged particles of bhūtādi, being charged by varying quanta of rajas or energy. Thus, śāda, sparśa, rūpa, rasa and gandha tannātrās, represent varying quanta of mass and energy. These again collocate in various proportions and modes to form the five mahābhūtas. ¹

¹. "विद्विशेषः तथा शर्यनिस्मिन्य स्वर्णिस्मिन्य, उपत्तिनिमिन्य, रसतनिमिन्य, गन्धनिमिन्य च द्वितैौतिरं चतुर्भुजायिश्च. शुच्यः प्रभुविशेषः: "... " (Vyāsa-bhāṣya on Yogasūtra 2:19) भूतकाराय शर्यनिस्मिन्यं, तत्तथांहेतुतात् शर्यनिस्मिन्यं शर्यनिस्मिन्यं शर्यनिस्मिन्यं। एवम् क्लेस्यो एकौक्यं स्वर्णिस्मिन् तन्त्रं विशेषः। (Pravacanabhāṣya on Sāṃkhyaśūtra 1:62). तथा गन्धनिमिन्यं वर्जितवा चतुर्भुजायिश्च न्येत्यातीतीयानां एकः परिणामः बह्सपरमाणं, तत्तथा च महावकारिद। एवम् च गन्धपरस्य शर्यमिन्य शर्यनिस्मिन्यम्। बिन्नमिन्यम् तत्तथा एवं च महातुष्टिकादिद, एवं गन्धपरस्य शर्यमिन्य शर्यनिस्मिन्य शर्यनिस्मिन्य शर्यनिस्मिन्य शर्यनिस्मिन्य शर्यनिस्मिन्य। (Yoga-vārtika: on Yogasūtra 4:14) अभावं क्रमे-भूताद्व शर्यनिस्मिन्यं जायते, शर्यनिस्मिन्यं भूतादिराज्येष्ठिः, तत्तथां आकारं जायते, तत्त अर्थम्.
It will be seen from the foregoing that, in dealing with rajas (energy) at different levels of the evolution of prakṛti, we are in fact, dealing with the problems of entropy.  

An important point to note here is the fact that, at the level of rūpa tanmātra, rajas is patent, tamas is latent and sattva is sublatent. The main property attributed to this tanmātra is radiation and heat—its other properties being vibration (parispandana) and motion (vega). Since tanmātras are also stated to evolve in a consecutive series of five steps, the first step—

शब्दतन्मात्राः स्पष्टतमात्रां जाते स्पष्टतमात्रां श्वस्तत्मात्रात्मापूणयोतयी, एवं शब्दतन्मात्रास्वरूप आकाशस्वरूपताः स्पष्टतमात्रात वाक्यावयवंते, ततः अर्थात् स्पष्टतमात्रात् रूपतमात्रां जातेत्, रूपतमात्रां स्पष्टतमात्रात्मापूणयोतयी, एवं स्पष्टतमात्रास्वरूप आकाशस्वरूपताः रूपतमात्रात्ते जातेत् and so on; अर्थ-कः तत्वविविधिः कृत्यादृश्यतः। वर्तमानिनि तत्तत्वविश्वाः, (अचित्त प्रकृतः)।


1. The concept of entropy can be briefly summed up as follows: Natural events tend to change from improbable (aviseṣa) situations to more probable (viṣaṇa) ones. The degree of improbability is ultimately determined by the amount of energy (rajas) required to maintain a given situation. Zero energy expenditure is equivalent to least improbability i.e., maximum probability or certainty. This concept can be illustrated as follows: The total environment, physical, chemical or biological, display a tendency towards balanced stability. For example when a glass of water is shaken, the fluid surface oscillates up and down; by oscillating, the system accommodates to the initial disturbance until the force of the latter is spent, and a stable condition is again attained. Events on earth can be compared to the seesawing of water. This initial disturbance was the cause of the formation of the solar system. Ever since environmental oscillation occurred—as they will occur in future also—tending to establish a stable balance, but such a balance cannot be attained as long as the sun shines and the earth spins; every imbalance creates a subsequent imbalance which tends to counteract the first. This, in essence, is the response principle, which moves the whole environment including the living system.
being represented by śabda-tanmātra, the second by sparśa-tanmātra, the third by rūpa-tanmātra, the fourth by rasa-tanmātra and the fifth by gandha-tanmātra; the relative status of rajas and tamas is gradually found to change, that, in the case of rasa and gandha tanmātras, tamas becomes patent, rajas latent and sattva sub-latent. In other words, up till the rūpatanmātra energy is manifest, and beyond this level, mass and inertia become more preponderant. However, rajas or energy is implicit in all tanmātras, as indeed in all the sthūlabhūtas, which latter represent tanmātric systems.

Thus, the phenomena of tejas or agni—understood at the phenomenal level, in many forms viz., the forces of motion, radiation, heat, electricity and magnetism (including forces of cohesion and friction) is implicit in the concept of and potential in rajoguna of mūlaprakṛti. The origin of agni—both the physical and biological is, therefore, to be traced to rajoguna of mūlaprakṛti. By implication, all the active and productive aspects of parināma or evolution, at the macro- and micro-cosmic levels are due to rajas (energy).
SECTION II
AGNI IN NYĀYA-VAIŚEṢIKA

According to Nyāya-vaiśeṣikas, tejas, in which agni is implicit, is one of the navadrayas and, it is represented by tejas paramānu. One of the properties ascribed to tejas paramānu, by Nyāya-vaiśeṣikas, is heat. Caraka has included tejas among the group of fundamental substances. Both Nyāya-vaiśeṣikas and Caraka have treated tejas, just like prthvi, ap, vāyu and manas, as ānu.

The Nyāya-vaiśeṣika school of natural science, representing the ‘doctrine of commencement or aṇambhavāda has postulated the view that, the order of creation must primarily be in the nature of creation, first, of the atoms or ānus of vāyu, tejas, ap, prthvi and manas and, the things of the universe arise out of two or more atoms of these elemental substances being put together. This school of scientific thought has subscribed to the doctrine of a manifold of ultimate “reals or tattvas,” whose atoms combine variously, to form the things of the universe.

The aṇambhavādins, like the earlier physical chemists of modern times, described ānus as follows: by dividing and subdividing things, a stage is reached, when, further division of matter is no longer possible. The matter, at this stage, is the ānu. According to Kaṇḍāda the union or combination of

1. तत्र द्रव्याणि पृथिव्यपूर्णोद्वायकाकाळिभिगतममनोनिष्ठि नववेषः (Tarkasamgraha).
2. उष्णपरवलेषः (Ibid.).
3. खादीन्यास्मा मनः कालिभिगत द्रव्यसंगमः (Caraka: Sūtra 1:48).
4. Robert Boyle (1627-1691) postulated the principle of the ‘elements’ or ‘first principles,’ of which matter was composed. He reviewed the atomic-hypothesis, held by Democritus and Lucretius—the Greek Philosophers—and defined the term ‘element’ as a substance, which may not be further analysed into simpler substances. However, the difference between the Gautama cum Kaṇḍāda school of thought and that of Boyle’s relates
the elementary particles of \textit{paramāṇus}, leads to the production of diverse forms of things. The \textit{paramāṇus} combine, in twos (\textit{dvyanukas}) and threes (\textit{tryanukas}) and so forth, to yield myriad of new things, arising out of the various modes of their combinations and permutations.

Udayana, in his \textit{Lakṣaṇāvalī} has defined \textit{tejas} as that which is the substratum of colour and which shares a common substratum with the absolute absence of taste.\textsuperscript{2} \textit{Kanūda-rahasya} has stated that “Tejas is that which has a common substratum with colour but not with weight. This represents the special feature of \textit{tejas}.”\textsuperscript{3} According to \textit{Vyomavati}, quoted by Umesha Misra, the qualities of \textit{tejas} can be summed up as follows—\textit{rūpa} (Colour), \textit{sparśa} (touch), \textit{saṅkhya} (number), \textit{parimāṇa} (dimension), \textit{prthaktva} (separateness), \textit{saṁyoga} (conjunction), \textit{vibhāga} (disjunction), \textit{paratvāparatva} (priority and posteriority), \textit{dravatva} (fluidity), \textit{vega} (velocity)—colour and touch being the only distinct qualities of this element. Its colour is illuminating (\textit{bhāsvara}) and, touch is hot (\textit{ūṣma}).\textsuperscript{4} According to \textit{Prāśastapāda}, the natural movement of \textit{tejas} is upward.\textsuperscript{5}

Its colour and touch do not undergo any chemical change, to the number of elements, which, in the former case, comprises of five kinds of atoms—\textit{prthōi}, \textit{āp}, \textit{tejas}, \textit{nīya} and \textit{manas}; whereas, according to latter as further modified by Dalton, envisaged over ninetytwo different elements. According to both the views, an element or \textit{āp}, is a distinct species of matter, which has not yet been shown to be composed of two or more different kinds of matter (each atom is now, again, divisible into many parts viz. proton, electron and neutron etc.)

1. तत्त: परम्परणुद्वयसंयोगी सति व्युक्तस्यवते। विभिन्निभिरवेक्षणुक्तम्। \(\text{Dīpikā on Tarkasamgraha}\).


hence, they are nitya or eternal in the paramāṇus and anitya or non-eternal in kārya or products. ¹

According to Udayana, the solar-heat is the source of all the store of heat required for chemical change in the world. Citing the example of the colour of grass, he has stated that it (the colour) is due to tejas in the form of invisible heat, not in the form of agni and, that the cold, in winter, cannot take away the store of heat, derived from the sun. ²

Annaṁbhaṭṭa in his Nyāyabodhīṇī on Tarkasaṅgraha, has stated, “An unripened fruit ripens, under the influence of solar-heat. Ripening of an unripened mango results in the change of colour, taste and smell etc.” This is referable, in his opinion, to the subtle decomposition and recombination (sāmyoga and vibhāga) that goes on in it. Likewise, is the cause of the rusting of metals in combustion, due to sūrya-pāka or solar heat. The conversion of food into rasa, and rasa into rakta are again examples of action due to jātharāṇāla or audaryatejas. The nature of contact with tejas paramāṇu or the kind of pāka (chemical action which brings about a change, in respect of colour), in his view is different from that which transforms flavour—vilakṣaṇa-tejah-sāmyoga and pāka. This applies equally to change in tactile quality. ³ The same authority has stated that, the substance tejas possesses the

1. नित्यं परमाणुपप्तं अनित्यं कार्यपप्तम् (Tarkasaṅgraha).
2. तुणादिविकारो हि यदि रुपादिराजितिमार्गेतुः स नूनमभवष्येयं तेजसा कर्तित्यं। तादेशं च पापे अनित्यं ब्रह्मितत। न किंचिदनिमंथमते। न हि सौरस्य तेजस्। बृहदर्विख्ययपठितोः। हिमाद्वागम्। क्षमते। अथ विकारो मरसा दिरूपो विविधतिः। सोदितं यथा हिमाद्वितेयं। तुणादिरूपाकतुर्वते। कल्याणं वा हि। अथ रुपादिराजितिमार्गेतृं। अधि। साधृयते। तदः कर्तित्यं। तथा दश्यस्वेतीषुनिणीयस्य। भोजस्यस्याविविधित्रविद्वतवाच्। अतां। रुपादिराजितिमार्गेतृं। जितुण्यस्य। निश्चित्तस्य सवितर्क्यविनियोगस्य। (Udayana: Kiranāvallī सुक्तसंहारविनियोगस्य)
3. पापो नामै। कालाभास्यवैविध्योऽभवं। स पच्चाचातिवधिः। विज्ञातिविज्ञातिविभविधि संकेतसांध्रतेषुप्रवर्तित। रसाननकोशविचारामेव। एवं स्पशादिरूपं अपि तथा। एवं प्रकारणियं भिन्नविभविधितयः। पापः कार्यविभाग्येन कल्पनायत। तथा हि रुपादिराजितिमार्गेतुः। अण्डक्षणविचारविवेचितः। वृस्तिरूपस्य अर्थस्यावृतिः। अव्यास्यतपसुविचाररूपस्य। सत्वे अथ। रसप्राप्तिविवेचितः। विज्ञातिविवेचितः। संयोगपाकविभवत। पुवेषान्नाः।
property of heat and could be cognised by tactile perception. It may occur in two forms—(a) nitya or eternal (indestructible), (b) anitya or transient. The former is in the nature of paramāṇu (atomic or corpuscular); on the other hand, the latter is to be understood as kārya or effect. Anitya or the transient type occurs in three forms viz., (i) tejas-śarira or the physical form of tejas which is well-known in sūryaloka (solar system); (ii) indriya-tejas is the sensory form of tejas. It is to be seen, at a point, within the black of the eye (pupil). It makes visual perception possible and, (iii) viṣaya-tejas or the tejas which occurs in the objects of the senses. This variety is of four kinds:

1. bhauma tejas or agni of the earth, such as fire etc.  
2. divya tejas or the tejas of the sky such as lightening, rays of the sun, moon and stars.  
3. audaryā tejas

रसनाश्च मधुरस्त्रयानुभवत। तस्मातप्रजनकोपेक्षया रसजनको विभवणे पवार्तकाये॥ रुपसाययोपरातृतो भो पूर्वेण नाश्च विजातीयवातक्षत्वाद सुरभिमलस्यवक्षये। देव श्रावणकोपेक्षे पाकवात्तक्षत मुद्रप्रयेत्यत्त्वम्। अतएव पार्थिवपरमाणुज्ञानेन जातीयवातः पाकमहिना विजातीयव्यावहर्तमुन्नाभः। वषो गोरुक्षुरुपादीनां आपराद्वन्ते महे तुरुगमकपरमाणुषु विजातीयवेजः संवेयोगवात्तक्षत्मुद्क्षत्वाय तदनेतरं दुष्कोष्ठिवादिकाने कर्तवे तात्त्वरसस्त्रग्रन्थनकार्येः संवेयः आज्ञाते तदुच्छति तात्रस्त्रपदयः कर्तवते। तात्त्वरसस्त्रपदिविशिष्यत्वम्मानुभिः दुष्कोष्ठिवादिकाने।

तत: व्युक्तिकालिफङम महद्युक्तारस्त्वम शतिः॥ (Nyāyabodhini on Annambhata's Tarkasāṅgraha).

1. Light, according to modern view, has got two forms viz., particle or corpuscular and wave. Whenever it hits, whenever it enters our eyes, burns our skin or takes a photograph, then light is said to behave as particles. It is, in the act of getting to us and in particular, the quantity of it that gets to us is stated to behave as waves. Apparently, therefore, the particle or corpuscle represents the nitya type of tejas. Its wave form occurs as kārya or the effect, when it performs karma or motion i.e., when it is active. It is in this aspect of tejas, that the anitya or transient form may have to be understood.

2. This form of tejas has been described as uleaka piṭṭa in āyurveda, corresponding to the visual purple of retina described by modern physiology.

3. Bhauma tejas: Oxygen, which is responsible for oxidation, is a form of bhauma tejas; so also is the case with phosphorescence of the glow-worm.

4. Eelectro-magnetic phenomenon and the stellar emanations.
or the *tejas* that occurs in the gastro-intestinal secretions, which, latter, are held to be responsible for the execution of the digestion of food and drink \(^1\) and (4) *ūkaraja tejas* or the *tejas* present in metals (minerals?) dug from mines, such as gold, silver etc. \(^2\)

Implicit in the foregoing citation is the idea, that heat and light represent the obverse and reverse of the same coin viz., *tejas*.

According to Udayana, heat and light rays are stated to consist of extremely small particles, which dart-forth or radiate rectilinearly in all directions, at an inconceivable speed. \(^3\) The way in which *tejas* in its two aspects viz., heat and light works, has been described by the same authority. According to him heat may either penetrate through the inter-molecular-spaces, as in the case of conduction of heat, which when applied under the pot, boils the water or fries the paddy, without involving the pot in any chemical reaction i.e., causing no decomposition or recomposition of its molecules; no change of its molecular collocations, is stated to take place. As regards the phenomenon of translucency or transparency (*svacchatā*), light rays, in his view, penetrate through the inter-atomic-spaces, with vibration (*parispanda*) of the nature of deflection or reflection (*tiryaṇgamana*), very much as when fluids penetrate through porous bodies (*तत्र परिस्परस्यः तीर्यगमनं*,

---

2. This corresponds to *pāsaka pitta* or *jāṭhāraṇī, dhāteṇa* and *bhurāṇis* of *Āyurveda*, which in its turn parallels the enzymes of the gastro-intestinal tract and the other metabolic agents.

3. Ions, radio-active metals and minerals. *उष्णस्वच्छब्जः* | तर्दयः-विध्वम | निस्मातिःस्तैः | निस्मायिः परमाणुक्रमः, अस्त्रियः कार्यक्रमः | पुनर्वित्व शरीरान्तीविशिष्यकथा | शरीरामाधित्योक्तः, इत्यादि रूपाकं चष्ठा | तथा कृत्ताताप्तप्रतिः | विषयः: ज्ञातविचः—मौपत्वीयवाच्यकथां भवति | मौमं वान्यविद, विस्मादिविनाविदुतातिः, अतः परिवाहितीवाच्यम्, आकर्षः यत्वादिः | (Tarkasāṅgāra—Tejoniṟuṇaṇa).

4. *चत्रिष्यो हि तेजसो लाभविषयवेषवेषवेष| वेषवेषवेषवेषवेषवेषवेषवेष| एव भगवति मन्युमालामिनि मन्यन्तदयु भालोक इत्यभिमानं धीकिकायाद। (Udayana: Kirāṇiṟvali—Tejoniṟuṇaṇam).
CONCEPT OF AGNI IN ĀYURVEDA

परिचयः पात इति । or in the alternative, they may impinge on paramāṇus and rebound back (मूर्त्तिः किरणविभड़ति). They may, also, be obstructed by anus in their pathway, leading to degrees of shadows or opacity. All these phenomena are, also stated to be physical and not due to decomposition (vibhāga) and recomposition (sahyoga) or the alteration in the molecular grouping.

Light, in this view, may also hit the paramāṇus, in a peculiar way, so as to break up their grouping, transform the physico-chemical characters of the anus and, again, recombine them due to its chemical impact, at an inconceivable velocity. 3 & 4

1. Udyotakara on Vatsyayanaabhāṣya on Nyāyasūtra 3 : 1 : 47.
3. वर्त्तेश्वरे विपिनपरि तेनः प्रसर्पण प्राप्तादेहर्व व्याप्तिः। तत्र कथा हेतो ? पृष्ठवाकाण्डः। स्वभावः प्रसर्पण न स्वपरिमाणानुविशिष्टिः प्रत्ययमात्रे, चित्तु विचित्रनादनुविशिष्टिः। स्फटिकान्तरितोऽरैष्ठुरिः प्रसारस्वभाववा स्फटिकादिनां तेज्योगतेनत्तत्वस्वायत्तवा प्रदर्शनभवाद्विपम्पा। Udayana तेजप्रभुवदृष्टिः in reply to the objection यदिः वि प्राणगृहीताः प्रतिक्रियातिना स्फटिकात्मकेन विभूषणात् प्रसर्पणादिकम् नावदीत, तस्माद-प्राणपकारिः, ततो न तेजसम् Udayana : Ibid : Definition of Svaccāṭa, इद्यातसम्युतप्रत्येकाव्यः स्वच्छात। इद्यातप्रतिच्छेदः काशात्राप्रत्येक-स्फटिकान्तरितेशः तेजसात्नैव। स्वार्थविदु च पारस्य तेजदृष्टिप्रचारात्। Udyotakara 3 : 1 : 38. आदिद्वस्यैः स्फटिकान्तरितेशिवत हारोदिच्यवातात् Sūtra 47, where Udyotakara notes : कौशिकाधिपत्यं? वस्य इद्यातसम्युतप्रत्येकाव्यः न उत्साहते तस्य अतन्तववृत्तैः अत्युहमास्य योजितसम्बन्धः सोभिनियात् हैति। Vācaspatī explains वस्य इद्यात स्फोटनकालादेः अववा: पूर्वविवेकयुतवासर्वपरमकत्वविभिन्नाशे स्फोटनिर्यातनकल्पितोत्सववा युढ्यहुः तत्त्र कियते वस्य इद्यात स्फोटनकालादेः इद्यातसम्युतप्रत्येकाव्यः योजित-सम्बन्धः वहे: सोभिनियात्। अनंतः प्रक्षेपः कुशानोत्सववा वैद्यविभाज्यात्। तेन वेच्छितवाय विभिन्नं नोदादिनन्यायमेता अववयेव मिलता, कियती विभयात्, विवाहादमार्मकत्वविभिन्नः etc. Jayanta Bhaṭṭa in Nyāya Maṇjarī. पूर्णादिनदशोः For opacity, shadows, etc. vide छाया हु तेजसम्युतप्रत्येकाव्यात युढ्यमानाः अतन्तववृत्तैः तेजः। वे ने अववयेव तत्र छायति। विरलः तेजः स्फोटनेन इद्यातसम्युतप्रत्येकाव्य्यात छाया। इद्यातसम्युतप्रत्येकाव्य्यात। सर्ववै ह्यावतेत्त स्फोटनेन ते तात्त्वमस्य कालिः (Udyotakara, 4 : 2 : 25).

4. This description has a parallel in the Chemical action brought about by ultraviolet and X, rays.
The foregoing are among the few important references to *tejas* (agni) in the Nyāya-vaiśeṣika system of natural philosophy. There are many more such references but the few cited here would suffice to invite attention to the fact that, these two ancient schools of scientific thought have offered a fully developed theory, relating to light and heat. What is perhaps important in the context of this thesis is the application of these theories in practice, to explain a variety of phenomena which border on thermo-dynamics.

The theories of Nyāya and Vaiśeṣika relating to *pāka* (chemical action) are based on their concept of *tejas*, *kāla* and *dik*. These theories are germane to this paper.

*Nyāya-vaiśeṣika concept of *pāka* (chemical-action):*—Pāka-kriyā, as described by Nyāya-vaiśeṣika system may sound to be quaint when studied on the background of modern concept of chemical action. None-the-less, they appear to be basically sound, in principle, even when examined from modern points of view. In the view of this system, when an object is brought in contact with *tejas*, motion or *karma* is stated to be produced in the ultimate constituents (*aṇus*) of that object, due to abhīghāta¹ (forcible contact) or *nodana*² (impulsion) of *tejas*. (The Nyāya-vaiśeṣikas reject force operation i.e., *śakti* except as modes of motion—*karma*). This motion, in its turn, is held to produce *vibhāga* (disjunction), which results in this destruction of the *samīyoga* (con-
juction) that existed between the various constituents of the substrate resulting, finally, in their breakdown into their ultimate particles (paramāṇus). When thus, loosened their attachments, paramāṇus, in contact with another group of tejas, results in the destruction of their original gunas or qualities. Subsequently, again, similar fresh contact with tejas is stated to take place, which results in the production of fresh gunas in the place of old ones. These latter gunas are known as pākaja (due to the influence of chemical action).

It would, in other words, appear that a single contact with tejas, which destroys the previous gunas or qualities of the substrate, may not produce fresh gunas or qualities in the place of old ones. By implication, the destruction of the old gunas and the emergence of new ones, depend upon several contacts, at distinctive periods of time, between the substrate and tejas. This interesting description of pāka or chemical action, has been described under two headings, viz., pilu and pithara pākas.

Pilupākas

The term pilu refers to paramāṇu (atom) and the term pāka to the transformation or change brought about in the relationship between pilus, under the influence of tejas (light and heat). According to Vaiśeṣikas Pilus, (paramāṇus) combine, separate and recombine, under the influence of tejas—heat and light. In this view, the difference observed between one substance and another or generally speaking, between all substances, as regards their colour, consistency (roughness and smoothness etc.) is due to pākabheda (difference in chemical actions). According to Vācaspati Miśra, it is agni and agni alone that can cause transformation in respect of colour, tastes, smell or physical characteristic of paramāṇus. This depends, in his view, on (a) the nature of the constituent substance in contact, (b) intensity or degree of agni, described in terms of khara, mṛdu and madhya, and the species of tejas

1. Endothermic and exothermic reactions.
anu that impinge on anus or atoms and the nature of the impact (vilaṃśa-tejas-sanīyoga).

Stated in brief, the Vaiśeṣika school holds that "decomposition of pitharas into pilus, which compose them; the transformation of the qualities of paramāṇus, and finally their recombination, all take place under the influence of tejas." Various are the examples given to illustrate the pākas substances undergo under the influence of agni. The ripening of an unripe mango under the influence of solar heat resulting in the transformation or change in the colour, taste, smell etc., of the latter is one such example.

These changes are considered to be brought about by subtle (sūkṣma) chemical action resulting in the decomposition and recombination of molecules (pitharas) under the influence of heat supplied from outside (vijātiya 3 or vilakṣaṇa-tejah-sanīyoga). Implicit in this example, is the idea of the presence in the molecules of the mango of sajātiya tejas which when activated by vijātiya tejas leads to radical changes in the physical and chemical characteristics of the fruit. This example has special reference to pākas to which organic substances are subjected and it has relevance to the study of pākādi karma to which ahāra dravyas are also subjected, likewise, in the living body. 4

1. न मूर्भोमिश्यं सङ्गोऽस्मि एकादशम् स्पवदयं ध्व, अर्थे दु वृहद्वात्रि विशेषप्रेषा. यदृ त्रूत्य पवयते अवलिस्योगेन तत्तथे दु वृहद्वादसंगावं तत््म स्वास्ती विशेषत- मेलेकमाणं अवलिस्योगं: तत्त्वर्ता निस्यो: विशेषत्तामरम्। Quoted by B. N. Seal in the Positive Sciences of Ancient Hindus, p. 105.

2. अस्माकस्ममेऽ अर्थे उपादास्त्य पिठत्य औष्ठवारस्यस्य न बहु: संयोगस्य पूर्वधारिप्रतिबंधसानां कारणां नेवारा भिन्नावतीयाः जायन्ते सन्योगस्यायां: वशिस्त्वविनिस्माणं। (Ibid).

3. The Vijātiya-tejah-sanīyoga referred to here is reminiscent of the optimum temperature required for enzyme action and oxygen. The obvious fact is that, the heat mentioned is atmospheric in nature. This represents energy, the origin of which is the Sun.

4. Umeśa Miśra has quoted Vyomāvatī, a commentary on Padārthadharmaśaṅgara, also known as Praśastapūda bhāṣya (Vizianagaram Sanskrit Edition), as stating that these pākas include.

2 A.
The example of pākas which take place during the baking of a clay pot in a kiln usually cited by Nyāyavaiśeṣikas are of interest and will be instructive. In the process of the baking of a raw clay-pot by a potter under the condition of temperature that obtains in the potter’s kiln, quick succession of changes are considered to take place in the material of the pot in respect of its colour, density and consistency etc., similar to changes that take place during the process of cooking of food. The vaiśeṣikas interpret and explain the successive phases of transformation and changes, as due to the decomposition of the constituent molecules of the material pot into their component anus (atoms) and the subsequent recomposition of the latter under altered spatial relationship—different from their original configuration—in the material of the raw-clay-pot which was subjected to the action of āgni. The entire process of change in the molecular and atomic configuration is stated to occur in these consecutive steps viz.,

(i) the decomposition of the material of the pot into its molecules, in the first stage;

(ii) the decomposition of the molecules into their constituent anus, in the second stage;

(iii) the recombination of the anus, in new relationship and altered spatial alignment, into molecules of two anus (dvyaṇukas), three anus (tryaṇukas) and so forth.

Thus, the spatial relationship that originally existed between one anus and another, in the material of the unbaked clay-pot is now seen to be completely changed resulting in the even human body, but generally, "no example is taken from these cases, for the simple reason that if anyone comes to know of the chemical action, taking place in him, he may be disgusted with his own body and his interest may cease towards it."

(Author’s comment: This peculiar attitude was perhaps the cause-belle for the neglect and avoidance of any mention of the details of pākādi karmas, referred to in the latter Ayurvedic commentaries such as those by Cakrapāṇi Datta, Ďalhaṇa, Aruṇa Datta, Hemādri and so forth.)
exhibition, by the finished pot of new properties as regards its colour, density, consistency etc.

The transformation or changes referred to, in the foregoing paragraphs, are stated to occur in nine kṣanas—each kṣaṇa being equal to 2/45th of a second. ¹ The quaint way in which Vaiśeṣikas have described these nine steps, corresponding to nine kṣanas, mentioned above, are as follows—“It takes nine kṣanas or moments for the completion of the consummation of the change from the unbaked to baked state of the clay-pot. In the first moment (kṣaṇa) the dvayaṇukas are destroyed. In the second kṣaṇa, the original black colour of the unbaked clay-pot is destroyed. In the third kṣaṇa, a different colour—red—is generated under the influence of heat and light. In the fourth kṣaṇa, the paramāṇus combine to form the new substance. In the fifth kṣaṇa, the paramāṇus separate themselves from their old position i.e. from their former place. In the sixth kṣaṇa, they separate themselves again. In the seventh kṣaṇa they combine with other paramāṇus. In the eighth kṣaṇa, they again align themselves as molecules of two paramāṇus i.e. dvayaṇukas. In the ninth kṣaṇa, the specific or characteristic properties of the paramāṇus such as colour, touch etc., manifest in the constituent dvayaṇukas of the material of the new (now) fully baked pot. ² Thus, in nine moments or kṣanas, the soft, dark, unbaked clay pot is transformed into the hard and red baked pot. The concept of pilu-pāka³ may be aptly described as chemical change.

1. A kṣaṇa of Nyāya-vaiśeṣika is equal to 2/45th of a second. (Fundamental principles of Ayurveda by Dr. C. Dwarkanath: Part I, p. 40).


3. अत्र परमाणुप्रथम पात्रः न वायुकादी। अमापकनिष्ठतानी वेद परमाणु प्रनतार्यशती स्वामित्वस्य अन्वयम्। वायुकादिकादिक ैव खण्डरूपायम्। तत्र परत्वतः समवार्थस्वरूपायम्। तेजसंबोध्योजनमवार्थस्वरूपायम्। अत्र द्वैतविद्याय प्रार्थ रूपसमवार्थस्वरूपायमिति पीयवायुकादित्वो वैश्वितिः। (Diptika on Tarkasaṅgraha).
Piṭhara pāka—

Piṭhara pāka means "the union of cause and effect (kāraṇa and kārya)" i.e. atoms by means of heat.¹ The Naiyāyikas hold that the piṭharas or molecules or larger aggregates of them, assume new characteristics, under the influence of heat, without involving the break down of the molecules or change in the characteristic of the paramāṇus.² That is to say, piṭharas (the material of the clay pot is stated to be composed of numerous piṭharas), undergo transformation under thermal influence. Consequential changes in them relate merely to a physical change of the molecules concerned. In this view, the pāka does not imply any radical change of the ānus which compose the piṭharas. A piṭhara is stated to consist of two or more ānus (atoms). The change in colour from black to red, assert the Naiyāyikas is really a change in the colour of piṭharas. This view resembles modern description of physical change.

Thus, according to Nyāya-vaiśeṣikas, all changes at the macroscopic and microscopic, and organic and inorganic levels, are due to pākas, i.e. chemical actions, brought about under the influence of tejas (agni). Agni in this view, is the power which is responsible for bringing about the break down and synthesis of substances. The action of agni is correlated to and is implicit in the motion or karma³ performed

2. पूववतनाँद विनेच अवधिविनि अववेषु परमाणपरवेषु 
   अ युगपन्तारातीमिति पिटराकङ्क्वादिनो न्यायिका: ||
   (Dīpikā on Tarkasāṅgraha).
3. The karma or motion, described by this system under the influence of tejas—is reminiscent in some respects of modern views on thermal disorder, according to which, "the irregular motion of molecules of any material substance is known as heat or thermal motion, for the simple reason that these motions are responsible for the production of heat. Such molecular motions, visible in the slanting beams of the sun falling into a dark room through a chink or hole, or the molecules which make up water or any other substance is known as Brownian motion. These molecules oscillate back and from, colloiding with one
by bodies as will be evident from the observations of Caraka regarding *karma* viz., "action which is the cause of *sānyoga* (conjunction) and *vibhūga* (disjunction) is implicit in the substance or *dravya*. Action is the performance of what is to be done. It depends on nothing else. ¹

**Summing up**: The concept of *tejas* (*agni*), is implicit in the *rajas* of *Sāṃkhya system*, *Rajas*, according to this system of scientific thought, stands for kinetic energy of the universe. All events—at the galactic, molar, molecular and atomic levels (including the physiological and psychological)—are governed by the important and vital role played by *rajas*. The doctrine of *rajas* of *Sāṃkhya system* represents one of the fundamental aspects of a pure science.

The *Nyāya-vaiśeṣika* system of scientific thought, which deals with *tejas* (*agni*), *karma* (motion) and *pākas* (chemical

another at random. Greater the agitation, the higher is the temperature. When a liquid freezes, molecular motion is reduced sharply. At a temperature of $-273^\circ C$ or $-459^\circ F$, thermal agitation of matter completely ceases and all its molecules come to rest. This is apparently the lowest temperature—known as absolute zero. Still lower temperatures do not seem to exist because, there is no motion lower than the apparent rest. Near the point of absolute zero temperature, molecules of any substance have little energy, and the cohesive forces which act upon them cement them together into a solid block. In this state, the molecules can only quiver slightly in their frozen state. When the temperature is raised, the quivering becomes more intense and at certain stage, molecules obtain freedom for motion and they slide by one another, and the rigid frozen substance becomes fluid. The temperature at which melting occurs, depends upon the strength of the cohesive forces which act upon the molecules. More thermal agitation breaks up the cohesion and the molecules become loosened completely and move up e.g. the evaporation of water. Thus, for every motion, *agni* is essential and this motion, in its turn produces *agni*.

1. संयोगे च विभूगे च कारणोऽन्ध्माथितम् ।
कार्यन्यस्य किष्क तमैः कर्म नान्नदः पेशुते ॥ Caraka : Sūtra 1 : 52.
actions) on the other hand would appear to represent an applied aspect of science.

From the *Upaniṣadic* point of view, *agni* and *soma*, known also, as *anna* and *prāna* respectively, represent two aspects of the universe.\(^1\) The term *soma* or *anna* has been interpreted as referring to the things of the universe, which are utilised for existence.\(^2\) It has been stated that *soma* or *anna* represents the matter-stuff of the universe, which allows itself to be cooked (decomposed or disintegrated). That which cooks *soma* or *anna* is stated to be *agni*—also known as *prāna*. *Soma* and *agni* are stated to be inseparable, that is to say, they are bound together inseparably—‘मिथ्युनमुपाधयते’. This inseparable relationship of the two has been described as ‘*rayi*’ (राय).\(^3\)

In modern scientific thought, matter and energy correspond to *soma* and *agni*. Energy and matter, according to modern views, are not separable from one another; they are interchangeable. All things of the universe represent two aspects of nature i.e. matter and energy, which are in a state of *mīthuna*. In other words, they represent the obverse and reverse of the same coin. It may be added that the view summarized above as regards *agni* and *soma* are also shared by Suśruta.\(^3\) The only point which need an emphasis, here, is the fact that, *agni* is the kinetic factor at all levels of nature.

---

1. (a) अग्नियोपायमयामकं जगत् | *Śatapatha Brāhmaṇa*: *Kāṇḍa 6*.
   *Brāhmaṇa* 1.

1. (b) अग्नियोपायमयाप्राणयः | *Suśruta*: *Sūtra 40*: 5.

2. अग्नि तत्त्वेन तत्समादनं तदुत्त्वते | *Taistirīya Upaniṣad*: 2. 2. 1.

3. The reference to views held by Suśruta on this issue has been mentioned by Vāgbhaṭa both in his *Saṃgraha* and *Hṛdaya*.

Suśruta’s reference runs as follows:

(a) अग्नि तत्त्वात् | *Suśruta*: *Sūtra 40*: 5.

(b) तत्त्वात् | *Suśruta*: *Sūtra 40*: 5.

SECTION III

CONCEPT OF AGNI IN ÁYURVEDA

Agni in Áyurveda, is reflected in the concept of pitta of this system. The term pitta is derived from the root ‘tap’—
to heat or ‘to burn’. This term is seen to have three meanings viz., तप ऐसारे, तप दाहे and तप सांतापे. 3 (a) tap saṅtāpe refers to the generation of heat; 4 (b) tap dāhe relates to the act of burning of the nutrition consumed 5 and (c) tap aśvare refers to that factor which is responsible to make one achieve the eight kinds of benefits. 6 These references are obtained from the Bhattogi’s Siddhāntakaumudi and would therefore furnish the vyākarana version of the term pitta. From the point of view of Áyurveda, pitta has been described as agni (fire), since it performs fire-like actions i.e. pāka, which refers to pācana (digestion); dahana (burning, combustion or oxidation) including bhūnna saṁghāta (splitting); tapana (heat production), parinamama 7 (conversion), para-vṛtti 8 (transformation), prakāśana (illumination), rañjana or varṇakara (colouration) and prabhākara (to cause lustre). 9

1. अभिनवें शरीरे शितान्तर्गतः । Caraka : Sūtra 12 : 11.
2. तप संतापे । Sūruta : Sūtra 21 : 5.
3. तप ऐसारे -divīdi gaga-( तप्यते )
   तप दाहे -eṇrāti gaga-( तापमाति, तपयति )
   तप सांतापे -bhūnādi gaga-( तपति ) Siddhāntakaumudī.
4. तपति कल्पायणासाध्यततात्मतिः पिच्छम ।
5. तपयति दशिति मुक्तमाधारजाति ृति पिच्छम ।
6. तपयते द्विशर्यान्याचिकिष्ठतिः पिच्छम ।
7. पाक: परिणाती ( Medīti ).
8. पाक: पायसिः ( Ibid ).
9. Some of the functions ascribed to pitta such as pācana including bhūnna saṁghāta (splitting), dahana (burning, combustion, oxidation), tapana (heat production), parinamama (conversion) and parāvṛtti etc. are reminiscent of some of the chemical reactions described by modern chemistry and biochemistry. They
In a general sense, the term kāya or body itself has been equated to agni. Caraka has recorded Martci as having stated that "it is only agni, which is located in pitta, that gives rise to beneficial or adverse consequences according as it is in normal or abnormal state of functioning." Clarifying the implication of the term pittāntargata, used in above description, Cakrapāṇi has observed that, this term does not mean that the pitta of the body is flaming fire and it only refers to the phenomenon of heat which is associated with fire. By implication, heat is seen to be associated with the function of pitta. The references made by Medini and Amarakośa to the functions of pitta, have a direct bearing on the pāka karmas to which āhāradrayyas are subjected, resulting in their pariṇāma or transformation. The implications of these two aspects of pitta-vyāpāra are digestion of food and its transformation into various functional and structural factors of the body.

The question if pitta and agni are identical or different has been raised and answered by Suśruta in the 21st chapter of the sūstrasthāna of his Sarinītā. The passage under reference runs as follows—"It may now be asked, if pitta is the same as agni or it is something different. This question may be answered by stating that pitta is the same as agni, since it performs dāhana (burning, combustion or oxidation) pacana (digestion) and similar actions performed by fire, hence pitta are combination reaction, substitution reaction, addition reaction, decomposition reaction, dissociation reaction, displacement reaction, hydrolysis reaction, oxidative reaction and reduction reaction. These reactions are usually mediated by catalysts. In biochemical reactions, organic catalysts, viz., enzymes accelerate these reactions.

1. Aṭṭha: Prātiṣṭhāna: Kāya śvabhāviyatē.
   वर्तम चिकित्स्तोसीमां त स व कायचिकित्सक: || Bhoja : Quoted by Śivadīsa Sena in his Commentary on Caraka : Śūtra 30 : 28.

2. मरोचिन्नवचः अगिने धनरीरे विचालयः || कृपिताकृपितेऽशुमासुमापि करोति || Caraka : Śūtra 12 : 11.

3. पिचालयः धति वचने धनरीरे ज्वालादित्वकविनकितेन पिलितप्रमपश्च बलेः सदाभ दश्यते || Cakrapāṇi on Caraka : Śūtra 12 : 11.

is known as *antarāgni.*”¹ It may be necessary in this connection to make a passing reference to the controversies as regards the identity of *pitta* and *agni,* referred to by Ćālhaṇa and Cakrapāṇi in their commentaries on the passage from *Suśruta Samhitā,* under reference as well as the *tika* of Vijayarākṣita in his *Madhukosā nyākyā* in the chapter on *Kṣudraroga* of *Mādhava Nidāna.* Without going into details of the controversy, which appear to have involved logical subtilities, divorced from objective realities for the settlement of an obvious fact, about which Suśruta himself has been very catagorical, it may be stated that Vijayarākṣita has closed the controversy by quoting Bhoja as follows—

```
पित्तस्य नेत्रोऽवष पावकः—तदाहोपः—
 "हमूमोचिऩ्तं हेतुतः पित्तोभ्यम पचातैति यत्।
 मृत्तिको रसबीयांम्यां समानद्यानसंहितः॥"
 हर्यासभ—तस्मातेजोम्यं पित्तं पित्तोभ्यं यः सपक्कःमानुः
 स कायामिनः स कायोभ्या स पक्षा सः च जीवनः।²
```

The controversies such as one under mention would appear to have been the fashion of the day—indulgence in logical polemics. Such fashions prevalent in his days should have upset Vācaspati Miśra, so much that he was constrained to observe that “Lovers of tarka, often seek to perceive even the perceptible things by inference.”³

However, the various issues raised in this regard by Bhāva Miśra—for and against—are furnished in the Appendix VI.

Neither Caraka and his commentator Cakrapāṇi, nor Suśruta or Vāgbhaṭa, appear to have had any doubt as to the part played by *pitta* in *pacaṇa* and *dahana karmas* with which the production of heat is associated. No doubt, *pitta* is instrumental or better still the factor responsible for bringing about the *sanākhātabheda* of *āhāra-dravyas,* which serve as

1. तत्र विद्यायं किं पित्तस्यतिरङ्कामधवन्योगिनः? आशोरितवर्णमेवानानिरितिः?
   अर्थशास्त्रम्यं न खलु पित्तस्यतिरङ्कामधवन्योगिनिमित्तं, आशोरितवर्णमेव
   दहनपवासादिप्रवत्तायामेवानानिमित्ततः फिरीक्तेति-तर्फितिै।
   *Suśruta : Sutra 21: 9.*


3. प्रत्यावरिक्कलितमार्गुणानुसारनिरन्तरितसः तत्तवरितः। (Vācaspati Miśra).
indhana and are burnt releasing in the process, uṣmā or heat. Hence, in the final analysis pitta is the cause for the production of heat out of the indhana (fuel) represented by ahūra and therefore pitta would appear to be the nimittakāraṇa, indhana the upādānakāraṇa; and uṣmā the kārya. The logic and validity of this conclusion will be shown at a latter stage.

A careful study of the existing editions of ancient Ayurvedic classics and allied literature shows that pitta performs functions similar to those of agni. The employment of the agency of physical fire in the cooking of food will serve as an effective illustration. The cooking of food with the help of fire is meant to render the former fit for ingestion and digestion. In other words, the heat employed to cook food substance loosens the molecules of the food material. A parallel to this idea is the employment of the agency of fire (heat) in our chemistry laboratories to bring about the decomposition and disintegration of substances as well as to speed-up chemical reactions. The idea that underlies the fire-like action of pitta has to be considered in the light of the foregoing.

Further, a proper appreciation of the physical structure (Composition) of pitta described in terms of pañcabhūtas may go a long way in the clarification of the āgneyaguna of this factor. According to Caraka, Suśruta and Vāgbhaṭa, the composition of pitta is dominated by agnibhūta. Caraka, as well as Vāgbhaṭa have stated that pitta is the fluid (sāra) and liquid (drava). The latter two qualities of pitta have been attributed to the preponderance of ap-bhūta also, in the pañca-

1. (a) एवं रसस्मायाः श्रावमाहस्मायाः स्मायाः ।
   पञ्चमिनिंश्यायां स्मायाः श्रावमाहस्मायाः स्मायाः ।
   Caraka : Cikitsā 15 : 8.
   (b) समुदायतः समायाः पञ्चमिनिंश्यायाः ।
   अष्टाङ्गहर्द्यास्मायाः ।
   Ashtāṅghārdaya : Śāstra 3 : 56.

2. (a) Caraka : Śāstra 7 : 16.
   (b) पित्तमानिंश्याः । Suśruta : Sūtra 42 : 5.
   (c) Ashtāṅgasāṅgāra : Sūtra 20.
bhautic composition of this factor. \(^1\) Vāgbhaṭa has clearly stated that *pitta* is *paṇcabhautic* and it is *drava* in consistency, inspite of which, it performs actions, similar to *anala* (fire-like), in the course of the process of digestion, largely due to the actualisation of its *tejas* component (discarding its liquidity—*dravatva*). This fact is inferred from the way in which it performs *pākādi karmas*, viz., it digests food, separates *sāra* from *kiṭṭa* of the food. It is because of this, it is known as *pācakapitta*. \(^2\) By implication, the *pitta* complex would appear to contain as one of its essential constituent elements, a substance possessing *āgneya-guna* by virtue of which it (the *pitta*) is able to perform various chemical actions, implied in the process of digestion of food.

The concept of *agni* of *Āyurveda*, which refers to the manifold functions ascribed to *pitta* is at once comprehensive. It not only includes chemical agencies responsible for *āhārapacana* in the *koṭṭha* (corresponding to gastro-intestinal digestion), which leads to separation of *sārabhāga* (nutrient fraction) of the *āhāra* (food) from the *kiṭṭabhāga* \(^3\) (the indigestible or undigested residue of the food) but also metabolic events—energy, synthesis and maintenance metabolism. In addition, it is seen to comprehend photo and chemo synthetic processes. *Pācakapitta* known variously as *jūtharāgni*, *koṭṭhāgni*, *antarāgni*, *pācakāgni* and *dehāgni* etc.; while being located in its own place in an area between *āmaśaya* and *pākvāśaya*, \(^4\) directly participates in the digestion of food and at the same time, lends support to and augments the functions of the remaining *pittas*, present elsewhere in the body. \(^5\) The reference here, obviously relates to the remaining *pittas* viz., *raṇjaka*, *sādhaka*,

\(^1\) *Sārīra* 7:16.

\(^2\) *Aṣṭāṅgaḥṛdaya* : *Sūtra* 12:10.

\(^3\) *Aṣṭāṅgaḥṛdaya* : *Sūtra* 12:11.

\(^4\) *Aṣṭāṅgaḥṛdaya* : *Sūtra* 12:10.

\(^5\) *Aṣṭāṅgaḥṛdaya* : *Sūtra* 12:10.
śālocaka and bhrājakā. It is held that the pācakapittra contributes moities of itself to the seven dhātvagnis, and supports and augments the function of the latter. ¹

It would be seen from the foregoing that the Āyurvedic concept of agni includes, not only five kinds of pittas but also, the dhātvagnis and bhūtāgnis. It is clear from the classical Āyurvedic texts that the enumeration of the number of agnis (which include pitta) varies from author to author. According to Caraka Samhitā, read together with its main commentary by Cakrapāṇi Datta, the number of agnis enumerated are over 13 as shown below—

antaragni 1, bhūtāgni 5, dhātvagni 7. ²

On the other hand, Suśruta is seen to have described only five agnis viz. Pācakagni, raṅjakagni, śālocakagni, sādhakagni and bhrājakagni. ³ There is however an indirect reference in Suśruta Samhitā to five bhūtagnis, in the brief description made to the transformation, which foodstuffs undergo in the organism. ⁴ When these five agnis are taken into consideration, the total number of agnis according to Suśruta would be ten.

Vāgbhaṭa is seen to have reckoned

5 pittas
5 bhūtagnis
7 dhātvagnis
3 doṣagnis
3 malagnis

in all twentythree agnis. ⁵ Of the more recent authorities, Śāṅgadhara is seen to have recognised five pittas only. ⁶ On the other hand, Bhāva Miśra is seen to have followed Caraka and Vāgbhaṭa. ⁷

---

1. स्वस्थनवस्थय कायानेत्रवं: धातुः संस्कृत:।
   लेण्य सारानिप्रिष्ठां धातुविक्षिप्तवोऽन्नम्।। आश्वेषगार्दयाः सूत्र 11:34.
4. प्रभूतानां देः धारारं: प्रभूतानां:।।
   विपक्ष: पन्धासा सम्पर्क स्वास्त: रुणानांनिवर्तयेद्।। सूत्र 46:526.
5. आश्वेषगार्दयाः सूत्र 12, and Śāṅgīra 3.
6. Śāṅgadhara; Pṛṇakhaṇḍa : 5th. Chapter.
I
PITTAFORMATION IN YAKRT

YAKRT PARAMANU
(LIVERCELL)

RAKTAVAHÁ DHAMANI
(HEPATIC ARTERY)

RAKTAVAHÁ SIRÁ
(PORTAL VEIN)

PITAVAHÁ SROTAS
(BILEDUCT)
The general physical characteristics and properties of *pitta* or *agni*, as could be gathered from the available editions of the works of Caraka,¹ Suśruta,² Kāśyapa,³ Vāgbhaṭa,⁴ Śāraṅgadhara⁵ and Bhāva-Miśra⁶ are furnished in the table below:

<table>
<thead>
<tr>
<th>Colour</th>
<th>Consistency Density</th>
<th>Taste</th>
<th>Smell</th>
<th>Other properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Śuklārṇa varja</td>
<td>Sara (fluid)</td>
<td>Kaṭu (acrid)</td>
<td>Visra fleshly</td>
<td>Sattva</td>
</tr>
<tr>
<td>(Colours other than white and red)</td>
<td>Laghu</td>
<td>Amla (sour)</td>
<td>Vai-gandhya (unpleasant smell)</td>
<td>Uṣṇa (hot)</td>
</tr>
<tr>
<td></td>
<td>Drava (liquid)</td>
<td></td>
<td></td>
<td>Tikṣṇa (keen sharp or penitrating or intense or quick in action)</td>
</tr>
<tr>
<td></td>
<td>(light)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pāṇḍu vivarjita</td>
<td>Iṣat or anatisneha (all colours other than Pāṇḍu)</td>
<td>and</td>
<td>Pūtī-gandha (putrid smell)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>viscus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nila and Pita</td>
<td>(Blue and yellow)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A careful appraisal of the physical characteristics and properties tabulated above, *vis-a-vis* *pitta* to which they may refer

1. (a) *सर्वोत्तमं तीक्ष्णं च द्रवमं चर्णं कठोऽ]।
   विपरीतमुक्तिः पितं द्रव्यारस्य प्रशाश्यस्य]
   **Caraka : Sūtra 1 : 60.**

2. (b) *अथवः तीक्ष्णं द्रव्यमात्रेणिष्ठिः वर्णं च द्रव्यमात्रेणिष्ठिः
   गरब्धं विस्तं; रसी च कठ्रकाण्डी सर्वं च पितृस्यात्मस्थाणिः।
   **Caraka : Sūtra 20 : 15.**

3. *पितं तीक्ष्णं द्रव पूर्ति नोत्तर पीतं तथैव च।
   द्वरणं कठ्ठरं सैव विदर्शः चाम्बेन च।** Suśruta : Sūtra 21 : 11.

4. *हाष्टं तीक्ष्णमीयं च वर्णं द्रव्यमात्रेणिष्ठिः।
   वैश्वं कठ्रकाण्डव्यमीयं परस्यंश्च विस्तम्।** Kāśyapa.

5. *पित्रः सर्वोत्तमस्य च लघुविविशं सर्वं द्रवम्।
   अष्टादाशय दयाः सर्वाच सर्वविविश्चारम्।**

6. *पित्रः सर्वं द्रवम् सर्वं चपक्कल संस्थाभारं
   सर्वं कठ्रकाण्डव्यं तीक्ष्णसम्भवं तु प्रकटः।**
   Bhāva-prakāśa : Pūrvakhaṇḍa : 3 : 120.
shows that they are very general in their outlook and may refer in particular to the _pitta_ known in modern times as hepatic-bile. However, qualities such as _sara, drava, usṇa_ and _tikṣṇa_ may pertain to all the _pittas_ or _agnis_ of the body and, in special, to _pācaka pitta_ (complex). As regards the colour, consistency, taste and smell ascribed to _pitta_, such as _śukla-rūpavārja_ or _pāṇḍuvivarjita_; _anadhika sneha_; _kaṭu_ and _āmla_; _visragandha, vaigandhya_ and _pātigandha_; _nīla_ and _pita_, it would appear that they have a direct bearing on the more familiar _bile_ secreted by the _yākṛti_ which as will be shown later may form part of the _acchapitta_ (complex). This view finds support from the description of _pitta_ as the _mala_ of _rakta_ (अद्धः: वितं) and also, the reference made by Caraka and Vāgbhaṭa to _pitta_ as the _vikṛti_ of _rakta_—both because of its intimate co-existence with and capacity to impair the integrity of _rakta_; also because of the fact that, _pitta_ and _rakta_ possess nearly identical smell and colour; in addition, the location of these two factors are _yākṛti_ (liver) and _plīṭhā_ (spleen). This view finds direct corroboration from modern physiological views as regards blood-bile relationship which can be summed up as follows—"The pigment of bile-bilirubin and biliverdin are the essential constituents of the haemoglobin-complex of the erythrocytes. From this point of view, it may be stated that _rakta_ is the seat of _pitta_. These two bile pigments are also the wasteproducts or the _malas_ of _rakta_. _Rakta_ and _pitta_ are stated to have identical colour. The truth of this statement will become evident by taking into consideration the fact that, though bright red in colour, if left undisturbed, the blood separates into two parts—the lower,

2. सत्त्वगाद दूषणादलू समामायदक्षणवर्गै:।
   रक्तस्य विसमायकस्ति रक्तपितीत मनोपिनिमितः।
   प्लङ्क्षिनिः च यक्रुऽविव तदे प्रभुवानीः जायते (तत्त्वेति)।
   स्मरणास्ति रक्तवाहिनी तनयुधामि हि देहिनाम्। Caraka: Cikitsā 4: 9-10.
3. विन्ते रक्तस्य विव्रते: सत्त्वगाद दूषणादपिः।
   गम्भर्वादूसुभेष्ठ रतेन व्यपदिद्वयते।
   प्रमवस्थाः: स्थानांत्स्थोतो यक्रुऽविव ततः।

Āṣṭāṅgahṛdaya: Nidāṇasthāna 3: 3.
contains the cell and is opaque and red, while the upper part is a clear yellow liquid—the plasma. Under the microscope, an enormous number of pale yellow discs—the red blood corpuscles-floating in a colourless clear fluid, can be seen. Although yellow, when seen individually, the erythrocytes appear to be red in bulk. The colour of the hepatic-bile is golden-yellow which is largely due to its pigments—bilirubin and biliverdin. When set free into the blood, the bilirubin contributes to the normal colour of the plasma. Both bile and blood have nearly the same characteristic fleshy smell. In addition, both blood and bile are intimately connected with the liver and spleen.

Therefore, the correlation of _pitta_ and _rakta_, referred to in _Ayurvedic_ classics, may represent the summation of the normal relationship that exists between blood and some of the important constituents of bile. This can be seen from the fact, that the formation of bile consists in the removal of bilirubin from blood; its conversion in the liver; its excretion in the bile canaliculi, the reabsorption of it from the intestine in the form of the colourless compound—the stercobilinogen, which latter is utilised by liver cells for the production of fresh haemoglobin. The role of spleen as regards the disposal of the red blood corpuscle can be seen from the fact, that the macrophages present in it, convert the fragmented dust of degenerated red cell into bilirubin, which is transported to the liver where it is utilised for purposes mentioned above.¹

¹ The breakdown and rebuilding of the important constituents of the blood corpuscles, which are being continuously formed and destroyed by the reticulo-endothelial cells, proceed throughout the life of the organism. Erythrocytes, to a large extent, undergo destruction in the blood stream due to stresses and strains to which they are subjected during their passage through blood vessels. At last, becoming aged, they are not able to withstand different kinds of stresses and strains to which they are exposed—they undergo fragmentation. Fragments of different shapes and varying in size, from that of a half or quarter
Additional support to this view is derived from the reference made by all the ancient authorities of Ayurveda to the symptomatology of pītavṛddhi, viz., yellowness of urine, faeces, eyes and skin, increased appetite, thirst, burning sensation in the body and insomnia. These symptoms, especially, yellow colour of the urine, faeces, skin and eyes are stated, by modern physiology, to be due to the circulation, in excess, of the pigment bilirubin a condition described as bilirubinemia. It is significant to note that Cakrapañi Datta in his commentary on Caraka’s description of sākhasrīta kamala has observed that, the non-excretion of pitta (which imparts to faeces

of the whole cell to mere dust-like remnants containing haemoglobin (haemoconia) are to be found circulating in the blood, spleen and to a lesser extent, occasionally in other tissues. From the determination of bile pigment excretion, it has been estimated that in health between seven to ten millions of red cells are destroyed in this way every second. Of course, the same number must be formed afresh by the blood forming tissues. The loss of haemoglobin is between 16 to 24 g. daily. The haemoglobin dust is changed into organic iron and pigment bilirubin. The bilirubin is transported to the liver through the medium of plasma and is slightly changed, during the passage into bile. Part of the bile is excreted into the intestine through the bile duct and in the bowel bilirubin is changed into colourless stero-bilinogen and stercobilin, which latter gives to the faeces its natural dark colour. The stercobilinogen is reabsorbed into the portal blood-stream and is utilised by the liver for the production of new haemoglobin. Following the bilirubin in the liver it is seen that it is broken down by Kupffer’s cells and gets converted into bile-pigment-biliverdin which when reduced becomes bilirubin. The protein-free portion is set free into blood, contributing to the yellow tint of the plasma.

( Based on physiological Basis of Medical Practice by Best and Taylor and Human Physiology by Winton and Bayless ).

1. पीतविद्यम्येनेनाच्छलृकरणकारिकाकृतिसंकल्पितः Astāṅgahṛdaya: Sūtra 11: 7.
its characteristic colour—*malaraṇjaka*) into *kośtha*, is responsible for *śveta varcas* or whitishness of *puriṣa*, in this condition.  

The explanation of *śvetavarca* (corresponding to the whitishness of faeces) in *sākhāśrita kāmalā* (corresponding to obstructive jaundice) finds support from the modern biochemical findings and they focus attention to the substance the non-excretion of which into the intestine (corresponding to the *kośtha* of *Āyurveda*) causes clay-coloured stool (corresponding to *tilapiṣṭanibha varcas*). According to modern biochemistry, “when bile is totally excluded from the intestinal tract, as a result of severe liver-dysfunction, extra-hepaticbiliary obstruction or biliary fistula, lipid absorption is more critical. As a result of total lipid content in faeces in a cholic animal is elevated largely owing to an abundance of salt of fatty acids. The presence of these soaps, chiefly insoluble calcium salts, together with the absence of bile-pigments, result in the characteristic clay-coloured stools seen in biliary obstruction.”

It would seem, that the *pitta* to which the physical characteristics and qualities, under discussion are attributed may refer to liver-bile and not others.

An appraisal of the functions, ascribed to *pitta* would lend support to the view expressed above. According to Caraka, who has recorded *Marījī*, in his *Samhitā*, as having stated that “Digestion or indigestion, visual perception or impairment of it; the normal or abnormal body temperature; the normal or abnormal colour of the body; courage or fear; anger or cheerfulness; lucidity or confusion of mind and such opposite traits are the functions of *pitta*. According to *Susruta*, *pitta*

1. व.प.संतुष्टिको वायुः स्थानार्थिच्छः श्रविश्वासः ।  
हारिदण्डनमुखानः शेतत्वाचास्तः सरः ॥ ( _Caraka : Cikitsā_, 16 : 126 )  
शेतत्वाचः श्रुति कोशस्थिरश्च मलरास्त्रस्य  
शहिनिग्रध्विभैः इत्यपि शैवताः मधवः ॥ ( _Cakrapāṇi_ on the above).


3. मरीचिवाच्:—अथिरेव दशरीश विनालंतांत: कपितकुपचित: द्रुमाधुरोम्मानि करोति  
तवश्च पक्षमयक्ष्मा कर्शामदर्शिनं माध्रामायाब्द्वृत्तव्यं: प्रक्रितिविन्दुक्तिकताः शैवेः  
सद सौर्य शरीर मोहायरामायस्तोदनिः चापराणि हन्तारि ।  
(Caraka : _Sūtra_ 12 : 11.)
in its five varieties, imparts colour (*rāgakṛt*), promotes digestion and metabolism (*paktikṛt*) forms *ojas* (*ojakṛt*) promotes vision (*tejaskṛt*), causes intellect (*medhākṛt*) and body-heat (*ūsmakṛt*). In the opinion of Vāgbhaṭa *pitta* is responsible for the causation of body-heat; it contributes to vision, confers *prabhā* (lustre of the body) and is responsible for *buddhi* and *medhā*, courage or valour and *mārdava* or softness of the body.

The functions attributed to *pitta*, in general, are summed up in the table below:

<table>
<thead>
<tr>
<th>Somatic or <em>Śārīra</em></th>
<th>Psychological or <em>Mānasika</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Prākṛta or <em>physiological</em></td>
<td>Prākṛta or <em>physiological</em></td>
</tr>
<tr>
<td>Vaikṛta or <em>abnormal</em></td>
<td>Vaikṛta or normal <em>physiological</em></td>
</tr>
<tr>
<td>production of hunger, appetite, thirst and digestion</td>
<td>impairment of hunger, appetite, thirst and digestion</td>
</tr>
<tr>
<td>Metabolism</td>
<td>Abnormal or subnormal states of metabolism</td>
</tr>
<tr>
<td>visual perception</td>
<td>Impairment of visual perception</td>
</tr>
<tr>
<td>Haemopoiesis or the colouration of <em>rasa</em> in the process of <em>rakta</em> formation</td>
<td>Impairment of the formation of <em>rakta</em></td>
</tr>
<tr>
<td>production of body-heat and temperature</td>
<td>Abnormal or subnormal temperature</td>
</tr>
<tr>
<td>The formation of <em>ojas</em></td>
<td>Impairment of the formation of <em>ojas</em></td>
</tr>
</tbody>
</table>

1. राघवनिर्वर्धितेऽमेवेषायो मेयित हरितभित किं प्राकृत प्रविशातक्षमित्वमेयित्वः अनुवादः कारति ।
   (*Suśruta*: Sūtra 15: 4.)

2. ॐ प्राकृतप्रक्षणः । एकाढोऽश्रियाप्रक्षणायाधिकृतसः ।
   (*Aṣṭāṅgahṛdaya*: Sūtra 11: 2-3).
It is obvious that, of the various functions attributed to *pitta*, only a part of it namely, the production of hunger including appetite (*ks\u00e0t*), thirst (*tr\u00e0d*), digestion (*pak\u00e0ti*) may relate to the physical characteristics and qualities, now under discussion, which have been described in the *sa\u00e0h\u00e0t\u00e0* *gran\u00e0tas*. The discussion of the concerned *pitta* is really a study of *p\u00e0cakra pitta* as a whole and *accha pitta* in part.

Both Su\u00e0r\u0101ta\u0111 and V\u0131gbh\u00e0t\u0102 have stated that *p\u00e0cakra pitta* obtains in an area between the *pak\u00e0s\u00e0y\u0130* and *\u0131m\u00e0s\u00e0y\u0130*; whereas Caraka\u0111 has stated in very clear terms that *acch\u00e0pitta* is secreted as the food which has acquired *amlabh\u00e0y\u00e0* traverses from the *\u0131m\u00e0s\u00e0y\u0130* to the next lower portion of the *ko\u0161\u00e0h\u00e0*.* It is of importance to note that none of these authorities have made any mention of the colour, consistency, taste etc. of either *p\u00e0cakra pitta* or *accha pitta*.

Likewise, both Su\u00e0r\u0101ta and V\u0131gbh\u00e0t\u0102 have indicated that the organ known as *grah\u00e0n\u00e0* is located between *pak\u00e0s\u00e0y\u0130* and *\u0131m\u00e0s\u00e0y\u0130* and that (a) the relation that exists between *agni* and *grah\u00e0n\u00e0* is reciprocal, i.e., *agni* supports the function of *grah\u00e0n\u00e0* and *grah\u00e0n\u00e0* supports the function of *agni*; (b) *grah\u00e0n\u00e0* is also spoken of as *pittadhar\u00e0 k\u00e0l\u00e0* and it holds the ingested food for the duration of its digestion, before the *ki\u00e0t\u00e0* or undigested food residue is propelled into the *pak\u00e0s\u00e0y\u0130*. V\u0131gbh\u00e0t\u0102 has emphasized the latter point and described it as ‘*grah\u00e0n\u00e0t grah\u00e0n\u00e0*’. Su\u00e0r\u0101ta has defined *k\u00e0l\u00e0* as ‘*d\u00e0h\u00e0tv\u00e0s\u00e0y\u00e0\u0141ntara-mary\u00e0d\u00e0*’ meaning ‘*k\u00e0l\u00e0*’ is the structure which intervenes

1. तबाइत्रैमेव विशेषेण पक्वाष्ठयमयमध्यस्य पिपं चनुदिष्मष्मपाले पचति |
   (Su\u00e0r\u0101ta : S\u0101tra 21 : 10).
2. तत्र पक्वाष्ठययमध्यस्य |
   (A\u0154\u0131\u00e0gh\u00e0h\u00e0d\u0154\u00e0y\u00e0a : S\u0101tra 12 : 10).
3. परंतु पक्वाष्ठयमयमयमध्यमात्राः |
   नाश arousalमयमयमयमयमध्यमात्राः (Caraka : Cik\u00e0t\u00e0a 16 : 10).
4. A\u0154\u0131\u00e0gh\u00e0h\u00e0d\u0154\u00e0y\u00e0a : S\u0101\u00e0r\u0101ra 3 : 53.
5. Su\u00e0r\u0101ta : Uttarak\u00e0t\u00e0tr\u00e0ntra 40 : 169, A\u0154\u0131\u00e0gh\u00e0h\u00e0d\u0154\u00e0y\u00e0a S\u0101\u00e0r\u0101ra 3 : 50.
   A\u0154\u0131\u00e0\u00e0g\u00e0\u0154\u00e0\u00e0\u00e0m\u00e0\u00e0\u00e0gra\u0111a : S\u0101\u00e0r\u0101ra 5.
6. Caraka : Cik\u00e0t\u00e0a 16 : 57.
7. Caraka : Cik\u00e0t\u00e0a 16 : 56. A\u0154\u0131\u00e0gh\u00e0h\u00e0d\u0154\u00e0y\u00e0a S\u0101\u00e0r\u0101ra 3 : 50.
8. Su\u00e0r\u0101ta : S\u0101\u00e0r\u0101ra 4 : 4. A\u0154\u0131\u00e0\u00e0g\u00e0\u0154\u00e0\u00e0\u00e0m\u00e0\u00e0\u00e0gra\u0111a S\u0101\u00e0r\u0101ra 5.
between *dhātus* and *āśayās*. From available descriptions of this structure, it is seen that *kalā* resembles, in some respects, the semipermeable membrane and in other respects the mucosal lining of hallow visceral organs such as the mouth, oesophagus, small and large intestines. In the present context, the description of *pittadharā kalā* would appear to refer to the lining membranes and in special to the lining membranes of the gastro-intestinal tract extending from the pyloric region, up to the ileo-cecum. In fact, the lining or the mucosal-membrane (including the submucosa) of the intestines—small intestine in this context—represents the demarcation between the underlying *srotānisī* and *māṁsa dhātu* on the one hand and, the food in the lumen of the gut on the other. In addition, it not only serves the purpose of a covering membrane but also (a) as a system of glands, which provides the necessary digestive enzymes, (b) as the surface, on which, various kinds of digestive reactions take place, and (c) as the surface from which absorption of the digested *āhārarasa* takes place. The *grahaṇi* or *pittadharā kalā*, as it is also called, has been uniquely contrived to meet the foregoing threefold functions.

The significance of this arrangement, in keeping with the observations made by Vāgbhaṭa to *pācakapittha*, its place and functions, and, that of *grahaṇi*,¹ *vis-a-vis pittadharā kalā*

---

¹ Sri S. C. Dhyani, in his thesis on "Grahaṇīroga" offered for his post-graduate diplomaship in 1956, has effectively shown that, in view of evidence gathered by him from the available editions of *saṁhitā-granthas* and modern developments in the field of physiology of digestion and metabolism, that the *urdhva-āṁāśāya* is the region of the stomach which extends from the fundus to the pyloric area and *adhva-āṁāśāya* is the region which extends from the pyloric-actrum to the ileo-cecum. He has, also, defined the latter portion as *grahaṇī*, in view of the fact that (1) the pyloric sphincter, at the outset, retains the food in the stomach for the duration of gastric digestion and the production of acidified chyme; (2) the duodenum exercises a regulating control over the secretion of some of the important digestive juices and gastric activities. The remaining portion
and its function as described both by Suśruta and Vāgbhaṭa and lastly Caraka’s reference to the physiological events which are stated to take place when āhāradravyas which have previously undergone amlabhāva in the ārdhva-ūmāśaya are passed on to the next lower portion of the koṣṭha leading to the secretion of accha-pitta, can be summed up in the light of known facts of anatomy and physiology as follows:—

The āhāradravyas of different kinds—āsīta, pīta, liḍha and khāḍita—attain (i) madhurabhāva, as soon as they reach āmāśaya. This stage of digestion is reminiscent of salivary digestion which is completed in the fundus of the stomach, where the insoluble starch-polysaccharide—is converted to soluble dextrin, under the influence of salivary amylase (ptyalin). Thus, the cooked starch is seen to proceed through the following stages in this reaction:

starch→erythrodextrin→achrodextrin→stable dextrin.

The action of the Salivary amylase is of the nature of bhinnasārīghāta or splitting, brought about by hydrolysis. The of the area, known as grahaṇī is lined with pittadharā kāla. It provides the essential ingredients of jāṭhāragni, responsible for the completion of aquāka, which forms part of jāṭhāragni vyāpāra. In addition, the formation of sūra or annarasa—chyle, and the separation of it from kīṇa—the undigested residue of the food, takes place in this area. The sārabāga, corresponding to chyle, is retained in the area for the duration, required for its śaṣaya or absorption, while the kīṇa or the undigested residue of the food is removed and passed on to the paksāṇaya—large intestine—under the influence of samāna vīyu. He has thus shown with convincing evidence that the entire small intestine commencing from the antrum of the pylorus including the pyloric sphincter to ileocecal sphincter, represent a total entity, spoken of as the grahaṇī. Further, he attached significance to the area extending from pylorus and ending with duodenum and showed that this is the operative and controlling part of the entire grahaṇī system. (S. C. Dhyani; Grahani Roga Post Graduate Thesis: 1956: pp. 23-40).
final *rasa* or taste of the resultant product, in the upper portion of the *urdhva āmūśaya*, is *madhura*.

(ii) This digestion is brought to an end by the secretion of hydrochloric acid. Here is seen to commence the second part of the *avasthāpāka*, when the *ūhāra*, is stated to undergo *amālabhāva*, corresponding to the conversion of insoluble proteins into soluble protein, under the influence of pepsin, in the presence of hydrochloric acid. The protein fraction of the food, proceeds through the following stages:

protein→proteoses→peptons before it is rendered soluble.

The final outcome of the entire gastric digestion is the acidified chyme, which has been characterised by Caraka as *vidagdha*¹, which term, as interpreted by Cakrapāṇi Datta is *pakhāpakva*² or *khiḍitpakva-khiḍidapakva* (i.e. partly digested). The implication of this phase of digestion as described by Caraka and elaborated by Cakrapāṇi Datta is that the *ūhāra*, in this state, is not yet fit for absorption and utilisation for *bhūtāgni* and *dhatvagnipāka*.

It is of significance, in this connection to note that Caraka and Vāgbhaṭa have mentioned that *māmsa rasa* (muscle-juice) stimulates *jāṭhārāgni*.³ This suggestion is reminiscent of the modern finding that, the “humoural phase” of the secretion of gastric juice, “depends in some way on the presence together in the stomach of food and gastric juice. It must be the product of the action of the gastric juice on the food which acts as a secretagogue; that this is so is proved by digesting the meat *in vitro* with gastric juice and, then, giving the solution by stomach tube, when the secretion begins almost

---

1. वर्न्य पश्चमानस्य विद्वषस्थाभावतः।
   आश्वायां पश्चमानस्य पितामहसुदृशिते॥ (Caraka Cikitsā 15:10).
2. विद्वषस्थेति पश्चवायुस्तय—(Cakrapāṇi on above).
3(a). प्रत्सहानां रसैः साम्यमित्वेति पितामहसुदृशम्।
   क्रुद्दोपन्नाणिश्रीपिण्याद दीपक्षयात् तेजसम्॥

(b) *Aṣṭāṅgaḥṛdaya*: Cikitsā 10:76.
at once.”¹ The humoral substance thus produced by gastric mucosa arising out of the action on the latter by polypeptides, is known as the Gastrin² which is considered to be responsible for the profuse secretion of gastric-juice.

Resuming from where we digressed—the digression was necessary to emphasise the fact that the amlatva attained by the food, at this stage of āhāra pacana, is due to an amla factor secreted by the urdhva-ūmāśaya.³ Synchronising with the passage down of the āhāra which has attained anlabhīva into the next lower portion of the mahāsrotas, accha pitta is stated to be secreted. This is a very significant and, possibly a very early observation in that it has been shown by recent advances in experimental physiology that the acidified chyme as it passes down slowly from the pylorus into the duodenum acts as a secretagogue and stimulates the duodenal glands (Bruner’s glands), to secrete a number of internal secretions which in their turn have been shown to be responsible for making available the bile and pancreatic juice to the duodenum for carrying out further digestion of the partly digested chyme. The important internal secretions which are shown to be secreted by duodenal glands, under the influence or acidified chyme are: (i) secretin, (ii) pancreozymin, (iii) cholecystokinin and (iv) entero-gastrone. It has been shown that “the flow of pancreatic juice like the flow of bile is regulated hormonally by the introduction of gastric chyme into duodenum. Pro-secretin granules in the mucosa of the duodenum are apparently activated by the acid of the chyme to yield secretin which enters the circulation to stimulate the acinous tissue of the pancreas and promote the secretion of pancreatic juice.”⁴ “The secretion of pancreatic juice is

2. There is a controversy, if gastrin is the same as histamine.
3. Modern advances have identified this factor as hydrochloric-acid.
under both neural and hormonal control. The presence of secretagogue or acid in the upper duodenum results in the liberation into the circulation of a hormone—secretin—which stimulates the flow of pancreatic juice. Since secretin is effective in the atropinised animal as well as after a section of vagus a direct action of the hormone on the secretory cells may be assumed. The pancreatic juice obtained after secretin stimulation is copious in volume relatively deficient in enzyme action and of normal electrolytic composition... Secretin also enhances the secretion of bile and intestinal juice.\(^1\)\(^2\)\(^3\) “A second intestinal hormone—pancreozymin—which unlike secretin, stimulates the secretion of enzymes by the pancreas, has been stated to occur in intestinal mucosa....”\(^4\)\(^5\) “The contraction of gall bladder is apparently under hormonal regulation; the hormone cholecystokinin, arising in the upper segment of the small intestine and entering the circulation, when fatty foods are introduced into this portion of the intestine.....results in the prompt contraction of the normal gall bladder and discharge of its contents.”\(^1\) “Emptying of the gall bladder occurs only under the influence of partially digested food in the intestine. This seems to be under neural control, but contraction and emptying of the gall bladder may be observed after complete denervation of the organ and introduction of partially hydrolysed lipid into duodenum. Acid extracts of duodenal mucosa contain a material called cholecystokinin, believed to be a hormone, released by small intestine.\(^1\) “Of particular interest in this connection is the inhibition of gastric secretion which results from the presence of sufficient quantities of lipid in the upper duodenum. Since this inhibition is also manifest in subcutaneously transplanted gastric pouches the effect has been ascribed to a hormone—enterogastrone.”\(^5\) A mention has to be made in this connection to the humoural regulation of intestinal juice; “It has

\(^1\) Abraham White \textit{et al.: op. cit.}, p. 751.
\(^2\) Ibid., p. 751-752.
\(^3\) Ibid., p. 454.
\(^4\) Ibid., p. 754.
\(^5\) Ibid., p. 749.
been established that the presence of chyme in the small intestine calls forth still another hormone......This one has been labelled as enterocrinin and it is thought to be a potent stimulator of the cells which manufacture intestinal juice.”

In has been shown by Grossman that suitably prepared extracts increase the rate of succus-entericus secretion by the jejunum and ileum and also, increase the enzyme component of the secretion.

The table below will furnish the entire picture of the hormonal control of the υṛdhydro amṛśaya and the first upper segment of the grahaṇi.

<table>
<thead>
<tr>
<th>Endocrine glands and hormones</th>
<th>Principal site of action</th>
<th>Principal processes affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Secretin</td>
<td>Pancreas</td>
<td>Secretion of alkali and fluid.</td>
</tr>
<tr>
<td>Pancreozymin</td>
<td>Pancreas</td>
<td>Secretion of digestive enzymes</td>
</tr>
<tr>
<td>Cholocystokinin</td>
<td>Gall bladder</td>
<td>Secretion and emptying</td>
</tr>
<tr>
<td>Enterogastrone</td>
<td>Stomach</td>
<td>Inhibition of motility and secretion</td>
</tr>
<tr>
<td>Gastrin</td>
<td>Stomach</td>
<td>Secretion of acid</td>
</tr>
</tbody>
</table>

From the foregoing experimental observations, cited from more recent advances, it would seem that the vidagdhāhāra from the amṛśaya, which is amla in rasa, stimulates the humoral mechanism, located in the upper segment of adho-amṛśaya and the discharge of accha pitta into this area. The term accha has been interpreted by Cakrapāṇi Datta and Gaṅgadhara Sena as aghana and svaccha, meaning thin and clear respectively. It

4. (a) Cakrapāṇi Datta on Caraka: Cikitsā 15:10.
   (b) Gaṅgadhara Sena on the same.
is obvious that the concept of *acchapitta* includes the gall bladder bile and pancreatic juice, which together have been shown to be responsible for proceeding with further stages of digestion of fats, proteins and carbohydrates in the small intestine. This concept may also include the activities of the intestinal juice, viz., succus-entericus. *Acchapitta* would, therefore represent a total concept; possibly it forms part of the much wider concept—*jātharāgni* (*koṣṭhāgni* or *pācakapitta*).

The facts reviewed above represent but one aspect of the concept of *pācakāgni* or *pācaka pitta* which may have to be studied with the structure known as *grahani* vis-a-vis, *pitta* (*agni−*) *dhāra kāla*, described both by *Suśruta* and *Vāgbhāṭa*. There still remains another and perhaps, a major aspect of this concept, which is of fundamental importance. It relates to the observation made by all the three main authors of *Āyurveda* (*Vṛddhatrayi*) that *antarāgni* contributes to and augments the functions of other *agnis*, which are found elsewhere, in the body. For example, says Caraka, *koṣṭhāgni* is considered to be the leader of all factors concerned with metabolism in the body. They are all derived from it. Their activities or otherwise, are dependent upon an increase or decrease as the case may be of *jātharāgni*.¹ Says Suśruta, “by a dispensation which is unseen (a cause which can not be perceived or explained and which is hidden), *pitta* which is located in an area between *āmāsaya* and *pakvāsaya*, is responsible for the digestion of four kinds of food ingested by living beings and the elimination of the residue in the form of urine and faeces after the completion of the process. Located as it is in its own place (between *āmāsaya* and *pakvāsaya*) it contributes to and augments the functions of other locations of *pittas*, in the performance of actions. This *pitta* is, therefore, spoken of as *pācakāgni*.²

1. अन्तर्य चक्षु सर्वेषां चक्राकामिषयें मेतः।
   तन्मूलणे ति तन्त्रमूलायुक्तिः कयमालमकः॥ (Caraka: *Cikitsā 15:39*).

2. तत्तवाः तत्त्वेतृत्तनां निर्माणं पक्काग्नाय च चिंतृकिंगमयूरं प्रचयति, विशेषतः च द्रूपदा पुष्पमाणि तत्त्वमेव चालस्तत्वावशेषाणि पितामाणानि
   शरीरस्थापात्मनः अनुभवं करोति, तस्मान पिने पावनायतिरिति संहा।
   (Suśruta: *Sūtra 21:10*).
II
PĀKA OF DIFFERENT TYPES OF FOOD

PROTEIN

MOUTH
NO ACTION
Pepsin
HCL
PROTEOLYTIC STOMACH
PEPTONES
GALL BLADDER
ENTEROGENESIS
SECRETIN
SACCHARIN
ENTEROCYTES
ENTHRO GASTRIN
ACIDS INTESTINAL JUICE
AMINO ACIDS
PANCREAS
GASTRIN ENERGO GASTRIN
GASTRIC ACIDS

CARBOHYDRATE

MOUTH
MALTOSE
SUCROSE
LACTOSE
GALL BLADDER
ANIMAL ACTION
MALASE
SUHRASE
LACTASE
SMALL INTESTINE
GLUCOSE
FRUCTOSE
GALACTOSE
PANCREAS
SECRETIN
SACCHARIN

FAT

MOUTH
NO ACTION
LIPASE
GALL BLADDER
MINIMAL ACTION
BILI
SMALL INTESTINE
LIPASE
FATTY ACIDS
GLYCEROL
PANCREAS
SECRETIN
SACCHARIN
Vāgbhaṭa, in his *Aṣṭāṅgahrdaya*¹ and *Sāṃgraha*² that the *pitta*, located between *pakvāsaya* and *āmūsaya*, is *pānceabhautika* and a *drava* inspite of which it performs actions like *anala* or fire, largely due to the predominance of its *tejas* component over the remaining members of the *bhūta pentad* that composes it. This fact is inferred from the way in which it performs *pakādi karmas*, such as the digestion of food and separation of *sāra* from *kīṭa*. In addition, while being located in its own place, it contributes to and augments the functions of other *pittas* elsewhere in the body.

In the chapter “*Doṣādīvījāniya*” of his “*Sāṃgraha*”, Vāgbhaṭa has stated that: “A decrease or an increase of the *dhātus*, occur, according as the *ṭikṣṇātā* or the *mandaṭā* of the aspects of *pācakāgni*, present in the *dhātus*.

“As the flame of the forest fire tends to increase or decrease, according to the quantity (more or less as the case may be) of the *indhana* (available in the proximity), so also is the case with *dhātuparamparā*. *Dravyas* are either *tālya* or *vīśīṭa*, which cause an increase or decrease, as the case may be, of the *dhātus* due to properties potentially inherited by them, as in the case of a seed; “homologous properties of *dravyas* cause sufficient and rapid increase of identical or homologous properties in the *dhātus*. “³

¹ *Aṣṭāṅgahrdaya* 12: 10-12
² *Sāṃgraha* 12: 19: 16-18
Scheme representing the relationship between Pācakāgni and other Pittas and Agnis of the body:

Bhrājaka  Ālocaka  Raṅjaka  Sādhaka
Pitta  Pitta  Pitta  Pitta

Pācakāgni in Koṣṭha
(Producing annarasa)

Rasadhātvagni
Pācakāṁśa
Sthāyirasa

Raktadhātvagni
Pācakāṁśa
Sthāyirakta

Śukradhātvagni
Pācakāṁśa
Sthāyiśukra

Majjādhātvagni
Pācakāṁśa
Sthāyimajjā

Māuśadhātvagni
Pācakāṁśa
Sthāyimāṁsa

Asthidhātvagni
Pācakāṁśa
Sthāyyasthi

Medodhātvagni
Pācakāṁśa
Sthāyimedas.

Again in Aṣṭāṅghar̥daya, he has summed up the earlier Sāṁgraha version quoted above in the following terms:

"Moieties of kāyāgni, which is located in its own place are distributed to and permeate through all the dhātus; a decrease of it makes for an increase of the dhātus, while an increase of it makes for the decrease of the dhātus." ¹

These two references, studied together, with the reference from Caraka Samhita that "Pācakāgni is the leader of all agnis" open out many and far-reaching possibilities. Stated in brief these references envisage a generic and intimate relationship that is stated to exist between the pācaka pitta (agni) located between the āmāsaya and pakvasaya on the one hand.

¹. स्वस्वस्वस्तस्वः कायास्नाति स: धातुं संक्षिप्ताः ।

२. तेन तान्त्रिकविविधाय धातुः प्रकाश्येत् ॥

(Aṣṭāṅghar̥daya: Sūtra 21: 34).
and, the anīṇyas of it present in the dhātus on the other. The increase of the one (quantitative and functional), would appear to determine an increase paripassu of the other. The outcome of an increase or decrease as the case may be of the pācakāṁśas in the dhātus, would appear to make for a decrease or increase of the dhātus respectively, subject of course to the availability or otherwise of indhana, represented by poṣakadravyas. This has been illustrated with the simile of the forest fire and the availability of the fuel in the proximity of the fire. If the nutrition available in the proximity is homologous to the dhātu, which is to be nourished by it, then, the pācakāṁśa aids the normal process of dhātuvṛddhi. If, on the other hand, the poṣakadravyas is not tulya (i.e., it is non-homologous) and is viśiṣṭa, then, dhātu undergo kṣaya—the pācakāṁśas corresponding to forest fire consumes or destroys the dhātus themselves. The analogy, here relates to the scarcity of nutrition homologous to the tissues which in effect can be compared to scarcely vegetated forest where one of the two things may happen viz., the complete consumption of the available trees and the final extinction of the fire itself or if the jungle is densely vegetated the fire would spread throughout and destroy the jungle. The same is the case with pācakāṁśas in the dhātus, where suitable indhana is either deficient or is not available, the pācakāṁśa in the dhātus may burn the dhātus themselves—thus, making for their kṣaya. If on the other hand, there is a deficiency in the dhātus of the pācakāṁśas, then, in this view, there may be a vṛddhi or increase of the dhātus.

The idea underlying the classical description of the behaviour of the pācakāṁśas in the dhātus, in the two circumstances stated above, can be illustrated with the example of the conditions described as atyagni—known also as bhasmaka, and mandōgni corresponding in modern parlance to hyper and hypo-metabolism respectively. The former condition is usually associated with hyper-thyroidism which as is well known is marked by a gradual increase or speeded up cellular respiration. This results in the liberation of so much of heat that the affected subject feels hot all the time. In spite of
voracious eating so much of food is burnt that the body weight may decrease; the patient is constantly under nervous tension, highly irritable by stimuli and yet unable to do sustained work due to the lack of fuel reserve and suffers retarded growth. The symptoms of the analogous tikṣṇāgni in the patient is that he easily digests even a very heavy meal in a very short space of time. Inspite of his all too frequent and heavy meal he continues to suffer from voracious hunger, parched throat, palate and lips and other discomforts due to it. The latter (hypometabolism) corresponding to mandāgni can be illustrated with low thyroxin availability—thyroxin activates cellular oxidative processes throughout the body and an insufficiency of this hormone has been shown to be followed by a reduction in the oxidative reaction,—the B. M. R. may fall to 25%. The other related symptoms of the condition are: the development of myxedema which is characterised by a reduction of mental and bodily vigour, the loss of sex drive, loss of hair and an abnormal thickening of the skin as if much water has been accumulated in it (œdema); it leads to an increase of body weight, since less food is burnt in the cells and much of it it stored as fat.

In our academic discussions at the Post-Graduate Training Centre, two possibilities as regards the statement that the anīsas of pucakāgni are responsible for pacana and dahana karmas in the dhātus, were examined in detail. The first possibility was an outcome of the preliminary experimental observations made by the professor of Kāya cikitsā at Mysore and Jamnagar form 1952 to 1958, on the effect produced by the fresh aqueous extract of the agni(pitta)dharā kalā (corresponding to the mucus membrane of the pylorus and duodenum), in cases of jalodara. The theoretical basis for

2. Dwarakanath et al: A brief report on the preliminary observation on the effect of Agnidharākulasaṇā or a complete aqueous extract of gastric and duodenal mucosa in cases of seīha (œdema) and jalodara (asciti): Antiseptic: July 57.
this experimental observation was the assumption that the *pitta* (agni) *dharā kalā* described by both Suśruta and Vāgbhaṭā, may be the same as the mucus membrane of the pylorus and duodenum, in particular and the small intestine in general; the administration of an aqueous extract of this membrane should replace at least for the time being the deficit of *pācakōgni* the deficiency of which is stated to be the main etiological and pathological feature of *udara-roga*. In a large number of cases of *jalodara*, in which *agnidharākālaśāra*, as the extract is known was administered, a dramatic clearance of the ascitic fluid through increased micturation was observed coinciding with progressive return of the patient to normal, increased appetite and capacity to digest food were observed. This phenomenon, according to some authorities is due probably to the inhibition as may be exercised by some factor present in the macosal extract of the anti-diuretic hormone of the posterior pituitary for it was seen that the pronounced diuresis noted in these cases, when this extract was administered was not observed when the same extract was administered to normal subjects. In addition, the observations made by Dr. F. I. Tovey showed that in advanced cases of liver cirrhosis with ascitis preparatory administration of duodenal extract for 10 to 15 days followed by *‘mersalyl’* diuretic response was noted which could not be observed either with the extract or mersalyl alone. There is, therefore, some basis for the belief that some principle in the extract works by counteracting the high secretion and retention of the anti-diuretic hormone which is known to be present in cases with cirrhosis and thus, make it possible for the mercurial diuretic to act on the kidney. On the basis of the foregoing observa-

1. (a) अष्टांशार्दयाद्वैतानमन्त्यां रोगांशयः पृथक्षेतः: ।
   निष्कृतिः विकायते निरोधायांति हूँ ॥ ( *Caraka: Cikitsā 13:9* ).
   (b) अष्टांशार्दयादः: *Nidāna 12:1*.

2. Frank I. Tovey: Personal communication to Prof. C. Dwarkanath (1957).

3. Mersalyl is a powerful mercurial diuretic.

4. Frank I. Tovey: Ibid.
tions, it was suggested that the *pittadharā kalā* may contain, yet, another factor which may regulate the pituitary control over thyroid and its hormone. If this hypothesis can be sustained by experimental and clinical observations then hyper-metabolism associated with thyrotoxicosis, corresponding to *atyagni* or *bhasmaka* and hypo-metabolism, generally associated with such conditions as Simmond's disease (in which there is a low secretion of thyroid hormone) and hypothyroidism may be explained. *Paripassu*, the correlation between *pācakāgni*, located between *pakvāśaya* and *āmāśaya* and the *pācakānāśas* said to be present in the *dhātus* may also be explained.

An alternative possibility has emerged out of the more recent studies and discussions, the author had with his professor, on the significance and the implications of the doctrine, under reference, *vis-a-vis*, the group of enzymes included under the category of *cathepsins.*

1. Cathepsin—(Greek—Kathepsin, to boil down). Any one of the several proteolytic enzymes present in tissue catalyzing the hydrolysis of high molecular weight proteins to protocoses and peptones, and having an optimum pH, between 4 and 5. It is believed that after death the tissues become acid and cathepsin produces autolysis (*protolysis*). 'Gould' Medical Dictionary, p. 217: 1956 edition.

proteins into amino-acids by hydrolysis and pepsin and trypsin etc., could synthesise proteins in all cells by dehydration. Generally speaking, conditions of mass action and energetics are such that protein synthesis is appreciable only in living cells, while digestion predominates in the gut.\(^1\) Weisz has observed that all cells contain cathepsin enzymes mediating the synthesis of cellular proteins, after death, when reaction-energy and amino-acid raw materials are no longer supplied, the same enzymes decompose the protein which they originally aided to build. Post-mortem disintegration is partly due to this and partly due to bacterial action.\(^2\) & \(^3\)

Although, little is known about the specific mechanism and enzymes which are responsible for the synthesis of body proteins from amino-acids during growth, regeneration of injured tissue and for the maintenance of tissue mass of the adult animal, none-the-less, recent contributions as regards cathepsins point to the fact that the important proteolytic and hydrolytic enzymes of gastro-intestinal tract and the cathepsins of the tissue belong to the same generic and functional group and the possibility of an interrelationship between the two cannot be ruled out. In any event, these contributions when examined in the light of \(p\text{\= a}cak\text{\= a}g\text{\= n}\text{\= i}\) or \(p\text{\= a}cak\text{\= a} p\text{\= i}t\text{\= t}\text{\= a}\) would appear to suggest that cathepsins in the tissues may represent the \(p\text{\= a}cak\text{\= a}n\text{\= i}\text{\= s}\text{\= a}\text{\= s}\), while the \(p\text{\= a}cak\text{\= a} p\text{\= i}t\text{\= t}\text{\= a}\) itself continues to be located in the intestine. \(A\text{\= s}{\text{\= t}}\text{\= a}\text{\= n}\text{\= g}\text{\= a}\text{\= s}\text{\= a}\text{\= y}\text{\= r}\text{\= a}\text{\= h}\text{\= a}\text{\= s}'s\) citation, in this regard, it is considered, can be explained having regard to cathepsins in the tissues and the lack of \(i\text{\= n}\text{\= d}\text{\= h}a\text{\= n}\text{\= a}\) (amino-acid raw material) which may lead to the breakdown or destruction of \(d\text{\= h}a\text{\= t}\text{\= u}\text{\= s}\) by hydrolysis.

The foregoing represent an over-all picture of the concept of \(p\text{\= a}cak\text{\= a}g\text{\= n}\text{\= i}\) (pitta). As mentioned in pages 43–44 this concept comprehends \(j\text{\= a}\text{\= t}\text{\= h}\text{\= a}\text{\= r}\text{\= o}g\text{\= n}\text{\= i}\) and \(b\text{\= h}\text{\= u}\text{\= t}\text{\= o}g\text{\= n}\text{\= i}\) \(v\text{\= y}\text{\= a}\text{\= p}\text{\= a}\text{\= r}\text{\= a}\), which are important, in the context of this thesis, for according to Caraka, the criterion of efficient functioning of \(a\text{\= g}n\text{\= i}\) is to be.

---

2. Ibid. p 61.
4 A. A.
determined by *jarañāṣakti* or the capacity of the human organism to digest the food ingested in fourfold manner. This has reference to digestive events which take place from the time the food enters the mouth to the time the *sūra* or the nutrient fraction of it is separated from the *kiṭṭa* or the undigested residue. These events, in the parlance of modern physiology and biochemistry are salivary, gastric and intestinal digestion. It is not as though these three aspects of digestion are different and unrelated events. They form part of a process represented by distinct phases—each phase contributing to and determining the events of the next succeeding phase. The foregoing are in keeping with the description of *āhārapacanakriya* in the Āyurvedic classics, which, by the way, derive experimental and clinical confirmation from modern developments in related fields of sciences, as can be seen in what follows.

Anatomical considerations:

According to Āyurveda, the *mahāsrotas*, corresponding to the alimentary tract, is immediately concerned with the process of alimentation (ingestion and egestion). *Mahāsrotas* is also spoken of as *koṣṭha*. It may be noted here, that the term *koṣṭha* has several synonyms, such as *mahāsrotas* (the great channel), *śarīra madhya* (the middle portion of the body or trunk), *mahānimna* (the great cavity), *āmapakvāśaya* (the organ of preliminary and final aspects of digestion) and *ābhyanantarārogamārga* (internal pathway of disease). All these terms pertain to the trunk with its great cavity, partitioned into two parts, the *uroghā* or the thoracic cavity and the *udaraguhā* or the abdominal cavity. In another sense, the *āśayas* contained in them, such as the *nābhī* (umblicus?),

2. कौशः पुनरथयो भातीत: शरीरवयः महानिन्न्त भामपः सद्यवेति पराय-श्वेत: । स रोगमार्गः अष्टवंसः । Caraka: Śūtra 11:48.
3. It is not clear from the available texts—if *nābhī* represents umblicus or it is an anatomical landmark to indicate an organ or organs contained in the corresponding area of the abdomen. In the view of the author *nābhī* when treated as an
III
DIFFERENT PARTS OF MAHASROTAS

[Diagram showing various parts of the digestive system with labels in Sanskrit: Annanalika, Urdhva-amaśaya, Yakṣṭ, Pittāśaya, Grahaṇī, Agnyāśaya, Adhāmaśaya, Pakvaśaya, Purṣadharā, Uttara Guda, Adinara Guda]
VI
GRAHAṆĪ AND AGNYĀŚAYA (DISSECTED)

RAKTAVĀHA SROTAS
PITTAṆĀHA SROTAS.

AGNYĀŚAYA
GRAHAṆĪ
AGNYĀŚAYA RASAVAH SROTAS
PITTAṆĀHASROTAS
AMPULLA OF VATER
<table>
<thead>
<tr>
<th>Organ</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>hrdaya (heart)</td>
<td>pitha (spleen), vinegar (kidneys), vasti (bladder), purishadharana (sigmoid colon, known also as pelvic colon)</td>
</tr>
<tr>
<td>amsaaya (stomach and intestine)</td>
<td>uttaraguda (upper segment of the rectum), adhoguda (the lower segment of the rectum including the anus), kshudrantra (small intestine), sthulantra (large intestine) and vapaavahana (omentum).</td>
</tr>
</tbody>
</table>

It would seem from the discussion above that there is a mix up in the enumeration of the anatomical and functional parts, especially of the gastro-intestinal tract, i.e., koṣṭhāṅgas, which when properly classified will work up as follows:

Anatomical divisions of mahāsrotas: Āmaśaya (stomach), Kṣudrāṅtra (small intestine), unḍuka (ileo-cecum), sthulāṅtra (large intestine), uttaraguda (upper segment of the rectum) and adhoguda (lower segment of the rectum with anus).

Physiological or functional divisions of mahāsrotas: Āmaśaya with its two parts viz. ārdhva and adha-āmaśaya (also known as pacyamānāśaya) (stomach and small intestine including duodenum), pakvāśaya (large intestine) and purishadharana (pelvic flexure ending in anus).

According to Suṣruta, the following constitute the koṣṭha: the āmaśaya, pakvāśaya, agnyāśaya, mātrāśaya, raktaśaya, hrdaya, organ may correspond to agnyāśaya, interpreted as the pancreas. Pancreas, as we know today, plays two roles viz. digestive and metabolic—the former relates to important enzymes it contributes to the digestion of proteins, carbohydrates and fats in the small intestine, and the latter, to sugar metabolism. An important organ like pancreas lying immediately above nābhi cannot have been missed by the ancient authors of Ayurveda who have mentioned the liver, spleen, kidneys bladder etc.

1. "पंचदशोधकान्ति तथा—नासिषाच, हुद्वच च, कोषम च, वकस्च, प्रोश्चो च, शूकृच च, वरितस, पुरुषनाधारस, आमाशयस, पक्काशयस, उष्णगुण च, आयुगुण च त्राग्निः च स्वजात्रस च, वपावहने चैति। (Caraka: Sūtra 7:10).

2. "पितामहेन्द्रमाधवः इति आमाशायसत्वादभागः। केशभुवतिव आमाशयः इति आमाशायसत्वादभागः।। (Cakrapāṇi on Caraka: Sūtra 20:8)"
unduka, phuphusa. This description would appear to be purely functional. It may be noted here that these organs constitute the viscera of the abdomen and thorax. According to this view, functional divisions of mahāsrotas will be as follows—āmāsaya (stomach), pakvāsaya (large intestine) and pacyamūnāsaya (between āmāsaya and pakvāsaya corresponding to kṣudrāntra or small intestine). The latter is also known as grahani. Suśruta has very clearly stated that āmāsaya is the seat of kapha, whereas, Caraka and Vāgbhaṭa have described āmāsaya, not only as the seat of kapha but also as that of pitta. It is probably with a view to clarifying the position that Cakrapāṇi differentiated āmāsaya into two functional parts, viz., ārdha and adha-āmāsaya, which later, he has described as pacyamūnāsaya.

It is of interest to note that of the fifteen kōṣṭhāṅgas described by Caraka and of the eight by Suśruta, phupphusa (lung), āmāsaya in its two parts—ārdha and adha, the latter correspond to kṣudrāntra, nābhi (pancreas?), vṛkka (kidney), vasti (bladder), pakvāsaya (large intestine), purisūḍhāra (pelvic colon), uttaraguda and adhoguda (upper and lower segments of rectum) are seen to be developed from the “primary alimentary tube” laid down in the embryo, as will be seen from the following:

“The embryonic digestive tube is essentially a blind tube of entoderm as it is first formed. The muscular layer which surrounds the tube is formed secondarily from splanchnic mesoderm. An oral cavity (or stomodeum), which will later become the mouth, invaginates from the anterior end of the embryo to meet the anterior end of the entodermal tube. The surface ectoderm is pulled in with this invagination and lines the anterior part of the oral cavity. In the same way a posterior ectodermal invagination pushes in to meet the

1. व्याश्यमामामधोपक्षामुक्तयोरविशेषम।
   हृद्युक्कः पुष्पस्वयं भ्रोष्टं श्यामयिषै। || Suśruta : Cikitsā 2 : 12.

2. (a) Suśruta : Uttaratantra 40 : 169.
   (b) Suśruta : Sūtra 21 : 10.

3. मात्राद्वारं पित्तमहां नरकेरिदिवारपथवेषं।
   आमाशये सम्बन्धितं प्रक्रियादिवारपथवेषं। || Suśruta : Sūtra 21 : 13.

IV

EMBRYONIC DEVELOPMENT OF MAHASROTAS

ORAL CAVITY

PHARYNX

GESOPHASUS

LUNGS

STOMACH

DUODENUM

LIVER

GALL BLADDER

VENTRAL PANCREAS

DORSAL

SMALL INTESTINE

URINARY BLADDER

CLOACA
DIFFERENT PARTS OF MAHĀSROTAS WITH THEIR SPECIALISED FUNCTIONS

1. URDHVA-ĀMĀŚAYA
   (a) Madhura Auasthāpāka
   (b) Amla avasthāpāka
   Vidagdha Pāka

2. ADHĀMĀŚAYA, KṢUDRĀNTRA
   ON PACYAMĀṆĀŚAYA
   Amlaavasthāpāka (Contd.)
   (Annarasaśoḍaṇa)

3. PAKVĀŚAYA ON
   STHŪLĀNTRA
   Kaṭubhāva
   (Pinḍikaraṇa and Purtṣotpatti)
entodermal tube near its caudal end. The caudal end of the entodermal tube forms a common posterior opening called the cloaca. In mature animals that retains the cloaca, such as birds and reptiles, the urinary and reproductive ducts open into this common opening. The human embryonic cloaca soon divides to form the rectum dorsally and urinary bladder and uro-genital sinus ventrally. The urethral and anal canals are soon established and the cloaca disappears. The anal canal by virtue of its origin is lined with an epithelium of ectodermal origin.

The pharynx region has been discussed from the standpoint of its derivatives. Certainly the structure derived from the pharyngeal arches and gill clefts constitute a most interesting part of the history of embryonic development.

The pharynx itself is a soft tube at the back of the mouth and leading to the oesophagus. The tonsil lie embedded in its lateral walls. The oesophagus is at first a short tube leading to a slight enlargement in the digestive tube—the stomach. During the fifth week the stomach enlarges and begins to assume the shape of the mature organ. It is originally located rather high in the body cavity, but during the sixth and seventh weeks the body elongates and the stomach appears closer to its permanent location. The oesophagus elongates at this time also.

"The liver arises as a diverticulum below the stomach from the region of the intestine destined to become the duodenum. The entodermal diverticulum grows into a thick walled visicle from which the liver tubules and hepatic ducts arise. The entodermal ducts grow into splanchnic mesoderm which provides the connective tissue of the liver and its capsule. The posterior portion of the diverticulum gives rise to the gall bladder and cystic duct. The fetal circulatory plan provides that food-laden blood from the placenta shall pass through the liver. The liver becomes proportionately very large in the foetus, accounting for around ten per cent of the body weight in the fetus of nine weeks. The liver is still large at birth but represents approximately only five per cent of the body weight, while in the adult the proportional weight
shrinks to two or three per cent. The liver eventually becomes located below the diaphragm largely on the right side. The stomach lies to the left and is partially covered by the liver.

"Two diverticula from the primitive entodermal tube give rise to the pancreas. One evagination from the dorsal wall becomes the dorsal pancreas and the other evagination from the dorsal wall becomes the ventral pancreas. The duct of the ventral pancreas is associated with the common bile duct. The lengthening of the bile duct and the growth and flexure of the duodenum bring the ventral pancreas to a position directly below the base of the dorsal pancreas, and the two parts fuse in the embryo in seven weeks. The greater part of the mature gland is derived from the dorsal pancreas; and the ventral pancreas forms only the lower basal portion. The dorsal pancreatic duct joins the ventral duct in a manner to retain the base of the ventral duct and its primitive connection with the bile duct. The single duct of the mature pancreas, then joins the common bile duct in the ampulla of Vater and empties the pancreatic fluid into the duodenum along with that of liver.

"The intestine at first is a straight tube extending from the stomach to the cloaca. It is held in place by a connective tissue sheath called the mesentery. Anteriorly in the duodenal region there is both a dorsal and a ventral mesentery dividing the body cavity or ceolom into right and left portions. Posteriorly the right and left ceolom form a common cavity. The ceolom, itself arises as a narrow cavity between layers of somatic and splanchnic mesoderm. The transverse septum which latter becomes a part of the diaphragm, separates the plural and cardiac cavities from the abdominal cavity. The lungs and heart occupy the thoracic cavity, and the intestine comes to lie in the abdominal cavity.

The intestine lengthens, forms a loop, and then grows rapidly to form so many coils that the small abdominal cavity apparently cannot contain them. A loop of intestine then pushes out into the umbilical cord at about five weeks. The abdominal cavity continues to enlarge and in the embryo of ten weeks the extended portion is pulled back through the
umbilical ring. The caudal part of the intestine is actually of smaller diameter than the small intestine in the early embryo. At a latter stage in its development as in the fetus of five months, it begins to resemble the large intestine of the new born infant. ¹

“The area immediately posterior to the pharyngeal pouches give rise to a laryngotracheal ridge on its ventral surface in very young embryos. The primordial outgrowth of the larynx and trachea then arises as a bud from the primitive gut in this region. The tracheal bud elongates and branches to form bronchial buds. The whole structure is bilobed and is commonly called the lung bud. The bronchial buds by continued branching from the entire respiratory tree, the bronchial tubes, bronchioles, and alveoli. The bronchial buds are entodermal but they grow into a mass of mesenchyme from which will arise the supporting tissues of the lungs and bronchial tree; only the epithelial lining of the passage ways remain entodermal in origin. The lung buds grow out dorsally and on either side of the heart into that portion of the body cavity which will later become the pleural cavities. The lungs are small at birth since they are never fully expanded with air. While respiratory movements may take place before birth, the lungs are not functional until the new-born infant takes its first grasp of air. The lung tissue may not become completely inflated until several days after birth.”²

AVASTHĀ PĀKA

Avasthāpāka refers to changes, which āhāradrayas undergo in the kośṭha. Two phases of it have been described viz. prapāka and vipāka. Prapāka has been defined as prathama-pāka or the first outcome of pāka or chemical action.³ Vipāka has been defined as the outcome of the action of jātharāgni on the āhāra substrate—the resultant of the previous.

³. प्रपाकतः इति प्रथमपाकतः | Cakrapāṇi on Caraka.
pāka, i.e. prathama pāka, which is to be judged from the point of view of the taste of the end products of gastrointestinal digestion viz., madhura (sweet), amla (sour) and katu (acrid or pungent).

It has been stated that dravya is the basis for rasa, guna, virya, vipāka etc., and therefore, it is of fundamental importance. By dravya is meant the anus or atoms of the bhūta pentad. The main mode of the formation of compound substances is stated to proceed as follows: the adhiṣṭhāna or basis for the formation of a compound is prthvi paramāṇu, ap serves as the yoni or medium and, agni, pavana and nabhas, align themselves (in varying numbers and modes) in the compound.

It was noted earlier at page 9 that prthvi, ap, tejas and vāyu, according to Nyāya-vaiṣeṣika system have anuṭva, i.e., they are finite or atomic. Ākāśa, in this view, is vibhu (continuum or infinite). They are kāraṇa dravyas. But, in the view of sāmkhyas, paramāṇus of prthvi, ap, tejas, vāyu and nabhas are all kārya dravyas and they are finite. This is also, the case with nabhas which, at the level of tāmasāhamkāra, has been stated to be vibhu. In the Nyāya-vaiṣeṣika sense, the anus can neither be created, nor destroyed or altered. They are eternal. In this sense, the anus of Vaiṣeṣikas are neplus-altra.

It is the number in which different kinds of bhūta paramāṇus combine and their spatial relationship with each other, that confers on the compound thus formed, its characteristic rasa

1. आठरेणाशिनिना योगाच्छुदेति रसान्तरम्।
   रसान्तपरिणामस्ते स विशाल हि स्युतः॥ अष्टाङ्गहर्दयस् सूत्र 9:20.
2. (a) द्रव्यमेव रसादोषसंयोजिते हि तदाध्ययः।
   अष्टाङ्गहर्दयस् सूत्र 9:1.
3. पंचसूता मूलकं तत् हस्तमिथिष्ठाय जावते।
   अन्योग्यश्चित्तिनिपन्नमसं समबायतः॥
   तत्त्वादिविवेकःḥ
4. The paramāṇus, in their turn, are stated to be composed by more elementary units of substances spoken of as tannātrīs which are five in number: viz. sabda, sparśa, rūpa, rasa and
(taste), **virya**¹ (mode of energy viz., *uṣṇa* or kinetic and *ṣīta* or potential), **vipāka** (the outcome of the chemical changes to which the compound is subjected in the body, described in the terms of *rasa*), **guna** (quality) and **prabhāva**² (specific and characteristic property which may not be described or explained in terms of *rasa*, *guna*, *virya*, *vipāka*).

Compounds which are formed with the five kinds of *kāraṇadravyas* are **anītya** (transient); their qualities and properties are also transitory—they last as long as the combination lasts. **Aṇus**, contained in a compound belonging to the same species, combining in the same number but in different spatial relationships may appear apparently to be identical in *rasa*, *guna*, *virya* and *vipāka*, but their actions in effect may be different and not be explicable from the point of view of *rasa*, *guna*, *virya*, *vipāka*. This peculiar and what to the ancient authorities appeared to be an unseen³ and inconceivable power (*acintya śakti*) has been explained by Professor C. Dwarakanath as follows: “Pressing the analogy of modern physico-chemical concept, isomerism, he explained the observed difference in the functional behaviour of two substances, which have an identical atomic structure but the atoms whereof are spatially aligned differently exhibiting distinctly different properties. He illustrated this difference with the example of ammonium cyenate and urea, and also with the common place example or the difference in the meaning and the

---

1. (a) श्रीलोण्मितिवीर्य तु कित्यते वैन या किया।
   नावीय तित्तवे लिचलसव चीर्यक्तता किया। *Caraka* : *Sūtra* 26 : 65.

2. (a) श्रीलोण्मितिवीर्य तु कित्यते वैन या किया।
   *Aṣṭāṅgahṛdaya* : *Sūtra* 1 : 17, & *Aṣṭāṅgasāṅgraha* : *Sūtra*.

3. (a) रसादिवस्तम्य वस्त्रिक्ष सिद्ध तदप्रतीक्षम्। *Aṣṭāṅgahṛdaya* : *Sūtra* 9 : 26.

---

2. (b) *Caraka* : *Sūtra* 26 : 67.
   (c) *Suśruta* : *Sūtra* 40 : 19–21.
   (d) *Aṣṭ. Saṅgraha* : *Sūtra* 17.

3. प्रभावोद्वितय उक्ततेः। *Caraka* : *Sūtra* 26 : 70.
significance of the terms 'God and Dog,' 'Pot and Top,' 'Karma and Amrak' etc." 1

The digression into the nature of dravya became necessary in view of the description of the products which represent the final outcome of the jōtharāgni pūka, in terms of their rasa or taste. The only important point to note here is the fact that changes in rasa are directly correlated to changes in the composition of drayyas, brought about under the influence of jōtharāgni.

Thus, the ṛhāra pūka in the kośha may be stated to proceed in the following order—

(1) The presence of food in the mouth is followed by the perception of its taste, under the influence of bodhaka kapha. This kapha is stated to be present in the tongue 1. Madhurabhāva and it enables the perception of taste. 2 The implication of bodhaka kapha needs an examination. It is obviously a fluid present in the mouth in which food substances are dissolved or ionised; for a substance which

1. "According to this concept, substances may possess identity of chemical composition and yet exhibit different properties. The cases of urea—\( C<\text{NH}_2\text{NH}_2 \) and ammonium cyanate—\( \text{NH}_4\text{CNO} \)
can be cited as examples of isomerides. Both these compounds have the same molecular formula \( \text{N}_2\text{H}_4\text{CO} \) and yet they are different in their properties. The same is also the case with ethyl ether—\( (\text{C}_2\text{H}_5)_2\text{O} \) and butyl alcohol—\( \text{C}_4\text{H}_9\text{OH} \). From these, it will be seen that the chemical composition which largely determines the secondary qualities of substances, such as rasa, gūṇa, vīrya and viśāka does not, therefore, uniquely determine a chemical compound. The examples of ‘isomerides’ effectively illustrate the concept of prabhāva."


2. (a) विज्ञानसूक्तिकथायो विज्ञानेन्द्रियस्य सौम्यतावश सम्मुदायनां स्वस्ते।


(b) रसबोधनात्। वोषकां रसनास्वायो

Ayāṅgāryādaya : Sutra 12 : 17.
<table>
<thead>
<tr>
<th>Avastha Paka</th>
<th>Name of the cavity where secreted</th>
<th>Glands or cells</th>
<th>Vata vyāpāra (Nervous control)</th>
<th>Activated by</th>
<th>Medium for work</th>
<th>Srava nāma (Name of the secretion)</th>
<th>Substrate</th>
<th>Paripāla (End-Products)</th>
<th>Vipaka</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Madhura upto Ḫurdhavābhīgī (Upper portion or fundus of the stomach)</td>
<td>Mukha (Buccal cavity)</td>
<td>1 Sub-maxillary</td>
<td>Aṁśas (Portion of) prāṇa viz, 1. A branch from chordotympanic (Parasympathetic) 2. Sympathetic from the plexuses around facial artery.</td>
<td>1 Darśāna āśādāna and aghraṣa, etc. of food 2 Mānasika or Psychic</td>
<td>16.0 pH 245°C Temp.</td>
<td>1 Bodhaka Kapha (Mucin) 2 Pāṇika Fīta (Phyto or salt-vary amylase)</td>
<td>Cooked and uncooked starch</td>
<td>Soluble starch</td>
<td></td>
<td>Vidagdha or arha-pakva</td>
</tr>
<tr>
<td>Madhura in the upper portion (Fundus) and Aṇa in the body and lower portion (Pylorus), upto the end of Adhotmāṣāya (small intestine)</td>
<td>Ḫurdhavābhīgī (Stomach)</td>
<td>1 Peptic 2 Oxynitic 3 Mucoid 4 Surface 5 Castle cells</td>
<td>Aṁśas (portion) of Samāna vāyu viz., 1 sympathetic from coeliac ganglion and 2 Para-sympathetic from vagus (10th cranial) nerve</td>
<td>1 Reflex phase due to a, Psychic effect b, Distention of the stomach 2 Mechanical stimulation by the presence of food 3 Humoral phase 4 Presence of digestive products in duodenum 5 Chemically (Gas-trin)</td>
<td>14-5 pH 237°C Temp. 3 Presence of Hel helps the function of pepsin</td>
<td>1 Kaledaka kapha 2 Raṣjakapitta 3 Pāṇakapitta a Hel (from oxynic cells) b Renin c Lipase d Pepsin (from peptic cells)</td>
<td>Ingested diet</td>
<td>cane sugar and other sugar, Soluble caseinogen, Fat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aṁlapāka</td>
<td>Grahaṇi (Duodenum)</td>
<td>Agnīyāṣāya or Pancreas</td>
<td>Aṁśas (Portion) of Samāna vāyu viz., Sympathetic from Coeliac ganglion 2 Parasympathetic from Vagus, 3 Intrinsinc nerves (Peripheral Brain)</td>
<td>1 Reflex from the entrance of acidified chyme 2 Humoral a Secretin b Pancreozymin 3 Neural</td>
<td>16 pH 2 Trypsin is activated by entrokinase</td>
<td>Pāṇakapitta viz. 1 Trypsin (Proteinase) 2 Chemo Trypsin and carboxy peptidase 3 Amylase 4 Lipase (Stear sin) 5 Milk curding enzyme</td>
<td></td>
<td>1 Protein 2 Elastin 3 Proteoses and Peptones on starch, first acted by Hel Fat Milk</td>
<td></td>
<td>Amla</td>
</tr>
</tbody>
</table>

<p>| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th>Avasthā Pāka</th>
<th>Name of the mūya-vaya where secreted</th>
<th>Glands or cells</th>
<th>Vāta vyāpāra (Nervous control)</th>
<th>Activated by</th>
<th>Medium for work</th>
<th>Śrēva nāma (Name of the secretion)</th>
<th>Substrate</th>
<th>Periṅāma (End-products)</th>
<th>Vipāka</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahlapāka (contd)</td>
<td>Kaṇḍrānta (Small Intestine)</td>
<td>Crypts of Liver-kūna</td>
<td>Adhās (Portions) of Samāna Vāyu. Viz., 1. Extrinsics A. Sympathetic B. Parasympathetic 2. Intrinsic A. Auerbach’s plexus B. Minner’s plexus (Which form the Perifical Brain)</td>
<td>1. Neural 2. Chemical like secretin. 3. Mechanical by presence of food and peristalsis</td>
<td></td>
<td>Pāṇkapītā viz.</td>
<td></td>
<td>Cane sugar or Sucrose Maltose and Dextrase Lactose Peptones Proteoses Fat</td>
<td>Glucose and Fructose</td>
<td>Madhura</td>
</tr>
<tr>
<td>Kaṇḍrānta (Small Intestine)</td>
<td></td>
<td>From Bacteria</td>
<td>Adhās (portion) of Apāna Vāyu viz., 1. Extrinsics A. Sympathetic B. Parasympathetic 2. Intrinsic A. Menners plexus B. Auerbach’s (But nerves are not responsible for Bacteriāl enzyme secretion)</td>
<td>1. Presence of food 2. Peristalsis</td>
<td>6, 9 to 7, 2 pH</td>
<td>Various Bacterial enzymes</td>
<td>Carbohydrate Cellulose Fat Proteins Alanin</td>
<td>Lactic acid-carbonic acid Sulphide and Butyric acid, Carbonic acid+Methane Valeric and Butyric acid Peptones and Amino acids Ammonia, Indol and Skatol Ethylamine</td>
<td>Amla Kaṭu</td>
<td></td>
</tr>
</tbody>
</table>

Foot Note: — * This Substance together with Antheleone and Villicrinin are found in the gastro-intestinal tract; but they are stated to be not well defined entities. West & Todd: Text Book of Biochemistry: 1955 edn: Page 1293.
can neither dissolve nor ionize cannot invoke the sensation of taste. It is obvious that, since bodhaka kapha is a variety of kapha, it should possess at least some of the invariable qualities of this doṣa viz. the āpyaguna. In addition, it should have the capacity to permeate through food and loosen the component particles, so that, they may go into solution.¹ The concept of bodhaka parallels the description of saliva, secreted by the salivary glands, especially paroteids, which abound in serous cells and which produces a thin watery secretion. It is of course, understood that, the mucus cells, especially, of the sublingual glands, provide a thick substance. These glands, also, provide the enzyme-ptylin. Thus, saliva, the analogue of bodhaka in Ayurveda, performs the following functions²—(i) it dissolves some substances, thus making taste possible; (ii) the enzyme content in it begins to act and (iii) it lubricates the food, so that it may be swallowed. The outcome of the action of bodhaka on food, especially that fraction of its composition which is essentially madhura in taste, is seen to be continued and completed in the upper portion of ʻurdhva ūmāṣaya described in the modern anatomy as the fundus of the stomach. By now, the insoluble madhura portion of food becomes sufficiently soluble and mixed up with the frothy kledaka

1. भाकालों रसादिमेदानिविन्नु बिहारसं गुणाति।
   Ayurvedasūtra: Praśna 1-81.
   भाकालों रसं विहारविविवित्यवत् गुणाति। वुक्तान्विभत्तं च करोति इतथः।
   Yogāñnandanaśthā on the above.

2. It is seen that, even as early as the fifteenth century when Yogāñnandanaśthā is said to have written his commentary on Ayurveda Sūtra, tāla in the mouth, corresponding to bodhaka kapha (saliva), described by earlier authorities, perform two functions viz., it enables taste perception and splits the food in the mouth. The former function was attributed by him to the āph or watery component of tāla and, the latter, to the potential tejas from which āph has been stated, by some of the Dārśanika philosophies. Whatever the philosophical interpretation of this phenomenon may be, the fact remains that it was recognised by the medieval Ayurvedic authorities that saliva performs both the functions described above.
kapha (mucin) present in the ārdhva āmāsaya. It is obvious that this fraction of the dhūra dhavaya, which is meant to undergo amlabhāva remains in this stage still to be digested and it also becomes mixed up with kledaka which latter acts upon it and performs klinna (that is to say, it permeates through and loosens the particles.) The madhura bhāva of the avasthāpāka is now brought to an end, synchronising with the commencement of the second avasthā, namely, amlabhāva.

The entire movement of food from mouth to āmāsaya is due to the action of prānavāyu. According to Caraka,1 Suśruta2 and Vāgbhata,3 functions of prānavāyu include the secretion and spitting of saliva (śthivana), eructation (udgāra) and deglutition (annapraveṣa). The act of secretion of saliva, according to modern physiology, is due to the stimulation of sympathetic and parasympathetic.

The term annapraveṣa, translated verbatim, means the entry of food into āmāsaya or, in other words, its propulsion into this organ, under the influence of prānavāyu. Stated in terms of modern physiology, actions ascribed to prānavāyu, which is stated to be located in the mūrdhā or head, resemble those of the autonomous nervous system in general, and parasympathetic in particular, even though the ancient Āyurvedic description includes some functions of the peripheral nervous system also. The deglutition centre is seen to be situated in the medulla-oblangata. These facts are in keeping with the description of prānavāyu and its location in the mūrdhā or head.4

The phenomenon of amlabhāva was discussed earlier in pages 39–41. This aspect of the avasthāpāka, can be seen from contributions made by modern physiology,

2. Amla bhāva to correspond to peptic digestion of proteins and it does not appear to have anything to do with the digestion of substances which possess madhura

---

2. सोद्रज्ञ प्रवेशयथान्त : प्राणिवायवर्द्धेन | Suśruta : Nidāna 1 : 13.
3. वर्षकेणलोके विहिटं देवसिद्धसिद्धवत् | Śrīvatsacaturāraśārabāharaṇa

4. (a) प्रभावण मूर्गीः | Astīrghārydaya : Sūtra 12 : 4.
   (b) स्वार्ण प्रभावण मूर्गीः | Caraka : Cikitsā 28 : 6.
rasa viz. the carbohydrates. On the other hand, the insoluble proteins are digested, predominantly by the amla type of srāva, that occurs here, rendering this substance viz., proteins, soluble. At this stage, the food substances remain partly digested and partly undigested i.e., their digestion is still incomplete. This aspect was described earlier at page 38. It would appear that the amlabhāva of the avasthāpāka, is further continued under the influence of jātharāgni, resulting in the final breakdown—bhinnasamghāta—of various constituents of the food, which are meant to be absorbed from the āmāśaya into the system. Caraka says “The food that has reached āmāśaya or the seat of digestion, being fully digested, is distributed in its changed form to the entire body by means of dhamanis. ¹ The term ‘dhamani’ in this context obviously refers to blood vessels and lymphatics in the villi of the small intestine, through which the absorbed food is transported to the liver and cysterna chyle respectively, from whence, it is distributed to all the parts of the body through the circulating channels for providing nourishment to tissues.

Samāna Vāyu—A reference to samāna vāyu is necessary here, as this vāyu is stated to reside in and exercise control over intestinal digestion. According to Vāgbhaṭa, samāna vāyu is present near agni and it always moves throughout the kośṭha. In addition, it is stated to enable the reception, digestion, separation and propulsion of food. ² Functions similar to those of samāna vāyu are seen to be performed, for the most part, by the intrinsic nerves of the stomach and intestine. It has been shown by modern researches that numerous nerves are found in the walls of the stomach, intestine and oesophagus. Some of them have been shown to be the terminal fibres of the extrinsic nerves of these organs. These connect the gastro-intestinal tract anatomically and functionally with the brain and spinal cord. In addition to

¹. आमाशयवत: पाकमाहारः प्राप्य केवलम् ।
पत्वः सवैश्यं पश्चादमनोपिति: प्रपन्ते II Caraka : Vīmāna 2 : 24.]
². समानोदितसमाप्तं: कोष्ठेऽ चरति सर्वं ।
अनं गुरृतं पचति विवेशवत्तं सुकृति II Agnighataka : Sutra 12 : 8.
the above, it has been shown that these organs also have complete neurones especially beneath the mucosa and between the circular and longitudinal muscular layers. These neurones are shown to possess short dendrites and axons contained almost entirely within the walls of the tract. They make up a diffuse mesh-work of nerve tissue and serve as a kind of decentralised or "peripheral brain" by which the intestinal movements are controlled independent of the spinal cord and brain. These findings are based on experiments involving the severence of all the extrinsic neural connections of the stomach and intestines which slowed the digestive movements—peristalsis—though modified to some extent, still continue. In other words, as shown by Bayliss and Starling, the section of the sympathetic and parasympathetic does not abolish the peristaltic movements but the application of cocaine to the lower wall results in the abolition of the intestinal movements. Thus, while enteric plexuses function in maintaining the rhythmic peristaltic movement along the digestive tract, the central nerves viz., the parasympathetic and sympathetic exert a regulating effect on gastro-intestinal peristalsis which is of utmost importance to the process of digestion, in the same way as the description of the influence exerted by samāna on the process of digestion, as described by Ayurveda.

Peristaltic waves mechanically break-up intestinal contents which are well macerated and thoroughly mixed up with the juice of the pancreas, liver and intestine. Further, as parts of semiliquid mass are brought into contact with the absorbing surfaces of the intestinal wall, absorption of the digested portion of the nutrition takes place. The above description will provide an explanation of the function of samāna vāyu viz. annapacana or enabling the digestion of food, annavivecana or the separation of the nutrient fraction from the fraction, which is still to be digested or if undigested the expulsion or muhcana of this fraction to the subsequent segments of the

intestine where by churning movements followed by the peristaltic waves the process of digestion is continued without interruption, until, the finally digested residue is passed down in a semi-solid state into pakvāsaya.

The pāka, that takes place in the pacyamōnāsaya and which results in the separation of the sūrabhāga and its absorption into the body, and the propulsion of the kīṭabhāga, into the pakvāsaya, for further pākas is due to jāṭharūgni vyāpāra, and this description would appear to be a generalisation of the action or function of several substances, essentially conforming to the root meaning and definition of the term pitta viz., pacana and pariṇamana. Substances referred to above, would appear to include acchapitta—a total concept—which comprises of several digestive secretions viz., liver-bile, pancreatic juice and intestinal secretions such as, succus intericus etc. Details of various constituents of the jāṭharūgni the substrate on which they act and the final outcome of the several reactions are furnished in the table at page 66a.

Further digestive events which take place in the bhādantra or pakvāsaya, as it is also known, has been succintly described by Caraka in the following terms: “The

3. Kaṭubhāva material passed from ōmāsaya, having reached the pakvāsaya, being dried up by heat, is rendered into lumps. During this process, pungent (kaṭu) vāyu is produced.¹ Commenting on the above, Cakrapāṇi Datta has stated that by “paripīṇḍita pakvāsya” is meant the change to the form of lumps, in the process of formation of mala. By “vāyuḥ syot kaṭubhāvatāḥ” is meant, during the process of formation of lumps, pungent vāyu is produced.²

These observations find corroboration from modern researches, relating to the mode of formation of faeces, according

¹. पक्षेण तु प्रातश्च शोभयमाणस्य वडिनाः।
   परिपीिंर्याति पक्षं वायुः स्थालुक्षभावतः। | Caraka : Cikitsa 15 : 11.

². परिपीिंर्याति पक्षं भावति परिपीिंर्याति पक्षं मलपत्तयो पक्षं, वायुः स्थालुक्षभावतः।
   (Cakrapāṇi on above.)
to which during the passage of intestinal contents through the small intestine the products of digestion along with many other compounds such as vitamins and mineral salts, are absorbed. As the contents reach large intestine, the process of absorption with the exception of water is normally completed. In the large intestine more water and salts are absorbed and the remaining material, now converted into faeces, leave the body. The consistency of the faeces depends to a large extent on the degree to which the process of absorption of water has been carried. It is to be noted that the consistency of the faeces also depends upon such factors as gastro-intestinal mobility and the nature of the diet ingested. Slight variation in diet apparently has little or no effect on the nature of the faeces. However, an exclusively vegetable diet, generally yields a larger bulk and softer consistency of faeces while a meat-diet produces harder faeces and less in quantity. The large intestine is the nidus of a large bacterial flora of which *Escherichia coli* is ordinarily the predominant organism. These micro-organisms are shown to be involved in the alteration affecting products derived from the digestion of proteins. They are described as the putrifactive flora which bring about the putrefaction of the protein residues of the food and the liberation in the process of various kinds of pungent gases with disagreeable and often foul odour such as indol, skatol, phenol, hydrogen sulphide and ammonia. Some of these organisms synthesise vitamins of the ‘B’ group. A part supply of this group is obtained from the intestinal bacteria and a part from outside sources. Thiamin is stated to be produced in unknown quantities by intestinal flora. The importance of B group vitamins to the integrity of the nervous system is now fully recognised.

The foregoing modern contribution are seen, not only to confirm but also amplify the ancient *Āyurvedic* version of events that take place in the large-intestine and the formation of faeces with the production of pungent vāyu. In addition, an explanation of the *Āyurvedic* view, that *pakvaśaya* is the *sthāna* or seat of vāyu also becomes intelligible in view of
VII

SCHEMA SHOWING VĀTAVYĀPĀRO
(SYMPATHETIC PORTION ONLY) OF MAHĀSROTAS

(1) HEPATIC PLEXUS
(2-3) AUERBACH AND MEISSNER'S PLEXUS
(4) COELIAC PLEXUS
(5) SUPERIOR MESENTERIC PLEXUS
(6) INFERIOR MESENTERIC PLEXUS
(7) HYPOGASPIC PLEXUS
the important vitamins required for the wellbeing of the nervous system which are made available from this place.¹

Samāna and apāna vyāpāra, and pakvāsaya—

While samāna is stated always to move through the kośtha²—the latter term standing for mahāsrotas—apāna has been described by Suśruta as having its seat in the pakvāsaya ³ and in this place, it is stated to move the sakṛt (faeces) downwards. As in the case of intrinsic nerves of the small intestine, the large-intestine also has two intrinsic nerve-plexuses. It is also enervated by both sympathetic and parasympathetic nerves. In otherwords, the proximal part of the colon is enervated by fibres derived from the superior mesenteric plexus, which is partly sympathetic (from the lumber roots) and partly parasympathetic from the vagus. The distal part of the colon is enervated by sympathetic fibres which reach it from the upper lumber roots viz. the pelvic splanchnic branches, inferior mesenteric plexus and nerves. The parasympathetic supply to the distal colon is from the 2nd to 4th sacral root by the way of the hypogastric plexus in which are also scattered ganglia to the wall of the colon.

1. The view that the pakvāsaya is the primary sthāna or site of vāyu of the body, has a bearing on substances which are either available or produced here and which are necessary for the proper functioning of five varieties of vāyu, is derived from the following reference:

   वायुः पुनर्गराहरस्य च बहुलपतया तस्माः प्रक्षेपिताविशेषपद्मूः: शब्दवासीपल्लवः प्रत्युत्तर्प्रज्ञानां व विचारास्यां वायुः कोष्ठे प्रदत्तवति।


2. समानोद्धिरस्मीपथः कोष्ठे चरति सर्वतः।
   अंतः गुर्जरातिः पचति विवेचनाति मुःक्षति॥

   Agasthāngahṛdaya : Śûtra 12 : 8.

3. पक्षापनालोकोपनां कालिको पति चायथयथ।
   समीरणं शक्तमूर्तं शुकगमोपनायथ॥

   Suśruta : Nidāna 1 : 19.

5 A.
The intrinsic plexuses of the large intestine functions in the same manner as those of the small intestine do. As regards the action of the extrinsic nerves, there are different views held by different investigators. Says Lovatt Evans, "It has often been claimed that the sympathetic is inhibitory to the musculature of the colon, with the exception of the ileo-colic sphincter, to which it is motor, while the parasympathetic is motor to all, except the ileo-colic and anal sphincters. But there is doubt about the action of the sympathetic, which is without doubt, often motor, at all events to the circular coat, whether the vagus is motor to the caecum is, also, doubtful." 1

Movements of large intestine comprise both peristaltic and churning movements. In addition, antiperistalsis, especially in the descending colon is stated to enable to slow the movement of the faecal matter downwards overcoming the influence of gravity.

Pressing the explanations furnished earlier as regards samāna in the kṣudrānta, it may be said that brhadantra is also controlled by samāna while the predominantly parasympathetic (craniosacral) innervation will explain the influence of apūna.

In a brief review of the secretory activities of the mahāsrotas described under the heading pitta or agni it is necessary to note that the early observations made by Caraka about madhurabhāva and amlabhāva of the avasthāpāka, as well as the influence exerted by the āhāra, that has attained amlabhāva in the secretion of accha pitta, find experimental corroboration from the works of Povolv, Starling, Bayliss, Ivy and others, carried out since late nineties of the last century.

JĀTHARĀGNI PĀKA

Even though the āhārapācana, discussed above, under avasthāpāka, is essentially jātharāgnipāka, a further reference

to this *pāka*, would appear to be necessary, before proceeding to an appraisal of *bhūtāgni* and *dhaṭvāgni* *pākas*. From the point of view of *Āyurveda*, all *dravyas* and, in special, *āhāra-dravyas*, which possess six *rasas* viz. *madhura*, *amla*, *lavaṇa*, *kaṭu*, *tikta* and *kaśāya*, when acted upon by *jāṭharāgni*, are stated to yield the following *rasas*, towards the end of *jāṭharāgnipāka* when the formation of *āhāra rasa* is stated to be completed.  

| Suśruta3 quoting Aṣṭāṅga- Aṣṭāṅga- Saṃgraha4 Hṛdaya5 quoted Sūtra7 in Saṃgraha | Rasa Caraka2 others' opinion |
|----------------------------------------|-----------------|------------------|
| Madhura Madhura Madhura Madhura Madhura Madhura — |
| Amla Amla Amla Amla Amla Amla — |
| Lavaṇa Madhura Lavaṇa Madhura Madhura Madhura — |
| Kaṭu Kaṭu Kaṭu Kaṭu Kaṭu Kaṭu Lavaṇa |
| Tikta Kaṭu Tikta Kaṭu Kaṭu Madhura Madhura |
| Kaśāya Kaṭu Kaśāya Kaṭu Kaṭu Madhura Amla |

( The *pākas* which *āhāra* and *auşadha* *dravyas* are stated

1. आठरेखाचिन्ना योगावृद्धिति रसान्तरम्

2. कुड़कितक्षिप्याणां विपक्ष: प्रायवः कड़ः: ||
   अमलोक्यं पच्यते स्वादुमुचरं लक्षणस्तया ||
   *Caraka* : *Sūtra* 26 : 58.

3. तत्राहुरन्ये प्रतिरंसं पाक इति Suśruta : *Sūtra* 40 : 10.

4. विपक्षस्तु प्रायः स्वादु: स्वादुविक्षयीः अमलोक्यस्य कुड़कितोपरायः.
   *Aṣṭāṅgasaṃgraha* : *Sūtra* 17.

5. स्वादु: पद्धः मधुरममलोक्यं पच्यते रसः: ||

6. प्रकाश्यो रसानममलोक्यं पच्यते, कड़: कड़काम्: ||
   चल्लारोऽभ्य मधुरं संकोणरसातः संकोणम्. ||
   *Pārśāra* quoted in *Aṣṭāṅgasaṃgraha* : *Sūtra* 17.

7. तिकः स्वादुपके, कषायोऽक्षमसः; उष्णं शव्यं: पाके।
   *Āyurveda Sūtra* : *Praśna* 1 : 44-46.
to undergo, under the influence of ājātārāgnipāka as described by various authorities, are furnished under their names in the tabular statement above).

It will be seen from the table above that there is a difference of opinion between Caraka and Suśruta schools of thought about vipākas. According to the former, which have been followed by Vāgbhata in his Saṃgraha and Hṛdaya, three vipākas viz., madhura, amla and kaṭu are seen to be described; whereas, according to the latter’s view, which is followed by Bhadanta Nāgārjuna, there are only two vipākas viz., madhura, which is guru and, kaṭu, which is laghu. Gaṅgādhara Sena has suggested that Caraka’s views on vipāka are based on the rasa of the dravya, whereas, according to Suśruta’s school of thought, vipāka depends upon the alignment of the paŃcamahābhūtas in drayyas. 3

It is of interest to note that Āyurveda Sūtra,4 with a commentary by Yogānandana said to belong to the sixteenth century has described vipāka in a way not contemplated by the vṛddhatrayi, viz.,

(a) svādu vipāka of tiktarasa;
(b) amla vipāka of kaśāyārasa; and
(c) lavaṇa vipāka of kaṭurasa.

This work, according to authorities entitled to an opinion is stated to have been compiled on the basis of literature written

1. स्वादे हि द्विविष एव पाको मधु: कड़कः। तथोभूषाभारो गुहः, कड़काक्षो लघुरितां।

Suśruta : Sūtra 40 : 10.

2. दौ द्विविषयदशस्त्रायिनायमस्य।

Rasavaiśeṭṭika : Sūtra 50.

3. हत्या घर रसविकामिनाययेव विधापाक उत्ताः। इत्थते भूतस्यन्तायकामिनायक्षिदिनायक: उत्ताः।

Gaṅgādhara on Caraka : Sūtra 26 : 58.

4. Āyurvedasūtra with commentary by Yogānandana, Edited by Dr. R. Shama Sastry, Printed at Mysore Govt. Branch Press, 1922.
between first century B.C. and fifteenth century A.D. Though relatively recent, *Āyurvedasūtra* belongs to the late middle age and would represent a further stage of *Āyurvedic* development. In this sense, the views advanced by this work, mark a distinct advance over previous works and is, therefore, worthy of note.

The concept of *vipāka*, it is obvious, refers to the ultimate outcome of gastro-intestinal digestion, as could be judged from the *rasa* or taste of the final and products of origin, which, latter, is seen to be determined by the nature of their physico-chemical composition, as shown in the table below:

<table>
<thead>
<tr>
<th>Rasas</th>
<th>Caraka 1</th>
<th>SuSruta 2</th>
<th>Āṣṭāṅga-hṛdaya 3</th>
<th>Āṣṭāṅga-Saṅgraha 4</th>
<th>Rasa Vaiśeṣika 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prthvi</td>
<td>Prthvi</td>
<td>Prthvi</td>
<td>Prthvi</td>
<td>Prthvi</td>
</tr>
<tr>
<td>Amla</td>
<td>Prthvi+</td>
<td>Ap+</td>
<td>Prthvi+</td>
<td>Prthvi+</td>
<td>Ap+</td>
</tr>
<tr>
<td></td>
<td>Agni</td>
<td>Agni</td>
<td>Agni</td>
<td>Agni</td>
<td>Agni</td>
</tr>
<tr>
<td></td>
<td>Agni</td>
<td>Agni</td>
<td>Agni</td>
<td>Agni</td>
<td>Agni</td>
</tr>
<tr>
<td>Kaṭu</td>
<td>Agni+</td>
<td>Agni+</td>
<td>Agni+</td>
<td>Agni+</td>
<td>Agni+</td>
</tr>
<tr>
<td>Vāyu</td>
<td>Vāyu</td>
<td>Vāyu</td>
<td>Vāyu</td>
<td>Vāyu</td>
<td>Vāyu</td>
</tr>
<tr>
<td>Tikta</td>
<td>Vāyu+</td>
<td>Vāyu+</td>
<td>Vāyu+</td>
<td>Vāyu+</td>
<td>Vāyu+</td>
</tr>
<tr>
<td></td>
<td>Ākāśa</td>
<td>Ākāśa</td>
<td>Ākāśa</td>
<td>Ākāśa</td>
<td>Ākāśa</td>
</tr>
<tr>
<td>Kaśāya</td>
<td>Vāyu+</td>
<td>Vāyu+</td>
<td>Vāyu+</td>
<td>Vāyu+</td>
<td>Vāyu+</td>
</tr>
<tr>
<td></td>
<td>Prthvi</td>
<td>Prthvi</td>
<td>Prthvi</td>
<td>Prthvi</td>
<td>Prthvi</td>
</tr>
</tbody>
</table>

1. तेषां ष्ण्डः रसांं सोमगुणातिरेकान्मङ्गुरो रसः, पृष्ठिक्षिणांमूर्यिसल्लक्ष्म:- सहितायमूर्द्धवायावलय:- वायस्तितुगुणाष्टित्वालक्ष:- वायस्तिकाशालिसिफळिक:- पवनपृष्ठिक्षिणारक्षम:- श्िः | *Caraka* : *Sūtra* 26 : 40.

2. भूयमुखपावालुशामङ्गुर:- पृष्ठिक्षिणांमूर्द्धवायावलय:- तोषायमूर्द्धवायावलय:- वायस्तितुगुणाष्टित्वालक्ष:- पृष्ठिक्षिणामूर्द्धवायावलिक:- श्िः | *SuSruta* : *Sūtra* 42 : 3.


4. नमागीणसिद्धान्तः, स्वायम्बिनमङ्गुरसिद्धान्तः | *Ashtāṅga-hṛdaya* : *Sūtra* 18.


6. पृष्ठिक्षिणामूर्द्धवाण्डः | Text according to Yogendraṇātha Sena.
As pointed out earlier, *jāṭharāgni pāka* of āhāra, which latter is made up of substances possessing six different *rasas*, do not apparently undergo any chemical change. By implication, they undergo physical change only as can be seen from the fact that *dravyas* with *madhura rasa* are stated to undergo *madhura vipāka* i.e., their original *bhautic* composition is not destroyed. It must be noted here that generally glucose and its polymers are absorbed as such from the small intestine. Some portion of the carbohydrate of the diet is also seen to be “broken down to acids such as butyric acid and lactic acid, which give the ideal content a reaction which is acid.”

Similar is the case with *amladravyas*. In the case of *lavana*, there is, however, a suggestion of some change in the constitution of the compound itself, leading to *madhura vipāka*. This may, possibly, be explained by the fact that, with the dissociation of chlorine ions from sodium chloride in solution, the positive sodium ion is left behind. Moncrieff in his “Chemical Senses” has quoted Kahlenberg as having shown “that the saline taste of sodium chloride is due to Cl⁻ ions. It has been determined by the fact that NaCl should be more completely dissociated than sodium acetate and that, the concentration of Na⁺ ions in the sodium chloride solution would be greater than the sodium acetate solution. The taste of a molecule of sodium acetate is changed by the dissociation of acetate. Hence, the saline taste of NaCl is attributed to Cl⁻ in the molecule.” It will follow from this that the heavier Na⁺ fraction may have a taste of its own and the possibility that it may be sweetish can not be ruled out. *Katu* remains *katu*, while the claim that *kasāya* and *tikta* undergo *katu vipāka*, under the influence of *jāṭharāgni* involving a change in their composition leading *pari passu* to a change in their *rasa* awaits corroboration. The foregoing can be represented as follows on the basis of data furnished by modern physiology and bio-chemistry including pharmacology:

1. Leon Schiff; Pathologic Physiology : p. 278. 1951 Edn.
(A) Madhura—generally carbohydrate
   (a) Madhura as glucose and its isomers
   (b) Amla as lactic acid and butyric acid.

(B) Amla—mainly organic acids like lactic, butyric, acetic, citric and tartaric and malic acids.
   Amla—lactic, butyric, acetic, citric, tartaric acid.

(C) Lavana—mainly Sodium Chloride—NaCl
   Na⁺ + Cl⁻
   Na⁺ → Madhura (?)

(D) Katu
(E) Tikta
(F) Kasāya
   That, substances possessing these tastes, undergo a change by which their vipāka is rendered katu should await scientific evidence.

It would now seem that lavana vipāka, as an additional vipāka, may have to be added to the three already furnished by Vṛddhatrayi. Theoretically speaking, the principle, “as the molecular weight increases there is a gradual change in the taste of salts from saline to bitter and lower molecules of the homologous series will be sweet and higher members bitter”¹ may have an application to the tikta dravyas that are stated to undergo madhura vipāka by Āyurveda Sūtra. The example of saccharine can be cited in support of this view. This substance, in its pure form, is bitter but, when broken down to molecules of smaller size in solution it is seen to be sweet and vice versa. The group of substances which possess tikta rasa to begin with and attain madhura vipāka, under the influence of jātharāgni, can be expected to have

---
¹ Moncrieff: Chemical Sense: 1951 Edn. p. 147.
been broken down to molecules of lesser weight, thus releasing madhura rasa.¹

The question, if kaśāya rasa can yield amla rasa, awaits further study.

Summing up: The efficient conduct of jātrāgniṇipāka results in the conversion of complex food substances into their ‘elemental forms’ which are separated from the undigested fraction. The former is taken up for further chemical reactions before they are rendered fit for metabolic reactions.

Substances, which are of immediate interest and which are utilised in large quantities, in diet, relate in the order of importance and quantity, to madhura, amla and lavana groups. The quantity of substances which possess katu, tikta and kaśāya in an average Indian diet are relatively insignificant even though in certain parts of India especially in Andhra and Orissa katu dravyas are also utilised in respectable quantities as a part of normal diet.

BHŪṬĀGNI PĀKA

Both Caraka and Vāgbhaṭa have made direct references to bhūṭāgniṇipāka while, Suśruta has made an indirect mention of it. According to Caraka², the digestion of food by jātrāgniṇi, results in the breakdown of food into five distinct physico-chemical groups viz., pūrthiva, āpya, tājasa, vāyavya and nābhasa (The classification of dravyas under fivefold bhūta group is based upon certain physico-chemical properties

¹ An example of change from sweet to bitter on ascending homologous series, are the betines of amino acids. Khun et al showed that, while velerabetine and caprobetine have transient sweet taste, the betine to amino-penta-dicyclic acid was bitter. 

² भौमात्रामेयवावयव: पश्चिमाग्निस: सनामसान:।
'भौमात्रामेयवावयवयिवावात्रौ पश्चिमि हि।'

or qualities ascribed to each bhūta class)\textsuperscript{1} Jāṭharāgni is stated to ignite the agni fraction present in each of the five groups. This agni moiety is then said to digest the substance of that group (leading to a radical change in its qualities—vilaksana guṇa\textsuperscript{2}), which renders food substances fit for being assimilated into and built up as parts of corresponding bhūta class of substances present in the dhātus after the same has been subjected to the action of dhātvagnis.

According to Suśruta “the animated human organism is composed of five mahābhūtas and the food of a living organic being, necessarily partakes the qualities of its corporeal components. The food which consists of five mahābhūtas is digested in its turn by the five bhūtagnis and each of its principle proceed to augment its own homologue in the human organism.”\textsuperscript{3}

Events, described in the references cited above obviously occur after the ingested food has been suitably dealt with in jāṭharāgni pāka, leading to the reduction of the basic food stuffs into their elemental forms.\textsuperscript{4} The latter are classed on the basis of their physico-chemical properties under five

\begin{enumerate}
\item (a) तत्र द्रव्याणि गुष्करकृतिनमन्दिरसिंहबिस्विधसान्त्रस्यघणमयघुण्डुगुलिणि पाषिकानि, द्रविन्द्रशिरस्मिान्दिरसन्त्रस्यघणमयघुण्डुगुलिणि आस्याणि, वणोर्णोनकुमतच्छक्षविस्विधसान्त्रस्यघण्डुगुलिणि आस्याणि, कुशीतत्त्त्वकरविशद्वृत्तस्यघण्डुगुलिणि वायुघाणि”\textsuperscript{”}।
\begin{itemize}
\item \textit{Caraka: Sūtra 26: 11.}
\end{itemize}

(b) अष्टाङ्गार्दया : सूत्र 9 : 6-8.
(c) Suśruta : Sūtra 41 : 4.

\item भौमादव: प्रेयोग्याणि: पाषिकाबिद्रव्यव्यवस्थिता जाठराधसद्विद्विशिष्टवता अन्तर्वभू: विभिन्न पचनां स्वान्त स्वान्त पाषिकादीवृ पूर्वपाषिकाबिद्रव्यव्यवस्थिता गुणानु विभेदितानि।
\begin{itemize}
\item \textit{Cakrapāṇi on Caraka : Cikitsā 15 : 13.}
\end{itemize}

\item पञ्चमूत्रातकौ दैवेद दाहार: पाश्चात्त्वतां।
\begin{itemize}
\item विवक: पंचचा सम्म गुणान्वानामिनिति।
\end{itemize}
\begin{itemize}
\item \textit{Suśruta : Sūtra 46 : 526.}
\end{itemize}

\item जाठराधसद्विविष्टोऽसाक्षाताभिः पवित्रमूलस्याय: पंच स्वच स्वच्छ द्रव्यपचनम्।
\begin{itemize}
\item \textit{Cakrapāṇi on Caraka : Cikitsā 15 : 13.}
\end{itemize}
\end{enumerate}
bhautic groups viz., pārthiva, ṣāya, ṣāneya, vāyavya and nābhasa. It would seem that the ultimate products of jāṭharāgniṇīpāka are suitably processed by bhūtāgniṇīpāka, which are now fit to be acted upon by the specific agni associated with each one of the seven dhātus, before they are finally synthesised as a part of the latter.

The foregoing description of bhūtāgniṇīpāka resembles the description of auto digestion, comparable to anaerobic reactions. This step would seem to be necessary, as the food consumed are foreign to the body i.e. vijātiya and unless they are suitably processed they may not be converted as organism-specific i.e. sajātiya substances. This can be illustrated with the example of starchy, fats and proteins of the food which by the process of digestion are rendered fit to be re-synthesised as organism specific carbohydrate, fat and proteins. Thus, vegetable starch or cellulose is first broken down to its elemental form i.e. glucose and its polymers towards the end of the intestinal digestion before they are again rebuilt in the body as organism-specific animal starch or glycogen. Likewise, fats derived from plants and animals are broken down during the process of digestion to their elemental forms viz. fatty acids and glycerols before they are rebuilt in the body as organism-specific lipids. The same is the case with proteins—vegetable and animal—also. These are broken down into their elemental forms viz. amino acids before they are synthesised as organism-specific proteins viz., albumen, fibrinogen, most of the globulins and non-essential amino-acids.

It would, seem that bhūtāgniṇīpāka takes place in the adha-āmaśaya itself but speaking factually, it would appear from the available description of this pāka, that it resembles in some respects events which take place in the small intestine and, in others in the liver. It was shown elsewhere that yakṛt or liver itself is anatomically and functionally related to kosṭha. Hence, it may be possited that the bhūtāgniṇīpāka, which is commenced in the adha-āmaśaya, is continued and completed in the yakṛt.
Ahāra representing śaḍrasas in proper proportion (balanced diet)

I Stage—Madhura bhāva (Urdhva āmūsaya or stomach in the fundus-starch digestion)

II Stage—Amla bhāva (Urdhva āmūsaya in the body and pylorus of the stomach—protein digestion—formation of peptones and acidified chyme)

Pacakāgni (Jātharāgni)—passage of the gastric digest (acidified chyme) to adha āmūsaya (kṣudrāntra) resulting in the discharge, in this place of achapittta and its action on chyme.

Sāra (representing the ultimate elemental forms of the foods ingested—described on the basis of their physico-chemical qualities)—viḍāṭīya

Kitta in pakvāsaya where separation of substances meant to be eliminated through mūtra, purīsa takes place; Piṇḍikaraṇa; formation of ma-larūpa vāyu with pungent and disagreeable odour and the production of substances required for the five vāyus

III Stage—

Bhūtāgni Pāka

Parthiva Āpya Taijasa Vāyavya Nābhasa

Parthiva Āpya Taijasa Vāyavya Nābhasa

agni agni agni agni

Indhātvagni Pāka Upādāna and annarasa for utilisation for the production of Sajāṭīlya

Pārthiva Āpya Agneya Vāyavya Nābhasa

Structural Body constituents of the body Proteins etc.

Enzymes; metals and minerals like Fe, Cu, Co, Mg, Mag, Mo, Ca, K, Na, Cl, I etc. & many energy locked substances eg. phosphorus linked sugars vitamins (coenzymes), some hormones like thyroxin constituents required for the synthesis of neural structures and certain hormones like acetyl choline and sympathin etc.
The foregoing description of bhūtāgniṇāpāka is based on Carakaśamhitā. Vāgbhaṭa in his Saṁgraha and Hṛdaya has clearly described the steps leading to bhūtāgniṇāpāka and in his view, the separation of sūra from kiṭṭa, takes place after the completion of bhūtāgniṇāpāka.

A careful study of the works of both Caraka and Vāgbhaṭa shows that the formation of sūra and the separation of kiṭṭa occur towards the end of Avasthāpāka, jātharāgni and bhūtāgniṇāpākas which by implication would appear to take place in the terminal portions of the ileum. But available experimental evidences and observations show that as digestion of different compounds of food viz., proteins, fats and carbohydrates are completed, absorption of the digested fraction takes place almost immediately, the undigested portion being taken over for further reactions as it passes down. It would, therefore, seem that the process of digestion and absorption follow each other very closely throughout the entire length of kṣudrāṇtra and, by the time, the food reaches the cecum, hardly any digestible component of it is left. The portion that passes through the cecum represents, for the most part undigested cellulose. If these observations are to be extended and applied to the jātharāgni and bhūtāgniṇa pākas then jātharāgniṇāpāka of the āhārarāvyas, should be immediately followed by bhūtāgniṇa pāka, resulting in the separation of sūra and its absorption immediately the kiṭṭa being moved further

1. ॥ तत्त्वादिक विविधत आहारे पंच पन्चासमका महाभूतार्थयो बालुना ध्यस्तानी सबसृष्टि पन्च सूर्युणार्मार्धस्यान्तः पवनित। ते पक्षः पूर्णवा वायुमेव देशायतं तक्षविकारभुतानूर्धवत्वमाध्यमायतत॥
   एवं च पक्षादाहाररदिविशुष्टगर्भार्यसंप्रदेशाद्वृत्तः साररूपसंस्कृतः किष्टवथं शोभामिनिवर्तत॥ Astāṅgasaṁgraha : Śārīra 6 : 59-60.

2. ॥ मीमांसवन्यवाच्यायः पंचोपमणः सनातनः॥ पंचासमार्णमणः सवन्न पारिवार्दीरशमस्तु॥ वसायस्ते च पुष्य्यन्ती पक्षः सूर्युणामूषक।
   पारिवध: पारिवानेव क्षेत्र: क्षेत्रश: देशानाम॥ किदः सारसृष्ट्वस्थमण्य सम्प्रवत दिदाषा॥
   तत्रांश्च किष्टज्वरस्य मूल्यं विचारापन्नं शक्त॥ Astāṅgasāhrdaya : Śārīra 3 : 59-61.
down where the process repeats itself, until hardly anything of śūra is left. In this view, the two processes—jāṭharāgni and bhūtāgni vyāpāras are concurrent ones.

ANNAVAHA–SROTĀMSI

A reference to annavahasrotas would appear to be necessary at this stage. It may be recalled that, the terms mahāsrotas, kośtha, āmāśaya, pakvāśaya, kṣudrāntra, bṛhadantra etc., were used to designate the gastro-intestinal tract with which the jāṭharāgni and bhūtāgnis are intimately concerned. The use of the term annavahasrotas has also a relevance to the structure mentioned above. This term actually means the srotas that conducts anna i.e., the conduit or channel through which food is conducted. The term srotas at the macroscopic level means a conduit or channel and this term is applicable to varieties of structures such as the tubular system through which blood is conducted—the vascular system; the respiratory passages which conduct air; the lymph channels which conduct lymph, the neural pathways through which nerve impulse flows and the digestive tube through which food passes. All these represent the grosser types of srotāmsi. Each one of them, in its turn, is composed of subtle or extremely fine srotāmsi, through which various kinds of substances are exchanged from the outside environment with the inside. It may be noted that according to Caraka, all conduits or channels of transport—grosier or subtler—such as sirā (vein), dhamanti (artery), rasāyani (ducts in general and lymphatics in particular), rasavāhini (capillary), nādi (tubes), panthā (passage), mārga (pathway), śārīracchidra (various opening), samvṛtāsamvṛta (different kinds of glands some open and others close), sthāna (location), āśaya (organ), niketa (repertory) are to be deemed as srotāmsi;¹ whereas, according to Suśruta "Srotāmsi are channels which have their origin in an organ cavity and spread throughout the body conducting rasādi

¹. स्त्रोतायम्, सिरायं, वधमयं, रसायनयं, रसवाहिनयं, नाखयं, फस्तानं, गम्यं, शरीराकिष्कोशः संप्रवासामतिः, स्थानायतं, ऋषयं, व्यवः, निकेतायम् शरीर-पात्यवक्षायतं ऋषयाक्ष्ययतं नामानि महति। Caraka: Vīmaṇa 5:9.
dhātus. These are different from sirās (veins) and dhamaṇis (arteries) which may otherwise resemble them."

The term srotas is self explanatory, that it is defined as sravaṇāt srotāṃsi², meaning srotas is so called because of sravaṇa. Sravaṇa means “to exudate” “to transude,” “to permeate” or “to filter through.” The implications of srotāṃsi have been examined by Caraka and they are (a) structures through which sravaṇa (oozing, exudation or filtration of fluids) occurs; (b) these are channels through which body fluids are transported from place to place. Another implication, perhaps a significant one of this term as described by Caraka is that srotāṃsi are ayanamukhas,³ that is to say, the channels are themselves entrances. This has reference to the function, srotāṃsi performs, viz., the transport of nutrients or prasāda to and waste products or malas from the dhātus and aśayas. Clarifying the implication of the above, Cakrapāṇi Datta ⁴ has offered two explanations, viz., (a) the term ayanāni refers to channels through which something travels and (b) mukhāni places of entry through which something enters. Therefore, the channels and entrances of dhātus and malas are not distinct and different entities and the same channel serves both as vehicle for the conduct of prasāda and mala and they also serve the purpose of the ingress egress of these two substances. As will be discussed at a later stage, the srotāṃsi as described above by Caraka and commented upon by Cakrapāṇi Datta would refer to the capillary system which serve twofold purposes viz. ayanāni and ayanamukhāni.

Extending the foregoing explanations and clarifications to the annavaha srotas with which this thesis is concerned this

---

1. मूलाद खादनस्त देहि प्रस्तुतस्वभिमाति यथा।
   स्वत:स्वत: विलोप्य निराभधमनविविधयोऽयोऽस। शृवृत्ता: शृवृत्ता ९:१३।

2. ध्वानाद्वन्य: स्वायनस्वर्त: सर्वस्विनिर्माण:। Caraka: Sūtra 30:12.

3. तेषां दुं खदन महाप्रसादधारानां प्राधान्यं स्त्रीत्वं स्वायत्वमुखाः।
   Caraka: Sūtra 28:5.

4. अयानानि च तानि मुखानि शति अयनमुखानि। अत्र च आयास्थनेन शति।
VIII

ANNAVAHA SROTAS

RASĀNKURA
(VILLUS)

DUODENAL
GLANDS

PLĀMSAPEŚI
Circular

MĀMSAPEŚI
Longipidinal

LONGITUDINAL SECTION OF
RASĀNKURA (VILLUS)

SECTION OF KṢU-
DRĀNTRA
(ONE PART OF MAHĀSROTAS)

SECTION OF KṢU-
DRĀNTRA WITH
ANNAVASAVĀHĀ
DHAMANI

SIRĀ (Blood vessels)

RASĀYANI
(Lymphatics)
srotas is the long tube commencing from the mouth and ending with the anus through which food is propelled and in which it is digested and also the villi which line the inside of this tube through which the sūra or the digested fraction of the food is absorbed and made over to the portal vein and thoracic duct for being transported to appropriate places where they may be dealt with by further pākas. Caraka has made a clear reference to the channels through which digested food is absorbed and distributed throughout the body as dhamani, present in the āmāśaya.¹ The term dhamani, as in the case of sirā, refers to blood vessels through which the absorbed food material is transported (regardless of the distinction, made between dhamani and sirā which, in certain circumstances, are found to pertain to the same structure.²) Thus, while the mahāsrotas in its grosser aspect represents the gastro-intestinal tract, the intestinal villi represent the subtler units of srotāmsi which compose the former.

YAKRT AND ANNAVADA SROTAS

It may also be mentioned here that yakrt which, as pointed out in page No. 77, represents, in adult life an extension of the ūrdhvabhāga of the adha āmāśaya or grahanī, is, itself an organ, composed exclusively of srotāmsi. The existing editions of Āyurvedic classics, have recognized this organ as the mūla or root of raktavaha srotāmsi ³ and the sthāna of rakta ⁴ and raṅjaka pitta.⁵ From the point of view of advances made

---

1. अनामयम् मायामि, मुलामि तु: प्रविशामि। एते मद्यानां बालन्तय च यदेवर्तेन तदेव प्रविशामयमिति नान्यचन प्रवेशो नान्यचन गमनयमुयुक्तं सचनि ।
   Cakrapāṇi on the above.

2. भाषायनम्: पाकमाहार: प्राप्य केवलम्।


3. (a) श्रीनिणवहारां श्रीनिणस्य यक्ष्मूर्द्यः श्रीकां च। Caraka: Vimāna 5: 8.
   (b) रक्तवहै हे, तयोऽर्थं यक्ष्मूर्द्यानी रक्तवहिन्यथ भम्वन्।
   Suśruta: Śārira 9: 12.

4. श्रीनिव्वध स्वानं यक्ष्मूर्द्यानी। Suśruta: Śārtra 21: 16.

5. वषु यक्ष्मूर्द्योऽ: पिच्छ तसिमानुः रक्तकोपशिरिति संदर्भा।
   Suśruta: Śārtra 21: 10.
by modern medical science *yakṣṭ* is seen not only to be the *sthōna* of *rakta* and *raṇjaka pitta*, but also an organ immediately concerned with intermediary metabolism contributing as will be shown at a later stage, to *dhātvagni vyāpāras*. It is thus seen that "Liver is immediately concerned with carbohydrate, lipid and protein metabolism. In so far as the carbohydrate metabolism is concerned, it converts glucose to glycogen; segments of the carbon skeleton of a portion of the total amino acids metabolised in the body are converted into substances which, in turn, may be employed in glucose and glycogen synthesis—*gluco-neo-genesis*. Fatty acids are re-synthesised, *de novo*, in this organ and released to circulation for being deposited in the adipose tissues. Here also fatty acids of the diet are transformed into a mixture, more closely resembling that of the species. From lipids also the liver re-synthesies cholesterol and esters. In the course of its steroid metabolism the liver elaborates cholic acid and couples it with glycine and taurine to make the bile acids. In addition, the steroids elaborated by various endocrine glands undergo metabolic transformations. As regards protein metabolism, the liver fabricates the non-essential amino acids by employing nitrogen, either from other amino acids or from ammonia. Numerous other nitrogenous materials are synthesised in the liver—*ethanalamine, creatine, choline, purines* and *pyrimidins*. Moreover, it is in the liver, that the final steps of the nitrogen metabolism occur, with the formation of urea and uric acid in man. In addition to its activities, in the metabolism of individual amino-acids, liver also fabricates a number of plasma proteins, including albumin, fibrinogen, prothrombin and a major portion of globulins. The cells of this organ contain a significant amount of readily metabolisable protein, in the sense that, upon fasting or an ingestion of protein-free diet, proteins from the liver are rapidly utilised during the period of negative nitrogen balance.

The liver is the site of most of these reactions which involve alteration of foreign compounds which can be mobilised. These reactions include the acetylation of aliphatic and aromatic amines, methylation of mercapturic acid
and hippuric acid, synthesis, oxidation and glucoronide and etherial sulphate formation. Substances, other than glycogen are stored in the liver. These include iron as ferritin and lipid soluble vitamin.

Finally, there is the secretory role of the liver, concerned with the formation of bile. In this role, the liver prepares the bile salts, separates bilirubin from proteins with which it is associated in the plasma, resynthesises cholesterol and pours these with other bile components into the biliary capillaries and thence, via the connecting ducts to the gall bladder. This has also proved to be the route for the excretion of serum phosphatase.”

It will be seen from the foregoing that yakṛt or liver has not only inherited some of the functions of grahani—the duodenum in particular—but has also, extended the agni function of grahani, to a high degree of specialisation. If the function of the grahani-based pūcakōgni is of the nature of vibhāga or bhinnasaṁghāta of the āhāra dravyas, the yakṛt possesses in addition the function of samyoga or synthesis. In other words, the pūka that takes place in yakṛt is both of the vibhāga and samyoga types. It would, therefore, be necessary to take note of yakṛt, in connection with the study of dhātvagni pūka. The need for doing so becomes emphasised, in view of the fact that āhāra rasa, absorbed from the adha-āmāśaya, through the subtler annavaha srotānisi corresponding to villi has been shown to be transported to the yakṛt, through two channels viz., pratikārinisirā or portal vein, directly and rasaprapā or thoracic duct, indirectly, for further pūkas. If this is not done, the phenomena of dhātvagni pūka and subsequent events may remain unexplained.

DHĀTVAGNI-PĀKV

By the term dhātvagni pūka is meant, chemical reactions to which the āhāra rasa absorbed from the adha-āmāśaya is subjected to before it is utilised by the posya or the sthāyi


6 A.
dhātus, present in all parts of the body. The term dhātavagni refers to agnis or pittas, which take part in pākas, than occur from yakṛt onwards. Seven different kinds of dhātavagnis corresponding to seven species of dhātus have been envisaged by Ayurveda. They are rasāgni, rakṣāgni, māṁsāgni, medogni, asthyagni, majjāgni and sukrāgni. These agnis are stated to mediate or catalyse metabolic transformations of nutrient substances before they are supplied to the seven species of dhātus viz., rasa (plasma, tissue fluid, and lymph), rakta (the elements of the blood which are red in colour and which float in and circulate with rasa dhātu), māṁsa (muscle tissue), medas (adipose tissue), asthi (bone including the cartilage tissue), majjā (yellow or red bone marrow or the marrow tissue) and sukra (the male reproductive element) through their respective specific srotāmsi. Says Caraka “nutrient substances, that support the body, are subjected to pāka again, being acted upon by the seven dhātavagnis, giving rise to two kinds of substances viz., kiṣṭa and prasāda.” 1 “Nutritional substances, that nourish the dhātus, undergo pāka by the nāśa (agni) of the dhātus and then, they are made available to the latter, through this respective srotāmsi.” 2

Earlier, in the chapter on Vividhāṇapitīya of the sūtrakṛtāna of his samhitā, Caraka has observed that the wholesome foodstuff ingested in fourfold manner, having been digested by antarāgni, is followed by further pākas, under the influence of bhūtāgni which latter have been duly ignited by the former agni which again are subjected to further pākas by dhātavagnis, subject to the condition that the dhātusmā (dhātavagni), dhātuvaha srotāmsi and mūruta, are not impaired and dhātu pāka is proceeded with as inexorably as kāla. Dhātvāhāras thus prepared confer upon the organism strength, complexion, happiness, longevity and provide energy to the dhātus. The

1. समसम्बितारी वातन्त्रिक विचित्रं पुनः।
वयाधिनिनिमिती पाकेऻ पान्तिक विकटप्रसाधवत्। || Caraka : Cikitsā 15 : 15.

2. वयाधिनिनिमिती पाकेव शारोत्री वान्तिक वातन्त्रिकविचित्रं पुनः।
सृष्टतसा च वयाधिनिनिमिती वातन्त्रिकविचित्रं। || Caraka : Cikitsā 8 : 39.
SCHEME SHOWING DIFFERENT STEPS ĀHARADRAYAS UNDERGO TO BE TRANSFORMED INTO DHĀTU

Different Aṇus of Āhāra

Bhūtāgniṇā, in which agni present in each group having been ignited by jāṭhāgni transforms the vijātya amarassī into organism specific or sajātya poṣaka dravyas of dhātu.

These upādana dravyas combine in different proportions for the formation of dhātus.

Action of Dhātvagnīs.

Result of Dhātvagnī Pāka:

Prasāḥabhaṇa as Poṣya or asthāyi dhātu and Kīṭabhaṇa some portion of which are used up by the body and others eliminated either alone or in combination with anna kīṭa.

Poṣakahātu carried by specific srotāṁśas.

Before they are changed to poṣadāḥātu, they again, undergo pāka by specific pācakāṇḍaṁśas. After pāka, they are changed to sthāyī or poṣya dhātu.

Poṣadāḥātu, entering into the constituent of the body structures.

Through Rasa-

Through Māṁsa-

Through Medo-

Through Asthi-

Through Śākta-

Through Śāhāt-

Through Male & Female reproductive elements.
nutrients, obtained from food sources are the food for śarira dhātus and they contribute to the normalcy of the latter.¹

Similar references to dhātvagnipāka and the order, in which, it occurs are available in saṃhitā granthas and a few more of them, obtained from Aṣṭāṅgasāṅgraha is furnished in the footnote below. ² The facts that emerge out of these references are—

(1) The āhāradravyas, already suitably dealt with by jātharāgni and bhūtāgni pākas, are taken up for dhātvagni pāka.

(2) Dhātvagni pāka has two aspects viz., (a) Kiṭṭa pāka; (b) Prasāda pāka.³

(3) The final products arising out of prasāda pāka are then transformed to the śarira-dhātus through their respective srotāṃsi. ⁴

The seven kinds of dhātvagnis obviously refer to substances which like enzymes catalyse the synthesis of seven kinds of nutrient substances, required for the use of the seven species of dhātus—each agni, aiding the conversion of nutrient substances into what may possibly be called “precursor substances” of the formed dhātus, already present in the body. This view is based upon references to poṣaka or asthāyi dhātus and poṣya or sthāyi dhātus, found mentioned in Cakrapāṇi’s commentary on Carakasamhitā. ⁵ Thus, the rasāgni would

---

catalyse the conversion of appropriate substances and their incorporation into the rasādi dhātus which latter serves as the vehicle of transport of the remaining posāka or asthāyi dhātus. Similarly, catalysed materials obtained from āhāra-rasa are made available to corresponding sthāyi or posya dhātus.

It is obvious that the term dhātvagni is a collective noun standing both for group specific and reaction specific enzymes. Even so, metabolic reactions envisaged above are not exclusively anabolic but this also comprise catabolic reactions, which yield waste products or kiṭṭa in the process. This view is implicit in the kiṭṭapāka referred to by Cakrapāṇi Datta. The outcome of kiṭṭa pāka, are discharged from the body at periodical intervals and the remaining parts are utilised for the production of a number of structures of the body, such as hair, nail etc.

Prasāda Pāka—The available description of this pāka in sanhīta granthas, is reminiscent of synthetic reactions, which form part of the intermediary metabolism—the latter term being described as “all changes which may take place between the moment of entry and the moment of discharge of ultimate chemical products into the environment”; or in the alternative specific chemical reactions which occur within the organism—the other aspect being what is known as energy metabolism which deals with the overall energy production. In general, the process of new tissue formation and the maintenance of the structures already formed constitute tissue building or synthesis. In general, it represents the union of smaller into larger molecules. The reverse process of tissue break down is obviously, concerned primarily with the splitting of the larger protoplasm into smaller ones. The two aspects, the anabolic and catabolic, respectively constitute

1. भूमितिनिलेखारं द्रष्टिविश्वा गात्रविनिलेखारं द्रष्टिविश्वा सतातिभिनिहलित सतातिभिनिहलित। देहात्मारं देहात्मारं देहात्मारं देहात्मारं देहात्मारं देहात्मारं देहात्मारं।

2. Cakrapāṇi on Caraka: Cikitsā 15:15.

Gould: Medical Dictionary.
metabolism as a whole. As stated above, prasāda pāka, obviously relates to anabolic aspect and the kiṭṭa pāka—the catabolic.

Thus, dhāradrayyas, subjected to dhātvagni pāka synthesise from out of the nutrient substances, constituents required for the synthesis of each sthāyi (posya) or formed dhātu—the former known as asthāyi (posaka) or precursor dhātu. The dhātvagnipāka may also be described from the point of view of biochemical reactions as follows: regardless of the nature of the nutrient material, present in the annarasa—this may represent dravyas, possessing śaḍrasas—the pārthivāṁśa of annarasa being taken up for the synthesis of the pārthiva bhāvas of the compound necessary for sthāyi dhātu; ṣāpyabhāvas likewise, and so on as regards āgneya, vāyaviya and nābhasa. Be this, as it may, the important point that needs mention here is the fact that the products of bhūtāgnipāka, which represent the ingredients, required by the several dhātu in the body, are catalysed by rasāgni, raktaṇi, māṁśāgni, medogni, asthyagni, majjāgni and śukrāgni, the resulting products in the prasāda pāka, being the asthāyi rasadhātu, raktadhātu, māṁsadhātu, medodhātu, asthidhātu, majjadhātu and śukradhātu. These end-products or precursor dhātu are, then, stated to be transported through rasadhātu to the sthāyi dhātu, through srotāṁśi, specific to each dhātu where in the presence of pācakāṁśas, these asthāyi dhātu are synthesised as part of the existing sthāyi dhātu.

Kiṭṭa Pāka—The outcome of dhātvagni vyāpāra is stated to yield, among others, the following waste products—

sveda (sweat), mūtra (urine), puriṣa (faeces), vāta (gases like CO₂, indol, skatol, ammonia, hydrogen-sulphide etc.), pitta (bile pigment), ślesman (mucoid excretions), karna mala (waxy excretions from the ear), aksimala (mucoid excretions from the eye), Nāsikāmala (nasal discharge), aṣyamala (lactic and ascorbic acids, choline, phenols, urea, glucose, thyrocynate, iodides, nitrates, calcium etc.), lomakūpamala (excretions discharged through hair follicles—

sebum), prājanana mala (smegma and vaginal discharges), keśa (hairs), smaśru (beard), loma (hairs all over the body, other than the above) and nakha (gelatinous and fibrous tissue, keratin of the nails etc.).

It would appear from the above that waste products arising out of kiṭṭapāka, are the precursor elements with which several excretions referred to above are composed. As examples may be cited the cases of purīṣa, mūtra and nakha.

Puriṣa, is seen to represent, not only the undigested food—residue of the intestine, but also, malas, which arise from the kiṭṭapāka of dhātus and which are excreted into the pākvaśaya through the purīṣadharā kala. These two, together with other substances, present in the pākvaśaya, like sahaṣa kṛmis, which inhabit that locality, are thrown out as sakṛt or faeces.

It has been shown by modern researches that, “The faeces are composed of food residues, bacteria, materials secreted through the wall of the intestine and bile, leucocytes and disquamated epithelial cells. Food residues constitute a much smaller portion of the bulk of faeces than is usually realised. The fat, protein and carbohydrate of the diet are practically absorbed and if the food be free from indigestible material, especially, cellulose, the faeces are composed almost entirely

1. किठात् किठातिश्चपुराष्ट्रवातिसिद्धिपद्धमण: कामैशुतिकांस्यतोमण्डकप्रजननस्या: क्षास्वतन्त्रोपनिच्छायायायायायायायायायायायायायायायायायायायायायायायायायायायायायायायाया। Caraka: Sūtra 28 : 4.
2. उष्णव्वतन्त्राद् कोष्ठ्र मन्त्रान्वां यस्सुरां समास्यतिः। उष्णव्वतन्त्रां विसमर्गेऽधारं मल्लवरा कला॥ Suśruta: Śrīrā 4 : 16.
3. The water content of the faeces is usually from 60 to 70 per cent by weight. The 20 to 30 per cent dry matter is composed primarily of undigested dietary constituents, such as cellulose material, hair and seeds, fatty material, mineral matter and bacteria. The undigested food protein, carbohydrate and fat amount to very little since the digestion and absorption of these substances is normally 95% to 98% complete. Practically all the nitrogen present is of bacterial origin.

of bacteria and secretions. During starvation, for example, faeces continue to be formed and their composition does not differ materially from that of faeces, passed after an ample diet. Also, a segment of bowel when isolated from the rest of the intestinal tract, becomes, after a time, packed with a mass of pasty faecal material...... . Faecal fat is largely endogenous, continuing to appear in the faeces, though all fatty materials have been excluded from the diet; it differs chemically from ordinary food fat, but resembles closely the blood lipids; part of the cholesterol and lecithin is of biliary origin. Calcium, phosphates, magnesium and other inorganic materials in the faeces, are also derived mainly from the blood.”

The foregoing confirm, in part, the Āyurvedic view that some of the products of kitātapāka of the dhātvagni vyāpāra, are excreted through the purīṣa-dhāra kāla, into pakvāśaya, where together with annakiṭṭa and malaraṅjaka pitta, the entire matter now known as sakṛt, is eliminated from the body.

The foregoing can be represented as here under:

(1) Āhāra + jāṭharāgna sāra + kitā (purīṣa etc.)
(2) Sāra + Dhātvagni prasāda + kitā (purīṣa etc.)
(3) purīṣāṁśa of dhātu kitā + purīṣāṁśa of annakiṭṭa = Sakṛt.

As regards mūtra, it is seen from modern researches that indol and skatol contribute to the characteristic odour of the faeces. According to Abraham White et al., “indol-acetic-acid, which is excreted in normal urine, could be a result of its

2. Kalās have been described as structures that define and separate the different basic structural entities—dhātu—corresponding to the epithelial lining of various cavities. Purīṣadharā kāla extends from yakṛt, intestine and other abdominal viscera and serves as a barrier between the faecal matter and chyle. It may, also, be understood as the lining of the large intestine that secretes faeces into this place from the blood.
3. The formation of annakiṭṭa (purīṣāṁśa) separated from sūrabhāga of anna, under the influence of jāṭharāgniṇipāka has been described in pages 76–77.
formation in and subsequent absorption from large intestine. Indol-acetic-acid is also present in foods of plant origin and this may become another reason of its occurrence in the urine. The second example is tyrosin which in reactions of the large intestine, yields phenol. Reactions of this type probably account for the small amount of phenyl sulphate which may be found in the urine and for the presence of indican (indoxyl-sulphate) as a normal constituent of the urine since these aromatic alcohols are formed in the large intestine from tyrosin and tryptophen respectively absorbed from the gut conjugated with the sulphate in the liver and excreted in the urine.”

The foregoing relate to the intestinal contribution to some of the ingredients to mūtra. The remaining ingredients of it such as ammonia, urea, creatinine, uric acid etc., are seen to be derived from the blood and represent the outcome of the metabolic processes.

What has been stated above are seen to support the Ayurvedic view that dhātvagnipāka contributes in part substances which are utilised for the composition of mūtra. In essence, the nature of purīṣa as well as mūtra may be taken as an index of jāṭharāgni and dhātvagnipākas.

Some of the products of kīṭṭa pāka of dhātvagni vyāpāra corresponding obviously to degradation products specially of proteins are seen to be utilised for the synthesis of keśa (hairs), smaśru (beard), loma (hairs of the body other than the above two), and nakha (nail) etc. This is reminiscent of the modern view that some of the body proteins are degraded and built up as collagen fibres, keratins, hairs and nails etc.

The prasāda and kīṭṭa pāka, described above can be illustrated with the example of the formation of rasa and rakta dhātus corresponding to plasma and erythrocytes.

Rasadhātu—Substances, essentially protein, in nature (pārthiva and ṣaya predominantly) in the annarasa, corresponding to the amino acids, brought to the yakṛt, are synthesised

1. Dravyas required for the synthesis of the constituents.
   (A) of rasādhātu, present, among others, in ahara rasa.
   (B) Ashśāyī or poṣaka rasādhātu+ Pācačānātha→Poṣya or sthāyī rasādhātu(Plasma)?

2. Dravyas required for the synthesis of the constituents of ṛkṣadhaṭu, present among others in
   sthāyī rasa.
   (B) Ashśāyī or poṣaka ṛkṣadhaṭu+ Pācačānātha+ Rasajñāgi→Poṣya or sthāyī ṛkṣadhaṭu (Elements which compose the erythrocyte)

Note:—According to the concept, as now orientated, which is in keeping with the Ayurvedic view that, it is rasa, which is circulating throughout the body, having its main seat in the heart or hṛdaya—and which, in keeping with the root-meaning of the term rasa gatau “अन्वयस्वरूपः रसः”—means because it always moves and permeates through different parts of the body and also, the function of rasa has been described as the medium that transports prāṇa to and from dhatus. Yākeśi is the place, where this sthāyī rasādhātu is formed, for the most part. These dravyas, which are present in the āhāras or āśīra, in this view, undergo dhatuvigraha for the most part in the Yākeśi and poṣaka rasādhātu formed in the pakṣa, are added to the circulating rasa, which make them available to all the tissues in the body, to meet their needs.

3. (A) Dravyas required for the synthesis of the constituents of maṁsadhaṭu, present among others in
   sthāyī rasa.
   (B) Ashśāyī or poṣaka maṁsa dhaṭu+ Pācačānātha→Poṣya or sthāyī maṁsadhaṭu (Enters into the composition of pēti, sīniy, Kanyāra sīrā, etc.)

4. Dravyas required for the synthesis of the constituents of meḍo dhaṭu, present among others in
   sthāyī rasa.
   (B) Ashśāyī or poṣaka meḍodhaṭu+ Pācačānātha→Poṣya or sthāyī meḍodhaṭu (Enters into the composition of adipose tissue)

5. Dravyas required for the synthesis of the constituents of asthi dhaṭu, present, among others in
   sthāyī rasa.
   (B) Ashśāyī or poṣaka asthīdhātu+ Pācačānātha→Poṣya or sthāyī asthī dhaṭu (Enters into the composition of bones and cartilages)

6. Dravyas required for the synthesis of the constituents of majjīdhātu, present, among others in
   the sthāyī rasa.
   (B) Ashśāyī or poṣaka majjīdhātu+ Pācačānātha→Poṣya or sthāyī majjīdhātu (Enters into the composition of bones and cartilages)

7. Dravyas required for the synthesis of the constituents of sukradhaṭu present among others in
   sthāyī rasa.
   (B) Ashśāyī or poṣaka sukradhaṭu+ Pācačānātha→Poṣya or sthāyī sukradhaṭu (Enters into the composition of the male and female (? reproductive elements)

1. This obviously refers to intermediary metabolites of protein metabolism which are utilized for the production of mucus and such other secretions and excretions.
2. Tissue fluid, which is also a part of the concept of rasādhātu, is derived from plasma and lymph is derived from the tissue fluid, which again, combines with plasma, towards the end of its return journey. Slight variations in composition between plasma on the one hand, tissue fluid and lymph on the other are naturally to be expected.
3. These, obviously, represent waste-products, which arise during the synthesis of the essential constituents of erythrocytes, such as—its pigments, etc.
4. According to this concept, various ingredients with which the erythrocytes or the elements responsible for conveying red colour to blood, are synthesized by pācačānātha and rasajñāgi contributed by sūlīpa and yākeśi yield the finished product—the erythrocyte.

References:
in this organ into characteristic structural constituents of the *sthāyi rasadhātu*; corresponding to plasma proteins, and plasma respectively. These ingredients, plus water obviously replace those which have been already utilised. Thus, the main circulating fluid—*rasa*, serves as the transport medium of nutrients or *poṣakadravyas* (free amino acids, glucose, lipids, minerals, hormones etc.) required for the synthesis of all other *dhātus* in the body and the breakdown products of enzymes or those, which occur during the synthesis of enzymes. These substances must naturally fluctuate more or less widely in concentration depending upon bodily activities and the wear and tear sustained by the *śārīra dhātus*. These are nutrients in transit. Even-so, *rasadhātu* serves as the medium of transport of *malas* or waste products from the *śārīradhātus* and *avayavas* for being disposed of. Our immediate concern is with the constants of the *rasadhātu* itself.

*Rakta dhātu*—*Rasadhātu*, having been formed and replenished, carries in it, ingredients required for the synthesis of the several constituents of the *sthāyi rakta dhātu*, which constantly undergo destruction. Steps involved in the formation of *sthāyi raktadhātu*, can be visualised hereunder:

Firstly, the *poṣaka dravyas*, derived from *āhārarasa* are catalysed by *raṣāgni* to form the *asthāyi* or *poṣaka rasadhātu* i.e. formed elements, which are meant to be utilised for the synthesis of the *sthāyi raktadhātu*. These basic materials, together with *raṇjakāgni* or *raṇjaka pitta*, as it is also known, are finally built up as the fully formed *raktadhātu* with *pūcakāṁśa*, catalysing the reaction. This can be written as follows—

(1) *Raktapoṣakadravyas in rasadhātu* : *raktāgni poṣaka or asthāyi raktadhātu.*

(2) *Asthāyi rakta dhātu + raṇjakāgni sthāyi raktadhātu.*

*Pūcakāṁśa*

The orientation of the mode of formation of *raktadhātu* offered above on the basis of textual material available in *sānḥita granthas* and some of the important commentaries

1. Albumen, globulin and fibrinogen.
thereon are supported as it were by modern researches on the formation and maturation of erythrocytes.

Beaumont in his wellknown book on medicine observes that, "the primitive marrow cell is converted into a megablast, possibly with the aid of an unknown agent (italics mine). The active principle from the liver and stomach and, perhaps, the vitamin B complex helps in the change from megaloblast to normoblast. Iron, copper, thyroxin and possibly vitamin C are concerned with the change from normoblast to erythrocyte." ¹

It will be seen from the above that the maturation of erythrocyte from the stage of megaloblast to normoblast needs substances noted in the foregoing paragraph. These are in the nature of poṣaka dhātus—essentially āgneya in nature. In addition, the active principle from liver and stomach, corresponding to the raṇjakapitta of Suśruta and Vāgbhaṭa is also seen to be necessary at distinctly different stages of the evolution of the erythrocyte.

Substances referred to in the foregoing paragraph apart, the process of maturation of erythrocyte is also seen to need the aid of an ‘unknown agent’, mentioned by Beaumont. By implication, this process may not be completed with iron, copper, thyroxin, vitamin C, the stomach and liver factors only and it needs in addition, a factor, the identity of which is not yet known. The author has to suggest, as a hypothesis, that proceeding on the basis of study of the part played by pūcakāṁsas, in the final stages of the formation of sthāyi raktadhātu, the ‘unknown agent’ referred to by Beaumont, may possibly be some of the cathepsins the analogues of pūcakāṁsas, present in sarakta medas (red-bone-marrow). ²

2. Āyurveda has recognized majja, present in the hollow of long bones, as one of the dhātus (मेदसालानि पूर्वन्ते स्नेभो मांजः ततः स्मृतः: । Caraka: Gīkitā 15:32). Vaidyaka Šubdasindhu has described majja as śuddha sneha or pure fat (मक्खा अस्य: सुद्दस्नेहायाः ...... स्नेहास्त्रयः: शुचिरं स्प्यादः). This majja of Āyurveda has not been described as one of the raktasthānas. On the other hand
Metabolic equilibrium

That the two aspects of dhātvagnipākas viz., prasāda and kīṭā, under normal states of health, maintain an equilibrium is seen from Aṣṭāṅgasāṅgraha and Cakrapāṇi's commentary on Caraka. Says Cakrapāṇi, "Rasādi dhātus," which are always destroyed are being replaced by dhātvāhāras, derived from the four kinds of nutritions, ingested. In his view, the rasādi dhātus are lost in catabolic processes and such losses are made good, again, by anabolic events. 2 Says Cakrapāṇi, "Srīrā dhātus, which are destroyed by their own agnis are replenished by four kinds of foods ingested." 3

Different State of Jāṭhārāgni

All the available editions of the main Saṁhitā granthas have described four states of jāṭhārāgni viz., sama, viṣama, Suṣruta has designated the mājā or marrow present in bones other than long bones as saraktamedas (स्त्रूतासिद्धि विशेषेण मज्जा स्वस्थ्यनारीसिद्धा। अथवे सर्वधिक सरक्कमेद ध्येये। Suṣruta: Srīrā 4 : 15).

Elsewhere, discussing the sthānas of raiṇjakopita he has mentioned that this pitta, located in its own sthāna, supports the raktasthānas, except yakṛt or liver and pīṭha or spleen, (Suṣruta: Srīrā 21 : 16), which are the sthānas of rakta as well as raiṇjakopita. It has been suggested that the inclusion of saraktamedas as one of the raktadhātus, would help in enlarging the theories of the formation of blood from the point of view of Āyurveda. In the present context pānakāṃśa in saraktamedas, is considered to be necessary for the final transformation of the asthāyi raktaadhātus into sthāyi raktaadhātus. The former would include all materials produced and processed by bhūagni and dhātvagni pākas, as may be required, for the synthesis of the sthāyi raktaadhātus.

1. वसरोचासांप्रेक्षाेणे पूर्वों स्रोतसां वथाकालं सम्यक्याहारोपवोजन परिणामवतवायमानाः नापशयो भवति। तत्वे धातास्य प्रसावमकः स्वं स्वमेष माननुवृत्तं वथावथः:ःस्त्रीरस्मः। Aṣṭāṅgasāṅgraha: Srīrā 6 : 63.
2. धातवस्य स्वस्त्र, नित्यः क्षोभमाण: अक्षिताधिबिन्नत:। धातवाधारं एव सन्ते परं स्वस्थ्यनवृत्तं नायस्कैसयं। Cakrapāṇi on Caraka: Srīrā 28 : 3.
3. तेन सर्वद्रा स्वात्मिकाधिक्यमानातः। श्रीरस्वादिना उच्चवादियोजनसुपपश्चमिति दृष्यति। Cakrapāṇi on Caraka: Srīrā 28 : 3.
This classification of agni is seen to have two aspects viz., (a) an aspect, which may be described as natural and which forms part of prakṛti or temperament of the individual, and (b) an aspect, in which three doṣas become involved, due to the operation of different etiological factors (ādhyātmika, ādhibhaūtika and ādhaīdvika) on the body, leading to a reciprocal influence, between them and agni.

(a) Natural states of agni, as a part of temperamental make-up—

Prakṛti or temperament is inherited and predetermined; that is to say, genetically determined. According to Āyurveda, unless described otherwise, prakṛti is determined by the state of tridoṣas in the parents at the time of fecundation. In this view, the state of tridoṣas in the parents at the time of their mating influences the śukra or male-reproductive element and ārta or female reproductive element. Accordingly, the prakṛti of the child to be born is stated to be influenced and determined.

---

1. (a) अश्रु शारीरैः प्रत्येको विशेषयो वहनेद्रो भवति तथा—तीर्थ्यो, मन्दः, समो, विषमः। Caraka : Vimāna 6 : 12.

(b) प्रागामिनतो शिरस्य पानकः। स च तृत्तिको तवति, दीप्या निमित्तत एको, विक्षियामाकूपिततिविशी सवति। Suśruta : Sūtra 35 : 20.

(c) समोधितेष्वरस्तीश्च नन्दे विषति च चुति:। Aṣṭāṅgahṛdaya : Sūtra 3 : 74.

2. ऐते चुतिका भवेत्यमय:—चुतिका नैशवेतुप रुक्ताणाम्। तस्व सम्ब्रह्मकेष्यमाणां प्रकृतिस्तवानां समा पवन्यस्यः। वात्तालान े वातस्यमुऽक्षमयां विषमा पवन्यस्यः। पितामान तु पितास्य वातस्य विषमविभागा तीर्थ्या भवेत्यमयः। तितीयालान े श्च भवेत्यमुऽक्षमयां मन्दा भवेत्यमयः।

Caraka : Vimāna 6 : 12.

3. विषमा वात्तान, तीर्थ्यो, पित्तेन, मन्दः इक्ष्माण, चुतिका: समः। सर्वसामस्यादिति। Suśruta : Sūtra 35 : 20.

4. (a) शुक्रोगितिःसांहो यो महेद्र दोष उक्तः। प्रकृतिकालयत: तेन तस्य महेद्र शुक्र । Suśruta : Sūtra 4 : 58.

(b) शुक्राक्षोगिताः सांहो विषमातः। तां तितिः। प्रकृति: हीनमाध्यायमां:। पुष्काः। Aṣṭāṅgahṛdaya : Sūtra 1 : 9.

5. Caraka has furnished details as regards factors, which determine or influence, deśie states in the parents, from the point of view of—
The states of agni, according to prakṛti are as follows—

<table>
<thead>
<tr>
<th>Prakṛti or temperament</th>
<th>States of agni</th>
<th>Confer predisposition to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vāta prakṛti</td>
<td>Viṣamāgni (erratic or fitful)</td>
<td>vāta vikāras</td>
</tr>
<tr>
<td>Pitta prakṛti</td>
<td>Tikṣṇāgni (acute &amp; sharp)</td>
<td>pitta vikāras</td>
</tr>
<tr>
<td>Kapha prakṛti</td>
<td>Mandāgni (Dull &amp; Slow)</td>
<td>kapha vikāras resistance to disease</td>
</tr>
<tr>
<td>Sama prakṛti</td>
<td>Samāgni (normal)</td>
<td></td>
</tr>
</tbody>
</table>

This classification is of importance in preventive medicine.

(b) According to Vāgbhaṭa, the functioning of agni is normal, when samāna vāyu is functioning normally, in its own sthāna. On the other hand, if this vāyu moves to places other than its own, agni too will be disturbed; if the same vāyu commingles with pitta then the jātharāgni becomes tikṣṇa or acute; on the other hand, if it is afflicted by kapha, then the agni becomes manda or dull. In other words, if neural

(a) Kūla—relates to seasonal variations or fluctuations in deṣa rythm.

(b) Garbhāsaya—The states of deṣas, which have a bearing on garbhāsaya, possibly the sthānaka vāyu—apāna, the sthānaka kapha of trika—asalambaka and sthānika pitta—(?).

(c) The influence of nutrition and activities—physical and mental—of the mother which may influence the activities of the one or other of the deṣas.

(d) mahābhuta vikāra prakṛti—physico chemical peculiarities of the ṣukra and ṣogita (Caraka: Vimāna 8:95).

In addition to the above, which have been brought under pratyāntmanīyata type of prakṛti (vide Caraka: Indriya 1:5) other factors such as jāti (race), kula (family), deśa (geographical influences), kula (season) and vayāh (age) etc. play an important role, in the formation of prakṛti.

2. (a) विषमी वातािर्न रोगानु तोष्णः पितासिद्धिचाबान् || करोदकशिलदा मन्दी किकारानू कक्षसम्बन्ध || Suśruta : Sūtra 35:22.
   (b) Madhavanidāna 6:2.
3 सम: समाने स्थानस्य विषमीश्चिनिभवान्य || पितासिद्धिभिषिष्टे तोष्णे मन्दोदिरमनस्कीर्षिते ||
   Astāṅgahṛdaya : Śūrīṇ 3:73.
influences on the secretory mechanism of gastro-intestinal glands are normal, then the gastro-intestinal digestive events are also normal or sama. On the other hand, if neural influences on the secretory activities of gastro-intestinal glands are hyper–active, then the condition is referred to as atyagni or tikṣṇāgni. If, on the other hand, there is hypo-secretion of the gastro-intestinal glands due to lack of adequate neural stimuli then the resulting condition is mandāgni. Lastly, irregular and erratic secretions—sometimes more and sometimes less—correspond to viṣamāgni. The symptomatology of the four states of agni are furnished in the table below:

<table>
<thead>
<tr>
<th>Name of the doṣa</th>
<th>State of the agni</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vāta</td>
<td>Viṣamāgni</td>
<td>Sometimes digests slowly, sometimes normally and sometimes produces ṛdhmāna (distension of abdomen), śūla (colicky pain), udāvarta atisāra (diarrhoea), jaṭhara (ascitis), gaurava (heaviness), antrakājana (gurgling sound in the intestine), pravāhaṇa (dysentery).</td>
</tr>
<tr>
<td>Pitta</td>
<td>Tikṣṇāgni</td>
<td>Digests even large quantities of all, too frequent meals; after digestion produces galaśoṣa and dāha (parched throat) oṣṭha soṣa and dāha (parched lip) tāluśoṣa and dāha (parched palate) and santāpa (heat and burning sensation).</td>
</tr>
<tr>
<td>Kapha</td>
<td>Mandāgni</td>
<td>Cannot digest, even normal diet properly causing udaragaurava (heaviness of abdomen), śirogaurava (heaviness of the head) kūsa (cough), śvūsa (dyspnea) praseka (salivation), chardi (emesis), gātrasadana (weakness of the body).</td>
</tr>
<tr>
<td>Samadoṣa Samāgni</td>
<td></td>
<td>Properly digests the normal diet.</td>
</tr>
</tbody>
</table>
This is a state in which the action of जाठराग्नि is considerably inhibited due to the dominant influence of कप्तha, of the three दोषा. Hence, this state of अग्नि मांडग्नि is known as मांडग्नि. In this state, the अग्नि is unable to digest (and metabolise) even a small quantity of otherwise easily digestible food.¹

The action of जाठराग्नि in this state is influenced predominantly by पिता of the three दोषा. The अग्नि in this condition is said to be excessively excited तिक्ष्णग्नि and hence it is known as तिक्ष्णग्नि. तिक्ष्णग्नि easily digests even a very heavy meal, in a very short space of time. It causes voracious hunger—a condition usually spoken of as अत्यग्नि—(or भास्माका by certain authorities). It makes possible for a glutton to digest his all too frequent meals. It is stated to produce parched throat, palate and lips, heat or other discomforts.²

An erratic state of अग्नि arises, as a result of the influence of वातa, in the condition described as विषमग्नि. In this state, the action of अग्नि is irregular and fitful.

विषमग्नि It sometimes helps the process of complete digestion and at other times produces distension of the abdomen, colicky pain, constipation of the bowel, dysentery, ascitis, heaviness of the limbs and loose motions.³

---

1. (a) दुर्लभो विभाष्यते तथापूर्वेऽक्षेपोपि वा। Caraka : चिकित्सा १५ : ५१।
   (b) वस्तु त्वत्राः तथापूर्वेऽक्षेपसर्वादपात इत्यध्यायानि कुट्टा। महता तागलिन पचति स मन्दः। Suśruta : सुत्रा ३५ : २१।
   (c) मन्दस्तु त्वद्विभाष्य लोकां विश्रावात्वेद। कुट्टास्य शोषातिपांचन्त्वकृतान्याचारानाबृष्टम्। अष्टोत्तरचर्यादः सुत्रा ३ : ७६।

2. (a) तीक्षणां मन्दवेदना पातुतू प्रशोपयिति पावकः। Caraka चिकित्सा १६ : ५०।
   (b) योऽ प्रभृतिमुद्राक्षमात्र पचति स तीक्ष्णः। स प्रभृतिमुद्राक्षमात्रात पचति। धातुः धातुः स च। अष्टोत्तरचर्यादः सुत्रा ३५ : २१।
   (c) तीक्षणां वधिः पचेत श्रीव्यमस्यान्त्वमोक्षेत।

3. (a) विषमो धातुश्च विलोक्तं विषमो धातुः। Caraka चिकित्सा १५ : ५०।
   (b) योऽ तत्र तद्विभाष्यते तद्विभाष्यते कर्मात्कालचारानाबृत्तिसिद्धान्ततिर्विवधानस्त। अष्टोत्तरचर्यादः सुत्रा ३५ : २१।
   (c) विषमोऽस्माद्विभाष्य अस्वद्यान्त्वमोक्षेत।

अष्टोत्तरचर्यादः सुत्रा ३ : ७५।
In the well equilibrated state of functioning of tridoṣas, the jāṭharāgni is, also stated to function normally. This state of its function has been described as Samāgni samāgni. In other words, jāṭharāgni ensures complete digestion of food ingested at the proper time without any irregularities, when tridoṣas are in an equilibrated state of functioning. ¹

Influence of different states of jāṭharāgni upon dhātuḥ.

Since a co-relation between jāṭharāgni and dhātuḥ has been shown to exist in the form of pācakāṁśas present in the latter and any departure in the normal state of functioning of the former can logically be expected to influence the latter in many ways. In other words, hypo, hyper and erratic functioning of jāṭharāgni may be followed by hypo, hyper and erratic functioning of pācakāṁśas, present in the dhātuḥ leading to—

(a) hypo-metabolism or mandāgni leading to states analogous to myxedema, resulting in dhātu vrddhi.

(b) hyper-metabolism or tikṣṇāgni, resulting in the digestion of dhātuḥ themselves;

(c) erratic metabolism producing metabolic vagaries.

The implication of the foregoing may be visualised as hereunder:

Mandāgni—Due to deficient digestive secretions in the gastro-intestinal tract much of the nutrition, ingested is wasted and little if any of amino-acids, fatty acids glycerols and glucose as may be formed and absorbed may be inadequate to meet the needs of the tissues. Small quantities of these substances which may be absorbed may not be completely metabolised, due to deficient intermediary metabolism leading to the production of intermediary metabolites; hence, the synthesis of nutrition as well as energy-metabolism may be considerably lowered. In addition, the accumulation of partly

¹. (a) बुर्क सुक्तति कुर्को भातुसब्र्ह्म न मन्त्र | Caraka : Cikitsa 15 : 51.

(b) समस्तू हस्तवचार्त: विकृतिमार्गंतवाभारतत्रू प्रकृतिविवेर्द्धके | Caraka : Vimāna 6 : 12.

(c) तत्र से यथाकालपुरुषमयम न तम्सय स सम्य क पचि स सम्य मत्राय: | Sūtra : Sūtra 35 : 21.

(d) व: पचतस्म्येवाऽकुर्क सम्य कस्मस्तवृतय | Āṣāṅgahṛdaya : Sūtra 3 : 74.
metabolised substances in the body may, in their turn, block the metabolic pathways and inhibit or inactivate the enzymes leading to metabolic—hypotoxic—anoxic conditions, thus, conferring susceptibility to varieties of diseases of metabolic origin.

Tikṣṇāgni—In the case of tikṣṇāgni, the quantity of food material digested and made available to tissues are obviously consumed or burnt leaving hardly any material for the synthesis and maintenance of tissues as in case of thyrotoxicosis.

Viṣamāgni—The situation, visualised by this type of disturbances, is difficult to explain.

DHĀTUVAHA SROTĀMSI

Elsewhere, annavaha srotāmsi was discussed in page No. 77 in connection with āhāra pācana (digestion of food) and its śoṣaṇa (absorption). A reference was then made to two aspects of the concept of srotas viz. the sthūla or macroscopic, corresponding to the mahāsrotas or gastro-intestinal tube and the villi, including the capillaries in them respectively. Earlier, while discussing bhūtāgni and dhātvāgni pākas, a reference was also made to yakṛt, as an organ concerned not only with the formation of rakta but also with several chemical processes involved in dhātvāgni vyāpāra. The distribution of the poṣaka or asthāyi dhātus (precursor homologues) of several dhātus of the body was then stated to be transported to the sthāyi dhātus through their specific srotāmsi, for their synthesis and maintenance metabolism. Thus, the part played by dhātuvaha srotāmsi and the mode of distribution of poṣaka dhātus to the poṣya dhātus, as envisaged by Ayurvedic classics and important commentaries thereon assume importance in the context of this thesis.

The importance attached to srotāmsi, in physiological and pathological states, especially, in the description of saṁprāpti or pathogenesis of diseases, can be seen from the emphasis laid on the need to understand their structures, by Caraka, Suśruta and Vāgbhaṭa.
Observes Caraka, "malas (waste products) are removed from the dhātus and prasāda transported to them through the ayanamukhas of srotāñsi. These ayanamukhas nourish the dhātu with appropriate substances to the extent required.

"No structure of the body can flourish or decay independent of srotāñsi. It is undoubtedly the srotāñsi which convey the dhātus, which latter undergo transformative changes. Srotāñsi subserve the purpose of transportation.

"Nutrient substances which nourish the dhātus undergo pāka by tajma or agni of the dhātus and then, they are made available through their respective srotāñsi."

The foregoing citations are a few, among the many, which occur in the Samhītā granthas, but those cited above are sufficient to focus attention on the importance of srotāñsi, as the normal healthy state and functions of the body depends upon the integrity of its internal transport system.

Even so, pathological events are also stated to have their origin at the level of srotāñsi, as can be seen from the following quoted from the three main Ayurvedic Classics. Says Caraka, "The rasadhātu is continuously circulated throughout the body being propelled by vyāna vāyu. Thus, if rasadhātu accumulates in any part of the body due to pathological involvement of the srotāñsi (circulatory channels) abnormal changes are initiated. Doṣas in such a condition become localised and initiate the process of disease in their places." Says Suśruta, "The circulation of prakuptita doṣas is impeded due to the involvement of srotāñsi where, they react with

1. तैसि हु खय मध्यप्रसादास्यां धातुर्ग्रहणां स्रोतास्यवन्मुखानि। तामि यथा-विमाणेन प्रशास्य धातुवार्तकारित। | Caraka : Sūtra 28 : 5.
2. यथा हि मावः पुरुषे मात्रं लोकस्य भूतेऽभिनवतेऽन्ते, क्षयं वायुविभक्तिः। | क्षोति खय परिवार्तमास्यानां धातुभविभाष्यिनि भव्येति अध्ययनः। | Caraka : Vīmāna 5 : 3.
3. बधार्तेनोपभाग्यं पाकः शारीरका वानित धातवः। | शोत्तस्वा च वषापानं धातुः पुष्पति धातुः। | Caraka : Cikitsā 8 : 39.
4. भ्रमणम् खः (स्व)वैवधायम् साधारित यथ सः। | करोति विकसिति तथ ले वर्गमिव तीयदः। | Caraka : Cikitsā 15 : 37.
the dhātus and malas of the locality and give rise to various forms of diseases from that place.”

Observes Vāgbhaṭa in his Aṣṭāṅgahṛdaya, “In all diseases, prakūpta doṣas reach the site of the disease (rogādhiṣṭhāna) through the rasāyaniṣ3 and soon cause pathological states.”

Thus, a study in some detail of the internal transport system—both macroscopic and microscopic—through which different kinds of substances are transported to and from dhātus or tissues becomes necessary. These include gross channels, such as arteries, veins, lymphatics, respiratory passage, alimentary tract, various ducts which open out internally into several cavities of the body and externally through the skin and other structures. We are at the moment concerned with the study of the more subtler or microscopic channels as distribution of nutrient materials to and the clearance of waste products from the dhātus or tissues.

**Implication of the term ‘Srotāṇi’—**

Earlier, the definition of srotāṇi offered by Caraka, was referred to in the context of the description of annavahasrotas.4 To recapitulate, the ‘srotas’ is socalled because of ‘sravaṇa’ which takes place in it. The term ‘sravaṇa’ means ‘to exude’, ‘to transude’, ‘to permeate through’ or ‘to filter through.’ The term itself is derived from the sanskrit root ‘चु छव’ meaning to exude or to pass through.

The implication of the root-meaning sravaṇa, and the definition of srotāṇi, referred to above can be appreciated better by taking into consideration the observations made by Caraka that ‘malas’ or waste-products are removed from the

---

1. कुपितानां दु: दीषाणां शरीरैः परिषाबस्य।
   वर्त समं: खैडप्यायेण व्याहित्त्रोपवयते। | Sūtra | Sūtra 24:10.

2. Rasāyaniṣ is the synonym of srotas.

3. स्तोताःसि, सिद्धाः, ब्यायन: , रसायन: , रसवृहिन्य: , नाल्ल: , पनान: , सालाः, शरीरवेष्टिग्न्य संबंधासंबंधतानि, स्थानानि, आयुधाः, नित्तितायमेव शरीरवेष्टिका वक्ताणां क्षमाकस्याणां नामाणि ममाणि। | Caraka: Vīmāna 5:9.

4. Page 77.

5. Pr. Dhātup. 965.
dhātus and prasāda transported to them by ayanamukhas of srotāṃsi. These ayanamukhas nourish the dhātus with appropriate substances, to the extent required. In this view, there are two aspects to the concept of srotāṃsi, viz., (1) these are structures through which sravana or oozing (exudation or filtration) of fluid takes place; (2) they are channels through which body fluids are transported from place to place.  

Describing the state and forms of srotāṃsi, Caraka says that these take the colour of the dhātus they transport—they are either tubular, large, minute, elongated or reticulated in appearance. All these forms and in special the reticulated form of it have a relevancy to this discussion. Even so, the use of the term ayanamukhāni, is significant in the identification and description of the functions of srotāṃsi. This term is made up of two words viz. ayana and mukha. Caraka has described ayanamukhāni as channels, which are themselves entrances. Cakrapāṇi, in his interpretation of the term ayanāni, has stated that this term means channels through which materials travel and mukhāni—openings, through which materials enter or make an exit. Therefore, says Cakrapāṇi “the channels and entrances of dhātus are not different entities and the same channel serves both as a conduit for the transmission of prasāda and malas alike.” It also serves the purpose of their ingress and egress. It would, thus, seem that the term srotāṃsi refer to channels which serve both as a conduit as well as the medium through which fluids exude, transude, permeate or filter through. This interpretation is supported both by the nirukti and vyutpatti of the term ayana mukha. The term ayana is derived from the root ‘इण गति’  

1. अयनानि च तानि मुखानि वेष्यवनमुखानि । अश्रु आयानस्वनेन इति अयनानि मर्गगृहि, मुखानि तु वै: प्रविश्यन्ति ।
   Cakrapāṇi on Caraka : Śūtra 28 : 5.

2. स्थवातु समवर्णनि रुपस्मृतिक्षणनि च ।
   स्त्रोतसिः दर्पणायक्तः प्रतासनस्तर्पणनि च ॥ Caraka : Viṃśīna 5 : 25.

3. एतं महानां भूतानां च वदेवायं तदेव प्रबर्धमुखामिति नामेन प्रवेशी नामेन 
   ग्रामामिस्यूङ्कं भवति । Cakrapāṇi on Caraka : Śūtra 28 : 5.

meaning ‘to go’ or ‘to move’, implying “through which some-
thing moves.” The term ‘mukha’ is derived from the root
‘मुखः मोचने’ ¹ meaning, ‘to leave’ or ‘to be free.” Amarasiṃha
has used the term ‘निःसारण’ as a paryāya or synonym of ‘निःसारणा’
meaning a structure through which things get out or get in.
It is in this context Suśruta’s description of srotāṇi, with
certain reservations, assume importance. He has described
srotāṇi as channels, which have their root or origin in an
organ cavity (chidra—Daḥana) and spread throughout the
body conducting rasādī dhātus. These are different from
sirās and dhamanis, ² which may otherwise resemble them.

The mention, here, of rasādīdhātus, which are stated to
circulate through the srotāṇi need an elucidation. By rasādī
dhātus is meant the sthāyi rasa cum rakta which circulate and
transport the poṣaka or asthāyi dhātus to other poṣya or sthāyi
dhātus. The fluid that circulates through dhamanis and sirās
which have their origin in the hrdaya or heart, is stated to
be rasa. ³ This fluid is the vehicle which carries nutrients
to all the tissues of the body and it is this fluid, again, which
exudes, filters and diffuses through the ayana mukhas of the
srotas. A distinction between the circulating rasa and rakta
cannot obviously be drawn as the fluid that circulates in the
dhamanis and sirās, is a composite whole and a complex-
flowing tissue composed of the sthāyi rasa and rakta. It is
significant to note here that Ayurvedasūtra, a fifteenth century
work has advanced the view that “rasa itself is rakta, ⁴ rakta
is rasa ⁵ and rakta is both rasa and rakta.”⁶ In addition, pro-

1. Pa, Dhātup. 1455.
2. (a) मूलाद खाद्यतर्क देशे प्रस्तुतस्वभावः यद।
   स्वतत्त्वदिति विशेषे विशेषभवनिरेकुम् । Suśruta : Śūrīr 9 : 13.
   (b) मूलाद खाद्यतर्क देशे प्रस्तुतस्वभावः यद। Daḥana on above.
3. सम्बंधविभवः यद। स्वतत्त्वदिति विशेषे विशेषभवनिरेकुम् ।
   स्वतत्वदिति विशेषे विशेषभवनिरेकुम् । Suśruta : Śūrīr 14 : 2.
4. रसी भासुक्। रसी भासुक् । Ayurvedasūtra : Praśna 2 : page 100.
5. अस्त्रयोग रसायन। Apid : Praśna 8 : page 25.
6. अस्त्रयोग रसायन। Apid.
ceeding on the basis of adhikaraṇa siddhānta, the fluid that is drawn in raktamokṣaṇa is red and it is pumped or thrown out as it were by hṛdaya. This fluid is both rasa and rakta, in the sense that raktaḍhātu while being transported by rasaḍhātu, during its vikṣepaṇa imprints to the latter its characteristic red colour. Cakrapāṇi Datta has also recognized hṛdaya as the seat of rakta.2

Dhamanis are also stated to be the medium, through which ojas is made available to dhātus. They (daśamahāmūladhamaṇis) emerge from hṛdaya.3 Rasa4 and rakta are also, paryāya padas (synonyms) of ojas. It will be relevant to note here that, both Dalhaṇa5 and Cakrapāṇi,6 commenting on the term “Dhātugrahaṇanīḥsṛtam” in connection with ojovīraṇa, ojovyāpat and ojaktasaya, have interpreted this term as dhātuvaḥa srotas. Cakrapāṇi has in addition stated that their srotāṃsi are also ojovāhinis. It would thus seem that the daśamahāmūladhamaṇi, which emerge from the heart and spread throughout the body giving off ever smaller branches ultimately end as srotāṃsi which perforce must be extremely subtle tubes with innumerable openings or pores in their walls, through which rasa sravana takes place. In this sense, srotāṃsi would demarcate and line the dhātus and answer to the description of kālas viz., dhātvāsrayantara maryāda.7

The importance of the foregoing conclusions will be

1. तन्न वैषयाचार्योपन्ते तद्विधिकरणम्। Saṃrutta: Uttaratantra 65:8.
2. रक्तादानां तु सवैश्वर्यरचनार्थमिन्द्रिश्च विशेषण हत्या सतानुचक्।
   Cakrapāṇi on Caraka: Cikītāla 24:36.
3. तेन मुकेन महत्या महाशुभं मत्य दश। बोधेह: शरीरस्मिन्यो विक्षेपके समन्तः। Caraka: Saṃrutta 30:8.
5. भातुव्रह्मसन्धिता भात्वो गुणाने यैत्तानि भात्वमहानानि भात्ववाहिनि। छोटाः, तत्त्वः विश्वार्थ सन्यात्। Caraka: Saṃrutta: Sūtra 15:23.
6. भात्वो गुणानेत यैतितानि छोटाः कोशीवाहिनि। Caraka on the above.
7. कड़ा: खल्वचि सत मवनिता भात्ववाहायतमर्भदा। Saṃrutta: Sūrīra 4:5.
readily appreciated by the fact that Caraka has described the characteristic features of dhamanis, srotāṃsi and sirās in the context of the description of the mode of distribution of ojas to all parts of the body...... .” They are spoken of as dhamanis because they pulsate, as srotāṃsi because they permit oozing and sirās because they maintain continuous flow” ¹ obviously of rasa and rakta.

This passage is significant in the sense that it describes in simple terms different aspects of circulation in which the heart occupies a central position comparable to a pumping station. The order of enumeration of dhamanis, srotas and sirās is also seen to be meaningful and purposive. No doubt there exist morphological and functional differences between dhamanis, srotas and sirās, which, according to Caraka’s definition would appear to correspond to arteries, capillaries and veins respectively. The unity and diversity of these three component parts of the circulatory apparatus can be seen from the fact that the heart and the entire vascular system have been shown, to be lined with a single continuous layer of smooth flat epithelial cells. These constitute the entire internal wall of blood and lymph capillaries, but in larger channels muscle and fibrous elastic tissues envelop the lining layer the wider the vessel thicker is the wall. Arteries which bear the burnt of internal fluid pressure are particularly thicker as compared to veins and lymph vessels. Arterial blood flows in rhythmic spurts, in keeping with the rhythm of the heart. As each spurt of fluid impinges on the wall of arteries, it gives rise to pulse vibration ( dhmāna ). Likewise as the distance from the heart increases, the arterial spurt becomes less and less powerful. By the time blood, through the capillary vessels, reaches veins, it no longer spurts but flows in continuous even stream. Thus, hrdaya, dhamanis, srotāṃsi and sirās—including rasavaha srotāṃsi—constitute a single circulatory unit, which regulate the proper flow of blood, supply nutrition to and remove waste-products from dhātus.

1. ध्यानाद धमनयः, स्रव्याल्लोतांसि, सरणासिराः \ Caraka : Sūtra 30 : 12. \
The reason, why Śuṣruta sought to exclude śirāś and dhāmanīs from the description of srotāṇiṣi, will become clear by taking into consideration the fact that endocardium which is made up of a single layer of endothelial cells which as the tunica intima of large arteries like ‘Aorta’, medium sized arteries like the ‘femoral’ and small arteries like dorsalis pedis, arterioles, etc. finally end as capillaries and continue beyond as the tunica intima of veinules, small veins, medium sized veins and big veins which finally end as the endocardium of the heart. Even so, the lymphatics which commence at the level of the tissues are also lined by endothelial cells and finally end in the heart. Sravana does not take place either from a dhāmanī—big, medium or small or from śirāś (veins) likewise, but it actually occurs at the level of srotāṇiṣi, which are both ayanas and mukhas.

The dhātuvaḥa srotāṇiṣi can now be compared with the endothelial walls of capillaries with sufficient justification. Capillary walls have been shown to be composed of endothelial cells joined at edges to form a tube. These cells are not similar to other types of cells in that they possess the property or being semi-permeable, that is to say, they exercise selective discrimination in permitting certain materials to enter through them, while denying entry to others. The dimension of the capillary wall is one cell larger thick. They are made up of intercellular pores corresponding to the description of mukhāni of srotāṇiṣi.

Capillary system and dhātuvaḥa srotāṇiṣi—

Capillaries, like srotāṇiṣi, are extensively minute tubes that lie between the arterioles and veinules, the space between the two, being occupied by tissues or dhātus and tissue spaces filled with fluid. The diameter of a capillary is less than that of a hair, so that, in many of them red blood corpuscles may have to pass through in a single file. Their diameter varies from 5 to 20 microns and about 0.5 mm. in length.

The function of capillaries is apparently determined by their structure. This is specially important having regard to the two-fold functions ascribed by Āyurveda to srotāṇiṣi viz.
(1) ARTERIAL END OF THE CAPILLARY
(2) VENOUS END OF THE CAPILLARY
(3) TISSUE FLUID (LASIKÅ)
(4) TISSUE CELLS (DHÅTUPARAMÅNUS)
(5) LYMPH (LASIKÅ)
ayana and mukha. As mentioned earlier the capillary walls are composed of merely a single layer of that endothelial cells joined to one another at their edges by a cement substance which is considered to be made up of a mesh of calcium proteinate. Nutrient materials—poṣaka dravyas—and oxygen—vijātiya tejas—pass out from capillaries to the tissues and carbon-di-oxide—malarūpa vāyu and other breakdown products of metabolism—dhūtumalas—enter the blood-stream and they are carried away.

The space between the capillary wall and tissue-spaces is filled with tissue fluid which filter or oozes through the wall—sravaga—through ayanamukha of srotānsi-capillaries. This fluid is derived from blood plasma—sthūyi rasa dhātu.

A system of lymph vessels drain the fluid from extra cellular spaces and this fluid in lymph vessels (rasāyantis) is known as the 'lymph.' There is in fact no difference between the tissue-fluid and lymph. It may be noted that blood passing through tissues is really confined to capillaries and in the normal course of events, it does not come in direct contact with cells i.e. dhūtus. The lymph or tissue fluid on the other hand is in the tissue spaces outside the capillary wall and it is this fluid that baths tissue cells. Not only this, it acts as a medium of exchange between blood and tissues. Poṣakadravyas or nutrient materials pass through capillary wall and are carried by tissue fluid to cells. Even so, waste-products of cell metabolism, i.e. kīṭta that arise out of dhūtvagni pāka pass from the tissue or dhātu to tissue-fluid which is then absorbed into the blood stream and carried away. The rasāyanyah (lymphatic) system represent an one way traffic. Its function is to gather tissue-fluid and not to distribute it. Smaller rasāyanis join together to form large ones and in their turn they ultimately drain into veins or sirūs. At this point rasa or lymph once again becomes part of rakta or blood and is distributed by arterial or dhamani

1. स रसः: हस्तुच्चयते, तस्य हुर्यं स्थानं, स हुर्याद चुत्विशशिष्मनीरुप्रविष्योचर्या दश दशायोगमिताः: चतस्य तिर्यंगम: हस्तं शरीरमहर्ष्ट्रपतिः, वर्षयति, धारयति, गायतिः चायदेश्वतुकेन कर्मणा। Sufruta : Sūra 14 : 3.
system. Lymphatic capillaries are wider and irregular as compared to the blood capillaries. They anatomic to form elaborate plexuses or become reticulated.

Specificity of srotāṃsi—

Saṁhitā granthas have correlated srotāṃsi with dhātus and have described them by the name of poṣaka dhātu, they carry and the sthāyl dhātus to which they are conducted. Thus, there are references to rasavaha srotas and raktavaha srotas etc. Earlier in page 91 it was noted that praśāda portion of the final precursor products of prasāda pāka of dhātvagni vyāpūra are transported through specific dhātvaha srotāṃsi to particular dhātus to which the poṣakadhātus are meant to be supplied. Thus, the nutrient needs by māṃsa dhātu of specific substances is channeled through māṃsavaha srotas whereas the specific srotāṃsi of maffā can transport and supply specific substances required for this dhātu. In other words, each dhātvaha srotāṃsi can be said to be able to exercise a selective discrimination and specificity as regards substances, they carry to specific kinds of tissues. ¹ This view finds support from modern scientific researches. According to Abraham White et al, “Although consistent with many observed facts Starling’s concept of exchange of materials between the arterial and venous branches does not account for the difference of exchange among various tissues. Additional factors are the structure of the membrane which separate capillaries from tissue-spaces, and rapid diffusion along the length of the capillary. Insight into the differences in the nature of the walls of glomerular capillaries and the capillaries of striated muscle has been gained by comparative measurements of the rates of diffusion of water and solutes between the vascular bed and the extracellular spaces of kidney and muscle. In these studies the permeability to water was found to be hundredfold greater for the glomerular capillaries than for those of muscle. These results were most readily accounted

¹. न चाम्यत्रोतसात्यपाद्युप्तिः संभवति, सर्वपौष्पाः प्रणदेशश्च, न द्विप्रेतेन सोतसा प्रणदेशश्चयोः सत्नमतिः।

Cakrapāṇi on Caraka: Vīmaṇa 5:3.
for by assuming the presence in the capillary wall of pores, the number of which per unit area, as well as their shape and dimensions, can be assumed to vary according to the tissues in which the capillaries are found. (Italics mine). Thus, the Starling concept, which assumes the ultra filtration of blood constituents, is modified to include the concept of porous capillary wall, with pore numbers, dimensions and shapes varying in capillaries of diverse tissues and operation of a rapid diffusion process across the capillaries.¹

Modern trends as regards the specificity of capillaries as represented by the views of Abraham White et al extracted above will highlight the old Ayurvedic view that srotāṃsi are specific in their nature and function, according as, the nature of the poṣaka dhātu they transport and the dhātu to which they supply.

The relevancy of a discussion on srotāṃsi, arises in view of the Ayurvedic doctrine that agni-dusṭil may involve dhātu, resulting in an accumulation in them of malas or doṣas as they are called. This has been stated to be preceded by kha-vaiṣṇyav (srotō-vaiṣṇyav) leading to srotorodha and, in consequence, the obstruction to the free flow and circulation of normal doṣas and dhātu and the retention of malas or doṣas in the dhātu concerned, leading to an interaction between the doṣas and dhātu of the locality where, obstruction has taken place. This phenomenon has been described as doṣa-duṣya-sammūrchanā. The site, where doṣa-duṣya-sammūrchanā takes place, has been stated to be the site where the process of disease is initiated corresponding to the sthāna samśraya phase² of kriyākālas.

Adverting to the doctrine that moities of pāca (pāca-kāmśa) permeate the dhātu and augment the function of

2. एवं कुष्ठालास्तमान दसरथदेवेशानांमथ तास्ताना लघुपीक्षादिकत्वात् स्वाभावः जनविभिन्न || ते यदृच्छिक विकृति व धातुगत युक्तिः प्रबलतानुभूति जनविभिन्न, वर्तितानाः प्रमेयाश्वानां अन्तर्गतविन्द्रूपप्रभुवति || मेधमाता निषुद्ध-प्रकृष्टवर्धनेऽसुकृतिः प्रमुखतीम्.... || Suśruta : Sūtra 21 : 37.
sthāniṇika pitta must take into consideration the fact that even srotāṁsi, that answer to the description of kalās which form some of the vitally essential structures of our body corresponding in general to epithelial tissues (endothelium) have metabolic functions to perform in consequence of their vital activities. In cases of agnimāṇḍya or the duṣṭi of pācakāgni it can be logically expected that the pācakāṁśas in srotāṁsi too may be deficient leading to abnormal functioning of them corresponding to kha-vaiṅguṇya or functional impairment of srotāṁsi. This may be expected to result in the obstruction and occlusion of these vitally important structures resulting in the stasis of poṣaka dhatūs in circulation and the clearance of malas from the related sthāyi dhatūs. In other words 'srotorodha' is thus caused. This may be manifested as, described by Caraka, in either an excessive flow (atipravṛtti) as in bahumātra 1 or polyuria, resembling prameha or diabetes mellitus and insipidus etc. Another example given in the context is atisāra 2 or diarrhoea or diminished flow (saṅga) as in mātrakṛṣchra 3—anurea—and frequent voiding of faeces in small quantities of the contents of the affected srotāṁsi or their dilation (granthi) or diversion of the fluid circulating in the affected srotāṁsi through different other channels according to the nature of the involvement of the srotāṁsi i.e., srotoduṣṭi. 4 This would, in effect, mean a heightened permeability resulting in the leakage of materials from srotāṁsi or retention of fluid leading to back-pressure and dilatation or the fluid being moved through collaterals to parts other than those to which they supply. Thus, impairment of agni may in turn contribute to srotoduṣṭi and initiate the process of disease in the site of such occurrence.

1. अतिशयवेन प्राक्षिरिष्या मूषिवाहिनितलसा प्रमैदंकुमल्लता ।

Aruna Datta on Aṣṭāṅgahṛdaya: Śārīra 3: 45.

2. शाक्तदाहीनां स्तोतसां अतिशारववद पुरोपापविदितमात्राप्रथितिः । Ibid.

3. सहायप्रथितिः । फिंचिद्र प्राक्षिरिष्या राक्ष्यवद । सह: स्तोत कुऽवा पुरोपस्वः

प्रथिति, अववा साक्षोददातववद पुरोपस्वाप्रथिति : । Ibid.

4. (a) अतिप्राप्तिंतथां वा सिवायः अवस्थोपि वा

(b) Aṣṭāṅgahṛdaya: Śārīra 3: 45.

विमार्गाननं चापित स्तोतसा दुष्टिक्षणः ॥ Caraka: Viṃśāna 5: 24.
Classical books on Ayurveda have treated both *agnimāṇḍya* as well as *srotodūṣṭi* as factors responsible for the causation of diseases. In the view of the author of this thesis the order of occurrence of disease process should include first *agnidūṣṭi*, and *srotodūṣṭi* follows as its effect. This has an immediate bearing on Ayurvedic therapeutics, as it is seen that *pañcākarma* measures aim primarily at the correction of *agnidūṣṭi* before embarking upon treatments meant to remove *srotodūṣṭi*.

**Āmadoṣa**

In the Ayurvedic view, nearly all diseases, included under Kāyacakṣi, have their origin in āmadoṣa. Āmadoṣa and āmavīṣa are conditions which are stated to occur due to the impairment of kāyāgni. It was seen earlier that the kāyāgni, in its narrower sense relates to factors concerned with gastro-intestinal digestion and in its wider sense to metabolic events of the body. Āmadoṣa or āmavīṣa, both as acute and sub-acute or chronic conditions appear to relate to the gastro-intestinal as well as metabolic disturbances engendered due to the impairment of antarāgni or better still *agnidūṣṭi*. The basic doctrines of Ayurveda as regards health and disease revolve round nutrition and its utilisation by the body under the influence of agni. Its theories of pathogenesis are also co-related to the type of nutrition available and the functional states of *agni*. Generally speaking, āma has been defined as a condition in which the first dātu, namely rasa is not properly formed due to the lowered strength of āśmā (agni). On the other hand, in this state, the food

1. (a) रोगः सर्वंपि मद्देवाःतः || *Aṣṭāṅgahṛdaya* : *Nidāna* 12 : 1.
   (b) अनुभावानुमेर्यानि रोगांशा: पूर्वसिवः ||
2. (a) क्षयप्राणः स्वेग्यवादतः सक्षमात यथ सः ||
   करोति विकुलतं तथः || *Caraka*: *Cikitsā* 15 : 39.
   (b) Suśruta: *Sūtra* 24 : 10.
   (c) *Aṣṭāṅgahṛdaya*: *Nidāna* 1 : 23.
   (d) Ibid.: *Sūtra* 3 : 69.
3. कथनाद्वयविवर्त्तन भात्यमाध्यमविविधताः ||
   दुःखमाध्यवगतं रसमायं प्रचखते || *Aṣṭāṅgahṛdaya*: *Sūtra* 13 : 25.
ingested becomes duṣṭa. According to other authorities, quoted by Vāgbhaṭa, the impaired vātadi doṣas become mixed up with one another, leading to the formation of āmadoṣa, very much like the production of viṣa from the spoiled kodrava. The general outlook of the two descriptions of āmadoṣa would appear to be that in the absence of or due to the inhibition of kāyāgni the ingested food is not properly digested. Products which arise out of such an impaired digestion is retained in the āmāśayā and they undergo such changes as yield toxic substances which are known as āma. The etiological factors of āmadoṣa as described by Caraka and Suśruta, are the following and this range from dietic indiscretions including errors of nutrition to emotional tensions of different kinds.

I. Diatetic indiscretions—

(i) Abstinence from food
(ii) Indigestion
(iii) Over-eating
(iv) Ingestion of
   (a) Unwholesome food
   (b) Heavy or indigestible food
   (c) Cold and stale food
   (d) Excessively dry dehydrated food
   (e) Putrid articles.

II. Adverse effects of Therapeutic measures viz.

(i) Purgation
(ii) Emesis
(iii) Oleation

III. Emaciation or wasting brought about by other diseases.

IV. Incompatibility of the

(i) Country
(ii) Climate
(iii) Season

1. अनेको दोषयो एवाति दुष्टेऽर्थक्षयं कौदः विनिषेव सम्भवम् इ।

V. Volitional inhibition of natural urges. 1

VI. Mental tensions and emotional instabilities like

( i ) Envy, impatience
( ii ) Fear Complex
( iii ) Anger, rage
( iv ) Greed
( v ) Pessimistic outlook
( vi ) Enemity. 2

The aetiological factors mentioned above apart, note has to be taken of several definitions and descriptions of āmadoṣa furnished by Vijayarākṣita in his Madhukoṣa commentary on Mādhava Nidāna.

(i) “The term annarasa means āma. If annarasa is not properly digested and formed, then the outcome of such a digestion is known as āma.” 3

(ii) “In the view of some, due to the impairment of kāyāgni, the annarasa is not properly formed in the āmāsaya and in this state, it is known as āma.” 4

(iii) “There are others who hold that the undigested annarasa possessing foul odour and excessive pastiness depri-
ves the body of its nutrition and in consequence causes sadana. This is known as āma.”

(iv) Some hold the view that if due to the poor strength of jātharāgni a residue of āhāra rasa is still left behind undigested towards the end of digestion; it is then known as āma, which is the root cause of all diseases.”

(v) “The view that the food which is not properly digested is āma, is held by some. Yet, others describe the accumulation of malas in the body as āma.”

(vi) “There is also the view that the first stage or phase of doṣa-duṣṭi is āma.”

The mention made by Caraka of the śuktatva which the food is stated to undergo and its behaviour as viṣam studied together with the mention of daurgandhya and bahu picchilatva, made by Vijayarakṣita in his reference to other views held on the subject as also the mention made by Vāgbhaṭa to āmaviṣa as a serious toxic condition comparable only to acute stages of poisoning which exhibits a symptomatology comparable to viṣa may endanger life and therefore, to be treated fatal prognosis need an appraisal.

Implication of the term 'śuktatva’—

The term śuktatva refers to sourness. Śuktapāka means a chemical reaction that results in the productions of acids (tasting sour). It will be recalled that the term amlapāka was used by Caraka while describing the second avasthāpāka. This reference would imply the outcome of normal digestive reactions that occurs in the stomach in which certain

1. अपरे ल्वादः—अविपक्षसांख्यं दुर्गांनं बदिपिण्डहतः।
   सदमं सर्वगात्रणामां हस्यविचित्रः॥
   Madhukāsa: Madhava-nidāna: 25: 5.
2. अन्ये ल्वादः—आहारस्य रसं: शेषो बोनपकोलिन्दिनावलः।
   स मूलं सर्वरोगणामां हस्यविचित्रः॥ Ibid.
3. आमविषाः केवलं केवलं महासांक्षयस्। Ibid.
4. प्रथमं दोषदृष्टि च केवलां प्रभावः॥ Ibid.
5. Caraka: Cikitsā 14: 44.
6. अस्तित्वादीपमें महादोषों बहुविद्विषांसंस्करः॥
   विषेषकारित्वादिप्रदोषपकस्वतः॥ Astāṅgahṛdaya: Sūtra 8: 14.
components of food are acted upon by dravyas present in this place which are amla and therefore agneya \(^1\) in nature. It should be noted that even though suktapāka yields substances which are also amla, or sour, this term has not been used in the context of normal gastric digestion. The obvious inference to be drawn from this is that the latter term relates to the outcome of abnormal digestive reactions which yield substances having sour taste.

It was pointed out while discussing avasthāpāka that certain components of food assume madhura pāka and certain others amlapāka during the stage of prapāka or prathama pāka. These were then shown to be starch and proteins. In the case of suktapāka starches undergo fermentative change yielding vinegar-like substances with the difference that the fermentation of sugars in the stomach or intestine under the influence of bacterial enzymes yield various bi-products of fermentation of carbohydrate viz. butyric acid, acetic acid etc. Amadoṣa in which food attain suktatva obviously relate to the fermentation of sugars brought about by bacterial agents which latter have become active due to the loss of agni balance. These products are toxic.

Daurgandhya and Bahupicchilatva—

Even so, the decomposition of such organic substances as proteins under the influence of micro-organisms is accompanied by the development of disagreeable odours and products produced, in this process include gases such as ammonia, hydrogen sulphide, methane and others; toxic substances such as indol, sketol, phenol and others, in addition to coda-erverine \(^2\) and putrescein which are toxic products and known as protamines. Likewise the mass of proteins which has

1. पृष्ठियतिमभुविषयादांग्निः | Caraka : Sutra 26 : 40.
2. Pentamethylenediamine, a ptoaine formed by the action of the vibrio comma on protein. ‘New Gould Medical Dictionary,’ p. 189. Tetramethylene diamine, a product of decarboxylation of ornithin and also, found in putrifying flesh, formerly believed to be responsible for food poisoning and referred to as ptoamine. (Ibid.).
been subjected to putrefaction is also very slimy having been degraded in this process.

Sahaja Kṛmis or intestinal flora—

This brings us to an enquiry as to what part bacteria contribute to the nidāna of āmadoṣa or ānaviṣa. This issue will be appreciated better by an appreciation, if Āyurveda had recognised kṛmis or pathogenic organisms as the cause of disease. It is significant to note that Caraka, while describing twenty kinds of organisms which are pathogenic also made a reference in passing to innumerable sahaja kṛmis or normal organisms which are present in the body. His commentator Cakrapāṇi has described sahaja kṛmis as avaikārikas or non-pathogenic. The question will now arise if these avaikārikā or sahaja kṛmis are normal inhabitants of the body, what function they perform in the normal course of events? Following on this, two other questions will also arise viz. (a) whether these kṛmis lead a parasitic existence at the expense of their hosts by living on their nutrients or (b) they lead a saprophytic existence drawing their pabulum from the waste products or mālas of their hosts? Answers to these questions are not found in the available editions of the saṁhitāgranthas. Hence, it is necessary to take advantage of modern developments in the field of microbiology, to secure a better understanding of the role, the sahaja kṛmis play in normal states of health and contributions they make to abnormal states as well.

According to these developments virtually every animal possessing mahāsrotas or kośtha (alimentary canal) harbours billions of intestinal bacteria more specially in the large intestine. They freely draw upon materials which are either not digested or are indigestible by their host. As a result of their activities, these bacteria contribute to faecal decay.

1. इह खस्ताथिवेश | विशालिविषा: क्रमयः पूर्वसुधित्वा नानाविषेषम् प्रतिमानि- | नायन्यं सहेजेश | Caraka: Vimsāna 7:9.
2. अन्यथा सहेजेध इत्यन्ते शरीरसहरास्लेवकारिका: क्रमयो विश्वतर्धविक | मदद्विद्वत्त प्रतिभाति | Cakrapāṇi on above.
Under conditions of health bacteria cannot thrive in the stomach due largely to a *draiva* secreted in the place which possess *āgneya* properties viz., hydrochloric acid. Bacteria, as may enter the body together with food and drinks, are destroyed by the action of this acid. Nonetheless, a few of them which may manage to escape and survive are swept into the intestine and they gradually manage to find an asylum in the *bhādantra* or *pakvāśaya* where the climate for their survival is more congenial.

It has been shown that *bhādantra* compared to *ksudrāṇtra* is protected sufficiently to resist the passage of toxic substances into the blood stream. By implication, the *ksudrāṇtra* is relatively less protected to prevent the passage of poisonous substances into the blood stream. In other words, even though highly poisonous substances are formed in the *bhādantra* by the activities of some of these bacteria, the immunity which this portion of the *mahāsrotas* enjoys generally prevents mischief.

It has been shown that the *population* of *sahajakīmis* that inhabit the *ksudrāṇtra* are different from those of *bhādantra*. These organisms known as *bacillus Bifidus*, perform fermentative and not putrefactive action. The climate of the *uṇḍuka* region (ileo-cecum) is generally *amlā* or acid due to the nature of its contents which is inimical to the growth and activities of proteolytic *kīmis*. Ordinarily, so long as the supply of carbohydrate material is adequate, the inhabitants of *uṇḍuka* region flourish. Any other bacteria as may make an excursion into the *ksudrāṇtra* are thus prevented from getting a foot-hold in this region.

There are, however, certain conditions, especially in infants in whom the immunity of the *ksudrāṇtra* is less than that of the adults, a severe type of toximia, presenting the symptoms of *āmātīsaśra* and characterised by *vamana*, *atīśāra*, *ambukṣaya* (dehydration), extreme *dīnātva* (prostration) take place. This condition is stated to be caused by an extension of some of the population of *bhādantra* into the *ksudrāṇtra*. By way of treatment of such conditions measures
are directed towards encouraging the normal acid producing organisms to gain the upper hand. Thus, a liberal supply of carbohydrate especially in the form of lactose is made available for this purpose. This form of carbohydrate reaches further down, to the uṇḍuka region as compared to other forms of carbohydrates before it is absorbed. Another interesting method reminiscent of the administration of takra in such conditions is the administration of cultured fermentative organisms such as those of sour milk namely bacillus Bulgaricus.

It may be noted here that the microbes of large intestine or bṛhadantra perform two types of actions namely fermentation and putrefaction. The former term describes the action of a living organism in causing bhīnna-saṅghāta or the split of complex substances into their simplest components. An outcome of bacterial fermentation is the production of different kinds of gases. This may be illustrated with the example of the preparation of āsava and ariṣṭa. It may be noted here that some products are much more readily fermented in this manner than others. Putrefaction, on the other hand, is a like process and resembles in many ways fermentation with the difference that it refers specifically to bhīnna-saṅghāta of protein substances rather than carbohydrates into smaller molecules with the liberation of various disagreeable or foul smelling gases such as indol, skatol, phenol, hydrogen sulphide and ammonia etc. The term putrefaction itself means to make rotten.

Apart from the contributions these sahajakṛmis which normally inhabit the bṛhadantra are said to make to the welfare of the hoast to which a reference was made earlier the previous paragraph they may, by entering into kṣudrāntra and उर्ध्वा अमास्या specially when agnibala is considerably reduced-contribute poisonous substances by putrefying the protein constituents of food. These may be more easily absorbed from kṣudrāntra together with faultily formed rasa leading to toxaemic conditions answering to the description of āmaviṣa.

Events, specially the abnormal conditions visualised above may intoxicate cells which constitute the dhūtvahasrotāṃsi,
thus bringing about *kha-vaiṣṇava* which latter may lead to *srotorodha* leading in turn to an interaction between the abnormal *doṣas*, *sthānika dhātus*, *doṣas* and *malas* leading to the creation of *malasaṅcaya* or *doṣacaya* in that locality and thus, to initiate the process of disease. The condition envisaged above corresponds to the description of metabolic-hystotoxic anoxia described earlier in page 116.

**ĀMA FORMATION DUE TO DHĀTVAGNI MĀNDYA**

It is seen that Ṛālhaṇa 1 and Cakrapāṇī, 2 in their commentaries on Suśruta have stated that the formation of āma need not necessarily be due to *jaṭharāgni māndya* only, and it may also occur due to the impairment of *dhātvagnivṛtāra*. It is also seen from Ātaṅkadarpaṇa 3 commentary of Madhavanidāna that *āmadoṣa* may be caused due to *māndya* of *dhātvagnis* and *bhūtāgnis*, on account of which *śoṣa*, *vṛṣṇa*, *vidradhi* and such other diseases may be caused. It is necessary to bear in mind at this point that the term ‘*dhātu*’ used in this context by Ṛālhaṇa, Cakrapāṇī and Vācaspativaidya, refer to *asthāyi* or *poṣaka dhātus* and the *agni* referred to in this context is *dhātvagni*. In contrast, the *agni* present in *sthāyi* or *poṣya dhātus* are *pācakāṁśas*. While, *jaṭharāgni pāka* refers to digestive events, the *dhātvagni pāka* relates to intermediary metabolism and *pākas* carried out by these *pācakāṁśas* in *sthāyi dhātus* relate to the synthetic and maintenance metabolism in them. The *vaiṣamya* of *dhātvagni* referred to by Ṛālhaṇa, Cakrapāṇī and Vācaspativaidya, leads to the impairment of intermediary metabolism resulting in the production of incompletely metabolised substances which are obviously not

---

1. कथं रसाशास्त्रकथ्यति विन मनोयथ वचनम्? न दायको रसः स्यवेदेः स्यमें। लक्षणं जातीयनं रसं कः वैव भित्र विशिष्टमाकादानम् हृदयम्यवे। Ṛālhaṇa on Suśruta : Sūtra 15 : 35.

2. आमदव इति स्यवेदेऽपारिपूर्वाया इत्यथः। न तु 'आमाशयः कान्यनेदैवैवैवदिविपाशितः। हृदयिना उत्तः। तस्य रोगदेयतःतपः स्मायुक्तमेववेयन्तः शेयेजनकायोगाद्। Cakrapāṇī on above.

3. पदार्थो यथा जातिमृतो मान्यतेऽन्नामसंधास्तत्वित्वमायुक्तविद्यन्तिविद्यन्तिरेरोगाणि तत्तस्म्यस्मुऽक्षः मन्तवित्। वच यथा जातिम्मृतो मन्तवित् तवैवाध्यास्तत्वमाध्यास्तत्वमिदं पीवनोपछिं स्वादः। Ātaṅkadarpaṇa on Madhavanidāna 6 : 22.
fit for utilisation by the *sthāyi dhātu*. Thus, these products are in *āma* state and cause *āmadosa* at this level.

The clarification offered above may be amplified thus: *Dhātvagni pāka*, it is obvious, furnishes the elements necessary for the synthesis of *sthāyi dhātu* as well as energy-linked substances to produce the units of energy required for synthetic events. Proceeding on the basis that amino-acids contribute to the brick blocks with which cellular proteins are synthesised special enzymes are seen to be required for the transferance of oxidative energy through phosphorylation. It was noted in page 48 that hydrolytic breakdown of proteins in cells occur entirely through cathepsins. It is seen that the preponderance of this enzyme-activity depends upon a number of factors of which the followings are important, the concentration of amino-acids, pH, temperature, oxygen-tension, source of energy, the quality and condition of coenzymes concerned with the utilisation of energy through oxidative process, the presence or absence of toxic deleterious substances and the influence of certain hormones.

*Table furnishing conditions necessary for synthetic activity or otherwise.*

<table>
<thead>
<tr>
<th>Normal conditions.</th>
<th>Abnormal conditions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Normal pH</td>
<td>2. Abnormal pH</td>
</tr>
<tr>
<td>3. Normal temperature</td>
<td>3. Abnormal temperature</td>
</tr>
<tr>
<td>4. Normal oxygen-tension</td>
<td>4. Abnormal oxygen-tension</td>
</tr>
<tr>
<td>5. Unimpaired source of energy</td>
<td>5. Impaired source of energy</td>
</tr>
<tr>
<td>6. Presence of co-enzymes of good quality and condition</td>
<td>6. Absence of co-enzymes or their presence in bad quality and condition</td>
</tr>
<tr>
<td>7. Absence of toxic or deleterious substances</td>
<td>7. Presence of toxic or deleterious substances</td>
</tr>
</tbody>
</table>
Note—Conditions entered in column two above lead to āmadoṣa at the intermediate and cellular metabolic levels.

Details of the processes by which factors mentioned above operate are almost completely unknown. It is, however, seen that certain broad generalisations have been made. The synthesis is an endo-thermic reaction. It can take place in cells only if energy is made available. The endo-thermic reaction mentioned above is invariably anaerobic in nature and is comparable to bhūtāgni vyāpāra as described in page 72–73. A function of pācakāṁśas in dhātus would generally appear to be oxidative or aerobic. The source of energy referred to above is seen to be derived from the oxidation of small organic substances, such as pyruvic acid, derived from the intermediate metabolism of glucose, fatty-acids and amino-acids. A series of enzymes are seen to be involved for the utilisation of oxygen that has been transported into cells, in step by step processes which involve small exchanges of energy. But at any stage the energy transformation can be impeded by substances which inhibit or poison the enzyme system involved in this stage.

Thus, the inhibition of poisoning of the enzyme system involved both at the intermediary and the cellular levels has a parallel to the views on āmadoṣa due to dhātvagni and bhūtāgni māndya, advanced by Ďalhaṇa, Cakrapāṇi and Vācaspativaidya.

\[
\begin{align*}
\text{Food} & \quad jāṭhārāgni \ (manda) \rightarrow āma \\
& \quad \text{causing disease in mahāsrotas.} \\
& \quad \text{Also, some portion of it is absorbed to cause generalised symptoms.}
\end{align*}
\]

\[
\begin{align*}
\text{Āhāra rasa} \quad (Upādāna rasa) & \quad + \quad Bhūtāgni \quad \rightarrow \quad āma, \text{causing disease all over the body.} \\
& \quad \text{and} \\
& \quad Dhātvagni \ (manda) \\
\end{align*}
\]

1. Asthāyi dhātu + Pācakāṁśa (manda) → Vṛddhi of the specific dhātu.
2. Asthāyi dhātu + Pācakāṁśa (tikṣṇa) → Kṣaya of the specific dhātu.
ŚARĪRA BALA

Bala in ordinary parlance is strength. From a strictly technical point of view bala has two aspects viz., (a) the capacity to perform work or karmaśakti 1 (b) the capacity to resist or overcome diseases add vyādhikṣamatva. In general bala is stated to be of three kinds. 2

(a) Sahaja or inherited i.e. natural.
(b) Kālaja (Seasonal or in different ages of life)
(c) Yuktikṛta or strength promoted by such measures like rasāyana etc.

These three different kinds of balas may refer both to karmaśakti and vyādhikṣamatva. The proper functioning of antarāgni is the sine-qua-non, in either case. The author has confined himself, in this paper to the study of bala with reference to karma. Vyādhikṣamatva is a subject by itself and needs special study. In view of paucity of time the author of this thesis has confined himself only to the karmaśakti aspect of bala.

Karma or vyāyāmaśakti is obviously a function related, in main, to kapha and māṁsadhātu. Māṁsa is one of the main sthānas of prakṛta kapha. The former is seen to endow sthairyā (sturdiness and firmness) and drḍhata (hardiness) to the body. Thus, vyāyāma is stated to promote well-formed, broad and rotund limbs, confer lightness to the body, agility and dexterity in the performance of work, healthy appetite and slimmness of the body 3 (this relates to the reduction of body-fat). It is of importance to note that vyāyāma is stated to reduce medas, while promoting vibhaktaghanagātratva, which latter refers to an increase of māṁsadhātu. According to Ğalhaṇa, bala is to be determined by one’s power or capacity to lift and bear heavy loads etc. “bhāraharaṇādi-śakti-gaṁ-

1. कर्मशाक्त्या धारुमीयते वल्सैविध्यम् | Caraka : Vimsāna 8 : 121.
2. ब्रितिर्भ कूण्डति सहजं काल्यं युक्तित्वं च | सहजं वच्छरीरसच्चवं : प्राइतम् ,
काथुत्रसुतिबिधायं वश्यति च , युक्तित्वं पुनस्तयब्धारचेद्यंगमस् ।
Caraka : Sūtra 11 : 36.
3. लावण्व कर्मशास्त्रं दीपांश्रस्मेत हः | विनम्मतंवनानां व्यायामाहुपावते ॥ Aṣṭāṅgaḥṛdaya : Sūtra 2 : 10.
\[yasya\]^1 and Suśruta has referred \textit{bala} to well formed, well knit, compact and stable musculature of the body.\(^2\) The term \textit{sarvaceṣṭāyu apratīghāta} used by him in this connection refer to the power implicit in \textit{bala} to overcome forces of opposition in the performance of work or action. Force that opposes actions like lifting and bearing heavy loads running against gradients, climbing a hill etc., is expressed by or reflected through the activities of \textit{māṁsa} which overcomes opposition of various kinds in the performance of work specially such as those mentioned above.

The foregoing relate to the functions of different kinds of muscles of the body and in special to the skeletal muscles. As regards other kinds of muscles, the action of skeletal muscles is supported by the \textit{māṁsapeśi} of \textit{hrdaya} (cardiac muscle) which by its constant contraction and relaxation enables the organ to beat and supply \textit{rasa cum rakta} to all parts of the body, thus providing them with \textit{indhana}; which the \textit{māṁsa peśīs} of the hands, legs and other parts of the body burn to make available \textit{sakti} to perform work. \textit{Māṁsapeśīs} of \textit{āmāśaya} (both \textit{urdhva} and \textit{adho}) known as visceral or plain muscles, provide nutrition to the body churning the food, passing it through the intestine and thus, aiding the process of digestion. It is seen that about half of physical, chemical and metabolic processes occur in \textit{māṁsapeśīs} and at least 3/4th of the total metabolism is due to severe exercise. Even otherwise, much of the body heat is produced by \textit{māṁsapeśīs} as compared to other \textit{dhātus}.

Even though three grades of \textit{bala} viz., \textit{pravara}, \textit{madhya} and \textit{avara} have been mentioned by Caraka\(^3\) an objective description of them have not been mentioned in the related literature. The author in this thesis has attempted to provide objective and measurable values to these three kinds of \textit{balas}.

\(^1\) \textit{Dalhaṇa} on \textit{Suśruta: Sūtra 15 : 19}.
\(^2\) \textit{Dalhaṇa} on \textit{Suśruta: Sūtra 15 : 19}.
\(^3\) \textit{Caraka: Vimiṇṭha 8 : 123}.
SECTION IV

AGNIBALA PARİKŚĀ

Prior to proceeding to the practical study of agnibala, it is necessary to examine the existence of a possible correlation among agnibala, as understood from jaraṇaśakti (digestive capacity), bala as evidenced by vyāyāma śakti (capacity to perform physical work) and mātrā of uṣmā (quanta of heat) generated by the body, with all of which, pācakāgni is concerned. A reference to the scheme in between pages 44–45 relating to the inter relationship that exists between pācakapitta on the one hand and other pittas, as well as, agnis, on the other, will show that the former plays a vital role, (1) in the preparation of indhana from the food in the āmāśaya, (2) the processing of this indhana suitably in dhātvagnipāka for the utilisation by the sthāyi dhātus and (3) the actual burning of the indhana to produce the energy for work by pācakāṁśas present in the sthāyi dhātus, especially in the māṁsadhātu. An outcome of this process is the generation of heat. Heat, thus produced, represents the degraded aspect of energy left over after the performance of work.

\[\text{Āhāra}+\text{Jātharāgni}→\text{Upādāna rasa (anna rasa)};\]
\[\text{Upādāna rasa}+\text{Dhātvagni}→\text{Indhana.}\]
\[\text{Indhana}+\text{Pācakāṁśas}→\text{dhātukarma (energy)}+\text{uṣmā (heat)}+\text{ap (water—H}_2\text{O)}\.\]

That dehāgni is the basis of bala (strength), ēṛogyā (positive health), āyuḥ (longevity), prāṇa (élan-vital), varṇa (complexion), utsāhopacaya (increase of cheerfulness), prabhā (lusture), ojas (resistance to disease and decay), tejas (energy) and other agnis of the body is seen from the observation of Caraka.\(^1\) According to him agni blazes being fed with fuel derived from āṇna and pāṇa.\(^2\) Yogaratnākara,

---

1. (a) आयुर्वेदी वल्ल स्वास्थ्यमुख्तापिवच्यः प्रमाण।
   ब्रजस्तेजोप्रय: प्राणश्वेता देहाकार्येतुतुम। || Caraka : Gīkitā 15 : 3.
(b) वैभवस्तेजप्रचाराः प्राणश्वेतां प्रतितिहास। || Caraka : Sūtra 27 : 342.
2. अथपनान्यन्येतामिन्द्रापिवच्यति भवेति चान्यथा || Ibid.
SCHEME SHOWING DIFFERENT ASPECTS OF AGNIBALA PARĪKṢĀ

Āhāra + Jāṭharāgni

Sāra (upādāna rasa) + Bhūtāgni & dhātvagni

Sāra (poṣakadhātu) + Pācakāṁśa

Kīṭa

Rētilised in the body for the building of keśa nakha etc.

Dhātuāma

Can be examined from nutrition to the specific organs

Excreted in their specific channels

Purīṣa

Can be examined from symptoms produced in the body

Can be examined from khamalas and others

Can be examined from purīṣa

Āma in mahāsrotas

Can be examined by symptoms produced in mahāsrotas.

Formation of poṣyadhātu

Māṁsa bala

Uṣmā

Can be examined from samadhātutā

Can be examined by vyāyāma śakti

Can be examined by uṣmopādana

Agnibala or Jaraṇa Śakti Parīkṣā
a more recent *Ayurvedic* collection, has stated that agni is the *māla* (root) of *bala* in man as retas (semen) is the root of life. This work, has therefore, urged on the need to carefully preserve agni and retas. 

The views expressed above, draw attention to nutrition, the capacity of the body to digest metabolise and utilise it for the production of energy. In otherwords, *agnibala parikṣā* is not only concerned with the determination of the functional state of agni but also its capacity to metabolise the digested food and produce energy.

It should also be noted that the production of energy measured in terms of heat is directly correlated to the quality and quantity of nutrition made available and physical and mental work performed. Age and climatic conditions have also a bearing on the functional states of agni. In other words, *agnibala parikṣā*, studied together with *mūnisabala parikṣā* and capacity to produce *ūṣmā* is really the study of the metabolic state of the subject. This has a parallel in the determination of basal metabolic rate (B. M. R.) developed by modern medicine. This system speaks of food stuffs as being 'burnt.' This is a well chosen expression as if food is placed in an atmosphere of oxygen within a metal chamber and ignited approximately the same quantity of heat is produced as when the same amount of food is burnt in the body. The heat production is not only comparable but the end products of this process of burning are also identical. The heat thus produced is described in terms of calories. Two forms of calories have been described viz., small and large. The former has been defined as the amount of heat necessary to raise the temperature of one gram of water from 14°5₀ to 15°5₀ centigrade. The latter calorie is simply a thousand times greater than the small calorie. It is defined as the amount of heat, necessary to raise the temperature of one kilogram of water from 14°5₀ c to 15°5₀ c. Calorific value of food has also been worked out in terms of gram units.

1. अग्निसूक्ति यन्त्र गुणां रेतमूलं तु जीवितम्।
   तस्मात्स्वर्द्धाभोजन वर्धि शुक्लेच च रक्षणेत || *Yogaratnakara* : Page : 10.
Thus protein is stated to yield 4.1 calories per gram in the body, carbohydrate 4.1 calories and fat 9.3 calories per gram. The end products of the burning of food stuffs in the body yeilds carbon dioxide (CO₂) and water (H₂O).

As stated in the previous paragraph, heat production depends upon metabolic processes and these processes vary with subject’s activities. Metabolic determinations are being carried out under well defined and rigid conditions. It has been shown that the more active the individual, the faster is his metabolic rate. Conversely this rate falls to its lowest ebb during sleep which has been described as the true basal level. Since, it may be difficult to induce sleep whenever one decides to measure metabolic state the basal level is always calculated when a subject is awake, but at perfect rest and in post-absorptive state. In actual practice, the subject is instructed to eat a light meal in the night before the determination, retire to bed to ensure about 8 hours sleep, to refrain from the excessive exercise for atleast 24 hours and to forego break-fast before the test is conducted. Metabolic tests are performed early in the morning after the subject has rested in a quite semidark room for 30 minutes. Then the estimation proceeds. The following represents the heat production in an average man under varying conditions.¹

<table>
<thead>
<tr>
<th>Activities or occupation</th>
<th>Calories per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleeping</td>
<td>1560</td>
</tr>
<tr>
<td>Resting but awake-sitting up</td>
<td>2400</td>
</tr>
<tr>
<td>Light exercise—slow walk</td>
<td>4080</td>
</tr>
<tr>
<td>Exhaustive exercise</td>
<td>15000</td>
</tr>
<tr>
<td>Tailor</td>
<td>2950</td>
</tr>
<tr>
<td>Stone mason</td>
<td>9100</td>
</tr>
<tr>
<td>Typist</td>
<td>2575</td>
</tr>
<tr>
<td>House maid</td>
<td>3840</td>
</tr>
</tbody>
</table>

It will be noted that the procedure and findings as described above relate to B. M. R. It does not furnish any information as regards the optimum average output of heat which a subject is capable of generating under normal conditions. Valuable as the determination of B. M. R. is, a

study of the optimum average heat out-put in a given individual would also appear to be equally important. The present study relates to the latter aspect.

Before proceeding to the description of actual practical study undertaken by the author in the above regard it is necessary to take into account the signs and symptoms of the normal and abnormal states of antarāgni, having regard to inherited tendencies, season and age as described in the sāṁhitās. In fact, the findings reported in this thesis, are based on lakṣaṇas, relating to various conditions described above.

**TABLE I.**

**GENETIC ASPECTS OF AGNI**

<table>
<thead>
<tr>
<th>Prakṛti or Temperament</th>
<th>State of agni</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sama prakṛti</td>
<td>Sama or normal state</td>
</tr>
<tr>
<td>Vāta prakṛti</td>
<td>Viṣama or erratic state</td>
</tr>
<tr>
<td>Pitta prakṛti</td>
<td>Tikṣṇa or acute state</td>
</tr>
<tr>
<td>Kapha prakṛti</td>
<td>Manda or dull state</td>
</tr>
</tbody>
</table>

**TABLE II.**

**STATE OF AGNI OR JARĀṇAŚAKTI SEASON-WISE**

<table>
<thead>
<tr>
<th>Season</th>
<th>State of agni</th>
</tr>
</thead>
<tbody>
<tr>
<td>Griśma (June and July)</td>
<td>Durbala</td>
</tr>
<tr>
<td>Varṣa (August and September)</td>
<td>Durbala or weak²</td>
</tr>
<tr>
<td>Sarat (October and November)</td>
<td>?</td>
</tr>
<tr>
<td>Hemanta (December and January)</td>
<td>Tikṣṇa or acute³</td>
</tr>
<tr>
<td>Śīśira (February and March)</td>
<td>Tikṣṇa or acute⁴</td>
</tr>
<tr>
<td>Vasanta (April and May)</td>
<td>Manda or weak⁵</td>
</tr>
</tbody>
</table>

1. एते चतुष्पार्वम् सन्वन्धप्रवचक्षुविधानामेव पुरुषाणां। तत्र समवातापिक्षस्यक्षणा प्रकृतिकारणोऽभयं च प्रति मठ्यस्य विषयं। वातानां तु वातान्त्रिकर्त्तस्य विषयाणां विषयं। सन्वन्धप्रवचक्षुविधानां विषयं। सन्वन्धप्रवचक्षुविधानां विषयं। सन्वन्धप्रवचक्षुविधानां विषयं। Caraka : Vinītā 6 : 12.

2. भाद्रादित्येणोऽद्य पक्ता मवति दुःखः। स वर्षास्यन्ताराणां दूषण्याविच्य पुनः। Caraka : Sūtra 6 : 33.

3. शतों वाहिनिन्तस्यक्षुसंहतयों विषयात्यं कः। पक्ता मवति हेमंते मानाधवार्षक्यम्। Caraka : Sūtra 6 : 33.

4. हेमंताधिकरिः तूः भविष्योऽविषयणम्। Caraka : Sūtra 6 : 33.

5. भवते भविश्योऽविषयणम्। Caraka : Sūtra 6 : 33.
### TABLE III.

**STATE OF AGNI OR JARAŅAŚAKTI AGE-WISE**

<table>
<thead>
<tr>
<th>Age</th>
<th>State of agni</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vṛdha (Old age)</td>
<td>Manda or dull&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Yuvā (Youthful)</td>
<td>Tikṣṇa or acute&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Bala (Child)</td>
<td>Manda or dull</td>
</tr>
</tbody>
</table>

### TABLE IV.

The table below furnishes laksanās (signs and symptoms) of normal state of digestion.<sup>3</sup>

<table>
<thead>
<tr>
<th>Signs (Physical)</th>
<th>Signs (Mental)</th>
<th>Signs (Physical)</th>
<th>Signs (Mental)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Śārīra</td>
<td>Utsāha (Cheerfulness)</td>
<td>Eructation of sweet taste at the beginning of digestion, sour taste in the middle and saline taste at the end.</td>
<td>Viśuddha (a sense of cleanliness)</td>
</tr>
<tr>
<td>Mānasa</td>
<td></td>
<td></td>
<td>Viśada (clearness of mind)</td>
</tr>
<tr>
<td>Udgāra Śuddhi (normal eructation)</td>
<td></td>
<td></td>
<td>Sukha (pleasure)</td>
</tr>
<tr>
<td>Vegotsarga (Passing motion with force)</td>
<td></td>
<td></td>
<td>Kūnḳṣā (Desire for food)</td>
</tr>
<tr>
<td>Yathocottotsarga (Passing motion depending upon the nature of the diet)</td>
<td></td>
<td></td>
<td>Pipāsā (sensation of thirst)</td>
</tr>
<tr>
<td>Svasthayārttanuvṛtti (Continuity of health)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

1. (तत्सैवाष्पि:) कदाचिन्मन्दो भवति यथा वर्षाणुत्तरसः कथिते, Cakrapāṇī on Caraka Sūtra 5:3.
2. तत्सैवाष्पि: कदाचिच्छूद्रो भवति यथा—हेमते यीवने च, Ibid.
3. (a) क्षारशूद्रिचसाहो वेगोस्मां यथोचितः। खपुत खरिपासा च श्रीणिहारस्य वद्यान्त। Mādhavaniśāda 6:24, Bhāva prakāsa: Yogaratnakara.

---
Agni or jaraṇaśakti has also to be considered in the light of the digestibility of food substances. Accordingly foods which are not easily digestible are to be eaten up to half of one's satisfaction. As regards articles of diet which are light or easily digestible they are to be eaten up to one's full satisfaction or slightly less than that. It is necessary to

(b) काश्ये बुद्धि बैशाखे लघुता सिररता सुखम्।
स्वस्तीयानुसरितं समयम् जीवनसुखक्षणम्।

Kaṭyāpasāṁhitā : Sūtra 24.

(c) महुरं पूर्वमुद्र्यो मध्ये चाम्यों तथा भवेत्।
पवातालब्धक्षणापि नद्य दाः हवयां।
लघुवं तोडते कार्यं विशुद्धं विशवं सुखम्।

Bṛhmaṇa : Sūtra 10.

(d) द्वाग्रेग्रोधयो लघुता विशुद्धिं जसरावः।

Caraka : Chikitsa 30 : 303.

1. (a) गुहणमेवऽस्ति हस्ति।

Śūraṭa : Sūtra 46 : 530.

Asvaghosha : Sūtra 8 : 2.

(b) गुहणमेवऽस्ति हस्ति।

Caraka : Sūtra 27 : 341.

2. चम्मना तुम्मिरिष्ठते।

Śūraṭa : Sūtra 46 : 530.

3. चम्मना तुम्मिरिष्ठते।

Asvaghosha : Sūtra 8 : 2.

The guruta and laghuuta of uḥāra and ausadha draśyas, described here is in relation to their digestibility or otherwise, which are to be judged from the point of view of agni. Nonetheless, it is seen from Caraka (Vimāna 1 : 22) that uḥāra and ausadha draśyas have been classified as laghu or gurru from two points of view viz., (1) Seabhāna or prākṛta (natural) and (2) by saṁskāra or by suitably processing the material.

Examples of No. 1 above are mūṣa (bengal gram) and Śūkra (pig), as regards uḥāra draśyas which are naturally gurru or difficult of digestion and mūṣā (green gram) and eṛṣ (deer) and the classical examples of draśyas, those are laghu or easily digestible. As regards No. 2, substances rendered digestible or otherwise by subjecting them to different forms of processings like (1) the addition of water as by soaking, (2) the application of heat as by cooking or frying, (3) churning, (4) emulsifying, (5) storing them for fixed duration of time, (6) by maturation, (7) by flavouring, (8) impregnation, (9) preservation, (10) and by keeping them in selected containers (Caraka : Vimāna 1 : 22).
note in this connection that the term ‘\textit{tr̥pti}’ refers to feeling or sensation of satisfaction which is a highly individualised subjective criterion. The individual subject is in the final analysis the ultimate judge of it. There can be objective average standard by which \textit{tr̥pti} can be measured. In addition, a good nutrition should (1) appeal to the sense of taste, sense of smell and sight. In other words it should be tasty, possess pleasing odour and should not displease or offend the eye (2) be capable of filling the stomach (3) contain all the proximate principles of nutrition. \textit{From Ayurvedic point of view, dravyas representing the six kinds of rasas (madhura rasa dominating) constitute the balanced diet.}

From the point of view of modern nutritionology, apart from substances having qualities mentioned above in 1 and 2, a balanced diet should consist of an adequate quantity of proteins with biological value, fats, carbohydrates, minerals, water and vitamins, in keeping with the age, sex, climate, season and the kind of physical or mental work which the person does. All these factors can be classified from the point of view of their \textit{rasa} or taste.

\textbf{Šakṛt or Stool in Relation to Agnibala}

An important criterion of normal digestion is as related to the nature of faeces or \textit{šakṛt}, voided by an individual. It has been recognised by \textit{Ayurveda} that the nature of faeces, even under normal conditions depends to a large extent upon the nature of the diet consumed.\textsuperscript{3} All things being equal, the normal faeces has a reference to the normal state of digestion. In fact, \textit{mala parikṣā} forms part of \textit{aṣṭaśṭhāna parikṣā} as described in \textit{Yogaratnākara}.\textsuperscript{4} Not withstanding the importance attached to the examination of \textit{mala, mūtra} and other excre-

\begin{enumerate}
\item \textit{दशकृतग्रन्थरसस्या विशिष्टिकर्षितमश्रयां प्राणिनां प्राणनिहीनां प्राणान्तरर्तं प्राणिमाला}
\textit{कुशाला:} \textit{Caraka: Sūtra 27: 3}
\item \textit{पद्वर्त मधुरामयः}\textsuperscript{4} \textit{अदन्तवाद:} \textit{Ayāṅgahṛdaya: Sūtra 8: 36}
\item \textit{वद्यार्द्धित्तसाहो बेमोसंतो यथोचितम्} \textit{कुतुहल तत्रतिपास: यो भवोहरस्य कुतुहल:} \textit{Mādhavanidāna 6: 24}
\item \textit{नोन्नुक्तस्य तथा ग्रहात्यस्य} \textit{विजयरक्ष्ठिता on above.}
\item \textit{रोगकांतःशरीरस्य स्थानान्यश्च निरीक्षितेत} \textit{māla mūtra} \textit{Yogaratnākara.}
\end{enumerate}

\textsuperscript{1} Caraka: Sūtra 27: 3
\textsuperscript{2} Ajāṅgahṛdaya: Sūtra 8: 36
\textsuperscript{3} Mādhavanidāna 6: 24
\textsuperscript{4} Yogaratnākara.
ments, direct reference to the nature of normal faeces has not been made in the available editions of Ayurvedic literature. However, description of pathological aspects of faeces have been furnished here and there. The author of this thesis has worked out the qualities of probable nature of normal faeces, which has formed the basis of his investigation. They are furnished in the table below:

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Consti-</th>
<th>Colour</th>
<th>Smell</th>
<th>Other related data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snigdha</td>
<td>Samhata</td>
<td>Having</td>
<td>Less</td>
<td>No sula or colicky pain. Srsta mutra or free mituration</td>
</tr>
<tr>
<td>(Semi solid)</td>
<td></td>
<td>colours except shyava pita (yellow) nila (blue) rakta (red) and sveta (white)</td>
<td>foul smell</td>
<td>No gurgling sound of the intestine</td>
</tr>
</tbody>
</table>

No sensation of weakness of the thigh, lumber and calf region
Passage of motion in one bulk
Not frothy
Motion without passage of gas
Having moderate temperature
Free from thirst, fits, burning sensation, inflammation, fever etc.
Clearness of mind
Sound sleep
Lightness of the body
Free from eructation

The findings noted in the table above may have to be supplemented with additional facts of observation to make

---

1. संस्कृतमेधित्यस्य न्यूतममेव संस्कृतमस्य भिन्नता यथा ।
   पुरोऽथ सुस्तुर्गं भिन्नता ब्रह्मसंस्कृतमेव यथा ॥
   प्रतांतत्त्वं द्वै भिन्नता विपरीतात्त्वं नस्त्र द्वै ॥
   शास्त्रं च ब्रह्मस्य तस्य पक्षं विनिदेशेष ॥ Sutrata : Uttaratantra 40 : 11
the study of normal faeces complete. In appearance the normal stool is roughly cylindrical \(^1\) “having the consistency of butter in summer time” \(^2\); it may vary from solid to semi-solid. \(^3\) The appearance of stool depends upon the consistency as well as integrity of the passage. It depends to a large degree on the water content or stated differently on the degree to which the process of water absorption has been carried out. Certainly, other factors, such as gastro-intestinal motility and nature of diet, affect the consistency of faeces also. Small variations in diet have little or no effect on the nature of faeces. However, an exclusively vegetable diet tends to yeild a larger bulk and softer consistency faeces while on a meat diet the faeces are harder and the quantity is less.” \(^4\)

Colour of the normal stool may vary from light to dark brown due to stercobilinogen “chlorophyll and other pigments.” \(^5\) As regards smell, it is foul and offensive due to some fermentative and putrifactive products—gases-like indol, skatol, ammonia, hydrogen sulphide etc.

It is necessary, in passing, to advert to the colour of the normal puричa. There is no direct reference to this aspect of the physical qualities of puричa in the available editions of Saṁhitāgranthas. However, it is seen from a reference made by Cakrapañi \(^6\) that in Koṣṭhaśrita Kamala, the colour of the śakṛt resembles that of tilapiṣṭa (gingili cake) or svetavarcas. This is stated to be due to the non-availability of malaranjaika pitta on account of obstruction to its excretion in the concerned srotas. Factually speaking, the condition envisaged by Cakrapañi resembles the description of obstructive jaundice in which due to “obstruction of the entrance of bile to the intestine faeces of the colour of tilapiṣṭa or svetavarcas (pale coloured stool) is voided. The pigment which usually colours

---

2. Machinery of the body.
5. Savills system of clinical medicine.
6. शेतवच्च दश कौशल्य पिताम्ह महरावक्त्य वशिनिगमादुवेदेन केम्ब्रण शेतवच्च मवति | Cakrapañi on Caraka: Cikitsā 16.
the faeces is seen to be stercobilin, a product of oxidation of the precursor stercobilinogen which latter is derived from bilirubin a bile pigment (bilirubin is a breakdown product of R. B. C.). This pigment imparts to the normal faeces, its dark brown colour. Hence, the normal dark brown colour of the puriṣa has a reference to malarañjaka pitta. Thus, the study of the colour of puriṣa offers information relating not only to the functions of rakta and pitta sthānas like yakṛt and plīhā, but also, to the rakta itself.
<table>
<thead>
<tr>
<th>Normal and abnormal diagnostic events in different parts of kogha and corresponding symptomatology.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organs</strong></td>
</tr>
<tr>
<td><strong>Urdhva-&lt;nulamasya</strong></td>
</tr>
<tr>
<td>Normal function</td>
</tr>
<tr>
<td>Madhura-avastha paka</td>
</tr>
<tr>
<td>Amla avastha paka</td>
</tr>
<tr>
<td>Bhinnasampghata</td>
</tr>
<tr>
<td>Anna mardava karanca</td>
</tr>
<tr>
<td>Adhoh-&lt;nulamasya</td>
</tr>
<tr>
<td>Amla avastha paka</td>
</tr>
<tr>
<td>Rasasogana</td>
</tr>
<tr>
<td>Saradita-vibhijana</td>
</tr>
<tr>
<td><strong>Abnormal function</strong></td>
</tr>
<tr>
<td>Symptoms in abnormal function</td>
</tr>
<tr>
<td>Gurutu or Heaviness</td>
</tr>
<tr>
<td>Ukleda</td>
</tr>
<tr>
<td>Garja &amp; aksiga sotha</td>
</tr>
<tr>
<td>Udgara</td>
</tr>
<tr>
<td>Avidagha-pravartana (urdhvanarige)</td>
</tr>
<tr>
<td>Bhrama</td>
</tr>
<tr>
<td>Tfi</td>
</tr>
<tr>
<td>Murcha</td>
</tr>
<tr>
<td>Osha</td>
</tr>
<tr>
<td>Cotha</td>
</tr>
<tr>
<td>Daha</td>
</tr>
<tr>
<td>Organ</td>
</tr>
<tr>
<td>---------------</td>
</tr>
<tr>
<td>Pakvāaya</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
# Physical characteristics of normal and abnormal states of purīṣa (faeces)

<table>
<thead>
<tr>
<th>Physical properties</th>
<th>Normal</th>
<th>Abnormal with cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consistency &amp; shape</td>
<td>1. Solid to semi solid</td>
<td>1. Hard, dry roundish balls (ajaśakṛdvat) and generally coated with mucus, known as scybala due to defective intake of fluid or its excessive absorption by a greedy colon</td>
</tr>
<tr>
<td></td>
<td>2. Cylindrical</td>
<td>2. Pencil like, due to spasm of the anal sphinctor, possibly associated with anal fissure</td>
</tr>
<tr>
<td>Colour</td>
<td>Light to dark brown</td>
<td>3. Ribbon like, due to colopasm or stricture of rectum resulting from cancer, syphilis or gonorrhoea</td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Uniformly fluid, due to lesions of the small intestine like typhoid, sprue and Tuberculous or simple entritis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Slimy &amp; more fecal due to lesions of the large bowel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1. Lighter colour in diarrhoea</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Pale colour due to (a) obstruction to the entrance of bile into the intestine as in jaundice (b) dilution of the stool as in cholera (c) Excess of unabsorbed fat (d) a milk diet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Clay coloured stool due to obstructive jaundice</td>
</tr>
<tr>
<td>Physical properties</td>
<td>Normal</td>
<td>Abnormal with cause</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Colour (contd.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4. Pale bulky stool in stea-torrhoea, either due to defect in agnyāśaya rasa srāva (pancreatic secretion) or defective sneha śoṣaṇa</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Tarry stool due to haemorrhage in upper part of the mahāśrotas as in duodinal ulcer. Black stool also, seen in patients taking iron, bismuth, and charcoal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. “Red current jelly” or strawberry ice stools are seen in intussusception</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. Streaks of blood may be present with local lesions like arṣa</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8. Muco purulent in pravāhika etc.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9. Green stool due to entritis in infants as well as after the intake of calomel</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Odourless, colourless, rice water stool as in adhogavisūcika</td>
</tr>
<tr>
<td></td>
<td></td>
<td>11. Frothy acid yellow stool due to excessive carbohydrate fermentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12. Soft, brown, offensive alkaline stool of protein putrefaction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>13. Bilious pea soup stool due to āntrika sannīpāta</td>
</tr>
<tr>
<td>Odour</td>
<td>Foul due to skatol, indol, ammonia &amp; Hydrogen sulphide etc.</td>
<td>I. Characteristic gangrenous smell due to severe ulceration—cancerous dystnteric &amp; syphilitic</td>
</tr>
<tr>
<td>-------</td>
<td>---------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Presence of undigested particles of food</td>
<td>Should not be present</td>
<td>Presence of undigested food particle in excess is indicative of imperfect digestion (gastric or impental and unless the food has been excessive, denotes especially intestinal or pancreatic disease. In children this feature usually indicates overfeeding</td>
</tr>
<tr>
<td>Presence of mucus</td>
<td>Should not be present</td>
<td>When intimately mixed with the faeces it indicates catarrh of the small intestine. When it is present it isolated masses, it signifies the presence of catarrh of the large bowel. When long cylinders of mucus are passed, sometimes without much faeces, it indicates membranous of mucus colitis</td>
</tr>
<tr>
<td>Presence of blood</td>
<td>Should not be present</td>
<td>Blood of red colour in streaks or in quantity indicates haemorrhage from rectum or bowel. In haemorrhages from stomach and intestine, the blood undergo partly digested to give the stool a tarry colour</td>
</tr>
<tr>
<td>Presence of Pus</td>
<td>Should not be present</td>
<td>Indicates ulceration of rectum or colon which may be ulcerative colitis, dysentery, cancer, tuberculosis or of syphilitic origin</td>
</tr>
<tr>
<td>Presence of Gall Stones</td>
<td>Should not be present</td>
<td>Passed from Gall bladder</td>
</tr>
<tr>
<td>Physical properties</td>
<td>Normal</td>
<td>Abnormal with cause</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Presence of worms</td>
<td>Should not be present (Occasionally the presence of thread worm or Giardia is not taken as abnormality)</td>
<td>Some are macroscopic like round worm Tenia saginata, Tenia solium, Enterobius vermicularis etc. and others are microscopic like the ova of Ascaris lumbricoides, Trichuris trichuria, Ankylostoma duodenale, oxyurus vermicularis etc.</td>
</tr>
<tr>
<td>Vata</td>
<td>Pitta</td>
<td>Kapha</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Tiktodgāra (Bitter eructation)</td>
<td>Puti udgāram (foul smelling eructation)</td>
<td>Udgāra bāhulya (excessive eructations)</td>
</tr>
<tr>
<td>Śabda pravala udgāra (Eructation with great sound)</td>
<td>Amla udgāra (Acid eructation)</td>
<td>Udgārarodha (inhibition of eructation)</td>
</tr>
<tr>
<td>Saphena chardi (Frothy vomiting)</td>
<td>Vomiting of green, yellow, red, black, coloured material having sour and bitter in taste. Uṣṇa vamana (Hot vomitings)</td>
<td>Picchila vamana (slimy vomiting)</td>
</tr>
<tr>
<td>Vichina chardi (Vomiting with splitted material)</td>
<td>Māṃsodakābha vamana (Vomiting of flesh washed water)</td>
<td>Śleṣmayukta vamana (mucoid vomiting)</td>
</tr>
<tr>
<td>Kṛṣṇa chardi (Coffee ground vomiting.)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tanuka chardi (Thin vomiting)</td>
<td>Dhūṁra vamana (Vomiting of foamy substances)</td>
<td>Snigdha vamana (viscous vomiting)</td>
</tr>
<tr>
<td>Kasāya chardi (Astringent vomiting)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kṛchrenchardi (Painful vomiting)</td>
<td>Kṣārodakābha vamana</td>
<td></td>
</tr>
<tr>
<td>Alpa chardi (Vomitinginless quantities)</td>
<td>Hṛt dāha (Burning sensation in praecardial region)</td>
<td>Svādu vamana (Sweet vomiting)</td>
</tr>
<tr>
<td>Bhukte svāsthya (A sense of ease after taking meals)</td>
<td>Pipāsā (Thirst)</td>
<td>Śukla vamana (white vomiting)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Śīta vamana (Cold vomiting)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tantumat vamana (Thready vomiting)</td>
</tr>
<tr>
<td>Vata</td>
<td>Pitta</td>
<td>Kapha</td>
</tr>
<tr>
<td>----------------</td>
<td>----------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>Śvāsā (Dyspnoea)</td>
<td>Vipāka (Indigestion)</td>
<td>Kapha (Spitting)</td>
</tr>
<tr>
<td>Hṛṣṭk (Pre-cardial pain)</td>
<td>Vidaha (Burning sensation in epigastric area)</td>
<td>Nīghvāna (Spitting)</td>
</tr>
<tr>
<td>Prṣṭha śūla (Colicky pain in the back)</td>
<td>Hṛdayādavā (Voiding of undigested material)</td>
<td>Lavāna praseka (Saline salivation)</td>
</tr>
<tr>
<td>Agnimāṇḍya (Poor digestion)</td>
<td>Nabhidaśa dāha (Burning sensation umbilical region)</td>
<td>Tanu praseka (Thin salivation)</td>
</tr>
<tr>
<td>Kṣut (Appetite)</td>
<td>Prṣṭha śūla (Colicky pain during digestion)</td>
<td>Utkaśa (Nausea)</td>
</tr>
<tr>
<td>Trṣṇā (Thirst)</td>
<td>Śvāsā (Dyspnoea)</td>
<td>Gurtyā (Heaviness)</td>
</tr>
<tr>
<td>Pārṣvāra (Pain in flanks)</td>
<td>Aggravation after in taking meals.</td>
<td>Stimita Kṛṣṭa (Silent gastro intestinal tract)</td>
</tr>
<tr>
<td>Viṣāmāgni (Impaired Digestion)</td>
<td></td>
<td>Āmāṣāyāṅk (Pain in stomach)</td>
</tr>
<tr>
<td>Vata</td>
<td>Pitta</td>
<td>Kapha</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>--------------------------------------------</td>
<td>--------------------------------------------</td>
</tr>
<tr>
<td>Characteristics of the stool voided, are</td>
<td>Characteristics of the stool, voided, are</td>
<td>Bhinnamala (Broken stool)</td>
</tr>
<tr>
<td>as follows:</td>
<td>as follows:</td>
<td>Āma saṁśṛṣṭa mala</td>
</tr>
<tr>
<td>Drava (Liquid)</td>
<td>Nīlābha (Bluish)</td>
<td>(With undigested materials)</td>
</tr>
<tr>
<td>Suṣka (Dry)</td>
<td>Pitābha (Yellowish)</td>
<td>Śleṣma saṁśṛṣṭa mala (mucoid stool)</td>
</tr>
<tr>
<td>Tanu (Thin)</td>
<td>Pūti (Putrefied)</td>
<td>Guru (Heavy)</td>
</tr>
<tr>
<td>Āma (Undigested)</td>
<td>Uṣmā (Hot)</td>
<td>Picchila purṇa (slimy stool)</td>
</tr>
<tr>
<td>Šabdavat (Noisy)</td>
<td>Drava (Liquid)</td>
<td>Sveta purṇa (white stool)</td>
</tr>
<tr>
<td>Phenavat (Frothy)</td>
<td>Rakta (Bloody)</td>
<td>Snigdha mala (viscous stool)</td>
</tr>
<tr>
<td>Grathita (Scybalous)</td>
<td>Āma (with undigested food)</td>
<td>Tantumat purṇa</td>
</tr>
<tr>
<td>Picchānugata (Slimy)</td>
<td>Harita (Green)</td>
<td>Thready stool</td>
</tr>
<tr>
<td>Kṛṣṇa (Tarry)</td>
<td>Sambhinna (Broken)</td>
<td>Alpamala (Voiding in less quantity)</td>
</tr>
<tr>
<td>Śyāva (Brown)</td>
<td>Pracura (in large quantities)</td>
<td>Sapravānika mala pravr̥tti</td>
</tr>
<tr>
<td>Aruṇa (Redish)</td>
<td>Kṛṣṇa (Black)</td>
<td>(Voiding with tenesmus)</td>
</tr>
<tr>
<td>Paruṣa (Rough)</td>
<td>Atidurgandhi (very foul smelling)</td>
<td>Abhikṣa mala pravr̥tti</td>
</tr>
<tr>
<td>Vijjala (Slimy)</td>
<td>Others are:</td>
<td>(Frequent motions)</td>
</tr>
<tr>
<td>Viḍulata (which floats and spreads)</td>
<td>Vidāha (Burning sensation)</td>
<td>Viṣṭambha (constipation)</td>
</tr>
<tr>
<td>Avasādi (which sinks &amp; spreads)</td>
<td>Pāka (Proctitis)</td>
<td>Vaṅksaṅānāha (Distention of the lower abdomen)</td>
</tr>
<tr>
<td>Āmagnādhi (Having foul putrid smell)</td>
<td></td>
<td>Pāyu vikṛṣṭi (sucking of anus)</td>
</tr>
<tr>
<td>Modes/voiding are as follows:</td>
<td></td>
<td>Nābhi vikṛṣṭi (sucking of umbilicus)</td>
</tr>
<tr>
<td>Cirāt (Delayed)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duḥkha (with difficulty)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kapha</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vastivikṛṣṭi (sucking of bladder)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anubandha sīla (continuity of colicky pain)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sancayadupa vēsana (sudden voiding of large mass of retained faeces)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pitta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vāta saṅga (Retention of gas)</td>
</tr>
<tr>
<td>Viṣṇuṣaḥ (flatulence)</td>
</tr>
<tr>
<td>Vātraṇa (Tympanitis)</td>
</tr>
<tr>
<td>Kūkṣi rūk</td>
</tr>
<tr>
<td>Tiṣṭi rūk</td>
</tr>
<tr>
<td>Vāstī sīla</td>
</tr>
<tr>
<td>Vaṅkaṇa rūk</td>
</tr>
<tr>
<td>Udara vājjana</td>
</tr>
<tr>
<td>Jirne prakopā</td>
</tr>
<tr>
<td>Ahata ādhumāta</td>
</tr>
<tr>
<td>Dṛvāt śādha (Tympanic sound on percussion)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vāta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muhurbaḍha and muhurdrava (some times hard and sometimes liquid)</td>
</tr>
<tr>
<td>Stoka (in small quantities)</td>
</tr>
<tr>
<td>Sarvatrayaḥkaṣa (with tenesmus)</td>
</tr>
<tr>
<td>Frettam (with pain)</td>
</tr>
<tr>
<td>Viṭṭa saṅga (Retention of faeces)</td>
</tr>
<tr>
<td>Apaya (Painful distension with sound)</td>
</tr>
</tbody>
</table>

Other characteristics:
- Aṇāha (flattening)
- Adharmā (constipation)
Other Relevant Symptoms pertaining to Gastro-Intestinal Impairement.

1. Kaṇṭha śoṣa (Dryness in throat)
2. Āsyā śoṣa (Dryness in mouth)
3. Sarva rasagṛddhi (Desire for substances having all tastes)
4. Kaṇṭha dāha (Burning sensation in the throat)
5. Aruci (Distaste)
6. Trṛ (Thirst)
7. Āsyopdeha (coating over the mouth)
8. Āsyā mādhurya (sweet taste in the mouth)
9. Śṭītvana (spitting)
10. Vairasya (Bad taste)
11. Tṛpti (Satisfaction)
12. Kaṭu vaktratā (sensation of acrid or pungent taste in mouth)
13. Praseka (Salivation)
14. Svarabheda (Impairement in the production of sound)
15. Kṣavathu (smeezing)

Other symptoms relating to Dhātvagni pāka.

1. Sadana
2. Sauhityāsahatā
3. Balakṣaya
4. Bhrama
5. Moha
6. Harṣa
7. Tandrā
8. Santoṣa
9. Nidrā
10. Gaurava
11. Romaharṣa
12. Annadveṣa
13. Akrṛsasyāpidaurbalya
14. Strīsvaharṣaṇa
15. Ālasya
16. Kārśya
17. Śṭājvara
18. Gātrastambha
19. Sucivedhavatvedanā
20. Staimitya
21. Sveda
22. Jvara
23. Dāha

AGNIBALA PARĪKṢA
PRACTICAL STUDY

MATERIAL AND METHOD OF STUDY

Material—Materials available for the study of agnibala, mūmsa-bala and ṛṣmōtpatti are:

(1) The description of normal and abnormal symptoms,
pertaining to digestion of food in the kōṣṭha, as furnished in the available editions of Sanīhitā granthas, commentaries thereon and as allied subjects.

(2) Normal volunteers and patients in the hospital, attached to Post Graduate Training Centre in Ayurveda.

(3) Literature relating to balaparikṣā, gathered from extent āyurvedic works, as well as from allied modern medical literature.

Method—Methods of study, in so far as normal volunteers are concerned, were confined almost exclusively to māṁsabala and vāṣmotpatti. Observations relating to these two factors were noted by the author on the basis of his observation. Data as regards agnibala or jaraṇaśakti were obtained by interrogating the normal volunteers.

Agnibalaparikṣā—Findings subjective and objective, gathered in every patient studied, were recorded in a proforma, specially prepared for the purpose (vide appendix No. 8). Findings relating to mala parikṣā were based on unaided sense observation and these were mainly confined to inspection (rūpa) and smell (Gandha). The data, provided do not include laboratory findings.

Māṁsabala parikṣā—In so far as māṁsabala parikṣā is concerned normal volunteers as well as patients were requested to run slowly a measured distance on an average not exceeding a mile, in the hostel or hospital compounds and their ardhaśakti was noted, having regard to the appearance of beads of perspiration on the fore-head, axillae, nose, joints, extremities and the sensation of dryness in the mouth. This is based on references made by Suśruta and Vāgbhaṭa and commentaries there on relating to the limits, uptill which vyāyāma or physical exercise is to be practiced.

---

1. भ्यायामो हि सदा पघ्यो बसिन्त्यां सिन्घोचिनाम्।
   स च शोते बसन्ते च तेषां पघ्यतमः स्तूतः॥

2. भज्यायामृ निकेतन्तर सिन्घोऽस्मात् सिन्घोज्जिनिम्॥

---

Suśruta: Cikitsā 24: 45-46.

Aṣṭāṅgahṛdaya: Sūtra 2: 11.
Vyāyāma according to these authorities, is to be practiced up till the limit of half of one’s strength—ardhaśakti by those who are strong (balin) and who live on viscous and fatty types of foods (snidhabhojin). In addition, the permissible upper limit of strength up till which vyāyāma can be performed by persons, of the type mentioned above, is confined to Śītakāla (Varṣa—August and September), Hemanta (December and January), Śiśra (February and March), and Vasanta (April and May) and less during the hotter seasons of the year, namely Grīṣma (June and July) and Sarat (October and November). Ardhaśakti is seen to be a strictly individualised norm, which may vary from person to person, season to season and according to the nature of diets consumed by them. In view of these limiting considerations, the signs and symptoms of ardhaśakti of any individual should conform to the following criteria.

1. According to Suśruta when evidence of the movement of the sthānika vāyu of hṛdaya to vaktra (or mouth) is observed then ardhaśakti is to be deemed to have been reached. ¹

2. The appearance of beads of sweat in the axillae, brows (lalāṭa) nose, joints of the upper and lower extremities and dryness of mouth. ²

3. The appearance of sweat in the regions of brows, nose, joints of the limbs and axillae. ³

The criteria mentioned above have, the appearance of perspiration in certain parts of the body, as a common feature. Additional points, deserving of consideration are (a) the symptoms (lakṣaṇa) of the movement of hṛdīsthita

¹. इद्विस्थानस्थितो वायुपवद्र वत्तम प्रपंचते ।
ध्यायविन कुर्वेतो जन्तोत्स्नानार्थ हस्तद्वयम् ॥ Suśruta : Cikitsā 24 : 47.

². कत्त्वा कालाटनालानु इत्स्तपागादिदिशिपु ।
प्रस्वेदान्युक्तोषोषाभ्र षार्थ तत्तद्विदितेव ॥ Ćalhanā on above.

³. क्षत्त्वेदेशे नासायं गांवसंतिपु कष्मोः ।
वेदः संजावते वर्ण षार्थ तत्तद्विदितेव ॥

Note on Aṣṭāṅgaḥṛdaya : Sūtra 2 : 11.


Vāyu to the vaktra and (b) the dryness of the mouth. A point for consideration as regards (a) above is the identity of the ṛḍīsthita vāyu and the symptoms as may be produced in the vaktra. References in available literature to the five vāyus, draws attention to prāṇa vāyu which has been stated by Caraka¹ as uraḥstha (ḥṛdaya is an organ of uras). It is correlated to kaṇṭha, jihvā, āṣya, nāsīkā and functions such as, śṛṅivāna or spitting and vaktra saṅcāraṇa² (Suśruta) will exclude vyāna³ and udāna⁴ which are stated to be ṛḍīsthā and uraḥstha respectively. Since only vaktraśosa has been mentioned as a sign of ardhaśakti and not śvāsa (dyspnoea), which latter is correlated to ativyāyāma⁵ i.e., exercise, much in excess of ardhaśakti, śvāsa as a symptom of ardhaśakti is to be excluded. Thus, the criterion of ardhaśakti, in an individual, who is strong and well nourished with viscous fatty foods, in the cooler season of the year can be summed up as follows—

(1) Appearance of beads of perspiration on brows, nose, axillae and joints of the extremities.

(2) Dryness of the mouth. These highly individualised criteria of ardhaśakti are for the present study explained in the following terms—"The sympathetic and parasympathetic branches of autonomic nervous system are locked up in a continuous tug of war to maintain homeostatic state and are influenced by oxygen debt and hormonal responses. The stimulation of the sweat glands of the cranial, cervical and thoracic regions by the post-ganglionic adrenergic fibres of the sympathetic system at the exact stage-point when, in the perpetual automotive tug-of-war, the equilibrium begins to crack up. As this point of the commencement of autonomic

1. स्थानं प्राणस्य गृहिणार्कम्भोक्ति: व्यांग्धिताश्ववायात्माः।
2. योगवेदं वनस्पतिञ्जोगवेदकां नाम वै (सूत्रां)।
   सूत्राः: Nidāna 1: 13.
3. क्रियाः हृदयविर: क्रियां वनस्पतिञ्जोगवेदकां महागाः।
   अग्निकार्य: सूत्र 12: 6.
4. उदानस्य पुरुषां स्थानं नायुर: क्रिय एव च।
   Caraka: Cikitsā 28: 7.
5. शुद्धवायुचिन्तिकर्षिताः कर्मस्य अभिष्कर्षिताः।
   Caraka: Cikitsā 24: 49.
disequilibrium will always represent a particular stage of fatigue in every human being in relation to his basal, nervous and other reserves irrespective of temperament, constitution etc., and this sweat symptom in every case heralds the onset of this stage point. 1

Uṣmā Parīkṣā—The production of uṣmā or heat in the body is directly related to the following factors.

(a) The activities of pācakāṁśas in the dhatus, specially in the māṁsadhātu which represents the more active structural constituent of the body. Entering as it does into the structure of the hṛdaya, dhamani śirās, snāyus, kandārās and māṁsa-peśis etc. which participate in all kinds of movements viz., the movement of blood from hṛdaya to dhamanis, from dhamanis to phuphusa and back, from hṛdaya throughout the whole body through dhamanis and śirās and back all depending upon the property of māṁsa dhātu to contract and relax alternatively and the māṁsa peśis, snāyu, kandarā and such other structures, which possess apratighāta śakti and perform such functions like bhāraharaṇa gamanāgamana and so on.

(b) The indhana, derived from āhāra dravyas under the influence of pācakāgni and subsequently processed by bhūtāgni and dhātvagni.

(c) Tejolvāṇa vāyu of the external environment representing vijātiyatejas 2 (oxygen).


2. Nyāyabodhini has visualised different species of tejas. The combination of vijātiya tejas with a substance leading to a change in the physical and chemical characteristic of the latter, has been described as vijātiya teja saṅyoga (पक्षी नाम बिजातीयतेजः- संयोगः; स च नानातातीयः). The oxygen of the air as has been shown by modern biochemistry, combines with substances to produce oxidation or burning. This can be cited as an example of vijātiya tejahsaṅyoga. Since, all oxidative process, which take
It is the dahana of indhana by pācakāgni, present in dhātus that is responsible for the production of uṣmā.

Even during rest, the burning of indhana and the heat generation goes on as a part of life process, although the heat, thus generated, may be less than the amount produced when a man is active. No doubt, the amount of heat produced, on account of the activities of dhātus, specially of māṃsa dhātus must be considerable but the mātrā of uṣmā, produced in normal state, represents the degraded portion of energy, conserved to the extent required to subserve the needs of normal biological activities of the body. The surplus is eliminated through various channels and in special through sveda under the influence of samāna which latter, it may be noted, is also, held responsible for regulating the work of

place, in the body, in course of metabolism, need oxygen, specially in the case of aerobic reactions, which produce energy and heat. Oxygen which exhibits vilakṣya properties has to be treated as predominately agneya in nature. Even otherwise, according to the dārśanika and āyurvedika schools of thought tejās is derived from sāyu and sāyu in its turn, from ākāśa. Therefore, tejās, is stated to combine in it, the physical properties of both sāyu and ākāśa in addition to its own. All these dravyas specially sāyu and agni perform utkṣepaṇa or uḍḍhavagamaṇa. Proceeding on this basis that oxygen which is gaseous or vijāntyaka in nature is a pāneabhuṭika substance in which sāyu and agni are the more dominant factors. On account of its agneya property, it is able to participate in various kinds of pākas.

It is also, significant to note that according to Śarāgadhara, sāyu is transported through rasadhātu to all other dhātus of the body and nourishes them.

शिराभिमथो नाभिस्या: सत्वी व्याप्ति रित्यता तनुम् ।
पुष्णाभिं त्वनिष वायो: संयोगास्तवाहातुभिः ॥

Śarāgadhara : Pūrṇaṇanda 5 : 47.

Oxygen fulfils the requirements of sāyu and it is also treated by modern bio-chemistry as nutrient substance.
pūcaka in the koṣṭha.¹ In the final analysis bala, which is to be determined by vyāyāmasakti has to be considered from (1) the amount of energy produced to enable the performance of vyāyāma, (2) the amount of heat generated in the process and (3) the capacity of the body to dissipate the surplus of heat within a reasonable time.

Thus, the method adopted by the author for the determination of mātra of āṣmā by prescribing vyāyāma to the normal volunteers and patients is meant to furnish information relating to—

(1) The amount of āṣmā produced in consequence.
(2) The time taken by the body to develop this amount of āṣmā.
(3) The time taken by the body to regain its normal āṣmā.
(4) Increase in nāṭivega (pulse rate).
(5) The rate of śvāsa.

The prakṛta āṣmā in a svastha is taken for the purpose of this investigation as 98.4 F, in the Kākṣā (by keeping thermometer for three minutes), nāḍi at 72 per minute and śvāsa-prasvāsa at 18 per minute.

The procedure adopted for the examination of vyāyāmasakti and āṣmotpatti.

The temperature, pulse, and respiration of both volunteers and patients were taken (1) before retiring to bed in the previous night, (2) early in the following morning, while they are still in bed, after the nights rest (sleep), (3) before commencing vyāyāma (in the morning after visiting latrine and washing teeth), running slowly a measured distance, (4) when the signs of ardhaṇaakti appears, (5) thereafter, every 10 minutes, till the pulse, temperature and respiration returned to normal.

---

¹ स्वेददर्शायतुराशी स्तोतासि समविष्णुति।
अन्तरस्ट्रेष्य पार्श्वश: समालोक्तिमनविष्णुद:। II Caraka: Cikitsā 28:8.
PROCEDURE ADOPTED FOR AGNIBALA PARÍKṢĀ

The subjects chosen for agnibala parikṣā were patients admitted in the hospital, attached to the Post Graduate Training Centre in Āyurveda, for the treatment of various diseases. Agnibala parikṣā is carried out, as a routine, in every case admitted, specially in the wards of the professor of Kayacikitsā. Patients suffering from active diseases or stages of diseases as the āmāvasthā of jvara, atisāra etc. were not taken up for this examination.

These patients were kept for three days from the date of their admission, under observation. During this time no active treatments were given to them. They were placed on a diet which was sātmya to them. The mala voided by them during the previous twenty four hours were collected, measured and studied with reference to the following points:

(1) Time number and quantity of motions.
(2) Ākriti or appearance of the stool.
(3) Samhatatva or consistency of the stool.
(4) Varna or colour of the stool.
(5) Gandha or smell of the stool.
(6) Jalaparikṣā or examination by water.
(7) Others.

TIME NUMBER AND QUANTITY OF MOTION

The time of the voiding of motion with a view to study the preponderance or otherwise of doṣas in the stool as described in related books was found necessary. Incidentally the quantity voided in each time was noted. In the Āyurvedic view, thus, kapha is stated to be dominant in the morning, pitta in the mid day and vāta in the evening. The mala voided in the morning by a grahaṇī rogīn (patient suffering from sprue) and such other conditions have a bearing on the malaparikṣā specially of the morning specimen.

A normal man is stated to void stools twice a day—morning and evening, even though his occupation and habits are factors which may influence the timing. For conditions of India, where large population are vegetarians, two motions
a day is apparently normal. This is in keeping with the ayurvedic description that the passing of two motions a day indicates good health. Prakṛti or temperament of an individual is also seen to be considered. Thus, a person whose prakṛti is pañcika is stated to pass stool for number of times,¹ where as in the case of a person belonging to vāta prakṛti, it is considered to be less. In an abnormal state of health as in atisāra and pravāhikā, the quantity and number of motions may be increased. In these cases jātharāgni is stated to be impaired with the production of āma.

It will be seen from the foregoing, that the purīṣa, its quality, quantity and number of time, it is voided has a direct bearing on the state of kośṭha.

ĀKṛTI OR APPEARANCE OF THE STOOL

This relates to the form in which śakṛt is voided. Normal śakṛt should be well formed and resemble a ripe banana fruit or in other words, it must be cylindrical in shape. Such an appearance is suggestive of the integrity of the passage as well as the consistency of the stool. When the consistency of the stool is liquid we can not expect any definite shape. When the passage is obstructed by any growth or spasm of the colon, then also, there will be impairment of the shape (vide table in Page No. 190). The function pindikarana of stool has been attributed to the pakvāṣaya. In fact the food residue along with some excretions from the large intestine get a definite cylindrical from due to the pressure of the wall of the colon during peristalsis. This peristalsis in its turn, is regulated by the condition of the agnyādhiṣṭhāna i.e. grahāṇi (small intestine).

Thus the appearance of the stool is indicative of the condition of the colon as well as jātharāgni.

SAMHATATVA OR CONSISTENCY

The consistency of normal stool resembles that of butter summer time i.e. semiliquid. It varies in different indivi-

¹ Caraka : Vimśāna 8 : 97.
duals according to their habitates and food, they consume. In people with irregular habits of defecation, the stool remains in the colon for a long time and more *dravaśoṣaṇa* takes place from it to make it dry. On the other hand, in *atisāra*, due to violent peristalsis absorption of water is hampered and in consequence of the motion is liquid. In some conditions, in which the mucus membrane of the intestine is inflamed, there is more exudation of fluid from blood which makes the stool liquid. Again, in some conditions where there is the presence of toxic irritant material,—physical, chemical or bacterial more water is exudated from the intestinal blood vessels to make them liquified, and evacuated as in bacillary dysentery and cholera etc.

Persons taking much vegetable leave a large quantity of undigested cellulose material to be eliminated through the bowel which makes the consistency of the stool semiliquid. But when non-vegetarian meals are taken much of it is absorbed leaving a small amount of residue which is hard. The habit of taking large quantity of water may cause liquidity of the stool.

In *vātaduṣṭi*, the consistency of stool has been described as *śuṣka*, *tanu*, *vijjala*, in *pitta duṣṭi* it becomes *drava* and in *kapha duṣṭi*, it becomes *tantumat*.

Thus, from the consistency of the stool, the functional states of *jāṭharāgni* as well as, *dhātvagni* can be studied and described.

**VARUŅA OR COLOUR OF PURĪṢA**

Colour of normal *purīṣa* varies from light to dark brown. As mentioned previously in page 37 *varṇa* or colour of the stool is caused by *malaraṅjaka pitta* (stercobilinogen). Melanin, which is excreted from the bowel wall or synthesised from the aminio-acid-tyrosin, chlorophyll which is taken with vegetables and iron, copper etc. may also influence the colour of the normal faeces.

Pathologically, conditions of the bowel, like haemorrhage of the upper gastro-intestinal tract (black colour), obstruc-
tion to the passage of bile (clay colour), inflammation of the mucus membrane of the tract as in āntrika sanānipūta jvara or typhoid fever (canakayusābha or pea soup colour) also, influence the colour of the stool.

Vāta, vitiates the stool to produce kṛṣṇa (black), śyāva (grayish blue) or aruna (redish) colours, pitta produces nila (blue), pita (yellow), rakta (red) or kṛṣṇa (black) colours and kapha produces śveta (white) colour.

Thus, the colour of the stool is the index of local (gastrointestinal) as well as general conditions of the body.

GANDHA OR SMELL

Smell furnishes information relating the function of pakvāsaya. No doubt, as stated elsewhere, the gandha of ṣakṛt may vary according to the diet taken. Local conditions like more putrefaction, gangrene of the colon, cancer of small or large intestine etc., may give rise to particular kinds of smells. These diseases are also, related to āma at the level of dhātvagni or dhātvagni māndya as it is also, called. Putrefaction, though a normal event becomes more active when there is more of undigested protein material in the colon which in its turn is correlated to jāṭharāgni māndya.

Thus, the smell of purīsa, has reference to some of the functions of jāṭharāgni.

JALAPARĪKṢĀ

This test, carried out in lines, described in saṁhitā granthas by giving of small quantity of the specimen to a cup of clean tap water and the following points are noted:

(1) Whether it floats or sinks.
(2) Whether it is avasādī 1 (sinks and dissolves) or vipluta 2 (floats and spread). The interpretation of the observation made by jalaparīkṣā are on the lines furnished hereunder—

1. अवसादीते भूमी पतितत्व दोनों भवति।
   Cakrāpani on Caraka : Citra 19:5.
2. विपुलपतिते प्रसरणशीलम्। Ibid.
(1) If the specimen floats, it is to be inferred that āhāra pacana and drava śoṣana have satisfactorily taken place in the adho-āmāśaya and pakvāśaya respectively. The functional state of the adho-āmāśaya and pakvāśaya are also inferred from this parikṣā. An exception to this rule is whether the motion is watery or scybalous, very cold or mixed with mucus (śleṣmā). In fact that these exceptions relate to intense āmadosa will be obvious even without agnibala parikṣā.

(2) Avasāditva or viplutatva are indicative of vātātisāra.

OTHER FACTORS

Additional informations relating to the presence of āma (mucus), kṛmis (worms) and undigested food particles are, also to be noted. They furnish information as regards the functional states of agnis.

SIGNS AND SYMPTOMS RELATING TO THE STATES OF AGNI

Signs and symptoms of digestion or its impairment in the urdhva āmāśaya adho-āmāśaya and pakvāśaya are to be noted and interpreted on the basis of data, recorded in the table in pages 192–193.

In the course of this work, the author was able to examine about 38 patients for agnibala parikṣā and 13 cases of normal volunteers and 4 cases of patients for vyāyāma śakti and uśmotpādana. Table in Appendix III furnishes information relating to the cases studied so far. Graphs relating to bala parikṣā and uśmotpādana are also furnished in the appendix.

Details relating to the study of diseases due to the affection of different dhātus by āma formed by the impairment of dhātvagni vyāpāra are furnished in table of page 288 to 217. These relate to various kinds of metabolic disturbances, the most marked feature of which being various degrees of fatigue states.

1. मकरशामायुहलिड्रु पक्तवा तुफ्फाक्ते बबे।
बिनातिद्रसंख्यात शर्थव्यलेख्यप्रदृष्टणागु Caraka: Cikitsā 15:94.
DISEASES DUE TO THE AFFECTION OF DIFFERENT DHĀTUS.¹

<table>
<thead>
<tr>
<th>Dhātu</th>
<th>Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rasa</strong></td>
<td>Aśraddhā (Anoroxia), Aruci (Distaste), Āsyavairasya (Bad taste in mouth), Arasajñāta (Aguesia), Hṛllāsa (Nausea), Gaurava (Heaviness), Tandrā (Drowsiness), Aṅgamarda (Body-ache), Jvara (Fever), Tamas (Faintness), Paṇḍutva (Pallor) Srotorodha (obstruction to channels) Klaibya (Impotency), Sāda (Asthenia), Krśāṅgata (wasting of the body) Agninīśa (Loss of the capacity of digestion), Ayathākālavalī (Premature formation of wrinkless), Ayathākāla palita (premature graying of hair).</td>
</tr>
<tr>
<td><strong>Rakta</strong></td>
<td>Kuṣṭha (skin diseases), Visarpa (Erysipelas) Pidakā (Pimples), Raktapitta (Haemorrhage through different channels of the body), Aśrgdara (Menorrhagia), Meḍhrapāka (Pudentitis), Āsyapāka (Stomatitis), Plithā (Enlargement of spleen), Gulma (Fantum tumous), Vidradhi (Abscess), Nīlikā (Blue mole), Kāmalā (Jaundice), Vyaṅga (Freckless), Piplu (Port wine marks), Tilakālaka (Black mole), Dadru (Ring worm), Carmadala (A type of skin disease), Śvitra (Leucoderma), Pāmā (Scabies), Koṭha (Rashes), Asramandala (Red circular patchas).</td>
</tr>
<tr>
<td><strong>Mūnsa</strong></td>
<td>Adhīmāṁsa (Granuloma), Arbuda (Tumour), Kila (Warts), Galaśāluka (A disease of the oropharynx), Galaśundika (Tonsilitis), Putimūṁsa (Gangrene), Alaji (A type of skin disease), Gaṅḍa (Goitre), Gaṅḍamāla (Cervical adenitis), Upajīhvikā (Uvulitis).</td>
</tr>
</tbody>
</table>

(B) Caraka: Nidāna 4: 47.
<table>
<thead>
<tr>
<th>Dhātu</th>
<th>Diseases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medas</td>
<td>Keśa jaṭilibhūva (Matting of hair), Āsyamādhyāra (Sweet taste of mouth), Karapāda-dāha (Burning sensation in hands and feet), Mukhaśoṣa (Dryness of mouth), Tāluśoṣa (Dryness of palate), Kaṇṭhaśoṣa (Dryness of throat), Pipāsā (Thirst), Ālasya (Idleness), Kāyamala (Increased excrements of the body), Kāyachidra-ūpadeha (Increased discharge in the orifices of the body), Āṅgasūptata (Numbness in the body).</td>
</tr>
<tr>
<td>Asthi</td>
<td>Adhyasthi (Hypertrophy of bone), Adhidanta (Hypertrophy of teeth), Dantabheda (Pain in teeth), Dantaśūla (Colicky pain in teeth), Asthi-bheda (Pain in bones), Asthiśūla (Colicky pain in bones), Vivarratā (Pallor), Keśaloma &amp; smaśru-doṣa (Pathological conditions of hairs), Nakha-doṣa (Pathological conditions of nails).</td>
</tr>
<tr>
<td>Majjā</td>
<td>Parvaruk (Pain in finger joints), Bhrama (Giddiness), Mūrzhā (Fainting), Tamas (Faintness), Sthūlamūla parvaja aruṃśikā (Deep seated absess of the joints of finger).</td>
</tr>
<tr>
<td>Śukra</td>
<td>Klaibya (Sterility), Aharṣaṇa (Impotency), Rogiprajanana (Begets diseased offspring), Kliṣṭa prajanana (Begets impotent offspring), Alpāyu prajanana (Begets short lived child), Virūpa prajanana (Begets deformed offspring).</td>
</tr>
<tr>
<td>Snāyu, Sirā Stambha (Stiffness), Samkoca (Contraction), and Kaṇḍara Khallī (Traichiocrural newralgia), Granthi (Tumour), Sphuraṇa (Tremour), Supti (Numbness).</td>
<td></td>
</tr>
<tr>
<td>Dhātus</td>
<td>Symptoms due to vāta duṣṭ</td>
</tr>
<tr>
<td>--------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>1. Rasa (Tvak)</td>
<td>Rūkṣatvaka (Rough skin)</td>
</tr>
<tr>
<td></td>
<td>Sphūtita tvak (Broken skin)</td>
</tr>
<tr>
<td></td>
<td>Supta tvak (Numb-ness of skin)</td>
</tr>
<tr>
<td></td>
<td>Kṛśa (Thin)</td>
</tr>
<tr>
<td></td>
<td>Kṛṣṇa (Black)</td>
</tr>
<tr>
<td></td>
<td>Tūdana (Pain)</td>
</tr>
<tr>
<td></td>
<td>Ātanana (Stretching)</td>
</tr>
<tr>
<td></td>
<td>Sarāga (Redish)</td>
</tr>
<tr>
<td></td>
<td>Parvaruk (Pain in finger joints)</td>
</tr>
<tr>
<td></td>
<td>Vaivarnya (Disco-lourisation)</td>
</tr>
<tr>
<td></td>
<td>Sphurāṇa (Tremour-ing)</td>
</tr>
<tr>
<td>2. Rakta</td>
<td>Sarīpāpa (Feverish)</td>
</tr>
<tr>
<td></td>
<td>Tivraruuk (Excessive pain)</td>
</tr>
<tr>
<td></td>
<td>Vaivarnya (Disco-lourisation)</td>
</tr>
<tr>
<td></td>
<td>Kṛṣatā (Thinness)</td>
</tr>
<tr>
<td></td>
<td>Aruci (Distaste)</td>
</tr>
<tr>
<td></td>
<td>Gātra Arūṇi (Pim-les in the body)</td>
</tr>
<tr>
<td></td>
<td>Bhukta stambha (In activity of the body after taking meals)</td>
</tr>
<tr>
<td>3. Māṁsa</td>
<td>Gurbaṅga (Heavy-ness of the body)</td>
</tr>
<tr>
<td></td>
<td>Atyartha tudana (Excessive pain in the body)</td>
</tr>
<tr>
<td></td>
<td>Daṇḍāhatavat vedāṇā (Pain like beating with a staff)</td>
</tr>
</tbody>
</table>

1. Ṣaṅkhaṣa or Suśruta: uttaratantra 66 : 10.
<table>
<thead>
<tr>
<th>Dhātus</th>
<th>Symptoms due to Vātaduṣṭi</th>
<th>Symptoms due to pittaduṣṭi</th>
<th>Symptoms due to kaphaduṣṭi</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><em>Muṣṭhihatavat-vedāṇa</em> (Pain like beating with fist.)</td>
<td><em>Granthi</em> (Tumours)</td>
<td><em>Ārdra-carmavānavaddhābhāgatratā</em> (Feeling of being covered with a wet skin)</td>
</tr>
<tr>
<td></td>
<td><em>Atyartha Śrāmita</em> (Excessive exhaustion)</td>
<td><em>Sveda</em> (Sweating)</td>
<td><em>Tvak gaurava</em> (Heaviness in the skin)</td>
</tr>
<tr>
<td></td>
<td><em>Saśūla granthi</em> (Painful tumour)</td>
<td><em>Bhr̥ṣatṛt</em> (Excessive thirst)</td>
<td></td>
</tr>
<tr>
<td>4. Medas</td>
<td>Like those of <em>mōṁsa</em> and <em>Mandaruk-granthi</em> (Tumours having less pain)</td>
<td><em>Bhr̥ṣa vamana</em> (Excessive vomiting)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Avṛṇagranthi</em> (Tumour without any ulceration)</td>
<td><em>Asthidāha</em> (Burning sensation in bones)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Hāridranakha</em> (Yellow nails)</td>
<td></td>
</tr>
<tr>
<td>5. Asthi</td>
<td><em>Asthibheda</em> (Break bone pain)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Parvabhedha</em> (Breakbone pain in joints)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Sandhi śūla</em> (Pain in joints)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Māṁsakṣaya</em> (Wasting of muscle)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Balakṣaya</em> (Weakness)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Aswapna</em> (Sleeplessness)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Santataruk</em> (Continued pain)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Asthīsoṣa</em> (Wasting of the bone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Majjā</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Like those of asthi and Āprasāamaruk (Continuous pain)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Śukra</td>
<td><em>Kṣipra śukra muñcana</em> (Rapid ejaculation of semen)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Kṣipra śukra vandhana</em> (Speedy stoppage of semen)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Garbha <em>Kṣipra Muñcana &amp; Bandhana.</em></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SYMPTOMS DESCRIBED IN MODERN MEDICINE IN DISEASES OF GASTRO INTESTINAL TRACT.

A. In diseases of ārađhva-āmāsaya

1. Bad taste in mouth (Āṣya vairasya)
2. Dryness of mouth (Mukhaśūkatā)
3. Halitosis (Pūtigandhi niḥśvāsa)
4. Nausea (Utkleśa)
5. Vomiting (Chardi)
6. Thirst (Trśā)
7. Increased appetite (Kṣut)
8. Flatulence in the upper abdomen (Udara ārađhva bhūga udhmāna)
9. Heart burn (Hṛt dāha)
10. Acid eructation (Amlodgāra)
11. Hic cough (Hikkā)
12. Water brash (Lāla praseka)
13. Anoroxia (Anamūbhilāsa)
14. Perverted appetite (Kṣut vairparitya)
15. General malase (Aṅgamārdā)
16. A sense of ill health (Asvāsthya)
17. Incapacity for work (Ālasya)
18. Dark rim beneath the eye (Aksikūta kṛṣṇatā)
19. Sallow or earthy complexion (Pāṇḍutā)
20. Emaciation (Dhātukṣaya)
21. Palpitation (Hṛt dravatva)
22. Dyspnoea (Śvasakrēcha)
23. Pre-cardiac pain (Hṛdaya vyathā)
24. Syncope (Mūrcha-sannyāsa)
25. Vertigo (Bhrama)
26. Headache (Śiraḥ śūla)
27. Depression of spirit (Dainya)
28. Neurasthenia (Daurbalya)
29. Irritability of temper
30. Drowsiness (Tandrā)
31. Coated tongue (Jīhvā upadeha)
32. Disturbed sleep (Nidrā-ghāta)

1. These symptoms are collected from different diseases of the Gastro intestinal tract from:

A. Beaumont: Medicine
B. Savill's system of clinical medicine
C. Loewenberg: Medical Diagnosis 6th Edition
D. Price Medicine
33. Urticaria (Śitapitta)
34. Fullness of stomach (Udara gaurava)
35. Paroroxia (Desire for unusual food)
36. Diarrhoea (Atisāra)
37. Constipation (Viṣṭambha)
38. Urinary change (Mūtra parivartana)
39. Skin change (Tvak-Varṇa-parivartana)

B. In diseases of adho āmāsaya & pakvāsaya

1. Diarrhoea (Atisāra)
2. Tenesmus (Pravāhana)
3. Constipation (Vivandhā)
4. Flatuance (Ādhmāna)
5. Pain (Vedanā)
6. Tenderness (Sparśasaha)
7. Prostration (Dainya)
8. Vomiting (Vamana)
9. Collapse (Moha-sannyāsa)
10. Subnormal temperature (Śīta-jvara)
11. Wasting (Kṣaya)
12. Pyrexia (Jvara)
13. Exhaustion (Śrama)
14. Profuse haemorrhage (Atiraktasrāva)
15. Anaemia (Pāṇḍu)
16. Nausea (Utkleśa)
17. Headache (Śirahṣūla)
18. Colicky pain (Śūla)
19. Cheeks flushed (Gaṇḍa rāgatva)
20. Dry tongue (Śuṣka Jīhvā)
21. Coated tongue (Jīhvā upadeha)
22. Thirst (Pipāsā)
23. Mental confusion (Moha)
24. Cramps (Ākṣepa)
25. Thready pulse (Śūtravat nāḍī)
26. Fatigue (Śrama)
27. Asthenia (Daurbalya)
28. Oedema of feet (Padadeśaśotha)
29. Newrītis (Vedanā)
30. Sleeplessness (Nidrānāśa)
31. Urticaria (Śitapitta)
32. Embarrassed breathing (Śvāsakṛchra)
<table>
<thead>
<tr>
<th>Characteristics of the stool</th>
<th>Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offensive</td>
<td>Acute catarrhal infantile diarrhoea</td>
</tr>
<tr>
<td></td>
<td>Epidemic (Summer) infantile diarrhoea</td>
</tr>
<tr>
<td></td>
<td>Acute ulcerative colitis</td>
</tr>
<tr>
<td>Purulent</td>
<td>Bacillary dysentery</td>
</tr>
<tr>
<td>Odourless</td>
<td>&quot; &quot; (in last stage)</td>
</tr>
<tr>
<td>Yellow</td>
<td>Acute catarrhal infantile diarrhoea</td>
</tr>
<tr>
<td>Green</td>
<td>&quot; &quot; &quot; &quot;</td>
</tr>
<tr>
<td>Black</td>
<td>Acute ulcerative colitis</td>
</tr>
<tr>
<td></td>
<td>Gastro-duodenal ulcer and cancer</td>
</tr>
<tr>
<td>Red (Blood)</td>
<td>Acute ulcerative colitis</td>
</tr>
<tr>
<td></td>
<td>Bacillary dysentery</td>
</tr>
<tr>
<td></td>
<td>Amoebic dysentery, Malarial dysentery</td>
</tr>
<tr>
<td></td>
<td>Kala azar dysentery, Schistosomal dysentery</td>
</tr>
<tr>
<td></td>
<td>and Oesophago stomatic dysentery</td>
</tr>
<tr>
<td>Pale colour</td>
<td>Sprue</td>
</tr>
<tr>
<td>Colourless</td>
<td>Asiatic cholera</td>
</tr>
<tr>
<td>With mucus (Ama or slesma)</td>
<td>Infantile epidemic diarrhoea</td>
</tr>
<tr>
<td></td>
<td>Entero-colitis</td>
</tr>
<tr>
<td></td>
<td>Acute ulcerative colitis</td>
</tr>
<tr>
<td></td>
<td>Bacillary dysentery-gelatinous, mucus</td>
</tr>
<tr>
<td></td>
<td>Schistosomal dysentery</td>
</tr>
<tr>
<td></td>
<td>Cholera (flakes of columnar epithelium)</td>
</tr>
<tr>
<td></td>
<td>Muco-colitis-Mucus passed in masses and cast of several inches long</td>
</tr>
<tr>
<td></td>
<td>Amoebic dysentery-Brownish mucus</td>
</tr>
<tr>
<td></td>
<td>Balantidal dysentery-Gelatinous mucus</td>
</tr>
<tr>
<td>Slimy</td>
<td>Acute catarrhal infantile diarrhoea, Enterocolitis</td>
</tr>
<tr>
<td>Large quantity</td>
<td>Sprue, Amoebic dysentery</td>
</tr>
<tr>
<td>Frothy</td>
<td>Sprue, Enterocolitis</td>
</tr>
<tr>
<td>Consistency liquid</td>
<td>Cholera (Opaque rice watery)</td>
</tr>
<tr>
<td></td>
<td>Epidemic infantile diarrhoea, Schistosomal dysentery &amp; Others</td>
</tr>
<tr>
<td>Consistency Semi solid</td>
<td>Amoebic dysentery etc.</td>
</tr>
<tr>
<td>Consistency hard</td>
<td>Schistosomal dysentery</td>
</tr>
<tr>
<td>Frequency more</td>
<td>Cholera, Bacillary dysentery and others</td>
</tr>
<tr>
<td>Morning</td>
<td>Sprue</td>
</tr>
</tbody>
</table>

### Characteristics of Vomit in Different Diseases

**As Described in Modern Medical Science.**

<table>
<thead>
<tr>
<th>Characteristics of the Vomit</th>
<th>Disease or Condition for It</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. General Appearance</strong></td>
<td></td>
</tr>
<tr>
<td>1. With mucus</td>
<td>Chronic gastritis etc.,</td>
</tr>
<tr>
<td>2. Colouring matter</td>
<td></td>
</tr>
<tr>
<td>3. Saliva</td>
<td></td>
</tr>
<tr>
<td>4. Acids</td>
<td></td>
</tr>
<tr>
<td>5. Foreign bodies</td>
<td></td>
</tr>
<tr>
<td>6. Food (half digested)</td>
<td></td>
</tr>
<tr>
<td><strong>B. Consistency</strong></td>
<td></td>
</tr>
<tr>
<td>1. Watery</td>
<td>Alcoholic debauch, Chronic gastritis</td>
</tr>
<tr>
<td>2. Acidic</td>
<td>Hyper-chlorohydria, Acid fermentation, Peptic ulcer, Gastric crisis of Lebes, Hysteria, Migraine</td>
</tr>
<tr>
<td>3. Rice watery</td>
<td>Cholera</td>
</tr>
<tr>
<td>4. Semi solid</td>
<td>Sea sickness, Vertigo</td>
</tr>
<tr>
<td>5. Thick tenacious mucus vomiting</td>
<td></td>
</tr>
<tr>
<td><strong>C. Colour</strong></td>
<td></td>
</tr>
<tr>
<td>1. Green</td>
<td>Patulous pylorous</td>
</tr>
<tr>
<td>2. Yellow</td>
<td>&quot;</td>
</tr>
<tr>
<td>3. Grass Green</td>
<td>Intestinal obstruction</td>
</tr>
<tr>
<td>4. Yellow, black, blue, red</td>
<td>Due to different kinds of food and drinks</td>
</tr>
<tr>
<td>5. Red</td>
<td>(a) Swallowing of blood as in haemorrhage from mouth i.e. lips, gums, tongue, tonsils, after or during epistaxis.</td>
</tr>
</tbody>
</table>

---

1. Collected from
<table>
<thead>
<tr>
<th>Characteristics of the vomit</th>
<th>Disease or condition for it</th>
</tr>
</thead>
<tbody>
<tr>
<td>(b) Blood diseases-Purpura, Haemophilia, Seurvy, Severe secondary or primary anaemia, Leukaemia, Haemolytic jaundice, Cholema, Hodgkin's disease.</td>
<td></td>
</tr>
<tr>
<td>(c) Acute fevers like Severe malaria, Typhus, Epidemic influenza, Relapsing fever, Yellow fever, Small pox, Dengue, Chronic nephritis Well's disease, Portal obstruction, Atrophic cirrhosis, Yellow atrophy of liver, Passive congestion of liver, Mitral stenosis.</td>
<td></td>
</tr>
<tr>
<td>(d) Vicarious menstruation</td>
<td></td>
</tr>
<tr>
<td>(e) Haematemesis may also occur in Acute pancreatitis, Appendicitis, Cholecystitis, Mesenteric embolism and thrombosis.</td>
<td></td>
</tr>
<tr>
<td>(f) Gestic origin, like Gastric ulcer, Duodenal ulcer, Gastric carcinoma, (Coffee ground) Miliary aneuysm and varicosis of the stomach and oesophagns, Injury to epigastric area, Poisons like Arsenic and Mercury</td>
<td></td>
</tr>
</tbody>
</table>

D. Contents

1. Fecal vomit
   - Intestinal obstruction, Peritonitis, Gastrointestinal fistula
2. Pus
   - Pharyngeal abscess, Peritonsillar abscess, Oesophagial abscess,
   - Splenic or perirenal abscess
3. Phlegm (Śleṣmā)
   - Phlegmonous gastritis
   - Diphtheric inflammation of the stomach
<table>
<thead>
<tr>
<th>Characteristics of the pain</th>
<th>Diseases or conditions for it</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Acute pain, sharp lancinating or stabbing pain</td>
<td>Peritonitis</td>
</tr>
<tr>
<td>B. Pressing, aching, agonising pain</td>
<td>Diseases of Gall bladder, Intestinal obstruction, Pancreatitis, Perforated ulcer of the stomach</td>
</tr>
<tr>
<td>C. Throbbing pain</td>
<td>Any inflammation or suppuration of the digestive tract</td>
</tr>
<tr>
<td>D. Colicky Gripping pain</td>
<td>Cholera mobus, Asiatic Cholera, Biliary colic, Renal-colic, Intestinal obstruction, Pancreatitis, Strangulated hernia, Appendicitis</td>
</tr>
<tr>
<td>E. Grinding or gnawing pain</td>
<td>Carinoma of the viscera</td>
</tr>
<tr>
<td>F. Dull pain</td>
<td>Inflammation of the mucus membrane</td>
</tr>
<tr>
<td>G. With distress</td>
<td>Nervous dyspepsia</td>
</tr>
<tr>
<td>H. With burning sensation</td>
<td>Hyper-chlorohydria</td>
</tr>
<tr>
<td>I. Relation to food</td>
<td>Nervous dyspepsia, Acute and chronic gastritis Simple or malignant ulcer</td>
</tr>
<tr>
<td>I. Just after food</td>
<td>Excessive acidity due to hyper-secretion or fermentation</td>
</tr>
<tr>
<td>II. An hour after food</td>
<td>Nervous dyspepsia and carcinoma of the stomach</td>
</tr>
</tbody>
</table>

1. Collected from
(a) Savill's System of Clinical Medicine
(b) Loewenberg: Medical Diagnosis, 6th Edition
(c) Symptoms in Diagnosis by Jonathan Campbell Meakings, 6th Edition
## Symptoms in Different Diseases Relating to Kṣṭha According to Modern Medical Science

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Diseases or conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. <strong>Indigestion</strong> or <strong>Avipāka</strong></td>
<td>Diseases of Liver, Gallbladder, Appendix, Bowel, Pancreas, Heart, Lungs, Brain, Sinuses, Eyes, Nose, Throat, Thyroid, Kidneys and other disease like Anaemia, Fevers, Septicemia, Helminthiasis, Chronic Intoxication, Diabetes, Tebes dorsalis, Neurasthenia, Hysteria and Pregnancy</td>
</tr>
<tr>
<td>B. <strong>Appetite</strong></td>
<td></td>
</tr>
<tr>
<td>1. Excessive</td>
<td>Diabetes mallitus, Hypo-pituitarism</td>
</tr>
<tr>
<td>2. Loss of appetite</td>
<td>Chronic Gastro-intestinal disease, Fever, Anoroxia nervosa</td>
</tr>
<tr>
<td>3. Aversion to certain kinds of foods</td>
<td>Achlorohydria, Hysteria, Pregnancy</td>
</tr>
<tr>
<td>C. <strong>Heart burn</strong></td>
<td>Hyper-acidity due to acute and chronic gastritis, Gastric ulcer, Duodenal ulcer, Gastrectasis, Cholecystitis, Spastic and ulcerative colitis, Vagotonia, Achlorohydria</td>
</tr>
<tr>
<td>D. <strong>Nausea</strong></td>
<td></td>
</tr>
<tr>
<td>1. Psychic</td>
<td>Seeing revolting sights, smelling nauseating odours, listening to grave or boring tales</td>
</tr>
<tr>
<td>2. Reflex.</td>
<td>Eye strain, Diseases of the middle ear, Migraine, Sea sickness, Car sickness, Intestinal worms, Ovarian diseases, Pregnancy</td>
</tr>
<tr>
<td>3. Nervous cause</td>
<td>Hysteria, Neurasthenia, Psychoasthenia</td>
</tr>
</tbody>
</table>

1. Collected from

(a) Savill’s System of Clinical Medicine, 13th Edition
(b) Loewenberg: Medical Diagnosis, 6th Edition
(c) Jonathan Campbell Meakings: Symptoms in Diagnosis, 6th Edition
<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Diseases or conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. Gastrointestinal Causes</td>
<td>Cholecystitis, Duodenitis, Achlordhydria, Chronic gastritis, Acute gastritis, Carcinoma</td>
</tr>
<tr>
<td></td>
<td>of the stomach, Pyloric obstruction, Gastrorectasis, Cirrhosis of liver, Cotitis, Constipation, Toxic gastritis</td>
</tr>
<tr>
<td>5. Toxic causes</td>
<td>Eating greasy or spoiled food, over eating, Uremia, Pregnancy, Hyper-digitalisation</td>
</tr>
<tr>
<td></td>
<td>Other diseases are Pellagra Diabetes mellitus Acidosis, Acute Pancreatitis, Acute nephritis, Pulmonary tuberculosis, Exophthalmic goiter, Addisons disease. Chronic myocarditis, Mitral stenosis</td>
</tr>
<tr>
<td>E. Eructation</td>
<td>Oesophagitis, Stricture or obstruction of the oesophagus, oesophageal, diverticulm Gastric ulcer, Gastric dilatation</td>
</tr>
<tr>
<td>(Water brash)</td>
<td>Sea sickness, car sickness, after general anesthetics, certain types of food ingestions, emetic drugs like apo-morphin, ipecac, Copper sulphate, Zinc sulphate, Antimony etc. in psychic shock, Fright, undue Excitement, Anxiety, Disgust</td>
</tr>
<tr>
<td>(Acute)</td>
<td>Fracture of skull, Cerebral embolism, Sinus thrombosis, Yellow fever, Acute yellow atrophy of liver and Acute hepatic degeneration</td>
</tr>
<tr>
<td>(Chronic)</td>
<td>I. Stomach. Carcinoma, Ulcer, Achylia gastrica, Pyloric stenosis of infancy, Gastrorectasis, Chronic gastritis, Pylorospasm, Ulceration of the oesophagus, Hourglass contraction of the stomach, Syphilis or Tuberculosis of the stomach</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Diseases or conditions</td>
</tr>
<tr>
<td>-----------</td>
<td>------------------------</td>
</tr>
<tr>
<td></td>
<td><strong>II. Intestines.</strong> Chronic intestinal obstruction, Carcinoma of the colon, Carcinoma of the small intestine, Dysentery, Ulcerative colitis, Ulceration of the intestine, Paralytic ileus, Diverticulitis, Regional ileitis, Intestinal worms, Pancreatitis, Pancreatic cyst, Adenoma of the islands of Langerhans</td>
</tr>
<tr>
<td></td>
<td><strong>III. Liver.</strong> Cirrhosis of the liver, Amyloid liver, Bentis disease, Carcinoma of the liver, Carcinoma of the bile duct, Carcinoma of the Gallbladder, Abscess of the liver and Passive congestion of the liver</td>
</tr>
<tr>
<td></td>
<td><em>(B) Diseases of Nervous system</em></td>
</tr>
<tr>
<td></td>
<td>Cerebral tumour, Cerebral abscess, Hydrocephalus, Cerebral haemorrhage, Cerebral syphilis, Loco Motor ataxia, Pachy meningitis, Pituitary cachexia, Hystera, Psychosthenia, Nura-thenia</td>
</tr>
<tr>
<td></td>
<td><em>(C) Diseases of endocrine system, Exophthalmic goitre, Myxodema, Addison's disease</em></td>
</tr>
<tr>
<td></td>
<td><em>(D) Diseases of the cardio-vascular system</em></td>
</tr>
<tr>
<td></td>
<td>Congestive heart failure, Chronic myocarditis, Coronary thrombosis, Aneurysm of the abdominal aorta, Mitral stenosis</td>
</tr>
<tr>
<td></td>
<td><em>(E) Diseases of the haemopoetic system:</em> Purpura, Primary and severe secondary anaemia, Sickle cell anaemia, Leukaemia</td>
</tr>
<tr>
<td></td>
<td><em>(F) Reflex causes:</em> Eye strain, Pertussis, Angioneurotic oedema, Allergic reactions, Prostetis</td>
</tr>
<tr>
<td></td>
<td><em>(G) Toxic causes:</em> Chronic glomerular nephritis, Nephro sclerosis, Chronic nephrosis, Pregnancy, Chronic alcoholism, Vitamin deficiencies</td>
</tr>
<tr>
<td></td>
<td>Food and drug poisoning. Entero-colitis, Iilitis, Cholera morbus, Asiatic cholera, Bacillary dysentery, Acute amoebic dysentery, Sprue, Pallegra, Typhoid fever, Influenza, Mesenteric thrombosis, Vit 'B' and 'D' deficiencies</td>
</tr>
</tbody>
</table>

G. Diarrhoea

Acute.
<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Diseases or conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic entero-colitis, Ulcerative colitis, Mucus-colitis Tuberculosis enteritis, Sprue, Coeliac disease, Carcinoma of the pancreas, Chronic amoebic dysentery, Nervous diarrhoea and some other parasitic infections</td>
<td></td>
</tr>
<tr>
<td>H. Constipation.</td>
<td>Bad stool habit, improper diet, Insufficient liquid intake, Sedentary habit</td>
</tr>
<tr>
<td></td>
<td>In diseases like Intestinal obstruction, Strangulated hernia, Neoplasms, Strictures, Mucus colitis, Paralytic, ilitis, Fecal impaction</td>
</tr>
<tr>
<td></td>
<td>Lead poisoning, Opium poisoning, Visceroptosis, Haemorrhoids, Fissures in anus, Fistulæ in anus</td>
</tr>
<tr>
<td></td>
<td>Some other gastro-intestinal, hepatic gall bladder and nervous diseases and Anaemia</td>
</tr>
<tr>
<td>I. Abdominal pain</td>
<td>Generalised peritonitis, Acute haemorrhagic pancreatitis, Ruptured gastric ulcer, Mesenteric thrombosis, Acute gastro enteritis, Acute enterocolitis, Acute intestinal obstruction, Tumour of large intestine, Tumours of small intestinal food poisoning, ulcerative colitis, Mucus colitis, spastic colitis, Amoebic dysentery, Bacillary dysentery, Lead, Arsenic, Mercury, and other metal poisoning, Tebes dorsalis, Addition's disease, Exophthalmic goitre, Asiatic cholera, Achylia gastrica, Abdominal aneurysm, Tuberculosis, Peritonitis, Tension of an ovarian cyst, Abdominal neoplasm</td>
</tr>
<tr>
<td>(Generalised)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Occasionally in Appendicitis, Regional ileitis, Retro peritoneal malignancy, Chronic constipation, Allergic dyspepsia, Intestinal worms</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Diseases or conditions</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>II. Epigastric Pain</td>
<td>Hyper acidity, Gastric ulcer, Duodenal ulcer, Acute or chronic gastritis, perforated gastric or duodenal ulcer, Acute haemorrhagic pancreatitis, Chronic pancreatitis, Cholecystitis, Cholelithiasis, Nephrolithiasis, Abdominal angina, Tabes dorsalis, Omental hernia, Abdominal aneurysm, Retroperitoneal malignancy, Diaphragmatic hernia</td>
</tr>
<tr>
<td>III. Pain in the right hypochondrium</td>
<td>Cholelithiasis, Cholecystitis, Subphrenic abscess, Diseases of liver such as Carcinoma, Cyst, Abscess, Cirrhosis, and Active or Passive congestion, Carcinoma of the hepatic flexures</td>
</tr>
<tr>
<td>IV. Pain in the left hypochondrium</td>
<td>Diaphragmatic hernia, Splenic infarction, Splenomegally, Rupture of spleen, obstruction of the bowel, Carcinoma of the splenic flexure, Mucus colitis, Spastic colon</td>
</tr>
<tr>
<td></td>
<td>Referred pain by Cholecystitis and Cholelithiasis</td>
</tr>
<tr>
<td>V. Pain in the right loin</td>
<td>Nephrolithiasis, Hydronephrosis, Pyonephrosis, Pyelitis, Nephritis, Tuberculous-Kidney, Polycystic kindey Abscess and cyst of kidney and adrenals</td>
</tr>
<tr>
<td>VI. Pain in the left loin</td>
<td>As in right side</td>
</tr>
<tr>
<td>VII. Pain in iliac region.</td>
<td>Acute appendicitis, Acute salpingitis, Ruptured ectopic gestation, Ovarian cyst, Inguinal hernia, Acute diverticulitis, Acute pyelitis, Psoas abscess, Ulcerative colitis, Tuberculosis of caecum, Carcinoma of the colon, Fecal impaction, Regional ilitis, Typhoid fever</td>
</tr>
<tr>
<td>VIII. Pain in the hypogastric region</td>
<td>Retention of urine, Disease of ureter, bladder, uterus, Pelvic cellulitis, Constipation, Tumour and Cancer etc.</td>
</tr>
<tr>
<td>IX. Pain in rectum</td>
<td>Ischeo-rectal abscess, Haemorrhoids, fissures, Ulceration, Stenosis, Carcinoma polyp</td>
</tr>
<tr>
<td>Symptoms</td>
<td>Diseases or conditions</td>
</tr>
<tr>
<td>----------</td>
<td>------------------------</td>
</tr>
</tbody>
</table>
| I. Bad Taste in Mouth  
(Āṣya vairasya) | Gastric disorders |
| K. Dryness of lips and mouth  
(Mukha Oṣṭha śoṣa) | |
| L. Hallitosis  
(Pūtigandhi Śvāsa) | |
| M. Thirst | Dyspepsia, Acute dilatation of the stomach, Inflammation of Stomach, Vomiting |
| N. Flatulence | Chronic gastritis, Gall bladder dyspepsia, Nervous individuals |
| I. Gastric | |
| II. Intestinal | Fermentation of starch and sugar, constipation, Diarrhoea, Paralytic Ilius, Coeliac disease, Sprue |
| O. Hic cough | I. Reflex stimuli of phrenic nerve by gastric or colonic flatulence or by irritant food  
II. Irritation of the peritoneum—local or general—Typhoid  
III. Nervous hysteria |
| P. Water brash  
(Praseka) | Irritation of stomach, Dyspepsia, Peptic ulcer |
| Q. Anoroxia  
(Anannābhilaśa) | |
| R. Tenesmus  
(Praśāhaṇa) | I. Various conditions of the anus like Pruritus, Eczema, Fissure or Piles  
II. Rectal conditions like Carcinoma, Proctitis, Stricture etc.  
III. Hysterical and Nervous subjects  
IV. Other causes of diarrhoea as mentioned above. |
DISCUSSION

The concept of *agni* is seen to be based on earlier Śāṅkhya and Nyāya-vaiśeṣika concept of tejas. Ayurveda, while benefiting by these contributions, is seen to have modified them in the context of the process of life. The difference between dārśanika and āyurvedic views, in this regard is comparable to the science of physics (including Chemistry) in its pure aspect and bio-chemistry which is an applied aspect of the former science. But in general, the basic concept of *agni* is the same for both the pure and applied schools of sciences. The science of Āyurveda, which is basically the science of life or biology has seen in digestive and metabolic processes the manifestation of *tejas* or *agni*. Various biological substances present in the body which perform actions similar to *agni* have been classed under the heading or implicit in the concept of *pitta*.

In addition to the five kinds of *pittas* which have special functions to perform, Āyurveda has described seven species of *dhātvagnis* and five species of *bhūtagnis*. The former are seen to relate to substances, which are necessary for what is described as *dhātvagni vyāpāra*, and the latter to the principle present in each molecule of organic substances which are utilised for the digestion of the molecule itself in anaerobic type of reactions. Substances included under *dhātvagni* are seen to be represented by group specific and reaction specific enzymes. The latter was shown to represent the oxygen present in the structure of the molecule itself. This oxygen has been designated as *sajāṭiya tejas*, whereas molecular oxygen derived from the atmospheric air required for aerobic reactions as *vijāṭiya tejas* the two terms being drawn from Nyāyabodhini commentary on Annambhaṭṭa’s Tarkasāmgraha. Of the five *pittas*, described in Āyurveda, the importance of *pācakapitta* was brought out and its correlation to tissue metabolism was shown inviting, incidentally, attention to the role of cathepsins in anaerobic and catabolic processes. Jāṭharāgniṇipāka corresponding to gastro-intestinal digestion, in all its different aspects was discussed at some length. The process of digestion, as described in Saṁhitā granthas
was critically studied and reoriented and brought up to date indicating the digestive events that take place in different parts of the koṣṭha or gastro-intestinal tract. The concept of vipāka was also examined at some length in this connection. The implication of digestive events, that occur in the pakvaśaya, including the part, it plays as vāstasthāna was sought to be explained in the light of data contributed by modern researches in biochemistry and micro-biology.

Likewise dhātvagnipāka, corresponding to intermediary metabolism was explained drawing material therefor, from the available original Āyurvedic classics and important commentaries thereon. The nature of intermediary metabolites prasāda or poṣaka dhātus and kiṭṭa or waste products and their utilisation or disposal as the case may be was discussed and reoriented. The mode of production of dehaūṣmā or body heat was examined, vis-a-vis, pācakāṁśas, viṭṭiya tejas, and indhana represented by oxygen and nutrition respectively. (1) Jāṭharāgni and dhātvagni vyāpāra, in view of ag nibala and (2) vyāyamaśakti and uṣmotpatti in view of māṁsabala nirṇaya were studied in a number of normal subjects as well as patients admitted to the Hospital attached to the Post Graduate Training Centre, Jamnagar. The data gathered from (1) and (2) above were then studied together with a view to correlate ag nibala, māṁsabala and uṣmotpatti. It has to be noted here that bala nirṇaya referred to above does not cover vyādhi kṣamatva, as this aspect of bala forms a subject by itself, it has not been attempted in this thesis.

**Bala-vyāyamaśakti and production of Úṣmā**

The data collected from the study of vyāyamaśakti in normal subjects and patients in wards, led to the following highly suggestive conclusions.

(1) In six normal volunteers of age ranging from 22 to 25 years, it was seen that the time of reaching ardhaśakti ranged between 15 to 20 minutes having regard to the appearance of sweat on the forehead, axillae and joints of upper and lower limbs and corresponding temperature, pulse, and respiration rates-an average of 16.5 minutes. The time
taken for the temperature, pulse and respiration to reach back to normal ranged between 30 to 45 minutes, the average being 41.5 minutes. The ratio of the time taken to reach *ardhaśakti*, vis-a-vis an increase in the temperature, pulse and respiratory rates and their return to normal is seen to be on an average 2 : 5.

(2) In three normal volunteers of age ranging between 22 and 25 years the time of reaching *ardhaśakti* ranged between 7 to 10 minutes, having regard to the appearance of sweat in the fore-head, axillae and joints of limbs and the corresponding increase in their pulse, temperature and respiratory rates on an average of 8 minutes. The time taken for the temperature, pulse and respiration to return to normal ranged between 35 to 105 minutes—the average being 65 minutes. The ratio of the time taken to reach *ardhaśakti* and to return to normal is seen to be on an average 1 : 4.

(3) In another group of three normal volunteers of age ranging between 22 and 25 years the time of reaching *ardhaśakti* was 5 minutes in each case having regard to the appearance of sweat in fore-head, axillae and joints of limbs, corresponding to an increase in pulse, temperature and respiration rates. The time taken for the temperature, pulse and respiration to return back to normal ranged between 130 to 150 minutes, the average being 138 minutes. The ratio of the time taken to reach *ardhaśakti* and return to normal is seen to be on an average 1 : 27.

Figures presented above, though obtained from a small number of normal volunteers were still sufficient to provide hypothetical criteria for the determination of *pravara*, *madhya* and *avara* types of *bala* which can be summed up thus:

(i) *Pravara bala*—The return of temperature, pulse and respiratory rates to normal should be about $2\frac{1}{2}$ times, the time taken by the subject to reach his *ardhaśakti* (corresponding temperature pulse and respiratory rates).

(ii) *Madhyabala*—The return of temperature, pulse and respiratory rates to normal should be about four times the time taken by the subject to reach his *ardhaśakti* (corresponding temperature, pulse and respiratory rates).
Avarabala—The return of temperature, pulse and respiratory rates to normal is about 27 times the time taken by the subject to reach his ardhaśakti (corresponding temperature, pulse and respiratory rates).

Note—It is of course understood that these figures relate to snigdhabhojins who are exercised in the morning of late Śiśira. These figures in rūkṣa bhojins may possibly vary even in śītakāla and more so in uṣṇakāla. This hypothetical formula of three grades of balas can be studied in a much larger number of normal persons belonging to different age groups.

This study was extended in the first instance to three patients admitted to the Hospital attached to Post Graduate Training Centre in Āyurveda, Jamnagar. It elicited the data as shown in the Table at page 176.

The bala of these three patients, judged from the point of view of pravara bala may have to be treated as avara bala. As regards their agnibala, it was found that in all the three cases, it was manda.

Summing up—Proceeding on the basis of the material available in the Āyurvedic classics, it was possible to provide a fairly dependable clinical method for determining agnibala by jaraṇaśakti, and māṁsa bala and uṣṇotpatti from the point of view of vyāyama śakti. As regards the former, normal and abnormal states of functioning of agni in different parts of the mahāsrotas and clinical symptoms relating to them have been furnished. As regards the latter, note has been taken of the hṛdaya, which is the mūla of rasavaha and prāṇavaha srotas and the mūla dhamanis, srotas, māṁsa, sirā, kaṇḍara, all of which have māṁsa as a common structural factor. In judging śārira bala, as reflected by pravara type of vyāyamaśakti which signifies the integrity of the entire organism, hṛdaya is correlated to phuphusa through rasa-rakta, and to māṁsa dhātu every where in the body through sirās (vessels) which in their turn, also contain māṁsa dhātu in their structure. The rasa and rakta transporting pośaka-dravyas including vāyu to the sthāyi māṁsa dhātus, among others, the pācakāṁśa in the sthāyi dhātu representing in-
trinsic agni of this dhātu, sajātya tejas aṁśas present in the poṣaka dhātus, combining with vijātya tejas transported by rasa and rakta causes pāka, dāhana and tapanā, resulting in the production of karmaśakti (energy) on the one hand, and kiṣṭa (waste products lick CO₂, H₂O etc.) on the other. At the level of ardhaśakti, the production of kiṣṭāṁśa having reached a point where the available vijātya tejas is inadequate to digest them, leads to increased functioning of hṛdaya and prāṇavahā śrotas as reflected in an increased rate of hṛtspandana (heart rate) ucchvāsa-niḥśvāsa (respiration) and uṣmotpādana (temperature). These lastly mentioned factors, at the level of ardhaśakti and the corresponding time taken by any individual to reach this point, studied together with the rapidity with which these three factors return to their prakṛta level, constitute a fairly reliable index for assessing the māṁsa bala and agnibala in any given individual.

Conclusion—The author does not claim to have covered or exhausted the entire subject, considering the time and facilities he could command. None the less, he believes to have initiated a new mode of approach to some of the basic aspects of Āyurveda which may have to be continued in many directions not only by the future post graduates, but also by other workers interested in this subject, elsewhere in the country.
<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Disease</th>
<th>Duration of disease</th>
<th>Time taken to reach ardhaśakti</th>
<th>Time taken to come to normal</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ranchoda</td>
<td>21 yrs</td>
<td>Atatvabhiniveśa</td>
<td>2 months</td>
<td>3½ minutes</td>
<td>50 minutes</td>
<td>1:14</td>
</tr>
<tr>
<td>Babu Samji</td>
<td>14 yrs</td>
<td>Kṣudraśvāsa</td>
<td>1 year</td>
<td>9 minutes</td>
<td>135 minutes</td>
<td>1:15</td>
</tr>
<tr>
<td>Premji Hamid</td>
<td>17 yrs</td>
<td>Kṣudraśvāsa</td>
<td>2 months</td>
<td>15 minutes</td>
<td>130 minutes</td>
<td>1:8</td>
</tr>
</tbody>
</table>
## SECTION V

### APPENDIX I

Analysis of symptoms of diseases of Koṣṭha—classified in relation to different functional parts of mahāsrotas.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Symptoms relating to Tārdina-umāsīya</th>
<th>Symptoms relating to Adha-amaśaya</th>
<th>Symptoms relating to Pācāśaya</th>
<th>Other relevant symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vāta</td>
<td>1. Hṛt ṛakti + (Burning sensation in the praecardium) 2. Āṃlā udāra (Foul smelling eructation)</td>
<td>1. Ajneśṭṝa vṛddhi (Impaired digestion) 2. Tīraṣa (Thirst)</td>
<td>1. Udāra mala (Undigested stool)</td>
<td>Kanghiśṭṛa (Dryness in the throat)</td>
</tr>
<tr>
<td>Pitta</td>
<td>1. Ṛṣṭra (Nausea) 2. Chārdi (Emesis)</td>
<td>1. Aśṭṝa sarpa (Voiding undigested food in the motion)</td>
<td>1. Dvātra mala (Frothy stool)</td>
<td>Ayuśṭṛa (Dryness in mouth)</td>
</tr>
<tr>
<td>Kapha</td>
<td><em>Due to Ṛṣṭra vṛddhi</em></td>
<td>1. Ṛṣṭra sāra (Voiding blueish stool)</td>
<td>1. Udāra mala (Undigested stool)</td>
<td>Sarvarāsa gṛhitṛa (Desire for substances having all rasaś or tastes)</td>
</tr>
</tbody>
</table>

* *Due to upward pressure of the distended stomach + Due to putrefaction*
<table>
<thead>
<tr>
<th>Disease</th>
<th>Symptoms related to <strong>Urdhva-amśāya</strong></th>
<th>Symptoms related to <strong>Aha-amśāya</strong></th>
<th>Symptoms related to <strong>Pakṣāyana</strong></th>
<th>Other relevant symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Udara</strong></td>
<td><strong>Vāta</strong></td>
<td><strong>Pitta</strong></td>
<td><strong>Kapha</strong></td>
<td>Remarks</td>
</tr>
<tr>
<td><strong>Arisa</strong></td>
<td><strong>Hṛilāsa</strong> (Nausea)</td>
<td><strong>Agni-Vakṣanāya</strong> (Impaired digestion)</td>
<td><strong>Agnimāṇḍya</strong> (Poor digestion)</td>
<td><strong>Kukkiyathā</strong> (Pain in lower abdomen)</td>
</tr>
<tr>
<td><strong>Udgūra</strong> (Burping)</td>
<td><strong>Śvāsa</strong> (Dyspnoea)</td>
<td><strong>Chārdi</strong> (Emesis)</td>
<td><strong>Antrakājana</strong> (Noise in intestine)</td>
<td><strong>Vāksanā vyathā</strong> (Pain in groin)</td>
</tr>
<tr>
<td><strong>Hṛdayārtha</strong> (Embarrassment of the chest)</td>
<td><strong>Praśaka</strong> (Salivation)</td>
<td><strong>Nīthānīka</strong> (Spitting)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Hṛdayāśīrāma</strong> (Palpitation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Referred</em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

(178)
<table>
<thead>
<tr>
<th>Disease</th>
<th>Symptoms relating to Vata</th>
<th>Symptoms relating to Pitta</th>
<th>Symptoms relating to Kapha</th>
<th>Symptoms relating to Pakvaññaya</th>
<th>Other relevant symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parigha-saha</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Chardi (Emesis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hālita (Nausea)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Akṣaraka</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vritabanda (Retention of faces)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vījñalīpita (Slimy stool)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amapurīsa (Undigested stool)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vīpūrīṣā (Stool which spreads and flows)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Avasthāpurīsa (Stool which sinks and dissolves in water)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rāguśamala (Rough stool)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dīnāsāsāsā (Liquid stool)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amagandhini-mala (Stool having putrid smell)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sarūkṣā (Voiding with pain)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sāsābāmala (Voiding with noise)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Vibhāndhāvita (Retention of gas)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequent motions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avisāra</td>
<td></td>
<td></td>
<td>Avipāka (Indigestion)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Utikāla (Nausea)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ama mala</td>
<td></td>
<td></td>
<td>Pitamala (Yellow stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Haritamala (Green stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nālakṣā (Blue stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kṛṣṇamala (Black stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Raktamala (Red stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Atidurgandhama-mala (Voiding stool having putrid smell)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Snigdhamakṣa (Viscous stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Śvetamala (White stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pīcchāvamala (Slimy stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Taniyamala (Stool having thready appearance)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Amamala (Stool having undigested food material)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Guraṃmala (Heavy stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Durgandhama-mala (Stool having putrid smell)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Sākṣaṃa-pañca (Mucous stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Amubandha-sūla (Continued colicky pain)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alpanila (Less quantity of stool)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Abhiṣkṣa-mala (Frequent motions)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Suprābhārika-mala (Voiding with tenesmus)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease</td>
<td>Symptoms relating to <em>Urdhva-amalaka</em></td>
<td>Symptoms relating to <em>Adha-amalaka</em></td>
<td>Symptoms relating to <em>Pakvaamalaka</em></td>
<td>Other relevant symptoms</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------------------</td>
<td>-------------------------------------</td>
<td>-------------------------------------</td>
<td>-------------------------</td>
<td></td>
</tr>
<tr>
<td>Guina</td>
<td><strong>Vita</strong></td>
<td><strong>Pitta</strong></td>
<td><strong>Kapha</strong></td>
<td>Remarks</td>
<td><strong>Vita</strong></td>
</tr>
<tr>
<td></td>
<td>Hṛdāruka* (Praecardial pain)</td>
<td>Pipana (Thirst)</td>
<td>Hṛlāsā (Sensation of vomiting or nausea)</td>
<td></td>
<td>Harṣa (Pain in flanks)</td>
</tr>
<tr>
<td></td>
<td>Amśrtuk* (Pain in shoulder)</td>
<td>Vīdāha (Burning Sensation)</td>
<td>Gauravā (Heaviness)</td>
<td></td>
<td>Antraukāka (Gurgling sound in the intestine)</td>
</tr>
<tr>
<td></td>
<td>Bhuktē mṛdūta (Pain relieved after taking meal)</td>
<td>Alparuk (Less pain)</td>
<td></td>
<td></td>
<td>Vīṣamārga (Imbalanced digestion)</td>
</tr>
<tr>
<td></td>
<td>Urdhva Vāta (Reverse peristalsis)</td>
<td>Uḍīghra-bhāhāya (Excessive eruction)</td>
<td></td>
<td></td>
<td>Abhara-Vidāha (Burning sensation by ingestion of food)</td>
</tr>
<tr>
<td></td>
<td>Kṛtābāsāsu (Dyspnoea)</td>
<td>Chardī (Emesis)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>*Referred pain</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amla-pitta</td>
<td>Tikādātra (Bitter eruction)</td>
<td>Hṛdālu (Burning sensation in praecardial region)</td>
<td>Hṛlāsā (Nausea with palpitation)</td>
<td></td>
<td>Avipāka (Indigestion)</td>
</tr>
<tr>
<td></td>
<td>Vomiting of green, yellow, blue, black and red coloured material, sour in taste and like water of flesh wash</td>
<td>Vomiting of transparent slimy material mixed with mucus</td>
<td>Aggravation after taking diet.</td>
<td></td>
<td>Aggravation after digestion</td>
</tr>
<tr>
<td></td>
<td>*Referred burning sensation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease</td>
<td>Symptoms relating to Urdhva-imissaya</td>
<td>Symptoms relating to Adbhuta-imissaya</td>
<td>Symptoms relating to Pakratisya</td>
<td>Other relevant symptoms</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>--------------------------------------</td>
<td>-------------------------------------</td>
<td>-------------------------------</td>
<td>-------------------------</td>
<td></td>
</tr>
<tr>
<td>Chardi</td>
<td>Pita: Pipavamana (Yellow vomit)</td>
<td>Pitta: Kapha: Kapra praseka (Salivation)</td>
<td>Kapha: Aggravation of symptoms after digestion</td>
<td>Mukhasya (Dryness of mouth)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Harit: Urgavamana (Hot vomit)</td>
<td>Naigagavamana (Viscous vomiting)</td>
<td></td>
<td>Svarabheda (Change in voice)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Saradiprasaka: Svaradulagana</td>
<td>Ghanavamana (Thick vomit)</td>
<td></td>
<td>Aṣya madhurya (Sweet taste in mouth)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Eruption with great sound)</td>
<td>Svadha vanana (Sweet vomiting)</td>
<td></td>
<td>Aruc (Distaste)</td>
<td></td>
</tr>
<tr>
<td>Saphena</td>
<td>Tikavamana (Bitter vomit)</td>
<td>Alpa ruk (Slight pain)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chardi</td>
<td>Dhumara vamana (Vomiting of foam like substance)</td>
<td>Sukha vamana (White vomiting)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frotthy vomiting</td>
<td>Saraka vamana (Blood vomiting)</td>
<td>Sita vamana (Cold vomiting)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vicchhina</td>
<td>Ksrodaka-nibha vamana</td>
<td>Kapra canyata vamana (Muscid vomiting)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>chardi</td>
<td>(Vomiting of splited material)</td>
<td>Tantamut vamana (Thready vomiting)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kutia</td>
<td>(Coffee ground vomiting)</td>
<td>Haras (Nausea)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chardi</td>
<td>Tomaka chardi (Thin vomit)</td>
<td>Kaśya chardi (Astringent vomiting)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ksrodha chardi (Painful vomiting)</td>
<td>Ksrodha chardi (Vomiting in small quantity)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## APPENDIX-II

**Table Showing the Result of Agni Bala Pariksha (Jayahrūgī) of Patients**

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Age</th>
<th>Sex</th>
<th>Chief complaints</th>
<th>Brief history</th>
<th>Disease</th>
<th>Duration</th>
<th>Agni bala</th>
<th>Pariksha.</th>
<th>Amla pāka</th>
<th>Pačana kriya</th>
<th>Ūrdhva āmūśaya vyāpāra</th>
<th>Adha-ūmūśaya vyāpāra</th>
<th>Pākiṣṭha vyāpāra.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jammadas Mohanlal</td>
<td>32</td>
<td>Male</td>
<td>Frequent motion pain, in abdomen, weakness, cough</td>
<td>Commenced from the convalescent period over two months of continuous fever</td>
<td>5</td>
<td>4 mns.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Munda (stool sank in water for all three days)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>2</td>
<td>Smt. Lochaben Perumal</td>
<td>50</td>
<td>Female</td>
<td>Pain in the back side of the right leg, inability to use the limb, Giddiness</td>
<td>It started with neuralgic pain all over the body</td>
<td>6</td>
<td>1½ yrs.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Valṣamyas (Sometimes mala is śūṁa &amp; sometimes nīraṁa)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Abhikṛdaya or weakness)</td>
</tr>
<tr>
<td>3</td>
<td>Smt. Mukutben Prabhudas</td>
<td>22</td>
<td>Female</td>
<td>Excessive vaginal bleeding even after menstrual period, headache, pain in loins, Giddiness, Pānda</td>
<td>Derangement of the monthly Course with General malaise since last two years.</td>
<td>7</td>
<td>6 mns.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Manla (Pūriṣa soma for all three days)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Abhikṛdaya or weakness)</td>
</tr>
<tr>
<td>4</td>
<td>Thakurji Jetha</td>
<td>45</td>
<td>Male</td>
<td>Pain (Colicky) in right lumber region 2-3 hours after taking meals, Śvāsa, Kāsa, Palpitation, pre-cardiac pain</td>
<td>Started with loss of appetite and loss of memory</td>
<td>8</td>
<td>1½ yrs.</td>
<td>N.A.D.</td>
<td>Impaired (Sometimes ama ulgūra)</td>
<td>Viṣama (Stool sometimes ima and sometimes nīraṁa.)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Abhikṛdaya or weakness)</td>
</tr>
<tr>
<td>5</td>
<td>Dalamji Devji</td>
<td>30</td>
<td>Male</td>
<td>Kāsa, discharge of frothy sputum, pain in the left chest, heart burning, weakness</td>
<td>Having history of Jīrṇa pratīṣṭhyāya.</td>
<td>9</td>
<td>15 dys.</td>
<td>N.A.D.</td>
<td>Impaired (Heart bura)</td>
<td>Impaired (Stool ama for all three days)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Abhikṛdaya or weakness)</td>
</tr>
<tr>
<td>6</td>
<td>Abdul Rahim Hasam</td>
<td>45</td>
<td>Male</td>
<td>Pain in the right hypochondriac region, burning sensation, Kāsa Jvāra</td>
<td>Started after excessive vomiting</td>
<td>10</td>
<td>5-6 yrs.</td>
<td>N.A.D.</td>
<td>Impaired (Burning sensation in stomach and pain)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Abhikṛdaya or weakness)</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>7</td>
<td>Giridharlal Samji</td>
<td>25</td>
<td>Male</td>
<td>Mūlādaṇā, Pus in urine, Pain in right gluteal region and lower mandibular region, daṇḍīga Udērāśāla</td>
<td>These symptoms started after being attacked by a venereal disease</td>
<td>11</td>
<td>1 yr.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Abhikṛdaya or weakness)</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>8</td>
<td>Ramjibhai</td>
<td>32</td>
<td>Male</td>
<td>Pain in dākṣikūṭa pradeśa, no relation with food but aggravated at the end of digestion and weakness</td>
<td>Commenced with viṣṭambha</td>
<td>12</td>
<td>3 mns.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Abhikṛdaya or weakness)</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Age</td>
<td>Sex</td>
<td>Chief complaints</td>
<td>Brief history</td>
<td>Disease</td>
<td>Duration</td>
<td>Agni bala</td>
<td>Purika</td>
<td>Śūla-śūla ṛṇavīrāṇa</td>
<td>Adha-ḥūṣya ṛṇavīrāṇa</td>
<td>Śūla-śūla ṛṇavīrāṇa</td>
<td>Adha-ḥūṣya ṛṇavīrāṇa</td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>-----------------</td>
<td>-----</td>
<td>-----</td>
<td>------------------------------------------------------</td>
<td>----------------------------------------------------</td>
<td>---------</td>
<td>----------</td>
<td>-----------</td>
<td>--------</td>
<td>---------------------</td>
<td>------------------------</td>
<td>----------------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Jayasukhalal</td>
<td>20</td>
<td>Male</td>
<td>Udaraśīla sometimes motion with tenesmus and mucus,</td>
<td>Had chronic dysentery few years back</td>
<td>$Śūla$</td>
<td>1½ yrs.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Stool</td>
<td>Impaired (Stool</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Varichand</td>
<td></td>
<td></td>
<td>weakness, Tenderness in abdomen.</td>
<td></td>
<td>$śūla$</td>
<td></td>
<td></td>
<td></td>
<td>ime for all three days)</td>
<td>ime for all three days)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Prabhahan</td>
<td>48</td>
<td>Female</td>
<td>Pallor, giddiness, Number of motions more, Inability for hard work, dyspnoea</td>
<td>Started with loose motions</td>
<td>$Pīṇḍu$</td>
<td>3 mns.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Vīma (Sometimes ime &amp; sometimes niraṣa stool)</td>
<td>Vīma (Sometimes ime &amp; sometimes niraṣa stool)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amritadal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Pīṇḍu$</td>
<td></td>
<td></td>
<td></td>
<td>(Vataja)</td>
<td>(Vataja)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Gaffar</td>
<td>20</td>
<td>Male</td>
<td>Kṣaṭṭha vāppiṭānta, Kaṭṭhīla, Uroṣṭhāna, Ḥṛḍḍāna, Weakness, Pain in joints, Sleeplessness, Madhura udgarā (Sweet taste of cructation)</td>
<td>Arose after strenuous work</td>
<td>$Koṭṭhīśrīta vāta$</td>
<td>4 mns.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Vīma (Sometimes ime &amp; sometimes niraṣa stool)</td>
<td>Vīma (Sometimes ime &amp; sometimes niraṣa stool)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kasam</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Koṭṭhīśrīta vāta$</td>
<td></td>
<td></td>
<td></td>
<td>(Vataja)</td>
<td>(Vataja)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Yuvansingh</td>
<td>40</td>
<td>Male</td>
<td>Kṣaṇa, Śrīṇa, Kapilaṇaḥvāṇa Ḥṛḍḍānaṇa constipation &amp; Weakness</td>
<td>Suffered from syphilis earlier</td>
<td>$Śītra Graṇiḥāt (Antique aneu-rayas due to syphilis)</td>
<td>5 yrs.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Constipation)</td>
<td>Impaired (Constipation)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kanauji</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Śītra Graṇiḥāt (Antique aneu-rayas due to syphilis)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Manusukhal</td>
<td>24</td>
<td>Male</td>
<td>Weakness, Exhaustion by slight exercises, sleeplessness, loss of appetite</td>
<td>Śīṣṭraṣāya (At night) since last year</td>
<td>$Dhātaśrīta vāta vydhī$</td>
<td>6 mns.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Stool ime for all three days &amp; Kuṭṭhā nīla)</td>
<td>Impaired (Stool ime for all three days &amp; Kuṭṭhā nīla)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mohanlal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Dhātaśrīta vāta vydhī$</td>
<td></td>
<td></td>
<td></td>
<td>(Vataja)</td>
<td>(Vataja)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Aṣavi</td>
<td>32</td>
<td>Female</td>
<td>Śrīṇa, Kṣaṇa, Jvara, loss of appetite, Dehility, pain in bones and joints, Constipon</td>
<td>Started slowly with Kṣaṇa.</td>
<td>$Pratamoka śvīṣa$</td>
<td>1 yr.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Vīma (Stool times sinks in water &amp; sometimes fluids)</td>
<td>Vīma (Stool times sinks in water &amp; sometimes fluids)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mahamdia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Pratamoka śvīṣa$</td>
<td></td>
<td></td>
<td></td>
<td>(Vataja)</td>
<td>(Vataja)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Lallbhadur</td>
<td>28</td>
<td>Male</td>
<td>Colicky pain in abdomen, Dryness in throat, Pain in chest, Head &amp; lumber region</td>
<td>Developed such symptoms in the convalescence period of Kāmalā</td>
<td>$Śīla (Vataja)$</td>
<td>1 mn.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired (Stool ime for all three days)</td>
<td>Impaired (Stool ime for all three days)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Dipshahdu</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Śīla (Vataja)$</td>
<td></td>
<td></td>
<td></td>
<td>(Vataja)</td>
<td>(Vataja)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Mithabhai</td>
<td>70</td>
<td>Male</td>
<td>Frequent, painful micturation, flatulence, constipation sleeplessness, giddiness</td>
<td>Started after chronic constipation</td>
<td>$Paurava gronītaḥbaddha (Enlarged prostate)</td>
<td>20 dys.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Vīma (sometimes Puṣṇaṇaḥ &amp; sometimes apokva)</td>
<td>Vīma (sometimes Puṣṇaṇaḥ &amp; sometimes apokva)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$Paurava gronītaḥbaddha (Enlarged prostate)</td>
<td></td>
<td></td>
<td></td>
<td>(Vataja)</td>
<td>(Vataja)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Age</td>
<td>Sex</td>
<td>Chief complaints</td>
<td>Brief history</td>
<td>Disease</td>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>---------------</td>
<td>-----</td>
<td>-----</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>----------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Nandlal</td>
<td>30</td>
<td>Male</td>
<td>Pallor, stomatitis, Emaciation, weakness, liquid motion 7 to 8 times/day, Lethargy</td>
<td>Started with loose motion gripping pain and mucoid stool.</td>
<td>Pāṇḍu Atiśūra</td>
<td>6 mins.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kalidas</td>
<td></td>
<td></td>
<td></td>
<td>After attending local festival in hot sun and taking cold water just after it</td>
<td>Gāli-Sūhā</td>
<td>3 days.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Pravin-</td>
<td>15</td>
<td>Male</td>
<td>Pain in throat, cough, headache, excessive thirst</td>
<td>After headache and mürčā</td>
<td>Pakṣāṅghāta</td>
<td>1½ yrs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>kumar Moothal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Maheshwar</td>
<td>15</td>
<td>Male</td>
<td>Unable to use his left upper and lower limb. Having fits at an interval of 15 days to 2 months</td>
<td>Started suddenly after fever</td>
<td>Pakṣāṅghāta</td>
<td>2 yrs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rasiklal</td>
<td></td>
<td></td>
<td></td>
<td>Unable to move his right upper &amp; lower limb</td>
<td>Since his infancy</td>
<td>Prjēma</td>
<td>10 yrs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Mansukhlal</td>
<td>11</td>
<td>Male</td>
<td>Feeding and vesicles in the skin. Aggravates in rainy and winter season</td>
<td>After excessive exhaustion</td>
<td>Śvāsā (Kuśāra)</td>
<td>2 mins.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kabarji</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Jayantilal</td>
<td>11</td>
<td>Male</td>
<td></td>
<td>After inury to chest</td>
<td>Uraśa Kṛṣṭa</td>
<td>18 yrs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Ibrahim</td>
<td>48</td>
<td>Male</td>
<td>Śvāsā, cough Headache</td>
<td>She was a patient of Gāṇḍu pada Kṛmi and aḷiśāra</td>
<td>Gāṇḍu</td>
<td>2 mins.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lakha</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Somji Purushottam</td>
<td>35</td>
<td>Male</td>
<td>Pratiśāya, sometimes haemoptysis weakness</td>
<td>Started after chronic constipation, History of injury in lumber region</td>
<td>Katiṣṭhāvata (Abhiṅgacāra)</td>
<td>6 yrs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Chanduben</td>
<td>22</td>
<td>Female</td>
<td>Pallor, oedema in feet, dyspnea after slight exhaustion constipation, Madhura udgāra (sweet crustulation)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bhagabanji</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Mansur Ali</td>
<td>30</td>
<td>Male</td>
<td>Pain in gluttal region, constipation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alihbai</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Gauramaram</td>
<td>21</td>
<td>Male</td>
<td>Loss of appetite, constipation, loss of memory weakness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ranchoda</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Nandkishore</td>
<td>13</td>
<td>Male</td>
<td>Pain and swelling of joints of fingers, Impairment of the activities of the right arm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bhagabanji</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td>Debuli</td>
<td>17</td>
<td>Female</td>
<td>Śvāsā, Kūśa, Pain in chest, Headache, weakness</td>
<td>Started after pratiśāya.</td>
<td>Śvāsā (Tamośā)</td>
<td>2 yrs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belji</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Age</td>
<td>Sex</td>
<td>Chief complaints</td>
<td>Brief history</td>
<td>Disease</td>
<td>Duration</td>
<td>Agency bala Parikṣya</td>
<td>Adhara-umāsāya vyāpāra</td>
<td>Pācana Kriyā</td>
<td>Sarakṣaṁ sāthāya</td>
<td>Rasa goṣṭa</td>
<td>Pūlī karuṇa</td>
<td>Drena Saguna</td>
</tr>
<tr>
<td>-----</td>
<td>------------</td>
<td>-----</td>
<td>-----</td>
<td>------------------</td>
<td>---------------</td>
<td>---------</td>
<td>----------</td>
<td>----------------------</td>
<td>--------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>29</td>
<td>Sainya Anupala</td>
<td>30</td>
<td>Male</td>
<td>Sometimes drava male, sometimes bhaddha male, Pain in abdomen, Weakness, sometimes acid and sometimes sweet eructation, Pallor</td>
<td>Started with Rakṣajā právaḥīka</td>
<td>Grahaṇa (Pittakopāha)</td>
<td>9 mns.</td>
<td>Impaired (Sweet eructation)</td>
<td>Impaired (Acid eructation)</td>
<td>Impaired (Stool time for all three days)</td>
<td>Impaired (Stool time for all three days)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired</td>
</tr>
<tr>
<td>30</td>
<td>Sukirbhās Hasambhai</td>
<td>54</td>
<td>Male</td>
<td>Abdominal pain, vertigo, Headache, Abdominal pain, aggravation of pain after digestion</td>
<td>Started after chronic constipation, Burning sensation of epigastricum Acid eructation, Nausea, etc.</td>
<td>Guṇa (Viṣāja)</td>
<td>2 yrs.</td>
<td>Impaired (Sweet eructation)</td>
<td>Impaired (Acid eructation)</td>
<td>Impaired (Stool time for all three days)</td>
<td>Impaired (Stool time for all three days)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired</td>
</tr>
<tr>
<td>31</td>
<td>Navin Chandra Ranichodadas</td>
<td>23</td>
<td>Male</td>
<td>Rashness over the body stomatitis, constipation, at intervals of 1 to 3 days</td>
<td>After an attack of Influenza (śāṭyākśa jvara)</td>
<td>Sapitta</td>
<td>4 yrs.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>32</td>
<td>Premji Hamid</td>
<td>17</td>
<td>Male</td>
<td>Śvāsa (dyspnoea) Bhrana (Giddiness), Sarabhā (Headache, Dhimantā vyavhāti Burningle mieturation), Daurbalya (weakness)</td>
<td>Commenced after suffering from Prurita (Gonorrhoea)</td>
<td>Kṣaṇa śvāsa</td>
<td>2 mns.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>33</td>
<td>Babu Samji</td>
<td>14</td>
<td>Male</td>
<td>Kṣaṇa, Śvāsa, Daurbalya</td>
<td>More in winter season</td>
<td>Kṣaṇa śvāsa</td>
<td>1 yr.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>34</td>
<td>J. Krishna</td>
<td>20</td>
<td>Male</td>
<td>Unable to have writing work in left hand due to spasm of fingers at the time of typing</td>
<td>Developed slowly</td>
<td>Vāsu varūṇi (Angukara)</td>
<td>6 mns.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>35</td>
<td>Rebumkumari</td>
<td>22</td>
<td>Female</td>
<td>Haemoptysis with cough, Pain in chest</td>
<td>Started bronchitis in her native place—Nepal, After 14-15 days of continuous fever</td>
<td>Kṣoṭaja Kuto</td>
<td>4 yrs.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>36</td>
<td>Kahan Abdulrahim</td>
<td>7</td>
<td>Male</td>
<td>Inability to use left upper and right lower limb, Māṃsaśaya (wasting of muscles)</td>
<td>Amenorrhæsinse last 12 years</td>
<td>Rasa kṣaya</td>
<td>3 mns.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>Impaired</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>37</td>
<td>Gangabai Trikamchand</td>
<td>40</td>
<td>Female</td>
<td>Giddiness, weakness, Exhaustion on slight exercise</td>
<td>Started with Pratikṣāya</td>
<td>Kṣiṃ (Purīṣāja)</td>
<td>1½ yrs.</td>
<td>Impaired (Udgarā)</td>
<td>Impaired (Udgarā)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>38</td>
<td>Raghīben Hirabai</td>
<td>30</td>
<td>Female</td>
<td>Udgarābhātya, Pain in all over the abdomen, Headache, Pain in joints, constipation</td>
<td>Started with Pratikṣāya</td>
<td>Kṣiṃ (Purīṣāja)</td>
<td>1½ yrs.</td>
<td>Impaired (Udgarā)</td>
<td>Impaired (Udgarā)</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
<td>N.A.D.</td>
</tr>
<tr>
<td>No.</td>
<td>Name</td>
<td>Age</td>
<td>Diet</td>
<td>Agni</td>
<td>Previous night at bed time</td>
<td>Morning rising from bed</td>
<td>Before starting exercise</td>
<td>When attaining ardhaskantri</td>
<td>Time taken to attain ardhaskantri</td>
<td>Time taken for biltation</td>
<td>Distance covered in exercise</td>
<td>Remarks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----</td>
<td>------------</td>
<td>-----</td>
<td>----------</td>
<td>------</td>
<td>-----------------------------</td>
<td>-------------------------</td>
<td>--------------------------</td>
<td>----------------------------</td>
<td>-------------------------------</td>
<td>-------------------------------</td>
<td>-----------------------------</td>
<td>---------------------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>B. Nanda</td>
<td>22</td>
<td>Non</td>
<td>Sama</td>
<td>76</td>
<td>98.4</td>
<td>18</td>
<td>62</td>
<td>96.4</td>
<td>14</td>
<td>97</td>
<td>16</td>
<td>128</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Nanda</td>
<td>22</td>
<td>Vegetarian</td>
<td></td>
<td>80</td>
<td>98.4</td>
<td>17</td>
<td>73</td>
<td>96.5</td>
<td>13</td>
<td>96.5</td>
<td>13</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Bambhurail</td>
<td>22</td>
<td></td>
<td></td>
<td>72</td>
<td>97.2</td>
<td>20</td>
<td>52</td>
<td>96.8</td>
<td>18</td>
<td>97</td>
<td>18</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>V. S. Awasthi</td>
<td>22</td>
<td></td>
<td></td>
<td>72</td>
<td>97</td>
<td>19</td>
<td>52</td>
<td>96.8</td>
<td>19</td>
<td>97</td>
<td>23</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>G. C. Jain</td>
<td>23</td>
<td></td>
<td></td>
<td>70</td>
<td>99.2</td>
<td>18</td>
<td>68</td>
<td>97</td>
<td>16</td>
<td>97</td>
<td>16</td>
<td>137</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>H. S. Kasture</td>
<td>23</td>
<td></td>
<td></td>
<td>64</td>
<td>96.2</td>
<td>18</td>
<td>64</td>
<td>96.2</td>
<td>17</td>
<td>97</td>
<td>23</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>R. J. Agnihotri</td>
<td>23</td>
<td></td>
<td></td>
<td>77</td>
<td>97</td>
<td>19</td>
<td>69</td>
<td>96</td>
<td>19</td>
<td>97</td>
<td>23</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>A. P. Pandey</td>
<td>23</td>
<td></td>
<td></td>
<td>75</td>
<td>98.4</td>
<td>18</td>
<td>55</td>
<td>98.2</td>
<td>13</td>
<td>96.4</td>
<td>16</td>
<td>103</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>D. N. Jha</td>
<td>25</td>
<td></td>
<td></td>
<td>62</td>
<td>96.4</td>
<td>34</td>
<td>78</td>
<td>96.4</td>
<td>34</td>
<td>97</td>
<td>26</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>M. M. Kate</td>
<td>25</td>
<td></td>
<td></td>
<td>86</td>
<td>97.4</td>
<td>16</td>
<td>85</td>
<td>96.4</td>
<td>16</td>
<td>96.4</td>
<td>18</td>
<td>96</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>S. B. Sathe</td>
<td>25</td>
<td></td>
<td></td>
<td>80</td>
<td>97.8</td>
<td>19</td>
<td>70</td>
<td>97.4</td>
<td>16</td>
<td>97.6</td>
<td>17</td>
<td>122</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>R. N. Phadke</td>
<td>25</td>
<td></td>
<td></td>
<td>83</td>
<td>97.6</td>
<td>20</td>
<td>67</td>
<td>96.4</td>
<td>16</td>
<td>96.4</td>
<td>18</td>
<td>115</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>B. N. Pandey</td>
<td>25</td>
<td></td>
<td></td>
<td>72</td>
<td>98</td>
<td>22</td>
<td>57</td>
<td>97.2</td>
<td>18</td>
<td>97.4</td>
<td>20</td>
<td>132</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Ranchhoda</td>
<td>22</td>
<td></td>
<td></td>
<td>60</td>
<td>97.4</td>
<td>26</td>
<td>60</td>
<td>96.4</td>
<td>26</td>
<td>96.4</td>
<td>26</td>
<td>102</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Babu</td>
<td>14</td>
<td></td>
<td></td>
<td>55</td>
<td>96.2</td>
<td>29</td>
<td>55</td>
<td>94</td>
<td>26</td>
<td>95.5</td>
<td>29</td>
<td>144</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Premji Hamid</td>
<td>17</td>
<td></td>
<td></td>
<td>55</td>
<td>96.2</td>
<td>29</td>
<td>55</td>
<td>94</td>
<td>26</td>
<td>95.5</td>
<td>29</td>
<td>144</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX IV
Malaparikṣā according to Yogaratnākara

मलपरीक्षा

श्रवणमेते तु इत्यहता शुभक्ता चापि जायते।
पीतता जायते पितामहः शुभक्ता श्रेष्ठतो भवेत्। ॥ १ ॥
सब्यापते च सवर्णिणि लघुकण्ठिन महविन हि।
हृदिन्न फेनिंत रूपं धूसलं वात्तकोपतः।
वातश्चिमपाककेत्र च, जायते कपिलं महाम् ॥ २ ॥
बद्रं सुरुवंतं पौत्रानं मित्रानिणार्यं भवेत्।
पीतावतं श्रेष्ठस्मासंदीपितामहं च पिधितम् ॥ ३ ॥
श्रमं दुर्दत्तपीताम् बद्रमेतं जिंदोपतः।
दुर्गम्यं शीतलश्रेविशिशिस्तां यदा भवेत् ॥ ४ ॥
तदादशिर्कमितं श्वेतकृष्णशरीरस्थितवतं।
कपिलः ऊन्नीत्तं च यदि वचोवत्तोवयते ॥ ५ ॥
प्रत्येकमदाचोरेण दूषिता परिक्ष्यवते।
सितं वहस्त्विनिगंधं मधं ज्येष्ठं जीवेदैवे ॥ ६ ॥
श्रमं ज्येष्ठप्रभवितं पीतं सक्रियकवनम्।
अतिक्रमां चात्मामितिपायं तथास्यस्म।
मरणां मधं किंतु सुश्रुषां सुर्यवे ध्रुवम् ॥ ७ ॥

अन्यथा——

वातस्य च मधं कृत्यं ततं पितामहं पीतकिंद्र।
रक्षसानां च किंचितमलं कृप्तं कुश्चन्दम् ॥ ८ ॥
आयम् वा श्रेष्ठम् प्राणिमित्रं भून्धम् वचेदै।
अपकं श्वशुद्रीं तु पकं स्वर्गिण्यं भवेत् ॥ ९ ॥
अर्थमेत्र पिण्डः शृंखलं मन्वे मोहोऽन्तु द्वीकृतम्।
दूर्गम्यं च चित्रकायुक्तस्यां मल्लछिरम् ॥ १० ॥

१ सदनम्नानां अन्यस्माति तन्नानां योगरतनेऽरेण दशम्पूर्वे उद्दच्छत्म।
References showing difference between Agni and Pitta

पिताम्योः सम्बन्धः

ननु पिताम्योः सरिषाहृतिविद्वारामित्रविद्वारामित्रसम्प्रतिति सम्बन्धः ? उच्चते, पिताम्योः-विद्वारामित्रविद्वारामित्रसम्प्रतिति सम्बन्धः ? उच्चते, पिताम्योः-विद्वारामित्रविद्वारामित्रसम्प्रतिति सम्बन्धः ? उच्चते, पिताम्योः-विद्वारामित्रविद्वारामित्रसम्प्रतिति सम्बन्धः ? उच्चते, पिताम्योः-विद्वारामित्रविद्वारामित्रसम्प्रतिति सम्बन्धः ? उच्चते, पिताम्योः-विद्वारामित्रविद्वारामित्रसम्प्रतिति सम्बन्धः ? उच्चते, पिताम्योः-विद्वारामित्रविद्वारामित्रसम्प्रतिति सम्बन्धः ? उच्चते, पिताम्योः-विद्वारामित्रविद्वारामित्रसम्प्रतिति सम्बन्धः ? उच्चते, पिताम्योः-विद्वारामित्रविद्वारामित्रसम्प्रतिति सम्बन्धः ? उच्चते, पिताम्योः-विद्वारामित्रविद्वारामित्रसम्प्रतिति सम्बन्धः ?

तथा च वागमतः—

पाषंक निश्वासः स्यात् काठिन्यासाध्यः शोपतः।
अनुगृहाः विकृतं पितं पाक्रमं दर्शने॥
शुचि दस्तिबाहे जातिवसिन्धुमधुः॥
पिरे पंचायतं तथा पृथाविद्याम्याध्यायम् ॥ १० ॥
पंचायतासेवं कही वच्चासुगुंधयम्।
व्यक्त्वश्चं पादाक्रमणादनलशालिनं ॥ ११ ॥
पश्चायतं विभाषे सारिकी युवकः।
तद्रास्मे विषाणां शेयामयसुगुहम्॥
करोति बन्द्यूभन पाषंके नाम तत्रस्मृतम् ॥ १२ ॥

ननु यद्य पिताम्योः एवात्स्तृत्वं करं यूठं पितायां प्राणमकृत्वा प्रकर्मितं।
तथा मस्या य पितं कुर्बितं न च तेतदिवीक्षिकाः हि।
तथा पिताम्योः सहितोक्षोंविशिष्टं
रिष्ययं करं स्यात्।
तथा "सम्मोह समाक्षेपै" कवः न युक्ते।
तथा—
“द्वस्य ग्रज्ञनमयोः च पितं बहिःस्तोत्स्बन्धेति।”

अश्रोत्यं पिताम्ये स्नाताशिष्यामेः।

तथा चौर्क सत्तानं

अत्रिभिसिध्युक्तं: पितं भिन्नुणास्था।
द्वस्य ग्रज्ञनमयोः च पितं बहिःस्तोत्तत्था ॥ १३ ॥
तस्मात् तेषोऽयं पितं पितोभो य स शक्तिमानः।
स संचरति कुशिस्तः सर्वतो धमानीपुलः ॥ १४ ॥
स कायालिङ्गसः कायोभो स पक्षः स च जीवमसृ।
अन्यत्राभिस्वायं देशे काययस्मिति ॥ १५ ॥

तथा च मधुकोपे।

“द्वस्य य भाष्यायामस्वायामितर्पिताय तेजो भागोऽशिष्यिः।

तनेन पिताम्योः सन्निधिः।”

ज्ञाननियोः ज्ञानस्तु अस्ति: पिताम्योः

प्रस्तावत्तु अस्ति: पिताम्योः

नाम संदेशः ।

भावप्रकाश पृष्ठ १० ॥ १० ॥ १८
APPENDIX VII
A Case of Agnibalaparikṣā
आयुर्वीदीयकालकोटशिक्षणकेन्द्रम्, जामनगरम्
अभिवच-परीक्षा-पत्रकम्

नाम : श्रीमान् मनसूर अहमी अधीभाई
बयः : 30 वर्षांि
प्रवेशातिथि : १८ : ७ : ५८
रोगः : श्वेतोपुरुषातुष्क्यं अभिवचातजन्य कर्कागतवात्वशीः
प्रायकः : पुरुषः
प्रधानवेदना : उयः, यदृच्छिक विचारः, विठमलावः, वामवोदिति श्वासांहत्वम्, वहनप्रदेयो शूलम्, राष्ट्रांसहसंगमं, नींद्रा कर्कशोभम् संक्रियाशिलितव्रतम् : अस्तवर्गः रवि- धातु तुः शुक्रसन्धिम्, सुम्रुकात्तिम्, सदाहुमुक्तप्रबुद्धिः, तदन्तमें प्रद्वर्षः कर्कामाघातः, संजातः, सहविव- साध्याचरणं उदः, शुन्यं, शूलसहसंगमं च।

<table>
<thead>
<tr>
<th>तिथि</th>
<th>आहार वर्णां</th>
<th>परिमाणानुमाणम्</th>
<th>आहारगुणां</th>
<th>महसुपरिमाणम्</th>
<th>सल्लभ वर्णानुमाणम्</th>
<th>पकः पापकः</th>
<th>सश्च च</th>
</tr>
</thead>
<tbody>
<tr>
<td>प्रथम दिवस: १९-८-५८ दिशा</td>
<td>प्रातः</td>
<td>सामूह</td>
<td>आहार साधन</td>
<td>सामूह</td>
<td>१० तोला</td>
<td>२० तोला</td>
<td>एकवर्षम्</td>
</tr>
<tr>
<td>स्वाभाविकप्राप्त: २०-८-५८</td>
<td></td>
<td></td>
<td>२० तोला</td>
<td>१० तोला</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>दिनांकक्ष्रिय प्रातारिक्षार्दः यावत्</td>
<td></td>
<td></td>
<td>१० तोला</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>तिथि:</td>
<td>आहारवर्णन, परिमाण च आहारगुण:</td>
<td>महपरिमाण समयक:</td>
<td>मधस्य वर्णनम:</td>
<td>पकापक- परीक्षा:</td>
<td>मन्तव्यम्</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------</td>
<td>--------------------</td>
<td>-----------------</td>
<td>----------------</td>
<td>----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>द्वितीयव्रत:  20-8-50 र.य.</td>
<td>प्रातः सायमुः</td>
<td>35 तोऽ प्रातः वादन-समय (एकबारश्री)</td>
<td>सुपरिप्रितिः, अर्ध- चन्द्रुः क्रमणः</td>
<td>आमः</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>प्रातःस्वादनार्थम् 21-8-50 र.य.</td>
<td>प्रातः वादनस्थानम् (एकबारश्री)</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td></td>
</tr>
<tr>
<td>तृतीयव्रत:  21-8-58 र.य.</td>
<td>प्रातःस्वादनार्थम् 22-8-58 र.य.</td>
<td>प्रातःस्वादनार्थम् पाशोष्टीके सायमुः</td>
<td>प्रातःस्वादनार्थम् पाशोष्टीके सायमुः</td>
<td>प्रातःस्वादनार्थम् पाशोष्टीके सायमुः</td>
<td>प्रातःस्वादनार्थम् पाशोष्टीके सायमुः</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

सामान्यविवेचनम्: तिरित्रः यावत्र, रोगी अभिन्न-परीक्ष्य नियोजितः। प्रतिदिनः नातिसिद्धं यावत्र अनुमन्त तीन ५६ तोषक-मितिमाहारः, २२ तोषकमिति दुःख्य व्याप्त। स अनुपात: प्रतिदिनः ६० तोषकमिति मध्ययामगमरो:। अविच्छिन्नप्रतिबंधयां श्रेष्ठमाध्यमविशेषोऽयोऽध्ययनः ज्ञाते। सहस्त्रोपायः आत्मायां व्यवस्थानीयः। तस्मात् यद्यपि अविच्छिन्नप्रतिबंधयाः।

उपर्यामार्थश्रावणम्: न सन्ति तथा कायित्व वेदना-स्फूर्तिवाकस्त्रयस्तस्मात् अविच्छिन्नप्रतिबंधकृतमार्थश्रावणम् इति प्रतिपादितः।

धर्म आमार्थश्रावणम्: प्रथमानि विवेके पक्षविश्लेषयोगसायम। तद्वर्तं मिन्ह यावत्र आमार्थश्रावणं। तस्मात् विश्लेषमार्थश्रावण- व्यवस्था इति जातेः। रसशोषण-व्यवस्थायां न दख्ता कायित्वादिहूः। सारकृतव्यवजनमपि न सम्यमवतिः इति विश्लेषादिहासेः।

पक्षविश्लेषणम्: विनयमचारं वावतः सुपरिप्रितिमार्थश्रावणं सम्यक प्रतिकाविकाय अविच्छिन्न इति जातेः। तस्मात् धार्मिक पति सम्यकेनाधिनेन नातिन्द्रः नातिनरुपिषोपसर्गान्तः।
APPENDIX VI
Scheme to Show the Relation Between Agni & Pitta.

Padārtha

Bhāva

Abhāva

Dravya

Guṇa

Karma

Sāmānya

Viśeṣa

Samavāya

Prthvi

Ap

Tejas

Vāyu

Ākāsa

Kāla

Dīk

Ātma

Manas

Nitya

Anitya

Śarīra

Indriya

Viśaya

Nitya

Anitya

Śarīra

Indriya

Viśaya

Nitya

Anitya

Śarīra

Indriya

Viśaya

Jātharāgni

Dhātvagni

Bhītagni

Rasāgni

Raktāgni

Māṃsāgni

Medogni

Asthyagni

Majjagni

Sukrāgni

Jātharāgni

Gṛha

Prasāda

(Anarasa)

Poṣaka Rakta & Pitta

Poṣaka Rasadhātu

NOTE:—Taken with certain alteration from Dinanātha's commentary on Mādhavanidāna 55 : 32
<table>
<thead>
<tr>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
</tr>
<tr>
<td>Abhikṣaṇa mala pravṛti, 141</td>
</tr>
<tr>
<td>Abhyantararoga mūrga, 50</td>
</tr>
<tr>
<td>Abraham White, 87, 106, 107</td>
</tr>
<tr>
<td>Abscess, vidradhi, 155</td>
</tr>
<tr>
<td>acetāpīṭṭha, 35, 37, 39, 41, 42, 63, 66</td>
</tr>
<tr>
<td>acetāpīṭṭha, complex, 30</td>
</tr>
<tr>
<td>acid, katu, 66</td>
</tr>
<tr>
<td>acintya śakti, inconceivable power, 57</td>
</tr>
<tr>
<td>adha-ānāśaya, 41, 74, 84, 133, 154</td>
</tr>
<tr>
<td>adhībhautika, 92</td>
</tr>
<tr>
<td>adhidaiśika, 92</td>
</tr>
<tr>
<td>Adhikānta, 156</td>
</tr>
<tr>
<td>adhikarana siddhānta, 102</td>
</tr>
<tr>
<td>Adhimūrtasa, Granuloma 155</td>
</tr>
<tr>
<td>adhīśṭhāna, 56</td>
</tr>
<tr>
<td>adhimūrtas, 94, 134, 160</td>
</tr>
<tr>
<td>Ādhīmūrtas, Tymphanitis, 142</td>
</tr>
<tr>
<td>adhūguda, 51, 52</td>
</tr>
<tr>
<td>Adhyāsthi, 156</td>
</tr>
<tr>
<td>adhyātmika, 92</td>
</tr>
<tr>
<td>aghana, 41</td>
</tr>
<tr>
<td>agnīya, 74, 75, 85, 90, 113, 115</td>
</tr>
<tr>
<td>agnīya guṇa, 26, 27</td>
</tr>
<tr>
<td>Agni, 3, 8, 9, 16, 17, 22-26, 28, 29, 44, 49, 56, 73, 74, 83, et passim</td>
</tr>
<tr>
<td>agnībāla, 116, 122, 129, 144, 174-75</td>
</tr>
<tr>
<td>Agnībāla Parīkṣaṇ, 122, 124, 144, 150, 154</td>
</tr>
<tr>
<td>agnībhūta, 26</td>
</tr>
<tr>
<td>agnidhara kalāśāra, 47</td>
</tr>
<tr>
<td>agni duṣṭī, 107, 109</td>
</tr>
<tr>
<td>agni, jaraṇāśakti, 128</td>
</tr>
<tr>
<td>agnimāndya, Indigestion, 108-9, 140</td>
</tr>
<tr>
<td>Agninaśa, 155</td>
</tr>
<tr>
<td>agni of the earth, 12</td>
</tr>
<tr>
<td>agni, pitta, 66</td>
</tr>
<tr>
<td>agni ( pitta ) dhāraṇa kalā, 46</td>
</tr>
<tr>
<td>agni, tejas, 15, 20, 21</td>
</tr>
<tr>
<td>agni, tāmāra, 109</td>
</tr>
<tr>
<td>agnyāśaya, 51</td>
</tr>
<tr>
<td>aguesia, arasaññatā, 155</td>
</tr>
<tr>
<td>āhūra, 26, 27, 38, 55, 66, 70, 75, 87</td>
</tr>
<tr>
<td>āhūra dravya, 17, 24, 25, 37, 55, 60, 76, 81, 83, 85</td>
</tr>
<tr>
<td>āhūrapāneana, 27, 39, 66</td>
</tr>
<tr>
<td>āhūra pāneana, digestion of food, 97</td>
</tr>
<tr>
<td>āhūrapāneanakriyā, 60</td>
</tr>
<tr>
<td>āhūrapakṣa, 58</td>
</tr>
<tr>
<td>āhūravata, 36, 67, 89, 112</td>
</tr>
<tr>
<td>Aharāṇa, Impotency, 156</td>
</tr>
<tr>
<td>Āhata adhmūtā, 142</td>
</tr>
<tr>
<td>Ajāśakṣata mala pravartana, 134</td>
</tr>
<tr>
<td>Ajīrṇa Sarāṇa, 140</td>
</tr>
<tr>
<td>ākaroja tejas, 13</td>
</tr>
<tr>
<td>ākāśa, 6, 66</td>
</tr>
<tr>
<td>Akṣayaśāpīduśrahāla, 143</td>
</tr>
<tr>
<td>Akṣi, 150-51</td>
</tr>
<tr>
<td>Akṣepa, 160</td>
</tr>
<tr>
<td>Akṣikāṇa Kṛṣṇatā, 159</td>
</tr>
<tr>
<td>akṣimāla, mucoid excretions from the eye, 85</td>
</tr>
</tbody>
</table>
Ālaya, 143, 156, 159
alimentary canal, koṣṭha, 114
alimentary canal, mahāsrotas, 114
Aljī, 155
ālocaka, 28
ālocakāgni, 28
Alpa chardī, 139
Alpamala, 141
Alpāya prajānanana, 156
āma, 111-12, 117-18, 141, 151, 153-54
Āmadopa, 109-11, 113-14, 117, 118, 154
Āmadeśa, āmaviṣya, 109
Āma formation, 133
Āmagandhi, 141
amalabhūca, 60
āma, mucus, 154
āmapakviṣaya, 50
Amarakoṣa, 24
Āma samṛṣṭā mala, 141
āmāśaya, 27, 35, 37, 41-44, 48, 51, 52, 61, 77, 79, 111, et passim,
ambuṣaya, 115
aminio-acid-tyrosin, 152
aminopeptidase, 48
aṃla, 30, 41, 61, 67, 71
Amla anvāsthā pāka, 133
amalabhūca, 35, 37, 38, 66, 75
amladraṇya, 70
amlapāka, 112-13
aṃla rasa, 71
aṃla, sour, 56
aṃlatua, 38
Amla-udgāra, 134
Amlodgāra, 159
ammonia, 64, 85
Amrak, 58

Anūṣa ṛk, Pain in shoulder, 140
aṃśas of pānakāgni, 46
anadhika, 30
Anūḥa (flatulence), 142
anala, 27
anala, fire, 43
Anānābhitāsā, 159, 170
Andhra, 72
Aṅgadāha, 156
Aṅgamorda, 159
Aṅgamorda, body-ache, 155
Aṅgapīḍāna, 134
Aṅgasuptatā, 156
Anger, 111
anitiya, non-eternal, 11
anitiya, transient, 12, 57
anna, 22, 122
Annadeśa, 143
annakīṭṭa, 87
Anna mārdava karṇa, 133
Annabhāṭṭa, 11
Annabhāṭṭa’s Tarkasaṅgraha, 171
annapaṭaṇa, 62
annapraśva, deglutition, 60
anurasa, 85, 88, 111, 122
anna, soma, 22
annavahasthārota, 77, 79, 99
annavaha srotāṇi, 81, 97
annavivecana, 62
Anoroxin, aśraddhā, 155
antarāgni, 25, 27, 28, 42, 82, 109, 120, 126
antarāyana, 94
Āntra vikujana, 140
āntrika sampiṭṭā jvara, 153
āyu, 9, 14, 17, 18, 20, 56, 57
Anubandha Śūla, 142
aqitea, 56
Aorta, 104
<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>ap, 9, 56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apakṣāna, non-digestion of food,</td>
<td>133</td>
<td></td>
</tr>
<tr>
<td>āpāna, 65, 66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>āp-bhūta, 26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āplādrava-śoṣaṇa, 134</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āprasaśamuruk, 158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>āpratīkṣāta śakti, 147</td>
<td></td>
<td></td>
</tr>
<tr>
<td>āpya, 72, 74, 75, 88</td>
<td></td>
<td></td>
</tr>
<tr>
<td>āpyabhāva, 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>āpyaguna, 59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krambhavāda, 9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arasajñātī, aguesia, 155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aruda, Tumour, 155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ardhalakti, 144-46, 149, 172-75</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ārdra-carmā-vanasadāha bhagātratī, 158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ārogya, positive health, 122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ārta, 92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>arterioles, 104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aruci, 157</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aruci, Distaste, 143, 155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arūna, Redish, 141, 153</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aruda, 157</td>
<td></td>
<td></td>
</tr>
<tr>
<td>āśā, 36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>āśā, Organ, 77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ascitis, jāthara, 94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>aśita, 37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśraddhā, anoroxia, 155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āsramāṇḍalā, 155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āṣīghara, menorrhagia, 155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>āṣṭāṅga-hṛdaya, 43, 44, 99</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āṣṭāṅga Saṃgraha, 49, 83, 91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>āṣṭāsthūna parīkṣā, 129</td>
<td></td>
<td></td>
</tr>
<tr>
<td>asthāyi dhātu, 83, 84, 97</td>
<td></td>
<td></td>
</tr>
<tr>
<td>asthāyi, pēpaka, 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>asthāyi, pēpaka dhātus, 117</td>
<td></td>
<td></td>
</tr>
<tr>
<td>asthāyi rasadhātu, 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthenia, sāha, 155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthi, 156, 158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthibheda, 156, 158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>asthīdhațu, 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthīleṣa, 158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asthīśāla, 156</td>
<td></td>
<td></td>
</tr>
<tr>
<td>asthīyagni, 82, 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asașāna, 158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asvāṣṭhā, 159</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśa, 145</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśa mādhurya, 143, 156</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśyamala, 85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśyapāka, Siomatitis, 155</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśa śoṣa, 143</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśavāraśīva, 155, 159</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśveydeha, 143</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśo vairasya, 170</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśaṇa, 157</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āśkapāraṇa, 117</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ātidrava-śoṣaṇa, 134</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āṭidurgandhi, 141</td>
<td></td>
<td></td>
</tr>
<tr>
<td>atipraṣṭiti, 108</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Athāktāśrāṇa, 160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>atisāra, 115, 150-51, 160</td>
<td></td>
<td></td>
</tr>
<tr>
<td>atisāra, diarrhoea, 94, 108</td>
<td></td>
<td></td>
</tr>
<tr>
<td>atiyāyāma, 146</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Āṭopa, 142</td>
<td></td>
<td></td>
</tr>
<tr>
<td>atyagni, 45, 48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atyartha Śrāmīta, 158</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atyartha tudana, 157</td>
<td></td>
<td></td>
</tr>
<tr>
<td>atyagni, 95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>audaryatejas, 11, 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>avaiśārikas, 114</td>
<td></td>
<td></td>
</tr>
<tr>
<td>avara, 121, 173</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anaramala, 174</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aeasūdi, 141, 153</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aeasūditāna, 154</td>
<td></td>
<td></td>
</tr>
<tr>
<td>avasthāpāka, 38, 55, 60, 61, 66, 76, 112-13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aeidagdha-pravartana, vṛdhvamārga, 133</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concept</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>Āsvāka</td>
<td>140</td>
<td></td>
</tr>
<tr>
<td>Āvarāṇagranthi</td>
<td>158</td>
<td></td>
</tr>
<tr>
<td>ayana</td>
<td>100, 104-5</td>
<td></td>
</tr>
<tr>
<td>ayanamukha</td>
<td>98, 101, 105</td>
<td></td>
</tr>
<tr>
<td>ayanamukhas of srotāmāsi</td>
<td>18, 100</td>
<td></td>
</tr>
<tr>
<td>Ayathākāla palita</td>
<td>155</td>
<td></td>
</tr>
<tr>
<td>Ayathākālavali</td>
<td>155</td>
<td></td>
</tr>
<tr>
<td>Āyurveda</td>
<td>23, 26, 27, 32, 33, 50, 59, 62, 67, 82, 92, 104, 109, 114, 150, 170, 174-75</td>
<td></td>
</tr>
<tr>
<td>Āyurveda Sūtra</td>
<td>68, 69, 71, 101</td>
<td></td>
</tr>
<tr>
<td>Āyurveda Vṛddhatrayi</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic classics</td>
<td>31, 79, 97, 98, 172, 174</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic collection</td>
<td>124</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic concept</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic description</td>
<td>60, 151</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic doctrine</td>
<td>107</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic literature</td>
<td>130</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic texts</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic version</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic view</td>
<td>64, 87, 88, 107, 129, 150, 170</td>
<td></td>
</tr>
<tr>
<td>Ayurvedic works</td>
<td>144</td>
<td></td>
</tr>
<tr>
<td>ayus, longevity</td>
<td>122</td>
<td></td>
</tr>
</tbody>
</table>

### B

<table>
<thead>
<tr>
<th>Concept</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>baecillus bifidus</td>
<td>115</td>
</tr>
<tr>
<td>baecillus bulgaricus</td>
<td>116</td>
</tr>
<tr>
<td>bahumūdra, polyuria</td>
<td>108</td>
</tr>
<tr>
<td>Bahupīcchila, Extreme alminess</td>
<td>133</td>
</tr>
<tr>
<td>bahu pūchhilatou</td>
<td>112-13</td>
</tr>
<tr>
<td>bala, strenth</td>
<td>121-22, 149</td>
</tr>
<tr>
<td>Balakṣaya</td>
<td>143, 158</td>
</tr>
<tr>
<td>bala nirphaya</td>
<td>172</td>
</tr>
<tr>
<td>balaparikśā</td>
<td>144</td>
</tr>
<tr>
<td>balas</td>
<td>174</td>
</tr>
<tr>
<td>Bala-vyāyāmaśakti</td>
<td>172</td>
</tr>
<tr>
<td>balin, strong</td>
<td>145</td>
</tr>
<tr>
<td>Bayliss</td>
<td>62, 66</td>
</tr>
<tr>
<td>beard, smakru</td>
<td>86, 88</td>
</tr>
<tr>
<td>Beaumont</td>
<td>90</td>
</tr>
<tr>
<td>bhāraharāṇa</td>
<td>147</td>
</tr>
<tr>
<td>bhāsmaka</td>
<td>45, 48, 95</td>
</tr>
<tr>
<td>bhāvāra</td>
<td>10</td>
</tr>
<tr>
<td>Bhāʃtōjī’s Siddhāntakaumudi</td>
<td>23</td>
</tr>
<tr>
<td>bhauma tejas</td>
<td>12</td>
</tr>
<tr>
<td>bhautive composition</td>
<td>70</td>
</tr>
<tr>
<td>bhautive groups</td>
<td>74</td>
</tr>
<tr>
<td>Bhāva Miśra</td>
<td>25, 29</td>
</tr>
<tr>
<td>Bheda</td>
<td>134</td>
</tr>
<tr>
<td>bhinnamala</td>
<td>141</td>
</tr>
<tr>
<td>bhinnasaṅghāta</td>
<td>37, 61, 81, 133</td>
</tr>
<tr>
<td>bhinnasaṅghāta, splitting</td>
<td>23</td>
</tr>
<tr>
<td>Bhoja</td>
<td>25</td>
</tr>
<tr>
<td>bhrājaka</td>
<td>28</td>
</tr>
<tr>
<td>bhrājakāgni</td>
<td>28</td>
</tr>
<tr>
<td>Bhrama</td>
<td>133, 143, 156, 159</td>
</tr>
<tr>
<td>Bhratṛ, 158</td>
<td></td>
</tr>
<tr>
<td>Bhṛśa vamana</td>
<td>158</td>
</tr>
<tr>
<td>Bhukta stambha</td>
<td>157</td>
</tr>
<tr>
<td>Bhukte svāsthyā</td>
<td>139</td>
</tr>
<tr>
<td>bhūta</td>
<td>56</td>
</tr>
<tr>
<td>bhūta class</td>
<td>73</td>
</tr>
<tr>
<td>bhūtādi</td>
<td>5, 6</td>
</tr>
<tr>
<td>bhūtagni</td>
<td>28, 38, 67, 73, 97, 117, 147, 171</td>
</tr>
<tr>
<td>bhūtagnipāka</td>
<td>72, 74, 75, 76, 83, 85</td>
</tr>
<tr>
<td>bhūtagni vyāpāra</td>
<td>49, 77, 119</td>
</tr>
<tr>
<td>bhūta group</td>
<td>72</td>
</tr>
<tr>
<td>bhūta paramāṇus</td>
<td>56</td>
</tr>
<tr>
<td>bhūta pentad</td>
<td>43</td>
</tr>
<tr>
<td>bila</td>
<td>40</td>
</tr>
<tr>
<td>bile pigment</td>
<td>85</td>
</tr>
<tr>
<td>bilirubin</td>
<td>31, 32</td>
</tr>
<tr>
<td>bilirubinemec</td>
<td>32</td>
</tr>
</tbody>
</table>
CONCEPT OF AGNI IN ÁYURVEDA

Drava, Liquid, 141
Drava mala pravartana, 134
Drava-śoṣaṇa, 134, 152, 154
dravatva, fluidity, 10
dravya, 21, 43, 56, 58, 67, 70, 72, 113, 129
dṛghata, hardiness, 120
Drowsiness, tändra, 155
Dṛvot śabda, 142
Duḥkha, 141
duodenal mucosa, 40
duodenum, 39, 40, 46, 47
duṣṣa, 110
duṣṭi, 108
dvayuṣkas, 10, 18, 19
Dwarakanath, C., Prof., 57
dysentary, pravoṣhana, 94
dyspnea, śoṣa, 94, 146
effect, kārya, 12
eclan-vital, prāṇa, 122
emesis, kārti, 94
endocardium, 104
Enemity, 111
energy, rajas, 4, 5, 8
enlargement of spleen, pithā, 155
centero-gastrone, 39, 40
knvy, 111
enzymes, 40
eructation, udgāra, 60
erythrocytes, 30, 90
Escherichia coli, 64
eternal, nitya, 11, 12
Extreme sliminess, Bahuṣpicchila, 133

F
faeces, purīga, 85
faeces, śakti, 65
faintness, tāmas, 155
Fatum tumous, gulma, 155
Fear complex, 111
INDEX

femoral, 104
Fermentation, Suktopāka, 133
Fever, jvara, 155
fire, anala, 43
fluidity, drava, 10
Freckless, Vyaṅga, 155

G
Gaḷaśūkaka, 155
galaśa, 94
Gaḷasūḍāka, Tonsilitis, 155
gamanāgamana, 147
Gaṅga, 155
Gaṅga & akṣikāta śotha, 133
Gaṅga māla, Cervical adenitis, 155
Gaṅga rāgata, 160
gandha, 144, 150
gandha, smell, 153
gandha tanmātra, 6, 8
Gaṅgādhara Sena 41, 68
Gangrene, Puṭimūṣa, 155
Garbha Kṛṣṇa Muñeṣa & Bandhana, 158
gases, vīta, 85
Gastrin, 39
Gaṇḍra Arūmiṣi, 157
Gaṇtraśodana, weakness of the body, 94
Gaṇtrastambha, 143
Gaurana, 143
gaurava, heaviness, 94, 155
gingili cake, tilapīṭa, 131
Glomerular capillaries, 106
God, 58
Goltre, 155
grahāṭi, 35, 36, 41, 42, 52, 79, 81
grahāṭiroga, patient suffering from sprue, 150
grahāṭi, small intestine, 151
Granthī, 156, 185

granthi, dillation, 108
Granuloma, adhimāna, 155
Grathita (Scybolous) 141
greed, 111
Grīma-June and July, 145
Grossman, 41
Gulma, Fantum tumous, 155
guṇa, 3, 4, 16, 56, 57
Gurhaṅga, 157
Guru, heavy, 141
Guruṭh, Heaviness, 133
Gurutth, heaviness, 140

H
haemoglobin, 31
haemolobin, complex, 30
Hacemorrhage, raktapipta, 155
hairs all over the body, lema, 86
hairs, keśa, 86, 88
hardiness, drghatī, 120
Hāridranakha, 158
Hāridranetra, 158
Harita, 141
Harṣa, 143
heart, hydaya, 51, 101
heat production, tapana, 23
heaviness, gaurava, 94, 133, 155
heaviness of abdomen, udaragaurava, 94
heaviness of the head, śīregaurava, 94
Hemanta, December and January, 145
Hikkha, 159
hormone, 40, 41, 46, 47
hot, uṣma, 10
Hṛdak, Precardinal pain, 140
Hydaya, 68, 76, 102, 121, 145
147, 174-75
hydaya, heart, 51, 101
CONCEPT OF AGNI IN ÆYURVEDA

Hṛdayadraiva, Palpitation, 140
Hṛdaya vyathā, 159
hṛdistha, 146
hṛdisthita vāyu, 145-46
Hṛitāsa, nausea, 155
Hṛt daśa, 159
Hṛt drañata, 159
hydrogen, 64, 116
hydrogen sulphide, 85
hydrolysis, 49

I
ilea cecum, udāka reconstitution, 115
illumination, prakāšana, 23
Impaired vihājana, 134
impatience, 111
impotency, Klaibya, 155
Improper pinda karana, 134
inconceivable power, aśintya śakti, 57
increase of cheerfulness, utsahopāesa, 122
indhana, 26, 43, 45, 49, 121-22, 147-48, 172
Indhātvagni pāka, 75
indol, 64, 85, 116
indol-acetic-acid, 87, 88
indriya-tejas, 12
infinite, vibhu, 56
Iron, 90
insipidus, 108
Ivy, 66

J
Jalaparīkṣa, 150
jaladara, 46, 47
Jammagar, 46, 172, 174
jaranāsakti, 50, 122, 144, 174
jaranāsakti, agni, 128
jāthara, ascitis 94
jātharāgni, 27, 38, 42, 49, 55, 61, 63, 67, 70-73, 75-77, 83, 87, 88, 91, 93, et passim
jātharāgni māndya, 117, 153
jātharāgnipāka, 58, 66-68, 72, 73, 117, 171
jātharāgni yāpāra, 63
jātharānanāla, 11
Jaundice, Kāmalā, 155
jīhva, 146
jīhva upadeha, 159-60
jīrjati sūla, 140
jīrne prakopā, 142
Jvara, 143, 160
Jvara, fever, 155

K
Kahlenberg, 70
Kakṣa, 149
Kāla, 36, 102, 108
kāla, 3, 15
kālaja, 120
kāmalā, jaundice, 155
Kaṇḍa, 9
Kaṇḍa rahasya, 10
Kaṇḍara, 147
Kaṇḍara Khallī, 156
Kaṇṭha, 146
Kaṇṭha dāha, 143
Kaṇṭha soka, 143, 155
kapha, 52, 58, 59, 94, 95, 120, 139, 150, 153
Kapha duṣṭi, 152
Kūraṇa, 3
kūraṇa and kūrya, 20
kūraṇa dravya, 56, 57
Kūranīkāśa, 5, 6
Karapāndaśāha, 156
Karma, 20, 21, 46, 58
karma, motion, 21
karmaśakti, energy, 120, 175
Kārṇamala, waxy excretions from the ear, 85
Kārīya, 143
kārya, 3
kārya, effect, 12
kāryākūśa, 6
kārya, products, 11
Kāśa, cough, 94
Kāṭāya, 67
Kaśāya chardi, 139
Kāṭāya rava, 72
Kāśyapa, 29
katu, 30, 67
katu, acid, 56
katu, pungent, 56
Katu vakratu, 143
Katu vipāka, 70
Kātyāchidra-apadeha, 156
Kāṭya ekkīṭa, 46, 109, 150
kāyāgni, 44, 109-11
kāyāmala, 156.
Kēśa, hairs, 86, 88
Kēśa jaṭilībhāva, 156
Kēśaloma, 156
Khādīta, 37
Khara, 16
kha-rāgugna, 108, 117
Kha-rāgugna, srotas-rāgugna, 107
Kidneys, vīkka, 51, 52
Kīla, waris, 155
kīnīśipakva-Kīnīśidpakva 38
kīṭa, 27, 35, 43, 50, 76, 76, 84, 87, 91, 105, 172, 175
Kīṭa bhūga, 27
Kīṭāṇīśa, 175
Kīṭapaka, 84-88
Kīṭa-bhūga, impotency, 155
Kīṭa-bhūga, Sterility, 156
Kīledaka kapha, mucin, 59
Kīlība prājanana, 156
Kīśna, 60
Kedrana, 110
Kēṣha, 27, 35, 37, 50, 55, 58, 61, 65, 74, 77, 144, 149, 151, 172
Kēṣha, alimentary canal, 114
Kēṣhāgni, 27, 42
Kēṣhāgas, 51
Kēṣha, Rashes, 156
Kēṣhāśriya Kāmala, 131
Kṣchrena chardi, 139
Kriyākālas, 107
kṛmīs, 114-15
kṛmīs, worms, 154
Kṛśa, 157
Kṛśānagat, wasting, 155
Kṛśānū, 157
Kṛśa, 141, 157
Kṛśa, black, 153
Kṛśa, chardi, 139
Kṛśa, Tarry, 141
Kṛśa, 19
Kṛsvasatu, 143
Kṛṣya, 45, 160
Kṛṣpa śukra muñeana, 158
Kṛṣpa śukra vandhana, 158
Kṣudrantā, 52, 66
Kṣudrānta, 51, 76, 77, 115-16
Kṣudra rogā, 25
Kṣut, 35, 159
Kṣut, Appetite, 140
Kṣut vaipariya, 159
Kukṣi ruk, 142
Kuṣṭha, skin diseases, 155
L
lakṣaṇa, 126, 145
Lakṣaṇaḥ, 10
Lālī prāseka, 159
lalāṭa, 145
large intestine, pakṣaṇa, 52
laryngotracheal ridge, 55
lauṣaṇa, 67, 70, 71
Lauṣaṇa prāseka, 140
Leucoderma, svitrā, 155
nāḍha, 37
location, sthāna, 77
lema, 88
lema, hairs all over the body, 86
lemakūpamala, 85
longevity, āyus, 122
Levatt Evans, 66
lung, phuṣphuṣa, 52
lusture, prabhā, 122
M
Mādhava Nidāna, 26, 111, 117
Madhukarasa commentary, 111
Madhukarasaṇaḥ, 26
madhura, 38, 59, 67, 71
Madhura avastha pākā, 133
madhurabhāṣa, 37, 58, 60, 66, 75
madhura pākā, 113
madhura rasa, 70, 72, 129
madhura, sweet, 56
madhura vipāka, 70, 71
madhya, 16, 121, 173
Madhyabala, 173
magnesium, 87
mahābhūta, 6, 73
mahānimma, 50
mahāsrota, 39, 50–52, 65, 66, 77, 79, 97, 115, 174
mahāsrota, alimentary canal, 114
majja, 82, 156, 158
mājñādhātu, 85
mājñāgni, 82, 85
mala, 89, 99, 100, 108, 112, 117, 129, 150
mala(s), doṣas, 107
mala parīkṣa, 144
Māla apravṛttī, 134
mālagnis, 28
mala-mitra vibhājana, 134
mala of rakta, 30
mala parīkṣa, 129, 150
malarāṣṭra, 33
malarāṣṭrapāṭha, 87, 131–32
malarāṣṭrakaṭiṭa, stercobilinogen, 152
malarāṣṭha vāyu, 105
Malarāṣṭha vāyu pravartana, 134
maṇasa, 82, 120–21, 155, 157, 174
maṇasabala, 144
maṇasabala, 172, 174–75
maṇasabala parīkṣa, 124, 144
maṇasrūdhātu, 36, 85, 106, 120, 122, 147, 148, 174
maṇisagni, 82, 85
Maṇisakṣaya, 158
maṇisapāṇi, 121, 147
maṇisa rasa, 38
maṇisavaha srotas, 106
Maṇisavahakothana, 157
mana, 9
manda, 93, 174
manda, 45, 46, 94–96
Maṇḍaraṅga gṛanthi, 158
mārdava, 34
mārga, pathway, 77
Marīci, 24, 33
mārūta, 82
Maṣurikā, 157
mAtra, 122
mAtra of sranka, 148–49
medas, 120, 156, 158
medha, 34
medhary, 34
Mcgagak, pudentitis, 155
Medin, 24
medehita, 85
medegni, 82, 85
Meha, 158
Melanin, 152
Menorrhagia, ardgara, 155
mersaly, 47
mithuna, 22
mocusa, 40
Moha, 134, 143, 160
Moha sannyasa, 160
Moieties, 44
motion, karma, 21
mouth, vaktra, 145
mydu, 16
mucin, Kledaka kapha, 60
mucoid excretions from the eye, akpimala, 85,*
mucoid excretions, sleman, 85
mucus, ama, 154
mukha, 100, 101, 104–5
mukhini of srotamsi, 104
Mukhasukata, 159
Mukta Ojha soga, 170
mula dharami, srotas, 174
mula of rasaraha, 174
mulapraktri, 3, 4, 8
mula, root, 124
Mureh, 133, 156
Mureh, sannyasa, 159
murdha, 60
Mushtitanat, 158
mAtra, 86–88, 129

Mlatra parinartana, 160
Mlatra saya, 51
mAtra, urine, 85
myxodema, 46
Mysore, 46

N
nabhasa, 56, 72, 74, 75, 85
nabhia, 50
Nabhidesa dha, 140
nabhia, pancreas, 52
Nhbi vititti, 141
nd, tubes, 77
ndiyeu, 149
Nagarjuna, Bhadanta, 68
nail, nakha, 88
Naivyrikas, 20
nakha, 86
nakha, nail, 88
NLik, blue mole, 155
nasal discharge, nwikama, 85
mitsa, 146
Nwikama, nasal discharge, 85
Nausea, hyalosa, 155
Nasadrauva, 9
neplus-altra, 56
niama, 114
Nidra, 143
Nidra ghata, 159
Nidraha, 160
nisaana, 110
nica, repertory, 77
ni, 30, 130
Nilabha, 141
nil, blue, 153
nimittakarana, 26
nirukti, 100
Nisthivana (Spitting), 140
nitya, eternal, 11, 12
nodana, 15
CONCEPT OF AGNI IN ĀYURVÉDA

non digestion of food, Apakṣaṇa, 133
non eternal, aṇiṣṭa, 11
number, sāṅkhya, 10
Nyāya, 15
Nyāya-bodhiṇī, 11
Nyāya-bodhiṇī commentary, 171
Nyāya-vaiśeṣika, 9, 18, 20, 21, 56, 171
Nyāya-vaiśeṣika system, 15

O
oedema, 46
oesophagus, 61
eja, 102
ejaḥkṣaya, 102
eja, resistance to disease and decay, 122
ejaṅkṛt, 34
ejeṣṭhākṣaṇa, 102
ejeṣṭhākhśa, 102
ejeṣṭhāyat, 102
omentum, vaṅgabahana, 51
Orissa, 72
Oja, 133
ostha ṣaṣṭa, 94
oxidation, daḥana, 24
oxygen, oṣṭhaḥyatejas, 147

P
paṇa, 149
paṇakaṁśa, 45, 48, 49, 85, 89, 90, 96, 108, 117, 119, 122, 147, 172, 174
paṇana, 25, 46, 154
paṇana, digestion, 23, 24
paṇakaṅkarita, 27, 28, 30, 35, 36, 42, 44, 49, 122, 171
paṇayamāṇaḥsaya, 51, 52, 63
Padadēsaśoṭha, 160

pāka, 11, 16–18, 20, 55, 56, 67, 74, 79, 81, 82, 84, 117, 175
pākabhedas, 16
pāka, chemical-action, 15, 21
pākādi karma, 17, 27, 43
pākaja, 16
pāka karma, 24
Pākṣaṅkṣi, 15
Pāka, Proctitis, 141
pākti, 35
pākeṣṭapāta, 38
pākeṣṭanāya, large intestine, 52
pallor, pāṇḍutu, 155
Pāṇa, Scabies, 155
pāna, 122
pānea bhautie, 26, 43
pāneabhisṣa, 26
pāneakarma, 109
pāneamahabhisṣa, 68
pancreas, 39, 40
pancreas, nābhi, 52
pancreozymin 39
Pāṇḍū, 160
Pāṇḍuta, 159
Pāṇḍuta, pallor, 155
Pāṇḍuvioṣaṅjīta, 30
Pāṇḍuvanayā, 157
pantha, passage, 77
paramāṇu, 10, 11, 14, 16, 17, 19, 20, 56
paratoparatos, priority, and posteriority, 10
parīvṛtti, transformation, 23
Pārkatikā, sawing pain, 140
parikṣa, 154
parimāṇa, dimension, 10
<table>
<thead>
<tr>
<th>Page</th>
<th>Index Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>205</td>
<td>Piplu, Port wine marks, 155</td>
</tr>
<tr>
<td></td>
<td>Pīṭa, 37</td>
</tr>
<tr>
<td></td>
<td>Pīṭabhā, 141</td>
</tr>
<tr>
<td></td>
<td>Pīṭabhākā, 158</td>
</tr>
<tr>
<td></td>
<td>Pīṭa, yellow, 153</td>
</tr>
<tr>
<td></td>
<td>Pīṭhara, 17</td>
</tr>
<tr>
<td></td>
<td>Pīṭhara pāka, 16, 20</td>
</tr>
<tr>
<td></td>
<td>Pīṭta, 23-35, 43, 44, 52, 82, 93, 122, 139, 153, 170</td>
</tr>
<tr>
<td></td>
<td>Pīṭta, agni, 66</td>
</tr>
<tr>
<td></td>
<td>Pīṭta (agni-) dharā kala, 42, 47</td>
</tr>
<tr>
<td></td>
<td>Pīṭta and agni, 24</td>
</tr>
<tr>
<td></td>
<td>Pīṭta, bile pigment, 85</td>
</tr>
<tr>
<td></td>
<td>Pīṭtadharā, 43</td>
</tr>
<tr>
<td></td>
<td>Pīṭtadharā kala, 35, 36</td>
</tr>
<tr>
<td></td>
<td>Pīṭṭāntargata, 24</td>
</tr>
<tr>
<td></td>
<td>Pīṭta sthānas, 122</td>
</tr>
<tr>
<td></td>
<td>Pīṭtāvṛddhi, 32</td>
</tr>
<tr>
<td></td>
<td>Pīṭta vyāpāra, 24</td>
</tr>
<tr>
<td></td>
<td>Pīṭha, 132</td>
</tr>
<tr>
<td></td>
<td>Pīṭha, Enlargement of spleen, 155</td>
</tr>
<tr>
<td></td>
<td>Pīṭha, spleen, 30, 51</td>
</tr>
<tr>
<td></td>
<td>Polyuria, bahuṃutra, 108</td>
</tr>
<tr>
<td></td>
<td>Port wine marks, piplu, 155</td>
</tr>
<tr>
<td></td>
<td>Pōṣaka, 83, 84, 97</td>
</tr>
<tr>
<td></td>
<td>Pōṣaka, asthāyi 85</td>
</tr>
<tr>
<td></td>
<td>Pōṣaka, asthāyi dhātus, 101</td>
</tr>
<tr>
<td></td>
<td>Pōṣaka dhātu, 90, 106-8</td>
</tr>
<tr>
<td></td>
<td>Pōṣaka dhātus, asthāyi, 117</td>
</tr>
<tr>
<td></td>
<td>Pōṣaka dhātus, prasūda, 127</td>
</tr>
<tr>
<td></td>
<td>Pōṣakādravas, 45, 59, 105, 174</td>
</tr>
<tr>
<td></td>
<td>Positive health, ārogya, 122</td>
</tr>
<tr>
<td></td>
<td>Post Graduate Training Centre, 46</td>
</tr>
<tr>
<td></td>
<td>Post Graduate Training Centre in Ayurveda, 144</td>
</tr>
<tr>
<td></td>
<td>Post-mortem, 49</td>
</tr>
<tr>
<td></td>
<td>Pōṣa, 81, 83, 84</td>
</tr>
<tr>
<td></td>
<td>Pōṣa dhātus, 97</td>
</tr>
<tr>
<td></td>
<td>Pōṣa dhātu, asthāyi, 117</td>
</tr>
<tr>
<td></td>
<td>Pōṣa, sthāyi, 85</td>
</tr>
<tr>
<td></td>
<td>Pot, 58</td>
</tr>
</tbody>
</table>

16 A.
Povolv, 66
prabhā, 34
prabhākara, to cause lustre, 23
prabhā, lusture, 122
prabhūta, 57
Pracura, 141
prajānana mala, smegma and vaginal discharges, 86
prakāśana, illumination, 23
prakṛtī, 92
prakṛta, 175
prakṛta kapha, 120
prakṛta uṣmā, 149
prakṛti, 7, 151
prakūśita doṣas, 98, 99
prāṇa, 22
prāṇa, elan vital, 122
prāgavaha srotas, 174–75
prāṇavāyu, 60, 146
prāpaka, 55
prāpaka, prathamā pāka, 113
prasāda, 82, 88, 91, 98, 100
prasāda pāka, 83, 85, 106
prasāda, poṣaka dhūtus, 172
Prāṣastapāda, 10
Prasēka, 143, 170
praseka, salivation, 94
prathama pāka, 55, 56
prathama pāka, prāpaka, 113
pratikūrīnirita, 81
Pravāhaṇa, 160, 170
pravāhaṇa, dysentery, 94
pravāhika, 151
pravara, 121, 173
Pravara balā, 173–74
priority and posteriority, paratva-paratva, 10
Prāthā sūla, 140
prāthāktva, separateness, 10
prāthā, 9, 56
prāthāi paramāṇu, 56
Pudentitis meghrapāka, 155
pulse vibration, dhūma, 103
pungent, kaṭu, 56
pūrṇa, 86, 88, 131–32, 151, 153
pūrṇādāra, 51
pūrṇādāra kaṭa, 86, 87
pūrṇādāra, pelvic colon, 52
pūrṇa, faeces, 85
pūrṇaṁśa, 87
pūrṇaṁśa of annaśīla, 87
puruṣa, 4
Put, 141
pūrṇigandha, 50
Pūrṇigandha niḥśvāsa, 159
Pūrṇimaṇa, Gangrene, 155
Pūrṇiṣukra, 158
pylorus, 46, 47
R
rāgaṇkṛt, 34
rage, 111
rajas, 3, 6, 8, 21
rajas, energy, 4, 5, 7, 8
rajas of Sāṃkhya system, 21
rajas, 3, 8
rakta, 11, 30, 31, 82, 97, 101–2, 105, 121, 130, 132, 141, 157, 175
raktadhātu, 85, 88, 89, 102
raktāgni, 82
raktamokṣaṇa, 102
Raktapāṭha, haemorrhage, 155
rakta, red, 153
raktāśaya, 51
raktaśava srotas, 106
raktaśava srotānumiś, 79
raṅjaka, 27
raṅjakāgni, 28, 89
raṅjaka pitta, 79, 80, 89, 90
raṅjana, colouration, 23
rasa, 11, 38, 41, 56–58, 69, 70, 82, 89, 101–2, 105, 129, 155, 175
INDEX

rasa dhātu, 88, 89, 98, 102
rasādī dhātu, 84, 91, 101
rasagni, 82, 85, 89
rasaprapā 81
rasaraka, 174
Rasaśeṣaṇa, 133
rasa svaraṇa, 102
rasavaha srotas, 106
rasavāhinī, capillary, 77
rasa tannūtra, 8
rasāṇyāha, lymphatic, 105
rasāṇyani, 77, 99, 105
Rashes, ketha, 155
rayi, 22
realis, tattoo, 9
red-bone-marrow sarakta-medas, 90
redish, aruṇa, 153
red, raka, 153
repertory, niketa, 77
resistance to disease and decay, ejas, 122
respiration, ucehoṣa-naḥṣiṣa, 175
retas, semen, 124
Ring worm, dadru, 155
rogādhiśhāna, 99
Rogiprajanana, 156
Romahara, 143
root, mula, 124
rūkṣa bhēja, 174
Rukṣatvaka, 157
rūpavarna, 30
rūpa, 6, 7, 144
rūpa, colour, 10
rupa-tannūtra, 8
S
śabda, 6
Śabda pravala udgaṇa, 139
śabda-tannūtra, 8
Śabdasati ( Noisy ), 141
sadana, 112, 143
Śādā, asthenia, 155
śādaka, 27
śādakāgni, 28
śafrasas, 75, 85
sahaja, 120
sahajakṛmis, 116
Sahaja kṛmis, intestinal flora, 114
sajāṭya, 74
sajāṭya tejas, 17, 171
sajāṭya tejas añśas, 175
śākhsirita kāmalī, 32, 33
śakṛt, 86, 87, 121, 131, 151
śakṛt, feces, 65
Śakṛt, stool, 129
saliva, ṣṭhiṣana, 60
salivation, prateka, 94
sama, 94
samaṇi, 96
samaṇa, 65, 66, 148
Samāna vāyu, 61, 62, 93
Sambhūna, 141
sāṃghātaḥbhaḍa, 25
sāṃgraḥa, 43, 44, 68, 76
Sāṃhatattva, 150
Sāṃhatattva, consistency, 151
Sāṃhīti, 24, 33, 35, 82, 126, 130
sāṃhīti granthas, 83, 84, 91, 98, 106, 114, 131, 144, 153, 171
Sānākhyā, 3, 5, 56, 170
Sānākhyā Kārikā, 3
sānākhyā, number, 10
Sāmkṣea, 156
Sāṃśāpa, 158
sāṃśāpta, 97
Sāṃṛṭasāṃṛṭa, 77
śāmya, 4
śāmyāvasa, 4
šāmyoga, 11, 14, 21, 81
šāmyoga, conjunction, 10
śaṅgṛhaṇa, 146
Sancayadupadesana, 142
Śandhi śula, 158
INDEX

sṛṣṭa mūtra, 130
Stalimitya, 143
Stambha, 134, 157
Starling, 62, 66
stercobilinogen, 31
stercobilinogen, malarājyaka pīṭṭa, 152
sthāna, location, 77
sthāna saṁśraya, 107
sthāna of rakta, 79
sthānaka dhātus, 117
sthānaka pīṭṭa, 108
sthānaka vāyu, 145
sthāyī-dhātus, 82, 84, 85, 108, 117, 118, 122, 174
sthāyī mānas dhātus, 174
sthāyī, paśya dhātu, 117
sthāyī rakta dhātu, 89, 90
sthāyī raśadhātus, 89, 105
śṭhīna, 146
śṭhīna, saliva, 60
śṭhīna, spitting, 143
śṭhula, 97
śṭhulabhūtas, 8
Śṭhulamāla paroja aruṇīkā, 156
Śṭhulānta, 51
Śṭhulata, 158
Stimita Kṛṣṇa, 140
Stoka, 142
Stomatitis, śīva-pāka, 155
stool, śakṛt, 129
strength, bala, 122
Striśvahāraśaṇa, 143
strong, balīn, 145
succus-entericus, 42
Sūsūvahastvedana, 143
śūla, 94, 130, 134, 160
sulphide 64
Śūkla nerta, 158
śūkra, 82, 156, 158
śūkradḥātu, 85
śukrāṇi, 82, 85
Śukra saṁśaya, 188
śūkṣma, 17
Śuktapāka, 112–13, 140
Śuktapāka, Fermentation, 133
śuktaiteva, 112–13
śuṣka, 152
śuṣka, Dry, 141
sūryaloka, 12
sūrya pāka, 11
Suṣṭa toaṅk, 157
Suṣṭi, 156
Śuṣka jīva, 160
Suṣruta, 22, 26, 28, 29, 33, 35, 42, 47, 51, 52, 60, 68, 72, 73, 90, et passim.
Suṣruta Saṁhitā, 25, 28
sūtrashāna, 24, 82
Suṭraṇat niśī, 160
svāseha, 41
Svarabheda, 143
śvāsa, 149, 170
śvāsa, dyspnoea, 94, 140, 146
Śvāsakṛṣeṇa, 159–60
śvāsa pravṛṣṭa, 149
svaṣṭha, 149
sveda, 130, 143, 148, 158
sveda, sweat, 85
Śveṭa purīṣa, 141
svetavaras, 131
śveṭa, white, 153
Śvitra, Leucoderma, 155
sweet, madhura, 56
sweat, sveda, 85
Śyāna, Brown, 141
Śyāna, grayish blue, 153
śyāna pīṭa, 130

T

tañjasa, 72
Tālukṣaṇa, 94, 156
takra, 116
tamas, 3–5, 7, 8, 156
tāmasāhaṁkāra, 56
Tamas, faintness, 155
Tamasika ahañkāra, 5
Tandra, 143, 159
Tandrā, drowsiness, 155
tanmatra, 6-8
tanmatric system, 8
Tanuk chardi, 139
tanu, 152
Tanu praseka, 140
Tanu, thin, 141
tantumat, 152
Tantumat puriṣa, 141
tap, 23
tap alsoreye, 23
tap dāhe, 23
tapana, 175
tapana, heat production, 23
Tarkasañgraha, 11
tattvas, 3
tattvas, real, 9
tejas, 6-12, 16, 17, 21, 56, 170
tejas, agni, 15, 20, 21
tejas, energy, 122
tejasākṛt, 34
tejas of the sky, 12
tejasaparamāṇu, 9, 11
tejas īrīra, 12
temperature, śanopādana, 175
thyroxin, 90
țika, 25
țikṣa, 30, 93
țikṣṇāgni, 46, 94-97
țikṣṇata, 43
țitka, 67
Tīlaka, Black mole, 155
tilapiṣṭa, 131
tilapiṣṭa, gingili cake, 131
tilapiṣṭanibha varas, 33
țiryaγgamana, 13
Tīvra, 157
to cause lustre, prabhakara 23
Toda, 134
Tonsillitis Gālaśuṇḍika, 155
Top, 58
Touch, sparśa, 10
Tovey, F. L., Dr., 47
transformation, parāvytti, 23
transient, anīśa, 12, 57
trīśoja, 92, 96
trīguna, 3, 4
Trīka ruk, 142
trīṣ, 35
trīṣṭi, 129, 143
Trīṣṇā, 159
Trīṣṇā, Thirst, 140
Trī, 133
Trī, thirst, 143
tryaṇakas, 10, 18
tryptophen, 88
trypsin, 48, 49
tubes, nāḍī 77
Tudana, 157
tulāya, 43
Tumour, arūbūda, 155
tunica intima, 104
Tvak, 157
Tvak gaurava, 158
Tvak-Varna-parivartana, 160
tyrosin, 88
U
uṣṭhava-ṛhita, respiration, 175
udāna, 146
udara gaurava, 160
udaragaurava, heaviness of abdomen, 94
udaraguha, 50
udara roga, 47
udara trāśita bhūga adhāna, 159
udara vīṇā, 142
udāvarta, 94
<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>vega, velocity</td>
<td>10</td>
</tr>
<tr>
<td>vcinules</td>
<td>104</td>
</tr>
<tr>
<td>veins, śrās</td>
<td>104</td>
</tr>
<tr>
<td>velocity, vega</td>
<td>10</td>
</tr>
<tr>
<td>vibhāga, 11, 14, 21, 81</td>
<td></td>
</tr>
<tr>
<td>vibhāga, disjunction</td>
<td>10</td>
</tr>
<tr>
<td>vibhaktagahanagātātva</td>
<td>120</td>
</tr>
<tr>
<td>vibhu, continuum</td>
<td>6, 56</td>
</tr>
<tr>
<td>vibhu, infinite</td>
<td>56</td>
</tr>
<tr>
<td>vidadgāhāra</td>
<td>41</td>
</tr>
<tr>
<td>Vidāhā, 140-41</td>
<td></td>
</tr>
<tr>
<td>vidradhi</td>
<td>117</td>
</tr>
<tr>
<td>Vidradhi, abscess</td>
<td>155</td>
</tr>
<tr>
<td>vaidamya</td>
<td>117</td>
</tr>
<tr>
<td>Viśayarakṣita, 25, 111-12</td>
<td></td>
</tr>
<tr>
<td>viṣajīva, 17, 74</td>
<td></td>
</tr>
<tr>
<td>viṣajīva tejas, 17, 105, 171-72, 175</td>
<td></td>
</tr>
<tr>
<td>viṣajīva tejas, oxygen</td>
<td>147</td>
</tr>
<tr>
<td>viṣajala</td>
<td>152</td>
</tr>
<tr>
<td>viṣajala, Slimy</td>
<td>141</td>
</tr>
<tr>
<td>Viśāśnabhikṣu, 6</td>
<td></td>
</tr>
<tr>
<td>viśēpāna</td>
<td>102</td>
</tr>
<tr>
<td>vilakhāga guna</td>
<td>73</td>
</tr>
<tr>
<td>vilakhāga-tejaḥ-sāmyoga, 11, 17</td>
<td></td>
</tr>
<tr>
<td>viśāka, 55-57, 68, 69, 71, 172</td>
<td></td>
</tr>
<tr>
<td>Viplita, 141, 153</td>
<td></td>
</tr>
<tr>
<td>Viśāpa prajanana</td>
<td>156</td>
</tr>
<tr>
<td>viśya, 56, 57</td>
<td></td>
</tr>
<tr>
<td>viṣa, 110, 112</td>
<td></td>
</tr>
<tr>
<td>viṣam, 112</td>
<td></td>
</tr>
<tr>
<td>Viśamūgni, 94, 95, 97, 140</td>
<td></td>
</tr>
<tr>
<td>Viśarpā, 157</td>
<td></td>
</tr>
<tr>
<td>Viśarpā, cryaipecas</td>
<td>155</td>
</tr>
<tr>
<td>Viṣaya-tejas</td>
<td>12</td>
</tr>
<tr>
<td>viṣīsta</td>
<td>43, 45</td>
</tr>
<tr>
<td>Viśhūṭaka</td>
<td>157</td>
</tr>
<tr>
<td>viśragandaḥa</td>
<td>30</td>
</tr>
<tr>
<td>Viśṭambha</td>
<td>160</td>
</tr>
<tr>
<td>Viśṭambha, constipation</td>
<td>141-42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>viśra 48,</td>
<td></td>
</tr>
<tr>
<td>Viṭ saṅga, (Retention of faeces)</td>
<td>142</td>
</tr>
<tr>
<td>vinandha</td>
<td>160</td>
</tr>
<tr>
<td>Viśarṇata, 156</td>
<td></td>
</tr>
<tr>
<td>Viśidhāṣitapītiya</td>
<td>82</td>
</tr>
<tr>
<td>viśo, 48</td>
<td></td>
</tr>
<tr>
<td>ivoṣa, 117</td>
<td></td>
</tr>
<tr>
<td>viṣadhārayī</td>
<td>68</td>
</tr>
<tr>
<td>viṭka, kid-neys</td>
<td>51, 52</td>
</tr>
<tr>
<td>viśādhikṣamataḥ</td>
<td>120, 172</td>
</tr>
<tr>
<td>viśākarana</td>
<td>23</td>
</tr>
<tr>
<td>viṣīna, 146</td>
<td></td>
</tr>
<tr>
<td>viṣīna víyus</td>
<td>98</td>
</tr>
<tr>
<td>Viyaṅga, Freckless</td>
<td>155</td>
</tr>
<tr>
<td>viṣūparā sakti</td>
<td>122</td>
</tr>
<tr>
<td>viṣāyama, 120, 144-45, 149</td>
<td></td>
</tr>
<tr>
<td>viṣāyāmasakti, 120, 149, 154, 172, 174</td>
<td></td>
</tr>
<tr>
<td>Viṣomavati</td>
<td>10</td>
</tr>
<tr>
<td>viṣupatti</td>
<td>100</td>
</tr>
</tbody>
</table>

**W**

<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warts, kita</td>
<td>155</td>
</tr>
<tr>
<td>waste products mallas</td>
<td>98</td>
</tr>
<tr>
<td>wasting, kyāṅgata</td>
<td>155</td>
</tr>
<tr>
<td>waxy excretions from the ear karna-mala</td>
<td>85</td>
</tr>
<tr>
<td>weakness of the body, gūtra sadana</td>
<td>94</td>
</tr>
<tr>
<td>Weiss, 49</td>
<td></td>
</tr>
<tr>
<td>White, śoṣa</td>
<td>153</td>
</tr>
<tr>
<td>Worms, kṛmis</td>
<td>154</td>
</tr>
</tbody>
</table>

**Y**

<table>
<thead>
<tr>
<th>Term</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>yaktṛ, 30, 74, 79-82, 88, 132</td>
<td></td>
</tr>
<tr>
<td>yellow, pita</td>
<td>153</td>
</tr>
<tr>
<td>Yogāṇandanaśtha</td>
<td>68</td>
</tr>
<tr>
<td>Yogaratnākara, 122, 129</td>
<td></td>
</tr>
<tr>
<td>Tagavārtikā</td>
<td>6</td>
</tr>
<tr>
<td>Tukṣṭikṛta</td>
<td>120</td>
</tr>
</tbody>
</table>
Name: B. Nords Age: 22 yrs.

LEGENDS

A - Record of the previous night while going to bed
B - Morning while leaving the bed
C - Before exercise
D - At the time of attaining orthostatic

- - Pulse
- - Temperature
- - - - Respiration
Annoyed by Age - 25 yrs

A. Sensitivity to previous night's drink
B. Tolerance after leaving the bed
C. Headaches on arising
D. All the time on obtaining to Sooth

<line_graph>

- X = Touched Here
  - X = Sensation

<axis_labels>

[graph_details]
Name: Babu - Age: 4 yrs.

LEGENDS

A - Recorded on the previous night while going to bed.
B - Morning while leaving the bed.
C - Before exercise.
D - At the time of obtaining results of

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulse</td>
<td>92</td>
<td>102</td>
<td>100</td>
<td>98</td>
<td>96</td>
</tr>
<tr>
<td>Temp.</td>
<td>98</td>
<td>97</td>
<td>97</td>
<td>96</td>
<td>95</td>
</tr>
<tr>
<td>SpO2</td>
<td>99.9</td>
<td>99.8</td>
<td>99.7</td>
<td>99.6</td>
<td>99.5</td>
</tr>
</tbody>
</table>

DATE

DAILY ROUTINE

- 6:00 AM: Exercise
- 7:00 AM: Breakfast
- 8:00 AM: School
- 4:00 PM: Afternoon snack
- 6:00 PM: Dinner
- 8:00 PM: Bedtime
Name: V.S. Anantkhi Age: 24 yrs

LEGENDS

A: Record on the previous night while going to bed.
B: Morning while leaving the bed.
C: Before exercise.
D: At the time of attaining ardhaasakhi.

* * Pulse  * * Temperature  * * Respiration