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Contents

Reconciliation of Different Philosophical View-points : An Attempt Made by Jaina Philosophers	71
<i>Yajneswar S. Shastri</i>	
Thakkura Pheru and the Popularisation of Science in India in the Fourteenth Century	86
<i>Sreeramula Rajeswara Sarma</i>	
Main Characteristics and Achievements of Jaina School of Ancient Indian Astronomy	96
<i>S. S. Lishk</i>	
Beyond the Endless Dusts	102
<i>Leona Smith Kremser</i>	
Four Panca-Tirthikas from Bhagalpur	104
<i>Ajoy Kumar Sinha</i>	
Books Received	106
<i>Plates</i>	
Jaina Scholars Felicitated	71
Panca-Tirthikas from Bhagalpur	105

Books Received

JAINI, MANAK CHAND, *Life of Mahāvīra*, The Academic Press, Gurgaon, Haryana, 1985. Pages xix+91. Price Rs. 45.00.
Offset reprint of earlier edition published in 1908.

MUNI CHANDRAPRABHASAGAR, *Mahopādhyāy Samayasundara : Vyaktitva evam Kṛtitva*, Kesaria & Company, Calcutta, 1986. Pages viii+497. Price Rs. 40.00.
A thesis on Mahopadhyay Samayasundara : the Man and his Contribution.

MUNI CHANDRAPRABHASAGAR, *Prākṛt Sūkti Koṣa*, Jayasri Prakashan, Calcutta, 1985. Pages 16+295. Price Rs. 25.00.
Collection of some Prakrit verses with Hindi translation from books like *Vajjālagga*, *Uttarādhyayana*, *Mokṣa Pāhuḍa* etc.

TIWARI, MARUTI NANDAN PRASAD, *Elements of Jaina Iconography*, Indological Book House, Varanasi, 1983. Pages iv+164. Price Rs. 200.00.
Gives a detailed and critical assessment of the origin and development of Jaina Iconography. With plates and bibliography.

UPADHYAY, DEVACANDRA, *Vicār Ratnasār*, Jayasri Prakashan, Calcutta, 1985. Pages 8+127. Price Rs. 10.00.
It contains Hindi translation of the original book by B. L. Nahata. Written in dialogue form it answers doubts raised concerning Jain religion and philosophy.

Reconciliation of Different Philosophical View-points—An Attempt Made by Jaina Philosophers

YAJNESHWAR. S. SHASTRI

Jainism is one of the three major religions of India. Since 2500 years, it has made manifold contributions to human society through its literature, religion and philosophy. On accounts of its liberal, catholic and reciprocal attitude towards Brahmanism and Buddhism, it is the only non-Vedic creed that has survived to the present day in India out of many that are preached in the 5th century B.C. in opposition to the Vedic rituals.

Principle of non-violence (*ahimsā*) is the dominant trend in Jainism. Lord Mahavira emphasized the doctrine of *ahimsā* towards every living beings in practical life. This principle, embodied in the respect for the life of others was transformed by the Jaina philosophers at the intellectual level into respect for the views of others. This attitude of toleration, which is hallmark of this system inspired Jaina philosophers to make a unique attempt to harmonise, reconcile, all conflicting view-points in the field of philosophy. Learned Jaina thinkers thought that various systems of philosophy being dogmatic in their assertions, created bitterness amongst the followers of different philosophical schools. The age-old philosophical disputes and controversies between the various schools of thought are on account of their conditional assertion in regard to philosophical propositions. On account of this rigid attitude each school asserts its view is to be true and thus, philosophers of these schools do not really try to understand the view-points of others, which resulted in hatredness and rivalry towards other systems of thought. This is also a kind of violence in the realm of thought. To avoid this kind of intellectual violence, Jaina thinkers adopted a unique, synthetic, philosophical methodology, technically known as *anekāntavāda* (i.e. doctrine of manisidedness of reality), which consists of dual doctrine viz. *ṇayavāda* (the doctrine of different view-points) and *syādvāda* (the theory of relativity of truth) which is also known as—*saptabhaṅgī* (the seven-fold predication). This doctrine is accepted to co-ordinate, unify and harmonise the divergent, seemingly disagreeing philosophical view-points into a practicable whole. It is better to have clear idea about this great doctrine which is misunderstood and misrepresented by many scholars, before we start our actual thesis.

History of Jainism tells us that, although scratches of *anekānta* is found in Mahavira's teachings, its all round development took place only when

Sanskrit language came to be used by the Jaina writers. This doctrine, being itself a synthetic philosophy presupposes the existence of various well-developed philosophical schools on the Indian soil. In the works beginning from *Āṅgas* and the *Cūrṇis* in Svetambara literature and in *Pravācanasāra* and other works of Digambara literature, there is no attempt at the synthesis of *anekānta* with the Upanisadic monism and other currents of Vedic thought. This attempt to reconcile different philosophical view-points is found first in a slight degree in the works of Siddhasena Divakara (Circa 5th century A.D.), and Samantabhadra (7th century A.D.). In the *Sanmatitarka* (Prakrit text) of Siddhasena a distinct synthesis of the doctrines of Bauddha, Sankhya and Nyaya-Vaisesika is found.¹ But reconciliation of some philosophical schools such as Brahmadvaita, Sabdadvaita and others are not found in the Jaina Prakrit literature. In the subsequent Jaina Sanskrit literature an attempt is made to reconcile the doctrines of all these philosophical systems. This unique attempt, started by Siddhasena and Samantabhadra, is found clearly on a large scale in the works of Haribhadra (8th century A.D.), Akalanka (8th century A.D.), Vidyānanda (9th century A.D.) and Abhayadeva Suri (10th century A.D.). The same attempt to synthesize all these systems is carried out on an extensive scale by Hemacandra (12th century A.D.), Mallisena (12th century A.D.) Vadideva Suri (13th century A.D.), Gunaratna Suri (15th century A.D.) and Yasovijaya (17th century A.D.).

Jaina theory of *anekāntavāda* is really an offshoot of *vibhajyavāda* (a theory of analysis and differentiation) of Buddhism.² Literally, the term *anekāntavāda* means the theory of the manisidedness of reality. This term is used in two senses in the Jaina philosophical literature. First of all, this term denotes the Jaina philosophical doctrine i.e. the theory according to which reality is manifold and each entity consists of manifolds and modes of innumerable aspects. Reality is one and many. Secondly, it indicates the Jaina philosophical method which allows for reconciliation and integration of conflicting philosophical views.³ In the first place, it claims that everything in the world is complex in its structure and as such has many aspects. All kinds of sources of valid knowledge, mediate and immediate, prove only one thing that every object has innumerable

¹ *Sanmati-Tarka*, with a critical introduction and an original commentary by Pt. Sukhlal Sanghavi and Pt. Becharadas Doshi, ed. Pt. Dalsukh Malvania, Pub : Sri Jaina Svetambara Education Board, Bombay, 1939, p. 134 (Introduction).

² *Nyayavatara-Vartika-Vrtti* of Santi Suri, Introduction, ed. Pt. Dalsukh Malvania Pub : Bharatiya Vidya Bhavan, Bombay, 1949, pp. 11-35.

³ *The Central Philosophy of Jainism*, Bimal Krishna Matilal, Pub : L. D. Institute of Indology, Ahmedabad, 1981, pp. 24-25.

aspects. Each entity is one in many. We are all imperfect human beings. We cannot comprehend an object in its totality and our view of it is limited. We are really wrong when we emphasize and say that our view is perfect and final. An object or reality is to be understood in its totality. To view a thing, thus, not only from a single point of view, but to examine it from all possible points of view is the real meaning of the doctrine of *anekāntavāda*.

The notion of reality is a characteristic example of Jaina *anekāntavāda*. Reality (substance) consists of production, destruction and permanence.⁴ A substance is permanent in respect of its essential qualities and also subject to generation and destruction in regard to its changing modifications. When a substance, conscious or unconscious originates without leaving its own nature, it is called origination. Destruction is loss of existence in a thing that had it before. Permanence is the essential characteristic of substance, which remains unchanged in both the conditions viz, in origination and decay. To cite an example, a jar, originates from clay without leaving the nature of clay, clay leaves its former mode or shape when it becomes a jar, and the essential nature of clay remains unchanged in both the conditions. These three, differ in their nature but they are not mutually independent. Change and permanence, modes and substance exist together, neither is possible without the other. But permanence and change are not applied to a thing in one and the same capacity but in different capacity.⁵ There is no contradiction involved and no violation of law of contradiction in applying opposite predicates to the same thing in different capacities, because, they are applied to its different aspects such as matter, state, space and time.⁶ It is seen that mutually contradictory elements can exist in one and the same thing in different capacity such as, the same man is a father to his son, son to his father, husband to his wife, and so on.⁷ In fact, the positive and negative aspects must both belong to everything. If only the positive aspects belong to it, there would be nothing to distinguish it from another and all things would become one 'sat'. If instead, only the negative aspects belong to a thing,

⁴ *Tattvarthasutra*, V-29, Part-I, ed. H. R. Kapadia, Pub : J. S. Javeri, Bombay, 1925.

⁵ *Syadvadamanjari* (S.M.), XIV, ed. : A. B. Dhruva, Pub : Bombay Sanskrit and Prakrit Series, 1933, p. 92.

⁶ (a) *Ibid*, XIV, p. 92.

(b) *Aptamimamsa-Vrtti* by Vasunandi, 47 ; Devagama-Vrtti, ed. and trans. K. B. Nitve, Kolhapur.

⁷ (a) *Sarvarthasiddhi*, V-32, Pub : K. B. Nitve, Kolhapur, Sake 1839, p. 17.

(b) *Tattvartharaja-Vartika*, I-6, ed. Gajadharlal Jain, Pub : Sanatana Jaina Granthamala, Kasi, 1915, p. 26.

it would have no intrinsic nature.⁸ So, manisided characteristic of substance, is the basis of *anekāntavāda*.

Jaina, thinkers following this doctrine of manisidedness of reality, state that philosophers of other schools of thought emphasize only one aspect of reality—describing it as either one or many, real or unreal, universal or particular, thus represent partial truth and the *anekāntavāda*, according to which reality is neither absolutely real nor unreal, neither one nor many, neither particular nor universal, neither identical nor different, but both real and unreal, one and many, particular and universal, unity and diversity, from different points of view, reveals complete truth.⁹ To obtain complete truth, there is no other way, except admitting the *anekānta* path. It reconciles and assimilates all the partial view-point of other schools of thought. The word *anekānta* itself indicates its style of reconciliation. This word makes it very clear that ‘many’ is not diametrically opposite of ‘one’, for many includes one. It means different one-sided views (*ekānta*) are, thus, only constituents of the *anekānta* only. It is a philosophy of synthesis and emerges out of the examination of the partial truths of other systems.¹⁰

Reconciliation of divergent philosophical view-points is not easy task and it poses many problems. To solve this difficult problem, Jaina thinkers have developed *nayavāda* in which views of different philosophical systems are individually accommodated and *syādvāda* which reconciles all of them giving complete picture of reality. Both these doctrines are the two faces of the same coin viz. *anekāntavāda*. ‘As a philosophical methodology, it takes its flight on the two wings of *nayavāda*, the doctrine of stand-points and *saptabhaṅgī*, the doctrine of seven-fold predication.’¹¹

Philosophical understanding is generated by both *pramāṇas* and *nayas*.¹² *Syādvāda* reveals the thing as a whole, thus, it is called *pramāṇa-vākya* (*sakalādeśā*) while *naya* reveals only a portion of it (*vikalādeśā*).¹³ A *pramāṇa* is like an ocean while *nayas* are simply like ocean-water kept

⁸ S. M., XIV, p. 91.

⁹ *Saddarsanasamuccaya-Tika* by Gunaratna Suri, ed. Mahendrakumar Jain, Pub : Bharatiya Jnanapith, Kasi, 1969, p. 34.

¹⁰ *Sodasaka* of Haribhadra, XVI-13.

¹¹ *Jaina Theories of Reality and Knowledge*, V. U. Padmarajah, Jaina Sahitya Vikasa Mandal, Bombay, 1963, 0.173.

¹² *pramanayanayairadhigamah*, Tattvarthasutra, I-6.

¹³ (a) *Laghiyastraya—Srutopayogapariccheda*, 12, *Laghiyastrayadisangraha*, ed. Pt. K. B. Nitve, Pub : M. D. Jaina Granthamala Samiti, V. S. 1972, 0.83.

(b) *Pramananayatattvalokalankara* (PNT), IV-44, ed. H. S. Bhattacharya, Pub : Jaina Sahitya Vikasa Mandal, Bombay, 1967, pp. 350-354.

in different pitchers. A *pramāṇa* can be reached through aggregation of all the constituent stand-points.¹⁴

Naya means the points of view which gives only partial truth about reality.^{15A} When we present only one aspect of manisided reality supressing others, then it falls under the *nayavāda*, the doctrine of view-points. Traditionally, the Jainas mention seven or six kinds of *nayas*, taking into account, the different philosophical views, prevalent in ancient India. They are : *naigama*, *saṁgraha*, *vyavahāra*, *ṛjusūtra*, *śabda*, *samabhirūḍha* and *evambhūta*.^{15B} Again these *nayas* are fundamentally divided into two main categories viz. *dravyāstika*, according to which substance is the fundamental reality and the modifications are nothing apart from it and *paryāyāstika*, which states that, modifications are the only reality, the substance being nothing apart from them.¹⁶ The first one may be called, view-point of generality and the second one, the view-point of particularity. These different kinds of *nayas* or standpoints represent views of different schools of thought, which are partially true. *Naigama naya* recognises both the universal and the particular. Nyaya-Vaisesikas are the followers of this *naya* because they recognise both the universal and the particular, in an isolated and non-relative sense. *Samgraha naya*, upholds the universal only. Advaitins and Sankhyas, represent this *naya*, because former merges all particulars in the universal, 'sat' and the latter to the cause *prakṛti*. *Vyavahāra* is a point of view of commonsense view, which does not penetrate below the surface of things. The Materialists (Carvaka) way of looking at things is that of *vyavahāra*. *Rjusūtra* refers to changing modes only and states that reality is always in constant flux. Buddhist view of *kṣaṇabhīṅagavāda* is very good example of this *naya*. *Sabdanaya* accepts single object denoted by variants of synonymous terms. *Samabhirūḍha* goes a step further and accepts different meanings of synonyms based on their etymology. *Evambhūta* takes the word signifying an object, which possesses the action, connoted by etymology. The Grammarians and the Mīmamsakas represent the *śabda* and other *nayas*, because they emphasize the grammatical, etymological importance of words.¹⁷ In this way, *nayavāda* comprises views of all others. These views are right in

¹⁴ *Tattvartharaja-Vartika*, I-6, pp. 24-27.

^{15A} *ekadesavasisto artho nayasya visayomatah*, *Nyayavatara*, 29, ed. P. L. Vaidya, Pub : Jaina Svetambara Conference. Bombay, 1928, p. 64.

^{15B} *P.N.T.*, VII-7-33, pp. 514-528 and also See *T.S.* I-34.

¹⁶ *Sanmati-Tarka*, I-7-21.

¹⁷ (a) *S.M.* XXVIII, 161-165.

(b) *Adhyatmasara, Jinamatastuti*. 6, ed. Muni Nemicandra, Pub : Sri Nirgrantha Sahitya Prakasan, Delhi 1976, p. 429.

their own respective spheres but if they are taken in absolute sense they are wrong and become fallacious (*durnaya*).¹⁸

The doctrine of *syādvāda* or *saptabhāṅgī* entertains within its fold every possible theory. It welcomes in it, all *nayas* and thus is like a necklace of pearls wherein every system has its proper place like a pearl.^{19A} In this doctrine discordant notes are blended so as to make a perfect harmony. As rivers mingle in the ocean, so do all the systems mingle in the *syādvāda*.^{19B}

The doctrine of *syādvāda* is nothing but systematic description of manisided nature of reality in words. Jaina thinkers claim that no philosophical proposition can be true if it is simply asserted without condition. If it is asserted, then, it becomes onesided (*ekānta*) view. It also excludes other rival possibilities. To avoid this shortcoming, *syādvāda* makes use of the convenient particle '*syat*' (=in certain respect) in all the seven varieties of a particular predication. The particle '*syat*' indicates the manisided nature of a proposition. It is a doctrine of relativity of truth, according to which affirmative and negative statements can be made in regard to one and the same thing in the following way :

1. Relatively the pot does exist.
2. Relatively the pot does not exist.
3. Relatively the pot does exist and does not exist.
4. Relatively the pot is indescribable.
5. Relatively the pot does exist and is indescribable.
6. Relatively the pot does not exist and is indescribable.
7. Relatively the pot does exist, does not exist, and is indescribable.²⁰

Each philosophical proposition is subjected to this sevenfold formulation in order to remove the danger of onesidedness (*ekāntavāda*). This is also called *saptabhāṅgī*, because, it consists of seven kinds of expression regarding one and the same thing with reference to its particular aspects,

¹⁸ (a) Sanmati Tarka I-13, p. 18.

(b) *P.N.T.*, VII-2, p. 511.

(c) *Aptamimamsa*, 108, ed. Pt. Giridharlal Jain, Pub : Siddhanta Prakasini Sanstha, Benares, 1914.

^{19A} *S.M.*, XXX, p. 174.

^{19B} *Dvatrimsika*, IV-15, *Dvatrimsad Dvatrimsika*, ed. P. Sushilavijaya Gani, Pub : Vijayalavanayasurisvara Jnanamandir, Botad, Saurashtra, V.S. 2012, p. 10.

²⁰ (a) *S.M.*, XXIII, p. 142-143.

(b) *P.N.T.*, IV. 13-21.

one by one, without any inconsistency, by means of affirmation and negation, made either separately or together.²¹ This is also called '*anekāntavāda*', since it expresses the object that possesses many characteristics.²²

The Jainas upholding, this doctrine of *anekāntavāda*, state that the theories of other schools of philosophy being but partial views of the comprehensive reality are naturally at variance with each other, and that they would find their final reconciliation in the *syādvāda* or *anekāntavāda*. On the basis of this doctrine, therefore, the Jainas try to reconcile some of the fundamental doctrines of non-Jaina schools of thought, such as, the doctrine of causality, the problem of universal and particular, the problem of reality, the doctrine of self, the theory of sounds and so on.

Siddhasena Divakar, probably, is the first man in the Jaina philosophical history, who has laid down the foundation stone of reconciliation of other schools of thought by synthesizing the Sankhya, the Buddhist and the Vaisesika's views with that of *anekāntavāda*. He observes that the system of philosophy taught by Kapila is a representation of the 'only substance exists' view-point and that which is taught by the Buddhist is an exposition of 'only modification exists' view-point. All though Vaisesikas employ both view-points, but they employ each independently of the other. So, all these view-points are partial, and can be reconciled with the help of *anekāntavāda*.²³

The doctrine of causality is one of the important doctrines in the development of the early philosophical thoughts in India. Most probably, taking the hint from *Nāsadiyasūkta* of the *Rgveda*,²⁴ about the origin of the Universe, different systems proposed diametrically opposite views. The Sankhya philosophers upholding the *satkāryavāda* claim that, the effect pre-exists in the cause before its production, while the Naiyayikas admit *asatkāryavāda*, according to which, effect does not exist in the cause before its production. Effect is a new beginning. The Sankhyas believe in the real transformation of *prakṛti*. Origination is explained as the unfolding of the hidden potentialities. The Naiyayikas hold that only such things come into existence as did not exist before. Some of the Buddhists uphold the same view and state that change is order of nature.

²¹ (a) *Tattvartharaja-Vartika*, I.6, p. 24.

(b) *P.N.T.*, IV-14.

²² *S.M.*, V, pp. 13-20.

²³ *Sanmati-Tarka*, III. 48-49.

²⁴ *Rgveda*, X 129, *Rksuktavaijayanti*, ed. Pt. Velankar, Bombay.

The Advaita Vedanta maintains that, there is no real change in the cause, change is only an appearance (*vivarta*). It is the cause which was reality and that what is called the effect is indescribable i.e. neither pre-existent nor not pre-existent and thus, ultimately false.

The Jainas try to reconcile, these opposite views on causality by applying *anekānta* method. They point out that the Sankhya view is correct in some respects, for, so far as the substance underlying the effect and the cause is concerned, it is the same ; it persists in its immutability through the cause and the effect, which are two modes of its expression, therefore, in a very real sense, the effect is existent even before its emergence as an effect. On the other hand, effect is also a new creation (as Naiyayikas and some Buddhists hold) in some respects, because it has its own significance, own practical efficiency and all those features which pertain to a real effect were not in evidence before its emergence.²⁵ The Jainas, thus, admit the partial validity of both the Sankhya and Nyaya-Vaisesika views. From the stand point of its underlying substance, the effect exists in the cause before its production, from the consideration of the effect as a mode, it is new creation, not existent before its actual production. To cite an instance, a 'jar' is separate from as well as identical with the cause i.e. 'clay'. It is identical with clay because, clay has a potentiality to produce a 'jar' and 'jar', when it is produced, is not without the essence of clay. It is also different, because, before its production as a 'jar', there was merely clay and the 'jar' was not in a manifested form. It has no practical efficiency to carry out work as a 'jar'. Thus Siddhasena rightly pointed out that, the Nyaya-Vaisesikas and the Bauddhas are right in so far they point out the faults and fallacies of the Sankhya view of causality and the Sankhyas are correct in so far as they criticise the Nyaya-Vaisesikas and Bauddhas. But when these two views of causality are adjusted together in compliance with the *anekānta* method, the result will be the true insight.²⁶

Even Advaita vedantins' views of causality is onesided and it can be reconciled with the help of *anekānta*. It is true as Vedantins hold that effect cannot be described in language, it is inexpressible. But indescribability does not mean, unreal or false. Indescribability of the effect is not absolute, it is indescribable only in some respects. Effect is neither—absolutely real nor absolutely unreal. It is both real and unreal.²⁷

²⁵ *Sanmati-Tarka*, I.27, pp. 29-30.

²⁶ (a) *Ibid.*, I.

(b) *Anekantavada*, Harisatya Bhattacharya, Pub : Jaina Atmananda Sabha, Bhavnagar, 1953, pp. 177-178.

²⁷ *Ibid.*, 178-180.

The problem of universal and particular is, again, one of the most controversial problems in the field of philosophy. According to Advaita Vedanta, there is only one highest universal (*mahāsāmānya*) in which everything is included.²⁸ Some of the Buddhists claim that, particulars are the only reals. Nyaya-Vaisesikas give equal treatment to both *sāmānya* and *viśeṣa* as principles of reality, but recognise them as absolutely distinct entities.²⁹ But all these views are partial representation of truth. Reality is neither absolutely universal nor absolutely particular. Suppose if we accept that there is nothing except the general and that there is no such thing as particular, (as Vedantins maintain) then we should be forced in everyday activity to give up all the particulars of a thing and to accept only its general aspect. For instance, all the transformations of gold, such as ear-rings, bracelets, necklace etc. that are real in our daily life and that are actually experienced by us shall have to be given up and everytime we shall have to deal with gold as gold and nothing else—no varieties or transformations of it. If on the other hand, we accept only the particulars of gold such as ear-rings, bracelets, etc. and eliminate the underlying substance gold from our daily exchange, then we have to face great confusion and inconvenience in our daily experience. The truth is that exclusive acceptance of the general only or particular only would land us into utter confusion. We thus, have to accept, both universal and particular, but not as independent categories, as Nyaya-Vaisesika philosophers hold. Nyaya-Vaisesikas hold that universality or generality consists in a group of features common to a number of individuals and as such, is absolutely different from the particularities which are peculiarities characterising each of the individuals. The Jainas state that, both these are not different but really inseparable. Neither of the universal and the particular has real existence, independent of the other. In the individual of our experience, the generality manifests itself through the particular and the particularity appears as the particular mode of the generality. When we see a cow, we apprehend a certain unity of animal form, such as belongs to all individuals, we call cows, but at the same time we apprehend its distinction from other animals such as buffalo, horse, etc. Moreover, when, we speak of 'brindled cow', thus referring to the particular character (*viśeṣa*) of the animal, we also recognise the fact that the animal is a cow, we, thus, notice, the generality and the particularity, the two-in-one. Similarly, 'brindledness' too has a variety of forms. So, when we speak of 'a brindled cow', we do not refer

²⁸ *ekasmin mahasamanya antarbhavah prajnanaghana, Bhadaranyaka Upanisad with Sankarabhasya*, II. IV-9, The principle *Upanisads*, Pub : Motilal Banarasi Dass, Delhi, 1978, p. 762.

²⁹ *S.M.* IV, pp. 10-12.

to any brindled colour of the animal, but the particular brindled colour which we see in the cow before us. So, here again, the perception of the generality is at the same time a perception of the particularity. The two are never-experienced separately from each other anywhere. Things are themselves co-ordinated with things of their own class and differentiated from things of other classes and consequently, there is no need to accept these two as independent categories as Nyaya-Vaisesikas think. They are two relative aspects and aspects only of one and the same thing.³⁰ Accepting this view only, an apparently inexplicable contradictions involved in the doctrine of the generality and particularity is to be solved.

With respect to the ultimate reality the Advaita Vedanta upholds the non-dualistic view, stating that it is one without a second.³¹ The Sankhya-Yoga, holds a dualistic view, claiming *prakṛti* and *puruṣa* as two independent realities³² and the Nyaya-Vaisesika system admits pluralistic view. And each of these schools opposes the others. The truth is, each of these views, is right to certain extent and each suffers from one-sided partiality. From the *anekānta* view-point, the ultimate reality is one in some respects, it is dual in some respects and is manifold in some respects. The Vedantin's view that the reality is one is certainly correct, by reality (or substance) we are to mean that which is the basis of all phenomenalities. But in consideration of the fundamental differences in their nature i.e. that between the conscious and the unconscious, a dualism between the psychical and un-psychical realities is to be accepted. In view, again, of their exclusiveness of each other the material atoms, time, etc. are reals, as held by the Nyaya-Vaisesikas. The difference, between the three views about the ultimate reality is, thus a difference of stand-points (*nayas*) only. In *anekāntavāda*, the validity is attached to the views of the three schools to some extent and their mutual oppositions are avoided.³³

Advaita Vedantins, hold that, changes, modes or forms are unreal while the Nyaya-Vaisesikas state that modifications are real. The Jainas reconciles these two opposite views by stating that a mode is real as well as unreal. A mode is the form in which the substance is presented, it is real in this sense. It is unreal because, it has no existence, apart from its

³⁰ *Ibid.*, pp. 10-12 ; and 84-89.

³¹ *ekameva hi paramarthsatyam brahma, Taittiriyaopaniṣad* with *Sankarabhasya*, II.8.

³² *Sankhayakarika*, 3, ed. Sivanarayana Sastri, Pub : Panduranga Jawaji, Nirnaya-sagara Press, Bombay, 1940.

³³ *Anekantavada*, pp. 175-76.

underlying substance. Thus, it is real in certain respects and that it is unreal also in certain respects.³⁴

The attitude of Vedanta and Sankhya philosophy and that of Buddhists towards soul is that of eternalism and non-eternalism respectively. Eternalism claims that, soul is absolutely eternal. Thus it is never tied to wheel of *samsāra*, while non-eternalism states that soul is absolutely transient—unreal. Both these views are partially true and can be reconciled on the basis of doctrine of relativity. The soul is eternal, never changing from the view-point of substance and it is everchanging, non-eternal on the ground of modification point of view. Viewed from the transcendental stand-point, it is unchained, but viewed from the phenomenal point of view, it is chained. In its own nature it is real, but as matter it is unreal. It is one from the stand-point of *ātmatva*, it is many from the point of view of *samsāra*. If *ātman* be exclusively eternal, the experience of happiness and misery, will be impossible. For, to be eternal means to be unchangable, and there cannot be experiences of pain and pleasure one after another unless *ātman* could pass (or change) from one state to another. Again, merits and demerits, liberation and bondage are, not possible. Similarly absolute non-eternality of *ātman* is untenable. If *ātman* is absolutely non-eternal, everchanging, then, it means an end to the law of retribution which requires personal identity of doer and enjoyer. Again merits and demerits, bondage and liberation become meaningless.³⁵ So, *ātman* is eternal with change. We have to accept *pariṇāmīnityatva* of *ātman*—the doctrine of identity-in-change, of unity-in-difference, of one-in-many.

Again, the doctrine of sound is one of the most debated topics among the Mīmamsa and Nyaya philosophers. The Mīmamsakas maintain the theory of eternity of sound,³⁶ while the Naiyayikas uphold the impermanent character of sound³⁷ and state that, sounds have beginning and an end. These two extreme views about sounds are partial and they be reconciled, following the path of *anekānta*. The Naiyayika's view is right in some respects. Sound is obviously produced by human efforts. Whatever is produced is impermanent. So, sound is non-eternal in this sense.

³⁴ *Ibid.*, 177.

³⁵ (a) Haribhadra, *Astaka Prakarana*, 4-7, ed. Vijayadeva Suri, Pub : Jaina Grantha Prakasaka Sabha, Ahmedabad, 1973.

(b) Yosovijaya, *Adhyatmasara*, III 24-29, 38-39.

³⁶ (a) *sabdo nityah vyomamatragunatvat vyomaparimanavat*, Prabhakara, quoted in *Syadvadamanjari*, ed. Jagadish Chandra Jain, Pub : R. C. Desai, Srimad Rajacandra Asram, Agas, 1970, p. 340.

³⁷ *Nyayadarsana* with *Vatsyayanabhasya*, II.II-13, ed. Ganganath Jha, Pub : Chowkhamba Sanskrit Series, Benaras, 1929, p. 362.

Sound is also eternal in respect of its basic substance. Sound is a mode of matter, the substratum underlying sound is a *puḍgala* (matter) which as a substance is eternal. From this point of view, the Mimamsaka's view is correct. So, considering the aspect of modifications in sound, it is unreal, while on account of its everlasting substantial basis, it is eternal. In this way, both these irreconcilable theories can be reconciled.³⁸ Similarly, Advaita Vedantins negative approach in respect of the existence of the world, i.e. the world is neither absolutely real like Brahman, nor absolutely unreal like son of a barren woman, but indescribable (*anirvacanīya*) and ultimately this is to be treated as unreal can be reconciled with that view according to which the world is absolutely real ; by accepting the view that the world is real in some respects i.e. in respect of its basic substance and in respect of the changes of the phenomena it is unreal. Even the Sunyavadi Buddhists view of absolute negativism, i.e. 'an object is neither existent nor non-existent, nor both nor-neither', can be reconciled, by accepting the path of *anekānta*, i.e. these statements are true in some respects only. In this way the Jainas point out that, applying this *anekāntavāda*, to each and every problem of philosophy, a sound harmony can be established in the field of philosophy.

This attempt to reconcile different philosophical doctrines is unique contribution of Jainas to Indian philosophy. In respect of reconciliation it is said that, there is no philosophical method superior to *anekāntavāda*.³⁹ But not much attention has been given to this praiseworthy attempt in the field of philosophy.

It is also very important to note that, this doctrine of *anekāntavāda* which tries to reconcile different philosophical view-points, is not the sole monopoly of Jainism. It is right that, this doctrine became central philosophy of Jainism and its systematic exposition is found only in this system, but this doctrine was existent in ancient Indian literature and is traceable here and there in all the non-Jaina works such as *Nāsadiyasūkta* of *Rgveda*, *Taittīriya Brāhmaṇa*, *Upaniṣadas*, *Bhagavadgītā*, *Mahābhārata* and so on.⁴⁰ In fact, even Jaina thinkers themselves maintained that every system of philosophy has accepted *anekānta* in one way or the other.⁴¹

³⁸ (a) *S.M.*, XI, pp. 69-70.

(b) *Anekantavada*, pp. 180-181.

³⁹ *Ayogavyavachhedika*, 28, see *S. M.*, ed. by Jagadish Chandra Jain, p. 276.

⁴⁰ *Darsan aur Anekantavada*, Pt. Hamsaraj G. Sharma, Pub : Atmanand Jain Pustak Pracarak Mandal, Agra, 1928, pp. 133-149.

⁴¹ (a) *Saddarsanasamuccaya Tika* by Gunaratna Suri, see *S. M.*, Appendices, pp. 318-322.

(b) *Saptabhangitarangini*, Pub : Manoharlal, Raicandra Jain Sastramala, Bombay, V.N.S., 2442, pp. 90-92.

(c) *S.M.*, XXX, p. 172-174.

The Materialists (Carvakas) view that, consciousness is product of combination of different material elements which is neither identical or different from each of these, is acceptance of manisided aspects of consciousness only. It really means, in some respects, it is identifiable with material elements and in some respects, different from them. Madhyamamarga or Madhyamapratipat of the Buddhists, which is accepted as middle way between two extreme views of eternalism and non-eternalism, bears the same significance as the word *anekānta*. Madhyamika philosopher's view of reality, that, 'it is neither existent nor non-existent, nor both nor neither', is a form of *anekāntavāda* only.⁴² Even, the view of Vijnanavada Buddhists, according to which this world is transformation of eternal, non-dual consciousness⁴³ (*vijñāna*), is acceptance of *pariṇāmīnityatā* of *anekāntavāda*. The Nyaya-Vaisesika philosophers apply this *anekāntavāda* without being aware of it. These philosophers in stating that atoms constituting a material 'pot' are eternal while the pot as a product and a passing phase of matter is non-eternal, are practically admitting the *anekānta* position, which is that a 'pot' is non-eternal in some respects (as a mode of matter) and that it is eternal also in some respects⁴⁴ (i.e. in respect of its constitutive substance). Again, while describing *anyonyābhāva*, the Vaisesikas point out like Jainas that 'pot' is real as 'pot' not as cloth.⁴⁵ Earth (*pṛthivī*) is both eternal as well as non-eternal. *Citrarūpa* is a conglomeration of several mutually exclusive *rūpas* which belong to a single substance.⁴⁶ Even though Nyaya-Vaisesikas have accepted the generality and particularity as two independent categories, they are not able to discard the path of *anekānta*. Vatsyayana mentions that both contradictory elements can exist in one and the same place.⁴⁷ *Jāti* is, again, both general as well particular.⁴⁸ Amongst the two kinds of universals, (i.e. *parā* and *aparā*) *aparāsāmānya* is both, general as well as particular.⁴⁹

The Sankhya doctrine of evolution of *prakṛti* according to which *prakṛti* is neither absolutely eternal nor absolutely changing, but eternal-cum-change is in no way different from the Jaina doctrine of *pariṇāmīnityatā*. The difference between the two views is that the Sankhya doctrine

⁴² *Sanmati-Tarka*, Introduction, p. 138.

⁴³ *Trimsika I, Vijnaptimatratasiddhi*, ed. Svami Mahesvarananda, Pub : Gitadharma Karyalaya, Varanasi, 1962, p. 3.

⁴⁴ *S.M.V.*, p. 17.

⁴⁵ *Vaisesikadarsana*, with *Upaskarabhasya*, I-I-4-5, see *Darsan aur Anekantavad*, p. 82.

⁴⁶ *S.M.* V-20.

⁴⁷ *Nyayadarsana*, I-I-41, p. 160-162.

⁴⁸ *Ibid.*, II-II66, p. 424.

⁴⁹ *Vaisesika Darsana*, with *Prasastapadabhasya*, I-II-5 ; IX-II-3, see *Darsan aur Anekantavad*, pp. 78-80.

is applicable only to non-sentient *prakṛti*, while the *anekānta* of Jainas has its application to all the fundamental things, sentient as well as non-sentient.⁵⁰ Vyasa and Vacaspati Misra followed the path of *anekānta* in their commentaries on Patanjala *Yogasūtra* in many places. Both of them admit the eternal-cum-non-eternal nature of the phenomenal world and substance. Even, things are always both, general and particular. In respect of *prakṛti-puruṣa* relation, Vyasa clearly admits the identity-cum-difference like the Jainas. *Puruṣa* is not absolutely different from intellect (i.e. product of *prakṛti*), nor absolutely identical with it. The relation between the two is identify-cum-difference.⁵¹ The Mimamsa school practically admits the *anekāntavāda* by stating that substance has three characteristics of origination, decay and permanence.⁵² Kumarila Bhatta, while discussing the part and whole (*avayava* and *avayavi*), clearly states that, both are not absolutely different from each other. Their relation is identity-cum-difference.⁵³ Parthasarathi Misra upholds the same position. A thing is real as well as unreal, universal as well as particular.⁵⁴ Again, the view, that the same eternal word (*vāk*) manifests itself in the evanescent phases of the *vaikharī*, the *madhyamā* and the *paśyantī* is very similar to *anekāntavāda*.⁵⁵

Anekānta method has place in all the schools of Vedanta philosophy. Even, Sankara the great critic of *anekāntavāda*, has applied this doctrine in some places. Sankara, while criticising the *prakṛtikāraṇavāda* of Sankhya, states (like Jainas) that both *pravṛtti* (activity) and *nivṛtti* (inactivity) which are contradictory, can exist in Isvara.⁵⁶ The Advaita Vedantins view that the same immutable self appears in the changing states of waking, dreaming and dreamless sleep, is basically, *anekāntavāda* only.⁵⁷ Influence of *anekāntavāda* is found in the latter Vedanta works such as works of Ramanuja, Bhaskara, Vijnanabhiksu, Nimbarka, Srikantha Sivacarya and Vallabha.⁵⁸

⁵⁰ *Sanmati-Turka*, Introduction, pp. 139-140.

⁵¹ *Darsan aur Anekantavad*, p. 28-45.

⁵² *tasmadvastu trayatmakam, Mimamsa-Sloka-Vartika* quoted in *Darsan aur Anekantavada*, p. 16.

⁵³ *Ibid.*, pp. 55.

⁵⁴ *Sastradīpika*, Pub : Vidya Vikas Press, Kasi, V. S. 1964, pp. 387, 412.

⁵⁵ *Anekantavada*, p. 187.

⁵⁶ *Brahmasutra Sankarabhasya, Tarkapada*, II-II-4, ed. with Gujarati translation, Pt. K. V. Abhyankar and Dr. J. M. Sukla, Pub : K. V. Abhyankar, Ahmedabad, 1958, p. 14.

⁵⁷ *Anekantavada*, p. 187.

⁵⁸ *Darsan aur Anekantavad*, p. 94-119.

It shows that, *anekāntavāda* the doctrine of reconciliation is acceptable to all the systems of philosophy. Yasovijaya, the great 17th century Jaina stalwart, keeping all these views in his mind, makes a beautiful statement that every system of Indian philosophy has accepted this *anekāntavāda*, which harmonises all the conflicting views, and sees unity in diversity. There is really no reason to reject this doctrine.⁵⁹

⁵⁹ *Adhyatmopanisat-Prakarana*, I-44-53, and 61-62, *Adhyatmasara*, *Adhyatmopanisat Jnanasara*, *Prakaranatrayi*, Pub : Sanghavi, N. K. Jamnagar, V. S. 1994.

Thakkura Pheru and the Popularisation of Science in India in the Fourteenth Century

SREERAMULA RAJESWARA SARMA

0.1 Until the introduction of English in India, scientific texts as well as other scholarly works were written mainly in Sanskrit and that too in metrical form. Though Sanskrit had the advantage of being the pan-Indian medium of communication, its accessibility within any region of India was limited, and the writings in Sanskrit were naturally elitist in character, being written chiefly by Brahmins for Brahmins. Moreover, the enormous respect for tradition and the urge to preserve it in all its purity resulted in a faithful following of the traditional framework in all intellectual endeavours, so much so that the chapter titles of almost all texts in a particular branch of science sound alike. If any innovations were made it was always within this framework. The lack of discrimination in the selection of ideas and the reluctance to discard outmoded concepts, coupled with a language of limited accessibility, resulted in the stagnation of Indian science in the middle ages. There is one more factor which contributed to this decline. This is the absence of communication and therefore absence of any interaction, between science and technology. While the writers on scientific subjects were upper caste Brahmins, the practitioners of technology were artisans of low social standing. The techniques employed by the latter in their professions were rarely recorded in writing ; these were transmitted orally from father to son or from master craftsman to apprentice and remained in many cases guild or trade secrets.

0.2 The literature of the Jainas offers some sort of an exception to this general state of affairs. Though the Jainas respected Sanskrit as a vehicle of scholarly exposition, Prakrit also enjoyed religious sanction among them. Even while writing in Sanskrit, there was often a conscious attempt to simplify the language for the sake of wider understanding.¹ The Jaina monks played an active role in the affairs of the community and seem to have been responsible for the spread of learning to all strata of

¹ For instance, Jinapala, writing at Delhi in 1248, explains at the end of his *Kharataragacchalamkara-Yugapradhanacarya-Gurvavali*, a chronicle of the pontiffs of the Kharatara sect, how he simplified Sanskrit in this work in order that even children can understand it. Henceforth this chronicle will be referred to as the Kharatara chronicle. It was published in the *Kharataragaccha-Brhadgurvavali*, ed. Muni Jinavijaya, Bombay 1966. Jinapala's statement occurs on p. 50.

society, notably to the more numerous mercantile class of Vaisyas. In Gujarat where Jainism was influential, the Jainas of the merchant class played a prominent role in the middle ages. A Jaina called Vira was the superintendent and minister of four successive rulers Mularaja, Camundaraya, Vallabharaya and Durlabharaya at the close of the tenth century and beginning of the eleventh.² His son Vimala was the commander-in-chief of Bhima I and built in 1031 the famous Vimalavasahi temple with its exquisite marble carvings on Mt. Abu. In the thirteenth century Vastupala served the Vaghela rulers as their chief-minister, and was a great patron of learning.³

0.3 Aside from these instances of political power, commerce was the exclusive forte of the Jainas, and much of the economic activity in the Gujarat-Rajasthan-Delhi region was controlled by them. The members of the Srimala caste, in particular, specialised in minting and money-exchange. Even after the political domination of northern India by Muslims from the thirteenth century onwards, the expertise represented by this banker's caste was utilised by the Muslim rulers of Delhi in their minting operations,⁴ just as Hindu and Jaina masons and stone-carvers were employed in the construction of the Islamic monuments. The Kharatara chronicle mentions a number of wealthy Jainas from Delhi who enjoyed good relations with the rulers.

1.0 Notable among these members of the Srimala caste in the employment of the Sultans of Delhi is Thakkura Pheru who stands out as a writer on a wide range of scientific subjects in popular speech. He wrote six scientific works : *Vāstusāra* on architecture and iconography, *Jyotiṣasāra* on astrology and astronomy, *Ratnaparīkṣā* on gemmology, *Gaṇitasāra* on arithmetic, *Dhātutpatti* on metallurgy and perfumery trade, and *Dravyaparīkṣā* on assay and money-exchange.⁵

² Cf. U. P. Shah, "Coinage of Early Calukyas of Anhillavada-Patan", *Journal of the Numismatic Society of India*, XVI. 2 (1954), pp. 239-42.

³ Cf. B. J. Sandesera, *Literary Circle of Mahamatiya Vastupala*, Bombay 1953.

⁴ Cf. John Scott Deyell, *Living Without Silver: The Monetary History of Early Medieval India* (The University of Wisconsin-Madison Ph. D. Thesis, 1982. Xerography in 1983 by the University Microfilms International, Ann Arbor), Vol. I, p. 339.

⁵ All Pheru's works are published in the *Thakkura-Pheru-Viracita-Ratnaparīksadi-Saptagranthasamgraha*, ed. Muni Jinavijaya, Jodhpur 1961. For other editions of the individual texts, see my *Thakkura Pheru's Rayanaparīkṣā: A Medieval Prakrit Text on Gemmology*, Aligarh 1984.

1.1 Pheru's biography can be pieced together from the personal references in his works. His first known work was written in 1291,⁶ hence his birth may have taken place around 1270. His native place was Kannana situated in the modern state of Haryana, and this place was not far from the then imperial capital Delhi. It was then a centre of pilgrimage for the Jains. Pheru was born in a prosperous bankers's family belonging to the Kharatara sect of the Svetambara Jains. Pheru's grandfather, Kaliya or Kalasa, was a prominent banker of Kannana. It is not stated where Pheru's father Canda resided, but unlike his father, Canda had the title Thakkura. The Kharatara chronicle lists a number of prominent Jains by their names, castes and titles. A cursory survey of those enjoying the title of Thakkura shows that they are all from Delhi. This would suggest that Thakkura was a court title and that Canda may have been associated with the Sultan's treasury at Delhi.

1.2 Nothing is known about Pheru's early life and education, but it is likely that he was brought up and educated at his native town Kannana. There in 1291, presumably at the conclusion of his formal education, he composed a eulogy of the pontiffs of his sect. Sometime later, but much before 1315, he joined the treasury of Alauddin Muhammad Khalji at Delhi and was apparently in charge of the jewellery. This job inspired him to write the *Ratnaparīkṣā*, a manual on gemmology, for the instruction of his son Hemapala in 1315. In the same year he wrote two more works : the *Jyotiṣasāra* on astrology and the *Vāstusāra* on architecture. In 1318 he must have been the assay-master in the mint of Qutbuddin Mubarak Shah and produced his invaluable *Dravyaparīkṣā* on assay and money-exchange. According to the Kharatara chronicle, he participated in that year in a pilgrimage to the holy places around Delhi. The chronicle reports further that in 1323 he joined the pilgrim congregation to Satrunjaya in Gujarat.⁷ It is not known if he was still employed at the court, but the very mention of his name among the Jaina prominence of Delhi suggests that he may have continued his services under Ghiyasuddin Tughluq as well. Thus, like Vira of Gujarat, Pheru also served four successive Sultans, Alauddin Muhammad Khalji (1296-1316), Shihabuddin Umar (1316), Qutbuddin Mubarak Shah (1316-1320) and Ghiyasuddin Tughluq (1320-1325).

1.3 It is noteworthy that Pheru's literary activity was not limited to his caste or professional interests only but extended beyond these to

⁶ This is the *Kharataragaccha-Yugapradhana-Catuhpadika*, an eulogy of the pontiffs of his sect, written in Apabhramsa.

⁷ See *Kharataragaccha-Bṛhadgurvavali*, pp. 66-68, 72-77.

encompass astrology, architecture, metallurgy etc. Though well-read in Sanskrit, Pheru did not choose that language for his scientific writings nor did he choose the literary Prakrit of the Jaina clergy but wrote instead in a mixture of Prakrit and Apabhramsa. Perhaps he was reluctant to abandon Prakrit altogether but at the same time wished to be understood by a wide strata of professionals like bankers, jewellers, traders, architects and masons. This way his language probably came very close to the spoken language of his day. Though he broke with the tradition of writing in Sanskrit, he still adopted the metrical form which is more suitable for memorising. However, in order to enhance the practical utility of the works, he included a large number of tables and occasional diagrams. With this background, we shall now discuss his scientific works individually in a chronological sequence as far as possible.

2.1 The *Vāstusāra*, completed on the auspicious festival of the Vijayadasami (ca. 19 September 1315) at Kannana, is divided into three chapters. The first deals with astrological matters related to the selection of the site for house-building, auspicious moments for beginning the construction, for occupying the house etc. Normally these topics are dealt with in astrological works and not in those on architecture. But Pheru quite pragmatically includes them in his work on architecture and merely touches upon them in his book on astrology. The second chapter discusses the iconography of Jaina images and the third the architecture of various types of temples. V. S. Agrawala was of the opinion that this text "must have served as a practical handbook for architects of Jaina temples in the early Sultanate period."⁸ The Kharatara chronicle describes many instances of the construction of Jaina temples, installation of idols etc. in the Rajasthan-Delhi region in this period. It will be interesting to make a comparison of the theory expounded in this work with the extant examples of this period.

2.2 The *Jyotiṣasāra*, also written in 1315, deals with the usual topics of astrology and the related areas of astronomy. This work contains many tables of computation and a detailed list of contents in Sanskrit at the end. The work is apparently meant for the use of the Jainas in the territory of Delhi, for at one place computations are given for Delhi and Hansi ; the latter was the first military outpost beyond Delhi.

At the beginning of the work, Pheru mentions the authorities consulted by him. I list them here to indicate his vast learning. These are

⁸ "A Note on Medieval Temple Architecture", *Journal of the United Provinces Historical Society*, XVI. 1 (1943), p. 112.

Haribhadra, Naracandra, Padmaprabha, Jauna, Varahamihira, Lalla, Parasara and Garga. The first three are Jains. The Jains held *jyotiṣa* (i.e. astronomy, astrology and mathematics) in high esteem and wrote a large number of works on this subject. The influence of these Jaina writers on Pheru is considerable. Haribhadra (9th century) wrote an astrological work called *Lagnakuṇḍalikā*.⁹ Pheru apparently followed him in naming the chapters of his work *dvāras* (doorways). Padmaprabha Suri's *Bhuvanadīpikā* or *Grahabhāvaprakāśa*, written in 1164, was an immensely popular text. There are several commentaries on it, and about three hundred manuscripts of this work are extant today.¹⁰ Naracandra Suri (d. ca. 24 August 1230) was a teacher of the famous Vastupala and the author of the *Jyotiṣasāra*, also known as *Nāracandra* or *Naracandra-paddhati*. This was also a very popular work, for there are some two hundred and odd manuscripts available today.¹¹ Pheru's aim seems to be to present the teachings of these Sanskrit works in simple Prakrit.

2.3 The *Ratnaparīkṣā* on gemmology was also written in 1315. At the beginning of this work, Pheru states that (i) he has studied the earlier Sanskrit texts on gemmology, (ii) seen the ocean-like vast collection of gems in Alauddin's treasury and (iii) observed the gem-testing by other experts. To put it differently, Pheru (i) acquired theoretical knowledge from the existing literature, (ii) had the practical experience of handling gems in the royal treasury, and (iii) underwent a period of apprenticeship under experts. One would call this a truly modern scientific approach. Pheru was indeed well placed to fulfil all the three conditions. His wide learning and good command of Sanskrit enabled him to read Sanskrit manuals on gemmology by Buddhabhatta, Agastya, Brhaspati and others. Secondly, Alauddin amassed enormous quantities of gems and precious metals during his campaigns, and his treasury must indeed have resembled an ocean full of gems. There can be no doubt that many of the gems were of a rare quality. An exquisite diamond said to have been acquired by Alauddin reached the hands of the Mughal emperor Babur in 1526. Babur states that "it is so valuable that a judge of diamonds valued it at half the daily expense of the whole world."¹² Thirdly, Alauddin's court boasted

⁹ Cf. Ambalal P. Shah, *Jaina Sahitya ka Brhad Itihas*, Vol. V, Varanasi 1969, p. 168.

¹⁰ Cf. David Pingree, *Census of the Exact Sciences in Sanskrit*, Series A, Vol. 4, Philadelphia 1981, pp. 173-179.

¹¹ *Ibid.*, Vol. 3, Philadelphia 1976, pp. 132-36.

¹² *Memoirs of Zehir-ed-Din Muhammad Babur*, tr. John Leyden and William Erskine, London 1921, Vol. II, pp. 191-92. Many historians and gemmologists thought this diamond to be identical with the famous Koh-i-Nur, but this view is no more favoured.

of Muslim experts also who were well versed in Islamic gemmology. The quartermaster-general was such an expert, so was the court poet Amir Khusrau. Under these circumstances, one would expect that Pheru's treatise would (i) present Indian theories of gemmology, (ii) describe some of the rarest gems in the royal treasury, and (iii) display some acquaintance with Islamic gemmology, in particular with the Arab discoveries about the specific gravity of gems.

But Pheru's aim was modest, namely to provide his son with a practical handbook containing the contemporary tariff of prices along with some amount of the traditional theory and lore of gems. Therefore, he paraphrases the earlier writings—sometimes indiscriminately—on the mythology, properties and sources of gems. About the sources, he is most careless, repeating often the same lists of places enumerated by the earlier writers, sometimes even misunderstanding them. But unlike the earlier writers who mention the price of each gem separately along with its description, Pheru has an entire section where he quotes the prices very systematically, first in verses and then in tables for easy reference. Though the royal treasury might be overflowing with gems of large size, the prices quoted are only for gems weighing up to 18.35 metric carats. Perhaps gems beyond this weight were not offered for sale in the market but were surrendered to the royal treasury.¹³

Besides this innovation of a separate section on the price tariff, there is another aspect where the *Ratnaparikṣā* distinguishes itself. It is the description of the gems imported from Persia (spinel, cornelian and turquoise). Pheru was the first Indian gemmologist to describe these gems, and his information is quite precise and accurate as can be seen from the contemporary Arabic works on gemmology.¹⁴

Though the *Ratnaparikṣā* cannot be counted among Pheru's best works, it exemplifies certain characteristics of Pheru as a writer. These characteristics are as follows; (i) Where there exists a corpus of traditional literature on a subject, he is content to follow the traditional framework and to present the material in Prakrit (as in the description of gems). (ii) However, he makes innovations in the traditional framework if practical considerations demand them (e.g. the price tariff; see also 2.4 below).

¹³ Fernao Nuniz reports in the sixteenth century that in the kingdom of Vijayanagara all diamonds exceeding 25 ct. were to be given to the king's treasury. See Robert Sewell, *A Forgotten Empire : Vijayanagara* (reprint), Delhi 1962, p. 369.

¹⁴ Cf. Eilhard Wiedemann, *Aufsätze zur arabischen Wissenschaftsgeschichte*, hrsg. Wolfdietrich Fischer, Hildesheim/New York, Vol. I, pp. 835-53.

(iii) But where there is no traditional literature to lean on, he writes from his practical knowledge, and is most original and precise (e.g. on the gems imported from Persia). The *Dhātutpatti* (see 2.5) and more particularly the *Dravyaparīkṣā* (see 2.6) belong to this category of original works.

2.4 The *Gaṇitasāra* on arithmetic is not dated but must have been written before 1318. Compared to the previous text, this one is more innovative, not so much in the theoretical portions but in the application of arithmetical rules to a wide range of areas. It is a commonplace to say that arithmetic is one of the most practical of sciences, its rules being employed by traders, masons, carpenters, tax-collectors and the like for the calculations connected with their professions. The units of measurement and the examples to illustrate arithmetical rules given by Pheru throw a flood of light on the economic and social conditions of this period. Here a few examples will suffice.

In the section on solid geometry, Pheru gives the rules for the volumes of domes (*gonamṭā*), square and circular towers with spiral stairways in the middle (*pāyaseva*), towers with fluted columns (*munārayā*), niches (*tāka*), staircases (*sopāna*), bridges (*pulabaṃdha*) and so on (III. 74-86). It should be noted that some of these are new architectural features being introduced by the Muslim rulers in India in this period. The purpose of such rules is to enable the chief mason to calculate the number of bricks or stones needed for these constructions. To do this calculation more exactly, Pheru informs us, one should first calculate the total volume of the wall-space subtract from this the volume of the space occupied by the doors and windows and then reduce the remainder by three-twentieths, the latter being the volume of the mortar (III. 70-71). The result when divided by the volume of a single brick yields the number of bricks.

Historically more significant is the following statement: "The *munāraya* is like a circular tower with a spiral stairway in the middle, as far as the inside is concerned. But the difference is this: the wall contains half triangles and half circles" (III.80). The meaning of the cryptic last sentence is that in a horizontal cross-section of the *munāraya*, the outer circumference consists of alternate triangles and semicircles. It should be remembered that about a hundred years before this time, Qutbuddin Aibak built the Qutb Minar in Delhi and that Alauddin himself started constructing another tower twice as high. Now, the lower story of the Qutb Minar consists of alternately angular and circular columns, and it is clear that Pheru is referring here to such a tower with fluted columns.

In another section, dealing with cloth (IV.i.18-37), Pheru mentions different kinds of silk, woollen and cotton materials, the rate of shrinkage or loss in washing, cutting and sewing, and the area of cloth needed to make various types of tents. There is a last section (IV.iii.1-17) listing the average yields of grains, pulses, etc. per *bīghā*, the average yield of molasses and brown sugar per maund of sugarcane, the amount of clarified butter that can be obtained from cow's and buffalo's milk and so on. Mention must also be made of Pheru's rule for converting Vikrama dates into Hijri dates and vice versa (IV.i.17) which is probably the first such rule to be formulated in India. It must be emphasised that all this is not germane to arithmetic as such, but Pheru is adapting arithmetic here to suit the needs of a variety of professions.

2.5 The *Dhātutpatti*, also not dated, deals with a heterogeneous mixture of topics, namely origin of metals, extraction of metals and perfumery articles. In the shape it has come down, the text does not seem to be complete or even continuous. Perhaps here are separate extracts from the lost *Bhūgarbhaprakāśa* said to have been written by Pheru. Even so, the present text offers valuable material. The section on the perfumery articles describes the properties, varieties, provenance and prices of camphor, aloe wood, sandalwood, musk, saffron etc. But more important is the section which discusses the techniques of extracting or preparing brass, copper, lead, tin, bronze, mercury, vermilion, red lead etc. This and the first part of the *Dravyaparīkṣā* (to be discussed below) show Pheru's familiarity with metal technology, and are unique contributions to the history of metallurgy in medieval India.

2.6 The *Dravyaparīkṣā* was written in 1318 during the reign of Qutbuddin Mubarak Shah. Pheru states that he wrote this work on the basis of his direct experience of various types of coins while he was employed in the Delhi mint. The expression *dravyaparīkṣā* denotes the examination of the metal content in coins or the assay. Since there was no official rate of exchange at that time for different currencies, the official or private money exchangers priced a coin on the basis of its metal content. For this purpose the coins had to be assayed either by melting some samples or, if the coins were few and of gold or silver, by rubbing them on the touchstone.¹⁵ Pheru states that he wrote this work for the sake of his son and brother who may have been embarking on the profession of money exchangers.

¹⁵ See my paper, "Varnamalika System of Determining the Fineness of Gold in Ancient and Medieval India" *Aruna-Bharati: Professor A. N. Jani Felicitation Volume*, Baroda 1983, pp. 369-389.

The *Dravyaparīksā* can be divided into two parts. The first part (vv. 1-50) deals mainly with the techniques of refining gold and silver and of determining their fineness, and thus provides the necessary technical background for money exchange. The second part (vv. 51-149) can be termed a coin catalogue and is numismatically most valuable. Here are described the *mullu tullu davvo nāmam thāmam*, the name, provenance, weight, average metal content and the exchange rate in terms of the Khalji currency. This data is given both in verses and in tables for some 260 types of coins belonging to the thirteenth and early fourteenth centuries, issued by various kingdoms of northern India. Some of the coins described here are no more extant and the *Dravyaparīksā* remains the only testimony we have for the monetary history of several kingdoms.

Of the names listed by Pheru, some are based on the denomination, some on the king who issued them, some on the shape and some on the ornaments. The different kingdoms that issued these coins include Khurasan, Multan, Jalandhar, Banaras, Tahangarh, Malwa, Canderi, Devagiri, Gujarat, Narwar and, of course, Delhi. It is worth noting that where a number of coins from a single kingdom are listed, these are arranged in the correct chronological sequence.

Now we turn to the most valuable data, the metal content. In the case of gold and silver coins, Pheru gives their degree of fineness. For coins made of alloy, the weight of each metal per 100 specimens is listed. Such information must have been obtained by Pheru, in most cases, by his own assay. Some of his assays, done through what would be considered primitive methods today, have been compared with modern assays and found to be quite accurate.¹⁶

The most interesting and comprehensive list is naturally of the coinage issued by the Sultans of Delhi, especially Alauddin and his successor Qutbuddin Mubarak. Pheru lists 12 types of coins issued by the former and 63 types by the latter. It should be noted that Mubarak issued 63 types during the brief span of his reign from 1316 to 1318. Apart from the large number of types, the quality of his coinage was far superior to that of his predecessors. Nelson Wright observes: "The coinage of Qutbuddin Mubarak stands out for its boldness of design and the variety of its inscriptions... There is perhaps no finer coin in the whole

¹⁶ Cf. John Scott Deyell, *op. cit.*, I. p. 344.

pre-Mughal series than the broad square gold *tankah* of high relief struck at Qutbabad Fort."¹⁷

Occupying a high position at the mint, Pheru must have had an active role in issuing these diverse types of coins and in the improvements in minting technology. It is indeed fortunate that he shared his master's enthusiasm for coins and, drawing upon his own experience and that of his caste, left us an excellent guide to the coinage of northern India.

3.0 It is now pertinent to ask whether Pheru's attempt at popularisation of science has had any impact or emulation. Perhaps a thorough survey of the Jaina Mss. collections in Gujarat and Rajasthan may one day bring to light some scientific texts written in popular speech, but on the whole the tradition of writing in Sanskrit metres was so strong that Pheru's example was rarely followed. On gemmology, however, there are some texts written in old Hindi and old Rajasthani by jewellers and even by Jaina monks. But these are faithful renderings of the Sanskrit originals and do not exhibit any innovations.¹⁸ An old Gujarati text of the fifteenth or sixteenth century called *Vividha-varṇaka* enumerates *tamkaparīkṣā* (i.e. examination of coins) as one of the sciences,¹⁹ but except the *Dravyaparīkṣā* no other text on this subject has been discovered so far.

Just as English is used today in India for the sake of pan-Indian or even worldwide communication, the Hindu and Jaina scientists wrote in the pan-Indian medium of Sanskrit until it was replaced by English. Thakkura Pheru, therefore, remains the only versatile scholar to have attempted to popularise science.

¹⁷ H. Nelson Wright, *The Coinage and Metrology of the Sultans of Delhi* (reprint), New Delhi 1974, pp. 107-8.

¹⁸ Cf. Agarchand Nahata and Bhanwarlal Nahata, *Ratnapariksa*, Calcutta n.d.

¹⁹ See *Varnaka-Samuccaya*, ed. B. J. Sandesera, Pt. 1, Baroda 1956, p. 48.

Main Characteristics and Achievements of Jaina School of Ancient Indian Astronomy

S. S. LISHK

Abstract

Jaina school of astronomy belonged to dark period (post-Vedanga pre-Siddhantic period) in the history of ancient Indian astronomy. Due to lack of scientific inquiry into this field, some of the Western scholars hold an opinion that ancient Indian astronomy owe its origin to Greece and Mesopotamia. Here an attempt has been made to show that Jaina school of astronomy has to its credit certain peculiar achievements which have hitherto remained untraced elsewhere except fragmentarily in contemporary Indian literature. Some unique developments in Jaina astronomical period include notions of declination, celestial latitude and obliquity of ecliptic, method of measurement of celestial distances projected over the surface of the earth, systems of units of time length and arc division, the use of shadow lengths for the determination of seasons and time of the day elapsed at any instant etc. An exhaustive study of Jaina school of astronomy paves the way for the development of Siddhantic astronomy in India.¹ Besides, some unique achievements being quite independent of any foreign influence may be attributed to the native scholars unknown as yet in the history of astronomy.

Theory

Certain peculiar achievements of Jaina School of astronomy are mentioned as under :

1. *Units of Measurement*

(a) *Time-units*

In *Atharva Veda Jyotiṣa*, there exists an unique thirty-fold division system of time-units which may conveniently be called as 'trigesimal

- ¹ (a) Lishk, S. S. and Sharma, S. D. (1977), "Role of Pre-Aryabhata School of Astronomy in the Development of Siddhantic Astronomy", *IJHS*, Vol. 12 No. 2, pp. 106-113, INSA, New Delhi.
(b) See also Lishk, S. S. (1985), *Jaina Astronomy*, Sumati Sahitya Sadan, Delhi.

system'.² Jains had developed their peculiar system of time-units³ which is quite different from the parallel Vedic and Buddhistic systems of time-units, yet Jaina astronomical system based on the theory of two suns and two moons worked as an efficacious *via media* in paving the way for the probable emergence of sexagesimal system from the trigesimal system of time-units.⁴

(b) Length-Units

Anuyogadvāra Sūtra, one of the *Cūlikā Sūtras* belonging to Jaina Canonical literature⁵ describes three systems of length-units, viz. *pramāṇa*, *ātma* and *utsedha* systems. Accordingly we have

$$\begin{aligned} 1 \text{ pramāṇa yojana} &= 500 \text{ ātma yojanas} \\ &= 1000 \text{ utsedha yojanas} \\ &= 8 \text{ Tiloya-Pannatti yojanas} \end{aligned}$$

Such a type of classification of systems of length-units has not hitherto been found anywhere in Pauranic or Buddhistic literature also.

(c) Units of Arc-Division

A unique achievement of the Jaina astronomical system is that the zodiacal circumference was graduated in time-degrees days of a *nakṣatra* month (lunar sidereal revolution) and subsequently in time-degrees *muhūrtas* (1 *muhūrta* = 48 minutes) of a *nakṣatra* month, 54900 *gagana khaṇḍas* (celestial parts), numerically equal to 54900 *muhūrtas* of a five-year cycle and finally in 360 *saura* days (a *saura* day means the time taken by the sun to traverse $\frac{1}{360}$ part of zodiacal circle). Consequently the concept of 360 modern degrees of arc might have been developed. Such an evolution of the system of arc division seems to be quite independent of any foreign influence.⁶

² Lishk, S. S. and Sharma, S. D. (1976), "Time-units in Ancient Indian Astronomy", *Tulsi Prajna*, Vol. 2 Nos. 7-8, pp. 100-108, Ladnun.

³ *Ibid.*

⁴ See ref. 1(b)

⁵ Lishk, S. S. and Sharma, S. D. (1979), "Length-units in Jaina Astronomy", *Jain Journal*, Vol. 13 No. 4, pp. 143-154, Calcutta. See also ref. No. 8.

⁶ Lishk, S. S. and Sharma, S. D. (1979), "Zodiacal Circumference as Graduated in Jaina Astronomy", *IJHS*, Vol. 14 No. 1, pp. 1-14 INSA, New Delhi.

2. Cosmography

Like many other ancient peoples, in an effort to understand the real world around, Jainas had developed a unique mathematical model comprising of some peculiar notions,⁷ viz. the notion of circular flat earth, the notion of the theory of two suns and two moons, the notion that the moon is 80 *yojanas* higher than the sun. Besides, different accounts about the dimensions of the mount Meru are found in Pauranic literature, but the unique dimensions as extant in Jaina canonical literature⁸ form a mathematically consistent picture implying the notion of obliquity of ecliptic.⁹

3. Gnomonics

In *Atharva Veda Jyotiṣa*, an attempt had been made to measure shadow-lengths as a function of time wherein *muhūrta* (=48 minutes) was standardised as the fundamental unit of time.¹⁰ Jainas measured time as a function of shadow-lengths¹¹ and employed the use of shadow-lengths for the determination of seasons.¹² It is worthy of note that the evolution of the science of gnomonics in India is well-traced through the study of Jaina astronomical system. Moreover, Jainas had advanced

⁷ Lishk, S. S. (1982), "Some Strange Notions in Jaina Cosmology", *Tattva Jnan Smarika*, pp. 11-17 (English section), Sri Vardhaman Jain Pedhi, Palitana, Saurashtra.

⁸ Jaina canonical literature comprises of sacred texts of the Jaina sect in India. Its present recension is generally ascribed to the council of Valabhi under the presidency of Devardhi Gani which met in 5th or 6th Century A.D. The principal sources of Jaina astronomical texts are *Surya-Prajnapti*, *Candra-Prajnapti*, *Jambudvipa-Prajnapti* and also *Sthananga-Sutra*, *Anuyogadvara-Sutra* etc. Some later works like *Tiloya-Pannatti* and *Trilokasara* etc. are also of much interest. However, for more details, see our paper "Sources of Jaina Astronomy", *The Jaina Antiquary*. Vol. 29 Nos. 1-2, pp. 19-32.

⁹ Lishk, S. S. and Sharma, S. D. (1978), "Notion of Obliquity of Ecliptic Implied in the Concept of Mount Meru in Jambudvipa. Prajnapti", *Jain Journal*, Vol. 12 No. 3, pp. 79-92.

¹⁰ Lishk, S. S. and Sharma, S. D. (1980), "Standardization of Time-Unit Muhurta through the Science of Gnomonics in Atharva Veda Jyotisa", *IJHS*, Vol. 15 No. 2, pp. 134-143.

¹¹ Lishk, S. S. and Sharma, S. D. (1976), "The Time of Day Measured Through Shadow-Lengths in Surya-Prajnapti", *The Mathematics Education*, Vol. 10 No. 4, pp. 83-89.

¹² Lishk, S. S. and Sharma, S. D. (1977), "Seasons Determination through the Science of Sciatherics in Jaina School of Astronomy", *IJHS*, Vol. 12 No. 1, pp. 33-34.

in measuring shadow-lengths to such an extent that summer solstice had been determined up to 30 *muhūrtas* of one day.¹³

4. Kinematics of the Sun and the Moon

Jainas had determined the spiral paths of the solar and the lunar motions whose equations are akin to that of the Archimedian spiral. Such a kinematical model owes its provenance to the concept of a solar or lunar *maṇḍala* (diurnal circle) which implied a notion of declination.¹⁴ The notion of declination has neither been found in *Vedāṅga Jyotiṣa* nor in Pauranic or Buddhistic texts so far. Later the phenomenon of heliacal combustion of Venus had also been studied¹⁵.

5. Jaina Calendar

Jainas had strived for the reformation of the quinquennial cycle of *Vedāṅga Jyotiṣa* and the beginning of the five year cycle had shifted from Winter solstice in *Vedāṅga Jyotiṣa* to Summer solstice in Jaina astronomical system. Jainas had classified *nakṣatras* into *kula* (category), *upakula* (sub-category) and *kulopakula* (sub-sub-category) *nakṣatras* depending upon their positions with respect to moon's position among asterisms at syzygies. Thus, the five-year cycle of sixty-two lunar months was fixed on the sidereal lunar zodiac. It is worthy of note that the theory of classification of *nakṣatras* into *kula*, *upakula* and *kulopakula* does not fit exactly in the theory of Jaina five year fixed calendar based on mean motion of the moon. It seems plausible that the five-year fixed calendar was used for regulating their religious life whereas the concept of classification of *nakṣatras* into *kula* etc. was devised to study lunar motion for astronomical purposes. Such a classification of *nakṣatras* has not hitherto been found anywhere else.¹⁶

6. Cycles of Eclipses

Jainas had found out a unique cycle of eclipses depending upon two component cycles, viz. forty-two eclipse months cycle of lunar eclipses

¹³ Lishk, S. S. (1983), "Post-Vedanga Pre-Siddhantic Indian Astronomy", *Jain Journal* Vol. 17 No. 3, pp 88-95.

¹⁴ Lishk, S. S. (1984), "Notion of Declination Implied in the Concept of Mandala (Diurnal Circle) in Jaina School of Astronomy", *Jain Journal*, Vol. 18 No. 3, pp. 83-101.

¹⁵ Lishk, S. S. (1983), "Kinematics of Venus in Bhadrabahu Samhita", *Jain Journal*, Vol. 18 No. 1, pp. 1-19.

¹⁶ Lishk, S. S. (1980), "A Note on Jaina Calendar", *The Jaina Antiquary*, Vol. 33 No. 2, pp. 15-77.

and forty eight eclipse years cycle of solar eclipses. These cycles of eclipses were based upon observation of periodic repetition of eclipses in five different colours irrespective of any accurate knowledge of true motion of Rahu (lunar ascending node). Jaina eclipse-cycles are completely free from any foreign influences of Chaldean Saros or Metonic cycle.¹⁷

7. Lunar Occultations and Conjunctions with Nakṣatras

The concept of direction of lunar conjunction with a *nakṣatra* implies the notion of position of identifying star or the *nakṣatra* with respect to the region where the moon moves among the stars. Thus, any *nakṣatra* situated inside the belt of lunar zodiac occults the moon from both the northern and the southern directions depending upon the position of lunar nodes. It appears that Jainas had some trends towards the notion of celestial latitude of the moon.¹⁸ Besides *chatrāṭichatra yoga* (lunar occultation with Citra or α Virginis) has been explicitly defined in Jaina canonical texts. It is surmised that, that might have been the time when reckoning of the first point of zodiacal circumference was shifted from Winter solstice to Vernal equinox and consequently Abhijit (α Lyrae) was replaced by Asvini (β Arietis), Citra having celestial longitude 180° with respect to it, to head the list of *nakṣatras*.¹⁹

8. Measurement of Celestial Angular Distances

Jainas had developed the concept of height of astral bodies above *samātala bhūmi* (earth having plane surface denoting circular area with centre at the pole of ecliptic) and thus had measured their celestial latitudes in *yojanas* (basically, linear measures of length) in terms of corresponding distances projected over the surface of the earth. Babylonian ephemerides²⁰ of "System-A" measure the latitude of the moon in units called 'Barley Corn' (=Se) related by $72 \text{ Se} = 1^\circ$. But Jaina concept of *samātala bhūmi* as related to the measurement of latitude of the moon

¹⁷ Lishk, S. S. and Sharma, S. D. (1976), "Cycles of Eclipses in Jaina Astronomy", Sumerchand Memorial Volume, pp. 46-48, Jabalpur.

¹⁸ (a) Lishk, S. S. and Sharma, S. D. (1975), "Occultations of the Moon in Jaina Astronomy", *Tulsi Prajna*, Vol. 1 No. 3, pp. 64-69.

(b) Lishk, S. S. and Sharma, S. D. (1975), "Latitude of the Moon as Determined in Jaina Astronomy", *Sraman*, Vol. 27 No. 2, pp. 28-35, P. V. Research Institute, Varanasi.

¹⁹ Lishk, S. S. and Sharma, S. D. (1976), "Chatratichatra Yoga in Surya-Prajnapti", *Tirthankar*, Vol. 2 No. 1, pp. 27-35, 41.

²⁰ Neugebauer, O. (1975), *A History of Ancient Mathematical Astronomy*, p. 514.

speaks of their originality in measuring the celestial distances in this manner.

Conclusion

Jainas had a keen sense of observation. They generated a shadow-clock through gnomonic-experiments still in use with the Buddhistic monks in Ceylon, observed lunar occultations, determined summer solstice upto one day only, studied kinematics of the luminaries and the phenomenon of heliacal combustion of Venus, determined latitude of the moon, determined a new eclipse cycle through observation of colours of (*parva*) Rahu denoting Jaina concept of shadow causing an eclipse, classified *nakṣatras* into three categories through a skilled observation of the celestial phenomenon. Besides gnomon, some sort of clepsydra (water clock), and star clock might have also been used.

Obviously, some aspects are similar to both *Vedāṅga Jyotiṣa* and Jaina astronomy, e.g. five year cycle ; four time measures viz. *sāvāna* (civil), *saura* (solar), lunar and *nākṣatra* (sidereal) ; use of zig-zag functions and variation of length of daylight²¹ etc. But Jaina astronomical system exhibits a stage far advanced than *Vedāṅga Jyotiṣa* period. Besides, there are several unique developments in Jaina Astronomical period, e.g. notions of declination, celestial latitude, obliquity of ecliptic, method of measurement of celestial distances projected over the surface of the earth, systems of units of time, length and arc-division, the use of shadow-lengths for the determination of seasons and time of the day elapsed at any instant etc. These developments appear to be made quite independent of any foreign influence and they had paved the way for the development of Siddhantic astronomy.²² Consequently Pingree's views about the Mesopotamian origin of ancient Indian mathematical astronomy become quite questionable. There exists ample scope for further research into this field so that the worth of native scholars in ancient India may properly be recognized.

²¹ The ratio 3:2 of maximum and minimum lengths of daylight as extant in *Vedāṅga Jyotiṣa* and Jaina canonical literature belongs to 19.6°N. latitude of Ujjain, a renowned seat of learning in ancient India and not to 35°N latitude of Babylon as advocated by D. Pingree. (See Pingree, D., "Mesopotamian Origin of Ancient Indian Mathematical Astronomy", *JHS*, Vol. 4, pp 1-12.) For more details, see Sharma, S. D. and Lishk, S. S. (1978), "Length of Day in Jaina Astronomy", *Centaurus*, Vol. 22 No. 3, pp. 165-176, Denmark.

²² Lishk, S. S. and Sharma, S. D. (1977), "Role of Pre-Aryabhata-I Jaina School of Astronomy in the Development of Siddhantic Astronomy", *IJHS*, Vol. 12 No. 2, pp. 106-113.

Four Pañca-Tīrthikas from Bhagalpur

AJOY KUMAR SINHA

The Svetambara Jaina Temple, Campanagar¹ (a suburb of Bhagalpur town) stands upon the ruins of ancient Jaina temple site of glorious Campapuri, the capital city of Anga. The present temple was however constructed in about 1760 A.D. by the benevolent Svetambaras of Murshidabad town.² Martin Mantgomery³ left behind him a detailed account of this temple in his book. Buchanan⁴ attributed this temple to Jagat Seth, banker of Murshidabad Nawab. The present temple is an example of solid masonry work and its thick round large-sized pillars reminds one of the Greco-Roman architectural style. It contains as many as fifty stone and bronze images among whom four bronze *Pañca-Tīrthikas* of great archaeological as well as religious importance have been selected by the present author for study.

The antiquity of *Pañca-Tīrthika* icons is hardly four to five hundred years old. Majority of them have been reported from the western India and some of them are housed in the museums abroad. The present author thinks that the Jainas during their golden days (*circa* 15th-16th century A.D.) propagated the five fold path for attaining the *samyak Jñāna*⁵ (one of the *tri-ratna*) in terms of these *Pañca-Tīrthika* icons. This may also be related to the five fold vows⁶ of the Jainas, viz non-injury, non-lying, abstinence from theft, chastity and detachment from all external and internal temptation.

The *Pañca-Tīrthikas* under discussion are beautiful examples of the mediaeval metal art of India. They are well preserved and are under worship. Five Tirthankaras are grouped together in a geometrical composition. The *mūla-nāyakas*, in all the four icons are seated cross-legged in deep meditation. There are two standing Tirthankaras by the side of the *mūla-nāyaka*, and on each end is a standing flywhisk-bearer in *tribhaṅga*

¹ Sinha, Ajoy Kumar, 'Jaina Shrines in Bhagalpur', *The Jaina Antiquary*, Vol. 36 No. 2 (Arrah-1983), pp. 22-23.

² Patil, D. R., *The Antiquarian Remains in Bihar* (Patna-1963), pp. 78-79.

³ Martin, Mantgomery, *The History, Antiquities, Topography and Statistics of Eastern India*, Vol. II (London-1837), pp. 29-30.

⁴ Buchanan, H., *An Account of the District of Bhagalpur* (Patna-1839), pp. 75-76.

⁵ *Uttaradhyayana Sutra*, (*Jaina Sutras* translated by H. Jacobi).

⁶ *Tattvartha-raja-vartika*, Ch. VII, I (Sanatana Jaina Series).

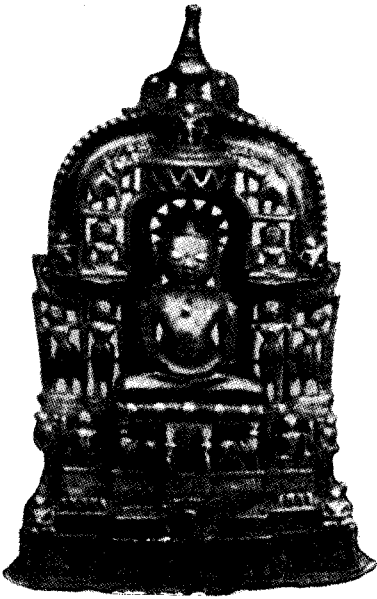


Fig. 1

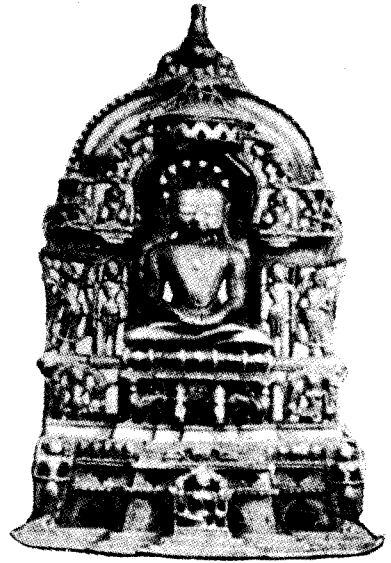


Fig. 2

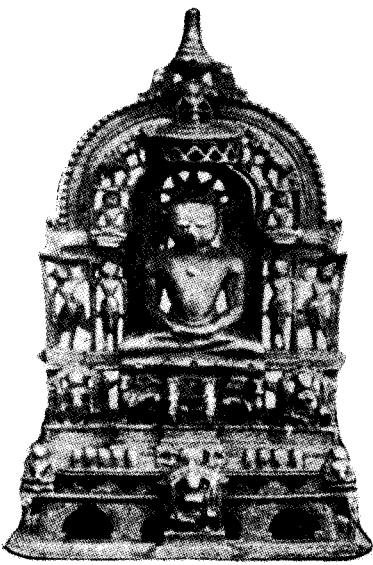


Fig. 3

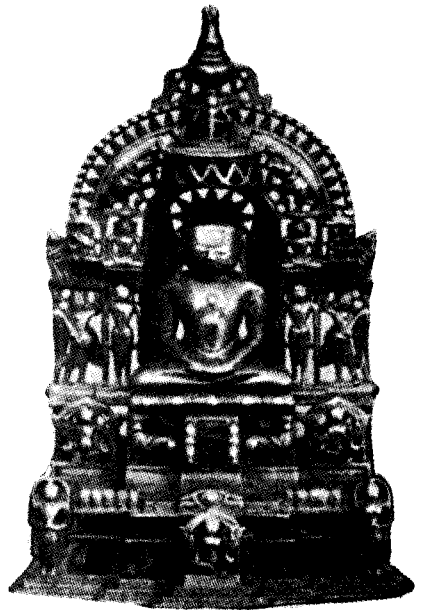


Fig. 4

posture. By the side of the each *mūla-nāyaka's* halo are two seating Tirthankaras also in deep meditation and on each end is a dancing Gandharva. Pair of truncated elephants are on either side of *mūla-nāyaka's chatra*. On the right and left ends of the lion-throne of the *mūla-nāyaka* are shown respectively the figures of the attendant Yaksa and Yaksi. In the centre of the lower-most end of the pedestal is placed the mother goddess seated in the '*ardha-paryāṅkāśana*'. The shrine is topped by a beautiful finial flanked by pair of fishes.

The earliest of these *Pañca-Tīrthikas* bears the date samvat 1523 (A.D. 1466). The *mūla-nāyaka* in this icon is Bhagavan Sambhavanatha, the third Jaina Tirthankara (fig. 1). It bears an inscription on its back. The next belonged to samvat 1581 (A.D. 1524) and its *mūla-nāyaka* is Bhagavan Santinatha, the sixteenth Jaina Tirthankara (fig. 2). The third bears the date samvat 1585 (A.D. 1528). The *mūla-nāyaka* in this icon is Bhagavan Adinatha, the first Tirthankara (fig. 3). The last *Pañca-Tīrthika* belonged to samvat 1603 (A.D. 1546) and its *mūla-nāyaka* is Bhagavan Sumatinatha, the fifth Jaina Tirthankara (fig. 4). Stylistically, all these four icons belonged to one school and show similarities with the western school of Jaina metal art. The *Pañca-Tīrthikas* from Bhagalpur show similarities with the *Pañca-Tīrthikas* from west India displayed in the Los Angeles County Museum (U.S.A.),⁷ Salar Jung Museum, Hyderabad,⁸ Central Archaeological Museum, Gwalior and one enshrined in Sagardighi, Murshidabad.⁹ But in comparison to each other the Bhagalpur *Pañca-Tīrthikas* are artistic from iconographic point of view as they contain all iconographic details.

⁷ Ghosh, A., *Jaina Art and Architecture*, Vol. III, pl. 333.

⁸ Sharma, B. N., *Jaina Pratimayen* (New Delhi-1979), p. 9.

⁹ Lalwani, Ganesh, *Bhagavan Mahavira* (Calcutta-1974), pl. 13.

Beyond the Endless Dusts

[Dedicated to SRI HARAKHCHAND BOTHRA]

Leona Smith Kremser

Caravans of the living
And their goods in due season
Pass into the endless dusts.

Thereof speak Jaina teachers :
“Living and non-living alike,
Neither are created nor destroyed,
Only their substances modify,
Pot to shards, dust and again clay,
Person to birth, death and rebirth
—Cycle without beginning,
And for the non-living without end,
For therein is no eternal entity.

Whilst in all living beings are
Souls, pure, individual and eternal,
In plant, animal and human alike.
Soul-bondage to the wailing body may
End by non-attachment,
For attachment is cause of rebirth,
And rebirth is effect of attachment.
Yet, everyday view-point sees
Living beings cleaving to body-life
—Ultimate attachment in conflict
With spiritual progress.

How many lifetimes of thorns
Till the foot sets to the path
Bequeathed by the Tirthankaras ?
—Path with venerable guidepost
...*Non-violence.*
Truth-seeker follows step-by-step
In Jaina restraint and penance
Toward harmless thought, word and deed,
Till the potential of purity

Within the soul becomes actual.
O joy ! Body-bondage is cast off,
And for holy perpetuity
Soul rests in all-wise bliss.”

Praise the teachers, that they speak
To all living beings, that all behold
The Jaina path to peace for the soul,
Beyond the pains of *karma* and rebirth,
Beyond the endless dusts.

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