

SET THEORY IN JAINA SCHOOL OF MATHEMATICS

L. C. JAIN

Department of Mathematics, Govt. Postgraduate College, Sehore, (M.P.)

(Received 10 January 1972)

This article renders a simple probe into the development of the set concept for exposing a compendium of all knowledge including the mathematical theory of *karma* bonds and their annihilation. The role of set theory therein is thus due to the classification of souls in various stages of life and developments towards omniscience. The role of the controls over a soul's modifications is mapped through a complicated role of the effected ultimate material particles. This gives rise to various types of sets in forms of matrices in relation to *karma*. Thus the mathematical and symbolic manipulation of all such events through a set theory, marks an ingenious contribution of the Indians right from the era of science awakening.

I. INTRODUCTION

The Progress of research on Jaina mathematics and cosmology may be surveyed through various articles and books.¹ Yet the set theoretic approach in the Jaina School of mathematics has not been elaborated in either of them.

The importance and applications of set theory are as unique as those of the theory of relativity and the theory of quanta. Georg Cantor (1845–1918) is credited with the original creation of the modern theory of sets.²

The fundamental word basic to Indian mathematics is *rāśi*. The Latin word 'ratio'³, meaning reason, appears to have phonetic correspondence with *rāśi*. The Greek word for ratio was λογος (LOGOS) which meant "a word" and also "the mind behind a word" for any number that could be expressed as a ratio. In *Sthānāṅga-sūtra*, a Jaina canonical work of about 300 B.C., *rāśi* forms one of the ten topics for discussion.⁴ *Rāśi* is synonomical with *samūha*, *ogha*, *puñja*, and synonyms for *ogha* are *vṛnda*, *sampāta*, *samudaya*, *piṇḍa*, *avaseṣa*, *abhinna* as well as *sāmānya*⁵.

The word *rāśi* appears in other Jaina texts in several contexts⁶. Cosmological sets may be found in details in *Tiloyapaṇṇatti*.⁷ Philosophical sets relating souls, their becomings; nature of *karma*, the number of particles involved therein, along-with their intensity of reactions and stay-periods; the deep-rooted theory of 'bhāva' (becoming) operators, operands and transforms may be found in great details in *Ṣaṭkhaṇḍāgama*⁸ and its commentaries, etc. In this short and survey article, it is proposed to expose various types of sets and the methods of their

manipulation. Mathematical and symbolic descriptions are available in *Artha-samdr̥ṣṭi* and related commentaries.⁹

The basis of set classification in *Gommaṭasāra*¹⁰ and *Labdhisāra*¹¹ in particular, rests on the division of souls and *karmas* as well as their mutual interactions and neutrality. Sets of souls have been coded under control-stations, soul-groups, development, vitality, animate feeling, fourteen wayward-stations, and up-yoke.¹² Control-stations are fourteen and general abridged descriptions are made according to the controls attained by the souls.¹³ There are fifty-seven subdivisions or soul-groups according to genus.¹⁴ Special and detailed descriptions are made according to wayward-stations.¹⁵ *Karmas* are divided into eight types¹⁶ and structure of each type is governed by ten kinds of conditions.¹⁷ The conditions of bond, rise and existence are treated according to the nature, stay-period, intensity of impartation, and the number of ultimate material particles involved.¹⁸

The mathematical structure of the above is planned on the basis of vector (*varga*), vector-group (*vargaṇā*), super-vector-group (*spardhaka*), geometric-regression (*guṇahāni*), nisus (*niṣeka*), and mutual-product (*anyonyābhyasta*), sets.¹⁹

The display of various kinds of becomings of souls having false and right faiths, based on faith and character attainment of favourable chances, forms the subject of *Labdhisāra*.²⁰ This work includes the destruction process of character-delusion, knowledge-obscuring and other *karmas*.²¹ For final accomplishment, the soul then begins to cease all operations, till complete annihilation of the remaining *karma* bond-chains.²² During the above becoming-operations over the becoming-operands, the becoming-transforms are mapped through mathematical and set-theoretic details in symbols and notations.²³

II. CLASSIFICATION

(i) *Unitary elements of sets*

The six fluents (*dravyas*) form the natural units. They are soul (*jīva*), material ultimate particle (*pudgala paramāṇu*), motion-causality-continuum or non-material aether (*dharma*), rest-causality-continuum or non-material anti-aether (*adharmā*), time-particle (*kālāṇu*), and space (*ākāśa*).²⁴ The practical units are instant (*samaya*)²⁵, point (*pradeśa*)²⁶, indivisible-corresponding-section (*avibhāgī praticcheda*)²⁷, instant-effective-bond (*samaya-prabaddha*)²⁸, and vector (*varga*)²⁹.

(ii) *Fundamental measure-units of sets*

The foundation of measure rests on the number of units or elements contained in any set. The cardinal of the set may then be defined through the number-measure of the fluent elements, through the finger-unit or the linear content of point elements thereof, through the units of pit, etc., of instants contained in the time occupied by the set elements, and finally through the becoming units of indivisible-corresponding-sections contained in the knowledge thereof.³⁰

For the above classification, the basic measures are ordinal or sum (*saṃkhyā*) measure and cardinal or simile (*upamā*) measure.³¹ The ordinal measure is of summable (*saṃkhyeya*), non-summable (*asaṃkhyeya*), and infinite (*ananta*) types; further subdivided into various ranges.³² The cardinal measure is of eight types. The first two are instant-cardinals: pit (*palya*), and sea (*sāgara*). The latter six are point-cardinals: linear finger (*sūcyāṅgula*), square finger (*prataraṅgula*), cube finger (*ghanāṅgula*), universe-line (*jagāśrenī*), square universe (*jaga pratara*), and cube universe (*ghana loka*).³³ The relation between the above two is given by

$$(\log_2 P)^2 = (\log_2 F),$$

where P is the set of instants in the time interval *addhā palya* and F is the set of points in the length interval *sūcyāṅgula*.

The above units come under the post-universal (*lokottara*) measures. The least measure in fluent measure is an ultimate particle, the greatest one being the set of all fluents. The least measure in quarter measure is a point, the greatest one being the whole space. The least measure in time measure is an instant, the greatest one being all time. The least measure in becoming measure is the (set of indivisible-corresponding-sections of) event-knowledge of the fine-vegetable-attainment-nondevelopable soul, the greatest one being the set of indivisible corresponding-sections of omniscience.³⁴

(iii) Fixed fluent sets examples

The set of all souls (*jīva rāśi*), the set of all ultimate material particles (*puḍgala paramāṅgu rāśi*), the set of all time-uniform-particles (*kalāṅgu rāśi*), form fixed fluent sets. The single element continuum fluent sets are the space (*ākāśa*), the non-material aether (*dharma*), and the non-material anti-aether (*adharmā*).

(iv) Point-sets examples

The matter-fluent structures have summable, non-summable and transfinite point-set formations. The non-material aether, the non-material anti-aether, a soul, the universe-space have each a non-summable point-set structure. Time fluents do not form a body, hence each of them forms a singlet point-set.³⁵

(v) Instant-sets examples

The transmigrating souls undergo five types of change-cycles of wandering. The change-cycle of matter, the change-cycle of space, the change-cycle of time, the change-cycle of incarnation and the change-cycle of becomings form instant-sets.³⁷ Other instant-sets are the all-time set,³⁸ the past-time set, the present-time set, the future-time set, the intra-fortyeight-minute (*antarmuhūrta*) set,³⁹ the trail-time (*āvali*) set,⁴⁰ the creation-time (*kalpa*) set,⁴¹ a singlet instant set,⁴² and so on.

(vi) *Biggest set*

The set of indivisible-corresponding-sections of knowledge in omniscience is the greatest set.⁴³ This also implies the set of all the knowledge sections of all the omniscients. The concept of union of sets is inherent here.

(vii) *Null set*

The conceptual set containing no element is the null set. For example, the instant-set of the past may be said to have been exhausted by the soul-set of the wrong faith souls.⁴⁴ The set of hellish wrong faith souls is exhausted by the set of non-summable-non-summable hyposerpentine and hyperserpentine periods of instant-sets.⁴⁵

(viii) *Sets of souls in control and wayward stations*

There are sets of souls in fourteen control stations from wrong faith to non-volition omniscient, and beyond all these is the set of the variable set of the accomplished souls,⁴⁶ increasing at a given variable rate. These stations help in giving a deep and extensive study of the topology of sets of souls in various living, wayward⁴⁷ and other⁴⁸ stations.

(ix) *Finite sets*

The finite sets are either summable or non-summable, i.e. they are not unending. For example, the point-sets of a soul, the non-material aether, the non-material anti-aether, the universe-space, etc., are non-summable finite sets.⁴⁹ The soul-set of non-erratic disciplined souls is summable.⁵⁰

(x) *Indivisible-corresponding-section sets of controls*

The energy levels of controls (*gunas*) of fluents are measured through the number-set of the indivisible-corresponding-sections. For example, the set of indivisible-corresponding-sections of the non-gravity-lightness (*agurulaghutva*) control of the aether and anti-aether fluents is one of the subsets of the set of indivisible-corresponding-sections of knowledge control of an omniscient soul.⁵¹ Similarly the touch control of an ultimate particle of matter in the lowest impartation station, with lowest impartation bond is successively divided through intelligence till the last section. This section is called the indivisible-corresponding-section of touch control, and defines energy levels of particles, decisive for bonds in affine and anti-affine types of matter.⁵² The set of indivisible-corresponding-sections of maximum yoke (*yoga*) responsible for influx of *karma* is greater than the instant-set of common-vegetable-body-stay (*nigoda kāya sthiti*).⁵³

(xi) *Transfinite sets*

The set which cannot become a null set, by being exhausted for unending time, has been called transfinite by the great saints.⁵⁴ Several examples of

transfinite sets have been given in this article.⁵⁵ The set of all souls, the set of points in all space, the set of instants in all time are a few examples.

(xii) *Sets of vector-group of matter*

There are two types of vector-groups of matter (*pudgala vargaṅās*), the inner and the outer. The inner is of twenty-three kinds⁵⁶ and the outer one is described in four ways.⁵⁷ These are important so far as a survey of structures of material forms is concerned in medical and other sciences.

(xiii) *Sets in relation to karma-structures*

Apart from the basic sets,^{57(a)} the *karma*-structures are classified as sets of merits, demerits, entrant-portal, restraint-portal, and emergent-portal; all in terms of becomings of mundane souls and their corresponding *karma* particles.⁵⁸ Similarly there are the sets of bond and redemption; the former amounting to the instant-bond, and the latter amounting to the product of an instant-bond and slightly less than one and a half geometric regressions.⁵⁹

The *karma*-structures are again classified into the eight types of sets of the knowledge-obscuring, the conation-obscuring, the feeling-producing, the deluding, the longevity-determining, the status-determining, and the obstructing; the subdivisions being one hundred and forty-eight. The treatment may also be based on the non-summable universes of subdivisions of above structures.⁶⁰ Each of these is to be set into the forms of *karmic* bond, rise, and existence.⁶¹ Again they have set compositions into the nature, the stay-duration, the impartation-chains, and the particles-chains of *karma*-structures.⁶²

(xiv) *Variable sets*

Various types of becomings of living⁶³ and non-living beings are in form of variable sets. Souls in various control and wayward-stations also form variable sets since souls enter, stay and leave them in flow of time. The *karmic* sets also change every instant. The set of instants in the past is increasing whereas the set of instants in the future is ever decreasing, the present instant-set being in the state of flux. The set of periodic rise and fall of indivisible-corresponding-sections of non-gravity-levity control of a fluent in six stations needs special mention. They occur as a dividend or multiple of summable, non-summable and infinite. These result in twelve types of own-becoming-events as instantaneous happening of the control in every fluent.⁶⁴

III. SYSTEM OF SET OPERATIONS

(i) *Analytical methods*

The method of *reductio-ad-absurdum* has been common.⁶⁵ The method of one-one correspondence was used by Virasena for comparing transfinite sets.⁶⁶ He used eight logical methods as well for illustrating and exposing the measure

of sets. They are respectively those of measure, reason, explanation, extra-creation, cut, division, spread, and removal or subtraction.⁶⁷

(ii) *Analytic operators*

In *Dhavalā* the laws of indices, the theory of logarithms to all types of bases, special methods of dealing with the fractions involving the transfinite, the method of square-piling, etc., have been elaborated regarding all types of sets.⁶⁸

(iii) *Operators in relation to karma-structural sets*

(a) Types of becoming operators of souls in general are these due to the subsidence, the destruction, the destruction-cum-subsidence, as well as the rise of *karmas*. There is one more becoming operator known as the inherent nature or capacity of the souls, operating independent of *karmas*.⁶⁹

(b) The becoming operators responsible for influx of *karma* are the bodily, speechful, and mental volitions.⁷⁰

(c) The becoming operators responsive for nature and particle (point) *karma*-bonds are the volitions, whereas those conclusive for stay-period and impartation *karma*-bonds are the affections.⁷¹

(iv) *Becoming operations in relation to karma-structural sets*

(a) In every type of *karma*-bond there are ten types of operations⁷² with few exceptions.

(b) The becoming operations corresponding to *karmic* subsidence-cum-decay are the sets of the low-tended, the unprecedented and the invariant becomings.⁷³

(c) There are various becoming operations corresponding to *karmic* destruction becoming-operators.⁷⁴

(v) *Becoming operands in relation to karma-structural sets*

The operands are the *karma*-bonds, *karma*-existence, and *karma*-rise, expressed mathematically in terms of type, particles, stay and impartation structural forms.⁷⁵ It may be noted that the operands are both the becomings of corresponding mundane souls as well as the becomings of the *karma*-particles in bond, rise and existence. In general, the operands are those which are subject to various types of operations in relation to *karmic* activities.

(vi) *Becoming transforms in relation to karma-structural sets*

Due to the operation of operators on operands the *karma*-structural sets are transformed.⁷⁶ This is in reference to both, the becomings of the mundane souls as well as the becomings of corresponding material particles in *karmic* rise, bond and existence. It is evident that in the process of differential purification of the becomings of souls, there are complicated chain-reaction revolutions in the corres-

ponding set of chained geometric regressions. Thus there are transformations in the nature, the number, the fruition, and the stay-period.

IV. COMPARABILITY

(i) Comparability (*alpa-bahutva*) of summable, non-summable and infinite types of sets is one of the methods of analytical studies into the knowledge of order of smallness or largeness in relation to seven *tautos* (*tattvas*).⁷⁷ It is also defined as the nature of number also.⁷⁸ The three types of comparability are about souls, about non-souls, and about both (mixed). When the states of knowledge, perception, volition and intensity of *karmic* rendering are depicted, the comparability is of *noāgama* type. All types of comparability are in general treated in three ways : in one's own place, in other place, and in general.⁷⁹

As an example of mixed⁸⁰ type of comparability, the comparability of sixteen sets is important.

(ii) The relations used in comparability are expressed as follows :

Small,⁸¹ equal,⁸² smallest,⁸³ non-existent,⁸⁴ distinctly great,⁸⁵ distinctly less,⁸⁶ summable times,⁸⁷ non-summable times,⁸⁸ infinite times,⁸⁹ non-summable first square-roots of pit measure,⁹⁰ non-summable part of first square-roots of pit measure,⁹¹ two times decrease,⁹² two times increase,⁹³ least passive,⁹⁴ most intense.⁹⁵ The relations connected with equality relation along with other relation are also cited.⁹⁶

(iii) Comparability is of two kinds according to brief or detail denotations.⁹⁷ The three ways of comparability in 'feeling' chapter are regarding least, greatest and least-greatest terms.⁹⁸ The other two ways describe the order of increase in geometrical progression.⁹⁹ In the chapter on bond the comparability is of two kinds : the soul comparability and bond-particle comparability.¹⁰⁰ Again it is described in two ways according to time and soul.¹⁰¹ *Yati Vṛṣabha* treats comparability of various kinds of magnitude regarding non-summable islands and oceans on the basis of nineteen extra-creations.¹⁰²

V. SEQUENCES LOCATING ALL THE SETS

In order to locate the order of comparability of all finite and transfinite sets described in the Prakrit texts, fourteen types of sequences with the first term, the last term and other corresponding station-terms are described.^{102(a)} Such ordering implies the use of well-ordering theorem and stronger axioms of choice. In all of these the first term is the minimal element, the last term is the maximal element. Then each of the remaining corresponding terms is placed at an appropriate station (*sthāna*) denoting order in the particular sequence. All the sequences are monotonic increasing. The structures of the sets appearing as station-terms in the sequences are of various types : ordered, non-ordered, and so on. Various

structures of the sequences contain only those sets which are admissible in the production process, characterizing a particular sequence.

The all-sequence (*sarva dhārā*) contains all the sets, starts from unity and ends at the omniscience-set of indivisible-corresponding-sections of all knowledge. All the remaining sequences are its products.¹⁰³ The even-sequence (*sama dhārā*) contains only even terms, the omniscience-set being an even term.¹⁰⁴

The station-terms of the square-maternal-sequence (*varga mātrka dhārā*) are those whose squares exist or are contained in the sequence. The first term is unity and the last term is the square-root of the omniscience-set.¹⁰⁵ The subsequent terms up to the omniscience-set belong to the non-square-maternal-sequence.¹⁰⁶

The first term of the diadic-square-sequence (*dvirūpa varga dhārā*) is the square of two, each of the succeeding terms being the square of the preceding term.¹⁰⁷ If to each of these station-terms, unity is added, they all form Fermats' numbers.

The resultant transfinite station-terms in succession of various infinite squaring operations are the sets of the following: all souls, all matter-particles, all points of two-dimensional product space, the indivisible-corresponding-sections of non-gravity-lightness of the non-material aether and anti-aether, the indivisible-corresponding-sections of the least knowledge of fine-vegetable-non-developable souls, the indivisible-corresponding-sections of the destructional attainment of right faith, and the indivisible-corresponding-sections of the omniscience-set (or the maximum attainment due to complete annihilation of *karmas*).¹⁰⁸

The total number of stations in the above sequence is obtained as logarithms to base two of the logarithms to base two of the omniscience-set.¹⁰⁹ The first term of diadic-cube-sequence is cube of two, and each of the succeeding terms is obtained as a result of squaring the preceding term. The resultant transfinite sets, consequent on characteristic transfinite operations, are those of cube of the set of all souls, the points of three-dimensional product-space, and the cube of the fourth root of the omniscience-set.¹¹⁰

For further details, Nemicandrācārya refers to a treatise on sequences, 'Vṛhaddhārāparikarma' which is not available at present.¹¹¹

VI. SYMBOLISM FOR SET THEORY

In the original Prakrit texts of the second century, the approach to set formulation appears to be semantical. Later on simple symbolism seems to have been developed, and hundreds of pages of symbolic manipulation appear in *Gommaṭasāra*¹¹² detailed commentaries. Herein the two texts of Toḍaramala¹¹³ form important guides on symbolism. The first is *Artha Saṃdṛṣṭi* on *Gommaṭasāra*, consisting of 307 pages. The second is *Artha Saṃdṛṣṭi* on *Labdhisāra* (including *Kṣapaṇāsāra*), consisting of 207 pages. These works were compiled round about A.D. 1761. Symbolism in these texts and other texts has already been discussed.¹¹⁴

CHART No. 1.

NAME	SOUL	NON-SOUL	SOUL-MERIT	NON-SOUL-MERIT	SOUL-DEMERIT	NON-SOUL-DEMERIT	FRANT-PORTAL	RESTRAINT-PORTAL	EMERGENT-PORTAL	BOND	COMPLETE-EMERGENCE
नाम	जीव	अजीव	जीव पुण्य	अजीव पुण्य	जीव पाप	अजीव पाप	श्रव	संवर	निर्जरा	बंध	मोक्ष
FLUENT-MEASURE द्रव्यमान	१६	३ ≡ १६ख	१ — प ४ ४ ४ ४ ४ ४	स ४ १२— शु	१३—	१८ स ४ १२—शु शु	४	स ४	स ४ १२—६४ ओ प ८५ ४	स ४	स ४ १२—
QUARTER-MEASURE क्षेत्रमान	≡ ख ख	≡ ख ख ख	२ ४	≡ ख शु	≡ ख ख—	१८ ≡ ख शु शु	ख	≡ ख	≡ ख	≡ ख	। ≡ ख
TIME-MEASURE कालमान	अ ख	अ ख ख	क ४	क ख—	क ख—	क ख	ख	क ख	क ख	क ख	क ख
BECOMING-MEASURE भावमान	के ख ख	के ख	ओ ४	के ख ख ख	के— ख ख	के ख ख ख	के ३	के ख ३	के ख ३	के ख ३	के ख ३

Cf. To. *op. cit.*, p. 190. Here १६ is the set of all souls; ≡ is set of points contained in universe-space (three-dimensional non-empty product-space); ख is infinite, also used as a multiplier or a divisor; स is instant-effective-bond; ४ is non-summable; शु is summable; क is creation-time instant; अ is past-time instant-set; के is the set of indivisible-corresponding-sections of omniscience; ओ is the set of indivisible-corresponding-sections of clairvoyance; प is instant-set called १३ is the set of mundane souls; १२— is slightly less three by two geometric regression set; and so on.

CHART No. 2.

NAME नाम	PIT पत्य	SEA सागर	LINEAR FINGER सूक्ष्मगुल	ARREAL FINGER प्रतरांगुल	CUBE FINGER घनांगुल	WORLD-LINE जगच्छ्रेणि	WORLD-SURFACE जगप्रतर	UNIVERSE लोक
MEASURE प्रमाण की	प	सा	२	४	६	—	=	≡
LOGARITHM TO BASE TWO अर्द्धच्छेद की	छे	वृ छे	छे छे	छे छे २	छे छे १ ३	छे छे छे १ ३ व	वि छे छे १ ६	वि छे छे १ ६
LOGARITHM TO BASE TWO OF LOGARITHM TO BASE TWO वर्गशलाका की	व	०	व २	१— व २	व २	व १ ६ १ २ व २	१— व १ ६ १ २ व २	व १ ६ १ २ व २

The symbols are arithmetical, algebraical, geometrical and place-valued. The work on symbolic manipulation is much involved owing to complex structure of the deep-rooted *karmic* theory, consequently there seems to be no attempt at exposing or improving the symbolism for analytical or deeper studies after *Todaramala*.

The charts will give an idea of prominence and outstanding features of the symbolism.

ACKNOWLEDGEMENT

The author is thankful to Dr. K. S. Shukla for his important suggestions in preparation of this paper.

REFERENCES AND NOTES

¹ Vid.

- Da 1 : Datta, B. B., *The Jaina School of Mathematics*, *Bull. Calcutta Math. Soc.*, 21 (1929), pp. 115-145.
- Da 2 : Datta, B. B., *Mathematics of Nemichandra*, *The Jain Antiquary*, Arrah, 1, no. ii (1935), pp. 25-44.
- Da 3 : Datta, B. B., and Singh, A. N., *History of Hindu Mathematics*, Asia Publishing House, Bombay (1962).
- Jg : Jain, G. R., *Cosmology old and new*, Central Jaina Publishing House, Lucknow (1942).
- Jl 1 : Jain, I. C., *Tiloya Pannatti kā Ganita*, Reprinted from introduction to *Jambū Diva Pannatti Samgaho*, Jivaraja Granthmala, Sholapur (1952), pp. 1-109.
- Jl 2 : Jain, L. C., *On the Jaina School of Mathematics*, *Babu Chhote Lal Jaina Smriti Granth*, Calcutta (1967), pp. 265-292 (Eng. Sec.).
- Si 1 : Singh, A. N., *Mathematics of Dhavalā I*, *Satkhaṇḍāgama*, book iv, edited by Dr. H. L. Jain, Amaraoti (1942), pp. v-xxi.
- Si 2 : Singh, A. N., *History of Mathematics in India from Jaina sources*, *The Jaina Antiquary*, 15, no. ii (1949), pp. 46-53; and 16, no. ii (1950), pp. 54-69, The Central Jaina Oriental Library, Arrah.

² Vid.

- Ca : Cantor, G., *Contributions to the founding of the theory of Transfinite Numbers*, translated by P. E. B. Jourdain, The Open Court Publishing Co., La Salle, Illinois (1952).

³ Cf. Ho, p. 75.

- Ho : Hooper, A., *Makers of Mathematics*, London (mcmlxi). For further observations cf. Neu, p. 51; Be, p. 41, and Sm, pp. 477-478.
- Neu : Neugebauer, O., *The Exact Sciences in Antiquity*, Providence (1957).
- Bell, E. T., *Development of Mathematics*, New York (1945).
- Sm : Smith, D. E., *History of Mathematics*, vol. 2, Dover (1958).

⁴ Sutra, 747,

परिकम्म ववहारो रज्जु रासो कला सवन्ने व ।

जावंतावति वग्गो घनो त तह वग्ग वग्गो विकप्पो त ॥

Cf. Da 1 *op. cit.*, pp. 119, 120.

⁵ Vid. Pu, 1, 2, 1, book 3, p. 9.

Pu : Puspadanta and Bhūtabali : *Śaṅkhaṇḍāgama*, Books 1 to 16, (1939-1959), edited by Dr. H. L. Jain, published from Amaraoti and Vidisha during the last thirty years. This contains the well-known commentaries, called Dhavalā series of texts, a life-work of Virasenācārya. Publisher : S. Shitabrai Laxmi Chandra Jain, Sahityo-ddharaka Fund, Amaraoti. *Śaṅkhaṇḍāgama* was composed probably during the first two centuries of the Christian era. Dr. H. L. Jain has fixed the date of completion of Dhavalā as 8 October, A.D. 816.

⁶ Vid. *Abhidhāna Rajendra Kosha*, Jain Shwetamber Samasta Samgh, Ratlam (1923), vol. 6, p. 562 :

रासि—राशि—पुं, । समूहे, औ. । अध. । अनु. । विशेषे. । पुत्रजे, ज्ञा. १ श्रु. १ अ. ।
 . . . इह सजातीय वस्तु समुदायो वर्गाणां समूहो वर्गो राशिरिति पर्यायाः । विशेषे. । शालि
 धान्यादि राशि वद्राशिः . . . । तं जहा—जीव रासी अजीव रासी य । . . . संख्यानं राशिः स. च
 पाठ्यां राशि व्यवहार इति प्रसिद्ध । स्था. १० ठा. ३ ड. । त्रैराशिक पञ्चराशिकादिषु,
 स्था. ४ ठा. ३ ड. । वर्ग राश्यादिषु, विशेषे. आ. म. । धान्यादीनां पुञ्जे य होति वट्टो, सो
 चैव य ईस आयतो रासी । कुलिया कुङ्कुलीणा मिति कडा संसियामिती ।

⁷ For the following words vid. Ya.

Ya : *Yati- Vṛṣabha, Tūloya Paṇṇatī, Bhāga-1* (1943), *Bhāga 2* (1951), edited by Dr. A. N. Upadhye and Dr. H. L. Jain, Jivaraja Grantha Mala, Sholapur.

This work is assigned to some period between A.D. 473 and A.D. 609.

दोष्यदि रासियम् (4-130), सलाय रासिदो (4-310), उपण रासिम् (4-310), p. 181 ;
 असंखेज्ज रासिदो (4-310), p. 182; तेउक्काइय रासि (5.280), p. 597 ; धुव रासि (7-123),
 p. 674 ; जोदिसिय जीव रासि 7-613), रिण रासिस्स (7-613), p. 765.

⁸ Vid. Pu, *op. cit.*, for the following words. In them, the succeeding word *rāsī* does not occur explicitly in condensed sutras :

मिच्छाइट्टो (1, 2, 2) ; अणंता (1, 2, 2) ; अणंताणंताहि श्रोसप्पिणि-उत्सप्पिणीहि (1, 2, 3) ;
 अणंताणंता लोगा (1, 2, 4) ; पलिदोवमस्स असंखेज्जदि मागो (1, 2, 6) ; कोडि पुधत्तं (1,2,7) ;
 सेढीओ, जगषदस्स, अंगुल वग्गमूल (1, 2, 17) ; सेढीए आयामो असंखेज्ज जोयण कोढीओ
 (1, 2, 42) ; पदरस्स बेहप्पणंगुल सय वग्ग पडिमाणेण (1, 2, 55) ; जोइसिय देवा (1, 2, 65) ;
 अमव सिद्धिया (1, 2, 173) ; सध्व लोमे (1, 3, 4) ; अद्ध पोग्गल परियट्टं (1, 5, 3) ; एग
 समओ (1, 5, 5) ; आवलि आओ (1, 5, 8) ; अंतोसु हुत्तं (1, 5, 9) ; पुव्वकोढी (1, 5, 18) ;
 खुदामवग्गहणं (1, 5, 66) ; सन्बद्धा (1, 5, 79) ; सागरोवमाणि (1, 5, 93) ; कम्मइयकाय
 जोगीसु मिच्छादिट्टो (1, 5, 217) ; ट्टिदिबंधो (1, 9-6, 4) ; आबाधूणिया कम्मट्टिदी कम्मणिसेओ
 (1, 9-6, 6) ; अंतोकोढाकोडिट्टिदिं (1, 9-8, 3) ; तेउक्काइया वाउक्काइया बादराखुहुमा
 पज्जत्ता अपज्जत्ता तिरिक्खा (1, 9-9, 115) ; जोगट्टाणाणि (4, 2, 4, 19) ; जोगाविमाम
 पडिच्छेदा (4, 2, 4, 177) ; वग्गणा (4, 2, 4, 180) ; फइयं (4, 2, 4, 182) ; णाणा जोग
 दुगुण वडिद-हाणिट्टाणंतराणि (4, 2, 4, 196) ; संकिलेस विसोहिट्टाणाणि (4, 2, 6, 51) ;
 पदेसगं णिसित्तं (4, 2, 6, 102) ; णाणावरणीय-दंसणावरणीय-अंतराहय वेयणाओ (4, 2, 7, 49) ;

कंदयं (4, 2, 7, 215); अणुमाग बंधञ्जवसाणट्टाणाणि (4, 2, 7, 230); समय पबद्ध (4, 2, 14, 24).

Cf. Pu, *op. cit.*, refered vols.

Digression :

संजोगावरणट्ठं चउसट्ठिं थावए बुवे रासिं ।

अण्णोण्ण समन्नासो रूवूणं गिहसे गणितं (5, 5, 46).

⁹ Vid.

To: *Ṭoḍaramala, Artha Saṃdṛṣṭi Adhikāra*, being two independent chapters of the commentaries of Nem 1, *op. cit.*, compiled before circa A.D. 1761. *Artha Saṃdṛṣṭi* means Symbolism for Measure.

¹⁰ Vid.

Nem 1: Nemicandrācārya, *Gommaṭasāra Jivakāṇḍa, Gommaṭasāra Karmakāṇḍa, Labdhisāra, Kṣapaṇāsāra*, (abbr. as G.J.K., G.K.K., L.S., K.S., respectively), along with commentaries; Gandhi Haribhai Deokarana Jaina Grantha Mala, Calcutta (Publication year not mentioned). It appears to have been published round about 1910.

Nemicandrācārya (circa tenth century A.D.) prepared the above condensed works from the earlier sources *Ṣaṭkhaṇḍāgama, Mahābandha* and other Prakrit texts.

¹¹ Vid. Nem 1, *op. cit.*

¹² गुण जीवा पञ्जती पाणा सण्णा ष मग्गणाओ य ।
उवओगो वि य कम सो वोसं तु परूवणा मणिदा ॥ २ ॥

Cf. Nem 1, *op. cit.*, G.J.K., v. 2.

¹³ मिच्छो सासण मिस्सो अविरदसम्मो य देसविरदो य ।
विरदा पमत्त इदरो अपुव्व अणियट्ठि सुहमो य ॥१॥
उवसंत खीण मोहो सजोग केबलि जिणो अजोगी य ।
चउदस जीव समासा कमेण सिद्धा य णादवा ॥१०॥

Cf. *ibid.*, v.v. 9, 10.

¹⁴ भू आउ तेउ वाऊ णिच्च चदुग्गदि णिगोद थुलिदरा ।
पत्तेय पदि ट्ठिदरा तस पण पुण्णा अपुण्ण दुगा ॥७३॥

Cf. *ibid.*, v. 73. At this juncture the reader may be made aware of the recent researches of Rashevsky on a newly defined concept of 'Organismic Sets' in mathematical biology. For instance, vid. the following :

Ra 1: Rashevsky, N., Outlines of a General Theory of Biological and Social Organisms, *Bulletin of Mathematical Biophysics*, 29, 1967, Michigan.

The latest one is :

Ra 2: Rashevsky, N., Contribution to the Theory of Organismic Sets, III, *Bulletin of Mathematical Biophysics*, 33, 1971, Michigan.

¹⁵ गह इंदियेसु काये जोगे वेदे कसाय णाणे य ।
संजम दंसण लेस्सा मविया सम्मत्त सण्णि आहारे ॥ १४२ ॥

Cf. Nem 1, G.J.K., v. 142.

- 16 गणस्स दंसणस्स य आवरणं वेयणीय मोहणियं ।
आउगणामं गोदंतरायमिदि अट्ट पयडीओ ॥ ८ ॥
Cf. Nem 1, G.K.K., v. 8.
- 17 वंधुकट्टण करणं संकम मो कट्टु दीरणा सत्तं
उदयुव सामणिसी गिकाचना होदि पडिपयडी ॥ ४३७ ॥
Cf. *ibid.*, v. 437.

- 18 पयडिट्टिदि अणु भागप्पदेस बंधोत्ति चट्टु विहो बंधो ।
उक्कस्समणुक्कस्सं जहणणमजहणणंति पुधं ॥ ७१ ॥
Cf. *ibid.*, v. 89.
- 19 अविभाग षडिच्छेदो वग्गो पुण वग्गणा य फड्ढयगं ।
गुणहाणी वि य जाणे ठाणं पडि होदि णियमेण ॥ २२३ ॥
गुणहाणि अणंत गुणं तस्स दिवड्ढं णिसेय हारो य ।
अहिय कमाणणोणभ्मत्यो रासी अणंत गुणो ॥ ४३५ ॥—कुल्यं ।
Cf. *ibid.*, v. 223 and v. 435.

The concept of the vector (*varga*) here corresponds to the set of the ultimate *karmic* particles in its lowest energy-level. It consists of a set of indivisible-corresponding-sections of the impartation control of the each one of the set of the *karmic* particles in the equivalent energy-levels. Thus its measure varies from the least to the greatest. It is said to have a cardinal which is non-summable times the set of points of universe (*loka*).

A vector-group (*vargaṇā*) is the set of *karmic* particles each of which has the same vector, i.e., the vectors at the same energy-level. Its measure also varies from the least to the greatest.

Similarly a super-vector-group is defined as the set of vector-groups, and a geometric-regression (*gunahāni*) is a set of super-vector-groups (*sparadhakas*).

All geometric-regressions contain equal number of terms, called dimension (*āyāma*). The set of all geometric-regressions is called various-geometric-regressions (*nānā gunahāni*). Twice the dimension of a geometric-regression is called a nisus-wearth (*niṣeka hāra*). The product of dimension and the number of various-geometric-regressions is called the dimension of stay-period which is different for different *karma*. This is called '*sthiti āyāma*'. Two raised to the number of various-geometric-regressions is called the mutual product set (*anyonyūbhyaṣṭa rāśī*).

- 20 सिद्धे जिणिंद चंदे आयरिय उवज्जाय साहु गणे ।
बंधिय सम्महंसण-चरित्तलद्धिं परूवेमो ॥ १ ॥
चदुगदि मिच्छो सण्णी पुण्णो गम्भज विसुद्ध सागारो ।
पदमुवसमं स गिण्हदि पंचम वर लद्धि चरिमग्ग्हि ॥२॥
खयउवसमिय विसोही देसण पाउग्गकरणलद्धी य ।
चत्तारि वि सामण्णा करणं सम्मत्तचारित्ते ॥३॥
दुविहा चरित्तलद्धी देसे सयले य देसचारित्तं ।
मिच्छो अयदो सयलं तेवि य देसो य ल भ्मेई ॥१६६॥

Cf. L.S., op. cit., Nem 1, vv. 1, 2, 3, 166.

- 21 तिकरणमुमयोसरणं कमकरणं खवणदेसमंतरयं ।
 संकम अपुव्वफड्ढध्यकिट्टीकरणुमवण खमणाये ॥३७१॥
 चरिमे पदमं विग्घं चउदंसण उदयसत्तवोल्लिण्णा ।
 से काले जोगिजिणो सव्वण्हू सव्वदरसी य ॥६१०॥

Cf. *ibid.*, vv. 389, 605.

- 22 जोगिस्स सेसकालं मोत्तूण अजोगिसव्वकालं च ।
 चरिमं खंडं गेण्हदि सीसेण य उवरिमठिदीओ ॥६१०॥
 तत्थ गुणसेदिकरणं दिज्जादिकमो य सम्म खवणं वा ।
 अंतिमफालीपढणं सजोगगुणठाण चरिमम्हि ॥६४१॥
 से काले जोगिजिणो ताहे आउगसमा हि कम्मणि ।
 तुरियं तु समुच्छिण्णं किरियं ऋायदि अयोगिजिणो ॥६४२॥

Cf. *ibid.*, vv. 640, 641, 642.

23 Vid. To, *op. cit.*

- 24 जीवा पोग्गल काया धम्माधम्मा य काल आयासं ।
 तच्चत्था इदि मणिदा णाणगुणपज्जएहि संजुत्ता ॥ (नि. ९)

Cf. Ku, Ni, 9, p. 22.

Ku : Kundakundācārya, *Prābhṛta Saṃgraha*, edited by K. C. Jain, Jivaraj Granthmala, Sholapur (1960). This is a collective volume wherein important verses from *Kundakunda* have been placed according to topics.

- 25 आगासमणुणिविट्ठं आगासपदेससण्णया मणियं ।
 सव्वेसिं चअण्णं सव्वकदि तं देदुमवगासं ॥ (प्रव. २, ४८)
 जधते णमप्पदेसा तधप्पदेसा हवंति सेसाणं ।
 अपदेसो परमाणू तेण पदेसुब्बवो मणिदो ॥ (प्रव. २, ४५)

Cf. *ibid.*, Pr, 2-45, 2-48, p. 24.

- 26 समओ दु अप्पदेसो पदेसमेत्तस्स दव्वजादस्स ।
 वदिवददो सो वट्टदि पदेसमागासदव्वस्स ॥ (प्रव. १, ४६)

Cf. *ibid.*, 2-46, p. 46.

The definition of *samaya* or instant depends on that of *pradesā* or point. Point is the space occupied by an ultimate particle of matter. A point may accommodate many such particles. The practical time corresponding to an event of a time fluent is called an indivisible unit of time (*samaya*). The indivisible time taken by an ultimate particle of matter just in transgressing the adjoining point (*pradesā*) is also as an instant. The concept of least possible velocity is also related to such a transgression.

27 Cf. the verse cited in 19.

- 28 जीरदि समयपबडं पओगदो जेग समय बडं वा ।
 गुणहाणीय दिवड्ढं समयषवडं हवे सत्तं ॥ १ ॥

Cf. Nem 1, G. K. K., v. 5.

The instant-effective-bond is the amount of *karma*-particles, set as *karmā*-bond in a mundane soul at an instant. Infinite part of the set of the emancipated souls, or infinite times the set of non-emancipable souls is the amount of particles in an instant-effective-bond which a mundane soul may bind to itself in an instant. This amount may be greater or smaller according to intense or mild yoke (*yoga*). The total amount of *karma*-particles which remain bound to a mundane soul is slightly less than one and one half of geometric-regression multiplied by the instant-effective-bond. Thus it will be obvious how much complicated is the manipulation of these variable time-dependent amounts, functionally dependent on the variable becomings of a mundane soul. It may be also noted that the becomings of a mundane soul are also interacted upon by the becomings of various *karmic* particles. Handling of all such situations forms the subject of the theory of *karma*.

²⁹ Cf. the verse cited in 19. The set of vector-groups forms a *nisus* (*niṣeka*) which happen to rise in for decay at an instant, usually.

³⁰ दन्वपमाणानुगमेण दुविहो णिदेसो ओषेण आदेसेण य ॥ १ ॥
ओषेण मिच्छाद्वी दन्वपमाणेण केवडिया ? अणता ॥ २ ॥
अणताणताहि ओसप्पिणि-उस्सप्पिणीहि ण अबहरंति कालेण ॥ ३ ॥
खेत्ते ण अणताणता लोगा ॥ ४ ॥
तिण्हं पि अधिगमो मावपमाणं ॥ ५ ॥

Cf. Pu, *op. cit.*, 1, 2, 1; 1, 2, 2; 1, 2, 3; 1, 2, 4; 1, 2, 5.

³¹ तत्र द्रव्य प्रमाणं द्वेषा संख्योपमा भेदात् ॥ ५ ॥

Cf. Ak, 3-38-5, p. 206.

Ak : Aklaṅka Deva, *Tattvārtha-Vārtikam*, Part I (1953), Part II (1957), Bharatiya Jnana Pitha, Kashi.

³² तं उवरि मणिस्सामो संखेज्जमसंखाणंत मिदि तिविहं ।
संख तिल्लदु तिविहं परित्त जुत्तं ति दुगवारं ॥ १३ ॥

Cf. Nem 2, T.S., v. 13.

Nem 2 : Nemicandra Siddhānta Cakravartī, *Trilokasāra*, (abbr. T.S.), Hindi Jaina Sahitya Prasarak Karyalaya, Bombay (1918).

³³ पल्लो सायर सूर्ह पदरो य घणं गुले य जगसेदी ।
लोयपदरो य लोगो उवमपमा एवमट्टविहा ॥ १२ ॥

Cf. Nem 2, *op. cit.*, T.S., v. 92.

For further details, vid. Da, Jg, JI, Si, *op. cit.*, vide also :

Jj : Jaini, J. L., *Jaina Gem Dictionary*, The Central Jaina Publishing House, Arrah (1918).

³⁴ पत्थतुलचुलययगप्पहुदी गुंजातुरंगमोल्लादी ।
दन्वं खित्तं कालो माबो लोयुत्तरं चदुधा ॥ १० ॥
परमाणु सयलदन्वं एगपदेसो य सब्बमागासं ।
इगिसमय सब्बकालो सुहुमणिगोदेसु पुण्णेषु ॥ ११ ॥
षाणं जिणेषु य कमा अबरवरं मज्झिमं अण्येयविहं ।
दन्वं दुविहं संखा उवमपमा उवम अट्टविहं ॥ १२ ॥

Cf. Nem 2, T.S., vv. 10-12.

- 35 जीवा अर्णतसंखार्णतगुणा पुग्गला हु तत्तो दु ।
धम्मत्तियं एक्केक्कं लोगपदेसप्पमा कालो ॥ ५८८ ॥
Cf. Nem 1, G.J.K., v. 588.
- 36 संखेज्जासंखेज्जाणंतपदेसा हवंति मुत्तस्स ।
धम्माधम्मस्स पुणो जीवस्स असंखदेसा हु ।।
लोयायासे ताव इदरस्स अर्णतयं हवे देहो ।
कालस्स ण कायत्तं एयपदेसो हवे जम्हा ॥ (निय० ३५-३६)

Cf. Ku, Ni. *op. cit.*, vv. 35, 36, p. 24.

- 37 सन्वे वि पोग्गला खल्ल एगो भुत्तुङ्गिमाया हु जीवेण ।
असयं अर्णतखुत्तो पुग्गलपरियट्टसंसारे ॥ २५ ॥
सव्वम्हि लोयखेत्ते कमसो तं णत्थि जं ण उप्पण्णं ।
उग्गाहणेण बहुसो परिममिदो खेत्तसंसारे ॥ २६ ॥
अवसप्पिणि-उस्स प्पिणि-समयाबलियासु णिरवसेसासु ।
जादो सुदो य बहुसो परिममिदो काल संसारे ॥ २७ ॥
णिरयाउजहण्णादिसु जाव दु उबरिल्लया दु गेवेज्जा ।
मिच्छत्तसंसिदेण दु बहुसो वि भवट्ठिदी ममिदो ॥ २८ ॥
सव्वे पयत्थिद्विदिओ अणुभागपदेसबंधं ठाणाणि ।
जीवो मिच्छत्तवसा ममिदो पुण भावसंसारे ॥ २९ ॥

Cf. Ku, *op. cit.*, vv. 25-29, p. 141.

- 38 ओषेण मिच्छादिट्ठी केवचिरं कालादो हीति ?
णाणा जीवं पडुच्च सव्वद्धा ॥ २ ॥

Cf. Pu, *op. cit.*, 1, 5, 2.

- * ववहारो पुण तिविहो तीदो वट्टं तगो मविस्सो दु ।
तीदो संखेज्जावलिहदसिद्धाणं पमाणं तु ॥ ५७८ ॥
समओ हु वट्टमाणो जीवादो सव्व पुग्गलादो वि ।
भावो अर्णतगुणिदो इदि ववहारो हवे कालो ॥ ५७९ ॥

Cf. Nem 1, G. J. K., vv. 578, 579, *op. cit.*

- 39 एग जीवं पडुच्च अणादिओ अपज्जवसिदो,
अणादिओ सपज्जवसिदो, सादिओ सपज्जवसिदो ।
जो सो सादिओ सपज्जवसिदो तस्स इमो
णिदेसो—जहणेण अत्तोसुहुत्तं ॥ ३ ॥

Cf. Pu, *op. cit.*, 1, 5, 3.

स समयमाबलि अवरं समऊणसुहत्तयं तु उक्कस्सं ।
मज्जासंखवियप्यं वियाण अत्तोसुहुत्तमिणं ॥ १ ॥

Cf. Nem 1, G. J. K., v. 575 (1).

40 उक्कस्सेण छ् आवलिआओ ॥ ८ ॥

Cf. Pu, *op. cit.*, 1, 5, 8.

आवलिअसंखसमया संखेज्जावलि समूहमुस्सासो ।

सत्तुस्सासा थोवो सत्तत्थोवा लवो मणियो ॥ १७४ ॥

Cf. Nem 1, *op. cit.*, G. J. K., v. 574.

41 Vid. Js, pp. 97, 98.

Js : Jain, S. A., *Reality* (English translation of *Pūjyapāda Sarvārthasiddhī*), Vira Shasana Sangha, Calcutta (1960).

42 एग जीवं पडुच्च जहण्णेण एग समयं २० ॥

Cf. Pu, *op. cit.*, 1, 5, 20.

43 लद्धं तिवार वरिगदसंवरग करिय केवले णाणे ।

अवणिय तं पुण खित्ते तमणंताणं त सुक्कस्सं ॥ ११ ॥

Cf. Nem 2, *op. cit.*, T. S., v. 51.

44 ओधेण मिच्छाइट्ठी दव्वपमाणेण केवडिया ? अणंता ॥ २ ॥

अणंताणंताहि ओसप्पिणि-उस्सप्पिणीहि ण अवहिरंति कालेण ॥ ३ ॥

Cf. Pu, *op. cit.*, 1, 2; 2 and 3.

45 संखेज्जाहि ओसप्पिणि-उसप्पिणीहि अवहिरंति कालेण ॥ १६ ॥

Cf. Pu, *op. cit.*, 1, 2, 16.

46 मिच्छो सासण मिस्सो अविरदसम्मो य देसविरदो य ।

विरदा पमत्त इदरो अपुव्व अणियट्ठि सुहमो य ॥ ९ ॥

उवसंत खीणमोहो सजोगकेवलि जिणो अजोगी य ।

चउदस जीवसमासा कमेण सिद्धा य णादव्वा ॥ १० ॥

Cf. Nem 1, *op. cit.*, G. J. K., vv. 9, 10.

The possible becomings (*bhāvas*) through which souls are distinguished are defined as control stations (*gūṇa sthānas*) or summary (*saṃkṣepa*) or proposition (*ogha*). These stations are due to attachment and volition. Broad classification is fourteen, while fine classification could be non-summable.

47 Wayward stations (*margaṇā sthānas*) are those by means of which, or among which, souls, as known in scriptural knowledge, are searched for; other denominations being detail (*viśāra*) and exposition (*ādeśa*). These stations are due to soul's own *karma*.

The fourteen wayward stations are again fourteen types of soul sets :

गइ ई दिए काए जोगे वेदे कसाए णाणे संजमे दंसणे

लेस्सा भविय सम्मत्त सण्णि आहारए चेदि ॥ ४ ॥

Cu. Pu, *op. cit.*, 1, 1, 4.

48 गुण जीवा पज्जत्ती पाणा सण्णा य मग्गणाओ य ।

उवओगो वि य कमसो वीसं तु पस्वणा भणिदा ॥ २ ॥

Cf. Nem 1, *op. cit.*, G. J. K., v. 2. In the concentration stage, Kundakundācārya denies all these stations :

जीवस्स पत्थि वग्गो ण वग्गणा वेव फड्ढया केई ।
 णो अज्जप्पट्ठाणा वेव य अणुमायठाणाणि ॥ ५२ ॥
 जीवस्स पत्थि केई जोयट्ठाणा ण बंधठाणा वा ।
 वेव य उदयट्ठाणा ण मग्गणट्ठाणया केई ॥ ५३ ॥
 णो ठिदिबंधट्ठाणा जीवस्स ण संकिलेस ठाणा वा ।
 वेव विसोहिट्ठाणा णो संजमलद्धिठाणा वा ॥ ५४ ॥
 वेव य जीवट्ठाणा ण गुणट्ठाणा य अत्थि जीवस्स ।
 जेण दु एदे सव्वे पोग्गलदव्वस्स परिणामा ॥ ५५ ॥

Cf. Ku, *op. cit.*, S. S., vv. 52-55, p. 203.

49 Cf. 36, *loc. cit.*

50 अप्पमत्त संजदा दव्व पमाणेण केवडिया ? संखेज्जा ॥ ८ ॥
 Cf. Pu, *op. cit.*, 1, 2, 8.

51 तं तिण्णिवारवग्गिदसंवग्गं करिय तत्थ दायव्वा ।
 धम्माधम्मागुरुलघुगुणाविभागप्पडिच्छेदा ॥ ५० ॥
 लद्धं तिवार वग्गिदसंवग्गं करिय केवले णाणे ।
 अवणिय तं पुण खित्ते तमणंताणंतमुक्कस्सं ॥ ५१ ॥
 Cf. Nem 2, *op. cit.*, T. S., vv. 50, 51.

52 स्तिग्गधरूद्धत्वादन्धः ॥ ३३ ॥ न जघन्य गुणानाम् ॥ ३४ ॥
 गुण साम्ये सच्चानाम् ॥ ३५ ॥ द्वयधिकादि गुणानां तु ॥ ३६ ॥
 बन्धेऽधिकौ पारिणामिकौ च ॥ ३७ ॥
 Cf. Js, *op. cit.*, vv. 33-37.

53 तत्तो असंखलोग कदि ठाणे चडिय वग्गसलतिदर्यं ।
 निस्संति सव्वजेट्ठा जोगस्स विभागपडिच्छेदा ॥ ८७ ॥
 Cf. Nem 2, *op. cit.*, T. S., v. 87.

54 संते वए ण णिट्ठादि कालेणार्णतएण वि ।
 जो रासी सो अणं तो ति विण्णिद्धिठ्ठो महेसिणा ॥ ३० ॥

Cf. Pu, *op. cit.*, book 3, 1, 5, 4, p. 338. This verse has been mentioned by Virasenācārya.

55 वणप्फदि काइय-णिगोद जीवा बादरा सुहुंमा
 पज्जत्ता अपज्जत्ता दव्वपमाणेण केवडिया ? ॥ ७९ ॥ अणं ता ॥ ८० ॥
 Cf. Pu, *op. cit.*, 2, 5, 79-80.

56 अणुसंखासंखेज्जाणं ता य अगेज्जगेहि अंतरिया ।
 आहारतेजमासामणकम्मइया धुवक्खं धा ॥ ५६४ ॥
 सांतरणिरंतरेण य सुण्णा पत्ते यदेहधुवसुण्णा ।
 बादरणिगोदसुण्णा सुहुमणिगोदा णमो महक्खं धा ॥ ५६५ ॥

Cf. Nem 1, *op. cit.*, G. J. K., vv. 594, 595.

57 तत्थ इमाए बाहिरियाए वगणपाए अण्णा परूवणा कायव्वा भवदि ॥ ११७ ॥ तत्थ इमाणि चत्तारि
अणियोगट्टराणि पादव्वाणि भवंति-सरीरि सरौर परूवणा सरौर परूवणा सरौर विस्सासुवचय परूवणा
विस्सासुवचय परूवणा चेदि ॥ ११८ ॥

Cf. Pu, *op. cit.*, 5, 3, 117, 118.

57(a) Vid 19, 28, *loc. cit.*

58 जीविदरे कम्मचये पुण्णं पावोत्ति होदि पुण्णं तु ।
सुहपयढीणं दव्वं पावं असुहाण दव्वं तु ॥ ६४३ ॥
आसव संवरदव्वं समयपबद्धं तु णिज्जरादव्वं ।
तत्तो असंखगुणिदं उक्कस्सं होदि णियमेण ॥ ६४४ ॥

Cf. Nem 1, *op. cit.*, G. J. K., vv. 643, 644.

The becoming of a soul effecting the inflow of auspicious and evil *karmic* matter into the points of the soul is entrant-portal (*āsava*) or influx which is also said to be effected due to bodily, speechful and mental volitions. The becoming which effects the mutual intermingling of the soul and the corresponding *karmas* is bondage which may be merits or demerits, according as the activity is virtuous or wicked. The becoming of a soul obstructing the inflow of *karmic* matter is restraint-portal (*saṃvara*). The becoming which effects decay of *karmic* matter from the soul is emergent-portal (*nīrjarā*).

59 वंधो समयपबद्धो किंचूण दिवडुमेतगुणहाणी
मोक्खो य होदि एवं सद्दहिदव्वा दु तच्चट्टा ॥ ६४५ ॥

Cf. Nem 1, *op. cit.*, G. J. K., v. 645.

60 तं पुण अट्टविहं वा अब्बालसयं असंखलोगं वा ।
ताणं पुण धादित्ति अ-धादित्ति य होति सण्णाओ ॥ ७ ॥
णाणस्स दंसणस्स य आवरणं वेयणीयमोहणियं ।
आउगणामं गोदंतरायमिदि अट्ट पयढीओ ॥ ८ ॥

Cf. Nem 1, *op. cit.*, G. K. K., vv. 7, 8.

64 णमिऊण णेमिचंदं असहायपरक्कमं महावीरं ।
बंधुदयसत्तजुत्तं ओधादेसे थवं वोच्छं ॥ ८७ ॥

Cf. Nem 1, *op. cit.*, G. K. K., v. 87.

62 पयडिड्ढिदि अणुभागप्पदेसबंधोत्ति च्चदुविहो बंधो ।
उक्कस्समणुक्कस्सं जहणमजहणणंति पुधं ॥ ८६ ॥

Cf. *ibid.*, v. 89.

63 कम्मवसमम्मि उवसममावो खीणम्मि खइयमावो दु ।
उदयो जीवस्स गुणो खओवसमिओ हवे मावो ॥ ८१४ ॥
कम्मदयजकम्मिगुणो धीदिययो तत्थ होदि मावो तु ।
कारणणिरवेक्खमवो सभावियो होदि परिणमो ॥ ८१५ ॥ जुम्मं ।

Cf. *ibid.*, vv. 814, 815.

- 64 तस्य कषायध्यवसायस्थानान्यसंख्येव्यलोकप्रमितानि
षट्स्थानपतितानि तस्स्थितियोग्यानि भवन्ति ।
Cf. Puj, 2/10, p. 167, et seq.
Puj : *Pūjyopāda Sarvārthasiddhi*, edited by Pt. Phool Chandra, Bharatiya Jnana Pitha,
Kashi (1955). For English translations vid. *Je, op. cit.*, p. 58, et seq.
अवस्वरिम्मि अणंतमसंखं संखं च मागवड्ढीए ।
संखमसंखमणंतं गुणवड्ढी हीति हु कमेण ॥ ३२३ ॥
Cf. *Nem 1, op. cit.*, G. J. K., v. 323.
The measure and order of the above are given by the following verses :
जीवाणं च य रासी असंखलोगा वरं खु संखेज्जं ।
मागगुणमिह य कमसो अवट्टिदा हीति छट्टाणे ॥ ३२४ ॥
Cf. *ibid.*, v. 324, et seq.
- 65 अण्णाइस्स अदीदकालस्स कथं पमाणं ठविज्जदि ?
et seq.
Cf. *Pu, op. cit.*, books 3, 1, 2, 3, p. 30.
- 66 तेण कारणेण मिच्छाइट्टि रासी ण
अवहिरिज्जदि, सव्वे समया अवहिरिज्जंति ।
Cf. *ibid.*, the same.
‘अणंताणंताहि ओसप्पिणि उस्सप्पिणिहि ण अवहिरंति कालेण’
त्ति ज्ञापकाद-वसीयते यथा अनन्तानन्ता मिथ्याद्रष्टय इति, व्याख्यानतो
विशेष प्रतिपत्तिरिति न्यायाद्वा ।
Cf. *ibid.*, 1, 2, 3, pp. 18, 19. Vid. also *Si 1 and Ji 2, op. cit.*
- 67 मिच्छाइट्टिरासिस्स पमाणविसए सीदाराणं णिञ्जुप्पायणट्टं मिच्छाइट्टिरासिस्स पमाण परूवणं
वग्गट्टाणे खं षिट्ठि-माजिद-विरलिद-अवहिद-पमाण-कारण-णिहत्ति-वियप्पेहि वत्तइस्सामो ।
Cf. *Pu, op. cit.*, books 3, 1, 2, 5, p. 40. For details of method of extra-creation and that of
reason, vid. *Ji 2, op. cit.*, p. 273, et seq.
- 68 Vid. *Si 2, op. cit.*, p. 47 et seq. Vid. also *Si 1 and Ji. 2, op. cit.*
खेत्ते ण असंखेज्जाओ सो ढीओ जगपदरस्स असंखेज्जदिमागमेत्ताओ ।
तासिं सेदीणं विक्खंभसूची अंगुल वग्गमूलं विदियवग्गमूलगुणिदेण ॥ १७ ॥
Cf. *Pu, op. cit.*, 1, 2, 17.
मणुसपज्जत्तेसु मिच्छाइट्टो दव्वपमाणेण केवडिया ? कोडाकोडाकोडीए उवरि
कोडाकोडाकोडाकोडीए हे ट्टदो छण्हं वग्गणमुवरि सत्तण्हं वग्गण हे ट्टदो ॥ ४५ ॥
Cf. *ibid.*, 1, 2, 45.
खेत्ते ण पदरस्स बेद्धण्णणंगुल सय वग्ग पडिमाणेण ॥ ५५ ॥
Cf. *ibid.*, 1, 2, 55. Further
वग्गिदवारा वग्गसलागा रासिस्स अद्धेदस्स ।
अद्धिदवारा वा खलु दलवारा हीति अद्धिद्वी ॥ ७६ ॥
Cf. *Nem 2, T. S.*, v. 76.

तियहोणसेदिछेदणमेत्तो रज्जुच्छिदी हवे गच्छो ।
जंबदीवच्छिदिणा छरूपजुत्ते ण परिहीणो ॥ ३५६ ॥

Cf. *ibid.*, v. 359.

एवं सलागरासिं णिठ्ठाविय तत्थतणमहारसिं ।
किच्चा तिप्पडि विरलणदिज्जादी कुणदि पुव्व व ॥ ४० ॥

Cf. *ibid.*, v. 40.

69 औषशमिकद्धायिकौ मावौ मिश्रश्च जीवस्य
स्वतत्त्वमौदयिकपारिणामिकौ च ॥ १ ॥

Cf. *Js, op. cit.*, 2, 1, p. 47.

Here is a simple analogy. Just as the mud in water settles down when clearing nuts are put into it, so also the *karmic* matter does not effect its power upon the soul due to its certain dispositions. This is subsidence (*upāsama*). Destruction (*kṣaya*) is compared to removal of the mud. *Kṣayopāsama* is the mixed state of subsidence and destruction of *karmas*. The imparting of fruition of *karmas* due to several factors is rise (*udaya*). The essential nature of the soul irrespective of *karmic* matter is the capacity inherent in the soul, called *parināma*.

70 कायवाहमनः कर्म योगः ॥ १ ॥ स आस्वः ॥ २ ॥

Cf. *Js, op. cit.*, vv. 1, 2, pp. 167, 168.

71 योगा पयडिपदेसा ठिदिअणुमागा कसायदो हौति ।
अपरिणदच्छिण्णेषु य बंधट्टिदिकारणं णत्थि ॥ २५७ ॥

Cf. *Nem 1, op. cit.*, G. K. K., v. 267.

72 बंधुककट्टण करणं संकममोकटट्टु दीरणा सत्तं ।
उदयुवसामणियत्ती निकाचणा होदि पडिपयडी ॥ ४३७ ॥

Cf. *ibid.*, v. 437.

73 तत्ती अमव्वजोग्गं परिमाणं वोलिऊण मव्वो दु ।
करणं करेदि कमसो अथापवत्तं अपुव्वमणियट्टिं ॥ ३३ ॥

Cf. *Nem 1, op. cit.*, L. S., v. 33.

74 तिकरणमुमयोसरणं कमकरणं खवणदेसमंतरयं ।
संकम अपुव्वफड्ढयकिट्टीकरणुमवण खमणाये ॥ ३८६ ॥

Cf. *ibid.*, v. 389. Cf. also the verses following v. 595.

Vid. ref. 61 *loc. cit.*

Cf. *Nem 1, op. cit.*, G. K. K., v. 87, et seq.

76 देहोदयेण सहिओ जीवो आहरदि कम्म णोकम्मं ।
पडिसमयं सव्वं गं तत्तायसपिंडओव्व जलं ॥ ३ ॥
सिद्धाणंतिममाणं अमव्वसिद्धादणंतगुणमेव ।
समयपबद्धं बंधदि जोगवौसादी दु विसरित्थं ॥ ४ ॥
जीरदि समयपबद्धं पओगदो जेगसमयबद्धं वा ।
गुणहाणीण दिवड्ढं समयपवद्धं हवे सत्तं ॥ ५ ॥

Cf. *ibid.*, vv. 3, 4, 5. For details of transformations, mathematical commentaries of G. K. K. and L.S. may be seen. The *karma*-bonds are marked by the following phenomena: Binding relative to *karma*-particles is bondage (*bandha*). Increment of stay-period or impartation intensity of *karmas* already bound is increase (*utkarṣaṇa*). Similarly, diminution of duration or fruition of *karmas* already bound is decrease (*apakarṣaṇa*). Transmutation of *karmic* matter already bound to a soul from one type to another under provisions is transition (*saṃkramaṇa*). Putting certain *karmic* nisusus beyond the time of operation into rise by decreasing their stay-period is premature-rise (*udīraṇā*). Subsistence of all *karma*-particles in a non-operative state corresponding to a soul is existence (*sattva*). Befalling of *karmic* particles into fruition in their own time is rise (*udaya*). Those *karmic* nisusus which cannot come into rise, into transition and rise or even into any of the four conditions of rise, transition, increase or decrease of stay or fruition are respectively said to be in *subsidence*, *nidhatti* or *nikācīta*.

Three more important encounters (*karāṇas*) of a soul heading towards purity may also be mentioned. These result in partial destruction or subsidence of deluding *karma*. A soul in the non-erratic control-station encounters the first experience known as low-tended (*adhah pravṛtta*). The steps of purity of experience here are non-summable times the cardinal of universe point-set. They are in uniform mathematical progression. The duration is *antarmuhūrta* or the period lying in the interval of an open set of forty-eight minutes. Having passed this period in the low-tended experience, increasing every instant in purity, the soul acquires the next stage of unprecedented experience (*apūrva karāṇa*). Steps in this are again non-summable times the point-set of universe, increasing for an *antarmuhūrta* gradually in purity, at every instant. Then is encountered the invariant experience (*anivṛtti karāṇa*). Herein the souls may, at one and the same instant, differ each other in matters like formation of body, yet they do not differ among themselves in purity of experience.

The subject of *Labdhisāra* begins with the above conditioning of *karmic* sets whose variations are depicted symbolically and semantically. The variations are in the nature, particles, impartation, and stay of *karmic* structural sets of bonds, existence and rise. The following equations will give an idea of the above structures.

We shall make use of the following symbols for representing nisusus of geometric regression in terms of vector-groups. The dimension of a geometric regression, when all the various geometric regressions are layed out in form of a matrix, will automatically represent the corresponding stay-periods of each of the nisusus, of course, subject to variation depending upon several factors.

N_α
 $B_{S_\beta G_\gamma}$ will denote a set of *karma* bound particles of N_α th nature ($\alpha = 1, 2, \dots$), consisting of S_β th super-vector group ($\beta = 1, 2, \dots$) of particles contained in G_γ th geometric regression ($\gamma = 1, 2, \dots$). $\frac{I}{V}$ will denote vector-groups contained in $B_{S_\beta G_\gamma}^{N_\alpha}$, where superscript I

denotes indivisible-corresponding-sections of affine or anti-affine energy levels of touch controls in each of subscript V of vectors contained in a particular vector-group. Herein i will represent the least value of I , $*S_\alpha$ will denote the total number of super-vector-groups contained in a geometric regression corresponding to N_α th nature of *karma*, and d will denote the common difference through which the vectors go on decreasing in a sequence.

Thus we have :

$$\begin{aligned}
 \frac{N_\alpha}{B S_2 G_7} &= W \frac{\beta i^* S_\alpha^{\gamma-1}}{V} + W \frac{\beta i^* S_\alpha^{\gamma-1} + 1}{V} - \left[\frac{(\beta-1) i^* S_\alpha^{\gamma-1}}{2^{\gamma-1}} + 1 \right] \frac{d}{2^{\gamma-1}} \\
 &+ \dots + W \frac{2\beta i^* S_\alpha^{\gamma-1} - 1}{V} \left(\frac{\beta i^* S_\alpha^{\gamma-1}}{2^{\gamma-1}} - 1 \right) \frac{d}{2^{\gamma-1}}
 \end{aligned}$$

In particular, the second super-vector-group of the third geometric regression of N_α the nature of *karma* will be given as follows :

$$\begin{aligned}
 \frac{N_\alpha}{B S_2 G_3} &= W \frac{2i^* S_\alpha^2}{V} \cdot \frac{i \cdot d}{2^2} + W \frac{2i^* S_\alpha^2 + 1}{V} - \left(\frac{i}{2^2} + 1 \right) \frac{d}{2^2} \\
 &+ \dots + W \frac{3i^* S_\alpha^2 - 1}{V} - \left(2 \cdot \frac{i^* S_\alpha^2}{2^2} - 1 \right) \frac{d}{2^2}
 \end{aligned}$$

Apart from the above, one should be aware of the principles of exclusion or non-becoming :

- (i) The present event (*pariyāya*) corresponding to a fluent does not exist in its preceding or succeeding events.
- (ii) The present event corresponding to a fluent does not exist in the present event of any other fluent.
- (iii) A fluent does not exist in any other fluent.

The above shows complete independence of existence of a fluent (*dravya*), along with its controls (*gunas*) and events in which it flows in time, along with other coincident fluent. An event referred above is corresponding to a certain control of a fluent. That is why in *karmic* theory one has to consider events in relation to a soul fluent and every member of its corresponding bond-set of matter fluents having independent existence at the space-points of its own accommodation. The actions and reactions in their independent becomings are thus simply objective (*naimittika*). This further demands a deep statistical study.

77 सत्संख्यादौ त्रस्पशनकालान्तरमावाल्पवहुत्वे ष्च ॥ ८ ॥

Cf. Js, *op. cit.*, V. 8, p. 15.

संख्यताषन्यतमनिश्चयेऽपि अन्योन्यविशेषप्रतिपत्यर्थमल्पबहुत्व बचनम् । १० ।

Cf. Ak, *op. cit.*, part 1, 1-8-10, p. 42.

78 किमप्या बहुषं ? संखा घम्मो, एदम्हादो एदं तिगुणं चदुगुण मिदि बुद्धि गेज्को ।

Cf. Pu, *op. cit.*, book 3, 1-8-1.

79 अप्पाबहुषं तिविहं, सत्थाणं परत्थाणं सन्व परत्थाणं चेदि ।

Cf. *ibid.*, 1, 2, 23, 208. Vid. also *ibid.*, 1, 2, 73, 288 and 1, 2, 102, 365, etc.

80 Vid. *ibid.*, pp. 30, 31.

81 सुद्धमसांपराइय-सुद्धिसंजदेसु सुद्धमसांपराइय उवसमा योवा ॥ २७२ ॥

Cf. Pu, *op. cit.*, 1, 8, 272.

- 82 सजोगिकेवली अजोगिकेवली पवेसणेण दो वि तुल्ला तत्तिया चव ॥ ६ ॥
Cf. *ibid.*, 1, 8, 6.
- 83 असंजदसम्मादि द्विट्ठाणे सव्वत्थोवा उवसमसम्मादिट्ठी ॥ १५ ॥
Cf. *ibid.*, 1, 8, 15.
- 84 संजदासंजदेसु अप्पावहुषं णत्थि ॥ २७५ ॥
Cf. *ibid.*, 1, 8, 275.
- 85 चउरिंदिथा विसेसाहिया ॥ १७ ॥
Cf. *ibid.*, 2, 11, 17.
- 86 माया विसेसहीणा ॥ ७८ ॥
Cf. *ibid.*, 4, 2, 7, 78.
- 87 रववा संखेज्जगुणा ॥ ४ ॥
Cf. *ibid.*, 1, 8, 4.
- 88 संजदासंजदा असंखेज्जगुणा ॥ १० ॥
Cf. *ibid.*, 1, 8, 10,
- 89 मिच्छादिट्ठी अणंतगुणा ॥ १४ ॥
Cf. *ibid.*, 1, 8, 14.
- 90 एयपदेस गुणहाणिट्ठाणंतरं असंखेज्जाणि पलिदेवमवग्गमलाणि ॥ ११२ ॥
Cf. *ibid.*, 4, 2, 6, 112.
- 91 णाणापदेसगुणहाणिट्ठाणंतराणि पलिदोवम वग्गमूलस्स असंखेज्जदिमागो ॥ ११३ ॥
Cf. *ibid.*, 4, 2, 6, 113.
- 92 एवं दुगुणहीणा दुगुणहीणा जाव सागरोवमसदपुधत्तं ॥ १९५ ॥
Cf. *ibid.*, 4, 2, 6, 195.
- 93 एवं दुगुणवड्ढिददा जाव जवमज्झं ॥ १९३ ॥
Cf. *ibid.*, 4, 2, 6, 183.
- 94 तिव्व-मंददाए णाणावरणीयस्स जहणियाए ट्ठिदीए जहण्यं
ट्ठिदिबंघज्जवसाणट्ठाणं सव्वमंदाणुमागं ॥ २७२ ॥
Cf. *ibid.*, 4, 2, 6, 272.
- 95 सव्वतिव्वाणुमागं त्सादावेदणीयं ॥ ६६ ॥
Cf. *ibid.*, 4, 2, 7, 66.
- 96 मणुसगदीए मणुस-मणुसपज्जत्त-मणुसिणोसु
तिसु अद्दासु उवसमा पवेसणेण तुल्ला थोवा ॥ ५३ ॥
Cf. *ibid.*, 1, 8, 53.
अभिनिबोहिय-सुदणाणी दो वि तुल्ला विसेसाहिया ॥ १५२ ॥
Cf. *ibid.*, 2, 11, 152.
मदिअण्णाणी सुदअण्णाणी दो वि तुल्ला अणंतगुणा ॥ १५५ ॥
Cf. *ibid.*, 2, 11, 155.

सामाह-च्छेदोवट्ठावण-सुद्धिसंजदा दो वि तुल्ला संखेज्ज गुणा ॥ १६३ ॥

Cf. *ibid.*, 2, 11, 163.

जसगित्ती उच्चागोदं च दो वि तुल्लाणि अणंतगुणहीणाणि ॥ ६७ ॥

Cf. *ibid.*, 4, 2, 7, 67.

97 अप्पाबहुआणुगमेण दुविही णिद्वेसो ओघेण आदेसेण य ॥ १ ॥

Cf. *ibid.*, 1, 8, 1.

98 अप्पाबहुए त्ति तत्थ इमाणि तिणिण अणियोगद्वाराणि-जहणणपदे उक्कस्सपदे जहण्णुकस्सपदे ॥ ४० ॥

Cf. *ibid.*, 4, 2, 7, 40.

99 अप्पाबहुए त्ति तत्थ इमाणि दुवे अणियोगद्वाराणि अणंतरोवणिधा परंपरोवणिधा ॥ २५५ ॥

Cf. *ibid.*, 4, 2, 7, 255.

100 अप्पाबहुअं दुविहं-जीवअप्पाबहुअं चेव पदेसअप्पा बहुअं चेव ॥ ५६७ ॥

Cf. *ibid.*, 5, 5, 567.

101 अप्पाबहुअं दुविहं अद्धा अप्पाबहुअं चेव जीव अप्पाबहुअं चेव ॥ ५६६ ॥

Cf. *ibid.*, 5, 5, 586.

102 Vid. J1 2, *op. cit.*, p. 276.

102(a) धारेत्थ सव्वसमकदिधणमाउगइदरबेकदीविदं ।

तस्स धणाधणमादी अंतं ठाणं च सव्वत्थ ॥ ५३ ॥

Cf. *Nem 2, op. cit.*, T. S., v. 53, Vid. also Jj, *op. cit.*, pp. 149-152, and Da 2, *op. cit.*

103 उत्तेव सव्वधारा पुव्वं एगादिगा हबेज्ज जदि ।

सेसा समादिधारा तत्थुप्पणोत्ति जाणाहि ॥ ५४ ॥

Cf. *Nem 2, op. cit.*, T. S. v. 54.

104 बेयादि बिउत्तरिया केवल पज्जंतया समा धारा ।

सव्वत्थ अवरमवरं रूऊणुकस्समुक्कस्सं ॥ ५५ ॥

एगादि बिउत्तरिया विसमा रूऊणकेवलवसाणा ।

रूवजुदमवरमवरं वरं वरं होदि सव्वत्थ ॥ ५६ ॥

Cf. *ibid.*, vv. 55, 56.

105 इह बग्गमाउआप सव्वगधारव चरिमरासी दु ।

पदमं केवलमूलं तट्ठाणं छावि तज्जेव ॥ ६२ ॥

Cf. *ibid.*, v. 62.

106 अकदीमाउअ आदी केवलमूलं सरुवमंतं तु ।

केवलमणेय मज्झं सुलूणं केवलं ठाणं ॥ ६३ ॥

Cf. *ibid.*, v. 63.

107 वेरूवगगधारा चउ सोलस बिसदसहियछप्पणं ।

पण्णट्ठी बादालं एकट्ठं पुव्वपुव्वकदी ॥ ६६ ॥

Cf. *ibid.*, v. 66.

- 108 तिविह जहण्णाणंतं वग्गसलादलच्छिदी सगादिपदं ।
 जीवो पोग्गल कालो सेढी आगास तप्पदरं ॥ ६६ ॥
 धम्माधम्मागुरुल्लु इ गिजीवागुरुल्लुस्स होंति तदो ।
 सुहमणिअपुण्णणाणे अवरे अविभागपडिक्खेदा ॥ ७० ॥
 अवरा खाइयलद्धी वग्गसलागा तदो सगद्धच्छिदी ।
 अहसगद्धप्पणतुरियं तदियं विदियादिमूलं च ॥ ७१ ॥
 सइमादिमूलवग्गो केवलमंतं पमाणजेट्टमिणं ।
 वरस्सइयलद्धिणां सगवग्गसला हवे ठाणं ॥ ७२ ॥

Cf. *ibid.*, vv. 69-72.

- 109 Vid. *ibid.*, v. 72.
- 110 बेरूवबिंदधारा अह चउसट्ठी चडित्तु स'खपदे ।
 आवलिघनमावलिया कदिबिंदं चावि जायेज्ज ॥ ७७ ॥
 पल्लघणं बिंदंगुलजगसेढीलोयपदरजीवघणं ।
 तत्तो पढमं मूलं सव्वागासं च जाणेज्जो ॥ ७८ ॥
 एवमणंतं ठाणं पिरंतरं गमिय केवलस्सेव ।
 विदियपद बिंदमंतं विदियादिममूलगुणिसमं ॥ ८१ ॥

Cf. *ibid.*, vv. 77, 78, 81.

- 111 ववहारुवजोग्गाणं धारारणं दरिसिदं दिसामेत्तं ।
 वित्थरदो वित्थरुहसिस्सा जाणंतु परियम्मे ॥ ६१ ॥

Cf. *ibid.*, v. 91. For the use of sequences in extra-creations (*vikalpas*), vid. Pu, *op cit.*, book 3, p. 40, et seq.

112 Vid. Nem 1, *op. cit.*

113 Vid. To, *op. cit.*

114 Vid. JI 2, *op. cit.*, pp. 276-279.