ṬHAKKURA PHERŪ'S

RAYAṆAPARIKKHĀ

A MEDIEVAL PRAKRIT TEXT ON GEMMOLOGY

Translated with an Introduction,
Sanskrit Chāyā and Commentary by

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VIVEKA PUBLICATIONS
ALIGARH

Published by
VIVEKA PUBLICATIONS
3/364, SAMAD ROAD
ALIGARH-202001 (U. P.), India.

First Published : 1984

Price : Rs. 45.00

Printed at :
Chitra Printing Press
Ganga Gunj, Parao Dubey,
Aligarh—202001 (U. P.), India.

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ERRATA

PAGE	LINE	FOR	READ
3	5 from below	Kaiasa	Kalasa
10	6	present	presents
	8	vermillion	vermilion
12	2	aud	and
26	9	वस	वंस
	17	वेध	वेधं
28	14	माणिक्काणुप्रत्ती	माणिक्काणुप्पत्ती
31	18	गरुडग्योरसि	गरुडस्योरसि
54	6	अइचुवखओ	अइचुक्खओ
	6	विरालवखो	विरालक्खो
36	6	नोलाभं	नीलाभं
72	1	fossile	fossil
73	6 f. below	DEYEL	DEYELL
80	last line	लालस्य	लालस्स
82	9 f. below	मदा	मंदा

INTRODUCTION

ṬHAKKURA PHERŪ'S LIFE

In the annals of the history of science and technology in India, Ṭhakkura Pherū stands out as a writer on a wide range of scientific subjects and also as a pioneer in popularising science by writing in a simplified variety of Prakrit which was close to the spoken language of his day. He was practically unknown until 1946 when Sri Agarchand NAHATA and Sri Bhanwar Lal NAHATA discovered a manuscript containing his seven works in the Sri Manijivan Jain Library of Calcutta. These were subsequently published by the great Jaina savant JINAVIJAYA MUNI under the title *Ṭhakkura-Pherū-viracita-Ratnaparīkṣādi-sapta-grantha-saṃgraha* in the Rajasthan Oriental Series from Jodhpur in 1961. These works are *Jyotiṣasāra* on astronomy and astrology, *Dravyaparīkṣā* on assay and exchange of coins, *Vāstusāra* on architecture and iconography, *Ratnaparīkṣā* on gemmology, *Dhātūtpatti* on metallurgy, *Kharataragaccha-yugapradhāna-catuḥpadikā*, a eulogy of the pontiffs of the Kharatara sect, and *Gaṇitasāra* on arithmetic [1]

The following abbreviations are used:
Bṛhadgurvāvali = Kharatagaccha-bṛhadgurvāvali
Catuḥpadikā = Kharataragaccha-yugapradhāna-catuḥpadikā
Saptagranthasaṃgraha = Ṭhakkura-Pherū-viracita-Ratnaparīkṣādisaptagranthasaṃgraha
Finot = Louis Finot, *Les Lapidaires Indiens*

1. This is the sequence of the works in the manuscript. For a description of this ms., see V. S. AGRAWALA, "Dhātūtpatti," *The Journal of the Uttar Pradesh Historical Society*, XXIV-XXV (1951-52), p. 321, and *Saptagranthasaṃgraha*, Introduction pp. 3-4, 8. The dates of copying were given at the end of three works. Both the *Dhātūtpatti* and the *Catuḥpadikā* were copied on 19 February 1347 and the *Gaṇitasāra* on 16 March 1347. The ms. was copied by or for Purisaḍa, son of Bhāvadeva. On the margin of the ms. is written *pattanīya pra.* Agarchand and Bhanwar Lal NAHATA conclude that this ms. was copied from another one deposited in Patan in Gujarat. If such is the case, then it throws an interesting light on the transmission of Pherū's works. It will be shown below that Pherū's last known date is 1323. Therefore, his collected works must have been copied at least twice within the next 24 years, possibly within his lifetime. For a second known ms. of some of the works, see the Appendix.

It is fortunate that most of these works are dated. The *Catuḥpadikā* was written in 1291, the *Ratnaparīkṣā*, the *Jyotiṣasāra* and the *Vāstusāra* in 1315, and the *Dravyaparīkṣā* in 1318. Besides, Pherū gives quite some information about himself in his works. The *Ratnaparīkṣā* begins thus:

सिरिमालकुलुत्तंसो ठक्कुर चंदो जिणिंदपयभत्तो ।
तस्संगरुहो फेरू जंपइ रयणाण माहप्पं ॥२॥
पुव्विं रयणपरिक्खा सुरमंति-अगत्थ-बुद्धभट्टेहिं ।
विहिया तं दट्ठूणं तह बुद्धी मंडलीयं च ॥३॥
अल्लावदीण कलिकालचक्कवाट्टिस्स कोसमज्झत्थं ।
रयणायरु व्व रयणुच्चयं च नियदिट्ठिए दट्ठुं ॥४॥
पच्चक्खं अणुभूयं मंडलियपरिक्खियं च सत्थाइं ।
नाउं रयणसरूवं पत्तेय भणामि सव्वेसिं ॥५॥

and ends in the following manner:

सिरिधंधकुले आसी कन्नाणपुरम्मि सिट्ठि कालियओ ।
तस्सुव ठक्कुर चंदो फेरू तस्सेव अंगरुहो ॥१३१॥
तेणिह रयणपरिक्खा विहिया नियतणय हेमपालकए ।
कर मुणि गुण ससि वरिसे (१३७२) अल्लवदी विजयरज्जम्मि ॥१३२॥

At the conclusion of the *Jyotiṣasāra*, Pherū states:

आसी सड्ढकुलेसु सिट्ठि कलसो ठाणे सुकन्नाणए
तस्संगस्स रुहो सुठक्कुरवरो चंदु व्व चंदो इह ।
फेरू तत्तणओ य तेण रइयं जोइस्ससारं इमं
दोसत्तग्गिग (१३७२) वच्छरे दुगसयं गाहा दु चत्ताहियं ॥

The *Vastusāra*, likewise, closes with a personal reference:

सिरिधंधकलसकुलसंभवेण चंदासुएण फेरेण ।
कन्नाणपुरठिएण य निरिक्खिउं पुव्वसत्थाइं ॥
सपरोवगारहेऊ नयण मुणि राम चंद (१३७२) वरिसम्मि ।
विजयदसमीइ रइयं गिहपडिमालक्खणाईणं ॥

Since his earliest known work is dated 1291 and the last chronological reference about him pertains, as will be shown below, to 1323, it can be assumed that Pherū was born sometime in the second half of the thirteenth century, say around 1270. His native place was Kannāṇā, known to Jaina Sanskrit Literature as Kanyānayana, a place of pilgrimage where

Jinadatta Sūri installed a statue of Vardhamāna.[2] This place survives today as Kaliana (Lat. 28°33′ N; Long. 76°12′ E)[2a] near the town Dadri in Mahendragarh district of Haryana.

Pherū belonged to the Śrīdandha gotra of the Śrīmālakula[3] and was a member of the Kharatara Gaccha of the Śvetāmbara Jainas. His father was Ṭhakkura Canda and his grandfather is variously referred to as Kalasa or Kāliya and had the title *śreṣṭhin*.[4] Pherū wrote his *Ratnaparīkṣā* for his son Hemapāla and the *Dravyaparīkṣā* for his son and brother. The latter's name is, however, not recorded.

We do not know much about Pherū's early life and education. In the *Catuḥpadikā* (*vv.* 26-27) he states that he composed this work at Kannāṇā in 1291 in the presence of Vācanācārya Rājaśekhara.[5] It is likely that he was brought up and educated at Kannāṇā, and Rājaśekhara may have been one of his teachers.

Nor do we know when exactly he entered the service of the Sultans at Delhi, but in 1315 he wrote the *Ratnaparīkṣā* at Delhi "during the victorious reign of Alauddin,...after having seen with his own eyes the vast collection of gems in Alauddin's treasury." Consequently he must have been employed there at least for some years prior to 1315, and served under Alauddin Muhammad, Shihabuddin Umar, Qutbuddin Mubarak

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2. *Kharataragaccha-bṛhadgurvāvali*, ed. Jinavijaya Muni, Bombay 1966, p. 66. See also p. 24.

2a. I owe this information to Dr Abha Singh.

3. On the Śrīmāla caste, see Kailash Chand Jain, "Jaina Castes and their Gotras in Rajasthan" in R. C. Dwivedi (ed.), *Contribution of Jainism to Indian Culture*, Varanasi etc., 1975, pp. 165-66.

4. The title "Ṭhakkura" was enjoyed by both Pherū and his father but not by the grandfather. This seems to indicate that like Pherū his father was also employed in the government service.

   The *Bṛhadgurvāvali* refers to a Sāhu Kālā, a resident of Kanyānayana and a member of the Śrīmāla caste, who organized a pilgrimage in early 1318 (p 65). Two months later he participated in the pilgrimage organized by Ṭhakkura Acala Siṃha of Delhi (p. 66). It will be shown below that Pherū joined this pilgrimage. It is difficult to say whether Pherū's grandfather Kaiasa or Kāliya is identical with this Kālā. If Pherū was born about 1270 and if we allow 20 years for a generation, his grandfather would be about 90 years old in 1318,

5. This Rājaśekhara Gaṇi was made a Vācanācārya in 1284 and the title Ācārya was conferred upon him in 1307 (*Bṛhadgurvāvali*, pp 58, 61).

Shah and possibly also Ghiyasuddin Tughluq.[6] 1315 was quite a prolific year for Pherū, for in this year he also wrote the *Jyotiśasāra* and the *Vāstusāra*. The last mentioned work was completed on the Vijayadaśamī (=*ca.* 9 September 1315), which festival he celebrated at Kannāṇā.

Three years later, when the *Dravyaparīksā* was written, Pherū occupied a high position in Quṭbuddin Mubarak Shah's mint at Delhi. It has been contended that Pherū was the mint-master at Delhi,[7] somewhat like the Dāroghā of Akbar's mint.[8] But the *Dravyaparīkṣā*, written obviously on the basis of Pherū's experience at the Delhi mint, does not contain expressions like *ṭaṅkaśālādhyakṣa* or something similar, but states merely: *siri ḍhilliya ṭaṃkasāli kajjathie*, "while being employed in the mint at the glorious Delhi." Moreover, if he was the mint-master, we should expect some description of the minting techniques in his work as one finds in the *Ā'īn-i Akbarī*. But the *Dravyaparīkṣā* deals only with the techniques of assaying and thus determining the exchange rate of some 260 types of coins. Therefore, it would be safe to say that Pherū occupied the position of assay-master, a position equivalent to the Ṣarrāf or Chāshnīgīr of Akbar's mint.[9]

The only mention we have of Pherū outside his own works occurs in the chronicle *Kharataragacchālaṃkāra-yugapradhānācārya-gurvāvalī*,[10] which describes the lives and activities of the pontiffs of the Kharatara

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6. The Jainas, both priests and laity, appear to have enjoyed the patronage of the Sultans. The *Bṛhadgurvāvali* mentions various pilgrimages, installations of statues, construction and repair of temples and other modes of worship undertaken by the Jainas in the territory of the Sultans, occasionally with their express permission. Glasenapp in his *Der Jainismus* (Berlin 1925, reprint; Hildesheim 1964, p. 66) says: "Alauddin, whom the Jainas called *khūnī*, 'bloodthirsty,' gave many gifts to the Jaina poet Rāmacandra Sūri and Sultan Firoz Shah Tughluq (1357-88) honoured Ratnaśekhara, the author of the *Śrīpālacarita*."
7. V. S. Agrawala, *loc. cit.*; Parameshwari Lal Gupta, *Coins*, New Delhi 1969, p. 87; Upendra Thakur, *Mints and Minting in India*. Varanasi 1972, p. 68; and more recently, John Scott Deyell, *Living Without Silver: The Monetary History of Early Medieval North India* (The University of Wisconsin, Madison, Ph. D. thesis 1982. Xerography in 1983 by the University Microfilms International, Ann Arbour, Michigan, U.S.A.), vol. I, p. 343.
8. *The Ā'īn-i Akbarī by Abū'l-Fazl 'Allāmī*. Translated from the Original Persian by H. Blochman [Second ed. revised and edited by Lieut. Colonel D. C. Phillot, Calcutta 1927], reprint, New Delhi 1977, vol. I, p. 18.
9. *Ibid.*, pp. 18, 24.
10. Printed in the *Bṛhadgurvāvali*, pp. 1-88.

sect from the beginning of the eleventh century up to 1336. The account up to 1248 was written by Jinapālopādhyāya at the request of Seth Hema of Delhi. The rest must have been periodically added by the clerks of the pontiffs concerned. It is an immensely valuable document and deserves close study. This chronicle reports that in 1318 Ṭhakkura Acala Siṃha secured a *firmān* from Qutbuddin Mubarak Shah and organized a pilgrimage of Jainas (called *saṃghayātrā*) to Hastināpura, Kanyānayana, Mathurā and other holy places under the spiritual leadership of Jinacandra Sūri, who was the pontiff of the Kharatara Gaccha from 1248 to 1319.[11] Along with other prominent Jainas of Delhi, Pherū also joined the pilgrim *saṃgha*. As they reached Tilapatha near Yoginīpura (i. e. Tilpat near Delhi), an Ācārya of the rival Drammakapurīya sect complained to the Sultan that Jinacandra Sūri was using a golden parasol and a golden throne, which were the exclusive privileges of the Sultan. The Sultan summoned Jinacandra Sūri to his presence but, finding no substance in the complaint, ordered the imprisonment of the rival Ācārya. Jinacandra Sūri, however, pleaded with the authorities and secured the release of his rival with the help of Pherū and others.[12]

In 1323 Pherū joined another pilgrimage to Śatruñjaya in Gujarat. This pilgrimage was organized by Rayapati, a wealthy resident of Delhi, under a *firmān* from Ghiyasuddin Tughluq.[13] It is not known whether Pherū occupied any official position at this date, but his very mention by name among the prominent Jainas of Delhi suggests that he may have continued his services under Ghiyasuddin Tughluq as well.

ṬHAKKURA PHERŪ'S WORKS

Pherū's first known work, the *Kharataragacchālaṃkāra-yugapradhāna-catuḥpadikā*, is written in Apabhraṃśa and consists of 28 stanzas in *caupāi* metre and a final 29th stanza in *chappai* metre. The first letters of the six feet of the last stanza form the name of his preceptor Jinacandra Sūri, the then pontiff of the Kharatara Gaccha. From the point of view of science, this work has nothing to offer to us.

The other six works dealing with different scientific subjects are written in Prakrit in *gāthā* metre. Because of the metrical constraints and possibly also because Pherū wished that his works be understood by common people, he employs a simplified variety of Prakrit, often dropp-

11. *Ibid.*, pp. 58, 68.
12. *Ibid.*, pp. 66-68.
13. *Ibid.*, pp. 72-77, especially pp. 72, 74.

ing the case-endings and using very few verbal forms.[14] His language is considerably influenced by Apabhraṃśa and, because of the nature of his works, there are plenty of *deśya* words. The colophons at the end of each work are in Sanskrit, and these mention the title of the work in Sanskrit. For this reason, it appears, JINAVIJAYA MUNI gave Sanskrit titles to all these works in his edition. But not all the titles as they appear in the colophons are in correct Sanskrit : *Dhātotpatti, Jyotiṣkasāra, Kharatara...catuḥpadikā.* Within the body of the texts, there are often sub-headings and sub-colophons. Curiously enough, these are sometimes in pure Sanskrit, sometimes in Prakrit, but often enough in a mixture of the two, as for instance, *iti māṇikyaparīkṣā samattā* or *athaiteṣām eva mūlyāni jathā gāhā.*[15] It is difficult to explain why Pherū employs such a mixture. The great number of Sanskrit authorities consulted by him testifies to his command of Sanskrit. On the other hand, the instances of mixed Sanskrit are too many to be attributed to the copyist.

I shall describe below the six Prakrit works individually and discuss their salient features, keeping the *Ratnaparīkṣā* to the last.

VĀSTUSĀRA

The *Vāstusāra* on architecture and iconography was completed on 19 September 1315. It contains 205 *gāthā*s and is divided into three chapters called *gṛhalakṣaṇaprakaraṇa, bimbaparīkṣāprakaraṇa* and *prāsādavidhiprakaraṇa.* V. S. AGRAWALA believes that this text "must have served as a practical handbook for architects of Jaina temples in the early Sultanate period."[16] The chronicle of the pontiffs mentioned above describes the

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14. In this period, similar efforts were made to simplify Sanskrit also. For instance, Jinapālopādhyāya, concluding his chronicle, says;

लोकभाषानुसारिण्यः सुखबोध्याः भवन्त्यतः ।
इत्येकवचनस्थाने क्वापि च बहूक्तिरपि ॥
बालावबोधनायैव सन्ध्यभावः क्वचित्कृतः ।
इति शुद्धिकृच्चेतोभिः सद्भिर्ज्ञेयं स्वचेतसि ॥

(*Bṛhadgurvāvali*, p. 50)

15. This practice of inserting sub-headings and sub-colophons in Sanskrit can be seen also in the old Hindi texts on gemmology collected by Agarchand NAHATA and Bhanwar Lal NAHATA in their edition of the *Ratnaparīkṣā,* Calcutta, n.d.

16. V. S. AGRAWALA, "A note on medieval temple architecture," *The Journal of the United Provinces Historical Society*, XVI. 1 (July 1943), p. 112. AGRAWALA goes on to say that "Ṭhakkura Pherū wrote also another book entitled the *Prāsādamaṇḍana* which awaits publication" (*ibid.*, p. 116). I do not know the basis for

construction of Jaina temples and installation of the Tirthaṃkara statues in the Haryana-Rajasthan region. It will be profitable to compare this text with the temples and statues of this period still available in this region.

JYOTIṢASĀRA

The *Jyotiṣasāra*, also written in 1315, consists of 242 *gāthās* and is divided into four chapters called *Dinaśuddhidvāra*, *Vyavahāradvāra*, *Gaṇitadvāra* and *Lagnadvāra*. It is interspersed with many tables and there is a detailed list of contents at the end. It is noteworthy that in one table (p. 19) calculations for *lagna* are made for Delhi and Āsi (i.e. modern Hansi in Haryana).

At the beginning of the work, Pherū mentions the authorities consulted by him. I list them below to show Pherū's vast learning. These authorities are Haribhadra, Naracandra, Padmaprabha Sūri, Jaüṇa, Varāhamihira, Lalla, Parāśara and Garga. Haribhadra, who lived in the first half of the ninth century and wrote the *Āvassayaṇijjutti*,[17] is supposed to be the author of an astrological text entitled *Laggasuddhi* or *Lagnakuṇḍalikā*.[18] Naracandra Sūri (died *ca.* 24 August 1230), a teacher of the famous minister Vastupāla, wrote *Jyotiṣasāra*, also known under the names *Nāracandra* or *Nāracandrapaddhati*. The two hundred and odd available manuscripts of this text listed by David PINGREE amply testify to its popularity.[19] Padmaprabha Sūri wrote a work on *praśna*

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this statement. Nor does AGRAWALA mention this text even once in the course of his long correspondence with Agarchand NAHATA regarding the publication of Pherū's works. (see Vṛndāvana Dāsa, *Pā. Vāsudeva Śaraṇa Agravāla ke Patra*, Delhi, 1974, pp. 72-92)

An edition of the *Vāstusāra* with Hindi and Gujarati translation was published by Pt. Bhagwan Das JAIN in the *Jain-Vividh-Granthmala* of Jaipur, apparently before 1943, which AGRAWALA consulted for the above-mentioned article. The text in this edition differs considerably from the one published in the *Saptagranthasaṃgraha*, where the variant readings from the former are given.

17. M WINTERNITZ, *Geschichte der Indischen Litteratur*, II, Leipzig, 1920, pp. 317-18.
18. Ambalal P. SHAH, *Jaina Sāhitya kā Bṛhad Itihāsa*, Vol. V, Varanasi, 1969, p. 168.
19. David PINGREE, *Census of the Exact Sciences in Sanskrit*, Series A, Vol. 3, Philadelphia, 1976, pp. 132-136. See also his *Jyotiḥśāstra : Astral and Mathematical Literature*. (Jan GONDA, ed., *A History of Indian Literature*, Vol. VI, Fasc. A), Wiesbaden, 1981, p. 122; B. L. SANDESERA, *Literary Circle of Mahāmātya Vastupāla and its Contribution to Sanskrit Literature*, Bombay 1953, pp. 73-75.

called *Bhuvanadīpikā* or *Grahabhāvaprakāśa* in 1164. This was also immensely popular, there being some three hundred manuscripts available today.[20] The word Jaüṇa (from Sanskrit Yavana) may refer to Greek astronomy in general or to the *Yavanajātaka*[21] of Sphujidhvaja (269-270) or to the *Vṛddhayavanajātaka*[22] of Mīnarāja (*ca.* 300-325). The other names are too well known to be introduced here.

GAṆITASĀRA

The *Gaṇitasāra*, also called *Gaṇitasārakaumudī* or *Gaṇitasārapāṭīkaumudī* in the colophons, is not dated. This treatise sub-divides the silver *tamka* into 50 *drammas*. But according to the *Dravyaparīkṣā* (*vv.* 134-136; 144-146 and the corresponding tables), the silver *tamka* issued by Alauddin Muhammad was equal to 60 *drammas* and this rate was continued under Qutbuddin Mubarak Shah also. Therefore, the *Gaṇitasāra* must have been written before 1318 and possibly during the earlier part of Alauddin's rule. Pherū does not mention any authorities consulted by him for writing this treatise, but a close study shows that it is considerably influenced by the *Pāṭīgaṇita* of Śrīdharācārya.[23] The *Gaṇitasāra* contains 311 *gāthās* and is divided into four *adhyāyas*. There is a detailed list of contents at the end. Some illustrative examples are composed in Apabhraṃśa.

Arithmetic is one of the most practical sciences, its rules being employed by traders, carpenters, masons and the like for the calculations connected with their trade. The units of measurement and the illustrative examples for the arithmetical rules given by Pherū reflect their wide application in different professions of that period. In this respect, the *Gaṇitasāra* is a most valuable document. In the section on solid geometry, Pherū gives rules for calculating the volumes of domes (*gomaṃṭa*), square and circular towers with a spiral stairway in the middle (*pāyaseva*), towers with fluted columns (*munārayā*), niches (*tāka*), staircases (*sopāna*), bridges (*pulabaṃdha*) and so on. It should be noted that some of these are new architectural features that were being introduced by the Muslims

20. David Pingree, *Census*, Series A, Vol. 4, Philadelphia, 1981, pp. 173-179. See also his *Jyotiḥśāstra*, pp. 111-112.
21. David Pingree, *The Yavanajātaka of Spujidhvaja*, 2 vols., Cambridge, Mass, 1978.
22. David Pingree, *Vṛddhayavanajātaka of Mīnarāja*, 2 vols. (*GOS* 162, 163), Baroda, 1976. The third volume is yet to come
23. I am preparing an English translation of the *Gaṇitasāra*, where Pherū's indebtedness to Śrīdharācārya will be fully discussed.

into India during this period. The practical applicability of these rules lies in the fact that the chief mason will be able to calculate the number of bricks or stones needed for these constructions. Even for simple constructions, his rules are quite innovative and practice-oriented. Thus for instance, he gives the following rule for calculating the number of bricks needed for the walls of a house:

"First calculate the volume of the total wall space by multiplying the breadth, length and height. Whatever is obtained, from it subtract each time [the volume] of the wood used in the house (i. e. the volume of the door space and window space enclosed within wooden frames). From the remainder, subtract one and a half times its tenth part (i.e. 3/20), which is the volume of mortar. The rest is the volume of the stones in terms of cubic cubits" (III. 70-71). This, when divided by the volume of a single brick, gives the number of the bricks needed for the walls of the house.

Historically more significant is the definition of what he calls a *munārayā*: "The *munārayās* are like circular towers with a spiral stairway in the middle, as far as the inside is concerned. But this is the difference. The wall contains half triangles and half circles" (III. 80). The meaning of the cryptic last sentence is this: in the horizontal cross-section of the *munārayā*, 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 Alauddin himself wanted to build another minar twice as high. Now, the lower story of the Qutb Minar consists of alternately angular and circular columns, the second story of circular columns and the third story of angular columns. I believe that Pherū is referring here to such a minar with fluted columns.

Likewise, in a section called *vastrādhikāra*, Pherū mentions different kinds of silk, woollen and cotton materials, the rate of shrinkage or loss in washing, sewing aud cutting, and the area of cloth required to make various kinds of tents.

Finally, there is a last section listing the average yields of grains and pulses per bighā, the average yield of molasses and brown sugar per maund of sugarcane and the amount of ghee that can be obtained from cow's and buffalo's milk. Though this section is extremely valuable for economic history, linguistically it is a tough nut to crack, because it abounds in *deśya* terms and these are often twisted to suit the metre.

V. S. AGRAWALA's statement about the *Vāstusāra*, quoted above, can be applied to this text perhaps with greater justification. Whether it was used extensively or not, Pherū on his part certainly intended it to serve as a practical handbook for many professions.

DHĀTŪTPATTI

The *Dhātūtpatti*,[24] consisting of 57 *gāthās*, presents a curious mixture of topics. These are origin of metals; techniques of preparing or extracting brass, copper, lead, tin, bronze, mercury, vermillion and red lead; formulas for worshipping the *dakṣiṇāvartaśaṅkha*, *rudrākṣa* and *sāligrāma*; properties and provenance of camphor, aloe wood, sandalwood, musk, saffron etc. The work contains no invocation at the beginning, nor is there a concluding verse. The colophon at the end seems to contain a lacuna and suggests that this work may be an extract from a larger treatise: *iti Ṭhakkura Pherū viracite* [?] *dhātotpatti* [sic!] *karaṇīvidhiḥ samāptā* [sic!]. One would expect the name of the larger work in locative after *viracite*.

It is reported that in 1319 Pherū wrote a work called *Bhūgarbhaprakāśa* on mining and metallurgy [25] It is likely that the *Dhātūtpatti* in the shape it has come down to us contains three separate extracts from this lost *Bhūgarbhaprakāśa*, namely origin of metals, extraction of metals and perfumery. The middle section on the extraction of metals is indeed valuable for our understanding of medieval technology. But Pherū mixes this with some amount of folklore as well. The following method for extracting mercury, if true, would no doubt enliven the work of the Geological Survey of India. Pherū records the folklore thus :

"A well-decorated young lady, riding on horseback, should peep into the well containing mercury and then run away from there without showing her back. Then the mercury will jump out of the well and chase

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24. *Dhātūtpatti* was published by V. S. AGRAWALA with a Hindi translation (by Bhanwar Lal NAHATA) and a *chāyā* in Sanskrit (by Narottam Das SWAMI) under the title "Dhātūtpatti" in *The Journal of the Uttar Pradesh Historical Society*, XXIV-XXV (1951-52), pp. 321-335. The text with the same Hindi translation was included by Bhanwar Lal NAHATA in his *Ṭhakkura Pherū viracitā Dravyaparīkṣā aur Dhātūtpatti*, Vaishali, 1976.

25. V. S. AGRAWALA in the article mentioned in n. 24, p. 321; Ambalal P. SHAH, *op. cit.*, p. 249 claims that this *Bhūgarbhaprakāśa* was published in the *Saptagranthasaṃgraha*, which is not at all the case

the girl. After looking at her pretty visage, the mercury will turn back and fall again into the well. Now, in the course of this game of chase, some amount of mercury may fall into the depressions in the ground This the girl should collect meticulously" (*vv.* 17-19).

DRAVYAPARĪKṢĀ

The *Dravyaparīkṣā*[26] consisting of 149 *gāthās* was written in 1318 in the reign of Qutbuddin Mubarak Shah. Pherū 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 (*v.* 2). *Dravyaparīkṣā* means the examination of the metal content in the coins. 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 on the touchstone if the coins were few and were of gold or silver. This type of money exchange was called *nāṇāvaṭṭa* by Pherū (*v.* 49) whence the modern family name Nanavati. Pherū states that he wrote this work for the instruction of his son and of his brother (*vv.* 3,149), who may have been embarking on the profession of money exchangers.

The *Dravyaparīkṣā* 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[27] and thus provides the necessary technical background for currency 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*, i. e. name, provenance, weight, average metal content (*davvo*), and the exchange value

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26. V. S. Agrawala published the text under the title "Ṭhakkura Pherū viracitā Prākṛtabhāṣābaddhā Dravyaparīkṣā" in *Indian Numismatic Chronicle*, Vol. IV. Pt. I (1964-65), pp. 75-94, and an English translation of *gāthās* 51-149 under the title "A Unique Treatise on Medieval Indian Coins" in *Ghulam Yazdani Commemoration Volume*, Hyderabad, 1966, pp. 81-101; the same was reprinted as "Dravyaparīkṣā of Ṭhakkura Pherū" in *Indian Numismatic Chronicle*, Vol. VII (1969), pp. 100-114. Bhanwar Lal Nahata published the text with his own Hindi tr. in 1976 (see n. 24 above) See also John Scott Deyell, *op. cit.*, Vol. I, pp 343-368, where additional bibliography is given. However, an annotated translation in English of the whole text is a desideratum. I hope to bring out such an edition in the near future.

27. See my paper "*Varṇamālikā* system of Determining the Fineness of Gold in Ancient and Medieval India" in *Aruṇa-Bhāratī : Professor A. N. Jani Felicitation Volume*, Baroda, 1983, pp. 369-389, where Pherū's methods are discussed,

in terms of the Khalji currency. This data is given both in verse form aud in tables at appropriate intervals for some 260 types of coins belonging to the thirteenth and early fourteenth centuries, issued by various kingdoms of North India.

Of the names listed by Pherū, some are based on the denomination, some on the king who issued the coins, some on the shape and some others on the ornaments. The different kingdoms which issued these coins include Khurasan, Multan, Jalandhar, Tahangarh, Banaras, Malwa, Chanderi, 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 metal content. In the case of gold and silver coins, Pherū 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 Pherū, in most cases, by his own assay. I have tried to compare some of Pherū's assays with those done at the laboratory of the British Museum and published by Nelson WRIGHT.[28] It is a testimony to Pherū's accuracy that his assays, done through what would be considered primitive methods today, match very well with the modern assays.[29]

The most interesting and comprehensive list is naturally of the coinage issued by the Sultans of Delhi, especially Alauddin Muhammad and Qutbuddin Mubarak Shah. According to Pherū, the former issued altogether 12 types and the latter 63 types. It should be noted that Mubarak issued these 63 types during the brief span of his reign from 1316 to 1318. Apart from the number, the quality of his coinage is 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. The coin legends of this reign reflect accurately the arrogant vanity of this Sultan, who took delight in calling himself the Alexander of the age, the most high Imam, the Kalifa of Allah...There is perhaps no finer coin in the whole pre-Mughal series than the broad square gold tankah of high relief struck at Qutbabad Fort."[30]

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28. H. Nelson WRIGHT, *The Coinage and Metrology of the Sultans of Delhi*, New Delhi, 1974.
29. See also John Scott DEYELL, *op. cit*, I, p. 346.
30. H. Nelson WRIGHT, *op. cit.*, pp. 107-108.

Pherū apparently shared his master's enthusiasm for coinage and left us an excellent guide to the coinage of North India.

RAYAṆAPARIKKHĀ[31]

India had been the chief supplier of precious stones, especially diamonds, to the world until the discovery of diamond mines in Brazil in the eighteenth century. Indian kings were fond of hoarding huge quantities of gems. This state of affairs is reflected in literature also. Gemmology (called more often *ratnaparīkṣā* than *ratnaśāstra* in Sanskrit) was regarded as one of the minor sciences. In Bāṇa's *Kādamābarī*, Prince Candrāpīḍa's curriculum of education included *ratnaparīkṣā*.[32] Jainas believe that Ṛṣabha, the first Tīrthaṃkara, taught *ratnaparīkṣā* among other sciences to his son Bāhubali.[33] In Sanskrit there are several short treatises on precious stones, dealing with their classification, properties and flaws, provenance, price, detection of spurious stones etc. Moreover, there are many stray references to gems in Sanskrit, Pali and Prakrit literatures. Gems are supposed to possess medicinal and magical properties and hence books on medicine and astrology discuss them. Thus there is vast material to be tapped for a history of gemmology in India.[34]

Of the authors on gemmology in Sanskrit, mention may be made of Kauṭilya (*Arthaśāstra* II. 11), Varāhamihira (*Bṛhatsamhitā* LXXX-LXXXIII), Buddhabhaṭṭa (*Ratnaparīkṣā*), the Western Chalukya monarch, Bhūlokamalla Someśvaradeva III (*Mānasollāsa* II. 4. 402-536), and another royal author from the same region, Basava of Kelādi (*Śivatattvaratnākara*, sixth *kallola*, seventeenth *taraṅga*).

Pherū's *Rayaṇaparikkhā*[35] is the only Prakrit text on this subject. In *v.* 3, Pherū states that he consulted the works of Suramiṃti,

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31. Though the colophon gives the Sanskrit title *Ratnaparīkṣā*, the text itself has *Rayaṇaparikkhā* (vv. 1, 3, 132). Henceforth I use the Prakrit form in order to distinguish Pherū's work from the science *ratnaparīkṣā* and also from other works entitled *Ratnaparīkṣā*.

32. *Kādambarī*, ed M. R Kale (fourth revised edn), Delhi, 1968, p. 126.

33. *Ādipurāṇa* XVI. 123-124

34. The first step in this direction was taken by Louis Finot in his *Les Lapidaires Indiens*, Paris 1896. His introduction is summarised by Moti Chandra in "Ṭhakkura Pherū kṛta Ratnaparīkṣā kā Paricaya" which was included in the *Saptagranthasaṃgraha* and also by the Nahatas in their edition of the *Ratnaparīkṣā* (See n. 35).

35 Agarchand Nahata and Bhanwar Lal Nahata published the text with a Hindi translation in *Ratnaparīkṣā*, Calcutta, n. d. This book contains also the *Ratna-*

Agastya and Buddhabhaṭṭa. No authority on gems called Suramiṃti is recorded. Instead of this word, I read Suramaṃti (Skt. Suramantrin), i. e. Bṛhaspati, because at one place he is mentioned as an authority on gemmology.[36] However, no work on gemmology bearing his name is known today. But obviously Pherū must have had such a work before him in the fourteenth century. Buddhabhaṭṭa, a Buddhist writer, probably belonged to the close of the fifth century or to the beginning of the sixth. His *Ratnaparīkṣā*[37] is the first exclusive text on gemmology known to us and has been a model for the later works, so much so that the *Garuḍapurāṇa* incorporates the whole text, after carefully removing from it all the traces of Buddhism.

Three apocryphal works on gemmology attributed to Agastya or Agasti have been published so far. These are *Agastimata*, *Agastīya Ratnaparīkṣā* and *Agastyasaṃhitā*.[38] Now Agastya is a legendary sage, credited with the expansion of Aryan culture beyond the Vindhyas and venerated by the Tamilians as their patron saint and the first teacher of science and literature. But what is his connection with gemmology ?

It is a well known fact that in the early centuries of the Christian era, Kaveripattinam was an important centre of the maritime gem trade. The Tamil classic *Shilappadikaram*, written about the end of the second century after Christ, contains a beautiful description of the gem market of Madurai, where gems mined in South India, pearls harvested in the Gulf of Mannar, sapphires and rubies imported from Ceylon, rubies imported from Burma may have been sold. Kauṭilya regards the trade route to South India as more profitable because it yields diamonds, rubies, pearls etc.[39] In Budhasvāmin's *Bṛhatkathāślokasaṃgraha*, assigned

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parīkṣā by Tattvakumāra Muni and another text of the same name by Vācaka Ratnaśekhara, both written in Old Hindi.

36. *Ratnaparīkṣāṭīkā*, ed. Buddhisāgara Sarma, Kathmandu VS, 2020 : p 1 ; *tathā ratnaśāstram agastibṛhaspatyādiviracitam.*

37. Buddhabhaṭṭa's *Ratnaparīkṣā* with a French tr. is included in Finot, *op. cit.*

38. The *Agastimata* (with a French tr.) and the *Agastīya Ratnaparīkṣā* are included in Finot, *op. cit.* The *Agastyasaṃhitā* is available in the *Agastyasaṃhitā Ratnaparīkṣā ca*, ed. Krishnaprasada Bhattarai, Kathmandu, VS 2020 On this work, see Wilhelm Rau, *Die Brennlinse im alten Indien*, Wiesbaden, 1983, pp. 12-21, and my fortheoming paper "Tools of the Lapidary according to the Agastyasaṃhitā".

39. *Arthaśāstra* 7. 12.22-24.

generally to the Gupta period, one Sānudāsa sets himself up as a *ratnaparīkṣaka* in Madurai of the Pāṇḍyas.[40] Trivikrama, writing at the beginning of the tenth century, says : *astu svasti samastaratnanidhaye śrīdakṣiṇasyai diśe.*[41]

Therefore, it can be assumed that the knowledge acquired in the gem markets of Kaveripattinam and Madurai was gradually developed and systematized into the science of *ratnaparikṣā*. This assumption gains strength from the fact that the beginnings of this science can be found in the description of the gem market of Madurai in the *Shilappadikaram*. Here it is mentioned for the first time that the diamond is assigned to the four castes on the basis of its colour and that it may contain four types of flaws called *kākapada*, *kalaṅka*, *bindu* and *rekhā*.[42] These words are not known to Kauṭilya, but become technical terms in the later works. Thus we are in the fortunate position of being able to pin-point the origin of *ratnaśāstra* and attribute it to Madurai at the beginning of the Christian era. Therefore, it is not surprising that a science which has its origin in the Tamil land should be attributed to its patron saint Agastya.

Coming back to Pherū, it is certain that he consulted the *Agastimata*. His discussion on the Maṇḍalika (gem appraiser) in *vv.* 106-110 closely follows *Agastimata*, *vv.* 61-75. Besides these three sources, Pherū seems to have consulted the gemmological section of Varāhamihira's *Bṛhatsaṃhitā* for *Rayaṇaparikkhā*, *v.* 12 is an echo of *Bṛhatsaṃhitā* LXXX. 3.

Apart from the study of important works by the earlier writers, Pherū also had the advantage of practical experience of handling gems. He states that he saw in Alauddin's treasury a vast collection of gems that resembled the ocean (*v.* 4). It is well known that Alauddin amassed huge quantities of gold and jewels during his campaigns and those by his generals. His court poet Amir Khusrau left a highly poetic yet valuable account of gems surrendered by Laddar Deo (Pratāpa Rudra II) of Warangal to Alauddin's general Malik Kafur in 1310:

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40. XVIII 368-386.
41. *Nalacampū*, I *ucchvāsa*, *v.* 55.
42. See *Shilappadikaram [The Ankle Bracelet] by Prince Ilango Adigal*, tr. Alain Danielou, London, 1967, 97-98; *Chilappadiharam (Adi Tamil Mahakavya) of Ilango Adihal in Hindi*, tr. S. Shankar Raju Naidu and S. N. Ganesan, Madras, 1979, pp. 191-192.

"The boxes were full of valuables and gems, the excellence of which *drove the onlookers mad.* Every emerald (*zabarjad*) sparkled in the light of the sun, or, rather, the sun reflected back the light of the emerald. The rubies (*yāqūt*) dazzled the eye of the sun and if a ray from them had fallen on a lamp of fire, the lamp would have burst into flames. The 'Cat's eye' (*'ainul hirrat*) was such that a lion after seeing it would have looked with contempt at the sun; and the 'Cock's eye' (*'ainud dīk*) were so brilliant that the 'Cat's eye' was afraid to look at it. The lustre of the rubies (*la'l*) illuminated the darkness of the night and the *mine, as you might light one lamp from another.* The emeralds had a fineness of water that could eclipse the lawn of the paradise. The diamonds (*ilmās*) would have penetrated into an iron heart like an arrow of steel, and yet owing to their delicate nature, would have been shattered by the stroke of a hammer. The other stones were such that the sun blushed to look at them. *As for the pearls, you would not find the like of them, even if you kept diving into the sea through all eternity.*"[43]

The following is Amir Khusrau's description of the gems brought back by Malik Kafur from his campaign to Madurai in 1311:

"If a description of the boxes of jewels were attempted, there is no breast in which it could be contained, nor any heart that could appreciate its value. There were five hundred *mans* of precious stones, and every piece was equal in size to the disc of the (sinking) sun. The diamonds were of such a colour that the sun will have to stare hard for ages before the like of them is made in the factories of the rocks. The pearls glistened so brilliantly that the brow of the clouds will have to perspire for years before such pearls again reach the treasury of the sea. For generations the mines will have to drink blood in the stream of the sun before rubies such as these are produced. The emeralds were of water so fine, that if the blue sky broke itself into fragments, none of its fragments would equal them Every diamond sparkled brightly; it seemed as if it was a drop fallen from the sun. As to the other stones, *their lustre eludes description just as water escapes out of a vessel.*"[44]

Moreover, there is a persistent notion that the famous diamond Koh-i-Nūr was acquired by Alauddin. Muhammad HABIB believes that a huge

43. Muhammad HABIB, tr. *The Campaigns of 'Alā'u'd-Dīn Khilji being the (Khazā'inul Futūḥ) (Treasures of Victory) of Hazrat Amīr Khusrau of Delhi*, Madras, 1931, p. 76.

44. *Ibid.*, pp 106-107.

diamond surrendered by Laddar Deo to Malik Kafur was the Koh-i-Nūr.[45] On the other hand "there is the diamond of Sultān Bābur, which his son Humāyūn received in the year A.D. 1526 from the family of Rājā Bikramjit, when he took possession of Agra. It had already then a recorded history, having been acquired from the Rājā of Mālwā by Alā-ud-dīn in the year 1304."[46] Bābur writes in his memoirs about this diamond that "it is so valuable, that a judge of diamonds valued it at half of the daily expense of the whole world."[47] A great number of historians and gemmologists hold this to be the Koh-i-Nūr. V. BALL argues that this diamond cannot be the Koh-i-Nūr, but "the Daryā-i-Nūr, a flat stone which weighs 186 carats, and is now in the Shāh's treasury, may very possibly be Bābur's diamond."[48]

Whether Alauddin possessed the Koh-i-Nūr or the Daryā-i-Nūr, it is, however, certain that his treasury, where Pherū worked, excelled not only in the quantity of gems it contained but also in their quality.

In addition to this practical experience, Pherū also consulted other experts on gems (*v.* 5). Now we must expect that in Alauddin's treasury

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45. *Ibid.*, p. 77, n. 3.

46. V. BALL in *Travels in India by Jean-Baptiste Tavernier*, tr. by V. BALL, 2nd edn. edited by William CROOKE, London 1925, Vol. II, Appendix I, p. 382. I do not find any contemporary evidence to support BALL's statement that the diamond was acquired from "the Rājā of Mālwā in 1304." According to Khusrau, Alauddin's army invaded Malwa in 1305 (see Muhammad HABIB, *op. cit.*, pp. 43-46).

47. *Memoirs of Zehīr-ed-Dīn Muhammad Bābur...*, tr. by John LEYDEN and William ERSKINE, London etc. 1921, Vol. II, pp. 191-192.

48. V. BALL, *op. cit.*, p. 343. On the Koh-i-Nūr, see *ibid.*, pp. 331-348. Recently V. B. MEEN and A. D. TUSHINGHAM published their gemmological study of the Daryā-i-Nūr in their *Crown Jewels of Iran*, University of Toronto Press 1968. (I have not seen this book. The following is based on an illustrated report published in the *Westermann Monatsmagazin*, August 1969, pp. 10-19). According to these scientists, the Daryā-i-Nūr is identical with the great table diamond offered for sale to Tavernier in 1642 at Golconda (see *op. cit.*, Vol. II. p. 78). Then it weighed about 242 Florentine carats or 232 English carats. This diamond was split in the last years of Fath Ali Shah's reign (1794-1834) into two pieces : one the Daryā-i-Nūr and the second Nūr-ul-Ain. The present weight of the former is estimated between 175 and 195 carats (exact weight cannot be measured because of the setting)

there were also Muslim gemmologists who may have been acquainted with Arabic and Persian works on gemmology.[49] One such expert is obviously the Ariz-i-Mumālik who examined Laddar Deo's jewels. "He divided them into 'genus' and 'species', 'class' after 'class', and had everything written down."[50] Already 300 years before this time, Al-Bīrūnī determined the specific gravity of many varieties of gems.[51] One would expect that from his Muslim colleagues Pherū must have learnt about the Arabic and Persian works on gemmology and, more particularly, about the importance of specific gravity in distinguishing a true gem from a fake. Unfortunately, there is no trace of such influence in the present work.

Pherū follows the framework of his Indian models faithfully, starting from the mythical origin of gems from the limbs of a demon to the eight types of pearls, only one of which is the true pearl offered in trade. However, he adds a number of interesting details from the contemporary gem trade. These will be discussed at the appropriate places in the commentary. Here a brief summary will suffice. Pherū describes many new varieties of the ruby, sapphire, emerald etc. He does not discard the traditional lists of the places of occurrence of gems altogether, but adds new ones. In addition to the gems described in the earlier treatises, he mentions, albeit briefly, gems imported from Persia. He gives a contemporary tariff of prices for all gems and so on.

Above all, Pherū's *Rayaṇaparikkhā* distinguishes itself because of its composition in an almost popular speech—in stark contrast to the

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49. For an excellent account of such works, see Eilhard WIEDEMANN *Aufsaetze zur Arabischen Wissenschaftsgeschichte*, Hildesheim/New York 1970, Vol. I, pp. 829-880 : on mineralogy in Islam.

50. Muhammad HABIB, *op. cit.*, p. 77. About such appraisers of gems in Aurangzeb's court Tavernier (*op. cit.*, Vol. I, pp. 110-111) reports as follows : "There are in the employment of His Majesty, two Persians, and a Banian, whose duty it is to see and examine all the jewels which one wishes to sell to the emperor...while these three valuers of the jewels are considering and examining them [i. e. gems] several Banians who are experts, some for diamonds, others for rubies, for emeralds and for pearls...write down the weight, quality, perfection and colour of each piece."

51. See S. M. R. ANSARI, "On the Physical Researches of Al-Bīrūnī", *Indian Journal of History of Science*, Vol. 10, No. 2, (November 1975), pp. 198-217.

Sanskrit of earlier writers—and thus paves the way for the popularisation of gemmology. Following this example, many jewellers and even Jaina priests wrote treatises on gemmology in popular speech in the subsequent centuries.[52]

This *Rayaṇaparikkhā* and other works of this genre have served as handbooks to jewellers in North India for several centuries. Therefore, it is instructive to study this text and see what purely gemmological facts and what myths and beliefs governed the thinking of the jewellers and also the majority of the wearers of gems throughout the ages.

I am preparing a history of *ratnaśāstra*. As a first step, I offer this edition of the *Rayaṇaparikkhā* with a Sanskrit *chāyā*, an English translation and a commentary where I discuss, among other things, parallels from earlier writers and invite attention to Pherū's innovations within the traditional framework.

For this edition, I have followed—in the absence of fresh manuscript material—the text published by JINAVIJAYA MUNI in the *Saptagranthasaṃgraha*, with emendations where necessary and minor changes in the spacing of words. In the footnotes, JINAVIJAYA MUNI's text is referred to as J, and that of Agarchand NAHATA and Bhanwar Lal NAHATA as N. There is an abridged version of the *Rayaṇaparikkhā*, which will be given in the Appendix.

Finally, it is my pleasant duty to acknowledge the help received in preparing this edition. I am under great obligation to Sri Bhanwar Lal NAHATA of Calcutta, who sent me some of his publications, especially his valuable edition of the *Ratnaparīkṣā*. I am grateful to Professor Dr. Wilhelm RAU, Professor of Sanskrit at Philipps University of Marburg, who has been encouraging my studies in *ratnaśāstra* by generously sending me rare material from Germany. My thanks are due to Professor S. H. RASUL and Mr. Noman GHANI of the Department of Geology, Aligarh Muslim University, for introducing me to modern gemmology.

52. A good account of such works is given by the NAHATAS in the introduction to their edition of the *Ratnaparīkṣā*.

Drs Abha SINGH, Pushpa PRASAD and Vishvanath SHUKLA deserve my thanks for various kinds of help. However, I hasten to add that whatever errors there may be here—either in the reconstruction of Pherū's Prakrit or in interpretation—, they are entirely due to me. I shall be happy if this small work promotes interest in this *śāstra*.

रयणपरिक्खा

सयलगुणाण निवासं नमिउं सव्वन्नं तिहुयणपयासं ।
संखेवि परप्पहियं रयणपरिक्खा भणामि अहं ।।१।।

सिरिमालकुलुत्तंसो ठक्कुरचंदो जिणिंदपयभत्तो ।
तस्संगरुहो फेरू जंपइ रयणाण माहप्पं ।।२।।

पुव्विं रयणपरिक्खा सुरमंति[1]-अगत्थ-बुद्धभट्टेहिं ।
विहिया तं दट्ठूणं तह बुद्धी मंडलीयं च ।।३।।

अल्लावदीणकलिकालचक्कवट्टिस्स कोसमज्झत्थं ।
रयणायरु व्व रयणुच्चयं च नियदिट्ठिए दट्ठुं ।।४।।

पच्चक्खं अणुभूयं मंडलियपरिक्खियं च सत्थाइं[2] ।
नाउं रयणसरूवं पत्तेयं भणामि सव्वेसिं ।।५।।

लोए भणंति एवं आसी बलदाणवो महाबलवं ।
सो पत्तो अन्नदिणे सग्गे इंदस्स जिणणत्थं ।।६।।

रत्नपरीक्षा

(संस्कृतच्छाया)

सकलगुणानां निवासं नत्वा सर्वज्ञं त्रिभुवनप्रकाशम् ।
संक्षेपे परप्रथितां रत्नपरीक्षां भणाम्यहम् ।।१।।

श्रीमालकुलोत्तंसष्ठक्कुरचन्द्रो जिनेन्द्रपदभक्तः ।
तस्यांगजः फेरू जल्पति रत्नानां माहात्म्यम् ।।२।।

पूर्वं रत्नपरीक्षा सुरमन्त्र्यगस्त्यबुद्धभट्टैः ।
विहिता तं दृष्ट्वा तथा बुद्ध्या मण्डलिकस्य च ।।३।।

अल्लावदीनकलिकालचक्रवर्तिनः कोशमध्यस्थम् ।
रत्नाकरमिव रत्नोच्चयं च निजदृष्ट्या दृष्ट्वा ।।४।।

प्रत्यक्षमनुभूतं मण्डलिकपरीक्षितं च शास्त्राणि ।
ज्ञात्वा रत्नस्वरूपं प्रत्येकं भणामि सर्वेषाम् ।।५।।

लोके भणन्त्येवमासीद् बलदानवो महाबलवान् ।
स प्राप्तोऽन्यदिने स्वर्गमिन्द्रस्य जयनार्थम् ।।६।।

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1. सुरमिति JN.
2. Thus J for सत्थायं.

तहिं पत्थिओ सुरेहिं जन्ने अम्हाण तुं पसू होह ।
तेण पसन्ने भणियं भविओहं कुणसु नियकज्जं ।।७।।
सो पसु वहिउ सुरेहिं तस्स सरीरस्स अवयवाओ य ।
संजाया वररयणा सिरिनिलया सुरपिया रम्मा ।।८।।
अत्थिस्स जाय हीरय मुत्तिय दंताउ रुहिर माणिक्कं ।
मरगयमणि पित्ताओ नयणाओ इन्दनीलो य ।।९।।
वइडुज्जो य रसाओ वसाउ कक्केयगं समुप्पन्नं ।
ल्हसणीओ य नहाओ फलियं मेयाउ संजायं ।।१०।।
विद्दुमु आमिस्साओ चम्माओ पुंसराउ निप्पन्नो ।
सुक्काउ य भीसम्मो रयणाणं एस उप्पत्ती ।।११।।
एवं भणंति एगे भूमिविकारं[1] इमं च सव्वं च ।
जह रुप्प कणय तंब य धाऊ रयणा पुणो तह य ।।१२।।
तट्ठाणाओ गहिया निय निय वन्नेहिं नवहिं सुगहेहिं ।
तत्तो जत्थ य जत्थ य पडिया ते आगरा जाया ।।१३।।
सूरेण पउमरायं मुत्तिय चंदेण विद्दुमं भूमे ।
मरगयमणीउ बुद्धे जीवेण य पुंसरायं च ।।१४।।

तैः प्रार्थितः सुरैर्यज्ञेऽस्माकं त्वं पशुर्भव ।
तेन प्रसन्नेन भणितं भवितास्मि कुरुत निजकार्यम् ।।७।।
स पशुर्हतः सुरैस्तस्य शरीरस्यावयवाश्च ।
संजाता वररत्नानि श्रीनिलयानि सुरप्रियाणि रम्याणि ।।८।।
अस्थितो जातो हीरको मौक्तिकं दन्ततः रुधिरतो माणिक्यम् ।
मरकतमणिः पित्ततो नयनत इन्द्रनीलश्च ।।९।।
वैदूर्यं च रसतो वसातः कर्कतनं समुत्पन्नम् ।
लशुनकश्च नखेभ्यः स्फटिकं मेदसः संजातम् ।।१०।।
विद्रुम आमिषतश्चर्मतः पुष्परागो निष्पन्नः ।
शुक्रतश्च भीष्मं रत्नानामेषोत्पत्तिः ।।११।।
एवं भणन्त्येके भूमिविकार इदं सर्वं च ।
यथा रूप्यं कनकं ताम्रं च धातूनि रत्नानि पुनस्तथा च ।।१२।।
तत्स्थानतो गृहीता निजनिजवर्णैर्नवभिः सुग्रहैः ।
तेभ्यो यत्र यत्र पतितास्त आकरा जाताः ।।१३।।
सूर्येण पद्मरागं मौक्तिकं चन्द्रेण विद्रुमो भौमेन ।
मरकतमणिर्बुधेन जीवेन च पुष्परागश्च ।।१४।।

1. Thus J for भूविकारं

सुक्केण गहिय वज्जं सणिदनीलं तमेण गोमेयं ।
केएण य वेडुज्जं मुक्का तत्थेव सेस तहिं ।।१५।।
इय रयण नव गहाणं अंगे जो धरइ सच्चसीलजुओ ।
तस्स न पीडंति गहा सो जायइ रिद्धिवंतो य ।।१६।।
पुणु जह सत्थे भणिया अदोस अइचुक्खया गुणड्ढा य ।
ते रयण रिद्धिजणया सदोस धणपुत्तरिद्धिहरा ।।१७।।
जइ उत्तिमरयणंतरि इक्को वि सदोसु कूडु समलु हवे ।
ता सयलउत्तिमाणं कंतिपहावं हणेइ धुवं ।।१८।।
भणिया मूलुप्पत्ती अओ य वुच्छामि आगराईणि ।
वन्न गुण दोस जाई मुल्लं सव्वाण रयणाणं ।।१९।।

वज्र जहा—

हेमंत सूरपारय कलिंग मायंग कोसल सुरट्ठे ।
पंडुर विसएसु तहा वेणुनई वज्जठाणाइं ।।२०।।
तंब सिय नील कुक्कुस हरियाल सिरीसकुसुम घणरत्ता ।
इय वज्जवन्नछाया कमेण आगरविसेसाओ ।।२१।।

शुक्रेण गृहीतं वज्रं शनिनेन्द्रनीलस्तमसा गोमेदः ।
केतुना च वैदूर्यं मुक्तानि तत्रैव शेषाणि तैः ।।१५।।
इमानि रत्नानि नवग्रहाणामङ्गे यो धरति सत्यशीलयुतः ।
तं न पीडयन्ति ग्रहाः स जायते ऋद्धिवांश्च ।।१६।।
पुनर्यथा शास्त्रे भणितान्यदोषाण्यतिशुद्धानि गुणाढ्यानि च ।
तानि रत्नानि ऋद्धिजनकानि सदोषाणि धनपुत्रर्द्धिहराणि ।।१७।।
यद्युत्तमरत्नानामन्तर एकमपि सदोषं कूटं समलं भवेत् ।
तत्सकलोत्तमानां कान्तिप्रभावौ हन्ति ध्रुवम् ।।१८।।
भणिता मूलोत्पत्तिरतश्च वक्ष्याम्याकरादीनि ।
वर्णगुणदोषजातिमूल्यानि सर्वेषां रत्नानाम् ।।१९।।

वज्र यथा—

हिमवत्सूर्पारककलिङ्गमातङ्गकोसलसुराष्ट्रेषु ।
पौण्ड्रविषयेषु तथा वेण्णानदी वज्रस्थानानि ।।२०।।
ताम्रसितनीलकुक्कुसहरितालशिरीषकुसुमघनरक्ताः ।
इमा वज्रवर्णच्छायाः क्रमेणाकरविशेषाः ।।२१।।

परं विशेषोऽयम्—

कोसल कलिंग पढमे दुइए हेमंत तह य मायंगे ।
पंडुर सुरट्ठ तईए वेगुज सोपारय कलिंमि ।।२२।।

छ क्कोण अट्ठ फलहा बारस धारा य हुंति वज्जा य ।
अट्ठ गुणा नव दोसा चउ छाया चउर वन्न कमा ।।२३।।

समफलह उच्चकोणा सुतिक्खधारा य वारितर अमला ।
उज्जल अदोस लहुतुल इय वज्जे होंति अट्ठ गुणा ।।२४।।

कागपग बिंदु रेहा समला फुट्टा य एगसिंगा य ।
वट्टा य जवाकारा हीणाहियकोण नव दोसा ।।२५।।

सिय विप्प अरुण खत्तिय पीय वइस्सा य कसिण सुद्दा य ।
इय चउ वन्न दुजाई चुक्खा तह मालवी नेया ।।२६।।

निद्दोस सगुण उत्तिम चत्तारि वि वन्न हुंति जस्स गिहे ।
तस्स न हवंति विग्घं अकालमरणं न सत्तुभयं ।।२७।।

चत्तारि वि वन्न तहा पीयारुण नरवराण रिद्धिकरा ।
सेसा नियनियवन्ने सुहंकरा वज्ज नायव्वा ।।२८।।

अपरं विशेषोऽयम्—

कोसलकलिङ्गौ प्रथमे द्वितीये हिमवांस्तथा च मातङ्गः ।
पौण्ड्रसुराष्ट्रौ तृतीये वेणुजसूर्पारकौ कलौ ।।२२।।

षट् कोणा अष्ट फलका द्वादश धाराश्च सन्ति वज्रे च ।
अष्ट गुणा नव दोषाश्चतस्रश्छायाश्चत्वारो वर्णाः क्रमात् ।।२३।।

समफलकमुच्चकोणं सुतीक्ष्णधारं च वारितरममलम् ।
उज्ज्वलमदोषं लघुतौल्यमिमे वज्रे भवन्त्यष्ट गुणाः ।।२४।।

काकपदं बिन्दु रेखा समलं स्फुटितं चैकशृङ्गं च ।
वर्तुलं च यवाकारं हीनाधिककोणं नव दोषाः ।।२५।।

सितं विप्रोऽरुणं क्षत्रियः पीतं वैश्यश्च कृष्णं शूद्रश्च ।
इमे चत्वारो वर्णा द्विजाति शुद्धं तथा मालवि ज्ञेयम् ।।२६।।

निर्दोषाः सगुणा उत्तमाश्चत्वारोऽपि वर्णा भवन्ति यस्य गृहे ।
तस्य न भवन्ति विघ्नमकालमरणं न शत्रुभयम् ।।२७।।

चत्वारोऽपि वर्णास्तथा च पीतारुणौ नरवराणामृद्धिकराः ।
शेषाणि निजनिजवर्णे शुभंकराणि वज्राणि ज्ञातव्यानि ।।२८।।

लच्छीए आयड्ढी थंभइ अरिणो परक्कमं[1] समरे ।
तेणं अरुणं पीयं नरेसरो धरइ वरवज्जं ॥२९॥

जह दप्पणेण वयणं दीसइ तह उत्तमेण वज्जेण ।
नर तिरिय रुक्ख मंदिर तहिंदधणुहाइं दीसंति ॥३०॥

अइचुक्ख तिक्खधारा पुत्तत्थीइत्थियाण हाणिकरा ।
चप्पडि मलिण तिकोणा रमणीणं वज्ज सुहजणया ॥३१॥

भणियं च—

अहमेव पढमरयणं सुपुत्तरयणाण खाणि मुह कुच्छी ।
कोण वराओ वज्जो इय दोसं दाउ धरइत्थी ॥३२॥

समपिंड सगुण निम्मल गुरुतुल्ला होणपिंड लहुमुल्ला ।
फार लहुतुल्ल वज्जा बहुमुल्ला सम समा मुल्लो ॥३३॥

वज्जं लहु फलह सिरं वित्थरचरणं तिलोवरिं काउं ।
जो जडइ अह जडावइ तस्स धुवं हवइ बहु दोसं ॥३४॥

जस्स फलहाण मज्झे वुड्ढो वुड्ढो हुंति भिन्न वन्नाइं ।
कागपय रत्तबिंदू तं वज्जं होइ पुत्तहरं ॥३५॥

लक्ष्म्या आकृष्टिः स्तम्भतेऽरेः पराक्रमं समरे ।
तेनारुणं पीतं नरेश्वरो धरति वरवज्रम् ॥२९॥

यथा दर्पणेन वदनं दृश्यते तथोत्तमेन वज्रेण ।
नरतिर्यग्वृक्षमन्दिराणि तथेन्द्रधनुरादि दृश्यन्ते ॥३०॥

अतिशुद्धं तीक्ष्णधारं पुत्रार्धिनीस्त्रीणां हानिकरम् ।
चिपिटं मलिनं त्रिकोणकं रमणीनां वज्रं शुभजनकम् ॥३१॥

भणितं च—

अहमेव प्रथमरत्नं सुपुत्ररत्नानां खनिर्मम कुक्षिः ।
किं वराकं वज्रमिमं दोषं दत्त्वा धरति स्त्री ॥३२॥

समपिण्डसगुणनिर्मलाद् गुरुतौल्यानि हीनपिण्डानि लघुमूल्यानि ।
स्फारलघुतौल्यवज्राणि बहुमूल्यानि समं सममूल्यम् ॥३३॥

वज्रं लघुफलकशिरस्कं विस्तृतचरणमधोमुखं कृत्वा ।
यो जटत्यथ जटायति तस्य ध्रुवं भवति बहुदोषः ॥३४॥

यस्य फलकानां मध्ये वृद्धानि वृद्धानि भवन्ति भिन्नवर्णानि ।
काकपदं रक्तबिन्दुस्तद्वज्रं भवति पुत्रहरम् ॥३५॥

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1. Thus J for परिक्कमं

वज्जेण सव्वि रयणा वेहं पावंति हीरए हीरा ।
कुरुविंदो पुण वेहइ नीलस्स न अन्नरयणस्स ॥३६॥
अयसार कच्च फलिहा गोमेयग पुंसराय वेडुज्जा ।
एयाउ कूडवज्जा कुणंति जे होंति कलकुसला ॥३७॥
कूडाण इय परिक्खा गुरु विन्नाया य सुहमधारा य ।
साणायं सुह घसिया दुह घसिया रयण जाइभवा ॥३८॥

॥ इति वज्रपरीक्षा ॥

अथ मुत्ताहलं—

गयकुंभ १ संखमज्झे २ मच्छमुहे ३ वस ४ कोलदाढे य ५ ।
सप्पसिरे ६ तह मेहे ७ सिप्पउड़े ८ मुत्तिया हुंति ॥३९॥
मंदपह[1] पीय रत्ता इय उत्तिम जंबुछाय मज्झत्था ।
वट्टामलयपमाणा गयंदजा हुंति रज्जकरा ॥४०॥
दाहिणवत्ते संखे महासमुद्दे य कंबुजा हुंति ।
लहु सेया अरुणपहा नरदुलहा मगलावासा ॥४१॥
मच्छे य साम वट्टा लहुतुला विमलदिट्ठिसंजणया ।
अरिचोरभूयसाइणिभयनासा हुंति रिद्धिकरा ॥४२॥

वज्रेण सर्वरत्नानि वेध प्राप्नुवन्ति हीरकेण हीरकः ।
कुरुविन्दं पुनर्विध्यति नीलं नान्यरत्नानि ॥३६॥
अयसारकाचस्फटिकगोमेदकपुष्परागवैदूर्याणि ।
एतेभ्यः कूटवज्राणि कुर्वन्ति ये भवन्ति कलाकुशलाः ॥३७॥
कूटानामियं परीक्षा गुरूणि वेध्यानि च सूक्ष्मधाराणि च ।
शाणायां सुघृष्टानि दुर्घृष्टानि रत्नानि जातिभवानि ॥३८॥

॥ इति वज्रपरीक्षा ॥

अथ मुक्ताफलम्—

गजकुम्भे शङ्खमध्ये मत्स्यमुखे वंशे कोलदंष्ट्रासु च ।
सर्पशिरसि तथा मेघे शुक्तिपुटे मौक्तिकानि भवन्ति ॥३९॥
मन्दप्रभानि पीतरक्तानीमान्युत्तमानि जम्बुच्छायानि मध्यस्थानि ।
वर्तुलामलकप्रमाणानि गजेन्द्रजानि भवन्ति राज्यकराणि ॥४०॥
दक्षिणावर्ते शङ्खे महासमुद्रे च कम्बुजानि भवन्ति ।
लघूनि श्वेतान्यरुणप्रभानि नरदुर्लभानि मङ्गलावासानि ॥४१॥
मत्स्ये च श्यामानि वर्तुलानि लघुतौल्यानि विमलदृष्टिसंजनकानि ।
अरिचोरभूतशाकिनीभयनाशकानि भवन्ति ऋद्धिकराणि ॥४२॥

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1. Thus J for मंदवह

गुंजसमा मंदपहा हवंति कच्छ वन सव्व भूमीसु ।
रज्जकरा दुक्खहरा सुपवित्ता वंसउद्धरणा ॥४३॥

सूवरदाढे वट्टा घियवन्ना तह य सालफलतुल्ला ।
चिट्ठंति जस्स पासे इंदेण न जिप्पए सोवि ॥४४॥

सप्पस्स नील निम्मल कंकोलीफलसमाण लच्छिकरा ।
छल च्छिद्द अहि उवद्दव विसवाही विज्जु नासयरा ॥४५॥

मेहे रवितेयसमा सुराण कीलंत कहव निवडंति ।
गिण्हंति अंतराले अपत्त धरणीयले देवा ॥४६॥

वायं छिज्जइ कोवि हु जलबिंदू जलहरंमि वरिसंते ।
सु वि मुत्ताहलच्छी[1] भणंति चिंतामणो विउसा ॥४७॥

एए हुंति अवेहा अमुल्लया पूयमाण रिद्धिकरा ।
लोए बहुमाहप्पा लहु बहुमुल्ला य सिप्पभवा ॥४८॥

रामावलोइ वव्वरि सिंघलि कंतारि पारसीए य ।
केसिय देसेसु तहा उवहितडे सिप्पिजा हुंति ॥४९॥

गुञ्जासमानि मन्दप्रभानि भवन्ति कक्षवने सर्वभूमिषु ।
राज्यकराणि दुःखहराणि सुपवित्राणि वंशोद्धृतानि ॥४३॥

सूकरदंष्ट्रासु वर्तुलानि घृतवर्णानि तथा च सालफलतुल्यानि ।
तिष्ठन्ति यस्य पार्श्वे इन्द्रेणापि न जीयते सः ॥४४॥

सर्पस्य नीलनिर्मलकङ्कोलीफलसमानानि लक्ष्मीकराणि ।
छलच्छिद्राह्युपद्रवविषव्याधिविद्युन्नाशकराणि ॥४५॥

मेघे रवितेजसमानि सुराणां क्रीडतां कथं वा निपतन्ति ।
गृह्णन्त्यन्तरालेऽप्राप्तानि धरणीतले देवाः ॥४६॥

वातं छिनत्ति कोऽपि खलु जलबिन्दुर्जलधरेषु वर्षत्सु ।
तमपि(?)मुक्ताफललक्ष्मीं भणन्ति चिन्तामणिं विद्वांसः ॥४७॥

एतानि भवन्त्यवेध्यान्यमूल्यानि पूज्यमानानि ऋद्धिकराणि ।
लोके बहुमाहात्म्यानि लघूनि बहुमूल्यानि च शुक्तिभवानि ॥४८॥

रामावलोके बर्बरे सिंहले कान्तारे पारसीके च ।
केसियदेशेषु तथोदधितटे शुक्तिजानि भवन्ति ॥४९॥

1. Thus J for मुत्ताहलच्छी

सव्वेसु आगरेसु य सिप्पउडे साइरिक्ख जलजोए ।
जायंति मुत्तियाइं सव्वालंकारजणयाइं ॥५०॥
तारं वट्टं अमलं सुसणिद्धं कोमलं गुरुं छ गुणा ।
लहु कढिण रुक्ख करडा विवन्न सह बिन्दु छह दोषा ॥५१॥
ससिकिरणसमं सगुणं दीहं इक्कंगि कलुसियं हवइ ।
तस्स य खडंस हीणं मुल्लं निंबउलिए अद्धं ॥५२॥
अहरूव पंकपूरिय असार विप्फोड मच्छनयणसमं ।
करयाभं गंठिजुयं गुरुं पि वट्टं पि लहुमुल्लं ॥५३॥
पीयद्ध अवट्ट[1] तिहा सछिद्द[2] छट्ठंसु करड[3] जह जुग्गं ।
सद्दोसे य दसंसं इयराणं दिट्ठए मुल्लं ॥५४॥

॥ इति मुत्ताहलपरीक्षा ॥

अथ पद्मरागमणिर्यथा—

रामागंगनईतडि सिंघलि कलसउरि तुंवरे देसे ।
माणिक्काणुप्परत्ती पिहु पिहु[4] पुण दोस गुण वन्ना ॥५५॥
पढमित्थ पउमरायं सोगंधिय नीलगंध कुरुविंदं ।
जामुणिय पंच जाई चुन्निय माणिक्क नामेहिं ॥५६॥

सर्वेष्वाकरेषु च शुक्तिपुटे स्वातिऋक्षे जलयोगे ।
जायन्ते मौक्तिकानि सर्वालंकारजनकानि ॥५०॥
तारं वर्तुलममलं सुस्निग्धं कोमलं गुरु षड् गुणाः ।
लघु कठिनं रूक्षं शबलं विवर्णं सबिन्दु षड् दोषाः ॥५१॥
शशिकिरणसमं सगुणं दीर्घमेकाङ्गे कलुषितं भवति ।
तस्य च षष्टांशहीनं मूल्यं निम्बगुलिकाया अर्धम् ॥५२॥
अर्धरूपं पङ्कपूरितमसारं विस्फुटितं मत्स्यनयनसमम् ।
करकाभं ग्रन्थियुतं गुर्वपि वर्तुलमपि लघुमूल्यम् ॥५३॥
पीतमर्धमवर्तुलं त्र्यंशं सच्छिद्रं षष्टांशं शबलं यथायोग्यम् ।
सदोषे च दशमांशमितरेषां दृष्ट्या मूल्यम् ॥५४॥

॥ इति मुक्ताफलपरीक्षा ॥

अथ पद्मरागमणिर्यथा—

रामगङ्गानदीतटे सिंहले कलशपुरे तुम्बुरे देशे ।
माणिक्यानामुत्पत्तिः पृथक् पृथक् पुनर्दोषगुणवर्णाः ॥५५॥
प्रथममत्र पद्मरागं सौगन्धिकं नीलगन्धि कुरुविन्दम् ।
जामुणियं पञ्च जातयः चुन्नी माणिक्यं नामभ्याम् ॥५६॥

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1. अयट्ठ JN 2. सखुद्द JN 3. खरड JN 4. विहु विहु JN

सूरु व्व किरणपसरा सुसणिद्धं कोमलं च अग्गिनिहा ।
जं कणयसमं कढिया अक्खीणा पउमरायं सा ॥५७॥

किंसुयकुसुमकसुंभयकोइलसारिसचकोरअक्खिसमं ।
दाडिमबीजनिहं जं तमित्थ सोगंधिया नेया ॥५८॥

कमलालत्तयविद्दुमहिंगुलुयसमो य किंचि नीलाभो ।
खज्जोयकंतिसरिसो इय वन्ने नीलगंधो य ॥५९॥

पढम तह सावगंधयसमप्पहं रंगबहुल कुरविंदा ।
पुण सत्तासं लहुयं सजलं च इय सहाव गुणं ॥६०॥

जामुणिया विन्नेया जंबू कणवीररत्तपुप्फसमा ।
मुल्लस्संतरमेयं वीसं पनरस दस छ तिग विसुवा ॥६१॥

सुच्छायं सुसणिद्धं किरणाभं कोमलं च रंगिल्लं ।
गुरुयं[1] समं महंतं माणिक्कं हवइ अट्ठगुणं ॥६२॥

गयछायं जड धूमं भिन्नं ल्हसणं सकक्करं कढिणं ।
विपयं रुक्खं च तहा अड दोसा भणिय माणिक्कं ॥६३॥

सूर्य इव किरणप्रसरं सुस्निग्धं कोमलं चाग्निनिभम् ।
यत्क्वथितकनकसममक्षीणं पद्मरागं तत् ॥५७॥

किंशुककुसुमकुसुम्भककोकिलसारसचकोराक्षिसमम् ।
दाडिमबीजनिभं यत्तदत्र सौगन्धिकं ज्ञेयम् ॥५८॥

कमलालक्तकविद्रुमहिङ्गुलिकसमं च किञ्चिन्नीलाभम् ।
खद्योतकान्तिसदृशमिमे वर्णा नीलगन्धेश्च ॥५९॥

प्रथमस्य तथा सौगन्धिकस्य समप्रभं रङ्गबहलं कुरुविन्दम् ।
पुनः सत्रासं लघुकं सजलं चेमे स्वभावगुणाः ॥६०॥

जामुणियं विज्ञेयं जम्बूकरवीररक्तपुष्पसमम् ।
मूल्यस्यान्तरमेतेषां विंशतिः पञ्चदश दश षट् त्रीणि विंशोपकानि ॥६१॥

सुच्छायं सुस्निग्धं किरणाभं कोमलं च रङ्गवत् ।
गुरुकं समं महन्माणिक्यं भवत्यष्टगुणम् ॥६२॥

गतच्छायं जडं धूम्रं भिन्नं लशुनयुतं सकर्करं कठिनम् ।
विपदं रूक्षं च तथाष्ट दोषा भणिता माणिक्यस्य ॥६३॥

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1. सुरुयं JN

गुणपुवुन्न जहुत्तं माणिक्कं दोसवज्जियं अमलं ।
जो धरइ तस्स रज्जं पुत्तं अत्थं हवइ तूणं ॥६४॥

गुणसहिय पउमरायं धरिए नरनाह आवया टलइ ।
सद्दोसेण उवज्जइ न संसयं इत्थ जाणेह ॥६५॥

अगुण विवन्नच्छायं ल्हसणजुयं थड्ढयं च खग्गं च ।
इय माणिक्कं धरियं सुदेसभट्ठं नरं कुणइ ॥६६॥

करचरणवयणनयणं सुपउमरायं पइस्स जणयंती ।
तो वहइ पउमरायं पउमिणि सुयपउमजणणत्थं ॥६७॥

अहवट्टि उड्ढवट्टी तिरीयवट्टी य जा हवइ चुन्नी ।
सा अहमुत्तिम मज्झिम कूडा पुण सव्ववट्टी[1] य ॥६८॥

जो मणि बहिप्पएसे मुंचइ किरणं जहग्गि गयधूमं ।
सा इंदकंति नेया चंदोव्व सुहावहा सघणा ॥६९॥

साणाइ पउमरायं जो छिज्जइ अंगुली छिविय कसिणा ।
तं च पाहण[2] सगब्भा चिप्पिडिया हवइ सा चुन्नी ॥७०॥

॥ इति माणिक्यपरीक्षा समत्ता ॥

गुणपूर्णं यथोक्तं माणिक्यं दोषवर्जितममलम् ।
यो धरति तस्य राज्यं पुत्रोऽर्थो भवन्ति नूनम् ॥६४॥

गुणसहितं पद्मरागं धृत्वा नरनाथ आपदो निवारयति ।
सदोषेणोत्पद्यन्ते न संशयमत्र जानीहि ॥६५॥

अगुणं विवर्णच्छायं लशुनयुतं स्तब्धं च खड्गाकारं च ।
इदं माणिक्यं धृतं सुदेशभ्रष्ठं नरं करोति ॥६६॥

करचरणवदननयनानि सुपद्मरागाणि पत्युर्जनयन्ती ।
तदा वहति पद्मरागं पद्मिनी सुतपद्मजननार्थम् ॥६७॥

अधोवर्तिन्यूर्ध्ववर्तिनी तिर्यग्वर्तिनी च या भवति चुन्नी ।
साधमोत्तममध्यमा कूटा पुनः सर्ववर्तिनी च ॥६८॥

यो मणिर्बहिष्प्रदेशे मुञ्चति किरणं यथाग्निर्गतधूमः ।
स इन्द्रकान्तिर्ज्ञेयश्चन्द्र इव सुखावहः सघनः ॥६९॥

शाणायां पद्मरागं यत्क्षीयतेऽङ्गुली स्पृष्टा कृष्णा ।
तच्च पाषाणसगर्भं चिपिटिका भवति सा चुन्नी ॥७०॥

॥ इति माणिक्यपरीक्षा समाप्ता ॥

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1. मट्टी N 2. पहाउ JN

अथ मरकतमणिर्यथा—

अवलिंद मलयपव्वय वव्वरदेसे य उवहितीरे य ।
गरुडस्स उरे कंठे हवंति मरगय महामणिणो ।।७१।।

गरुडोदगार पढमा कीडउठी दुईय तईय वासउती ।
मूगउनी य चउत्थी धूलिमराई य पण जाई ।।७२।।

गरुडोदगार रम्मा नीलामल कोमला य विसहरणा ।
कीडउठि सुहम णिद्धा कसिणा हेमाभकंतिल्ला ।।७३।।

वासवई य सरुक्खा नील हरिय कीरपुच्छसम णिद्धा ।
मूगउनी पुण कढिणा कसिणा हरियाल सुसणेहा ।।७४।।

धूलमराई गरुया तह कढिणा नीलकच्चसारिच्छा ।
मुल्लं वीस विसोवा दसट्ठ तह पंच दुन्नि कमा ।।७५।।

रुक्ख विफोडा पाहण मल कक्कर जठर सरज्जस[1] तह य ।
इय सत्त दोस मरगयमणीण ताणं फलं वोच्छं ।।७६।।

रुक्खा य वाहिकरणी विप्फोडा सत्थघायसंजणणी ।
मलिण वहिरंधयारी पाहाणी बंधुनासयरी ।।७७।।

अथ मरकतमणिर्यथा—

अवलिन्दमलयपर्वतबर्बरदेशेषु चोदधितीरे च ।
गरुडम्योरसि कण्ठे भवन्ति मरकतमहामणयः ।।७१।।

गरुडोद्गारं प्रथमं कीडउठी द्वितीया तृतीया वासउती ।
मूगउनी च चतुर्थी धूलिमराई च पञ्च जातयः ।।७२।।

गरुडोद्गारं रम्यं नीलामलं कोमलं च विषहरणम् ।
कीडउठी सूक्ष्मा स्निग्धा कृष्णा हेमाभकान्तिमती ।।७३।।

वासउती च सरूक्षा नीला हरिता कीरपुच्छसमा स्निग्धा ।
मूगउनी पुनः कठिना कृष्णा हरितालसमा सुस्निग्धा ।।७४।।

धूलिमराई गुरुका तथा कठिना नीलकाचसदृक्षी ।
मूल्यं विंशतिविंशोपकानि दशाष्ट तथा पञ्च द्वे क्रमात् ।।७५।।

रूक्षं विस्फोटं सपाषाणं मलं कर्करं जठरं सरजस्कं तथा च ।
इमे सप्त दोषा मरकतमणीनां तेषां फलं वक्ष्ये ।।७६।।

रूक्षं च व्याधिकरं विस्फोटं शस्त्रघातसंजनकम् ।
मलिनं बधिरान्धकरं सपाषाणं बन्धुनाशकरम् ।।७७।।

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1. सज्जरस JN

कक्कर सहिय अउत्ता जठरा जाणेह सव्व दोसगिहं ।
सरज्जसा[1] मामिच्चू मरगइदोसाइं ताण फलं ॥७८॥
सुच्छायं सुसणिद्धं अरेणुयं[2] गुरुं[3] च वन्नड्ढं ।
पंच गुणं विसहरणं मरगय मसराल लच्छिकरं ॥७९॥
सूराभिमुहं ठवियं कर उयरे मरगयंमि चिंतिज्जा ।
विप्फुरइ जस्स छाया पुन्नपवित्ता धुरीणा सा ॥८०॥
॥ इति मरकतमणिपरीक्षा समता ॥

अथ इन्द्रनीलम्—

सिंघलदीव समुब्भव महिंदनीला य चउ सुवन्ना य ।
नव[4] दोस पंच गुणाहि य तहेव नव छाय जाणेह ॥८१॥
सियनीलाभं विप्पं नीलारुण खत्तियं वियाणाहि ।
पीयाभनील वइसं घणणीलं हवइ तं सुद्दं[5] ॥८२॥
अब्भय मंदि सकक्करगब्भा सत्तास जठर पाहणिया ।
समल सगार विवन्ना इय नीले होंति नव दोसा ॥८३॥
अब्भयदोस धणक्खय सकक्कर वाहिउ मंदीए कुट्ठं ।
पाहणिए असिघायं भिन्नविवन्ने य सिंहभयं ॥८४॥

कर्करसहितमपुत्रकरं जठरं जानीहि सर्वदोषगृहम् ।
सरजस्कान्मातृमृत्युर्मरकतदोषाणां तेषां फलम् ॥७८॥
सुच्छायं सुस्निग्धमरेणुकं तथा गुरु च वर्णाढ्यम् ।
पञ्च गुणा विषहरं मरकतं मसृणं (?) लक्ष्मीकरम् ॥७९॥
सूर्याभिमुखं स्थापिते करतले मरकते चिन्तयेत् ।
विस्फुरति यस्य छाया पुण्यपवित्रो धुरीणः सः ॥८०॥
॥ इति मरकतमणिपरीक्षा समाप्ता ॥

अथेन्द्रनीलः—

सिंहलद्वीपसमुद्भवो महेन्द्रनीलश्च चत्वारः सुवर्णाश्च ।
नव दोषाः पञ्च गुणाश्च तथैव नव च्छाया जानीहि ॥८१॥
सितनीलाभो विप्रो नीलारुणः क्षत्रियो विजानीहि ।
पीताभनीलो वैश्यो घननीलो भवति स शूद्रः ॥८२॥
अभ्रकं मन्दं सकर्करगर्भं सत्रासं जठरं पाषाणिकम् ।
समलं समृद् विवर्णमिमे नीले भवन्ति नव दोषाः ॥८३॥
अभ्रकदोषे धनक्षयं सकर्करे व्याधयः मन्दे कुष्ठम् ।
पाषाणिकेऽसिघातो भिन्नविवर्णे च सिंहभयम् ॥८४॥

1. सज्जरसा JN 2. अणेरुयं JN 3. लहुं JN
4. छ JN 5. Thus N for सुद्दं in J

सत्तासे बंधुवहं समल सगारे य जठर मित्तखयं ।
नव दोसाणि फलाणि य महिंदनीलस्स भणियाइं ॥८५॥

गुरुयं तह य सुरंगं सुसणिद्धं कोमलं सुरंजणयं ।
इय पंच गुणं नीलं धरंति सणिकोव[1] पसमंति ॥८६॥

नील घण मोरकंठ य अलसी गिरिकन्नकुसुमसंकासा ।
अलिपंखकसिण सामल कोइलगीवाभ नव छाया ॥८७॥

हीरय मुत्तिय[2] माणिक मरगय नीलं च पंच रयणमयं ।
इय धरिए जं पुन्नं हवइ न तं कोडिदाणेण ॥८८॥

॥ इति इन्द्रनीलमहापंचरयगुच्चयं ॥

अह विद्दुम ल्हसणिययं वइडुज्जो फलिह पुंसराओ य ।
कक्केयग भीसम्मो भणियं इय सत्त रयणाणं ॥८९॥

विद्दुमं जहा—

कावेर विंझपव्वइ चीण महाचीण उवहि नयपाले ।
वल्लीरूवं जायइ पवालयं कंदनालमयं ॥९०॥

सत्रासे बन्धुवधः समले समृदि च जठरे मित्रक्षयम् ।
नव दोषाः फलानि च महेन्द्रनीलस्य भणितानि ॥८५॥

गुरुकं तथा च सुरङ्गं सुस्निग्धं कोमलं सुरञ्जनकम् ।
इमं पञ्चगुणं नीलं धरन्ति शनिकोपं प्रशाम्यन्ति ॥८६॥

नीलघनमयूरकण्ठातसीगिरिकर्णकुसुमसंकाशाः ।
अलिपङ्खकृष्णश्यामलकोकिलग्रीवाभा नव च्छायाः ॥८७॥

हीरकमौक्तिकमाणिक्यमरकतनीलाश्च पञ्चरत्नमयम् ।
इदं धृत्वा यत्पुण्यं भवति न तत्कोटिदानेन ॥८८॥

॥ इतीन्द्रनीलपञ्चमहारत्नोच्चयः ॥

अथ विद्रुमलशुनकवैदूर्यस्फटिकपुष्परागान् ।
कर्केतनभीष्मे भणामीदं सप्त रत्नानाम् ॥८९॥

विद्रुमो यथा—

कावेरीविन्ध्यपर्वतचीनमहाचीनोदधिनेपालेषु ।
वल्लीरूपं जायते प्रवालकं कन्दनालमयम् ॥९०॥

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1. Thus N for मणिकोव in J 2. चुन्निय JN

बहुरंगं सुसणिद्धं सुपसन्नं तह य कोमलं विमलं ।
घणवन्न वन्नरत्तं भूमिय पयं विद्दुमं परमं ।।९१।।छ।।

ल्हसणियओ जहा—

नीलुज्जल पीयारुण छाया कंतीइ फिरइ जस्संगे ।
तं ल्हसणियं पहाणं सिंघलदीवाउ संभूयं ।।९२।।

इक्को वि य ल्हसणियओ अदोस अइचुक्खओ विरालक्खो ।
नवगहरयणसमगुणो भणंति तं संपुलियं केवि ।।९३।।

वइडुज्जं जहा—

कुवियंगयदेसोवहि वइडूरनगेसु हवइ वइडुज्जं ।
वंसदलाभं नीलं वीरियसंताणपोसयरं ।।९४।।

फलिहं जहा—

नयवाल कासमीरे चीणे कावेरि जउणनइतीरे ।
विंझगिरि हुंति फलिहं अइनिम्मलदप्पणु व्व सियं ।।९५।।

रविकंताओ अग्गी ससिकंताओ झरेइ अमियजलं ।
रविकंतचंदकंते दुन्नि वि फलिहाउ जायंति ।।९६।।

बहुरङ्गः सुस्निग्धः सुप्रसन्नस्तथा च कोमलो विमलः ।
घनवर्णो वर्णरक्तो भूमितः प्राप्तो विद्रुमः परमः ।।९१।।

लशुनको यथा—

नीलोज्ज्वलपीतारुणच्छाया कान्त्या स्फुरति यस्याङ्गे ।
सो लशुनकपाषाणः सिंहलद्वीपे संभूतः ।।९२।।

एकोऽपि च लशुनकोऽदोषोऽतिशुद्धो बिडालाक्षः ।
नवग्रहरत्नसमगुणो भणन्ति तं सपुलकं केऽपि ।।९३।।

वैदूर्यं यथा—

कुवियङ्गयदेशोदधिविदूरनगेषु भवति वैदूर्यम् ।
वंशदलाभं नीलं वीर्यसन्तानपोषकरम् ।।९४।।

स्फटिकं यथा—

नेपाले कश्मीरे चीने कावेरीयमुनानदीतीरे ।
विन्ध्यगिरौ भवति स्फटिकमतिनिर्मलदर्पण इव सितम् ।।९५।।

रविकान्तादग्निः शशिकान्तात् क्षरत्यमृतजलम् ।
रविकान्तचन्द्रकान्तौ द्वावपि स्फटिकाज्जायेते ।।९६।।

पुंसरायं जहा—

बहुपीय कणयवन्नो सुसणिद्धो[1] पुंसराओ हिमवंते ।
जायइ जो धरइ सया तस्स गुरू हवइ सुपसन्नो ॥९७॥

कक्केयणं जहा—

पवगुप्पट्ठाणदेसे जायइ कक्केयणं सुखाणीओ ।
तंबय सुपक्कमहुवय नोलाभं सुदिढ[2] सुसणिद्धं ॥९८ ॥छ॥

भीसमं जहा—

भीसमु दिणचंदसमो पंडुरओ हेमवंतसंभूओ ।
जो धरइ तस्स न हवइ पाएणं अग्गिविज्जुभयं ॥९९॥

॥ इति रयणसप्तकं ॥

सिरिनायकुल परेवग देसे तह नव्वुया नईमज्झे ।
गोमेय इंदगोवं सुसणिद्धं पंडुरं पीयं ॥१००॥

गुणसहिया मलरहिया मंगलजणया य लच्छिआवासा ।
विग्घहरा देवपिया रयणा सव्वे वि सपहाया ॥१०१॥

मुत्तिय वज्ज पवालय तिन्नि वि रयणाणि भिन्नजाईणि ।
वन्न वि जाइविसेसो सेसा पुण भिन्नजाईओ ॥१०२॥

पुष्परागो यथा—

बहुपीतः कनकवर्णः सुस्निग्धः पुष्परागो हिमवति ।
जायते यो धरति सदा तस्मिन् गुरुर्भवति सुप्रसन्नः ॥९७॥

कर्केतनं यथा—

पवणुप्पठानदेशे जायते कर्केतनं सुखनिषु ।
ताम्रसुपक्वमधूकनीलाभं सुदृढं सुस्निग्धम् ॥९८॥

भीष्मं यथा—

भीष्मं दिनचन्द्रसमं पाण्डुरकं हिमवत्संभूतम् ।
यो धरति तस्य न भवति प्रायेणाग्निविद्युद्भयम् ॥९९॥

॥ इति रत्नसप्तकम् ॥

श्रीनायकुलपरेवगदेशेषु तथा नर्मदानदीमध्ये ।
गोमेद इन्द्रगोपः सुस्निग्धः पाण्डुरः पीतः ॥१००॥

गुणसहितानि मलरहितानि मङ्गलजनकानि च लक्ष्म्यावासानि ।
विघ्नहराणि देवप्रियाणि रत्नानि सर्वाण्यपि सप्रभावानि ॥१०१॥

मौक्तिकवज्रप्रवालानि त्रीण्यपि रत्नानि भिन्नजात्यानि ।
वर्णोऽपि जातिविशेषः शेषानि पुनर्भिन्नजात्यानि ॥१०२॥

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1. ससणिद्धो JN 2. सदिढ JN

इय सत्थुत्त[1] रयणा भणिय भणामित्थ पारसीरयणा ।
वन्नागरसंजुत्ता लाल अकीया य पेरुज्जा ॥१०३॥

अइतेय अग्गिवन्नं लालं वंदंखसाण देसंमि ।
जमणदेसे यकीकं लहुमुल्लं पिल्लुसमरंगं ॥१०४॥

नीलामल पेरुज्जं देसे नीसावरे मुवासीरे ।
उप्पज्जइ खाणीओ दिट्ठिस्स गुणावहं भणियं ॥१०५॥

॥ इति वज्रादिसर्वरत्नानां स्थानज्ञातिस्वरूपाणि समाप्तः ॥

अथैतेषामेव मूल्यानि वक्ष्यंते जथागाहा । पुनः भावानुसारेण जथा—

जे सत्थदिट्ठिकुसला अणुभूया देसकालभावन्नू ।
जाणिय रयणसरूवा मंडलिया ते भणिज्जंति ॥१०६॥

हीणंग अंतजाई लक्खणसत्तुज्झया फुडकलंका ।
अह[2] जाणमाणया वि हु मंडलिया ते न कईयावि ॥१०७॥

मंडलिय रयण दट्ठुं परोप्परं मेलिऊण करसन्नं ।
जंपंति ताम मुल्लं जाम सहासममयं होइ ॥१०८॥

इमानि शात्रोक्तरत्नानि भणितानि भणाम्यत्र पारसीकरत्नानि ।
वर्णाकरसंयुक्तानि लालाकीकपेरोजानि ॥१०३॥

अतितेजोऽग्निवर्णं लालं वंदंखसाणदेशे ।
यमनदेशेऽकीकं लघुमूल्यं पीलुसमरङ्गम् ॥१०४॥

नीलामलं पेरोजं देशे नीसावरे मुवासीरे ।
उत्पद्यते खनिभ्यो दृष्टेर्गुणावहं भणितम् ॥१०५॥

॥ इति वज्रादिसर्वरत्नानां स्थानजातिस्वरूपाणि समाप्तानि ॥

अथैतेषामेव मूल्यानि वक्ष्यन्ते गाथाभिः । पुनर्भावानुसारेण [यन्त्रेऽपि] यथा—

ये शास्त्रदृष्टिकुशला अनुभूता देशकालभावज्ञाः ।
ज्ञातरत्नस्वरूपा मण्डलिकास्ते भण्यन्ते ॥१०६॥

हीनाङ्गा अन्त्यजातीया लक्षणसत्त्वोज्झिताः स्फुटकलङ्काः ।
अथ जानन्तोऽपि खलु मण्डलिकास्ते न कदापि ॥१०७॥

मण्डलिका रत्नं दृष्ट्वा परस्परं मिलित्वा करसंज्ञाम् ।
जल्पन्ति तावन्मूल्यं यावत्सभासम्मतं भवति ॥१०८॥

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1. The ms. reads सत्थुत्तर 2. अय JN

धणिओ अमुणियमुल्लो हीणहियं भणइ[1] तस्स न हु दोसो ।
मंडलिय अलियमुल्लं कुणंति जे ते न नंदंति ।।१०९।।

अहमस्स अहियमुल्लं उत्तमरयणस्स हीणमुल्लं च ।
जे मयलोहवसाओ कुणंति ते कुट्ठिया होंति ।।११०।।

रयणाण दिट्ठ मुल्लं निरुद्ध वद्धं न होइ कईयावि ।
तहवि समयाणुसारे जं वट्टइ तं भणामि अहं ।।१११।।

तिहु राइएहिं सरिसम छहि सरिसम तंदुलो य बिउण जवो ।
सोलस जवेहि छहि गुंजि मासओ तेहिं चहु टंको ।।११२।।

एगाइ जाव बारस[2] तिग वुड्ढी जाम गुंज चउवीसं ।
चउ रयणाणं मुल्लं तोलीण सुवन्नटंकेहिं ।।११३।।

पंच दुवालस वीसा तीसा पन्नास पंचसयरी च ।
दसहिय सउ[3] सट्ठि सयं दो चाला तिसय वीसा य ।।११४।।

चारिसय तह य छहसय चउदससय उवरि विउणविउंण जा ।
इक्कारसहस दुगसय मुल्लमिणं इक्क हीरस्स ।।११५।।

धनिकोऽज्ञातमूल्यो हीनाधिकं भणति तस्य न खलु दोषः ।
मण्डलिका अलीकमूल्यं कुर्वन्ति ये ते न नन्दति ।।१०९।।

अधमस्याधिकमूल्यमुत्तमरत्नस्य हीनमूल्यं च ।
ये मदलोभवशात् कुर्वन्ति ते कुष्टिनो भवन्ति ।।११०।।

रत्नानां दृष्टमूल्यं निरुद्धं बद्धं न भवति कदापि ।
तथापि समयानुसारेण यद्वर्तते तद् भणाम्हम् ।।१११।।

त्रिभी राजसर्षपै [गौर] सर्षपः षड्भि[गौर] सर्षपैस्तण्डुलस्तद्द्विगुणो यवः।
षोडशभिर्यवैः षड्भिर्गुञ्जाभि [र्वा] माषकस्तैश्चतुर्भिष्टङ्कः।।११२।।

एकस्माद्यावद् द्वादश त्रिकवृद्धिर्यावद् गुञ्जानां चतुर्विंशतिम् ।
चतुर्णां रत्नानां मूल्यं तोलयित्वा सुवर्णटङ्कैः ।।११३।।

पञ्च द्वादश विंशतिस्त्रिंशत् पञ्चाशत् पञ्चसप्ततिश्च ।
दशाधिकशतं षष्ठिश्च शतं द्वि [शतं च] चत्वारिंशत् त्रिंशतं विंशतिश्च ।।११४।।

चतुश्शतं तथा च षट्शतं चतुर्दशशतमुपरि द्विगुणं द्विगुणं यावत् ।
एकादशसहस्रं द्विशतं च मूल्यमिदमेकस्य हीरकस्य ।।११५।।

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1. मुणइ JN 2. Thus J for रस 3. चउ JN

अद्ध इग दु चउ अट्ठ य पनरस पणवीस याल सट्ठी य ।
चुलसीइ चउदसुत्तरसयं च कमसो य सट्ठिसयं ॥११६॥
तिन्निसय सट्ठिसमहिय सत्तसया तह य वारससया य ।
दोसहस कणय टंका मुत्तियमुल्लं वियाणेहिं ॥११७॥
दो पंच अट्ठ बारस अड्ढार छवीसा य याल[1] सट्ठी य ।
पंचासी वीसा सउ सट्ठि सयं दुसय वीसा य ॥११८॥
चउसयवीसा अडसय चउदस चउवीस पिहु पिहु सयाणि ।
गुंजाइ जाव[2] टंकं उत्तिममाणिक्कमुल्लु वरं ॥११९॥
पायद्ध एग दिवढं दु ति चउ पण छच्च अट्ठ दह तेरं ।
ठार सगवीस चत्ता सट्ठि महामरगयमर्णाणं ॥१२०॥

अस्यार्थं एष पत्रपूठिजंत्रेणाह ॥छ॥

गुंजा	१	२	३	४	५	६	७	८	९	१०	११	१२	१५	१८	२१	२४
हीरा	५	१२	२०	३०	५०	७५	११०	१६०	२४०	३२०	४००	६००	१४००	२८००	५६००	११२००
मोती	०॥	१	२	४	८	१५	२५	४०	६०	८४	११४	१६०	३६०	७००	१२००	२०००
माणिक	२	५	८	१२	१८	२६	४०	६०	८५	१२०	१६०	२२०	४२०	८००	१४००	२४००
मराइ	०।	०॥	१	१॥	२	३	४	५	६	८	१०	१३	१८	२७	४०	६०

अस्य यंत्रस्य अर्थं गाह ११२ उपरे गाह १२० जाव जाणनीयं ॥छ॥

अर्धं एको द्वौ चत्वारोऽष्ट पञ्चदश पञ्चविंशतिश्चत्वारिंशत् षष्टिश्च ।
चतुरशीतिश्चतुर्दशोत्तरं शतं च क्रमशश्च षष्ठिश्च शतम् ॥११६॥
त्रिशतं षष्ठिसमधिकं सप्तशतं तथा च द्वादश शतानि च ।
द्वि सहस्रं कनकटङ्का मौक्तिकमूल्यं विजानीहि ॥११७॥
द्वौ पञ्चाष्ट द्वादशाष्टादश षड्विंशतिश्च चत्वारिंशत् षष्ठिश्च ।
पञ्चाशीति विंशतिश्च शतं षष्टिश्च शतं द्विशतं विंशतिश्च ॥११८॥
चतुश्शतं विंशतिरष्टशतं चतुर्दश चतुर्विंशतिः पृथक् पृथक् शतानि ।
गुञ्जाया यावट्टङ्कमुत्तममाणिक्यमूल्यं वरम् ॥११९॥
पादोऽर्ध एकः सार्धैको द्वौ त्रयश्चत्वारः पञ्च षड् अष्ट दश त्रयोदश ।
अष्टादश सप्तविंशतिश्चत्वारिंशत् षष्टिर्महामरकतमणीनाम् ॥१२०॥

1. Word supplied in J
2. Here also a word is omitted in the ms. J wrongly conjectures this to be मास

अद्धमासाय अहियं मासय अद्धद्ध जाम चउ मासं ।
तोलीण हेमटंकिहिं मुल्लु कमेण सुरयणाणं ॥१२१॥

एगं दुसढ छ नवगं पनरस चउवीस तह य चउतीसं ।
पन्नास लालमुल्लं पउणं एयाउ ल्हसणिययं ॥१२२॥

पा अद्ध पउण एगं दु पंच अट्ठेव तह य पन्नरसं ।
इय इंदनील[1] मुल्लं तहेव पेरोजयस्स पुणो ॥१२३॥

अस्यार्थ जंत्रे जथा—

मासा	०॥	१	१॥	२	२॥	३	३॥	४
लाल	१	२॥	६	९	१५	२४	३४	५०
ल्हसणी	०॥॥	१॥॥	४॥	६॥॥	११।	१८	२५॥	३७॥
इन्द्रनील	०।	०॥	०॥॥	१	२	५	८	१५
पेरोजा	०।	०॥	०॥।	१	२	५	८	१५

सिरि वद्धं गुण अद्धं पायं अणुसार पाय करडं च ।
टंकिक्कि जे तुलंती मुत्ताहल तं भणामि अहं ॥१२४॥

दस वारस पन्नरसा वीसं पणवीस तीस चालीसा ।
पन्नास[2] सत्तर सयं चडंति टंकिक्कि तह मुल्लं ॥१२५॥

अर्धमाषादधिकं माषस्यार्धमर्धं यावच्चतुर्माषम् ।
तोलयित्वा हेमटङ्कैर्मूल्यं क्रमेण सुरत्नानाम् ॥१२१॥

एकः सार्धौ द्वौ षण् णवकं पञ्चदश चतुर्विंशतिस्तथा च चतुस्त्रिंशत् ।
पञ्चाशल् लालमूल्यं पादोनमेतेभ्यो लशुनकस्य ॥१२२॥

पादोऽर्धः पादोन एको द्वौ पञ्चाष्ट तथा च पञ्चदश ।
इदमिन्द्रनीलमूल्यं तथैव पेरोजकस्य पुनः ॥१२३॥

सूत्रे बद्धस्यार्धं पादं वा गुणानुसारेण पादं शबलस्य च (?) ।
टङ्क एकस्मिन् यानि तोल्यन्ते मुक्ताफलानि तानि भणाम्यहम् ॥१२४॥

दश द्वादश पञ्चदश विंशतिः पञ्चविंशतिस्त्रिंशच्चत्वारिंशत् ।
पञ्चाशत् सप्ततिः शतं तोल्यन्ते टङ्क एकस्मिंस्तेषां मूल्यम् ॥१२५॥

1. Thus J for इंद 2. Thus J for पन्नार

पन्नासं चालीसं तीसं वीसं च तह य पन्नरसं ।
बारस दसट्ठ पण तिय इय मुल्लं रुप्पटंकेहिं ॥१२६॥

इति मुत्ताहलं ।

अथ वज्रं जथा—

एगाइ जाम बारस तुलंति गुंजिक्कि वज्ज ताणमिमं ।
मुल्लं मंडलिएहिं जं भणियं तं भणिस्सामि ॥१२७॥

पणतीसं छव्वीसं वीसं सोलस तेरस य[1] दसेवा ।
अट्ठ च एग ऊणा जा तिय कमि रुप्पट्टंकाय ॥१२८॥छ॥

अस्यार्थं जंत्रेणाह—

मोती टंक १	१०	१२	१५	२०	२५	३०	४०	५०	७०	१००		
रुप्प टंका	५०	४०	३०	२०	१५	१२	१०	८	५	३		
वज्र गुंजा	१	२	३	४	५	६	७	८	९	१०	११	१२
रुप्प टंका	३५	२६	२०	१६	१३	१०	८	७	६	५	४	३

पञ्चाशच्चत्वारिंशत् त्रिंशद् विंशतिश्च तथा च पञ्चदश ।
द्वादश दशाष्ट पञ्च त्रय इदं मूल्यं रूप्यटङ्कैः ॥१२३॥

॥ इति मुक्ताफलम् ॥

अथ वज्रं यथा—

एकस्माद्यावद् द्वादश तोल्यन्ते गुञ्जायामेकस्यां वज्राणि तेषामिदम् ।
मूल्यं मण्डलिकैर्यद् भणितं तद् भणिष्यामि ॥१२७॥
पञ्चत्रिंशत् षड्विंशतिर्विंशतिः षोडश त्रयोदश च दशैव ।
अष्ट चैकोनं यावत्त्रयं क्रमद्रूप्यटङ्कानाम् ॥१२८॥

1. Added by J

अइचुक्ख निम्मला जे नेयं सव्वाण ताण मुल्लु मिमं ।
न हु इयर रयणगाणं कणयद्धं विद्दुमे मुल्लं ॥१२९॥

गोमेय फलिह भीसम कक्केयण पुंसराय वेडुज्जे ।
एयाण मुल्लु दम्मिहि जहिच्छ कज्जाणुसारेण ॥१३०॥छ॥

सिरिधंधकुले आसी कन्नाणपुरम्मि सिट्ठि कालियओ ।
तस्सुव ठक्कुर चंदो फेरू तस्सेव अंगरुहो ॥१३१॥

तेणिह रयणपरिक्खा विहिया नियतणय हेमपालकए ।
करमुणिगुणससिवरिसे (१३७२) अल्लावदीविजयरज्जम्मि ॥१३२॥

॥ इति परम जैन श्री चंद्रांगज ठक्कुर फेरू विरचिता
संक्षिप्तरत्नपरीक्षा समाप्ता ॥

अतिशुद्धानि निर्मल ानियानि ज्ञेयं सर्वेषां तेषां मूल्यमिदम् ।
न खल्वितररत्नानां कनकार्धं विद्रुमस्य मूल्यम् ॥१२९॥

गोमेदस्फटिकभीष्मकर्कतनपुष्परागवैदूर्याणि ।
एतेषां मूल्यं द्रम्मैर्यथेच्छं कार्यानुसारेण ॥१३०॥

श्रीधन्धकुल आसीत्कन्यानयनपुरे श्रेष्ठी कालियकः ।
तत्सुतष्ठक्कुरचन्द्रः फेरू तस्यैवाङ्गजः ॥१३१॥

तेनेह रत्नपरीक्षा विहिता निजतनयहेमपालकाय ।
करमुनिगुणशशिवर्षेऽल्लावदीनविजयराज्ये ॥१३२॥

॥ इति परमजैनश्रीचन्द्राङ्गजठक्कुरफेरूविरचितायाः संक्षिप्तरत्नपरीक्षायाः
संस्कृतच्छाया समाप्ता ॥

TRANSLATION

0.1 Preamble*

1. Having bowed to the omniscient [Jina], the abode of all virtues and the illumination of the three worlds, I expound briefly [the science of] gem-testing (*rayaṇaparikkhā*), which has been extensively discussed by others.

2. Ṭhakkura Canda, devotee of Lord Jina's feet, is the crest-jewel of the Śrīmāla caste. His son Pherū describes the greatness of the gems.

3. In olden times, [manuals on] gem-testing were written by Bṛhaspati, Agastya and Buddhabhaṭṭa. Having studied them, and with an expert's (*maṇḍaliya*) knowledge,

4. having seen with my own eyes the vast collection of gems—like the ocean (lit. abode of gems), as it were—in the treasury of Alauddin, the [true] emperor of the Kali age,

5. having directly experienced the examination [of the gems] by the experts, and having known [other] sciences, I [now] state the nature of all gems individually.

On *maṇḍaliya*, expert of gems, see 106—110 below.

0.2 Mythical Origin of Gems

6. Thus it is narrated: [Once upon a time] there was the demon Bala, endowed with great strength. One day he went to the Heaven in order to conquer Indra.

7. He was requested by the gods: "Become the beast in our sacrifice." [Thus] propitiated, he replied: "[So] I shall become. You do your task."

8. That beast was slaughtered by the gods. The parts of his body became precious gems; [they were truly] the abodes of the goddess of wealth, dear to the gods and beautiful.

9. Diamond (*hīraya*) arose from [Bala's] bones, pearl (*muttiya*) from the teeth, ruby (*māṇikka*) from the blood, emerald (*maragaya*) from the bile, sapphire (*iṃdanīla*) from the eyes,

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* The headings in bold type have been added.

10. beryl (*vaiḍujja*) from the body fluid, chrysoberyl (*kakkeyaga*) from the marrow, cat's eye (*lhasaṇīo*) from the finger-nails, rock-crystal (*phyliya*) from the fat,

11. coral (*viddumu*) from the flesh, topaz (*puṃsarāu*) from the skin, and *bhīṣma* (*bhīsammo*) from the semen. This is the origin of gems.

Buddhabhaṭṭa is the first writer to narrate this myth in its full form in his *Ratnaparīkṣā*. Vela, the Vedic adversary of Indra, gains a new life in the *ratnaśāstra*. Though never a cult figure, this demon with sapphire-blue eyes and topaz-like skin is celebrated here as the hero who gave up his body for the gods' sacrifice and through this meritorious act gave rise to gems of all kinds. Buddhabhaṭṭa's version of the myth differs occasionally from Pherū's. According to the former, *vaiḍūrya* arose from Bala's cry (*nāda*), chrysoberyl from his finger-nails, and both coral and rock-crystal from his fat. *Lhasaṇīya* is not mentioned by the early writers and Pherū had to invent an origin for it.

12. Some say thus: all these [gems] are products of the earth. Just as silver, gold, copper and [other] metals [occur in the earth] so do gems.

Varāhamihira in his *Bṛhatsaṃhitā* LXXX. 3 gives three explanations in one breath: "Some say that gems originated from the demon Bala, others say from Dodhici, and yet others attribute the variety in gems to the nature of the earth."

0.3 Planets Governing Gems

13. From that place [of gods' sacrifice, the various parts of Bala's body] were seized by the nine excellent planets, each according to its own colour. Wherever [these parts] fell down from them (i.e. the planets), those [places] became the sources (*āgara*) [for the gem concerned].

Āgara (Skt. *ākara*) means mine also, but in these manuals mine is specifically denoted by the word *khani*. *Bṛhatsaṃhitā* LXXX.10 states that the *ākaras* are of three types : rivers, mines (*khani*) and places of sporadic occurrence (*prakīrṇaka*). As will be seen below, not all the *ākaras* enumerated for each gem refer to mining areas, some being merely the places where the gems are marketed. Hence I render *āgara* in a wider sense as source.

14. Ruby [was taken] by the sun, pearl by the moon, coral by Mars, emerald by Mercury, topaz by Jupiter,

15. diamond was seized by Venus, sapphire by Saturn, zircon by Rāhu and beryl by Ketu. The rest they left there itself.

16. If one endowed with truth and good moral conduct wears on his limbs these gems belonging to the nine planets, the planets do not harm him, and he becomes prosperous.

Only the sun is mentioned in Buddhabhaṭṭa's version of the myth, but not the other planets. According to Buddhabhaṭṭa, Bala's limbs became gem-seeds (*ratnabīja*), and Devas, Yakṣas, Siddhas and Nāgas rushed there to seize these seeds. In the ensuing tumult, these seeds fell on the earth. When the sun was running away with Bala's blood, Rāvaṇa attacked him and the blood fell into a river in Ceylon. This river, called henceforth Rāvaṇagaṅgā, became the source of rubies.

The concept of nine *ratnas* and their assignment to the nine planets is a late idea and is not mentioned by Buddhabhaṭṭa (see D. C. SIRCAR, "The Number of Ratnas," *S. K. De Memorial Volume*, Calcutta 1972, pp. 75-81). This belief is recorded in *Agastimata* 343-44 and became so firmly rooted that even today, barring the affluent, people in general wear gems in order to ward off the maleficence of the planets.

0.4 The Effect of Good and Bad Gems

17. Again, it is stated in the *śāstra*: gems that are flawless, very pure and endowed with qualities cause prosperity. Faulty ones [on the other hand] destroy money, sons and prosperity.

18. If among good gems there is even one that is faulty [or] spurious [or] with impurities, it certainly destroys the lustre and efficacy of all good ones.

0.5 Topics of Ratnaśāstra

19. [Thus] is stated the primeval origin. I shall state [now] the sources etc., colour (*vanna*), qualities (*guṇa*), flaws (*dosa*), varieties (*jāti*) and price (*mulla*) of all gems.

The topics of *ratnaśāstra* are listed almost in the same manner in *Agastimata* 3-4 :

उत्पत्तिमाकरान्वर्णाञ्जातिदोषगुणांस्तथा ॥
मूल्यं माण्डलिकं चैव ग्राहकं हस्तसंज्ञया ।

In this *śāstra*, *vanna* (or Skt. *varṇa*) means the primary colour of a species of gems (28, 59 etc.). Sometimes the word *chāyā* is used in this sense (23 etc.), but more often in the sense of shade or tint (21, 81, 87 etc.). *Vanna* has another meaning also. Certain gems, especially diamonds, are classified into the four castes according to their colour (see 26 below). This caste of a gem is called *vanna* (23, 26, 81). *Guṇas* are the desirable and *dosas* are the undesirable properties inherent in a species. *Jāti* denotes subvariety of a species (56) and also genuine gems (38).

Though not expressly stated here, Pherū also treats the other topics mentioned in the *Agastimata*, viz. *māṇḍalika*, *grāhaka* and *hastasaṃjñā* (see 106-110). Some writers discuss one more topic, namely *vijāti*, i.e. spurious gems and how to detect them. Pherū treats this aspect only in the case of diamond (37-38).

1.0 Diamond

1.1 Sources of Diamond

Diamond as follows :

20 The places [of occurrence] of diamond are the Himalayas, Sorpāraka, Kaliṅga, Mātaṅga, Kosala, Saurāṣṭra, Pauṇḍra, and the river Veṇṇā.

21. [The colour of] copper, white, blue, [the colour of] chaff (*kukkusa* ?) yellow orpiment, the flower of *Acasia sirissa* and dark red—these are the colours and shades of diamond successively. [Now] a special feature of the sources.

Moreover, this is the special feature [of the sources] :

22. In the first [age] Kosala and Kaliṅga, in the second the Himalayas and Mātaṅga, in the third Pauṇḍra and Saurāṣṭra, and in the Kali age Veṇuja and Sorpāra [are the sources of diamond].

All the manuals—from Buddhabhaṭṭa's *Ratnaparīkṣā* up to Tattvakumāra Muni's *Ratnaparīkṣā* written in 1788 (printed in Agarchand NAHATA and Bhanwar Lal NAHATA, *Ratnaparīkṣā*, pp. 41-88)—contain the same list of eight sources with minor variations. FINOT suggests that all these places were not actual mining areas even in Buddhabhaṭṭa's time. Some were clearly

emporia or trading places and some others may have contained merely abandoned mines. This notion of abandoned mines is implicit in *Agastimata* 18-11 which states that while the sources remain the same elsewhere, in India, however, they rotate in each *yuga* and that in the present Kali only Veṇuja (i. e. river Veṇṇā) and Sorpāra are the actual sources. Pherū faithfully reproduces these views, without throwing any light on the contemporary diamond workings. On the identification of these sources, see FINOT, pp. xxv-xxxvii, Moti CHANDRA, "Ṭhakkura Pheru kṛta Ratnaparikṣā kā paricaya," *Saptagranthasaṃgraha*, pp. 14-16; Ajay Mitra SHASTRI, *India as seen in the Bṛhatsaṃhitā of Varāhamihira*, Delhi 1969, pp. 325-327.

1.2 Properties of Diamond

23. Diamond has six solid angles (*koṇa*), eight facets (*phalaha*), twelve edges (*dhārā*), eight qualities, nine flaws, four colours (*chāyā*) and [belongs to] the four castes (*vanna*) respectively.

1.3 Qualities of Diamond

24. Symmetric facets (*samaphalaha*), prominent solid angles (*uccakoṇa*), very sharp edges (*sutīkkhadhārā*), of the first water (*vāritara*), free from impurities (*amala*), sparkling (*ujjala*), flawless (*adosa*), and light in weight (*lahutula*)-- these are the eight qualities in diamond.

The description given in these texts pertains mainly to rough gems, i. e. gems as they are found in nature, and reflects the state of affairs of a period when gemstones were not cut into regular or symmetric shape. Such cutting would have reduced the weight of the stone considerably. Therefore, gemstones were merely polished, after sawing off the defective parts, if any. Though this could not be true of Pherū's time, he follows the *śāstra* scrupulously.

Diamond belongs to the cubic or isometric system of crystals and its habit, i. e. the shape in which it occurs in nature, is octohedral. An octohedron has the form of two equilateral four-faced pyramids joined base to base. This form contains eight triangular facets, six solid angles and twelve edges or lines of intersection of any two facets. Tavernier calls these octohedral diamond crystals *points naïves* (*Travels in India*, Vol. II, pp. 57, 67). Linschoten reports that "there are Diamonds founde that are called Nayfes ready cut,

which are naturall, and are more esteemed than the rest, specially by the Indians themselves" (quoted in *ibid.*, Vol. II, p. 57, n. 3). *Ratnaśāstra* regards this form as the most desirable in diamond. Hence, the qualities emphasised are—apart from lustre and transparency—that the facets should be symmetric, the lines of intersection of any two facets be distinct and sharp and the solid angles prominent; the absence of these qualities is regarded as a flaw. Thus diamond crystals which develop irregularly and assume a flat triangular shape are treated as inferior (although they can be improved by cutting) and so are the crystals that are roundish because the angles are worn off.

Incidentally, our texts do not describe the crystal structure of other gems.

That diamond has a low specific gravity in comparison to other gems is known to all the texts. Hence, one of its qualities is *lahu*, low weight. Buddhabhaṭṭa 40 and *Agastimata* 325 go to the extent of saying that, except in diamond, low weight is not desirable in other gems.

Finally, Pherū's use of the term *vāritara* (and *sajala* in 60) in the sense of highly transparent is quite interesting and seems to be due to the influence of the Persian language, where the word *āb* (water) has this sense also. Indian jewellers call a limpid gem *ābdār*.

1.4 Flaws in Diamond

25. Crow's foot (*kāgapaga*), spot (*bimdu*), streak (*rekhā*), with impurities (*samala*), broken (*phuṭṭā*), one solid angle (*egasimgā*), round (*vaṭṭā*), barley-shaped (*javākārā*), and unequal solid angles (*hīnāhiyakoṇa*) are the nine flaws.

These flaws can be divided into two groups. The first relates to the imperfections in the crystal shape: having only one fully developed solid angle or unequal solid angles or a roundish shape. The second group contains various shapes of inclusions within the crystal. These shapes are crow's foot, spot and streak. According to *Agastimata* 27, one of the four kinds of spots is *yavākāra*, i. e. barley-shaped. *Samala* implies absence of limpidity.

1.5 Castes of Diamond

26. White [diamond] is Brahmin, red Kṣatriya, yellow Vaiśya and black Śūdra. These are the four castes. That which is Brahmin and pure is to be known as *mālavī*.

This classification of diamond into four castes, as we have noted in the Introduction (p. 15), occurs for the first time in the Tamil epic *Shilappadikaram* and continues at least until the last century. V. BALL reports: "As is usual, I believe, in all parts of India, the diamonds were classed as follows: 1. *Brahman* —white, pure water, 2. *Kshatrya*—rose or reddish, 3. *Vaisya*—smoky, 4. *Sudra*—dark and impure." (*The Diamonds, Coal and Gold of India. Their Mode of Occurrence and Distribution*, London 1881, p. 32). Pherū extends this classification to sapphire also, while some texts classify several other gems in this fashion.

The designation *mālavī* given to pure limpid diamonds implies that Malwa was the principal source of good diamond in the fourteenth century, but no diamond mines have been reported from this region. The king of Malwa is said to have given a huge and beautiful diamond to Alauddin (see p. 17 above). Probably it is because of the unsurpassable beauty of this diamond that all pure diamonds were classed as *mālavī*.

1.6 Effects of Diamond

27. One who has in his house the best diamonds of these four colours, which are flawless and endowed with qualities, will have no obstacles, untimely death or fear from enemies.

28. [Diamonds of these] four colours and [especially] yellow and red [ones] cause prosperity to kings. Other diamonds are known to be auspicious in the respective castes.

It will be interesting to see what Ibn al-Afkānī, who was born in Mesopotamia, practised medicine in Egypt and died in 1348 and thus a contemporary of Pherū, states in his Arabic work on gemmology entitled *Nachb al Dachāir fī Aḥwāl al Gawāhir*: "Indians prefer white and yellow [diamonds]; they do so because of the red rays that can be seen emanating from them if one holds them against the sun; they resemble the rainbow." Al-Afkānī goes on to say: "The excellent gentleman Nāsir al

Dīn al Zumurrudī told me that he had seen with the Sultan and King of Hind, namely Quṭb al Dīn, a great many things made of exquisite and enormously huge diamonds. But perhaps they are reluctant to allow the exquisite diamond [out of their country] because they expect good luck from it." (my translation from the German of Eilhard WIEDEMANN, *Aufsätze zur Arabischen Wissenschaftsgeschichte*, Vol. I, pp. 842-843). WIEDEMANN remarks in a footnote that this Quṭb al Dīn is either Qutbuddin Mubarak (1316-1320) or Qutbuddin Aibak (1206-1210).

29. It (i. e. diamond) attracts the goddess of wealth and arrests the prowess of the enemy in battle. Therefore, the king wears red [or] yellow precious diamond.

30. Just as one's face is seen in the mirror so are seen men, animals, birds, trees, buildings and also rainbows in diamond.

31. Diamonds that are very pure and with sharp edges cause harm to women who desire sons. Flat, impure and triangular diamonds are auspicious for women.

[For] it is [truly] said :

32. "I alone am the foremost gem and my womb is the mine of gem-like virtuous sons. What do I care for this lowly diamond ?" Having thus censured it, she wears it.

Perhaps because the diamond shares its name *vajra* with Indra's terrible weapon and has likewise sharp edges that can cut any substance, a limpid diamond with a perfectly octohedral shape was believed to induce abortion in women. Verse 32 has no parallel in the earlier works. It seems to imply that since woman is the foremost gem and gives birth to gem-like sons, a faulty diamond that is prescribed for her will have no evil effects on her.

1.7 Specific Gravity of Diamond

33. [In comparison to a diamond that has] the ideal mass (*samapiṃḍa*) and qualities and is limpid, those that are heavier in weight and have less volume (*piṃḍa*) (i.e. having higher specific gravity) fetch lower prices; those that are larger and lighter in weight (i.e. having lower sp. gr.) fetch higher prices; and that which is equal [in volume and weight gets] equal price.

This verse should be read in conjunction with *Agastimata* 42:

मनसा कुरुते पिण्डं यवमात्रैकतण्डुलम् ।
तत्पिण्डं सममन्येन ज्ञात्वा मूल्यं विनिर्दिशेत् ॥

While Buddhabhaṭṭa and Varāhamihira fix the price of diamond on the basis of its weight, the above verse recommends that the price should be fixed on the basis of both weight and volume. For this purpose, it says : "One should imagine a *piṇḍa* [of a diamond] having the volume of a barley grain and the weight of a grain of rice. By comparing with this, the price of others should be fixed." The *Agastimata* (49-52) goes on to fix the prices by this method as follows : If a diamond has the same volume but is lighter by a quarter, its price is eighteen times higher. If the weight is half, the price goes up to 36 times. If the weight is less by three quarters, the diamond floats on water, and its price is 72 times. On the other hand, if the weight is more by a quarter, the price is half. In other words, the *Agastimata* imagines that the sp. gr. of diamond varies between +25 per cent and —75 per cent. These variations are, to use Finot's polite French, "purement imaginaires," the actual variation being ±0.01.

Incidentally, the *Agastimata's* statement that a diamond floats on water when it weighs three quarters less than the ideal mass seems to imply that an ideal diamond is four times heavier than water, or that its sp. gr. is 4 (the true value is 3.52). This is perhaps the only reference to sp. gr. in our texts.

Pherū himself fixes the price of diamond on the basis of the weight only, without any reference to the volume, as we shall see below (123-125). There is no apparent reason for him to describe the *Agastimata's* mode of fixing the price, except that he wishes to record all that was said by the Pūrvācāryas.

34. One who sets or causes to set a diamond, after turning it upside down (*tilovarim kāum*), [so that the diamond now] has a small facet as its head and a large [facet] as its foot, commits a grave fault.

The expression *tilovari* is not listed in the Prakrit dictionary, the *Pāiasaddamahaṇṇavo*. The NAHATAS render it into Hindi as *ulṭā karke* and interpret the verse in the following way which is, of course, syntactically possible : "One who sets or causes to set a diamond having a small facet at the top and a larger part at the bottom, after turning it upside down, commits a grave fault." Two obscure verses in the *Agastimata* (57-58) seem to support

this view. But surely a diamond with unequal facets is set in such a way that the larger facet is exposed to the outside or to the top and not the other way !

35. If in the middle of whose facets [spots of ?] different colours occur increasingly, [or] crow's foot, [or] red spots, that diamond destroys the sons.

1.8 Hardness of Diamond

36. All gems can be cut by diamond. A diamond [can be cut] by [another] diamond. Again, [opaque] corundum (*kuruviṃda*), but no other gem, can grind sapphire.

One simple index to distinguish diamond from other gems is its superior hardness, i.e. the resistance to being scratched by other substances. In modern times, the relative hardness of minerals is measured by the Moh's Scale of Hardness, which has the following values : diamond—10 ; corundum (ruby and sapphire)—9 ; topaz—8 ; quartz—7, and so on What are the views of Indian writers ?

The maximum hardness of diamond is known to all writers on *ratnaśāstra*, and even beyond this science this property is so well known that it has become proverbial (see Bhavabhūti's famous line, *vajrād api kaṭhorāṇi mṛdūni kusumād api*, *Uttararāmacarita*, ii. 7). After all, diamond was given the same name as Indra's weapon with which he cleaved asunder the wings of the mythical mountains.

On the hardness of other gems, *Agastimata* 238 has this to say : "Sapphire or ruby can be tested [by scratching] with diamond. They cannot be scratched by other substances." This is perfectly in accord with the modern views. Both sapphire and ruby have the same crystal structure and chemical composition. They are but two differently coloured varieties of the same species called in modern gemmology "corundum" or more exactly "gem corundum." The Arabs also have a collective designation *yāqūt* for these two gems. Their hardness is 9, i.e. next only to that of diamond.

But Buddhabhaṭṭa's view (on which Pherū's verse rests) creates a problem. He says (137) : "*Padmarāga* and sapphire cannot be scratched by any substance other than diamond or

kuruvinda." As will be seen below (56-60), *padmarāga* and *kuruvinda* are varieties of ruby which has the generic name *māṇikya*. *Padmarāga* is also used quite often as ruby in general (see my comment under 61), but *kuruvinda* is never employed in this sense. Does this then mean that, according to Buddhabhaṭṭa, the *kuruvinda* variety is harder than all other varieties of ruby and also harder than sapphire? It is hardly likely, and our texts never make such a claim when discussing the *kuruvinda* variety. Therefore, in this context of hardness, the word *kuruvinda* must mean something else with which both ruby and sapphire can be scratched, or more correctly, ground. In my paper, "The Tools of the Lapidary according to the *Agastyasaṃhitā*," *Acharya Ramesh Chandra Sukla Felicitation Volume*, Badaun 1983, pt. 5, pp. 44-52, I have shown that *kuruvinda* has another meaning, namely the opaque corundum used as abrasive, and that grinding wheels were manufactured with a mixture of shellac and opaque corundum. However, opaque corundum has a lower hardness than gem corundum (i.e. ruby and sapphire). Therefore, it cannot "scratch" a ruby or sapphire, but a grinding wheel made with it can "grind" a ruby or sapphire. I think the *kuruvinda* mentioned by Buddhabhaṭṭa and Pherū should be understood in this sense.

Pherū's use of the genitive in *annarayaṇassa* is clearly wrong, because it would mean that *kuruvinda* can cut sapphire, but it cannot cut any other gem, which is absurd.

The relative hardness of other gems is not mentioned in our texts.

1.9 Spurious Diamonds

37. Iron powder (*ayasāra* ?), glass, rock-crystal, zircon, topaz and beryl. With these, they who are experts in the art [of counterfeiting) make spurious diamonds.

38. This is the test of the spurious [diamonds: they are] heavy, easily pierced, have faint edges, and are easily ground on the grinding wheel. [On the other hand] those which cannot be ground [on the grinding wheel] are genuine gems (*jātibhavā*). Thus the diamond-testing.

Buddhabhaṭṭa gives the same list of imitations (46, 47), but reads *ayasā* as the first item. It is nowhere stated how a spurious diamond can be manufactured with iron or iron powder.

The colourless varieties of the other gems listed here can simulate genuine diamonds, to detect which Pherū recommends four tests based on the specific gravity and hardness. It is not known how the weight of a gem in relation to its volume (sp. gr.) was determined either at Buddhadhaṭṭa's time or in the fourteenth century. But when Pherū says that the imitations are heavier than genuine diamonds, this is not true in most of the cases. Only zircon (sp. gr. 4.02 for low type and 4.68 for high type) is clearly heavier than diamond (3.52), while topaz (3.53) has almost the same weight, and rock-crystal (2.65) and beryl (2.70) are lighter. The other three tests based on the hardness can be more conclusive.

2.0 Pearl

2.1 Eightfold Origin of Pearl

Now pearl :

39. Pearls grow in the frontal globe on the elephant's forehead, in conch shells, in the mouth of the fish, in bamboo, between the tusks of the boar, on the head of serpents, in clouds, and in pearl oysters.

40. [Pearls] originating from the mighty elephants are round, of the size of a myrobalan, and bestow kingdom [upon the wearer]. Those with dull lustre and of yellowish red colour are the best and rose-apple-hued ones are middling.

41. Conch pearls occur in the right-whorled conch (*dakṣiṇāvarta*) in the great ocean. [They are] light in weight, white with a reddish tint and are inaccessible to men. [They are verily] the abodes of auspiciousness.

42. [Pearls occurring] in the fish are dark, round, light in weight, produce clear eyesight (?), destroy the fear from enemies, thieves, evil spirits and witches, and cause prosperity.

43. Those extracted from the bamboo are equal [in size] to the seed of *Abrus precatorius*, have dull lustre, and occur in forests with [tall] grasses in all lands. They bestow kingdom, remove grief and are very sacred.

44. Between the tusks of the boar [occur pearls that are] round, of the colour of clarified butter, and equal [in size] to the fruit of *Shorea robusta*. One who possesses them will not be defeated even by Indra.

45. [Pearls] of the serpents are blue, clear, equal [in size] to the cubeb, produce wealth and ward off deceit, dissension, snakes, calamities, poison, disease and lightning.

46. In clouds [there are pearls that glow] like the sun's radiance. When the gods are at play [these pearls] fall down somehow, and the gods catch them in mid-air. [Hence they are] not available on the earth.

47. When clouds rain, some drop of water cuts through the air [and dries up]. Learned men call this splendid pearl *Cintāmaṇi*.

48. These [seven types] are unpierceable, priceless, worthy of worship, cause prosperity and are full of great efficacy in this world. Those from the pearl oyster are small but fetch high price.

This is the traditional list of origins of pearl perpetuated by all the writers, but their accounts vary as to the size, colour, efficacy and availability. Modern writers tend to dismiss the first seven types as imaginary, but some are real substances enough.

Herbert SMITH begins his work with the dictum: "Beauty, durability and rarity: such are the three cardinal virtues of a perfect gemstone" (*Gemstones*, p. 17). In earlier times, and to a large extent even today, a fourth virtue is also sought in a gem, namely magical power. (See William CROOK, *The Popular Religion and Folklore of Northern India*, 3rd reprint, Delhi 1968, Vol. II, pp. 17-19). It seems that some roundish organic substances — real or imaginary — which were supposed to have magical properties were grouped together along with the true pearl which is also organically produced, and called eight types of pearls. It is difficult to say when such grouping took place, but both Buddhabhaṭṭa and Varāhamihira mention this eightfold origin. It is evident that the writers on *ratnaśāstra* do not have a clear idea even of the real substances and envelope all of them in a layer of fantasy. But they make a distinction between the seven magic pearls on the one hand and the oyster pearls on the other, when they say that the former cannot be stringed and should be worshipped if one is lucky enough to find any of them. Moreover, they make a mythological distinction as well. Buddhabhaṭṭa says that the oyster pearls owe their origin to Bala's teeth, thus implying that the others do not.

Now let us discuss the real ones among these magic pearls. It is a common misconception that pearls are produced only by the pearl oysters. In fact, many other species of marine animals produce pearls. Thus the common conch (*Strombus gigas*) or large conch (*Cassis cornuta*) produce pearls of ornamental value that are called conch pearls or pink pearls (see Herbert SMITH, *Gemstones*, p. 472). Robert WEBSTER says that these pearls are pink or white, and that they "are non-nacreous and have porcelain-like surface with a peculiar appearance and sheen like watered silk." (*Gems*, London 1962, Vol. I, p. 387). Pherū endows this pearl with a fabulous aura by associating it with the *dakṣiṇāvartaśaṅkha*, i.e. a conch in which the whorls grow towards, and the aperture is at, the proper right. (Zoologists designate it, from the onlooker's point of view, as sinistral, i.e. left-handed !) This type of conch shell is extremely rare and is worshipped by Hindus and Jainas. In his *Dhātūtpatti*, 28-36, Pherū describes its shape and the mode of its worship.

Likewise the bamboo pearl is quite real though it does not have any ornamental value. Some female bamboos produce a siliceous concretion in their joints which is called in Sanskrit *vaṃśamuktā*, *vaṃśalocana*, *vaṃśakarpūra*, *tvaksāra*, *tvakṣīra* (whence the Persian *tabāshīr*) and so on. It is supposed to have medicinal, and more particularly aphrodisiac, properties. This belief was shared not only by Indians, but by Persians and Arabs as well. (cf. Edward BALFOUR, *Encyclopaedia Asiatica*, 3rd edn., reprint, New Delhi 1976, Vol. VIII, p. 797 ; Henry YULE and A C. BURNELL, *Hobson-Jobson*, pp. 863, 887).

The elephant pearl, mentioned also quite often in Sanskrit *kāvyas*, is a pearl-shaped growth found in the elephant's forehead. Abul Fazl states : "They take out of his (i. e. of an elephant belonging to *bhadra* class) forehead an excrescence resembling a large pearl, which they call in Hindi *Gaj manik*. Many properties are ascribed to it" (*Ā'īn-i Akbarī*, Vol. I, tr. BLOCHMANN, p. 125). I understand that such a pearl from a late royal elephant is displayed in a museum in Kathmandu.

No such reports are available about the boar pearl, but it may also be an outgrowth developed in the body of the boar and somewhat akin to the bezoar stones, i. e. hard concretions

found in the bodies of animals to which antidotal virtues were ascribed in India and Persia. Ibn al-Afkānī lists bezoar among gems (WIEDEMANN, *op. cit.*, pp. 851-852. See also Tavernier, *Travels in India*, Vol. II, pp. 115-119; *Hobson-Jobson*, s. v. Bezoar).

Nothing is known about the fish pearl, but the earlier writers state that it grows in whales (*timija*: see Buddhabhaṭṭa 58; *Bṛhatsaṃhitā* LXXXI. 7; *Agastimata* 90; *Mānasollāsa* II. 4. 431). Therefore, I wonder if this pearl has something to do with ambergis which "consists of the faeces of the Cachelot or Sperm whale, Physeter macrocephalus, which inhabits the Indian Ocean" (see Tavernier, *op. cit.*, Vol. II, pp. 109-112, esp. p. 109, n. 1). Ambergis is known to Sanskrit lexica as *ambara* (from the Arabic *anbar*). (cf. P. K. GODE, "History of Ambergis in India. Between about A. D. 700 and 1900," in *Studies in Indian Cultural History*, Vol. I, Hoshiarpur 1967, pp. 9-14.)

No snake has been found possessing a pearl on its head, but India was, and still is, full of the so-called snake-stones, supposed to have been extracted from snakes and believed to be anti-venomous. (cf. *Hobson-Jobson*. s. v. Snake-stone).

The cloud pearl is, of course, purely mythical, and the origin of the fabulous jewel *Cintāmaṇi* that is supposed to fulfil all desires seems to be Pherū's own invention.

2.2 Sources of the Oyster Pearl

49. Oyster pearls occur in Rāmāvaloa, Vavvara, Ceylon, Kāṃtāra, Persia, Kesiya and also on the sea coast [elsewhere].

Departing from the traditional lists, Pherū enumerates here what are possibly contemporary centres of pearl fishery. The Gulf of Mannar in Ceylon and the Persian Gulf are well known sources. Rāmāvaloa seems to suggest Ramesvaram at the southern extremity of India. About this place, BALFOUR writes as follows: "Friar Jordanus, a quaint old missionary bishop, who was in India in 1330, says that 8000 boats were engaged in this fishery and that of Ceylon and the quantity of pearls was astounding and almost incredible. The headquarters of this fishery was then, and indeed from the days of Ptolemy to the 17th century continued to be, a chayl or coil, literally, the temple on the sandy promontory of Ramnad, which sends off a reef of rocks

towards Ceylon, known as Adam's bridge" (*Encyclopaedia Asiatica*, Vol. VII, p. 168; see also the well documented monograph, S. ARUNACHALAM, *The History of the Pearl Fishery of the Tamil Coast*, Annamalainagar 1952). According to Moti CHANDRA (*loc. cit.*), Vavvara (Skt. Barbara) refers to the African coast of the Red Sea. His suggestion that Kāṃtāra (lit. forest) is the coast of Aden is doubtful. Finally Kesiya must be identical with the island Qays in the mouth of the Persian Gulf. (For a contemporary account of pearl fishing here, see Ibn Battuta, *Travels in Asia and Africa* 1325-1354, tr. H. A. R. GIBB, 4th impression, London 1957, pp. 121, 353).

50. In all these sources, pearls grow when a drop of water falls into the pearl oyster under the asterism Svātī—[pearls] with which all kinds of ornaments are made.

2.3 Qualities and Flaws in Pearl

51. Lustre (*tāra*), round (*vaṭṭa*), without impurities (*amala*), glossy (*susaṇiddha*), soft to the touch (*komala*), heavy (*guru*) are the six qualities. Light in weight (*lahu*), hard (*kaḍhiṇa*), rough (*rukkha*), mottled (*karaḍa*), discoloured (*vivanna*), with spots (*saha bindū*) are the six flaws.

The characteristic lustre of pearl is called *tāra*, which *Mānasollāsa* II.4.45 defines as *tārakādyutisaṃkāśa*. Though Pherū declares here that there are only six types of flaws in pearl, the following verses mention some more.

52. [A pearl] that is bright like the moon's rays and possesses qualities becomes defective if it is longish [even] in one part. Its price falls down by one-sixth. [The price] is half if it is [shaped like] the Margosa seed.

These two flaws are styled *dīrgha* and *kṛśapārśva* by the earlier writers.

53. [A pearl that has] half the regular shape, or is filled with mud, empty, with blisters, resembling the fish-eye, like a hail stone, or with knots, fetches low price even if it is heavy and roundish.

For a similar list of flaws, cf. Buddhabhaṭṭa 98-100.

54. A yellow [pearl fetches] half [the price]; that which is not round one-third; that with holes one-sixth; mottled one as much as it

deserves; that with flaws one-tenth. The price of others is according to their looks. Thus the pearl-testing.

For a parallel verse, cf. Buddhabhaṭṭa 96.

3.0 Ruby

3.1 Sources of Ruby

Now ruby (*padmarāgamaṇi*) as follows :

55. On the banks of the river Rāmagaṅgā, in Ceylon, in Kalaśapura and in Tumbara country are the sources of ruby (*māṇikka*).

The earlier writers mention four sources : Ceylon, Kalapura, Andhra and Tumbara. In Ceylon, rubies are stated to be found in the bed of the river Rāvaṇagaṅgā (see my comments under 17). Pherū follows this tradition, but piously renames the river as Rāmagaṅgā. It is needless to speculate on the identity of Kalaśapura and Tumbara, for they will not reveal the sources of ruby in the fourteenth century. Ceylon, of course, did produce rubies in this century as at other times (see Ibn Battuta, *op. cit.*, pp. 256-57).

3.2 Varieties of Ruby

56. Here the first is *paümarāya*, [then] *sogandhiya*, *nīlagandha*, *kuruviṃda* and *jāmuṇiya*. [These are] the five varieties. [The species is known by two] names *cunnī* and *māṇikka*.

57. That which spreads its rays like the sun, is glossy, soft to the touch (*komala* ?), resembling the fire, like molten gold and not worn off is *paümarāya*.

58. That which is like the flower of *Butea monosperma*, safflower, the eyes of Cuckoo, of Sārasa or of Cakora [birds], or the pomegranate seeds is to be known as *sogandhiya*.

59. Like lotus, red lac, coral, or vermilion [but] with a slightly bluish tint, or glowing like the fire-fly—these are the shades of *nīlagandha*.

60. *Kuruviṃda* has the same shade as the first [variety] and also as *sogandhiya*, [but] its colour is intense. Moreover, with fractures (*sattāsa*), light (*lahu*) and with good water (*sajala*) are its natural qualities.

61. *Jāmuṇiya* should be known as that which resembles rose apple or the red oleander flower. The difference in the prices of these [five

varieties] is twenty, fifteen, ten, six, and three *visuvas* respectively.

Ruby is called by two generic terms *māṇikka* (Skt. *māṇikya*) and *cunnī*. It is difficult to say what the origin of the second word is. The *Hindī Sabdasāgara* (1967 edn.) seeks to derive the word from Skt. *cūrṇikā* or *cūrṇīkṛta* and explains it as a very small piece of ruby or any other gem. Pherū, however, uses it as a synonym for *māṇikya*, whether big or small. Like the other writers, he uses *paümarāya* (Skt. *padmarāga*) for the variety of this name and also for the ruby in general (14, 17 and the heading of this section). The word can have either meaning in 65 and 67.

Other writers mention only four varieties of ruby. These are *padmarāga* (red with a tinge of white), *kuruvinda* (intense red), *saugandhika* (yellowish red) and *nīlagandhi* (red with a blue or black tint), and these are assigned to the four castes in this order. Pherū introduces a new variety *jāmuṇiya* which is purplish like rose apple (*jāmun*). The word must be a contemporary trade name.

On the basis of Pherū's description, it is impossible to decide whether all these five are rubies of different shades or whether they include other reddish gems also. Only *paümarāya* is said to be *akkhīṇa*, not worn off, i. e. it has a higher hardness than the others. *Kuruviṃda* alone is described as *lahu*, light, i. e. it has a lower sp. gr. than the others. If they are varieties of ruby, they should have the same hardness 9, and variation in the sp. gr. (4.00) is a negligible ± 0.01. Also the great difference in price—from twenty units for *paümarāya* to three units for *nīlagandha*—makes one doubt if these are all rubies. Interestingly enough, it is said of *kuruviṃda* that it has *trāsa*. *Mānasollāsa* II 4.423 defines this term as *bhinnabhrāntikara*, creating an illusion of being broken. (Cf. 83 below where *sattāsa* is mentioned among the flaws in sapphire).

The five terms listed here for ruby varieties do not seem to be in use today in Indian gem trade. The first one, however, has reached Europe via Ceylon. Herbert SMITH says that "padparadschah, padparadscha or other corrupt form of the Sinhalese word, *padmaragaya* (lotus-colour), has been introduced for the yellowish aurora-red gem material from Ceylon" (*Gemstones*, pp. 289-90).

3.3 Qualities of Ruby

62. Good colour (*succhāya*), glossy (*susaṇiddha*), effulgent like the [sun's] rays (*kiraṇābha*), soft to the touch (*komala* ?), with intense colour (*raṃgilla*), heavy (*guruya*), symmetric in shape (*sama*), and large (*mahaṃta*)—thus ruby (*māṇikka*) has eight qualities.

3.4 Flaws in Ruby

63. Discoloured (*gayachāya*), dull (*jaḍa*), smoky (*dhūma*), broken (*bhinna*), with a milky layer on the surface (*lhasaṇa*), sandy (*sakakkara*), hard (*kaḍhiṇa* ?), asymmetric in shape (*vipaya*) and rough (*rukkha*)—thus the eight flaws [in] ruby (*māṇikka*) are stated.

Navaratnaparīkṣā 115 (FINOT, p. 160) defines *lhasaṇa* (Skt. *laśuna*) as *dugdhaliptasama*, as if it has been smeared with milk. *Komala* as a quality and *kaḍhiṇa* as a flaw are incomprehensible in the case of ruby. Other writers do not mention these.

3.5 Effects of Ruby

64. One who wears a pure ruby (*māṇikka*) that has the aforementioned qualities and is devoid of flaws acquires surely kingdom, sons and wealth.

65. Wearing a ruby (*paümarāya*) endowed with qualities, the king wards off calamities. [The same] are doubtless produced, you know, by a flawed one.

66. A ruby (*māṇikka*) that is devoid of qualities, with a milky layer on the surface, devoid of lustre (*thaḍḍaya* ?), or shaped like a sword, when worn, makes the man flee from a good country.

67. Bestowing a lotus-like hue upon her husband's palms, soles, eyes and face, a Padminī [type of woman] wears a lotus-coloured ruby (*paümarāya*) so that she may beget a lotus-like sun.

This quaint belief is not recorded in any other text.

68. A ruby (*cunnī*) [the radiance of which] goes downwards (*ahavaṭṭi*) upwards (*uḍḍhavaṭṭi*) or sideways (*tirīyavaṭṭi*) is inferior, superior or middling [in price]. That [whose radiance spreads] all around (*savvavaṭṭi*), on the other hand, is spurious.

Agastimata 213 ff. classifies ruby on the basis of the amount of radiance emitted by it when held against the sun as *ūrdhvavarti*, *pārśvavarti* and *adhovarti*. It does not mention *sarvavarti*.

69. That gem (i. e. ruby) which emits rays in the open space like a smokeless fire is to be known as *indakāṃti*. It is pleasing [to look at] like the moon surrounded by clouds.

70. That ruby (*paümarāya*) which breaks on the grinding wheel, darkens the finger when touched, or contains stony inclusions; that ruby (*cunnī*) is called *cippiḍiyā*.

Thus ends the ruby-testing.

It will be instructive to compare Pherū's description of ruby with that of Al-Afkānī (WIEDEMANN, *op. cit.*, pp. 836-840) and note the close similarities in the fine gradations of colour and also in the flaws. It has been stated above that the Arabs quite correctly treat ruby and sapphire as one species and call it *yāqūt*, and this gem occupies the first position in the gem list of Al-Afkānī. He enumerates seven varieties of the red *yāqūt*, i. e. ruby.

(a) *Rummānī* has the colour of the fresh seed of pomegranate or of a drop of blood (drawn from an artery) on a highly polished silver plate (pigeon-blood red in modern parlance). Under the Abbasids, the price of a flawless *rummānī* weighing 1 *miṭqāl* (=4.72 g or 23.6 ct) was said to be 1000 Dīnārs.

(b) *Bahramānī* resembles the flower of *Carthamus tinctorius*; its price for 1 *miṭqāl* was 800 D.

(c) *Agrawānī*, purple like the robes of the Byzantine kings; price 500 D.

(d) *Laḥmī*, flesh-coloured; price 100 D.

(e) *Banafsāgī*, violet; price 100 D.

(f) *Gullanārī*, colour of the pomegranate flower; price 200 D.

(g) *Wardī*, rose-coloured; price less than 100 D.

The flaws in *yāqūt* are given as follows :

(a) stone-like inclusions (*pāhaṇiya* of Pherū, see *v.* 83 below),

(b) *ratan*, clay-like dirt enclosed in the gem (*sagāra* 63, 83),

(c) *tafaṭ*, which corresponds to the cracks produced in glass when it is knocked against a hard substance (*sattāsa* 63, 83),

(d) white layer that is occasionally seen in the gem; this can be removed by grinding if it occurs only on the surface (*lhasaṇa* 63),

(e) parti-coloured (*dvicchāya* in *Mānasollāsa* II.4.479).

On the general properties, Al-Afkānī has this to say: "*Yāqūt* is [almost] the hardest gem. It can be scratched only by diamond. It cannnot be polished on the moist wood of *Calotropis procera*. One makes its surface even with emery and polishes it on a copper disk with calcinated shells and water. Of all the gems, *yāqūt* takes the best polish and has the most water. Its rays are red under the light of a wax candle at night, while those of spinel and other similar gems are white."

4.0 Emerald

4.1 Sources of Emerald

71. Big emerald gems occur in Avalinda, on Mt. Malaya, in Vavvara country, on the sea coast, and in the neck and chest of Garuḍa.

All the texts place the source of emerald outside India, on a mountain in Barbara country inhabited by Mlecchas. Buddhabhaṭṭa 150, for instance, says that Garuḍa dropped Bala's bile "on a mountain on the sea coast near a desert beyond Barbara country," and hence the mountain became the source of emerald. This mountain has been identified with Mt. Zabara on the Red Sea coast in Egypt, which was the principal source of emerald from earliest times. Pherū seems to have understood this source as three separate units: Mt. Malaya, Vavvara country and sea coast. Nothing is known about Avalinda. That emeralds grow on the neck and chest of the mythical Garuḍa (or some kind of kite or vulture called by this name) is a new belief, not found in any other text.

4.2 Varieties of Emerald

72. *Garuḍodagāra* is the first, *kīḍaüṭhī* the second, *vāsaütī* the third, *mūgaünī* the fourth and *dhūlimarāī* [the fifth. These are] the five varieties.

73. *Garuḍodagāra* is beautiful, bluish, clear and soft, and removes [the effect of] poison. *Kīḍaüṭhī* is minute, glossy, dark and has a golden-hued lustre.

74. *Vāsavaī* is rough, bluish green like the parrot's tail and glossy. *Mūgaünī*, on the other hand, is hard, dark, [green like a] pigeon and glossy.

75. *Dhūlimarāī* is heavy, hard and resembles blue glass. The prices are respectively twenty, ten, eight, five and two *visuvas*.

Such classification of emerald is not known to the other texts. Normally *garuḍodgāra* is used in the sense of emerald in general. However, *Ratnasaṃgraha* 12 (FINOT, p. 196) mentions four varieties of emerald, namely *garuḍodgāra*, *indragopa*, *vaṃśapattraka* and *tutthaka*, without describing them. The five names listed by Pherū were probably employed in the gem trade of his time, but it is difficult to say what they signify and if all are varieties of emerald. Curiously enough, almost all the varieties have a bluish tint but none has the verdant green hue of emerald. It is possible that acquamarine and bluish green beryl are also included here. *Vāsaütī* or *vasavaī* probably corresponds to the *vaṃśapattraka* of the above list, which resembles, as the name implies, the bamboo leaf, but Pherū's variety is bluish green. From the table of prices given between the verses 120 and 121, *marāī* (from Skt. *marakata* through Pkt. *maragaya*) seems to be the contemporary name for emerald. Then *dhūlimarāī* would mean dusky emerald.

4 3 Flaws in Emerald and their Effects

76. Rough (*rukkha*), with blister-like protruberences (*viphoḍā*), with stone-like inclusions (*pāhaṇa*), impure (*mala*), sandy (*kakkara*). dull (*jaṭhara*), with dust-like inclusions (*sarajassa*)—these are the seven flaws in emerald. I shall describe their effects.

77. Rough one causes disease, one with blisters injury from weapons, impure one makes [the wearer] deaf and blind, that with stone-like inclusions destroys the kith and kin,

78. sandy one makes [the wearer] sonless, dull one, you know, is the abode of all ills, and the one with dust-like inclusions causes mother's death. [These are] the flaws in emerald and their effects.

4.4 Qualities of Emerald

79. Good colour (*succhāya*), glossy (*susaṇiddha*), without dust-like inclusions (*areṇuya*), heavy (*guru*), with rich colour (*vannaḍḍha*) —these are the five qualities. A smooth (*masarāla* ?) emerald removes the [effect of] poison and causes wealth.

This belief in the anti-venomous property of emerald was shared by the Arabs also (see WIEDEMANN, *op. cit.*, p. 224).

80. Placing on one's palm an emerald so that it faces the sun, one should meditate (watch it ?). If its colour (*chāya*) sparkles, it is the most sacred and best.

Thus it should mean, if we follow the *Agastimata's* (299) definition of *mahāmarakata* :

कृत्वा करतले चैव भास्कराभिमुखं धृतम् ।
रञ्जयेदात्मपार्श्वं च महामरकतं स्मृतम् ।।

Pārśvarañjana, spreading its green colour all around, is supposed to be an important quality of emerald. But Pherū's text is not so clear. The second line may very well mean : "If somebody's shadow is reflected in the emerald, he is the most meritorious and the leader of men." This would imply that emerald was used as a sort of crystal ball. No other instances of such use are recorded.

Thus ends the emerald-testing.

5.0 Sapphire

5.1 Source and Properties of Sapphire

Now sapphire :

81. The grand sapphire (*mahiṃdanīla*) occurs in Ceylon. [It has] four castes, nine flaws, five qualities and nine shades—this you know.

In *ratnaśāstra*, the common name for sapphire is *nīla*, and superior varieties are called *indranīla* and *mahānīla*. According to Buddhabhaṭṭa, a sapphire in which the colours of the rainbow sparkle is an *indranīla* (195), and the one which, when placed in a bowl of milk, turns the milk blue is a *mahānīla* (196). The *Agastimata*, however, styles the second variety *indranīla* (268) and states that the sapphires from Ceylon are all *mahānīlas* but those from elsewhere are mere *nīlas* (244). Pherū seems to have combined these two words into *mahiṃdanīla*, but he uses this word (81, 85) and also *iṃdanīla*/*indranīla* (9, 19, heading and colophon of this section) and *nīla* (36, 83, 86, 88) in the same general sense. As regards the source, all writers agree on Ceylon but the *Agastimata* adds Kaliṅga and Kalapura. On sapphire mining in Ceylon in the fourteenth century, see Ibn Battuta, *op. cit.*, p. 257.

5.2 Castes of Sapphire

82. [A sapphire with a] whitish blue shade is Brahmin, bluish red Kṣatriya, blue with a yellow tint Vaiśya and dark blue Śūdra—this you know.

5.3 Flaws in Sapphire and their Effects

83. Cloudy (*abbhaya*), with feeble lustre (*maṃdi*), with sand grains inside (*sakakkaragabbhā*), with fractures (*sattāsa*), dull (*jaṭhara*), with stone-like inclusions (*pāhaṇiyā*), impure (*samala*), containing clay (*sagāra*), discoloured (*vivanna*)—these nine flaws occur in sapphire.

84. Cloudy [sapphire causes] loss of money, sandy one disease, one with feeble lustre leprosy, that with stone-like inclusions sword-cut, multi-coloured or discoloured one danger from lions,

85. one with fractures the murder of relatives, impure one, that with clay inside and the dull cause loss of friends. Thus are stated the nine flaws in sapphire and their effects.

5.4 Qualities of Sapphire

86. Heavy (*guruya*), good colour (*suraṃga*), glossy (*susaṇiddha*), soft to the touch (*komala* ?), spreading the colour [to the surroundings] (*suramjaṇaya*)—whoever wears a sapphire with these five qualities pacifies the anger of Saturn.

5.5 Shades of Sapphire

87. Blue, [like] the cloud, [like] peacock's neck, like the flower of *Linum usitatissimum*, resembling the flower of *Clitoria ternatea*, black like the bumble bee's wing, dark, the shade of cuckoo's neck—these are the nine shades.

88. Diamond, pearl, ruby, emerald and sapphire are the five [superior] gems. The merit that accrues when these are worn [does] not [accrue even] by the gift of a crore [of coins].
Thus the five superior gems including sapphire.

These five are *mahāratnas*, as distinct from the *uparatnas*, inferior or semi-precious stones. The number and the order of the latter vary from text to text. Pherū describes eight of them but enumerates only seven in the following verse.

6.0 Semi-Precious Gems

89. Now I shall discuss coral, cat's-eye, beryl, rock-crystal, topaz, chrysoberyl and *bhīṣma*—these seven gems.

6.1 Coral

Coral (*vidduma, pavālaya*) as follows :

90. In Kāvera, Mt. Vindhya, China, Greater China, ocean and Nepal, coral grows in the shape of a creeper, full of tubers and stalks.

91. Multi-coloured (*bahraṃga* ?), very glossy (*susaṇiddha*), very clear (*supasanna*), soft (*komala*), without spots (*vimala*), densely coloured (*ghaṇavanna*) and red in colour (*vannaratta* ?), the coral obtained from the earth (!) is the best

It is impossible to believe that Pherū was not aware of the marine origin of coral. This list of sources is found in no other text and is possibly based on the contemporary notions of the trade centres. Kāvera may be indentical with the southern port of Kaveripattinam. According to Moti CHANDRA (*loc. cit.*), China and Greater China refer to China and Canton whence coral traders may have come to India, and also from Nepal. It is inexplicable that Vindhya should find a place in this list. Moreover, the epithets *bahraṃga, ghaṇavanna* and *vannaratta* given to the coral from the earth (!) are difficult to distinguish from one another. The text seems to be hopelessly corrupt. The variant reading (given in the Appendix) is far better. It says rather precisely : "Coral grows in the shape of a creeper somewhere at the bottom of the ocean. [It is] dark red, hard, smooth, like a stalk and glossy all over."

6.2 Cat's-Eye

Cat's-eye (*lhasaṇio*) as follows :

92. The cat's-eye stone, from whose body shades of bright blue, yellow and red flash with [their] radiance, occurs in Ceylon.

93. Even one cat's-eye, [if it is] without flaws, very pure and [resembles] the eye of the cat (i. e. chatoyant), has the same effect as all the gems [belonging to] the nine planets [put together]. Some say [that this gem looks as if] it has horripilations.

Cat's-eye is a variety of chrysoberyl in which a bundle of microscopic channels runs parallel to a single direction, and if the stone is viewed at right angles to this direction, a band of light is visible running across this bundle (see Herbert SMITH, *op. cit.*, p. 76). This optical property is known as the cat's-eye effect or chatoyancy. Quartz, tourmaline and others also exhibit this property, but the best cat's-eye is the chrysoberyl variety from Ceylon. Pherū describes this gem accurately and the comparison with a human body that has horripilation or has the hair erect is quite apt. Amir Khusrau describes the cat's-eyes acquired by Alauddin's army (see Introduction, p. 16). He also mentions cock's-eye, but it is difficult to identify this gem.

6.3 Beryl

Beryl (*vaïḍujja*) as follows :

94. Beryl occurs in Kuviyaṃgama country, in the ocean and on Mt. Vaïḍūra. It has the shade of bamboo leaf or blue. It causes virility, offspring and sustenance.

Some translate Skt. *vaidūrya* (or *vaiḍūrya*) as beryl because these two words are cognate. FINOT (pp. xlv-xlvii) disapproves of such identification based merely on etymology. According to him, Buddhabhaṭṭa's description of *vaidūrya* (200) clearly establishes its chatoyant character. Therefore, he concludes, *vaidūrya* is cat's-eye, and *lahsuniyā* its synonym. The Bikaner Ms. of the *Agastimata* (Maharaja's Library, No. 1567) copied in Saṃ. 1735 contains some additional passages which might be late interpolations. Here *vaidūrya* and *lasaṇīya* are used as synonyms (see FINOT, p. 135).

On the other hand, Alfred MASTER maintains—on the basis of a number of Pāli, Prakrit and Sanskrit passages—that *vaidūrya* has the sense of beryl (see his "Indo-Aryan and Dravidian," *Bulletin of the School of Oriental and African Studies*, Vol. XI, 1943-46, pp. 297-307).

It seems that both err in supposing that the word *vaidūrya* was used for the same gem at all times in all places. Inconsistencies in the nomenclature of gems obtain even today in Indian gem trade and also in the West. Such seems to be the case, at least in Sanskrit poetry. While Kālidāsa's use of

vaidūrya in *Kumārasaṃbhava* I. 24 suggests the long columnal crystals (*ratnaśalākā*) of beryl, Māgha's use of the same word in *Śiśupālavadha* III. 45 clearly indicates the chatoyancy (*biḍālekṣaṇa*) of cat's-eye. Probably by Pherū's time, the chatoyant *vaidūrya* came to be called *lhasaṇiya*, and *vaïḍujja* meant a kind of green or blue beryl.

Pherū does not seem to have any notion of the sources of *vaïḍujja*. Buddhabhaṭṭa (199) states that it occurs at a mountain called Vidūra in Koṅgavālikasīmānta. The first word here is a fiction invented by the grammarians to explain the etymology of *vaidūrya*. The second expression, according to FINOT, refers to the borderland between the Koṅga and Chola kingdoms, i. e. modern Salem district. Pherū's *Koṃgavāyikadesa* appears to be a corruption of this expression. The third source, ocean, can at best imply that the gem was imported from beyond the ocean.

6.4 Rock-Crystal

Rock-crystal (*phaliha*) as follows :

95. Rock-crystal occurs in Nepal, Kashmir, China, on the banks of the rivers Kāverī and Yamunā, and on Mt. Vindhya. It is white like a very clear mirror.

96. From *ravikaṃta* fire [emerges] and from *sasikaṃta* nectar water drips. Both *ravikaṃta* and *sasikaṃta* (=*candakaṃta*) originate from rock-crystal.

The list of sources is again a slight modification of Buddhabhaṭṭa's (246) list : Kāverī, Vindhya, Yavana, Cīna and Nepāla, to which Pherū adds Kashmir. Rock-crystals from Kashmir were known to Al-Afkānī also (see WIEDEMANN, *op. cit.*, p. 850).

Ravikaṃta (or more commonly in Skt. *suryakānta*) and *sasikaṃta* (*candrakānta*) are mentioned often in Sanskrit literature. It is said that when the sun's rays touch the former it emits fire and when the moon's rays touch the latter it oozes water. At several places, it is said more clearly that when *sūryakānta* is held against the sun and cotton or dried cowdung is placed beneath it, they catch fire. *Ratnaśāstra* declares that these two are varieties of rock-crystal. In spite

of these consistent statements, the two words are often translated as sun-stone and moon-stone, which are in fact varieties of feldspar. Recently Wilhelm RAU conclusively established that *sūryakānta* is a double or plano-convex lense ground from rock-crystal, and that this was used as a burning-glass (see his *Brennlinse im alten Indien*, Mainz 1983). As for *candrakānta*, no stone is known to ooze water under moonlight. It looks as though *candrakānta* is a fiction invented as a companion piece to *sūryakānta*. On the other hand, Sanskrit literature is replete with *candrakānta* slabs on which lovers in separation seek solace and coolth. Can *candrakānta*, therefore, be an old name for marble and the oozing of water at the touch of the moon's rays a bit of poetic hyperbole ?

6.5 Topaz

Topaz (*puṃsarāya*) as follows :

97. Dark yellow or gold-coloured and glossy topaz occurs in the Himalayas. Jupiter is always favourable to him who wears it.

Cf. Buddhabhaṭṭa (216) who mentions the same source.

6.6 Chrysoberyl

Chrysoberyl (*kakkeyaṇa*) as follows :

98. Chrysoberyl occurs in the abundant mines of Pavaṇuppaṭṭhāna country. [It has the colour of] copper [or of] the ripe [berries of] *Madhuca indica* with a bluish tint, and is hard and glossy.

FINOT identifies this gem (Skt. *karketana*) with chrysoberyl on the basis of Buddhabhaṭṭa's description (221-230). Pherū's description is very brief and omits the golden hue emphasized many times by Buddhabhaṭṭa. On the identity of the source, Moti CHANDRA (*loc. cit.*) makes fanciful conjectures, but if we read the initial consonant as '*ya*', this name would appear to be a corruption of *javanopapanna* (i. e. obtained from the country of Yavanas) said of this gem by Buddhabhaṭṭa (221).

6.7 Bhīṣma

Bhīṣma as follows :

99. *Bhīṣma* is pale yellow like the moon in the daytime and occurs in the Himalayas. Whoever wears it will have no fear from fire or lightning.

This gem is difficult to identify. Of the earlier writers, only Buddhabhaṭṭa (231-240) describes it. According to him, it is basically white and occurs in the Himalayas. Probably it is some kind of white chalcedony.

Thus the seven gems.

6.8 Zircon

100. Zircon (*gomeya*) [occurs] in Sirināyakula, Parevaga country and in the Narmadā river. It [resembles] the cochineal insect, and is glossy, pale yellow or yellow.

Other writers state that *gomeda* is honey-coloured or has the shade of cow's urine. No other writer mentions the sources, nor are the first two listed here identifiable.

101. All gems which are endowed with qualities and devoid of impurities cause auspiciousness. They are the abodes of the goddess of wealth, removers of obstacles, dear to the gods and possess [magical] power.

102. Pearl, diamond and coral—[these] three are of different species. Caste is a variety within a species. Others are also of different species.

7.0 Gems imported from Persia

103. These are the gems mentioned in the *śāstra* that I have discussed [so far]. Now I shall discuss Persian gems along with their colours and sources, [namely], spinel (*lāla*), cornelian (*akīyā*) and turquoise (*perujjā*).

104. Very bright and fire-coloured spinel occurs in Badakhshan. Cornelian (*yakīka*) occurs in Yemen. Its price is low, and it has the colour [of the ripe berries] of *Salvadora persica* (*pilu*).

105. Blue and clear turquoise occurs in the mines of Nishapur (*nīsāvara*) and Al-Moussul (*muvāsīra*). It is said to be beneficial to the eyes.

So far Pherū has been relying rather heavily on the *śāstra* for the description and sources of the gems. The sources he gives are often not contemporary but taken from the traditional lists. However, his information about the gems imported from Persia, though brief, is very accurate. That he has a correct knowledge of the sources is attested by the contemporary Arab gemmologists.

Spinel occurs in a wide spectrum of colours, but the most cherished is the ruby-red variety. It is remarkably free from flaws. Pherū's statement that it is glowing red like fire is quite appropriate. That its principal source was Badakhshan is attested by Al-Afkānī (see WIEDEMANN, *op. cit*, 840-841). It is because of this source that spinel is also called Balass-ruby (see *Hobson-Jobson*, p. 52).

Though *aqīq* is loosely translated as agate, the *aqīq* of Yemen is cornelian of deep red hue (WIEDEMANN, *op. cit.*, pp. 858, 867, 869, 872). Therefore, the word *pīlu* in *v.* 104 should indicate red colour. The ripe berries of *Salvadora persica* (*pīlu*) are said to be dark red (Ram Sushil SINGH *Vanauṣadhinidarśikā*, Lucknow 1969, p. 232).

That good quality turquoise occurs in Nishapur in north Persia is stated by many writers. Ya'qūb praises Nishapur in these words : "Its stones are turquoises, bushes rhubarb. And its dust is edible clay. How could I leave such a land ?" (quoted by William CROOKE in Tavernier, *op. cit.*, Vol. II, p. 203, n. 3. See also *ibid.*, p. 81, n. 2).

The following statement by Al Ta'ālibī enumerates the best sources of various other gems : "The turquoise of Nishapur belongs to the category of most precious gems like the ruby and sapphire of Ceylon, the pearl of Oman, the emerald of Egypt, the cornelian of Yemen, the garnet of Balkh and the spinel of Badakhshan" (quoted in WIEDEMANN, *op. cit*, p. 867).

According to Moti CHANDRA (*loc. cit*), *muvāsīra*, the second source mentioned by Pherū for turquoise, is Al-Moussul in Iraq which was a trading centre.

Interestingly, the belief that turquoise is good for the eyes seems to have been imported along with the gem. Al-Afkānī also reports of such a belief. (See WIEDEMANN, *op. cit.*, p. 849). Needless to say that the names were also imported from Persia. Today most of the names in the gem trade in north India are Persian. It is rather surprising that Pherū does not mention lapis lazuli in this section. Though he does not include amber among the gems here, Pherū knows about its origin. In *Dhātūtpatti* 42, he says that camphor, like amber (*kaharuvva*), is a resin from certain plants. This is fairly true because amber is

a fossile resin of coniferous trees. The word *kaharuvva* is derived from the Persian *kahrubā* (amber; literally, attracting straw) and likewise Pherū's knowledge of the origin of amber must have been derived from Persian or Arabic sources.

Thus ends [the discussion of] the sources, varieties and properties of all gems starting from diamond. Now the prices of these very [gems] will be given in *gāthās*, and then [in tables] according to the meaning.

8.0 Expert of Gems

106. Those who are well-versed in the *śāstra* (i. e. theory) and in looking [at gems, i. e. practice] and are experienced, who know the [factors of] space, time and condition [as the determinants of the price], and the properties of gems are called Maṇḍalikas.

107. Those who have physical deficiencies, or belong to the lowest caste, or are bereft of [auspicious physical] signs and stamina, or whose disrepute is obvious, can in no circumstances become Maṇḍalikas even if they know [about gems].

108. The Maṇḍalikas, after examining the gem and mutually matching the hand-signs, go on quoting the price so long until it is acceptable to all concerned.

109. If the merchant, not knowing the [exact] price, quotes a lower or higher [rate], it will not be counted as his fault. [But] the Maṇḍalikas who fix a false price will never be happy.

110. Those who fix a high price for an inferior [gem] or a low price for a superior gem, due to arrogance or avarice, will become lepers.

111. There is never an accepted, restricted or fixed price for gems. Even so, I shall list the prices that obtain at this time.

The *Agastimata* (61-75) is the only text to lay down such detailed list of qualifications, disqualifications and ethics for the expert of gems whom it styles *maṇḍalin* or *maṇḍalika*. This expert examines the gems and fixes their price, and thus acts as a broker between the buyer and the seller. Though the other texts on *ratnaśāstra* (and even works outside this subject) anticipate such an expert, these terms are employed nowhere but in the *Agastimata*. Sanskrit dictionaries do not list them. Pherū's frequent employment of the term *maṇḍaliya* (3, 5,

106-109, 127) raises the question whether he merely took over the term from the *Agastimata* or whether the term (or its variation) was really used in this time among jewellers. I know of no contemporary evidence to support the second alternative.

A second thing that is exclusive to the *Agastimata* is the expression *hastasaṃjñā*. Bargaining is not done orally in gem trade but through hand-signs. Under the cover of a cloth, the broker holds the hands of the seller and presses so many fingers as many thousands, or hundreds or tens of coins he recommends as the price of a gem. There is also a more complicated system where each joint of each finger has a certain numerical value. The broker repeats this process with the buyer and the seller until both are satisfied. Such silent bargaining for gems and even other articles is described by travellers to India. (See Tavernier, *op. cit.*, Vol. II, p. 58, and n. 2 for other literature). This seems to be prevalent even today at Jaipur (see Rajrup TANK, *Indian Gemmology*, Jaipur n. d., p. 'e').

9.0 Metrology

112. Three *rāī*-s [make] one *sarisama*; six *sarisamas* [equal] one *taṃḍula*; twice [this is] one *java*; sixteen *javas* [or] six *guṃjās* [make] one *māsa*; four of these [equal] one *ṭaṃka*.

Though Pherū gives an elaborate table of weights here, the units actually used in this work are *gumjā*, *māsa* and *taṃka*. The last word is also the name for the standard silver and gold coins of this period. To avoid confusion, the coin will henceforth be referred to as Tanka. According to the *Dravyaparīkṣā* (36), three *ṭaṃkas* equal one *tola*. The same text (137, 141, 143) informs us that the standard silver and gold Tankas issued by Alauddin and Qutbuddin Mubarak weighed one *tola* each. On the basis of the extant coins, numismatists have equated the Khalji *tola* with 11.003 grams or 10·95 grams (see John Scott DEYEL, *Living without Silver* : *The Monetary History of Early Medieval North India*, Vol. I, pp. 349-55). For our purpose, the approximate figure of 11 grams will do. Accordingly, I give below the units used in this text and their modern equivalents in metric carats (=0.2 gram), corrected up to the second decimal place.

taṃka	=	18.33 ct.
māsa	=	4.58 ct.
guṃjā	=	0.76 ct.

It will be seen below that Pherū gives the prices only up to a weight of one *ṭaṃka*. It implies that only gems up to this weight were normally offered for sale in the trade, though gems of much higher weights were available at that time, especially in royal treasuries. Fernaõ Nuniz reports that in the kingdom of Vijayanagara in the sixteenth century, all diamonds exceeding 25 ct. in weight were to be surrendered to the king's treasury (see Robert SEWELL, *A Forgotten Empire : Vijayanagara*, reprint, Delhi 1962, p. 369). Perhaps some such restriction existed in Alauddin's reign also.

Departing from tradition, Pherū gives the tariff of prices for all gems together at the end of the work, that too both in *gāthās* and tables, thus enhancing the practical utility of the work.

10.0 Tariff of Prices

10.1 Diamond, Pearl, Ruby and Emerald

113. From one up to twelve, then [each time] an increment of three up to twentyfour *guṃjās*. The price in gold Tankas of [the first] four gems [having the above weights is as follows] :

114. Five, twelve, twenty, thirty, fifty, seventyfive, hundred increased by ten, sixty and hundred, two [hundred and] forty, three hundred and twenty,

115. four hundred, and then six hundred, fourteen hundred, beyond this [each time] double [the previous amount] up to eleven thousand and two hundred. This is the price of a [single] diamond.

116. Half, one, two, four, eight, fifteen, twentyfive, forty, sixty, eightyfour, hundred increased by fourteen, sixty and hundred,

117. three hundred increased by sixty, seven hundred, and also twelve hundred, and two thousand gold Tankas respectively, you know, is the price of a [single] pearl.

118. Two, five, eight, twelve, eighteen, twentysix, forty, sixty, eightyfive, twenty [and] hundred, sixty [and] hundred, two hundred and twenty,

119. four hundred and twenty, eight hundred, fourteen hundred, and twentyfour hundred—this is the maximum price of the best ruby [weighing] from one *gumjā* to one *ṭaṃka* [respectively].

120. Quarter, half, one, one and half, two, three, four, five, six, eight, ten, thirteen, eighteen, twentyseven, forty, sixty [are the prices] of grand emeralds.

See the table on p. 76.

10 2 Spinel, Cat's-Eye, Sapphire and Turquoise

121. The price in gold Tankas of [the following four] gems of good [quality] weighing respectively from half *māsa*, increased [each time] by another half *māsa* up to four *māsas* [is as follows] :

122. one, two and half, six, nine, fifteen, twentyfour, thirtyfour, and fifty are the prices of spinel. Cat's-eye [fetches] three-fourth of these.

123. Quarter, half, three quarters, one, two, five, eight, and fifteen. This is the price of sapphire and also of turquoise.

Note that the prices of these gems, being considerably low, are not given for each *gumjā* (=0.76 ct.) as in the previous case, but for a large unit of weight (half *māsa*=2.29 ct.). It is indeed surprising that the transparent and hard sapphire from Ceylon and the opaque and softer turquoise from Persia had the same value in the fourteenth century Delhi.

See the table on p. 76.

Price in Gold Tankas

	Weight in *gumjās* and carats															
	1*g.* 0.76 ct.	2 1.53	3 2.29	4 3.06	5 3.82	6 4.58	7 5.35	8 6.11	9 6.87	10 7.64	11 8.40	12 9.17	15 11.46	18 13.75	21 16.04	24 18.33
Diamond	5	12	20	30	50	75	110	160	240	320	400	600	1400	2800	5600	11200
Pearl	½	1	2	4	8	15	25	40	60	84	114	160	360	700	1200	2000
Ruby	2	5	8	12	18	26	40	60	85	120	160	220	420	800	1400	2400
Emerald	¼	½	1	1½	2	3	4	5	6	8	10	13	18	27	40	60
Spinel			1			2½			6			9	15	24	34	50
Cat's-eye			¾			1⅞			4½			6¾	11¼	18	25½	37½
Sapphire			¼			½			¾			1	2	5	8	15
Turquoise			¼			½			¾			1	2	5	8	15

10.3 Small Pearls sold in a Lot

124. A stringed (?) [pearl costs] half or one-fourth [of the price] according to its qualities. A mottled [pearl costs] one-fourth. [Now] I shall state the price of those pearls that weigh [together] one *ṭaṃka*.

125. [If] ten, twelve, fifteen, twenty, twentyfive, thirty, forty, fifty, seventy or hundred pearls weigh [together] one *ṭaṃka*, their prices are

126. fifty, forty, thirty, twenty, fifteen, twelve, ten, eight, five and three. These prices are in silver Tankas.

Thus the pearl.

No. of pearls weighing 1 *ṭaṃka* (=18.33 ct.)	10	12	15	20	25	30	40	50	70	100
Price of the lot in silver Tankas	50	40	30	20	15	12	10	8	5	3

I am not sure that I understand the first line of 124 correctly (cf. 54 for the price of the mottled pearl). 124B-126 give the prices of small (and perhaps stringed) pearls sold in a lot weighing 1 *ṭaṃka* (=18.33 ct.). The greater the number of pearls weighing 1 *ṭaṃka*, the lower their collective price.

10.4 Small Diamonds sold in a Lot

Now diamond as follows :

127. [If] from one up to twelve diamonds weigh [together] one *guṃjā*, their [price], as told by the experts, I shall now state.

128. Thirtyfive, twentysix, twenty, sixteen, thirteen, ten, eight, then one less [each time] up to three silver Tankas.

No. of diamonds weighing 7 *guṃjā* (=0.76 ct.)	1	2	3	4	5	6	7	8	9	10	11	12
Price of the lot in silver Tankas	35	26	20	16	13	10	8	7	6	5	4	3

Diamonds weighing less than a *guṃjā* (*g*) were not sold singly but in a lot weighing 1 *g*. Their price varied according

to the number of diamonds in 1 *g*. Interestingly, the price of a single diamond of 1 *g*. (=0.76 ct.) is given twice : here as 35 silver Tankas and in *v*. 114 as 5 gold Tankas. That is to say, in the year 1315, 1 gold Tanka=7 silver Tankas. But from the *Dravyaparīkṣā* written three years later in 1318 during the reign of Qutbuddin Mubarak, one can deduce a relation of 1 gold Tanka=8 silver Tankas (see John Scott DEYELL, *op. cit*, Vol. I, pp. 348, 357). Elsewhere, I have suggested that the gold price was raised in Qutbuddin Mubarak's reign (see my "*Varṇa-mālikā* System of Determining the Fineness of Gold in Ancient and Medieval India," *Aruṇa-Bhāratī* : *Professor A. N. Jani Felicitation Volume*, Baroda 1983, pp. 369-389).

10.5 Other Gems

129. These, it should be understood, are the prices of all that are very pure and free from impurities, but not of other gems. The price of coral is half that of gold.

130. Zircon, rock-crystal, *bhīṣma*, chrysoberyl, topaz and beryl. Their price is in Drammas according to one's inclination and according to the workmanship.

Dramma is a billon coin. One silver Tanka equalled fifty (*Gaṇitasāra* 1.4) or sixty (*Dravyaparīkṣā* 134-136; 144-146) Drammas.

11.0 Conclusion

131. In the city of Kannāṇā, there flourished in the Śrīdhandha community the merchant Kāliyaka. His son [is] Ṭhakkura Canda, and his son Pherū.

132. By him is composed the *Rayaṇaparikkhā* for the sake of his son Hemapāla in the [Saṃvat] year 1372 during the victorious reign of Alauddin.

Thus ends the brief *Ratnaparīkṣā* written by the devout Jaina, Ṭhakkura Pherū, son of Candra.

APPENDIX

Pandit Bhagwan Das JAIN brought out an edition of the *Vāstusāra* under the title *Paramajaina-Candrāṅgaja-Ṭhakkura-Pheru-viracita Vāstusāraprakaraṇa* with a translation into Gujarati from Jaipur in 1939 (Jaina Vividha Granthamālā, Puṣpa 4).[1] To this edition is appended, among others, a text called *Sirirayaṇaparikkhāpayaraṇa* on pp. 238-248. In a footnote in Gujarati on p. 238, JAIN informs that the text is based on an incomplete manuscript obtained through Muni Darśanavijaya,[2] but gives no other particulars about the manuscript.

Though ostensibly attributed to Pherū, this text is clearly an abridgement and adaptation of Pherū's treatise by some later redactor. Here the first 22 verses and the first three words of the 23rd verse are missing. Verses 60-124 constitute the *Dhātūtpatti* (longer by 8 verses than the text printed in the *Saptagranthasaṃgraha*), incorporated at this place apparently for the dubious reason that it deals with the "gems of metallic origin" (*dhāusaṃjāyā*, *v.* 57). Thus the gemmological text proper contains 62 verses including the three concluding ones, i.e. half the length of the original text.

The 23rd verse concludes the tariff of prices for gems sold singly. In the original version, this section occupies 12 verses (112-123). If we assume that it occupied about the same length here also, say from 12 to 23, it is still uncertain what the first 11 verses dealt with. However, while the original concludes with the price tariff, this version seems to begin with it. It will be noted that the prices are much lower than those in the original and probably corresponded to the time and place of the redactor. Since these two factors are not known, it is fruitless to speculate on the wide difference in prices between the two versions. But two points must be mentioned. The original quotes the prices of diamond, pearl, ruby and emerald for each *guṃjā* weight and those of other gems for

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1. I have seen this edition after the first eight pages of the Introduction had already been printed. Hence the uncertainty on p. 7. n. 76, In his introduction, JAIN says that he had published a Hindi translation of the *Vāstusāra* in 1937. H. D. VELANKAR, *Jinaratankośa*, Vol. I, Poona 1944, p. 349 lists seven mss. of the *Vātsusāra*. It is not possible to ascertain which mss. were utilized by JAIN.

2. Dr. Vishvanath SHUKLA has kindly translated the Gujarati for me.

each half *māsa*. This version gives the prices of all gems uniformly for each half *māsa*. Secondly, beyond a weight of two *māsas*, the prices of ruby and pearl here exceed that of diamond.

The description of gems in 29-59 is much too brief, omitting in most cases the qualities, flaws, effects and so on. The order of gems is also different. In the case of ruby, the word *paümarāga* is regarded as a generic name along with *māṇikka* and *cunni* (33), and only four varieties are mentioned, viz. *siriphalahi* (33) or *phalahi* (35), *sāvagandhaya*, *kurubiṃdaya* and *jāmuṇiya*. The first one is new and perhaps a misreading for *phaliha*, rock-crystal. The same five varieties of emerald are listed, but *vāsaüī* and *mūgaünī* change places and consequently also prices. If the final verse in Sanskrit in the *śārdūlavikrīḍita* metre is really by Pherū, it is the only one of its kind available to us.

This version has nothing to recommend for itself except that it is a curiosum in text transmission. The *Saptagranthasaṃgraha* and the *Ratnaparīkṣā* of the NAHATAS cite only *vv.* 23-26, 50-59 from this version as variant readings. I print below the entire text (minus the *Dhātūtpatti*), after correcting the obvious errors. The latter are given in the footnotes. The Arabic numerals after some verses represent the numbers of the corresponding verses in the original.

परमजैन-चन्द्राङ्गज-ठक्कुर फेरू-विरचितम्

सिरिरयणपरिक्खापयरणं

.....॥१-२२॥

.....दह तेरस सोलस बावीस तीस ठंकाइं ।
लालस्य मुल्लु एयं पेरुज्जं इंदनीलसमं ॥२३॥

अस्यार्थं यंत्रकेणाह—

मासा	॥	१	१॥	२	२॥	३	३॥	४
हीरा	७	१६	३०	६०	१००	१५०	२२०	३४०
चून्नी	८	१८	३०	६०	१२०	२४०	४८०	६६०
मोती	२	८	३०	८०	१२०	१८०	२७०	४०५
मराइ	४	६	१०	१५	२२	३४	५०	७०
इंद्रनील	।	॥	।॥	१	२	५	७	१०
ल्हसणीया	।	॥	॥।	१	२	५	७	१०
लाल	॥	३	६	१०	१३	१६	२२	३०
पेरोजा	।	॥	।॥	१	२	५	७	१०

बारस चउदस सोलस वीसाई दसहियं च जाव सयं ।
टंकिक्कि जे तुलंती मुत्ताहल ताण मुल्लमिमं ॥२४॥ 124b
चालीसं पणतीसं तीसं चउवीस सोलसिक्कारं ।
अट्ठ छ इगेग हीणं जाव दु कमि रुप्पटंकाणं ॥२५॥
एगाइ जाव बारस चडंति गुंजिक्कि वज्ज ताणमिमं । 127a
वीसा य सोल तेरस गारस नव इगूण जाव दुगं ॥२६॥

अस्यार्थं पुनर्यंत्रकेणाह—

मोती टंक प्रति	१२	१४	१६	२०	३०	४०	५०	६०	७०	८०	९०	१००
रूप्य टंकण	४०	३५	३०	२४	१६	११	८	६	५	४	३	२

हीरा गुंजा	१	२	३	४	५	६	७	८	९	१०	११	१२
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॥ इति परमजैन ठक्कुरफेरू[7] विरचिता संक्षेपरत्नपरीक्षा ॥

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