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Who is the native of the *Sarvasiddhāntatattvacūḍāmaṇi*?

Sreeramula Rajeswara Sarma

Düsseldorf

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Principal Contact:

Dominik Wujastyk, Editor, University of Alberta
Email: ⟨wujastyk@ualberta.ca⟩

Mailing Address:

History of Science in South Asia,
Department of History, Classics and Religion,
2–81 HM Tory Building,
University of Alberta,
Edmonton, AB, T6G 2H4
Canada

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Who is the native of the *Sarvasiddhāntatattvacūḍāmaṇi*?

Sreeramula Rajeswara Sarma

Düsseldorf

To Professor S. M. Razaullah Ansari,
for encouraging me to work on
the history of Indian astronomical instruments,
in friendship and gratitude.

INTRODUCTION

The british library in london holds a fabulously illustrated and illuminated horoscope in Sanskrit entitled *Sarvasiddhāntatattvacūḍāmaṇi*, "The Crest-jewel of the Essence of all Astronomical Systems" (MS London BL Or. 5259). The author, Durgāśaṅkara Pāṭhaka of Benares, attempted in this work to discuss all the prevailing systems of astronomy – Hindu, Islamic and European – around the nucleus of the horoscope of an individual personage. Consisting of 304 large-size folios, the unique manuscript commences with verses in praise of Gaṇeśa, Sarasvatī, Rāma and Kṛṣṇa, and horoscopes of Rāma, Kṛṣṇa, Guru Nānak and Guru Govind Singh, Maharaja Ranjit Singh, besides the main horoscope which is the subject of the present study. The manuscript also carries the portraits of Sikh Gurus Nānak and Govind Singh, paintings showing the personified images of various astrological elements such as the zodiac signs and decans, charts displaying horoscopes in diverse styles, zoomorphic and anthropomorphic images of star constellations and their disposition in the skies according to Hindu, Islamic and medieval European concepts, and so on. Some of these illustrations have been reproduced in recent times in various publications.

The manuscript was acquired in Benares by Fortescue W. Porter, a British colonial officer, who was the magistrate at Benares around 1881. He gifted it to the British Museum in 1897. The manuscript was transferred to the British Library sometime after its new building was inaugurated in 1998. The manuscript was

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Figure 1: Sudhākara Dvivedī (photo from the *Sārasvatī-Suṣamā*).

described by Cecil Bendall in 1902 in his *Catalogue of the Sanskrit Manuscripts in the British Museum*.[1] Bendall (1856–1906) was Professor of Sanskrit at the University College London and later at the University of Cambridge, with great experience in cataloguing Sanskrit manuscripts. It is surprising, however, that he did not read the text of the horoscope in order to determine whose horoscope it actually was. Instead, he relied on Sudhākara Dvivedī's hearsay account which, as will be shown below, he did not read carefully either.

SUDHĀKARA DVIVEDĪ

Sudhākara Dvivedī (ca. 1855–1910) was Professor of Mathematics and Astronomy at the Benares College[2] and made immense contributions to the study of Sanskrit texts on astronomy and mathematics by publishing many important texts with his own commentaries in Sanskrit; he also composed in Sanskrit and Hindi several textbooks on modern mathematics for the use of the students of the College. The colonial government conferred on him the coveted title Mahāmahopādhyāya in 1887.[3]

Sudhākara Dvivedī's *Gaṇakataraṅgiṇī* in Sanskrit is the first comprehensive account of the authors of Sanskrit works on mathematics, astronomy and astrology, arranged in chronological order, starting from Āryabhaṭa (398 Śaka = CE

1 Bendall 1902: 208, no. 501.

2 The college was established in 1791 by Jonathan Duncan on behalf of the East India Company; it was variously called the Queen's college, Benares College, or Sanskrit College, etc. It is now a full-fledged university called Sampurnanand Sanskrit University.

3 For a detailed bibliography of his writings, see Gupta 1900; Upādhyāya 1994: 300–317.

476) and reaching up to Govindadeva-śāstrī (1756 Śaka = CE 1833–34). It was published serially in the monthly journal of the College, the *Kāśīvidyā-sudhānidhi: The Pandit, Monthly Publication of the Benares College*.[4] It was also published in book-form in the same year.

In this *Gaṇakataraṅgiṇī*, Sudhākara Dvivedī stated that the present manuscript contains the horoscope of Nau Nihal Singh, the grandson of Maharaja Ranjit Singh of Lahore, and that the horoscope was prepared by Durgāśaṅkara Pāṭhaka of Benares who received one lakh of Rupees as his remuneration. Dvivedī does not mention the title of the manuscript but adds that it was decorated with many colourful pictures (*vicitra-citra-khacita*) and filled with many special features (*bahu-viśeṣa-vistṛta*).[5]

Bendall accepted this attribution of the horoscope to Nau Nihal Singh, as have the art-historian Jeremiah P. Losty and others.

THE GENESIS OF THIS PROJECT

In the summer of 1993, I spent six weeks in Britain for cataloguing the Indian astronomical instruments preserved there in different museums. I had already seen some of the illustrations from the *Sarvasiddhāntatattvacūḍāmaṇi* that were reproduced in modern publications.[6] Therefore, I took two afternoons off from my main work to look at the *Sarvasiddhāntatattvacūḍāmaṇi*, then in the British Museum. I copied the operative part of the horoscope and took notes about the rest of the manuscript.

While copying the horoscope, I could clearly see that the horoscope was not of Nau Nihal Singh as was generally supposed, but of Lehna Singh. Prince Nau Nihal Singh, the alleged native of the horoscope, was born in 1821 and died in 1840, whereas the horoscope deals with a birth that occurred in 1806 and clearly mentions the native's name as Lehna Singh, the son of Desa Singh. Lehna Singh was one of the generals of Maharaja Ranjit Singh. Disgusted at the court intrigues after the death of Ranjit Singh, he left Lahore and moved to Benares where he spent his time in the company of pandits. It is during this time that Lehna Singh must have had his horoscope prepared by Durgāśaṅkara Pāṭhaka and had it copied and illustrated by the artists in his entourage.

I thought that ideally the *Sarvasiddhāntatattvacūḍāmaṇi* should be studied by a team of scholars having expertise in Sanskrit astrology, history of astronomical paintings in Islam and in Medieval Europe and in the history of painting in the nineteenth century Punjab.

Recently I happened to discuss this illustrated horoscope with Professor Sumathi Ramaswamy and repeated my idea of teamwork. She responded by

4 Dvivedī 1892.

5 Dvivedī 1892: 118.

6 Losty 1982: 155, fig. 140; 1986: 79, fig. 69; Savage-Smith 1992: 69–70, figs 2.49, 2.50, 2.51; Pingree 1996: 126, fig. 42, plate VIII.

saying that, instead of waiting for a team in some indefinite future, I should publish my conclusions about the horoscope and set the record right about the native of the horoscope. This paper is the outcome of her suggestion.

OVERVIEW

This paper is divided into three parts. The first part contains the text of the horoscope together with my translation and comments. In the second part, I shall reproduce the published descriptions of the manuscript by Sudhākara Dvivedī, C. Bendall, J. P. Losty and others, and discuss the inconsistencies in these descriptions. The third part contains a brief outline of the life and accomplishments of Lehna Singh Majithia, the native of the horoscope.

1 THE HOROSCOPE

PHYSICAL DESCRIPTION OF THE MANUSCRIPT

In his catalogue, Bendall describes the physical properties of this manuscript in these words:[7]

> Or. 5259. — Foll. 293 (originally 1—304; foll. 5, 7, 9, 10, 17, 19, 101, 113, 117, 125, 156 are missing); 14 lines; European book-form, sm. 4to. Numerous illustrations (see below) and illuminations, the leaves being of coloured paper and beautifully bordered, and otherwise adorned. Bound in the style of many choice English works of earlier centuries in green velvet, ornamented on the sides with patterns worked in gold gimp with spangles. The method of using spangles to produce flower-forms is very unusual, and probably shows that the book was bound by a native workman of some originality, working merely after the general suggestion of a European model. Early 19th century.

The original copyist numbered the folios on the upper left corner on the reverse side of each folio in very small Devanagari numerals in red colour. The number 304 can still be seen on the reverse side of the very last folio. In London, the existing 293 folia were numbered continuously from 1 to 293, ignoring the omitted folia, by a European hand in pencil on the upper right corner on the obverse side. Bendall makes use of these pencilled folio numbers in his description, so does the British Library now. I shall also use them in my discussion. Bendall and Losty refer to the recto and verso of the folios as *a* and *b*. I shall follow the standard convention of *r* and *v*.[8]

7 Bendall 1902: 208a, no. 501.

8 Some of the personal names are variously spelt by different writers; I write "Nau Nihal Singh," "Lehna Singh," and "Dyal Singh."

LANGUAGE OF THE TEXT

The text contains a mixture of prose and verses in diverse metres. Several verses are presented in the form of pattern poetry (*citra-bandhas*), with lotus arrangements (*padma-bandhas*, where the syllables are arranged in the form of a lotus) predominating.[9] There are no marks of punctuation like *daṇḍas* to indicate the completion of a sentence in prose or the completion of a hemistich in verses. In my reproduction of the text, I have silently added *daṇḍas* at appropriate places.

Most striking are the unusual *sandhi*s, combining the last syllable of a word with the first syllable of the next word by unnecessary – sometimes incorrect – assimilation. For example,

- *śivaḥ śaṅkaro* is assimilated as *śivaś śaṅkaro* (folio 14*v*);
- *tārāvayāvībhūtaṃ ghaṭyādyaṃ* as *tārāvayāvībhūtaṅ ghaṭyādyaṃ* (15*r*-*v*);
- *guṇamitaṃ ghaṭīpramukham* as *guṇamitaṅ ghaṭīpramukham* (15*v*);
- *susaṃyutāsu* as *susañyutāsu* (15*v*);
  and so on.

In the reproduction of the text, I use the standard orthography and ignore these peculiar assimilations of the manuscript. Moreover, I introduce hyphens within the long compounds to facilitate reading.

Besides these orthographic peculiarities, there are several passages with obscure allusions, which I am unable to translate; such gaps in translation are marked with ellipsis dots.

The main text of the horoscope is written on 14*r*-16*v* (see Figures 3–8). Before introducing the horoscope, I may briefly mention what precedes the horoscope in the first 13 folios.

1*r* Invocation of Śiva (*śrīmat-sadguruḥ śivo vijayetarām*), followed by a verse with its letters arranged in the form of a lotus (*padma-bandha*); below that invocation of Gaṇeśa
2*r* Invocation of Gaṇeśa
3*r* Painting of Gaṇeśa with two attendants and a fat rat at his feet, upon the terrace of a Mughal building, with a pavilion at the back; in the background can be seen a river with a barge.
4*r* Invocation of Sarasvatī
5*r* Invocation of Śiva in a verse in *padma-bandha*

The last name appears somewhat unusual, but Dyal Singh himself may have written his name in this manner, for it is followed in the institutions named after him, i.e., Dyal Singh College and Dyal Singh Public Library, both in Delhi. In the case of Benares and Punjab, I retain the nineteenth-century spelling.

9 On *citra-bandhas*, see Battistini 2014; Ramakalyani forthcoming: appendix V.

6*r* Invocation of Rāma and his horoscope in a verse with the letters arranged in the form of a flower
7*r* Invocation of Kṛṣṇa and his horoscope in a verse in *padma-bandha*
8*r* Horoscope of Guru Nānak in a verse
9*r* Portrait of Guru Nānak, attended by a musician holding a *tānpurā*
10*r* Horoscope of Guru Govind Singh in a verse
11*r* Portrait of Guru Govind Singh, with an attendant holding a falcon
12*r* Ranjit Singh's horoscope in a verse, but no painting
13*r* Praise of Śrī-Śivalāla (Durgāśaṅkara's elder brother as well as his teacher), letters written in golden ink
13*r* Praise of the zodiac (*jyotiścakra*) with a diagram

TEXT AND TRANSLATION OF THE HOROSCOPE

The horoscope commences with an invocation of Īśa, the Supreme Principle. The invocation is written on folio 14*r* in 6 lines; the verse is encircled by garland of 12 large flowers, alternating with 12 small flowers. On the petals of the larger flowers are written various syllables to form some kind of multiple *padma-bandha*.

[14*r*]

प्रभवविरतिमध्यज्ञनवन्ध्या नितान्तं
विदितपरमतत्त्वा यत्र ते योगिनोऽपि ।
तमहमिह निमित्तं विश्वजन्मात्ययानाम्
अनुमितमभिवन्दे भग्नत्रैकालामीशम् ॥[10]

I worship Īśa, the Supreme Principle which can only be inferred,
Which transcends the triad of time (past, present and future),
Which is the Prime Cause for the origin and cessation of the Universe;
Of whose birth, death and the period between them,
Even the Yogins, who have realized the supreme truth, have absolutely no knowledge.

[14*v*]

शिवः शङ्करो[ऽस्]तु ते ।
श्रीमद्ब्राह्मे श्वेतवाराहसंज्ञे कल्पे यातेष्वत्र सौरात्मकेषु
भूभृत्खाङ्काष्टाब्धिनन्दद्विभूभृन्नन्दक्षोणी १९७२९४८९०७
सम्मितेष्वब्दकेषु

May Śiva be beneficent (*śaṃ-kara*) to you!

In the *kalpa* of Brahmā named *Śveta-vārāha*, when 1,972,948,907 solar (*saurātmaka*) years have elapsed;

10 Metre Mālinī.

एवमभ्रगचारकालतः सृष्टि-संज्ञत इहाब्दसञ्चये
शैलशून्यनववेदवारणाष्टेषुबाणनवभू १९५५८८४९०७ मिते गते[11]

likewise, from the time of the movement of planets (**अभ्रगचारकाल**), which is called the Creation (**सृष्टि**), when the cluster of years counted as 1,955,884,907 have passed;

यस्मिन्युगे षड्ककारका वै युधिष्ठिराद्याः खलु सार्वभौमाः

in that yuga in which there [flourished] six universal monarchs (**सार्वभौम**), beginning with Yudhiṣṭhira, who were in fact the founders of [their own] eras (**शककारक**);[12]

तस्याद्रिशून्याङ्कसमुद्रतुल्ये ४९०७ समागणे तिष्ययुगस्य याते

of that Tiṣya-yuga (= Kali-yuga), when a group of **4907** years (**समागण**) have passed;

स्वस्ति श्रीभूवासववीरश्रीविक्रमार्कशकनृपतेः राज्यानेहो [ऽ]तीते गुणरसधृति १८६३ सम्मिते वर्षे

may it be auspicious — [in] the era of the reign (**राज्य** + **अनेहः**) of the glorious hero Vikramārka, the resplendent Indra on the Earth (**श्रीभूवासव**), when the year 1863 has elapsed;

श्रीशालिवाहनो यः कलौ तृतीयः शकप्रवृत्तिकरः तच्छकवत्सरनिचये गजभुजनगभू १७२८ मिते ऽतीते

the glorious Śālivāhana, who was the third promulgator of an era,[13] in his era, when the group of years counted as **1728** have elapsed;

गौरवमाना[15*r*]द्रेवासौम्यविभागे विरिञ्चिविंशत्यां यस्येश्वरः शिखावानीश्वरसंवत्सरे तस्मिन्

according to the Jovian count (**गौरवमान**), [as practised] to the north of the [river] Revā, in the year Īśvara [the eleventh year which falls] within the twenty [years assigned to] Viriñci and whose regent is Agni [**शिखावान्**];

11 The *Sūrya-siddhānta* 1.24 postulates that after the commencement of the Kalpa, the Creator was busy creating the universe for 17,064,000 years, during which time the planets remained stationary and did not move. The difference between the commencement of Kalpa and the commencement of planetary movements is 17,064,000 years. The present manuscript mentions the time of birth in years counted from the beginning of the Kalpa and also from the time when the creation was completed.

12 Yudhiṣṭhira flourished in Dvāpara and not in Kali! Which era did he promulgate? Who are the other Śaka-kāraka?

13 Who are the first and second promulgators?

विषुवद्वलयादुत्तरयाम्यौ भागौ तु यौ क्रमशः तौ सौम्ययाम्यगोलावत्रोदग्गोलगे तरणौ मकरादिराशिषड्के चण्डकरस्यात्र संस्थित्या उदगयने सुरदिवसे ग्रीष्मर्तौ

— the parts to the north and south of the equator (**विषुवद्-वलय**) are respectively [known as] the northern and southern hemispheres (**गोल**) — here when the Sun (**तरणि**) is in the northern hemisphere (**उदग्गोल**), consisting of the six zodiac signs, beginning with Capricorn (**मकरादि-षड्क**); in the northern progress (**उदगयन**) because the Sun's (**चण्डकर**) situation here; in the day of the gods (**सुरदिवस**),[14] in the Grīṣma-ṛtu;

चण्डचण्डांश२गै सुन्दरसुधासरसिके २ मा मा सौम्ये व माधवे सक्ता मुख्यानेहसि तस्मिन् सरससुखासीमसंलब्धिः

...

गौणज्येष्ठे रिक्तिकोग्रादिष्टे कृष्णाश्रिता स्थिता ततः सुधर्मिणी पूर्णा जाता कृष्णे ऽपि सौख्यदा पीयूषरश्मिवारे दुर्गातिथौ घनप्रमाघटिकाः शक्रपलैः समेता १७ । १४ रविविधुगत्यन्तरेण संभूताः जीवनपतिनक्षत्रे रसदस्त्रा विधुशराश् चैतत् २६ । ५१ तारावयावी-भूतं [15*v*] घट्याद्यं

in the month of Jyeṣṭha, which is reckoned from full moon to full moon (**गौण**) ... on Monday (**पीयूषरश्मि-वार**), on the tenth lunar day (**दुर्गातिथि**),[15] at 17 ghaṭikās (**घनप्रमाघटिकाः**) and 14 palas (**शक्रपल**) [from sunrise]; at Jīvanapati-nakṣatra (probably Śatabhiṣaj), the nakṣatra which is produced by the difference in the respective velocities of the Sun and the Moon, the nakṣatra that commences at 26 ghaṭīs and 51 [palas from sunrise];

शशिजवोद्भूतं तोयपतेस्तारायां तात्कालिकतोयतारायामैन्द्रस्य पङ्क्तितुल्यं नगशरतुल्यं च १० । ५७ घट्याद्यं

arising out of the velocity of the Moon, ...[at] 10 ghaṭīs and 57 palas;

तदुपरि चरमे योगे शैलमितं गुणमितं घटीप्रमुखम् ७।३ यातं चैतद्दिनकरहिमकरगतियोग-सम्भूतम् ।

furthermore, in the final yoga (*Vaidhṛti*), in which 7 ghaṭīs and 3 palas have elapsed, – a yoga that arises out of the sum of the velocities of the Sun and the Moon (**दिनकरहिमकरगतियोगसम्भूत**);

14 The northern course of the sun (**उत्तरायण**) is said to constitute the day of gods and the southern course (**दक्षिणायन**) their night.

15 Here *durgā* apparently indicates 10; later in the horoscope (19*r*-*v*) the *tithi* is clearly mentioned as *daśamī*, with an illustration representing it.

प्रातश्चोग्रातुल्यं गर (?) तिथ्यर्धस्य शेषघटिकाद्यं १७।१४ तदुपरि वणिजे करणे गगनतर्काब्धयो ०।४६ यातम् ।

in the morning, the ferocious (उग्र) Gara [karaṇa], which is half of a lunar day, [which commences] at 17 ghaṭīs and 14 palas [since sunrise]; thereafter, in the *Vaṇija-karaṇa*, in which 0 ghaṭīs and 46 palas have elapsed;

एवंविधपञ्चाङ्गं यस्मिन्तस्मिन् शुभप्रदे दिवसे वृषभस्थेशानतनोस्

on such an auspicious day when such five limbs of calendric elements (पञ्चाङ्ग, i.e., तिथि, वार, नक्षत्र, योग and करण) coincide, when Īśānatanu is situated in *Taurus* (वृषभ),

सोमां२गन्तः सुदृक्कलावये श्रीपद्मिनीशतनुकेन्द्रकरोदयस्य कालाद्गतासु धृतिसम्मितनाडिक्सु । १८ । १ शीतांशुसम्मितपलेन सुसंयुतासु प्राग्भूजगे भवलयस्थितलेयराशौ हरिभवने हरिभार्द्धे मित्रत्र्यंशे बुधस्य नन्दांशे

[16*r*] भूनन्दनेन भागे हरिजत्रिंआंशके हरिजे
...

ईरानद्रुमखण्डनैकपरशुश्शाहाटवीपावको
वलाद्भूमभुजङ्गराजगरुडो रब्बाब्धिकुम्भोद्भवः ।
गर्जल्लुन्दनराजसिन्धुरहरिर्हष्शान्धकारार्यमा
मुल्तानाम्बुजचन्द्रमाः स रणजित्सिंहाह्वयो राजते॥[16]

The sole axe to cut down the tree that is Iran,
The fire [to burn down] the forest that are the Shahs;
The [divine] Garuḍa [to vanquish] the king of snakes [namely] ...
The Agastya to empty the ocean which are the Rabbas;
The roaring lion for the elephant that is the King of London;
The Sun [*aryaman*] [to dispel] the darkness which are the ...
The moon for the lotus that is Multan,
The one called **Raṇajit Siṃha** shines.

यदीयचञ्चन्निशितासिधारा
चण्डांशुतप्तावयवा विपक्षाः ।
कुर्युर् दिगन्ताद्रिगुहाप्रलीना
निजाश्रुभिर्निर्झरिणः स्वगोत्रान्॥[17]

The enemy troops, whose limbs are singed by the Sun which is the cutting edge of the sharp sword of his which is leaping, hiding in the caves of the remote mountains, convert with their tears their own gotras into waterfalls (?).

16 Metre Śārdūlavikrīḍita.

17 Metre Upajāti.

तस्येह धर्मगोप्तुर्हर्यवतारस्य शाककाले च
सन्मन्त्रिमुख्यमुख्यो देशासिंहः स राजवर्यो ऽभूत्॥[18]

Of this protector of dharma, the very incarnation of Hari, ..., Deśāsiṃha became the chief of the prominent ministers, this foremost chieftain (राजवर्य).

श्रीमद्भूसुरकैरवव्रजविधू राजन्यमौलिस्फुरद्-
रत्नव्रातमरीचिचुम्बितपदाम्भोजो वदान्यः सुधीः ।
देशासिंह इति प्रथामधिगतो दुर्वृत्तशास्ता च यः
साध्वी सूनुमसूत तस्य रमणी प्राची सुधांशुं यथा ॥[19]

Deśāsiṃha was the Moon for the cluster of night lotuses (कैरव), [namely] the prosperous Brahmins; his lotus feet were kissed by the rays of the sparkling gems on the heads of the chiefs; he was renowned for being munificent, wise and subduer of rogues (दुर्वृत्तशास्ता). His virtuous wife gave birth to a son, just as the eastern direction [gives birth to] the Moon.

कीर्तिपरागैर्जुष्टं तुष्टं रणजीतसिंहसूर्येण ।
अमृतसरोवरजातं लैह्ना-सिंहाख्यम् अम्बुजं जयति ॥[20]

The lotus named Laihṇā-siṃha excels, which grew in the lake of nectar (Amritsar), which is filled with the pollens of fame (कीर्तिपराग) of, and made to bloom (तुष्ट) by, the Sun, [that is] Raṇajīta-siṃha.

यः श्रीमान् यवनेश्वरान् विदलयन् शौर्यादिभिः सद्गुणैर्
नीत्याचार-विचार-सार-चतुरो वीरो गुरोः सेवकः ।
व्यूहाखेट-विशेष-विन् नृप-कर-ग्राही स शूराग्रणीर्
जीयाद् राजशिरोमणिर् विजयकृच् छ्री-लैहणा-सिंहकः ॥[21]

May this glorious Laihaṇā-siṃha flourish! He is endowed with radiance (श्रीमान्); he vanquished the Muslim rulers with his valour and other virtues; expert in the observance of the daily rituals and conduct; brave, devoutee of Guru [Nanak], one who has a detailed knowledge of military formations and hunting, one who collects tributes from [other] chiefs, the foremost of the valiant, the crest-jewel of the chiefs, the producer of victory.

शतपद-चक्र-विचाराच्
छततारायाश्चतुर्थ-चरणोत्थम् ।

18 Metre Udgīti.
19 Metre Śārdūlavikrīḍita.
20 Metre unknown.
21 Metre Śārdūlavikrīḍita.

स्वाद्यर्णसंयुतं तं तद्
दीर्घायुष्मज्जनेर्नाम राशिः ॥[22]
कुम्भः शूद्रवर्णो [ऽ]र्कसूनुर्भेशस्त्वाद्या नाडिका वाहयोनिः ।
वायुहंसश्चासुराख्यो गणो [ऽ]स्य ज्ञेयो वर्गो मेषको मङ्गलार्थम् ॥[23]

According to the [astronomical] table with one hundred cells (**शतपद-चक्र**),
born in the fourth quarter of the Śatabhiṣaj *nakṣatra*, ... longevity; the name of the zodiac sign at the time of birth [is] Aquarius (**कुम्भ**); the lord of the asterism (**भेश**) is Saturn, having the colour of a Śūdra; ...

[17*r*]

Horoscope as a rectangular diagram; below that is the following verse:

स्वस्ति श्रीमद्देशासिंहतनूजस्य शर्मयुक्तस्य ।
खगयुततनुकुण्डलिका विचाररम्या विनिर्मिता सुखदा ॥[24]

May it be auspicious! Of the son of the glorious Deśāsiṃha, [here] is drawn the horoscope chart (**तनुकुण्डलिका**), together with planetary positions (**खग-युत**), pleasing to ponder (**विचार-रम्या**) and beneficent (**सुखदा**).

[17*v*]

Horoscope as a circular diagram, 12 radial divisions, 7 concentric circles, showing planetary positions in different signs. The horoscope does not end here, but continues on folios 18*r*–22*v*, where additional material is presented, such as the effects (**फल**) of the various elements of Lehna Singh's horoscope and their personified images (**स्वरूप**).

[18*r*–*v*]

The effect of the time of birth (**जन्मफल**).

Miniature painting: a god performing **यज्ञ** with four attendants.

[19*r*]

The effect of the month (**मासफलम्**).

The effect of the fortnight (**पक्षफलम्**).

The lunar day is the tenth (**तिथि = दशमी**)

22 Metre Gīti.
23 Metre unknown.
24 Metre Gīti.

[19*v*]

The image of the lunar day (तिथिस्वरूपम्).

Miniature: personification of the tenth lunar day (दशमी) (four-armed goddess, hairy, dark-limbed, wearing golden clothes).[25]

[20*r*]

अथ ध्यानं वासरस्य

now the invocation of the weekday.

[20*v*]

Miniature: personification of Monday.

[21*r*]

अथ जननभरूपम्

now the image of the lunar mansion at the time of birth.

Miniature: personification of Śatabhiṣaj.

[22*b*]

जननसमययोगस्वरूपम्

image of the yoga at the time of birth

Miniature: personification of Vaidhṛti-yoga.

[22*v*]

Miniature: personification of Vaṇijākhya-karaṇa.

The rest of the manuscript carries summaries of Hindu, Islamic and Europeans systems of astronomy and astrology with appropriate illustrations and diagrams, including a diagram of the heliocentric system of Copernicus. All this must have been added at the instance of Lehna Singh who had greater exposure to the Islamic and Europeans systems at the Lahore Court.

Bendall states that the following verse occurs on folio 290 (he does not specify the side of the folio). It appears to be the concluding verse or the colophon.

25 On the pictorial representation of various astrological elements, see Hartner 1938; Pingree 1963; Savage-Smith 1985; Pingree 1989.

श्रीकाश्यां सर्वसिद्धान्तचूडामणिः कृतः ।
श्रीहरेः पत्रिकाव्याजाद्दुर्गाशङ्करपाठकैः ॥[26]

The *Sarvasiddhāntatattvacūḍāmaṇi* was composed at the auspicious Kāśī (i.e., Benares) by Durgāśaṅkara Pāṭhaka in the guise of the horoscope of the illustrious Hari.

Here the horoscope is said to be of Hari. Obviously it is a play on the words "*hari*" and "*singh*" in the name of Lehna Singh, for both the words denote "lion."

SUMMARY OF THE HOROSCOPE

Lehna Singh's birth took place at Amritsar on Kali 4907 (expired), Vikrama 1863 (expired), Śaka 1728 (expired), Īśvara (Jovian year, northern count, current), Jyeṣṭha month (*pūrṇimānta*), 10th *tithi*, Monday, *Vaidhṛti-yoga*, *Vaṇija-karaṇa*, the fourth *pāda* of the *Śatabhiṣaj-nakṣtra*, with the ascendant (*janma-rāśi*) in Aquarius (*kumbha*), *at 17 ghaṭikās and 14 palas* (6 hours, 51 minutes, 36 seconds) [*after sunrise*]. *The date corresponds to 12 May* 1806, Monday.

DATE OF COMPOSITION OF THE *SARVA-SIDDHĀNTA-TATTVA-CŪḌĀMANI*

Having determined that the horoscope is that of Lehna Singh, we now turn to the time of its composition. Obviously it was not prepared immediately after the birth of Lehna Singh in 1806, but much later when Lehna Singh came live in Benares about 1844. At Benares a son was born to him in 1848. The son Dyal Singh Majithia turned out to be the founder of modern institutions like the Punjab Bank and the newspaper *The Tribune*.[27] *He set up an educational trust which later established colleges and libraries like the Dyal Singh College and the Dyal Singh Public Library in Delhi.* He lost his parents when he was six, i.e. in 1854.

Therefore, the *Sarvasiddhāntatattvacūḍāmaṇi* must have been composed between 1844 and 1854; closer to 1854 because the miniature painting on folio 291*r* (Fig. 10) shows Dyal Singh as five or six years old. Apparently, Lehna Singh wanted his son also to be depicted in this painting, together with Durgaśaṅkara. They are seated on a terrace with an assortment of globes and other astronomical instruments.

Sudhākara writes that Durgāśaṅkara was an expert in singing, painting and playing several musical instruments.[28] But the present manuscript could not have been copied and illustrated by him. It is more probable that the manuscript was prepared by the artists in the entourage of Lehna Singh and that they imitated some of the paintings in the European books in the personal collection of Lehna Singh.

26 Metre Anuṣṭubh.

27 Gopal 1994.

28 *Gaṇakataraṅgiṇī*, p. 120: *ayaṃ saṅgīte citraracanāyām aśeṣavādyavidhau ca kuśalaḥ* ...

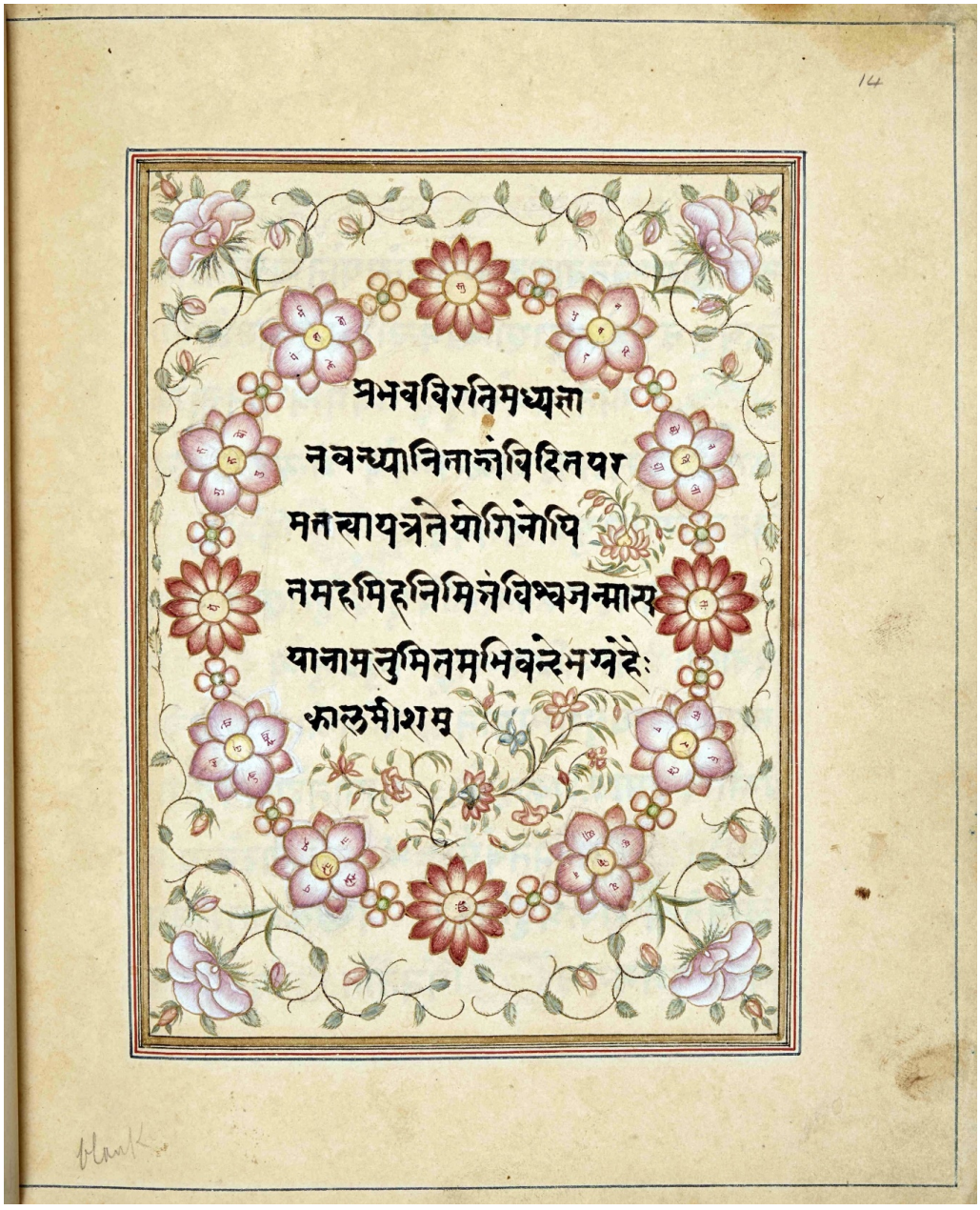

Figure 2: Lehna Singh's horoscope © British Library Board (MS London BL Or. 5259, f. 14*r*).

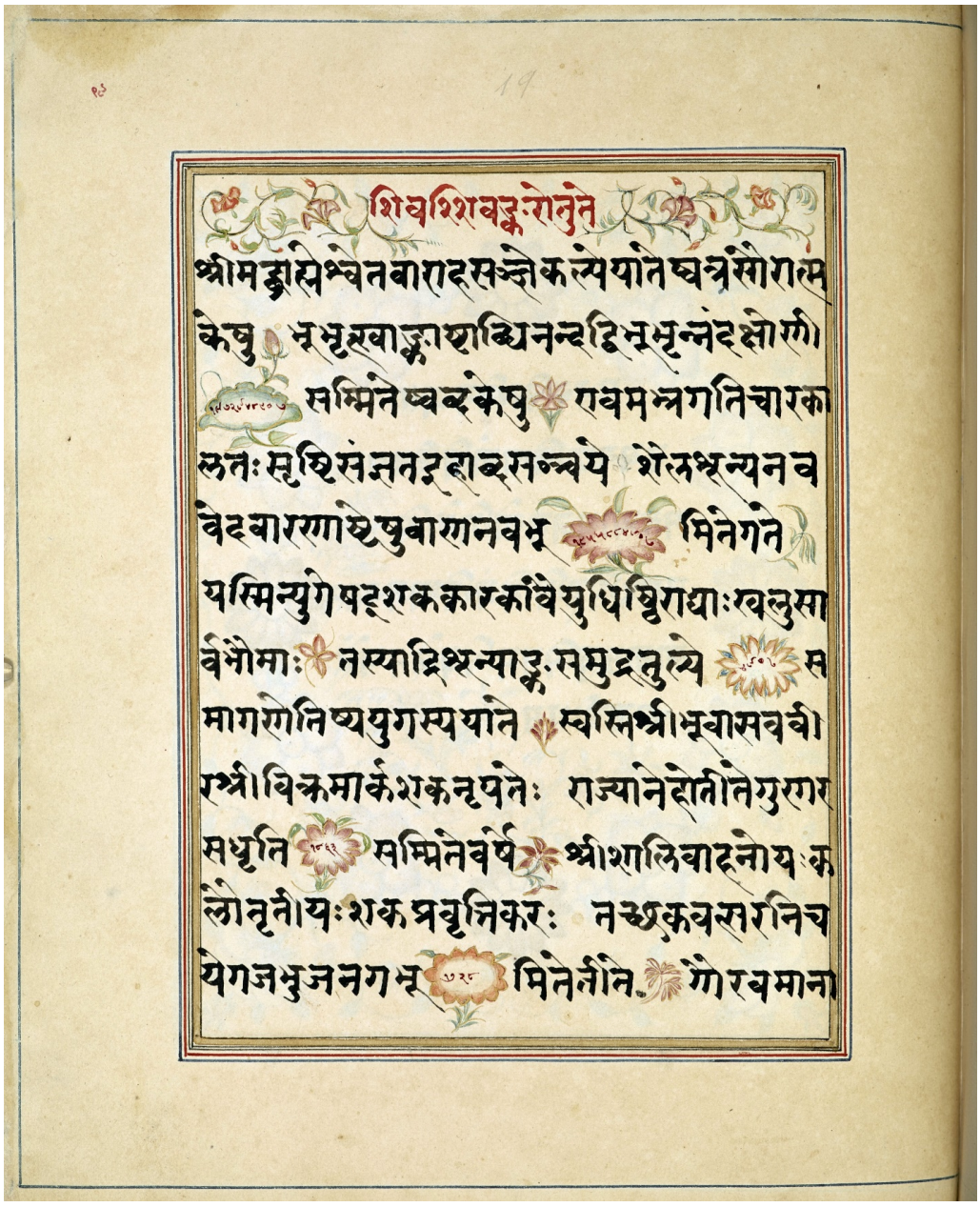

Figure 3: Lehna Singh's horoscope (continued). The original folio number 19 can be seen at the upper left corner. © British Library Board (MS London BL Or. 5259, f. 14*v*).

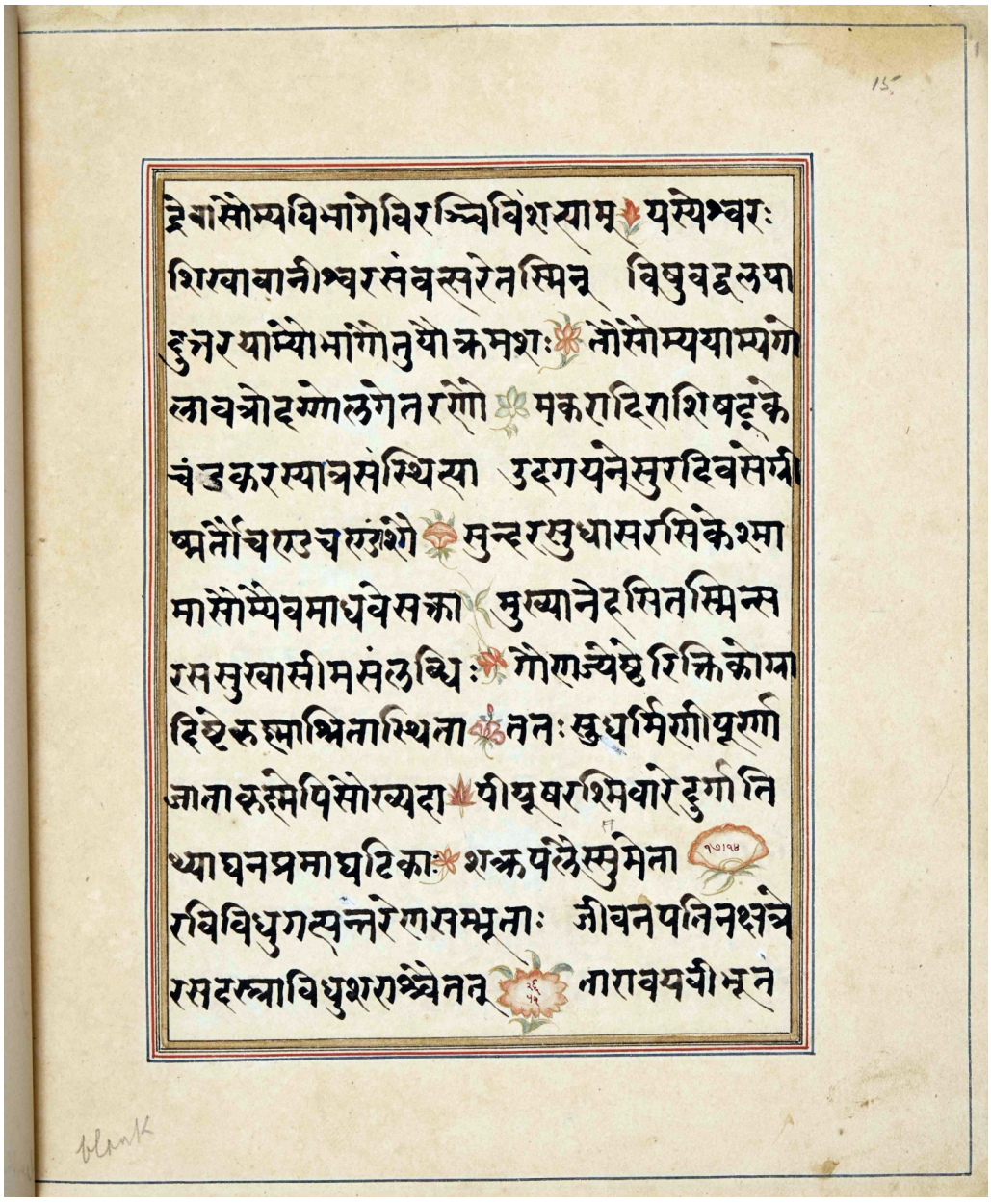

Figure 4: Lehna Singh's horoscope (continued). © British Library Board (MS London BL Or. 5259, f. 15*r*).

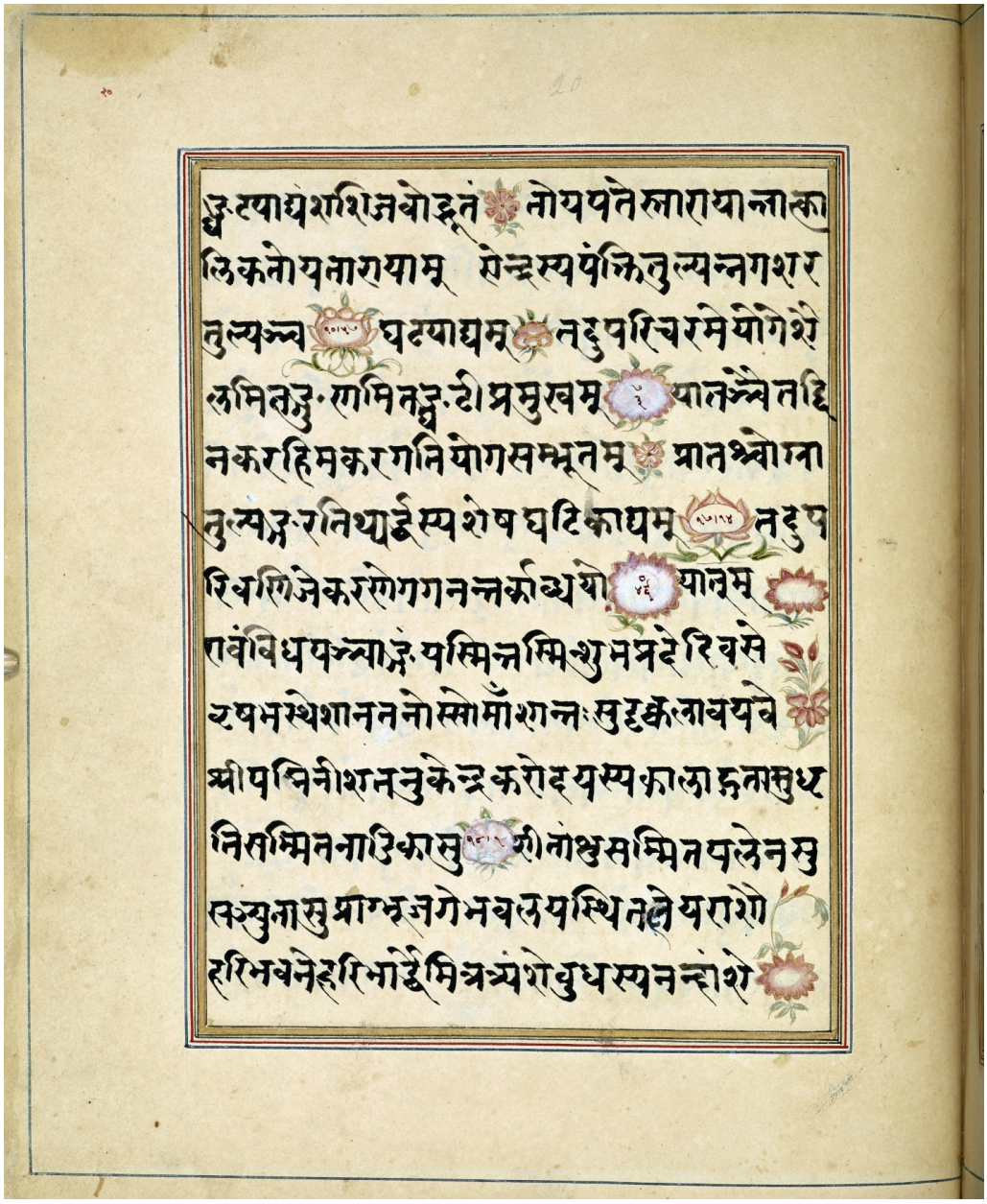

Figure 5: Lehna Singh's horoscope (continued). The original folio number 20 can be seen on the upper left corner. © British Library Board (MS London BL Or. 5259, f. 15*v*).

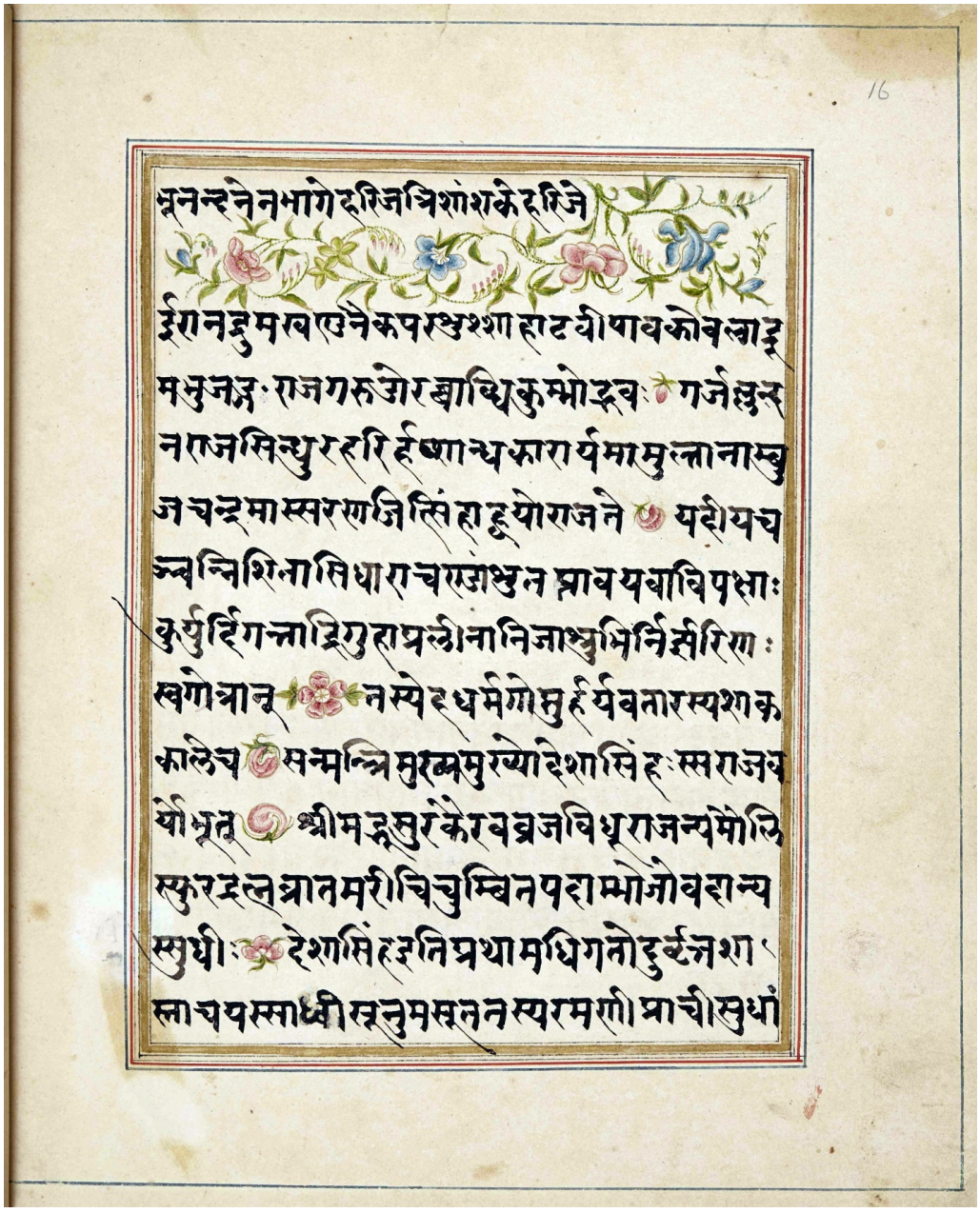

Figure 6: Lehna Singh's horoscope (continued). © British Library Board (MS London BL Or. 5259, f. 16*r*).

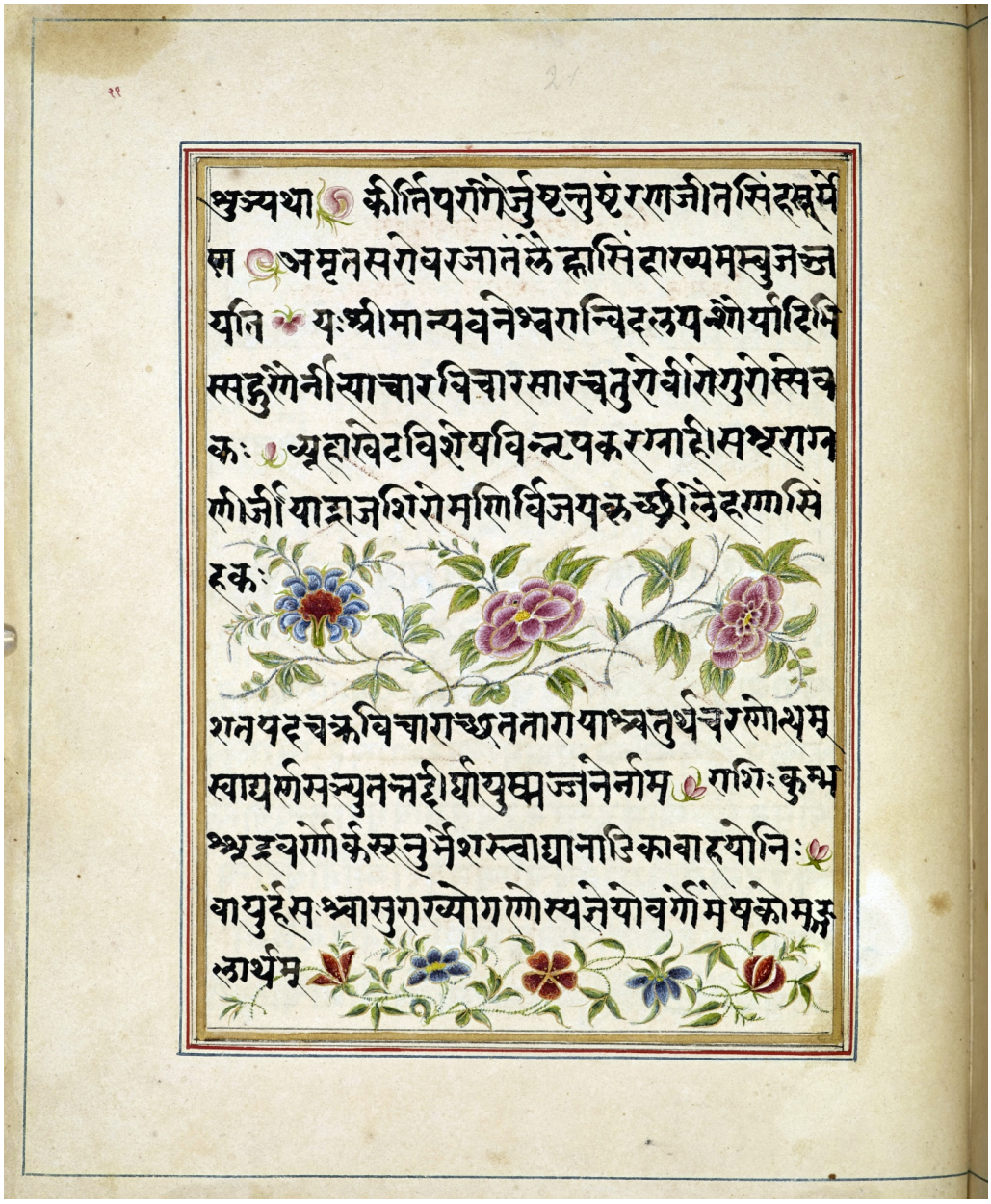

Figure 7: Lehna Singh's horoscope (continued). The original folio number 21 can be seen in the upper left corner. © British Library Board (MS London BL Or. 5259, f. 16*v*).

2 PUBLISHED ACCOUNTS ON THE NATURE OF THE HOROSCOPE IN THE *SARVASIDDHĀNTATATTVACŪḌĀMAṆI*

SUDHĀKARA DVIVEDĪ, *GAṆAKATARAṄGIṆĪ*, 1892

In his account of the life and work of Durgāśaṅkara Pāṭhaka, Sudhākara stated the following about the horoscope:[29]

दुर्गाशङ्कर पाठकः । १७०९
काशीस्थः शिवलालपाठकानुजो लक्ष्मीपतेः स्वभ्रातुश्चाधीतज्यौतिषव्याकरण-काव्यसाहित्यतन्त्रविद्य औदीच्यब्राह्मणः स्वसमये जगतां गुरुरासीत् । अस्य शिष्यो ज्योतिर्विल्लज्जाशङ्करशर्म्मा काशिकराजकीयप्रथानपाठशालायां प्रधानगणित-शास्त्राध्यापकस्तथा हीरानन्दचतुर्वेदश्च तत्रैव प्रधानकाव्यसाहित्याध्यापक आसीत् । लाहोरनृपतिरणजितसिंहनिधनानन्तरमेतन्मुहूर्तेन खड्गसिंहः सिंहासनमध्यारोहत् । तदनन्तरमेतेन नवनिहालसिंहस्य जन्म[a]पत्रं विचित्रचित्रखचितं बहुविशेषविस्तृतं विरचितं यदीयरचनया जातहर्षो लाहोरनरपतिरस्मै लक्षमुद्रासन्नधनानि ददौ ।

[a]इदं जन्मपत्रं काशीस्थछन्नूलालवकीलद्वारा पोर्तसाहिबेन गृहीतं तत्पत्नी च सम्प्रति तन्नीत्वा स्वदेशं गतवती । नवनिहालसिंहस्याकस्मान्मृत्युना तत्रासूचितेन तदनादरः पाठकानादरः पश्चान्महान्जातो लाहोरनगरे यत्रत्यजनैर्जन्मपत्रस्थमिथ्यालेखकारणक्रुद्धैः पाठकस्य मृत्युभयमुपस्थितं परन्तु लहनासिंहेन तत्र कोटाधीशेन रक्षितो बहुना काठिन्येन काशीमुपागमत्पाठक इति श्रूयते ।

Translation

Durgāśaṅkara Pāṭhaka was a resident of Kāśī (i.e., Benares), the younger brother (*anuja*) of Śivalāla Pāṭhaka, an *audīcya* Brahmin; studied the disciplines of *Jyautiṣa*, *Vyākaraṇa*, *Kāvya*, *Sāhitya* and *Tantra* with Lakṣmīpati[30] and with his own brother (i.e., Śivalāla Pāṭhaka); he was the *guru* of all the people of his time. His pupil Lajjāśaṅkara Śarmā was the chief preceptor of *Gaṇita* at the Government College of Kāśī (i.e. Benares College) and [his pupil] Hīrānanda Caturveda was the chief preceptor of *Kāvya* and *Sāhitya* in the same college. After the death of Ranjit Singh, the ruler of Lahore, Kharak Singh ascended the throne on the astrologically propitious moment (*muhūrta*) prescribed by him (i.e. Durgāśaṅkara).

29 Dvivedī 1892: 118–120.

30 On Lakṣmīpati, see *Gaṇakataraṅgiṇī* (Dvivedī 1892: 112–113). He was the teacher of Śivalāla Pāṭhaka, Durgāśaṅkara Pāṭhaka and others. When Jonathan Duncan established the Benares College in 1791, Lakṣmīpati was appointed there as the chief preceptor of mathematical astronomy (*Gaṇita*).

> Thereafter, he prepared the horoscope (*janma-patra*)[a] of [Kharak Singh's son] Nau Nihal Singh, decorated it with colourful pictures (*vicitra-citra-khacita*) and filled it with many special features (*bahu-viśaṣa-vistṛta*). Delighted by the production of this horoscope, the king of Lahore gave him one lakh of Rupees.

[a] This horoscope was acquired through the mediation of Channūlāl Vakīl of Benares by Mr Porter; his wife departed to her country along with this horoscope. Because of the sudden death of Nau Nihal Singh which was not indicated there (i.e., in the horoscope), contempt (*anādara*) was shown to it (i.e., the horoscope) and to Pāṭhaka in the city of Lahore. There was the danger of Pāṭhaka's death in the hands of people of Lahore who were incensed at the false writings in the horoscope (*janmapatrastha-mithyā-lekhana*); but it is said that he was saved by Lahna Singh, the commandant of the fort (*koṭādhīśa*) there, and that he returned to Benares with great difficulty.

Critique of Sudhākara Dvivedī's Account

Many Maharajas from different parts of India erected palaces in Benares, preferably on the banks of the river Gaṅgā, for their residence whenever they or the members of their family made the pilgrimage to Benares. Maharajas may also have consulted the astrologers of Benares and had them fix the auspicious times (*muhūrtas*) for important events. Therefore, it is not improbable that Durgāśaṅkara was asked by Kharak Singh to fix an auspicious time for his ascension to the throne of Lahore.

But there are problems about Kharak Singh's ascension. He was, no doubt, Ranjit Singh's first son and helped him in the conquest of Multan and in the annexation of Kashmir. Even so, there were other claimants to Ranjit Singh's throne and Kharak Singh's first priority was to overcome the other claimants and seize the throne of Lahore as soon as possible; he could not have had the time and opportunity to ask for an auspicious moment (*muhūrta*) for ascending the throne. In this connection, Madan Gopal writes:[31]

> Maharaja Ranjit Singh's death, in 1839, was followed by a period of near anarchy. Personal intrigues involving the claimants to the *gaddi*, Kharak Singh, Sher Singh, Tara Singh, Multana Singh, Peshaura Singh, three Dogra brothers, Chet Singh, Dhian Singh and Gulab Singh, and two Sandhanwallia chiefs Attar Singh and Ajit Singh were carried to murderous lengths. The British also played their cards adroitly.
>
> The person who succeeded Ranjit Singh was his eldest son, Kharak Singh by his second wife. Kharak Singh favoured the Dogra chief Chet Singh. [...] Within a few months of Ranjit Singh's death, Chet

31 Gopal 1994: 14–15.

> Singh was murdered and the following year Kharak Singh also died. His son, Nau Nihal Singh, was killed, while returning from the funeral rites of his father. A large piece of stone, it is said, was deliberately placed to fall on him, as he was passing through the gate.
>
> Kharak Singh's widow, Mai Chand Kaur, became a regent. She appointed Gulab Singh as the Commander-in-Chief and gave him the charge of the city of Lahore. In January 1841, Sher Singh shelled the city and forced his entry into the fort. Mai Chand Kaur's reign of a month-and-a-half was over.

Sudhākara's narrative implies that Nau Nihal Singh's horoscope was commissioned after Kharak Singh ascended the throne in 1839 (note the expression *tadantaram* "after that") and not immediately after the birth of Nau Nihal Singh in 1821. Sudhākara goes on to state that Karak Singh was pleased with the horoscope and gave one lakh of Rupees to Durgāśaṅkara. This would mean that the horoscope was received by Kharak Singh and that it was with him or with Nau Nihal Singh.

But the footnote contradicts the above statement in many ways. First, if Kharak was pleased with the horoscope and rewarded Durgāśaṅkara with a sumptuous honorarium, then this prized horoscope would be at the Lahore court and would not have reached Benares to be acquired later in the 1880s by Porter. The second sentence, with its clumsy syntax, implies that Durgāśaṅkara was present in Lahore at the time of Nau Nihal Singh's death. There are two possibilities. First, after presenting the horoscope to Kharak Singh who commissioned it and after receiving from him the honorarium, Durgāśaṅkara remained still in Lahore, for no apparent reason, until 5 November when both Karak Singh and Nau Nihal Singh died. Second, he reached Lahore about the time just when Kharak Singh and Nau Nihal died. Then he could not have received the remuneration of one lakh of Rupees.

It is true that Nau Nihal Singh's death was unexpected. But how could Nau Nihal's followers know that the sudden death was not mentioned in the horoscope? Durgāśaṅkara's style is not easy to understand; if two scholars like Bendall and Losty, who actually saw the manuscript, could not recognize Lehna Singh's horoscope on folios 14 ff., how would the people of Lahore, or those in the entourage of Nau Nihal Singh, understand the allegedly false statements in the horoscope of Nau Nihal Singh's horoscope?

Sudhākara, who wrote the account in 1892, i.e., about forty years after the production of the horoscope, clearly had no idea about the nature and the content of the horoscope, except that it was decorated and detailed (*vicitra-citra-khacita* and *bahu-viśeṣa-vistṛta*). His whole narrative is clearly based on the gossip among the Brahmin circles of Benares, with an undercurrent of jealousy towards Dur-

gāśaṅkara's contacts with the Maharajas of that time.

Unfortunately, Sudhākara's account of the horoscope made by Durgaśaṅkara is full of inconsistences. But I must hasten to add this account in no way reflects the reliability of the rest of the *Gaṇakataraṅgiṇī.* Indeed, since its publication in 1892, the *Gaṇakataraṅgiṇī* has served as an invaluable source for the history of astronomy and mathematics in India. In this work, the accounts of historical figures like Āryabhaṭa and Varāhamihira were fairly accurate, quite often based on the manuscript copies of their works preserved in the Benares College. More important, his accounts of his near contemporaries and contemporaries are very informative and give us a clear idea of the vibrant scholarly activities in nineteenth-century Benares.

CECIL BENDALL, *CATALOGUE OF THE SANSKRIT MANUSCRIPTS IN THE BRITISH MUSEUM*, 1902

Bendall's description of the physical properties of the manuscript have already been cited above on p. 170. His account of the contents of the manuscript is as follows:[32]

> SARVASIDDHĀNTATATTVACŪḌĀMAṆI, by
> DURGĀŚAṄKARA PĀṬHAKA
>
> An account of the career of Durgāśaṅkara is given at p. 118 [392] of the *Gaṇakataraṅgiṇi* by Pandit Sudhākara of Benares ('Pandit,' N. Ser., vol. xiv.). From it we learn that the author was the son [sic!] of Śivalāla Pāṭhaka, was born Śaka 1709 (A.D. 1787), and lived at Benares. The present document is the horoscope (*janmapattra*) of the prince Navanihāl Singh (1821-40) of Lahore, made by the orders of his father Khaḍga Singh.[a] Khaḍga ('Kharrak') succeeded his father Ranjit Singh in 1839, and was poisoned by order of Navanihāl[b] in November 1840.
>
> We also learn from Sudhākara's account that a lakh of rupees was originally paid for the present MS., and that it was acquired by Mr. Porter through the agency of a Benares *vakil* named Cunna Lāla.
>
> The work, besides the horoscope, contains much general information on astronomy and astrology, and is to be regarded as an album of *jyotisha*, having the horoscope merely as a nucleus.

[a] This statement rests on the authority of Sudhākara, who doubtless has full cognisance of the facts. I have not been able to verify it from the MS, which, indeed, requires an astrological expert for its full elucidation. The name of Navanihāl probably occurred on one of the lost leaves.

[b] L. Griffin, The Panjab Chiefs, pp. 1-5

32 Bendall 1902: 208, no. 501.

> The whole book forms an excellent example of modern Indian calligraphy, illumination and miniature painting.
>
> The book was drawn up before the death (1839) of Ranjit Singh. See foll. 11, 12, where he is mentioned, and a full-page miniature is given with portrait; more particularly about him at fol. 16*a–b*. Laihnā Singh is mentioned at fol. 16*b*.[a]
> At fol. 29 occurs another large miniature, showing the author's nephew Jaṭāśaṅkara ('Pandit, ' *l.c.*, p. 120) giving instruction in the use of astronomical instruments.
> Foll. 63–132 treat chiefly of the zodiac, with abundant finely executed illustrations.
> Fol. 133 contains a picture of a British ship, probably copied from an old picture.
> Fol. 291 consists of a fine drawing of an astronomer, presumably the author, giving instruction to a pupil.
> Title (fol. 290):
> **श्री काश्यां सर्वसिद्धान्तचूडामणिः कृतः । श्री हरेः पत्रिका व्याजाद् दुर्गाशङ्करपाठकैः ॥**

[a] Who subsequently befriended the author; Sudhākara, op. cit., p. 118, note,*. Sir L. Griffin (op. cit. p. 90) mentions his love for astronomy.

Critique of Bendall's Views

Bendall described the contents of the manuscript quite meticulously. About the native of the horoscope, he added in a footnote:

> This statement rests on the authority of Sudhākara, who doubtless has full cognisance of the facts. I have not been able to verify it from the MS, which, indeed, requires an astrological expert for its full elucidation. The name of Navanihāl probably occurred on one of the lost leaves.

(i) But had he paused to look at the dates on folio 14*b*, he would have noticed that the birth took place in Kali 4709, Vikrama 1863, Śaka 1728 = CE 1806, which could not be the year in which Nau Nihal Singh was born.

(ii) Unfortunately, Bendall did not read carefully the *Gaṇakataraṅgiṇī* either. There it is stated that Durgāśaṅkara was the younger brother of Śivalāla (**शिवलालपाठकानुजः**); he misunderstood it as the son (and this was repeated by Losty and others).

(iii) Sudhākara's mention of Śaka 1709 (= A.D. 1787) as the year in which Durgāśaṅkara was born was only a guestimate. He stated that Durgāśaṅkara sent a letter to Lancelot Wilkinson, the Agent of the East India Company at Sehore, on the Thursday 3 August 1837, or Śaka 1759 (**श्रावणशुक्लद्वितीया**

गुरुवासरे [विक्रम] संवत् १८९४) and on this basis estimated that if Durgāśaṅkara was fifty years old at that time, then his birth must have taken place in Śaka 1709.[33] Bendall, and following him Losty and others, took it as the actual year of birth; it is only an approximation. It would be correct to say that Durgāśaṅkara was born ca. 1787.

(iv) Bendall stated that,

> The book was drawn up before the death (1839) of Ranjit Singh. See foll. 11, 12, where he is mentioned, and a full-page miniature given with portrait; more particulars about him at fol. 16*a*–*b*. Laihna Singh mentioned at fol. l6*b*.

On folio 16*b*, there is a verse in Śārdūlavikrīḍita metre in praise of Ranjit Singh. The verse ends, "the one called Raṇajit Siṃha shines" (**रणजित्संह्वाह्वयो राजते**). It is true that this expression is in the present tense, but this should not be interpreted to mean that Ranjit Singh was alive when the horoscope was drafted. The context shows that Ranjit Singh was alive when the native of the horoscope, namely Lehna Singh, was born in 1806. In fact, the praise of Ranjit Singh on 16*b* is preceded by the long discussion of the time of Lehna Singh's birth; the year in different eras, the month and *tithi*, and the various astrological elements like the *nakṣatra*, *yoga* and *karaṇa* on folios 14*b*–15*b*. The praise of Ranjit Singh is followed immediately by the praise of his principal minister Desa Singh in two verses. At the end of the second verse, it is stated that Desa Singh's wife gave birth to a son. The verse that follows mentions that the son is named Lehna Singh, that he is the lotus in the lake of nectar (Amritsar) and that Ranjit Singh is the sun which makes the lotus (namely Lehna Singh) bloom.

JEREMIAH P. LOSTY, *THE ART OF THE BOOK IN INDIA*, 1982

In his catalogue of the exhibition, Jeremiah Losty described the manuscript as follows:[34]

> Sarvasiddhāntatattvacūḍāmaṇi.
>
> The Crest Jewel of the Essence of all Systems of Astronomy, a Comparison in Sanskrit of the astronomical systems of Europe, Islam, and India, by Durgāshankara Pāthaka of Benares. The point of departure for this treatise is apparently the horoscope (*janmapatra*) of Prince Navnihal Singh, grandson of Ranjit Singh, Mahārāja of the Punjab

33 Dvivedī (1892: 120): **सिंहोरनगरस्य एजेण्टसाहिबसविधे पत्रप्रेषणसमये ऽस्य वयः पञ्चाशद्वर्षसमं कल्प्यते तदास्य जन्मशको नवखसप्तेन्दु १७०९ समायाति ।**

34 Losty 1982: 154–155, no. 140.

(1780–1839), and this is the presentation manuscript, lavishly illuminated.

According to Sudhākara [article called 'Ganakatarangini', in *The Pandit*, Vol. XIV, Benares, 1892], the author was the son of Shivalāla Pāthaka, was born in 1787, and lived in Benares where he became a well-known astronomer. This Ms. was apparently commissioned by Kharrak Singh when he ascended the throne in Lahore following the death of Ranjit Singh in 1839. Durgāshankara went to Lahore to deliver it, but was driven out by the enmity of Navnihal Singh, and returned to Benares only with much difficulty. Kharrak Singh, who was apparently of weak mind, died in 1840, and his son immediately afterward—he was killed by falling masonry when returning from his father's funeral.

The Ms. does not entirely bear out Sudhākara's account. Navnihal is not mentioned, but there are several folios missing near the opening. At the beginning are portraits of Guru Nānak, Guru Gobind Singh, a missing but captioned portrait of Ranjit Singh and then a portrait of a boy about 10 or 12, with a halo, and a woman, presumably his mother (f. 25a). This must be Navnihal Singh and his mother, Rānī Chand Kaur. Since the boy is at most 12 years old, while Navnihal was 18 on his grandfather's death in 1839, the painting must have been done about 1833. A *terminus post quem* is provided by a dated watermark of 1833 in at least one of the folios, while Ranjit Singh is spoken of as still living. The main part of the Ms. must therefore have been completed between 1833 and 1839, the date of the colophon and the completion of the work. The text also pays considerable tribute to Laihnā Singh,[a] and to his father Desā Singh. This is the famous Sardar Laihnā Singh Majithia,[b] one of the chief Sikh nobles, the confidant of Ranjit Singh, Governor of the Hill States and of the Golden Temple in Amritsar. He was also a man of science and interested in astronomy and engineering. It seems likely however that Durgāshankara would not have met him before 1839, when he visited Lahore, and was befriended by Laihnā Singh when escaping from Navnihal Singh's anger. There appears to be a portrait of him at the end of the manuscript (f. 291a), in which he is seated with a boy of about 10, perhaps his son Dayāl Singh, and a pundit, obviously discussing astronomical matters from the number of instruments scattered about; the pundit must be the

[a] Sudhākara calls this personage the Rāja of Kotah, so clearly did not have access to all the facts.

[b] Griffin and Massy 1910.

author, who is also seen in another painting using a table-mounted telescope, watched by his nephew Jatāshankara (f. 29a). These portraits and the verses eulogizing the Majithia, were perhaps added on the author's return to Benares, while the details about Navnihal Singh were probably removed. All the formal portraits at the beginning are in traditional gouache, while those of Laihnā Singh and of the author with his nephew are in water-colour. There is no reason why they should have been put in the Ms. before 1839.

Apart from the portraits, the Ms. contains full-page paintings of representations of the signs of the Zodiac (with some missing), of the constellations according to Indian and European conceptions, of the traditional cosmography of the Hindus centred on Mount Meru as well as many smaller paintings of the planets, lunar mansions, etc. All these latter are more sketchily painted in water-colours, and by artists who were familiar with the work of both Lucknow and Chapra artists of the early 19th century. The folios are tinted in pastel shades, and every page bears decoration, much of it of European inspiration, floral designs, geometric patterns, etc. Even the many astronomical tables are beautifully laid out and decorated. The illuminator was an extremely skilful artist who must have had access to European pattern books, and seen pictures of early Victorian angels which he has used to charming effect several times, surmounting their curls with raffishly decorated turbans. The brilliant Zodiac patterns are also his work.

MS London BL Or. 5259.

ff. 293 (numbered 1–304, the missing folios being mostly portraits at the beginning and five of the signs of the Zodiac); 18 x 22 cm; paper, of European manufacture, watermarked 1833, tinted beige, pink, green, yellow and blue; 13 lines of *Nāgarī* script in panels 15 x 11 cm with margins ruled in gold and colours; 70 miniatures, many full-frame or full-age, 16 astronomical charts; most pages decorated with floral designs; original cover of green velvet with spangle and silver-wire decoration, with red velvet doublure, let into a green-leather frame and spine in a European binding.

Critique of Losty's Views

Losty is a renowned expert on Indian manuscript paintings. His remarks about the paintings, illumination and the binding of the present manuscript are indeed very valuable. But he was led astray by the account of Sudhākara.

(i) He remarks that "the Ms. does not entirely bear out Sudhākara's account,"

but accepts Sudhākara's footnote without any reservation. This notorious footnote states that "because of the sudden death of Nau Nihal Singh which was not indicated in the horoscope, a great disrespect was shown to the horoscope and to Pāṭhaka in the city of Lahore" (**नवनिहालसिंहस्याकस्मान्मृत्युना तत्रासूचितेन तदनादरः पाठकानादरः पश्चान्महान्जातो लाहोरनगरे**). Losty partly misunderstands this statement and speaks of "the enmity of Navnihal Singh" which means that Nau Nihal was alive when Durgāśaṅkara visited Lahore. But, if the manuscript contained originally Nau Nihal Singh's horoscope as Losty believes, why should Nau Nihal Singh display "enmity" towards Durgāśaṅkara, who must have written positive things about Nau Nihal Singh in the alleged horoscope?

Another case of misunderstanding is the following: "The text also pays considerable tribute to Laihnā Singh [Losty's footnote: Sudhākara calls this personage the Rāja of Kotah, so clearly did not have access to all the facts]...." Sudhākara describes Lehna Singh as *koṭādhīśa*, meaning commandant of the fort (*koṭa*); Losty misunderstands the term in the sense "the king of the princely state Kotah in Rajasthan"!

(ii) Folio 25*r* carries a portrait of young boy with halo and a woman seated in front of him. Losty considers that these two "must be Navnihal Singh and his mother, Rānī Chand Kaur." If so, why was the father, Kharak Singh, not shown in this family portrait? It is more likely that the boy and woman are the personifications of some astrological elements. The exact nature of the miniature can be determined only after a careful study of the contents in the preceding and following folios.

(iii) While Bendall tried to explain the absence of the name of Nau Nihal Singh in the manuscript by saying that the name may have been in the missing folios, Losty postulates a scenario of tampering with the manuscript, namely Durgāśaṅkara removed all the folios related to Nau Nihal and added new folios with the praise of Lehna Singh: "These portraits and the verses eulogizing the Majithia, were perhaps added on the author's return to Benares, while the details about Navnihal Singh were probably removed."

Losty's conjecture that the verses praising the Majithia were added later is untenable for the several reasons. On folio 16*r* (see Fig. 7) there are two verses in praise of Ranjit Singh and two verses on Desa Singh. The last line of the second verse mentions that Desa Singh's wife gave birth to a son. The last three syllables of this verse are written on folio 16*v* (see Fig. 8), and thereafter occur two verses in praise of Lehna Singh. If the verses in praise of Majithias are later additions, then the entire folio should be a latter addition, so also the verses in praise of Ranjit Singh! Moreover, all the folios dealing with Lehna Singh's horoscope bear the original serial numbers on the upper left corner on the reverse side (see Figs. 4, 6 and 8).

Furthermore, if it is assumed that Durgāśaṅkara had originally prepared a horoscope of Nau Nihal Singh and that his predictions about Nau Nihal Singh turned out to be patently false, would Lehna Singh, who is apparently knowledgeable in these matters, get his horoscope made by this incompetent astrologer Durgāśaṅkara? Would he, a man of great distinction, the governor of Amritsar and the administrator of the Golden Temple, agree to the cheap artifice of converting the presentation copy originally made for Nau Nihal Singh into one carrying his name by substituting the folios relating Nau Nihal Singh with new folios about him? Would he not expect a completely fresh manuscript for his horoscope?

(iv) Losty goes on to say:

> All the formal portraits at the beginning are in traditional gouache, while those of Laihna Singh and of the author with his nephew are in water-colour. There is no reason why they should have been put in the Ms. before 1839.

But it is not just portraits of Lehna Singh and of the author which are painted in water-colour, but many other illustrations as Losty himself informs us:

> Apart from the portraits, the Ms. contains full-page paintings of representations of the signs of the Zodiac (with some missing), of the constellations according to Indian and European conceptions, of the traditional cosmography of the Hindus centred on Mount Meru as well as many smaller paintings of the planets, lunar mansions, etc. All these latter are more sketchily painted in water-colours.

The use of two mediums for paintings can be explained with the assumption that two or more artists were working at the same time.

(v) There appears to be a portrait of him at the end of the manuscript (f. 291a), in which he is seated with a boy of about 10, perhaps his son Dayāl Singh, and a pundit, obviously discussing astronomical matters from the number of instruments scattered about; the pundit must be the author, who is also seen in another painting using a table-mounted telescope, watched by his nephew Jatāshankara (f. 29a).

Losty is quite right in thinking that the portrait on folio 291*r* is that of Lehna Singh and that the boy next to him is Lehna Singh's son Dyal Singh. He is also right in thinking that the pundit in this painting is the author of the manuscript, namely Durgāśaṅkara Pāṭhaka. But the person using the telescope on folio 29*r* is not Durgāśaṅkara. This person is clearly a Sikh and not a Brahmin pandit; he is obviously Lehna Singh; he has the same type

of turban and beard as in the painting on 291*r*, but his clothes are slightly different.[35]

THE ARTS OF THE SIKH KINGDOMS EXHIBITION, LONDON 1999

The manuscript of the *Suryasiddhāntatattvacūḍāmaṇi* was exhibited in the exhibition on "The Arts of the Sikh Kingdoms" at the Victoria and Albert Museum, London, in 1999. The exhibition catalogue, edited by Susan Stronge, carried the following description of the manuscript, signed by Jeevan Deol.[36]

> This comparison of astronomical systems was written in Sanskrit by Brahman Durgashankar Pathak of Varanasi, probably between 1833 and 1839. The author was well known for his command of astronomy as well as other branches of learning and later became the state astrologer of the Maharaja of Rewa. The manuscript is said to have been a horoscope for Maharaja Kharak Singh's son, Naunihal Singh, but the latter was said to have been displeased by it and tried to kill [sic!] Durgashanksar when he came to Lahore to present the text. Apparently the astrologer took refuse with Lehna Singh Majithia who is eulogised in the text and depicted in two of its paintings.
>
> Bought in Benares in the 19th century by Fortescue M. Porter who sold it to the British Museum in 1897; the manuscript is lavishly illustrated and decorated with floral patterns. The text begins with invocations to Shiva, Ganesha, Vishnu and the city of Kashi [sic!], after which occur horoscopes of Rama, Krishna, Guru Nanak and Guru Govind Singh, Mahararaja Ranjit Singh and Lehna Singh.
>
> The first illustrations in the text depict Ganesha, Guru Nanak and Guru Gobind Singh respectively, while a fourth missing miniature would presumably have been of Ranjit Singh. The astronomer in pl. 100, seated at right instructs a Sikh pupil or patron, presumably Lehna Singh Majithia.

This description follows substantially Losty's description, minor deviations notwithstanding. It is interesting, however, that Deol states that the text contains the horoscope of Lehna Singh among other horoscopes.

35 In his *Indian Book Painting*, Losty reversed the roles: "Durgashankar Pathak was a famous Benares astronomer, who is here depicted teaching his nephew Jatashankara to use an instrument for calculating the sun's elevation" (Losty 1986: 78–79, no. 69).

36 Stronge 1999: 221, item 98.

3 LIFE AND ACCOMPLISHMENTS OF SARDAR LEHNA SINGH MAJITHIA

A BRIEF OUTLINE OF THE LIFE OF LEHNA SINGH

Lehna singh's father sardar desa singh majithia was a feudal chief who joined the side of Maharaja Ranjit Singh in 1809. He accompanied him in his expedition to Kangra and helped him drive out the Gurkhas from the hill states. Ranjit Singh made him the Governor of the Hill States of Kangra and others. He was also appointed Governor of the city of Amritsar. In 1818 he served with distinction in the Multan campaign in the force of Prince Kharak Singh.

After the death of Desa Singh in 1832, his eldest son Lehna Singh was made the Governor of the Hill States as well as of Amritsar. At Amritsar, he had also the prestigious position of looking after the Golden Temple. About his interest in science and mechanics, Lepel H. Griffin wrote as follows:[37]

> Sardar Lahna Singh was a man of considerable ability. He was a skilful mechanist and an original inventor. He much improved the Sikh ordnance; and some very beautiful guns of his manufacture were taken at Aliwal and elsewhere. Among other things he invented a clock which showed the hour, the day of the month and the changes of the moon. He was fond of astronomy and mathematics, and was a master in several languages. As an administrator, Lahna Singh was very popular. The poor were never oppressed by him; his assessments were moderate; and his decisions essentially just. As a statesman, he may be said to have been almost the only honest man in Lahore.

Maharaja Ranjit Singh, on his deathbed, declared his eldest son Kharak Singh as his successor in 1839. But Kharak Singh did not enjoy a peaceful reign. He died a year later, on 5 November 1840, supposedly by poison. His son, Nau Nihal Singh, was killed while returning from the funeral rites of his father. Kharak Singh's widow, Mai Chand Kaur, became the regent, but her regency lasted just a month and a half. Sometime later, in 1843, Hira Singh eliminated several chiefs and proclaimed Duleep Singh, the youngest son of Ranjit Singh, as the new Maharaja. Duleep Singh was then just five years old.

The kingmaker Hira Singh was not favourably inclined towards Lehna Singh. Fearing for his security, Lehna Singh left the Punjab. Accompanied by 2500 men, and carrying a lot of wealth, he left on a pilgrimage to Hardwar, Benares, Jagannath Puri and Calcutta. Some chiefs requested him to return to the Punjab, but he ignored their appeal.

37 Griffin and Massy 1890: 275.

Subsequently, in the first Anglo-Sikh war, Sikh forces were defeated at Aliwal in February 1846. But Duleep Singh remained the Maharaja and because of his young age, a Council of Regency was formed and Lehna Singh was asked the return to the Punjab and join the Council. Lehna Singh refused to return and sent the following message from Calcutta on 11 March 1846:[38]

> I do not concern myself about public affairs, because it is now two years since I left my country for this, and have built a house at Benares for the purpose of visiting that place of worship and serving the Almighty.

But he was persuaded to return to the Punjab in August 1847. He joined the Council of Regency and was appointed the administrator of the Manjha region. However, he did not stay there long.

> On February 2, 1948, after giving away large sums of money in charities, he went from Amritsar to Majitha and from there to the source of the Ganga. And then on to Benares, where in 1848, a son was born to him.[39]

After the second Anglo-Sikh War, Lehna Singh returned to the Punjab once again in 1851 to look after his properties. In 1853, he again went back to Benares, where he died in 1854; a few months later, his wife too passed away, leaving behind the only child, the young Dyal Singh, aged six years. His relatives decided to leave Benares and return to the ancestral village Majitha. Probably, in their haste in dissolving the establishment at Benares, they may have left the horoscope among other things in Benares, and that is how Fortescue Porter was able to acquire it later.

PORTRAITS OF LEHNA SINGH IN THE *SARVASIDDHĀNTATATTVACŪḌĀMAṆI*

Lehna Singh is depicted in two miniature paintings on folios 29*r* and 291*r*.

This painting on 29*r* (Fig. 8) depicts Lehna Singh using the telescope under the guidance of Jaṭāśaṅkara Pāṭhaka. They are seated on elegantly carved chairs, Lehna Singh is on the left and Jaṭāśaṅkara on the right. Both are clad in dhotis, kurtas and upper clothes. The dhotis and the upper clothes are decorated with graceful borders. While Lehna Singh wears a single strand of necklace, Jaṭāśaṅkara has several strands of pearl and other necklaces around his neck.

An inscription, written in very small letters on the bottom of the parapet wall just behind Jaṭāśaṅkara identifies him by name with great reverence

38 Cited by Gopal 1994: 16.

39 Gopal 1994: 17.

Figure 8: Lehna Singh and Jaṭāśaṅkara Pāṭhaka with a telescope. © British Library Board (MS London BL Or. 5259, f. 29*r*).

(**श्रीमज्जटाशङ्करपाठकेन्द्राः**). The *Gaṇakataraṅgiṇī* merely states that he was the son of Durgāśaṅkara's brother and that he moved to the city of Koṭā along with all the books of Durgāśaṅkara.[40] However, on the folio preceding the

40 Dvivedī 1892: 120: **तान् [ग्रन्थान्] गृहीत्वा तद्भ्रातृ-पुत्रेण जटाशङ्करशर्म्मणा कोटानगरीं गत्वा तत्रैव स्वा व-सतिश्च चक्रे ।**

present miniature painting (28*v*), Jaṭāśaṅkara is praised profusely in a verse in Śārdūlavikrīḍita metre:

> सद्गोलानखिलान्खगादिगणितं प्रश्नान्सभङ्गांस्तथा
> नानादेशसमागतान्द्विजगणानध्यापयन्लीलया ।
> यन्त्रे वेधविधावतीवकुशलो यश्चोपपत्तौ पटुर्
> वादीवारणकेसरिर्विजयते सो[ऽ]यं जटाशङ्करः ॥
>
> To the groups of brahmins arriving from diverse regions, he taught – without much effort – the entire spherics, planetary computations and astrological interrogations with all the divisions; highly skilled in the construction and use of instruments, competent in presenting the rationales and proofs (*upapatti*), he is a lion for the elephants, namely the disputants; such is this Jaṭāśaṅkara, who flourishes.

Jaṭāśaṅkara was probably the son of Śivalāla Pāṭhaka, the elder brother and teacher of Durgāśaṅkara Pāṭhaka. In view of his expertise in astronomical observations, it is but appropriate that he is depicted in this painting as instructing Lehna Singh in the use of the telescope.

But the artist was not familiar with the astronomical instruments or with the method of observations. He depicted Lehna Singh looking through a telescope. The tube of the telescope is attached to a half-circle which is mounted at the centre of a vertical ring so that the tube can be rotated on a vertical plane along the graduations on this vertical ring. The vertical ring is situated in a horizontal ring with a fish-shaped magnetic needle at the centre. Both the rings appear to be graduated. The vertical ring should also be able to rotate within the horizontal ring, but the picture is not well drawn here. The horizontal ring rests on adjustable screws and a water level is incorporated on the side of the horizontal ring. The apparatus is set up on a round table resting on a single leg at the centre. This table is not well executed either.

The painter thoughtlessly drew the sun at the top of the painting with a golden orb and golden rays radiating all around, not realising that sighting the sun directly through the telescope would make one blind.

The scene is set upon the terrace of a building with a pierced parapet wall and a floor decorated with small flowers.

The next painting, on folio 291*r* (Fig. 9), is framed by a broad border with a monochrome floral design. It shows Lehna Singh, his young son Dyal Singh, and Durgaśaṅkara Pāṭhaka with an assortment of astronomical and time-measuring instruments. Durgaśaṅkara is on the right, seated on a carpet with a high bolster behind him, with his right hand raised in a posture of discourse. Lehna Singh is on the left, joining both his palms in a gesture of respectful attention to the discourse.

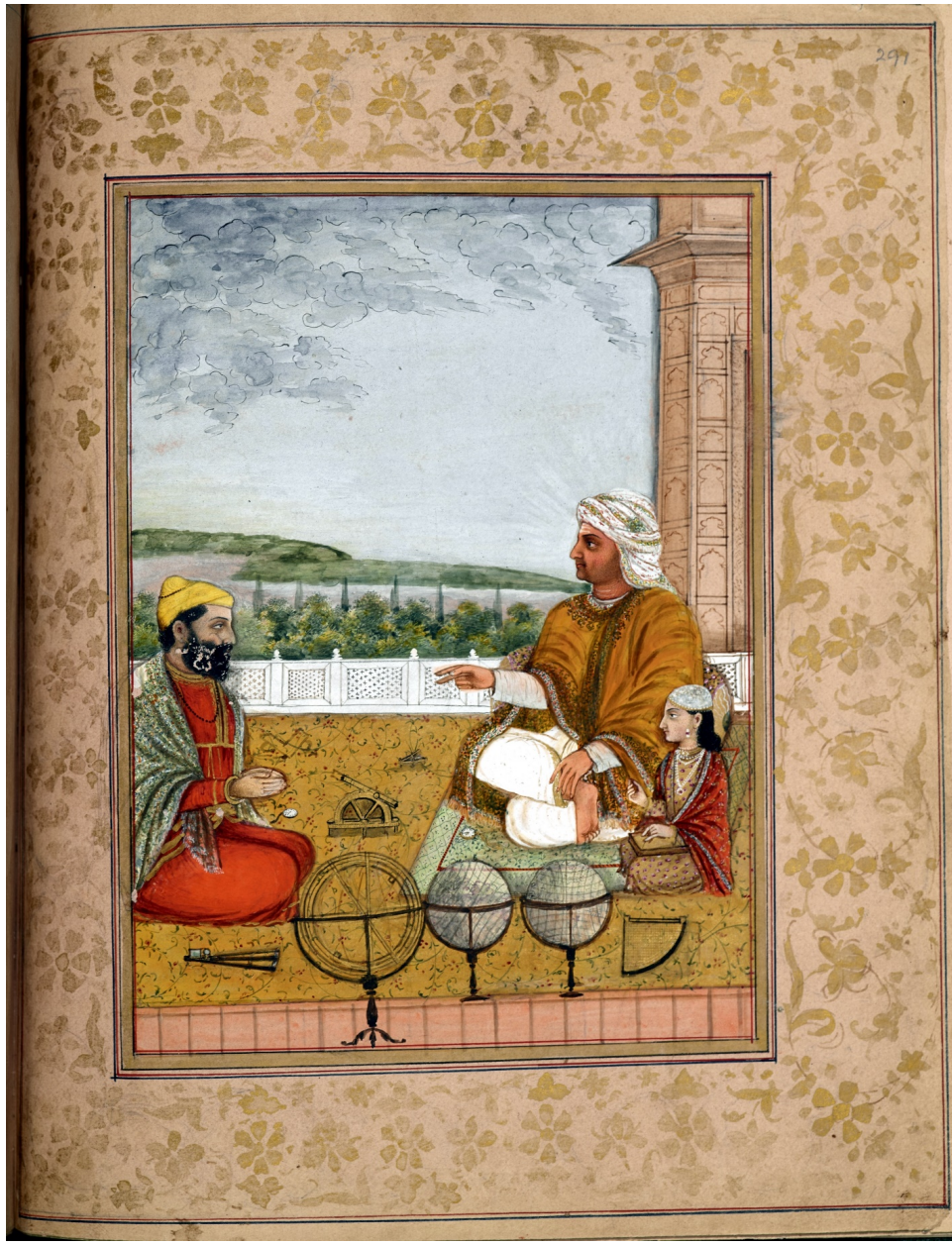

Figure 9: Lehna Singh, Dyal Singh and Jaṭāśaṅkara Pāṭhaka. © British Library Board (MS London BL Or. 5259, f. 291*r*).

The young Dyal Singh is seated next to Jaṭāśaṅkara with a writing board on his lap and probably a chalk in his raised right hand, in a posture of taking down the discourse. Dyal Singh was born in 1848. Therefore, the painting must have

been made between 1848 and 1854, closer to 1854.

All the three are wearing richly decorated shawls around their shoulders. Durgāśaṅkara is dressed in white *kurtā* and *dhotī*, Lehna Singh in a red *jāmā*, and the young Dyal Singh in a brownish *jāmā* decorated with flowers. While the previous painting suggests spring or summer, this one indicates autumn or winter.

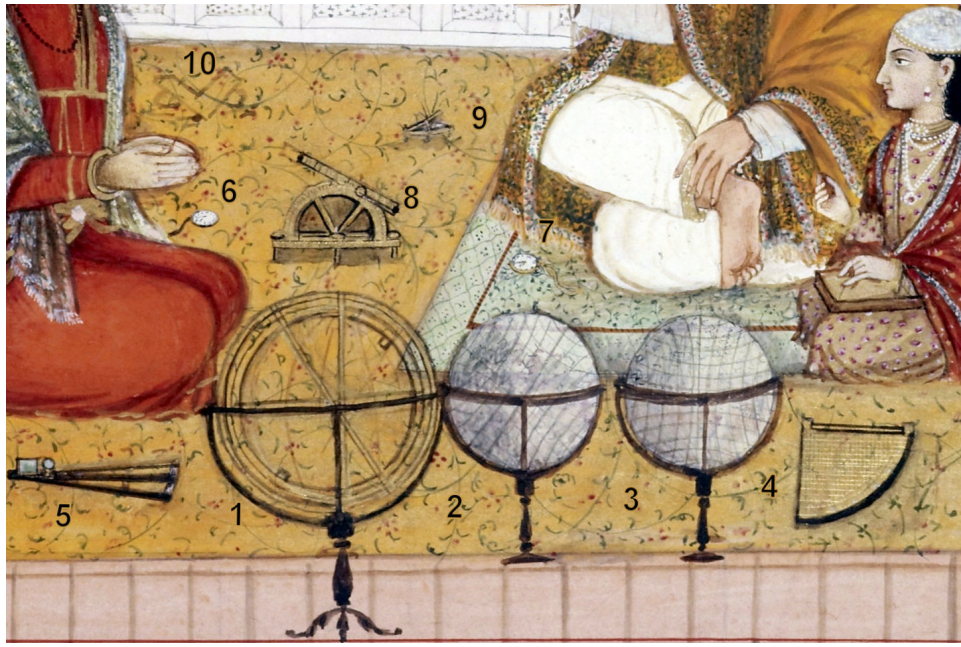

Figure 10: Detail of Figure 9, showing the instruments. © British Library Board (MS London BL Or. 5259, f. 291*r*).

Durgāśaṅkara is giving a discourse which Lehna Singh is listening to with great devotion. Around them is an assortment of European astronomical and time-measuring instruments, which must have been from the personal collection of Lehna Singh. In the close-up (Fig. 10), these instruments are numbered serially for the sake of identification.

1. Armillary sphere. The pattern of the carpet can be seen through the sphere. Therefore, it is not a solid sphere but made up of several rings.

2–3. Two terrestrial globes on which only the grid of longitudes and latitudes is marked but no outlines of the continents. The globe in 2 is slightly tilted. In both the globes, the artist correctly draws the latitude lines as parallel to the equator (because of the curvature of the globe, they are shown as slightly curved in the two-dimensional representation). The artist draws the longitudes also in the same way, but this is not correct, for the longitudes are not parallel but should converge at the poles. It is not clear why the artist drew

two terrestrial globes in what appears to be a representative assemblage of contemporary astronomical and time-measuring instruments.

4. Sine quadrant with a sighting tube, but without an index.
5. Jacob's Staff or cross-staff, which was used in navigation for measuring the angular height of a star or the distance between two stars.

6–7. Both Lehna Singh and Durgāśaṅkara have their pocket watches in front of them.

8. Telescope on a stand. The stand is not the standard one made in Europe but seems to have been designed in India. In the painting on folio 29*a*, the telescope is placed on a high table.
9. Universal equatorial sundial, which can be adjusted to the latitude of the place of observation. Khuda Bakhsh Library, Patna, has a similar sundial.[41]
10. Faint outlines of a book on an X-shaped book stand.

As in the previous painting, here also the scene is depicted on the terrace of a building with the same type of pierced parapet wall, with floral decorations on the floor. But here one can see the river Ganga beyond the parapet wall; the trees and bushes on the bank close to the building are drawn with great detail. The picture of Gaṇeśa on folio 3*a* also displays a similar terrace and the river with a barge on it. It is highly probable the terrace depicted in these three paintings was on the top of the building which Lehna Singh built for his residence in Benares, close to the river Ganga.

LEHNA SINGH'S INVENTIONS

Many writers lay stress on Lehna Singh's interest in mechanical instruments. The instruments he is said to have designed are as follows:

Clock

He designed a clock which showed the hour, the day of the month and the phases of the moon. Madan Gopal reports that the newspaper *The Tribune*, which was founded by Lehna Singh's son Dyal Singh, asked the Government in 1893 to acquire the unique clock in the possession of Raja Harbans Singh and place it in the Punjab Museum. It is not known whether this clock still exists somewhere in the Punjab.[42]

Artillery

He was in charge of Sikh ordnance factories at Lahore and Amritsar and introduced many improvements in the production of artillery. In recognition of his

41 See Sarma 2021: Q012; see also Ramaswamy 2017: 139–141.

42 Gopal 1994, p. 13.

work, Ranjit Singh conferred on him the title *Hisamuddoulah* (the Sword of the State). Some of the guns designed by him were seized by the British forces at the end of the first Anglo-Sikh War in 1846. Colonel Baird Smith made the following remarks about these guns:

> On that occasion an exquisitely beautiful battery of six field guns, the property of Lena Singh, and the produce, probably, of the same workshop which produced the *Pratoda* Dial [iron column dial, see the next item] was captured. Nothing could surpass the whole design and details of these guns, and while they were ornamented with great taste, they were at the same time good working guns, and had been vigorously used during the day.[43]

It is not known if any of these guns are still preserved.

Column dial

He designed an iron column dial (*pratoda-yantra*) which is to serve both as a timekeeper as well as a gun, for Lord Hardinge, Governor-General of India from 1844 to 1848. In the monthly general meeting of the Asiatic Society of Bengal, held on 7 November 1860, this column dial was presented to the society and discussed.[44] According to the presentation made at the meeting, the column dial had nine facets which ran length-wise and which carried scales of hours for use in different seasons; but it is not stated how this object functioned as a gun. Again, it is not known if this object is still with the Asiatic Society of Calcutta.

Fortunately, two other artefacts designed by Lehna Singh can still be seen in the Golden Temple at Amritsar.

Flagstaff

In his capacity as the Governor of Amritsar and the administrator of the Golden Temple, Lehna Singh erected there a flagstaff which still stands by the side of Rajit Singh's flagstaff.[45]

Sundial

Lehna Singh designed and set up a horizontal sundial with a triangular gnomon in the Golden Temple; it is still extant on the bridge that connects the gateway with the Temple proper (Fig. 11). Its dimensions are not available. Presumably the hypotenuse of the gnomon forms an angle of 32°, corresponding to the latitude of Amritsar at 31;38°. The Gurmukhi inscription at the base of the gnomon cannot be deciphered in the available photos; the first line appears to carry the

43 Griffith 1861: 426–427.

44 Ibid; for a description of the instrument, see Sarma 2021: P023.

45 Gopal 1994: 13.

year 1900 Vikrama Saṃvat which corresponds to CE 1842–1843. In the rectangular border are engraved two scales: the outer one shows modern hours, with subdivisions marked for 30 minutes and 10 minutes; the inner scale is of the traditional *ghaṭīs* (= 24 minutes), subdivided in half *ghaṭīs*.[46]

Figure 11: Horizontal Sundial designed and set up by Lehna Singh in the Golden Temple (photo courtesy of Basanta Rajkumar).

4 CONCLUSION

Now that it is firmly established that the horoscope presented in the *Sarvasiddhāntatattvacūḍāmaṇi* is of Sardar Lehna Singh Majithia who was born in

46 Sarma 2021: N003.

1806 – and not of Maharaja Ranjit Singh's grandson Nau Nihal Singh as has been generally assumed until now – it is hoped that someday a facsimile edition of this unique manuscript will be published, together with a complete translation, annotations elucidating the different astronomical and astrological systems presented here, and art-historical notes on the illustrations and illuminations.

5 EPILOGUE

It is embarrassing that in one of the last articles I shall ever write I have to find fault with Mahāmahopādhyāya Sudhākara Dvivedī whom I hold in highest esteem. Baladeva Upādhyāya, another Pandit of Benares whom I admire greatly, in his very comprehensive *Kāsī kī Pāṇḍityaparamparā*, narrates the following incident, under the sub-heading "a memorable event" (**एक विस्मरणीय घटना**):[47]

> When Sudhākara was studying at the Benares Queen's College, he once borrowed from his teacher Bāpudeva Śāstrī's text-book on algebra, *Bījagaṇit, Pratham Bhāg*, read it overnight and detected many errors there. He corrected all these errors in red ink and brought the book back to his teacher the next morning. When Bāpudeva Śāstrī saw it, he was not at all annoyed, on the contrary, he praised the sharp intellect of the sixteen-old Sudhākara and recommended to the Principal Griffith to bestow an award on Sudhākara.

I do hope, therefore, that the Mahāmahopādhyāya would condone my *avinaya*.

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47 Upādhyāya 1994: 302.

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The History of Science in South Asia • Department of History and Classics, 2–81 HM Tory Building, University of Alberta, Edmonton, AB, T6G 2H4, Canada.