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ARTICLE

Reassessing European impressions of Indian astronomy (1750–1850)

Ankur Kakkar[1,2]

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Abstract
The early colonial rule in India was characterised by, among other things, an increasing interest in various disciplines of Indian knowledge traditions. Within the vast array of Indian knowledge systems, the astronomical sciences and corresponding Sanskrit treatises attracted the attention of many prominent orientalists such as Henry Thomas Colebrooke and John Warren. This essay is an attempt to highlight and critically examine some prominent eighteenth century accounts of Indian astronomy.

Keywords Astronomy · Colonialism · Indian Knowledge Systems · Orientalism

1 Introduction

The early colonial rule in India was characterised by, among other things, an increasing interest in various disciplines of Indian knowledge traditions. Within the vast array of Indian knowledge systems, the astronomical sciences and corresponding Sanskrit treatises attracted the attention of many prominent orientalists such as Henry Thomas Colebrooke and John Warren (Sen, 1985). Some scholars have seen this enthusiasm in Indology as a genuine desire to learn about India's 'ancient wisdom' (Sengupta, 1996), while others have argued, in post-colonial fashion, that orientalism was nothing more than a hand-maiden of colonialism (Dalmia, 2007; Said, 2003; Vishwanathan, 1989). In fact, much of the existing literature on colonial scholarship suggests that 'oriental' learning remained subservient to overriding political or religious motives. More recently, however, a third approach has emerged. Scholars are now asking the 'obvious question' – 'why consider orientalism as just one story, a single narrative?' (Clarke, 1997). So, one of the primary aims of this article is to highlight and critically examine some prominent eighteenth century accounts of Indian astronomy. In doing so, this article identifies the political agenda of several orientalists and missionaries, but it does not simply rely on the Foucauldian framework of knowledge and power to analyse the multi-dimensional nature of orientalist accounts. Instead this essay focuses on hitherto neglected aspects of orientalist writings by bringing forth important observations made by leading scientists and mathematicians of eighteenth century Britain (Dharampal, 1971).

2 Various aspects of orientalism

2.1 William Jones and the beginnings of orientalism

Beginning in the late eighteenth century, a wide range of orientalist writings informed European understanding of Indian astronomy. Some of the pioneers of orientalism were William Jones (1746–1794) and Henry Thomas Colebrooke (1765–1837). Jones founded the *Asiatic Society of Bengal* in 1784 and started the first journal of oriental studies called the *Asiatic Researches*. While Jones is credited on several occasions for 'his varied research, brilliant analysis and his broad, deeply suggestive generalizations on Asian antiquity' (Kopf, 1969), he is also criticized for his 'salvaging motif' – the concern to rescue a 'decadent' Hindu civilization (Dalmia, 2007, p. 30). In his account on Indian Chronology, part of it based on his 'conversations with certain *pandits'*, Jones supposed that Indian astronomers formed their divine age by an arbitrary multiplication of 24,000 by 180' (Jones, 1801, p. 115). Therefore, he believed that the *divine*

✉ Ankur Kakkar
kakkarankur@yahoo.com

1 Heidelberg, Germany

2 Present Address: Centre for Indic Studies, Indus University, 5A/2 Toot Sarai, Malviya Nagar, New Delhi, Ahmedabad 110017, India

age can be rejected from a 'historical or civil chronology of India' (Jones, 1801, p. 115). Now, in making these suppositions, William Jones was perhaps unaware of the multi-dimensional nature of Indian knowledge systems where astronomy and chronology are intricately linked (Chatterjee, 1998). In fact, all modern mathematical studies of Indian Chronology are based on astronomical texts, primarily the *Sūryasiddhānta* and *Siddhāntaśiromaṇi*. Furthermore, while concluding his account on Indian chronology, William Jones compared the chronologies of Hindu, Christian and Islamic systems (Sengupta, 1947). However, he began this comparison at 5794 years before the year (then current) 1788 CE, which effectively means 4006 BCE (5794–1788 = 4006). This coincides with the Biblical creation of the universe, reinforcing the view that Jones 'never doubted the pre-eminence of Christianity over India and the Orient' (Clarke, 1997, p. 62). So it is evident that the commentary of Jones was neither free from religious prejudice nor devoid of fundamental ignorance about Indian customs. Hence, his scholarship may not be very reliable at least as far as a judgement of Indian astronomy is concerned. The above analysis seems to reinforce the position of most post-colonial scholars who portray orientalist works, including those of the *Asiatic Society,* in a monolithic fashion. But, as the following sections in this article reveal, orientalists like Jones do not represent the variegated landscape of writings on Indian Knowledge Systems. In fact, as we shall see, several European scientists were writing about Indian astronomy. But before proceeding to the accounts of scientists, let us examine the nature of missionary writings on Indian astronomy.

2.2 Missionary writings

Any survey of colonial accounts of Indian knowledge systems would be incomplete without the missionary accounts, although it is hard to put orientalists and missionaries into two mutually exclusive categories. For instance, Baptist missionary William Carey was elected to the Asiatic Society by a unanimous vote in 1806. In fact, both orientalists and missionary groups played a crucial role in what is frequently called the Bengal Renaissance. As Kopf has noted: The College of Fort William transformed the famed Asiatic Society of Bengal and William Carey's Serampore Mission into highly effective agencies for the revitalization of an Indian culture (Kopf, 1969). The Baptist mission at Serampore established, in 1793, by the trio of William Carey, Joshua Marshman and William Ward was regarded as the 'benchmark of all missions in India' (Grimshaw, 2010). Various missionary tactics to propagate the gospel through schools have been widely documented (Carey, 1792; Emmott, 1965; Laird, 1972). However, the 'intimate' connection between science and Christianity, in the context of colonialism, has only recently been explored by few scholars. Sujith Sivasundaram has shown that the trio of Carey, Marshman and Ward established the Serampore College in 1818, with an aim to 'instruct Asiatick Christians and other youth in eastern literature and European science'. Among other subjects, Sanskrit astronomical science was taught alongside the Copernican model (Sivasundaram, 2005). Such educational programs, involving the 'fusion' of Eastern and Western knowledge, were also encouraged by orientalists under the name of 'engraftment' – a policy according to which, western ideas would be gradually diffused into traditional learning (Zastoupil & Moir, 1999, pp.10–23). Therefore, Sivasundaram shows that the (actual) aim of Serampore College was the training of 'Christian pundits, who, although well versed in both Indian and European literature and science, would aid the propagation of the gospel' (Sivasundaram, 2005). The only difference was that unlike the orientalists, who preferred to hide behind jargons, the Serampore prospectus explicitly mentioned their aim of making Serampore 'the Christian Benares' (Carey, 1818, p.134).

Of the Serampore trio, it was William Ward who paid particular attention to Indian astronomy and science.

> In this department of science (astronomy), the Hindoos were capable of comprehending the heavens ... their astronomical works, though mixed with the most extravagant fancies, will long remain splendid moments of the highest powers of the intellect (Ward, 1818, pp. 559–473).

However, Ward's own comments comprise a minor portion of this section on Astronomy. Instead, he includes extracts from the *Asiatick Researches* – particularly the essay on astronomy by Samuel Davis (1760–1819). William Ward's attitude of cautiously avoiding direct comments is quite understandable, given that his own education was 'confined to the common branches cultivated in English schools' (Stennett, 1825; Ward, 1811). The above evidence suggests that owing to their modest background and limited formal education, the Serampore missionaries refrained from making extensive observations on advanced knowledge systems such as astronomy. In this respect, they may be credited for relying on their intellectual peers, many of whom wrote for the journal – *Asiatick Researches.* In sum, missionary understanding of Indian astronomy was either derived from the researches of *Asiatic Society* or from their own prejudices. Irrespective of the case, their intellectual enthusiasm remained subordinate to their religious zeal.

2.3 Accounts of European scientists

In this section, commentaries of the following scientific personalities will be surveyed: John Playfair (1748–1819),[1] Reuben Burrow (1747–1792)[2] and Samuel Davis (1760–1819).[3] These commentaries are highlighted because the views espoused by these scientists were corroborated by the observations of various other contemporary European scientists. This section focuses on the scientific temper in the commentaries of these European scientists. In doing so, it is argued that while scientific views, under normal circumstances, are deemed most authentic in a study of astronomical methods, this was not the case in colonial India. On the contrary, these views were suppressed and sharply criticized by officials of the East India Company.

A careful scrutiny of the first three volumes of the *Asiatick Researches* reveals the contributions of some eminent mathematicians. In the following words, John Playfair describes the threefold 'object' of his remarks:

> First, to give a short account of the Indian astronomy ... from the four sets of tables (obtained from the French astronomer Jean Sylvain Bailly[4]); second, to state the principal arguments that can be deduced from these tables ... and third, to form some estimate of the geometrical skill with which this astronomical system is constructed (Dharampal, 1971).

Samuel Davis, similarly, outlines the purpose of his essay:

> I began with calculating, by a modern Hindu formula, an eclipse which will happen in next November ... a computation of the above eclipse, not merely on the principles, but strictly by the rules of the *Surya Siddhanta,* is what I propose now to present you with (1801a, pp. 226–227).

However, as these accounts are based on observations or tables found at different locations in India–Benares (North), Bhagalpur (East) and Tirvalore (South)–it may be argued that they are unreliable in projecting a coherent picture of Indian astronomy. Samuel Davis allays such doubts by informing us that 'since the Brahmins of Tirvalore agree with those of Bengal, it is not at all probable that they should have different systems' (1801b, p. 209).

Moreover, all scientists concur that the primary source of all these tables is the text–*Sūryasiddhānta.* This is further confirmed by William Robertson:

> All the astronomers of Indostan rely entirely upon the precepts contained in a book called *Soorej Sidhant* (spelled variously as Surya Siddhantam or Soorej Siddhanta) composed in a very remote period (Robertson, 1794, p. 299).

Recognizing this fundamental commonality, Playfair comments that the four sets of tables, 'although scattered over an extensive country, they seem to be all originally adapted, either to the same meridian, or to meridians at no great distance' (Playfair, 1790).

Some of the salient points covered in the writings of European scientists are discussed below.

2.3.1 Originality of Indian astronomical tables

One of the questions discussed by European scientists was whether the Indian astronomical tables were original or whether they were borrowed from another system. Playfair observes that since the 'meridian'[5] of the Siamese tables is 1 h, 13′ west of Siam, nearly same as that of Benares, it may be concluded that 'the tables of Siam originally came from Hindostan'(Playfair, 1790). In order to probe this issue further, in scientific spirit, he urges that "we enquire whether the Indian epoch (18th Feb, 3102 BCE) is real or fictitious [...] whether it has been determined by actual observation or has been derived from the modern epochs of other tables"(Playfair, 1790). This question was studied by various astronomers and mathematicians for a long time. In 1902, the *Journal of the British Astronomical Association* published a paper titled "The Indian Tirvalore Tables" that surveyed prior investigation into this subject. The paper concluded that "it appears not impossible that the Hindu Kali epoch, 3102 BCE, may have been an actual recorded date, but it must then be shown that it was used prior to the eleventh century" (Stuart, 1902). A large body of inscriptional evidence that has come to light since the publication

[1] In 1785, John Playfair became joint professor of mathematics in the University of Edinburgh, and later in 1805 he was elevated to the chair of natural philosophy at Edinburgh. Being a founding member of the *Royal Society of Edinburgh,* he edited its *Transactions*, in which he published most of his own scientific papers. In 1811 he was the leading spirit in establishing the Astronomical Institution of Edinburgh, of which he was president until his death.

[2] Rueben Burrow attended the Leeds mathematical school of John Crookes (*fl.* 1762–1779). In Bengal, he was appointed mathematical teacher of the engineer's corps and was connected with the proposed Trigonometrical Survey of Bengal.

[3] Samuel Davis was an active member of the Asiatic Society . Basing his work on the *Sūryasiddhānta* and its commentary, he produced two papers that were published in the *Asiatick Researches*.

[4] 'Based on his research on the satellites of Jupiter, Jean Sylvain Bailly (1736–1793) was appointed a member of the Academy of Sciences on 29 January 1763.'.

[5] Meridian—an imaginary great circle on the surface of the earth passing through the north and south poles at right angles to the equator.

of this paper shows that the date of 3102 BCE was used and known throughout the country from the sixth to the nineteenth centuries. Dr. Raja's recent work furnishes evidence of 436 inscriptions that refer to 3102 BCE (Raja, 2020). Such widespread verifiably attested use of this epoch for at least five centuries before Stuart's requirement (that is, before eleventh century CE) and for at least eighteen centuries (that is, starting from the sixth century CE at least) deserves commensurate scholarly re-evaluation from first principles free from any colonial baggage.[6]

However, in nineteenth century Europe, the task of verifying this suspicion was taken up by French astronomer Jean-Sylvain Bailly, who 'computes the place of the moon for the same epoch, by all the tables to which the Indian astronomers can be supposed to have ever had access' (Playfair, 1790, p. 74). Using the methods of Greece, Tartary and Arabia, Bailly finds that the results obtained, in each case, are different from those mentioned in the Indian tables. This leads Playfair to comment that 'it is certain that astronomy of the Brahmans is neither derived from the Greeks, the Arabians, the Persians or the Tartars (Playfair, 1790, p. 75).

2.3.2 Ingenuity of Indian tables

A second issue concerning Indian Knowledge Systems was the ingenuity of Indian tables. From calculating the equation of the sun's centre to determining the inequalities in the mean motions of Saturn and Jupiter, the Indian astronomers made various sophisticated calculations. In a tone of awe and wonder, Mr. Burrow remarks:

> It is also reported that the Brahmins have rules for computing the returns of places of comets ... a matter astonishingly difficult and complicated (even for us) (Dharampal, 1971).

Among several features of Indian astronomy that were deeply appreciated, the simplicity and elegance of their mathematical methods is particularly striking.

> To calculate an eclipse is no trifling matter even in our astronomy and if the Brahmins have such short and easy modes of computation as to make that business a trifle, to gain their methods is certainly an object worthy of enquiry and the more so, as our modes of calculation are excessively tedious and intricate (Dharampal, 1971)

> The Hindoos ... usually gave two rules for the same operation, one couched in the shortest terms possible and often in verse for the ease of memory and the other ... for explanation (Burrow, 1799 , pp. 473–475).

2.3.3 Appropriation of Indian knowledge systems

Based on the communication between orientalists, scientists and colonial officials, it seems that certain aspects of Indian astronomy were carefully appropriated. In 1783, Maconchie wrote to Dundas, advocating that 'if the ancient works of the Hindoos were procured to Europe, astronomy and antiquities, and the sciences connected with them would be advanced in a still great proportion'. Further, he stated that 'the centre of most of this learning was Benares, where 'all the sciences are still taught' and where 'very ancient works in astronomy are still extant'.

With a view to accomplish such an objective, Mr. Burrow wrote to Warren Hastings:

> A journey to Benares would give an opportunity ... of making the best collection of astronomical and physical observations ... and if it was thought that umbrage might be taken at such a procedure by the natives, it might easily pass under the notion of measuring degrees of the meridian, or of longitude &c., to avoid suspicion (Dharampal, 1971).

2.3.4 Similarities with European astronomy

Another salient point that is discussed by European scientists is the similarity between Indian and European astronomy. John Playfair examined nine different astronomical elements ranging from the moon's acceleration to the obliquity of the ecliptic. All of these, he found, had been precisely recorded in Indian tables (as per their epoch). He verified these results by tallying them with the formulae of La Place, the rules of Mayer, the tables of Cassini and the theory of M. De La Grange.

> That observations made in India, when all Europe was barbarous or uninhabited, and investigations into the most subtle effects of gravitation made in Europe, near 5000 years afterwards, should thus come in mutual support of one another, is perhaps the most striking example of the progress and vicissitude of science, which the history of mankind has yet exhibited (Dharampal, 1971).

Moreover, Pierre Simon de La place (French astronomer) comments:

[6] To cite one example, Mr. Sewell's remarks on Samuel Stuart's paper refer to "an inscription dated during the reign of a Western Chalukya king, in Saka era 556, corresponding to CE 633–4. This inscription adds that the year is 3735 "since the Bhārata War." Now, the old Indian traditions fix this war (the war of the heroes of the great epic poem, the Mahābhārata), as the epoch of the Kali Yuga, which was BCE 3102, as I told you before. 3735–633 = 3102. Therefore, the composers of the inscription in CE 633–4 had got the correct epoch of the Kali Yuga at that date.".

> I find by my theory that at the Indian epoch of 3102 BC, the apparent and annual mean motion of Saturn was 12°,13′,14″, and the Indian tables make it 12°,13′,13″. In like manner, I find that the annual and apparent mean motion of Jupiter at that epoch was 30°, 20′, 42″, precisely as in the Indian astronomy (LaPlace, 1787, p. 80)

Furthermore, it is remarked that 'the construction of these tables implies a great knowledge of geometry, arithmetic, and even of the theoretical part of astronomy.' Playfair, again in true scientific spirit, concludes his essay by cautioning that 'the whole evidence on this subject is not yet before the public, and that the repositories of Benares may contain what is to confirm or invalidate these observations.'

3 Reactions to the scientific accounts

The views presented in the aforementioned scientific accounts were corroborated by various historians such as Thomas Twining and George Forster. For instance, Robertson remarked that "the Indian Brahmins, who annually circulate a kind of almanack, containing astronomical predictions [...] are in possession of certain methods of calculation, which upon examination, are found to involve in them a very extensive system of astronomical knowledge" (Robertson, 1794, p. 299). However, they met with sharp criticism from various quarters, including the Anglicists, Utilitarians and other colonial officials. The most vehement attack on Indian astronomy was launched by James Mill in the second volume of his widely published *The History of British India* in which he asserts that his objectivity is guaranteed by the fact that he has never visited India. According to Mill, all scientific commentaries which contained anything to suggest the ingenuity of Indian astronomers were to be 'distrusted', while those scientists who wrote pejoratively of Indian sciences were to be regarded as rational (Mill, 1858).

Let us briefly reflect on some of the major points of criticism:

3.1 The debate on originality of Indian astronomical sciences

We have seen above how Playfair and Bailly had empirically verified the originality of Indian astronomical tables. However, in the colonial drama of nineteenth century India, rationality, it seems, was subservient to power and prejudice.

While William Jones claimed that 'the Hindu ecliptic was derived from the Chaldeans', Montcula argued that it was borrowed from the Greeks.' But, Mill claimed that both systems (Chaldean and Greek) were 'the same in the end' (Mill, 1858).

Mill dismissed Bailly's analysis of Indian astronomical tables because from them,

> He (Bailly) inferred, not only advanced progress in science, but a date so ancient as to be entirely inconsistent with the chronology of the Hebrew scriptures.

Further, Bailly's scientific credibility was questioned in the following way:

> The man who invented a theory of an ancient and highly civilized people, now extinct, formerly existing in the wilds of Tartary ... is not to be trusted as a guide in the reasons of conjecture (Mill, 1858).

However, recognizing that he could not debunk Indian astronomy merely by dismissing Bailly, Mill further alleged that 'the most eminent of all the *mathematical converts*, gained by M. Bailly was Mr. Playfair.' [Italics mine].

At least in matters of scientific dispute, rarely does history reveal such ironies where a Scottish historian arbitrarily discounts the findings of a leading Scot astronomer.

Henry Colebrooke also contested the claim of originality of Indian astronomy by alleging that their solar zodiac was taken from the Greeks, but 'adapted to their own ancient division of the ecliptic into twenty–seven parts.'

In post-independent India, scientists like P.C. Sengupta, Lecturer in Ancient Astronomy and Mathematics, at Calcutta University, have shown us the difficulty of resolving this dispute:

> We are not suggesting that the Indian epicyclic astronomy as it was developed by Aryabhata I and his pupils was uninfluenced by Babylonians and Greek sciences. But the problem of discerning how far the Indian astronomers were original as regards planetary theory appears insurmountable (Sengupta, 1947, p. 81).

Sengupta sums up the whole controversy in the following words:

> Although scientific Indian astronomy is dated much later than the time of Ptolemy, barring the mere idea of an epicyclic theory coming from outside India, its constants and methods were all original (Sengupta, 1947, p. 82).

3.2 The controversy over antiquity of Indian epoch

Another major point of contention between nineteenth century European scholars was the antiquity of the Indian epoch, which, on the basis of Indian tables, was acknowledged by Bailly & c. to be the midnight of 17th and 18th February,[7] 3102 BCE. However, this opinion was contested by Bentley in one of his essays for the *Asiatic Researches* in which he argues that the 'principles of Hindoo astronomy were unknown' to both Baily and Playfair and their conclusions are 'ill-founded.' He then proceeds to 'do away' with such 'delusions' (Bentley, 1805). Quite expectedly, Bentley found an ally in Mill, whose tirade against Indian astronomy got another boost.

Playfair, naturally disturbed at these accusations, retaliated sharply:

> It was not likely that an *amateur*, however distinguished, should convict these astronomers of gross ignorance, or find it so easy to *do away* their opinions, in ... a science which, day and night had been for many years the subject of their study (Playfair, 1790).

Rather, he showed that 'were we ... to ascertain the age of the (Indian) tables by Mr. Bentley's rule, we should commit an error of about 1800 years.' With the help of three different examples, including the positions of the sun and moon, Playfair logically establishes the antiquity of Indian epoch at 3102 BCE, a conclusion that 'any man of plain sense and tolerable impartiality will be inclined to draw.' Bentley presupposes that Indian astronomers constructed their tables by 'comparing modern observations with a fictitious epoch'(Playfair, 1790). However, Playfair argues that 'this is nowhere proved by Mr. Bentley, though taken as the basis of all his computations.' In summing up this dispute, Playfair cautions that a 'great deal of scepticism ought to be preserved' as 'this subject still requires much investigation' and urges that we 'prevent opinion from taking on this head, any fixed and determinate position'. Despite being a strong advocate of rationality, Mill is probably unaware of his logical fallacy when he declares that 'whatever is unproved ... is altogether unworthy of belief (and) deserves simple rejection' (Mill, 1858). For those uninitiated in the methods of rational inquiry, the above debate provides an excellent illustration of the contrast between empiricism and sophistry.

3.3 The charge of irrationality

It is not uncommon to find Indian astronomy being denounced as irrational and static. French explorer, Pierre Sonnerat, wrote that Indian astronomers determine their eclipses 'by set forms, couched in enigmatical verses &c.' However, Samuel Davis, in his account, refutes this view and says that Sonnerat was 'too hasty in asserting (the opinion) generally' (Davis, 1801a, b). Moreover, Elphinstone accused Brahmins of hindering scientific progress:

> The same system of priest craft, which has exercised so pernicious an influence on the Hindus in other respects, has cast a veil over their science (Elphinstone, 1843, p. 140)

Moreover, the nineteenth century method of using shells to compute eclipses came under sharp criticism. Playfair describes this 'mysterious method' in his account:

> The Brahmin seating himself on the ground, and arranging his shells before him, repeats the enigmatical verses ... and from his little tablets and palm-leaves, takes out the numbers that are to be employed in it (Playfair, 1790).

James Mill uses the 'strangeness' of this method to launch a scathing critique of Indian astronomy:

> Scarcely can there be drawn a stronger picture than this of the rude and infant state of astronomy. The Brahmen, making his calculation by shells, is an exact resemblance of the rude American performing the same operation by knots on a string; and both of them exhibit a practice which then only prevails ... when the human mind is too rude and too weak to break through the force of an inveterate custom (Mill, 1858, p. 73).

However, much to the dismay of Mill, modern science vindicated the 'rude Brahmin'. Commenting on the *Vākyam method* of computation of eclipses, Sengupta notes:

> An interesting and rapid method of mechanical computation of eclipses was developed by Tamil calendar makers. This involved the use of shells to represent various numbers and their sexagesimal fractions (Sengupta, 1947, pp. 92, 93).

Further, Sengupta notes how this method has been studied and validated by modern scientists:

> The various numbers gathered from such sources and the tables compiled on the basis of oral information were recently studied by Neugebaeur and Van der Waerden, giving a very clear exposition of the *vakyam* process (Sengupta, 1947, pp. 92, 93).

In fact, John Warren, an astronomer of the East India Company, observed how the lunar eclipse of 31st May–1st June, 1825 was nearly accurately computed using the above *Vakyam* method.

4 Conclusion

This article has shown that there that the qualitative judgement of nineteenth century Indian astronomical methods did not happen in a purely scientific environment. By hijacking

[7] Epoch—an arbitrarily fixed date that is the point in time relative to which information (as coordinates of a celestial body) is recorded.

the scientific discourse of the nineteenth century, imperial, religious and political interests played a pivotal role in this process and eventually overshadowed the scientists. One such non-scientific work that influenced the discourse on Indian knowledge systems was *The History of British India* authored by James Mill, who occupied an influential position at the East India Company's headquarters in London. Mill's *History* became the standard textbook at all national universities and a required reading for Anglo-Indian administrators, many of whom shaped the educational policy of modern India (Goswami, 2012, p. 111). Mill's ideas also influenced Macaulay's famous minute of 1835, in which he denounced all attempts to teach "false history", "false astronomy" or "false medicine" because he found them "in company with a false religion" (Macaulay, 1835, p. 115).

The time has come to depart from colonial narratives of Indian knowledge systems. In a post-colonial world, which is witness to various endeavours to understand the diversity of indigenous knowledge systems, there is a dire need to revisit the history of Indian science and technology without the burden of colonial biases.

References

Bentley. (1805). *Esq. Article XII, On the Hindoo systems of Astronomy, Asiatick Researches* (Vol. 8). Calcutta: Asiatick Society.

Carey. (1818). *Prospectus of a college for the instruction of Asiatick children*.

Carey, W. (1792). *An enquiry into the obligations of Christians to use the means for the conversion of the Hindus*. London: Carey Kingsgate Ltd.

Chatterjee, S. K. (1998). *Indian Calendric System*. Publications Division, Ministry of Information and Broadcasting.

Clarke, J. J. (1997). *Oriental enlightenment: The encounter between Asian and Western thought*. Routledge.

Dalmia, V. (2007). *Orienting India*. New Delhi: Three Essays Collective.

Davis, S. (1801a). On the astronomical computations of the Hindus, *Asiatick Researches*, vol. 3, *Asiatick Society*, Calcutta, 1788–1839, republished in London: 1801a–1839, pp. 225–288.

Davis, S. (1801b). *On the Indian cycle of sixty years*, vol. 3, *Asiatick Researches*, p. 209.

Dharampal. (1971). *Indian Science and Technology in the Eighteenth Century*. New Delhi: Biblia Impex.

Elphinstone, M. (1843). *The History of India*. John Murray.

Emmott, D. H. (1965). Alexander Duff and the foundation of modern education in India. *British Journal of Educational Studies, 13*, 2.

Goswami, S. (2012). *Colonial India in children's literature*. Routledge.

Grimshaw, P., & May, A. (2010). *Missionaries, cultures and indigenous people*. Brighton: Sussex Academy Exchange.

Jones, W. (1801). On the chronology of the Hindus, *Asiatick Researches*, vol. 2, chapter VII. Asiatick Society: Calcutta 1788–1839), republished (London: 1801–1839).

Kopf, D. (1969). *British orientalism and the Bengal renaissance: The dynamics of Indian modernization, 1773–1835*. University of California Press.

La place. (1787). *Espirit des Journeaux* Nov. 1787.

Laird, M. A. (1972). *Missionaries and Education in Bengal, 1793–1837*. Oxford University Press.

Mill, J. (1858). The History of British India, Volume II, fifth edition. In H. Hayman (Ed.), *Wilson.* (Vol. 10). London: James Madden.

Macaulay, T. B. (1835). *Minute dated the 2nd February 1835, quoted in Henry Sharp, Selections from the educational records of the Government of India, Part 1: 1781–1839* (p. 1920). Superintendent Government Printing.

Playfair, J. (1790). Remarks on the Astronomy of the Brahmins. *Transactions of the Royal Society of Edinburgh, 2*(1), 135–192.

Raja, M. L. (2020). *Kali Yuga: Inscriptional evidence*. Blue Rose.

Robertson, W. (1794). *A historical disquisition*. In Strahan, A, & Cadell, T. Edinburgh, London.

Said, E. (2003). *Orientalism*. Delhi: Penguin Classics.

Sen, S. N. (1985). Survey of studies in European Languages. In S. N. Sen & K. S. Shukla (Eds.), *History of Astronomy in India.* New Delhi: Indian National Science Academy.

Sengupta, G. G. (1996). *Indology and its eminent western savants: Collection of biographies of western Indologists*. Punthi Pustak.

Sengupta, P. C. (1947). *Ancient Indian chronology*. Calcutta University Press.

Sivasundaram, S. (2005). *Nature and the Godly Empire: Science and Evangelical mission in the Pacific, 1795–1850*. Cambridge University Press.

Stennett, S. (1825). *Memoirs of the life of the Rev*. William Ward.

Stuart, S. (1902). The Indian Tirvalore tables. *Journal of the British Astronomical Association, 13*(1902), 76–82.

Vishwanathan, G. (1989). *Masks of conquest*. Columbia University Press.

Ward, W. (1811). *Account of the writings, religion and manners of the Hindoos*. Mission Press.

Ward, W. (1818). *A view of the History, Literature, and Mythology, of the Hindoos* (Vol. 1). Mission Press.

Zastoupil & Moir. (1999). *The great Indian education debate: Documents relating to the Orientalist-Anglicist controversy, 1781–1843*. Routledge.