

'A Christian Benares': Orientalism, science and the Serampore Mission of Bengal

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By using the case of the Baptist missionaries called the 'Serampore Trio'—Rev. William Carey, Rev. William Ward and Rev. Joshua Marshman—this article urges that science and Christianity were intimately related in early nineteenth-century north India. The Serampore Baptists practised a brand of Christian and constructive orientalism, devoting themselves to the recovery of Sanskrit science and the introduction of European science into India. Carey established an impressive private botanical garden and was instrumental in the formation of the Agricultural Society of India. Ward, in his important account of Hinduism, argued that true Hindu science had given way to empiricism, and that Hindus had confused nature with the divine. The Serampore College formed by the trio sought to educate Indians with respect to both Sanskrit and European science, and utilised a range of scientific instruments and texts on science published in India. The College aimed to change the way its pupils saw the material world by urging experimentation rather than reverence of nature. The style of science practised at Serampore operated outside the traditional framework of colonial science: it did not have London as its centre, and it sought to bring indigenous traditions into a dialogue with European science, so that the former would eventually give way to the latter.

The separation of science and Christianity as discrete bodies of intellectual endeavour is alleged to be central to the emergence of modernity. Until recently, scholars cast modern science as a Western invention, which diffused across the world on the winds of empires, taking seed and bringing nourishment to all humanity.¹ Those who studied the spread of Christianity took a similar position in urging the transplantation of European values and beliefs wholesale by evangelists.² These views have been decisively recast in the past two decades. On the one hand, some

¹ The most influential diffusionist position arose out of: Bassalla, 'The Spread of Western Science'.

² See, for instance, Latourette, *A history of the expansion of Christianity*, and Latourette, *Christianity in a revolutionary age*.

scholars claim that modern science emerged out of a process of dialogue with local sciences of nature, the body and the sky in non-European lands.³ At the same time, historians of religion argue that Western Christianity was radically transformed by its encounter with non-European cultures and religions.⁴ However, there are others who provide a different emphasis in both instances: instead of stressing dialogue and reconstruction, they point to power and cultural transformation.⁵ According to their view, Western science and Christianity are among some of the most potent ideological tools of imperialism, and lead to the colonisation of the mind and the reification of otherness.

Late eighteenth-century Britain saw the emergence of a spate of voluntary organisations of moderately Calvinist inclination which sought to heed the call of scripture and commission missionaries to sail abroad. Amongst these, the Baptist Missionary Society, which was formed in 1792 by a humble set of Northamptonshire ministers, was the very first.⁶ These societies together oversaw the globalisation of Protestantism, with a rapid dispersal of missionaries to all corners of the globe. Although it is obvious that these evangelists preached the Bible, they often took on other roles as well—as printers, agriculturists, doctors, and naturalists. Indeed, in the early nineteenth-century, missionaries were among the most important practitioners of Western science in the non-European world.⁷ Unlike army surgeons, who ministered to a select few, or travelling gentlemen, who only spent relatively short periods overseas, Christian missionaries took up residence in the non-European world and, in some cases, spent the rest of their lives abroad. In addition to seeing their stations as fields for the study of nature, they also sought to educate local peoples in science, and in this way served as some of the earliest popularisers of Western science in the non-European world. Although evangelicals were somewhat sceptical of William Paley's arguments about natural theology, they advocated a theology of nature which encompassed the view that converts could meditate on nature and come to God's character.⁸ Rev. William Carey, who had been a shoemaker and then turned to the ministry, might be credited as providing the impetus to the formation of the Baptist Missionary Society. By November 1793, Carey,

³ See, for instance, Bayly, *Empire and information*, and Fan, *British naturalists in Qing China*.

⁴ Walls, *The missionary movement in Christian history*.

⁵ This scholarship follows a Saidian inspiration. For Christianity, see Hall, *Civilising subjects*, and for science see Adas, *Machines as the measure of men*.

⁶ For a history of the Baptist Missionary Society, see Stanley, *The history of the Baptist Missionary Society*. The Baptist Missionary Society was followed by the London Missionary Society in 1795, the Edinburgh (Scottish) and Glasgow Missionary Society in 1796, and what became the Church Missionary Society in 1799.

⁷ In making this claim, I follow my work elsewhere. See Sivasundaram, *Nature and the godly empire*. For other work on missionaries and science, see also Livingstone, 'Scientific inquiry and the missionary enterprise'.

⁸ William Paley, the theologian and moralist, was the author of *Natural Theology* (1802). There is now a vast literature on the relationship between natural theology and science amongst elite

his wife and children had landed in Bengal, where Carey was to spend 41 years. In order to support himself, Carey took up the position of manager at an indigo factory, and in his first letter from India he asked for sickles, scythes, plough wheels and seeds of flowers, fruits and trees for his own garden.⁹ In 1800, he moved to the Danish settlement of Serampore, outside Calcutta, where he established what was said to be the most impressive private botanical garden in Asia.

This article describes the style of science practiced by Rev. William Carey and his closest collaborators—Rev. William Ward and Rev. Joshua Marshman—who, together with him, comprised the so-called 'Serampore Trio'. When viewed from Serampore, it appears that science and Christianity were intimately-related civilising missions. However, this essay reaches beyond this point to propose an anti-diffusionist position. The Baptist missionaries studied here did not merely bring Western science to Bengal; the science that they practised was distinct in several ways to that which emerged out of elite institutions in London or from the journals of gentlemanly travellers in India.

First, the missionaries sought to adopt Sanskrit science and to teach it alongside European science at a college that they instituted in Serampore. This allowed a certain amount of dialogue between different traditions of knowledge. At Serampore College, Sanskrit astronomical traditions were taught alongside Copernican ones. However, this dialogue did not operate in a power vacuum. By devoting themselves to the study of the allegedly lost sciences of India, the Serampore missionaries hoped to supersede that tradition of knowledge with true Christian science. This was then an instructive dialogue which was expected to lead to conversion.

Second, this article takes on an anti-diffusionist position in claiming that the genre of science that resulted in Serampore sought independence from the metropole. In forming his own botanic garden at Serampore, in collaborating closely with the superintendents of the Calcutta botanic garden and also in founding the Agricultural Society of India, Carey hoped to encourage European residents in India to take the lead in practising science. Science practised by residents was for Carey distinct from and more effective than the kind of science done by mere travellers. Furthermore, Carey's network of correspondence, which served as a means of gathering natural historical specimens, was centred in Serampore and Calcutta, and its node in England was not in London as much as it was in the Midlands. In this way, the Serampore network challenges the traditional structure of centre and periphery attributed to colonial science by historians.

practitioners. For a starting point, see Brooke, *Science and Religion*. Indeed, natural theology is now thought to have continued in strength through the long nineteenth century. See Lightman, 'The visual theology of Victorian popularisers of science'.

⁹ Farrer, *William Carey*. For perhaps the most recent account of Carey's arrival in India and evolving response to its cultural traditions, see Oddie, *Imagined Hinduism*, pp. 135–47.

An understanding of the status of missionaries in India in this period is useful as an introduction to the kind of science cultivated by these evangelists.¹⁰ Throughout the late eighteenth and early nineteenth centuries, missionaries were closely watched and controlled by the East India Company, who feared that they would aggravate local resistance by offending the religious sensibilities of Indians. When the Company's charter was debated in parliament in 1793, the campaigns of the evangelicals, Charles Grant, who became a director of the Company, and William Wilberforce, the slavery abolitionist, had little effect, as their proposal that missionaries should be sent to India at Company expense was rejected. Despite this opposition, voluntary societies continued to send missionaries to India, and these evangelists often succeeding in proving their utility to the Company. Evangelical Company officers in India formed alliances with missionaries, and a pragmatic policy of accommodation emerged.

In 1806, with the Vellore mutiny, however, the climate became less forgiving: there were calls for all missionaries to leave India, and Governor-General Minto of Bengal (1751–1814), imposed strict restrictions on both Anglican and dissenting missionaries. Danish safe havens such as Serampore and Tranquebar in the south had served as cradles of Christianity outside British control: but even Serampore came under strict control in 1808. Despite these setbacks, the mood swung again by 1813 because of developments in the metropole. When the Company charter was put to parliamentary debate, Wilberforce and his cohort found success at last. A pious clause was included necessitating that the Company give 'sufficient facilities' to those who proceeded to India to promote 'the Interests and Happiness' of Indians, as long as the 'the authority of the Local Governments respecting the Intercourse of Europeans with the interior of the Country be preserved'.¹¹ But this, in fact, made little practical difference in India itself.

In Serampore, the generally unsympathetic attitude of the Company meant that the trio had to ensure that the mission was self-sufficient throughout this period, and that the Company was aware of its usefulness. These two factors are important in making sense of why the science practised at Serampore was so localised. The missionaries adopted a model of community life borrowed largely from the Protestant Moravians and stressed that they should 'have all things in common, and that no one should pursue business for his own exclusive advantage'.¹²

Carey acted as translator and agriculturist in order to present the utility of his science, and with the hope of funding the mission. When Carey first arrived he had hoped that a position at the botanical garden might provide the necessary finances for his role as missionary. In 1801, he was appointed professor of Sanskrit, Marathi and Bengali at the Company's Fort William College, and his salary was

¹⁰ This description relies heavily on Porter, *Religion versus empire?* For missionary work in India, see also Neill, *A history of Christianity in India*, and Cox, *Imperial fault lines*.

¹¹ Cited in Porter, *Religion versus empire?*, p. 74.

¹² Cited in Stanley, *The history of the Baptist Missionary Society*, p. 40.

vital in balancing the mission's books.¹³ In 1812, he wrote to John Sutcliff, the Baptist minister, that he had been thinking about how to secure the financial security of the mission: 'I have thought much of some kind of cultivation of the soil.' Carey continued that Europeans were prohibited from buying land, but that some members of the Supreme Council had given him the idea that if he were to apply for a 'thousand Biggahs for the planting of timber' an exception may be made in his case.¹⁴ The Serampore missionaries' science was, therefore, intended as a financial safeguard. More personally, however, as Carey's correspondence network demonstrates, the science practised at Serampore was a means of cultivating proper habits of mind and body, and resisting the dangers of disease and worldliness in a foreign land. Carey's most erstwhile friends were in the Midlands, where the Baptist Missionary Society had blossomed: in fact, they had a fear of the Baptist circles in London, which were alleged to be characterised by self-importance and hyper-Calvinism. Carey's preference for Midlands correspondents for natural history makes sense in this light: by exchanging natural historical specimens, he could keep alive old friendships, whilst resisting links with London.¹⁵

While the science of the Serampore mission has not attracted any serious scholarship, there have been a few important articles in the past five years on the relationship between science and Christianity in India.¹⁶ Indira Viswanathan Peterson has published on the placement of science in the work of German missionaries in the other Danish settlement, Tranquebar. Documenting the cases of King Serfoji II (1777–1832) and Vedanayakam Sastri (1774–1864), Peterson argues that these two Indians adopted a distinctively pietist science which they then harmonised and reinterpreted in 'Indian contexts of learning, action and performance'.¹⁷ This emphasis on the adoption of Western science along the lines of existent philosophical traditions is also evident in Richard Fox Young's work on the evangelical sympathiser Lancelot Wilkinson and his wide circle of pundits, particularly Soobajee Bapoo. Based in Malwa, Wilkinson's astronomical exchanges with his pundits became famous in the 1830s.¹⁸ Wilkinson hoped to renew Sanskrit science by evolving it into Copernicanism. He wrote of Soobajee's conversion to Western astronomical traditions, but it seems more likely that Soobajee used his contact with Wilkinson to improve Sanskrit science along a route which was concordant

¹³ For more on the importance of Carey's translations and Ward's publications on Hinduism for the finances of the mission, see Oddie, *Imagined Hinduism*, p. 156.

¹⁴ Carey to Sutcliff, letter dated 13 Jan. 1812, IN/13, Angus Library, Regent's Park College, Oxford, (hereafter Angus Lib).

¹⁵ For the Baptist Missionary Society's birth in the Midlands and its view of London Baptist circles, see Stanley, *A history of the Baptist Missionary Society*, Ch. 1.

¹⁶ There have been very useful empirical accounts of Carey's science: Farrer, *William Carey and Mukherjee, William Carey's contribution to science*.

¹⁷ Peterson, 'Tanjore, Tranquebar, and Halle', cited p. 103. See also Peterson, 'The Cabinet of King Serfoji of Tanjore'.

¹⁸ Bayly, *Empire and information*, p. 258.

with Hindu sensibility. From his study of the encounter between science and religion in Malwa, Young concludes that the British were not always hegemonic in these intellectual domains: there was no 'totalistic regime of science'.¹⁹

A similar argument also emerges in an essay by Michael Dodson on the Benares Sanskrit College, which became a bastion of constructive and Christian orientalism, partly out of the inspiration provided by Wilkinson's model.²⁰ Here, John Muir and James Ballantyne, who successively held the post of Superintendent from 1844 and 1845 respectively, sought to use Western science as a 'tool for the propagation of Christianity among the Hindu learned elite'.²¹ In effect, they sought to resuscitate Sanskrit learning within a Christian developmental framework. But, in fact, the pundits at the College integrated this knowledge into their own ways of conceptualising the world. Both Young and Dodson's work outline cases of constructive and Christian orientalism from the 1830s to the 1850s that descended from the Serampore model of the early nineteenth century. Some of the scientific texts that were used in Serampore, such as those written by the Baptist missionary William Yates, and the Serampore periodical *Friend of India*, were important for these latter day orientalist. On the basis of Young and Dodson's work and this essay, the cohabitation of Christian science and constructive orientalism might be traced across these decades. This combination of ideologies allowed a meeting of utility and conversion with a devotion to Sanskrit scholarship: Christian and constructive orientalism was set apart from its more secular counterpart, even though it drew on the latter in complicated ways.²² While the pundits of Serampore had less direct access to print than those that served as collaborators for Wilkinson and Ballantyne, Raja Rammohun Roy's engagement with the Serampore mission suggests that a similar strategy of Indian response was evident in Serampore, to that documented by Peterson, Young and Dodson.²³

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¹⁹ Young, 'Receding from antiquity', p. 215.

²⁰ Dodson, 'Re-presented for the pandits'. At the time this article went to press Michael Dodson's book *Orientalism, Empire and National Culture* was forthcoming with Palgrave Macmillan.

²¹ Dodson, 'Re-presented for the pandits', p. 258.

²² This article will not go into a detailed treatment of how the Serampore missionaries' orientalism worked in parallel to more secular forms of orientalism in Bengal. It is important to stress, however, that even in their work on science, the missionaries' primary aim was conversion, and this set them apart from their more secular counterparts. Specifically in relation to views of religion, Geoffrey Oddie has provided a useful summary of points of similarity and difference between these two intellectual trajectories. He summarises that both types of orientalist held to the notion of Hinduism as Brahmanism, and the idea of a golden age in the past characterised by original monotheism. However, the secular orientalist showed some distance from the belief in Christianity as the one universal religion, and they displayed greater interest in the high scholarly traditions of Brahmins, unlike the missionaries who fraternised with lower classes from whom they extracted information. See Oddie, *Imagined Hinduism*, pp. 95–107.

²³ In addition to Dodson, Peterson and Young's work, there has also been a further recent article on science, religion and astronomy. In 'A transnarrative for the colony', Rajive Tiwari's uses the term 'transnarrative' to describe the way in which the dialogue between Christian science and indigenous

In uncovering why the Serampore missionaries practised science and in describing the results of this science, this essay takes account of the role of material culture. Writing to the superintendent of the Calcutta botanic garden, Nathaniel Wallich, in an undated letter from the 1820s, Carey noted: 'You have greatly obliged me by your very kind present. Accept my thanks. To me every such thing is a great acquisition. I shall feel much gratified if any thing I have will at any time give you pleasure.'²⁴ Central to Carey's science was the exchange of gifts: the natural artefacts he collected served as tokens of memory and symbols of improvement. Recent work by Margot Finn on the practice of gift-giving and the formation of kinship relations is useful in coming to terms with Carey's botanical network.²⁵ Unlike Finn's analysis of the governing classes of the Company, Carey's collecting of specimens needs to be cast as a project of self-improvement. But there is a similarity between these two cultures of gift-giving in the role they played in establishing notions of family and community, which were crucial in the isolating world of India. Gifts were also vital to the function of the Serampore College: a series of scientific instruments sent as a gift from Edinburgh was used by the newly arrived Rev. John Mack, who taught chemistry. By their physicality, these scientific instruments were supposed to impress Indians of the empirical veracity of European science. What mattered was not only what students saw at the end of telescope, for instance, but the rhetorical role played by these instruments. In his important account of Hinduism, Rev. William Ward described how Hindus' pantheon of gods revealed an inferior philosophy of representation. Ward asserted that the Hindus had not realised that their gods referred to another God. They had worshipped the images themselves, and these objects were made out of natural elements.²⁶ The instruments at Serampore College were alleged to demonstrate the fallacy of such a view, by showing how experiments could modify the very materials from which Hindus made their gods. Historians should thus attend to the status of material culture in the Serampore mission.

The discussion begins with a characterisation of Carey's Christian and constructive orientalism, and then moves to an analysis of the nature of the artefacts generated by Carey's scientific interests, and how his correspondence network forged his identity as a missionary and orientalist. The second half of the essay leaves Carey for the other missionaries in Serampore: the discussion turns to Ward's important work on Hinduism and to the Serampore College.

philosophical traditions was managed: 'A transnarrative upholds selected elements of the latter as being in harmony with the former. It co-opts these elements and strategically deploys them as catalysts.' (p. 13). While the term 'transnarrative' might obscure as much as it reveals, Tiwari's emphasis on the directed nature of the collision between Christian science education and Sanskrit traditions is helpful.

²⁴ Carey to Wallich, dated 23 Dec., possibly in the 1820s. IN/13, Angus Lib.

²⁵ Finn, 'Colonial Gifts'.

²⁶ For a detailed discussion of the dismissal of Hindu thought in Ward's book, see Oddie, *Imagined Hinduism*, p. 159ff.

Christian and Constructive Orientalism

In early nineteenth-century Bengal, Rev. William Carey was the exemplary missionary orientalist. Carey's scientific interests ranged widely from botany to zoology. He also played a major role in introducing new techniques of agriculture and printing.²⁷

When William Roxburgh, the superintendent of the Company's botanic gardens at Sibpur, returned to Edinburgh in 1813 to recover from illness, Carey took upon himself the publication of two of Roxburgh's important unfinished works at the mission press in Serampore. *The Hortus Bengalensis: or Catalogue of Plants Growing in the Honourable East India Company's Botanic Garden at Calcutta* appeared in 1814 and the *Flora Indica: or description of Indian Plants* was published first in two volumes in 1820 and 1824 respectively. The *Hortus* indicates Carey's close connection to the Company's gardens.²⁸ Carey forged close friendships with each of the superintendents of the gardens, and was on especially good terms with Roxburgh's eventual successor, the Danish botanist Nathaniel Wallich, who held the superintendence of the garden until 1846. Wallich helped Carey greatly with the publication of the *Flora Indica*.²⁹

Both the *Hortus Bengalensis* and the *Flora Indica* might be cast as works of orientalist botany. In introducing the *Hortus Bengalensis*, Carey noted that Europe's botanical knowledge could never have advanced without the repositories of plants in Asia, Africa, and America. He added that 'travellers and collectors' had made many advances in botany. However, since such individuals spent so brief a time overseas, their findings were necessarily limited. In colonial botanical gardens, valuable specimens could be deposited before they deteriorated over long journeys. In asserting this kind of independence, Carey questioned the fabric of imperial botany, which was predicated on centre and periphery. At this time, Sir Joseph Banks (1743–1820), President of the Royal Society, headed a network of collectors who respected the power of the centre. Meanwhile, gentleman-travellers like

²⁷ For Carey's printing, see Farrer, *William Carey*, Ch. 8.

²⁸ Indeed, there has been some speculation that Carey may have been considered for the superintendence of the garden before Roxburgh's appointment in Nov. 1793, which was about the time that Carey himself arrived in Bengal. Carey wrote to London in Jan. 1794 that 'a person of botanical taste had been sought for some time to superintend a part of the Company's Botanical gardens' (Carey to Sutcliffe, dated 3 Jan. 1794, IN/13, Angus Lib.). He carried on that the vacancy had been filled and that he might be offered another post in the gardens. The question of whether Carey superintended the Company gardens between 1813 and 1814, after Roxburgh's departure and before the appointment of Francis Buchanan to the post, has also been discussed. In the interregnum, Thomas Henry Colbrooke, the scholar and judge, is said by some to have functioned as superintendent, whilst others credit Carey. See Farrer, *William Carey*, p. 78. Also, Ghosh, 'William Carey (1761–1834)', footnote on p. 5.

²⁹ Carey wrote in the introduction to the first volume that Wallich had generously agreed to insert in the *Flora Indica* plants that he had found in Asia, and particularly those he had collected from Nepal. Wallich's initials 'N.W.' appeared in the volume against plants which he had added. The second volume carried what was titled 'an advertisement' by Wallich.

Joseph Dalton Hooker (1817–1911), botanist and son of Sir William Jackson Hooker (1785–1865), Carey's correspondent, made botanical expeditions to colonies such as India.

In the introduction to the *Hortus Bengalensis*, Carey explained why the Calcutta botanic garden should have a degree of independence. Of botanical specimens sent from England, 'scarcely one in ten of them, on an average, arrives in a living or vegetating state, and of those which grown, perhaps scarcely one in ten succeeds'. He concluded: 'Little dependence can therefore be placed on supplies from England.'³⁰ He boasted that out of 3,200 new species contributed to the Company's gardens in 20 years, three thousand were introduced by European residents in India.³¹ If these residents were encouraged in their endeavours and if the Calcutta botanic garden acted as the centre for their researches, they would in time have the honour of 'presenting to the public a list of plants the far greater part of which were unknown to European botanists'.³²

Carey proposed an elaborate network to support the botanical research of the Company's garden. He instructed gentlemen in various parts of India to 'appropriate a small plot of ground for the reception of the plants which grow wild in their neighbourhood'.³³ Carey noted that such gentlemen could collect all they found, even while riding, using their servants as helpers. The owners of these plots were asked to make a catalogue of their collections but to refrain from naming them. He emphasised that naming should be entrusted to a 'scientific botanist'.³⁴ Instead of names, the gentlemen were asked to give numbers and to note the place where the specimen was found, the soil in which it grew, and any remarks about the plant 'collected from the natives' or made by themselves.³⁵ In Carey's vision, the Company's garden would become the centre of a network of field collectors studying the 'undiscovered riches of the vegetable kingdom in the Eastern part of the World'.³⁶

It is possible that Carey envisaged his own botanical garden in Serampore, 20 miles outside Calcutta, as a satellite to the Company's garden. This was said to be 'second in extent only to the Company's Botanic Garden'³⁷; it was arranged according to the Linnaean taxonomic system. Carey's name appeared frequently as a donor to the Calcutta botanic garden in the *Hortus Bengalensis*.³⁸ Carey's personal copy of the *Hortus Bengalensis* survives, and is heavily annotated with a list of specimens in his own garden, and testifies to how closely he compared his own

³⁰ Roxburgh, *Hortus*, p. vii.

³¹ *Ibid.*, p. viii.

³² *Ibid.*

³³ *Ibid.*, p. ix.

³⁴ *Ibid.*, p. x.

³⁵ *Ibid.*

³⁶ *Ibid.*, p. xii.

³⁷ Cited, Farrer, *William Carey*, p. 83.

³⁸ According to S. Pearce Carey, Roxburgh acknowledges Carey for 80 new species that he had added to botany. Carey, *William Carey*, p. 392.

collection to the Company collection. Amongst those listed as donors to his garden are Roxburgh, Buchanan and Wallich, in addition to Hooker Sr and a long list of others.³⁹ Central to the operation of his garden was a team of Bengali gardeners, or *malis*: one visitor estimated that there were 50 such helpers.⁴⁰ Carey trained his own gardeners and taught them the Latin names of all the plants and trees. One of Carey's early biographers interviewed one of these gardeners and noted: 'He entered Carey's employ as a boy; and in his old age could give the botanical name of nearly every plant or flower, a list being taken from his lips of over 250 plants grown in the garden.'⁴¹

Carey's use of Bengali gardeners as assistants is unsurprising when put in the context of his reliance on pundits in the service of translation: here was a man used to collaboration with very different classes of informants. Carey is, in fact, probably better known for his literary work than his botany, and he relied heavily on pundits here. In total, he oversaw the translation of the Bible into six Indian languages: Bengali, Oriya, Sanskrit, Hindi, Marathi, and Assamese. Carey had a series of pundits who made this possible: his first was Ram Basu, a Bengali pundit who was dismissed in 1796 after allegedly committing adultery and procuring an abortion and then was rehired as one of Carey's pundits at Fort William College.⁴² Mrtyunjay Vidyalkar, who is said to be one of the finest Sanskrit scholars of the period, directed Carey's understanding of *sati*. One pundit who has left some traces on historical records was his Marathi collaborator, Vaidyanath. In 1801, Carey was appointed professor of Sanskrit, Marathi and Bengali at the Company's Fort William College. While working under Carey, Vaidyanath conducted the Marathi classes at the College. Vaidyanath also translated a series of books into Marathi, which were later published under Carey's name.⁴³ In explaining his use of pundits and the manner in which he conceived the division of labour, Carey wrote: 'We do employ natives, and avail ourselves of all the help we can, but we never give up our judgement, in any Languages ...'⁴⁴

The understanding that Carey and Roxburgh had acquired via pundits made a material difference to the kind of botany that they practised. The *Hortus Bengalensis* and the *Flora Indica* made use of local names. Roxburgh noted in his *Hortus* that he would omit the column usually devoted to English names and substitute this

³⁹ This annotated copy is in the Angus Lib.

⁴⁰ Farrer, *William Carey*, p. 83. Carey's reliance on lower castes might be contextualised in relation to another historical context, where there was transference of natural knowledge up the social scale. See Grove, 'Indigenous knowledge'.

⁴¹ Myers, *William Carey*, p. 129.

⁴² Potts, *British Baptist missionaries*, p. 82; Oddie, *Imagined Hinduism*, p. 148.

⁴³ Majumdar, 'William Carey and the pandit Vaidyanath'. For more on Vaidyanath and the dispute surrounding his connection to the Fort William College arising from Claudius Buchanan's remarks in his book *Christian Researches in Asia*, see Carey to Sutcliff, dated 5 Aug. 1812, IN/13, Angus Lib.

⁴⁴ Carey to Sutcliff, dated 4 May 1808, IN/13, Angus Lib. For more on Carey's translations see Young, *Resistant Hinduism*, p. 33ff.

with 'Sanskrit, Hindoostani, Bengali, Tamul, Telinga &c. &c. provincial and vernacular names, whenever they can be ascertained with any tolerable degree of certainty'.⁴⁵ Carey added various footnotes to Roxburgh's text which utilised his knowledge of Indian languages. One of these footnotes related to a tree from Nepal, of which a specimen had been sent by Francis Buchanan, the Company surgeon and botanist. Carey noted that Buchanan's name, 'Munko-khoshee', was corrupt. This was 'one of the hundreds which might easily be produced of the mistakes which constantly occur when persons unacquainted, in some measure at least, with the languages, set down words from the mouths of the natives'. Buchanan apparently only spoke 'Hindustannee' and Carey noted that 'Munko-khoshee' meant 'pleasure or delight to the mind'. Carey speculated that Buchanan had asked his guide for a name, and the guide had answered that it was a delightful tree. Carey again vented his frustration with individuals who were merely collectors rather than residents who knew the language, but quickly added that Buchanan did not belong to this group.⁴⁶

Despite this reliance on local language, Carey had a very different relationship with his gardeners, when compared with his interaction with pundits. For instance, in writing to William Hooker, Carey noted of his gardeners: 'I am convinced my people are great bunglers ... still, however, they are among the best to be found among the natives of this country, but indolence and a stupid inattention to the productions of nature are the prevailing traits of their character'.⁴⁷ In his introduction to the *Hortus Bengalensis*, he wrote of the surprise Indians showed at the thought that anyone should employ their time studying nature, a pursuit which seemed to them 'so useless and unentertaining'. He also dismissed the botanical knowledge possessed in India prior to Company rule.⁴⁸ But this was not atypical of orientalist science, which seldom saw Indian knowledge as complete. In fact, Carey closed his introduction to the *Hortus Bengalensis* with a striking revelation. He told his readers that he had trusted the final alterations to the *Hortus Bengalensis* to a 'native writer' and added that all the errors in the final version arose from the work of this individual. Carey's relations with his collaborators were, therefore, uneven: he differentiated between the pundits and the *malis*, and held to the view that accurate knowledge could only be forged by Europeans resident in India and conversant in the local languages. But in forging close relations with the *malis*, he demonstrated a typically missionary willingness to engage with local peoples lower down the social scale.

⁴⁵ Roxburgh, *Hortus*, p. iii, 'Explanatory Remarks' written by Roxburgh.

⁴⁶ Roxburgh, *Flora Indica*, Vol. II, pp. 414–15. Elsewhere, Carey referred to the names given by pundits to a tree 'common on almost every part of the coast of Coromandel' *Flora Indica*, Vol. II, 262; and noted Sir William Jones' word for parasitic plants; *Flora Indica*, Vol. II, pp. 204–5.

⁴⁷ Carey to Hooker, dated 3 Feb. 1831, Archives at Kew Botanical Gardens, London, (hereafter Kew).

⁴⁸ Roxburgh, *Hortus*, pp. vii–viii.

There is in Carey's devotion to botany a concern with utility, and this is important in explaining why he was so committed to botany while being a missionary. In the *Hortus Bengalensis*, he noted the role that botanical gardens could play in cultivating the best timber, grain and fruit trees, and providing specimens that could be used for medicinal purposes or for dyeing. He also noted the relevance of botany to ship-building.⁴⁹ This concern with utility comes across even more clearly in another of Carey's scientific articles, his 'Prospectus of an Agricultural and Horticultural Society of India', which emerged after conversations with Lady Hastings, Governor-General Warren Hasting's wife.⁵⁰ This pamphlet, and Carey's personal energy, led to the formation of such a Society at the Calcutta Town Hall in September 1820. The Society devoted itself to experiments on different soils and the rotation of useful crops, the introduction of new techniques, livestock and implements of agriculture, and the drainage of wastelands.⁵¹ It has recently been described as the best-known Society in early nineteenth-century India after the Asiatic Society: by 1830 it boasted a membership of around 460.⁵² The utilitarian thrust of Carey's vision comes across in his dismissal of Indian modes of agriculture: 'The same system with scarcely a single variation was persisted in for many centuries! Indeed we may aver, that so far as regards improvement, almost every thing remains yet to be done.'⁵³

Despite Carey's rejection in the 'Prospectus' of Indian modes of agriculture, another of Carey's works, an article in the *Asiatick Researches* for 1811, titled, 'Remarks on the state of Agriculture in the District of Dinajpur', presented a survey of existent modes of agriculture and suggested how European instruments and techniques could be introduced. For instance, Carey wrote of the 'Indian sickle': 'The blade is curved and edge-toothed like a sickle, but it is much smaller and more rude than the European one.'⁵⁴ In a plate which followed the article, Carey presented a collection of agricultural instruments from Dinajpur, set against an English scale.⁵⁵ Elsewhere in the article, he differentiated between Muslim and Hindu modes of agriculture, which, again, was concordant with orientalist practice: 'The higher lands in the southern parts of the district are principally inhabited by *Musulmans*, and the vallies by *Hindus*.' Carey explained that the modes of cultivation in each of these areas differed.⁵⁶ Just as his proposal for a network supporting

⁴⁹ *Ibid.*, p. vi.

⁵⁰ The prospectus was written in Apr. 1817, and then republished in the *The Friend of India* in 1820, and in the *Transactions of the Agricultural and Horticultural Society of India* in 1829. Farrer, Carey, pp. 118–20.

⁵¹ Farrer, William Carey, p. 121.

⁵² Arnold, *The tropics*, p. 107.

⁵³ Carey 'Prospectus of an Agricultural and Horticultural Society in India', p. viii.

⁵⁴ Carey, 'Remarks on the State of Agriculture in the District of Dinajpur', p. 6.

⁵⁵ *Ibid.*, Plate 1.

⁵⁶ *Ibid.*, 'Remarks', p. 2.

the Calcutta botanic garden urged the value of independent science based in India rather than in Europe, his view of the Agricultural Society's merits was also localised. A body of men united in forging agricultural knowledge in India could, with their 'joint stock' of information and experience, surpass the potential of the 'insulated individual'. In Carey's mind, this was, then, a Society where Europeans resident in India would take the lead.⁵⁷

Carey's botany and agriculture can, therefore, be labelled as an early manifestation of Christian and constructive orientalism. As a member and officer of the Asiatic Society, and with a devotion to Indian languages and pundits, Carey might easily be classed as an orientalist.⁵⁸ Yet, his was an orientalism constrained by a certain degree of utilitarianism and a profound belief that European knowledge and technique could alter the 'happiness of the country'.⁵⁹ His missionary vocation was pivotal to this restraint. For instance, an article in the *Friend of India* explained why the Serampore missionaries were so interested in agriculture: those who took on honest employment and who benefited from improved agriculture were more likely to convert to Christianity.⁶⁰ Central to his vision of science was also the importance of scholarly work undertaken in India itself, and which proceeded with some independence from Europe. Extended residence and linguistic ability were for Carey crucial requisites for a precise man of science.

Training Collectors

Having surveyed the nature of Carey's science, it is possible to consider further how his science framed his own identity as a long-resident missionary in India. Carey's extensive network of correspondence is very helpful in this, and also hints at how he hoped to place himself at the centre of a web of scientific collectors. Serampore and Calcutta could, in turn, become botanical centres in a network of godly and familial science.

Perhaps the most revealing of Carey's letters were those addressed to his family who served as his botanical collectors. His many surviving letters to his son, Jabez, who was a missionary first in Amboyna, close to Java, and then in Ajmere in India, often contain whole paragraphs devoted to natural history. In November 1815, Carey wrote:

Everything living which you sent by the first conveyance died before the ship's arrival. The shells however were a very welcome present and I hope you will continue to send more. Send ugly ones as well as the beautiful ones, in short,

⁵⁷ Carey, 'Prospectus', p. i.

⁵⁸ Carey was paid for some translation work by the Asiatic Society, see Carey to Sutcliff, dated 22 Aug. 1805, IN/13, Angus Lib.

⁵⁹ Carey, 'Prospectus', p. xiii.

⁶⁰ *The Friend of India*, Quarterly series, Vol. 1, 1820, p. 53.

... some of every sort you can procure. The beautiful louries [sic] you send for me by Capt Liell and the two doves arrived in good health and are so now. All the others died on the way. Most of the plants you sent were killed by the salt water but some seeds are come up in the box amongst which I see a Mongostan [sic]. All the parasitical plants you sent in the basket arrived alive and are growing one excepted.⁶¹

This letter continued in this vein, with precise instructions on how Jabez should pack stuffed birds and how to prevent the depredations of cockroaches and mice. Carey asked particularly for paradise birds, all the bulbous roots that Jabez could get, and different sorts of 'stones broke off the rocks' which were to be numbered, 'saying where they were found'.

Carey also passed on his interest in natural history to his eldest son Felix, who was at times the rebel of the family. Carey wrote to London praising Felix's 'knowledge of medicine and his love for science'.⁶² Felix had studied medicine in Calcutta, and there had been a hope that he would become the doctor at the Serampore mission.⁶³ Felix's name also appears in the *Hortus Bengalensis* as a contributor to the Company's gardens. In addition to his two sons, Carey's wider family in England was also instructed about natural history. For instance, he wrote to his sisters that he was 'greatly pleased' that their children were 'inclined to Gardening' and that they were sending him seeds and roots.⁶⁴ When one of his nephews emigrated to South Africa, Carey was delighted to have a new source of specimens.⁶⁵

One way of interpreting Carey's use of his family as collectors is to stress the role natural history played in forging godly habits at home. Carey's letters to his son often urge the serious use of all of his resources and time in a manner fit for a Christian, so as to avoid the supposition from 'men of the world' that Jabez was 'lax or carnal or conformed to the world'.⁶⁶ Indeed, a constant source of anxiety for Carey was the opposite of self-improvement, which he identified in Jabez's wife, Eliza. In 1815, he wrote to Jabez: 'Tell Eliza that I expect her to dry seeds for me and butterflies, also to pick up stones, shells and crabs.'⁶⁷ In later letters, the reason why Carey gave this instruction becomes clear: he was concerned with what he termed 'Eliza's finery'. He advised his son that his wife should not devote herself to her appearance. 'Eliza will be respected a thousand times more dressed in a Khassa gown than in Gaudy things more fitting for an actress than the wife of

⁶¹ Carey to Jabez Carey, dated 12 Jan. 1815, Angus Lib.

⁶² Carey to Sutcliff, dated 12 Aug. 1809, IN/13, Angus Lib.

⁶³ Chatterjee, *Felix Carey*.

⁶⁴ Carey to sisters dated 24 Feb. 1814, WCC/27, Angus Lib.

⁶⁵ For more on Carey's nephews and nieces and how they contributed to his botany, see Carey, *William Carey*, p. 392.

⁶⁶ Carey to Jabez Carey dated 9 June 1814, Angus Lib.

⁶⁷ Carey to Jabez Carey dated 1 Feb. 1815, Angus Lib.

a Gospel minister.⁶⁸ In order to counteract worldliness and to improve the mind, Carey lectured his family once a fortnight—together, perhaps, with all the Serampore missionary families, on natural philosophy.⁶⁹

Christian self-improvement necessitated careful circumspection, and the clarification of gender roles, and the study of nature provided the perfect context for these goals. In fact, in one of his letters, Carey made a metaphorical link between these various activities by referring to the Christian life as a context for God's husbandry.⁷⁰ The act of collection stimulated healthy bonds of family and faith across distances. For instance, Carey wrote to Jabez: 'Every shell or plant puts me in mind of you.'⁷¹ In effect, Carey's collecting was an exercise in remembrance. Some of his letters, in addition to carrying specimens, also carried portraits. For instance, to John Ryland, the Baptist minister and natural historian, Carey wrote that he had hoped to send three capsules of the plant named '*Careya Laborea*' by Roxburgh, but these had been spoilt. Carey noted that he had, however, already sent Ryland his portrait. So the botanical specimen named after Carey was cast in this letter alongside his own portrait.⁷²

But the artefacts exchanged between Carey and his correspondents did not only denote personal remembrance, they could also signify the remembrance of 'heathenism'. In addition to natural historical specimens, Jabez also sent his father a 'shield and spear' and Carey transmitted a collection of insects to Ryland, together with a set of idols of Hindu gods, for the Bristol museum. Natural historical collection, therefore, worked alongside the collection of other types of artefacts that might more explicitly be identified as trophies of the missionary enterprise.⁷³ Remembering each other across distance was expected to lead, in time, to the son imitating the father. Jabez had his own pundit and, as time passed and letter followed letter, seeds were dispatched in the opposite direction. Carey wrote to Jabez in 1819 in Ajmere: 'I will immediately send you some seeds etc. I fear coconuts will not prosper so far from the sea but I will send you some as soon as I can get some quite ripe.'⁷⁴ In one of his letters to Jabez, Carey followed up his instructions on how to

⁶⁸ Carey to Jabez Carey dated 12 June 1815, Angus Lib. For more criticism by Carey of Eliza's role see, Carey to Jabez Carey dated 3 Nov. 1826, Angus Lib.

⁶⁹ These lectures were in the company also of 'the higher class of scholars' which was presumably a reference to students at Serampore College, see below. Carey to Sutcliffe, dated 1 Jan. 1801, IN/13, Angus Lib.

⁷⁰ Carey to Jabez Carey, dated 16 Apr. 1826, Angus Lib.

⁷¹ Carey to Jabez Carey, dated 1 Feb. 1815, Angus Lib.

⁷² Carey to Ryland, dated 14 July 1812, H6/1, Angus Lib. Jabez received a frame for Carey's portrait in a tin box for the collection of paradise birds. Letter from Carey to Jabez dated 20 Jan. 1816, Angus Lib.

⁷³ Carey to Jabez Carey, dated 23 Nov. 1816; Carey to Ryland, dated 30 Jan. 1801, IN/13, Angus Lib.

⁷⁴ Carey to Jabez Carey, dated 15 Nov. 1815, Angus Lib.

report on the 'people, the languages spoken and the difficulties in [his] way', with the charge that Jabez had to carry on the 'spirit of mission' in the Carey family.⁷⁵

Carey's natural history, in addition to generating trophies of memory, also helped him conceptualise his views of health and its relation to contentment. An article in the *Friend of India*, which may have been written by him, provided a commentary on how to preserve the body from the effects of the Indian climate. The author noted the 'well understood' fact that a 'total disregard of sobriety and temperance'⁷⁶ would lead to ill health. He continued that a 'spirit of dissatisfaction' with India could also generate illness: 'When therefore the country, its climate, its productions, its inhabitants, are unhappily regarded with aversion, the recurrence of these objects is so frequent, that the mind is scarcely left at leisure for any other feelings than those of a painful nature; and the effect of this on the spirits, the digestive powers, and the system in general, cannot fail of being injurious.'⁷⁷ The writer advised that instead of being discontented with India, residents in India should seek to transplant in India the intellectual activities common in Britain. He also suggested that his readers undertake 'some heroic undertaking which shall find full employment for the mind'.⁷⁸ Taking on board typically orientalist sensibility, in one of his early letters he wrote that his own frame agreed better with the Indian climate than the British one, and concluded, 'I never was better in my life.'⁷⁹

Carey's belief that nature might effectively be improved and that Europeans could experience good health in India is tied to his Calvinist theology of nature. For him, every flood and storm was sent by God in judgement, but the Christian's role was to intervene in nature and to improve it with divine help. For instance, after Felix lost his first wife and two children when a brig overturned in a squall, Carey wrote that he was 'dumb with silence because God has done it'.⁸⁰ As the years passed, Carey's initial enthusiasm about the possibility of adapting to the Indian climate was somewhat changed. In a letter full of accounts of death, Carey wrote: 'This is indeed a miserable dying world.' He added that it was vital that human beings set their hope on the future world rather than the present one. Carey's theology of nature, therefore, had multiple sides to it: he combined a robust commitment to the collection, preservation and improvement of the whole realm of nature with a view of its eventual passing—and so the necessity of being unworldly. Even with his naturalist friends outside the missionary community, Carey hoped

⁷⁵ Carey to Jabez Carey, dated 5 May 1819, Angus Lib.

⁷⁶ 'Cursory observations on the means of preserving health in India', in *The Friend of India*, Quarterly Series, No. XV, 1825, p. 551.

⁷⁷ *Ibid.*, p. 552.

⁷⁸ *Ibid.*, p. 575.

⁷⁹ Carey to Sutcliff, 9 Aug. 1794, IN/13, Angus Lib.

⁸⁰ Carey to Jabez Carey, dated 1 Mar. 1815, Angus Lib. The same letter contains Carey's usual instructions with respect to preservation: 'If you send dried birds calk the box otherwise rats and cockroaches will destroy them.'

to use this theology of nature as a bridge. His letters to Wallich were usually full of matters of science, such as the naming of new species or the conduct of the Agricultural Society. However, in one of his later letters he took his correspondence from the natural to the spiritual level: 'Pray write to me, and tell me all your concerns, I certainly, if I feel an interest in the temporal and eternal happiness of any man, feel a very deep interest in yours.'⁸¹ For Carey, the practice of natural history had to be tied very closely to religious concerns.

It is helpful to see Carey's correspondence network as one that operated outside the connections that typified colonial botany at this time. His correspondence with Rowland Hassall, one of the first missionaries sent on board the *Duff* to Tahiti by the London Missionary Society in 1796, provides striking evidence of this. The first letter to Hassall from the Serampore mission begins: 'Although we are strangers in the flesh, yet we trust we are one in Christ, pursuing one object, and interested in one common cause, the enlargement of the Redeemer's kingdom.' The Serampore missionaries wrote that an exchange of news with the South Pacific would enable both sides 'to meet at a Throne of Grace' in prayer despite being separated by distance.⁸² And it was in this context that Carey wrote to Hassall asking for natural historical specimens from the South Pacific:

I am very fond of natural history, particularly of Botany and have made a large collection of plants from different parts of the world which are flourishing in the Mission Garden at Serampore. You will greatly oblige me by sending me some seeds, bulbous or fibrous roots as you may be able.... A few shells, corals &c would also be a very acceptable present, as would small specimens of the stones of New Holland.... Your weeds will be beautiful flowers here, and your sour fruits grateful [?], so much the more as coming from brethren employed in the same work, whom we should remember whensoever we behold the productions of New Holland.⁸³

But Carey's network did not, in fact, bypass England: several of his friends in the provinces, from Leicester, where Carey had been a Baptist minister before arriving in Bengal, and from Liverpool, exchanged natural historical specimens with him. Among them were William Roscoe, Liverpool lawyer, banker and later Member of Parliament, John Shepherd, a Liverpool horticulturist, Joseph Cooper, head gardener to Lord Fitzwilliam at Wentworth House in Yorkshire, and the Hopes of Hope Street, Liverpool.⁸⁴ In view of the importance of Sir Joseph Banks as a patron

⁸¹ Carey to Wallich, dated 3 Dec. 1828, IN/13, Angus Lib.

⁸² Carey, Ward, Mardon, Moore and Rowe to Hassall, dated 17 Jan. 1808, published in Manley, 'From William Carey in India to Rowland Hassall in Australia', p. 335.

⁸³ Carey to Hassall, n.d., but written to accompany letter dated 4 Aug. 1809, published in Manley, 'From William Carey', p. 339.

⁸⁴ Carey, *William Carey*, p. 393; also Farrer, *William Carey*, pp. 90–92.

of field-naturalists in the British Empire, it is surprising that there is no account of a correspondence between him and Carey, although there are nine surviving letters between Carey and William Hooker, to whom Carey had been introduced by Wallich.⁸⁵ But even in the letters to Hooker, there is some awkwardness on Carey's part. It is striking, for instance, that all the specimens that Carey sent Hooker were sent via Shepherd in Liverpool. Carey obviously respected Hooker's skills as a botanist, writing on one occasion that it was 'perfectly impossible' to preserve specimens of plants or animals in India, but that with Hooker everything 'will be safe'.⁸⁶ On another occasion, however, Carey had the audacity to question Hooker's expertise, suggesting that he had committed an error in the 30th volume of the *Botanical Magazine*. Intriguingly, Carey suggested that this was an error that arose from lack of knowledge of Indian language: 'The name *Annona* was undoubtedly formed from *nona*, the Indian name of the fruit, the *An* was prefixed by some Botanist who was ignorant of the Oriental language.' Carey continued that this foliage was as common in Bengal as maple trees in England, 'besides which their names are found in the ancient Hindoo writings'.⁸⁷

From Carey's letters that survive, it is clear that he corresponded more regularly and exchanged specimens more freely with his Midlands correspondents than with the likes of Hooker. In relying on provincial collectors, Carey could improve his own collection and so create an alternative network to that which was centred on London and which Banks and Hooker presided over. With Serampore and Calcutta at its core, his network of contacts from provincial England, America, South Africa, Australia, Abonyia, Assam, Sylhet, Burma and Nepal, to note just those which survive in the historical record, were able to provide what he desired.⁸⁸

Carey's network was distinctive in its deep Christian idealism. Practising natural history was expected to forge godly habits of mind and body, and would stimulate bonds of family and faith across distance by bringing to memory those afar. Natural history was suited to the missionary as it would lead to the betterment of nature and so to the improvement of the conditions of humanity. But, in the end, natural improvement had its limits. As nature decayed, and his own body weakened, Carey looked ahead to a new existence. By propagating such a view of nature, Carey hoped to build a community of godly collectors and naturalists who knew the proper meaning of, and connection between, the temporal and the eternal.

Hindu Astronomy

Carey was not the only Serampore missionary who was interested in science. His colleague, William Ward, paid particular attention to the status of ancient texts on

⁸⁵ On Wallich's introduction, see Arnold, *The tropics*, p. 155.

⁸⁶ Carey to Hooker, dated 30 Jan. 1832, Kew.

⁸⁷ Carey to Hooker, dated 9 Dec. 1829, Kew.

⁸⁸ Carey, *William Carey*, pp. 392–95.

astronomy and medicine in his *Account of the Writings, Religion and Manners of the Hindoos*, which was crucial in the emergence of the idea of Hinduism as a system of beliefs. This work would not have appeared without the assistance of Carey's circle of pundits. It was first published in five volumes from 1806 onwards. Ward, like Carey, had a lowly background, and had been a printer and the editor of a provincial newspaper, the *Advertiser and the Exchange Gazette*, published in Hull, before travelling to India in 1796.⁸⁹ It is important to note that his *Account* is based solely on observation of Hindu practice in Bengal. Ward's journalistic background is said to have affected the form of this work, resulting in a propagandist account for the public rather than a work which had the intended audience of other scholars.⁹⁰ By analysing Ward's commentary on science, it is possible to consider further the view of Indian scientific traditions held by the Serampore missionaries. This attention to Sanskrit science collided with and fed into their concern to extend the reaches of European scientific knowledge and practice.

Central to Ward's book is the clichéd orientalist thesis that the ancient texts under discussion suggest a connection between India and the classical civilisations of Greece and Rome. However, Ward's ultimate test for the veracity of Indian literature was the biblical account of history. In the introductory remarks to his book, and in writing on the subject of Creation, Ward noted the variety of views entertained by the Indian philosophers of ancient times on this topic: matter itself was said by some to be capable of the work of creation; other philosophers suggested that God united himself with matter and thus formed the world; yet others suggested that God united himself with energy in the very act of creation; another philosopher was said to hold that God manifested himself in a body of light from which the primary atoms issued. Among the other views noted were suggestions that an archetype, or pattern, was followed in the creation of the objects of the world; or that the world itself was eternal and so never created. Each of these positions was then related to ideas held by the classical thinkers. Plato, Cicero, Empedocles, Epicurus and Democritus were quoted on these pages. Following this commentary, Ward wrote of Indian philosophy:

'Yet there were some philosophers whose conceptions of God as the creator were more correct: Putunjulee says, "The universe arose from the will and command of God, who infused into the system a power of perpetual progression"; and Jatookurnu, another sage, delivers a similar opinion: "Creation arose out of the will of God, who created a power to produce and direct the universe."'⁹¹

⁸⁹ Potts, 'William Ward's Missionary Journal'; Oddie, *Imagined Hinduism*, p. 159.

⁹⁰ For more on Ward's work see Potts, *Baptist missionaries*, pp. 92–94. Also, Oddie, *Imagined Hinduism*, p. 159ff.

⁹¹ Ward, *A view of the history, literature and mythology of the Hindoos*, Vol. 2, 'Introductory remarks on the Hindoo literature', pp. xxxi–xxxiii. For Carey's views of creation, see Oddie, *Imagined Hinduism*, p. 145.

In this way, orientalist commentary set the context for the use of the biblical account as a test in deciding on the most 'accurate' Indian account of Creation.

Ward's theology of nature was vital to his account of what he termed Hinduism. The bulk of this work was devoted to presenting the various gods of the Hindus. In explaining why the Hindus had so many striking forms of divinity, Ward wrote: 'The extraordinary bodily organs of the gods' might have been intended to represent 'the *perfections of the Deity*' or to personify certain virtues.⁹² Indra was full of eyes, therefore, to exhibit his divine omniscience and Brahma had four faces to display his perfect wisdom. But this was for Ward an unpersuasive theory: instead, he urged a connection between Hindu notions of divinity and the pursuit of vice and immorality. The ideas of their gods that the Hindus held were said to have 'the greatest possible tendency to corrupt the mind with the love of riches and pleasure'.

Ward carried on that it was 'equally improbable, that the original framers of idols designed to teach by them a system of *natural science*'. In making this assertion, he argued that good men of science would have nothing to do with idolatry. Instead of taking any of these positions, Ward contended that, in fact, Hindu notions of their gods were formed by kings who wanted to gratify rather than instruct the populace. They were said then to teach 'popular sentiments' rather than 'profound mysteries'.⁹³ There followed a long list of the Hindu gods, ending with accounts of the worship of beasts, birds, trees, rivers, fish, books, stones and wood. Ward noted: 'How shocking then, how afflicting to a philanthropic mind, to see man prostrated before a beast or, a log of wood!'⁹⁴

In analysing this argument, it is useful to remind ourselves of Ward's Christian view of nature: nature was not to be cast as an image of God; rather, it was to point to or refer to God. Therefore, those who confused nature with God could never reach 'profound knowledge'. In presenting such a survey of Hindu religiosity, Ward hoped to simplify the difference between what he termed Hinduism and Protestant religion.

This was a view that was supported by a particular philosophy of images. Ward noted how the Hindus confused what was intended to be a mere image or representation of divinity with the divine being itself. 'The Hindoo is taught, that the image is really God, and the heaviest judgements are denounced against him, if he dare to suspect that the image is nothing more than the elements of which it is composed.'⁹⁵ Ward retold the conversation he had with a Brahman on this subject. The Brahman told Ward that the true God had made himself known in these forms, and directed that various images be made, in order that humans might be drawn to divine worship. The 'images are only necessary while men continue in a rude state,

⁹² *Ibid.*, Vol. 2, p. xi.

⁹³ *Ibid.*, p. xii.

⁹⁴ *Ibid.*, p. xxxv.

⁹⁵ *Ibid.*, p. xxxvi.

and may be laid aside by those who can attain to devotion by means of rational speculation'.⁹⁶ For Ward, the Hindus' confusion of the representation with the represented allowed the charge against them of irrationality.⁹⁷ Ward wrote of how every Protestant nation bore testimony to how idols were unnecessary; and so his philosophy of images also led him to a rebuttal of Roman Catholicism.⁹⁸ To back up his assertions of the fallacy of using common objects and common materials to represent the divine, Ward quoted from the Christian scriptures. He noted that the makers of idols exposed themselves to 'the cutting reproof of Isaiah': 'To whom then will ye liken God? Or to what likeness will ye compare him?'⁹⁹

In the end, the Hindus' supposedly inferior philosophy of images was put down to the corruption of their intellectual traditions from a once glorious past, when there had been a robust belief in the unity of God. This profound knowledge of the ancients had been lost, even as Hindu learning had been popularised. Ward gave his readers an account of what he termed 'the present state of learning' in India. He wrote:

The whole is a trade; hence knowledge is only so far pursued as it will be productive of money, and no art or science is carried to perfection; each person furnishes himself with what he thinks will carry him through life; he has no ambition to enlarge the bounds of knowledge; he makes no experiments; it never enters into his mind that he can exceed his forefathers; to gain the smallest moiety of what they acquired, is almost more than he hopes to realize.¹⁰⁰

For Ward, the India in which he lived possessed an intellectual culture which had been stunted and which only followed the corrupted wisdom of the past. He described how men of learning only possessed between 10 and 20 Sanskrit works, while the 'great bulk of the people' were 'perfectly unacquainted with letters, not possessing even the vestiges of a book'. Indian women, in the meantime, were said to be 'almost in every instance' unable to read.¹⁰¹ Of 100,000 Brahmans, Ward noted that only 10 would become learned in the astronomical *shastras*, while 10 more might understand them imperfectly.¹⁰² Ward's account of astronomy, which covered two chapters in his *Account*, exemplified this argument: true Hindu astronomy was said to have been displaced by popular astrology. In relation to medicine, too, he asserted that empirics held the day and that medical philosophy

⁹⁶ *Ibid.*, p. xxxv.

⁹⁷ For more on how the Enlightenment bequeathed a particular philosophy of rationality to Ward and his contemporaries, see Oddie, *Imagined Hinduism*, p. 162.

⁹⁸ Ward, *A view*, p. xxxv.

⁹⁹ *Ibid.*

¹⁰⁰ *Ibid.*, Vol. 1, p. 596.

¹⁰¹ *Ibid.*, Vol. 1, p. 598.

¹⁰² *Ibid.*, pp. 596–97.

was neglected. 'Not one in a hundred of those who practise physic in Bengal is acquainted with the rules and prescriptions of the shastru, but, possessing the knowledge of a few nostrums merely, they blunder on, regardless of how many fall victims to their incapacity ...'¹⁰³

Ward's views might be taken as an indicator of how the Serampore missionaries presented their beliefs to the public. They demonstrate that in engaging with existent science, these Baptist missionaries hoped to recover the truths of what they saw as ancient wisdom, which were consistent with the biblical narrative. The supposedly corrupt sciences of contemporary India, which had emerged out of popular Hinduism, would then be replaced. This process of rationalisation would eventually allow the introduction of Christianity. Central to this survey of existent science was the articulation of a particular mode of vision: Hindus worshipped nature without understanding what it pointed to, while Christians practised true science.

Serampore College

In placing Ward's survey of Indian astronomy and medicine alongside Carey's botanical endeavours, the Serampore missionaries' devotion to two separate intellectual undertakings is brought to view. These missionaries hoped to cultivate a particularly Indian brand of European science which suited the subcontinent, even as they sought to redirect the supposedly lost tradition of Sanskrit science. In order to understand why they devoted themselves to both these enterprises and how these two strands of science converged, the discussion will now turn to Serampore College. The College was first a centre for Christian and constructive orientalism, even though Anglicist policies, which sought to reform and improve the subcontinent along English lines quickly took hold.

On the banks of river Hooghly stands a magnificent two-storied building with Ionian pillars and a grand portico, dating from 1822. This is still the site of the Serampore College, which was first instituted in 1818. After its opening, the Serampore trio issued a prospectus that, in its title, indicated the aim of the institute: it was to be for the 'instruction of Asiatic Christians and other youth in eastern literature and European science at Serampore Bengal'. It is claimed that this prospectus was written by Rev. Marshman, who often took the lead among the three in matters of education.¹⁰⁴ In a later edition of the Prospectus, a letter appeared from the Danish governor of Serampore, Jacob Krefting, consenting to his own appointment as head of governors of the College. Lord Hastings, the Governor-General, also requested that his name be added at the head of the list of benefactors

¹⁰³ *Ibid.*, pp. 477–78.

¹⁰⁴ Laird, *Missionaries and education in Bengal*, p. 148, Anon, *The story of Serampore*, p. 21.

¹⁰⁵ This appears as a flap to the Prospectus in the copy of the Serampore College Reports, 1818–27, Angus Lib.

as first patron of the College.¹⁰⁵ The College was granted a royal charter by the Danish crown in 1827, which included the right to confer degrees. At the end of its first year, the College had admitted 37 students, 19 of whom were said to be from Christian families, 14 were of 'Hindoo cast' and four were alleged to have no caste or religion. The trio hoped to use the College to reach a cross-section of youth, regardless of their religious upbringing; by 1828, however, with the ascendancy of more Anglicist tendencies, the number of non-Christians fell to zero.¹⁰⁶ The students ranged from four years to 30 years of age.¹⁰⁷ By 1822, there were 50 students; by 1835, there were more than 100.¹⁰⁸ In due course, with the entrenchment of Anglicist views, those with a European background were given a different education to those who had Indian parentage. Among those who did not call themselves Christians, caste restrictions were strictly followed in the allocation of rooms and in the taking of meals. In 1845, Serampore College passed from Danish oversight to the British with the settlement of Serampore, and in 1857 it became affiliated with the newly-founded University of Calcutta. It is also said to have been an indirect model for the formation of University College, London.¹⁰⁹

The College's original prospectus reveals the ideology that underpinned the institution in its first decade. Rev. William Carey, Rev. William Ward and Rev. Joshua Marshman were keen to attend to the history of the early church and its encounter with Greek philosophy. The early Apostles, it was said, were well acquainted with classical learning, and little was necessary besides a good natural understanding to compare the theology and ethics of classicism with that of the gospel of Christ. 'The gradual effect was, that the theology, philosophy, and ethics of the heathen world were completely driven out of the field.'¹¹⁰ Having outlined this precedent, the trio then discussed their own situation in India and estimated that there were 200 million people who followed 'Bodhism and the Pauranic system of idolatry'. This figure was claimed to be equal to the population of the Roman Empire. In India too, it became imperative that the gospel be made known in a manner that would draw the attention of its audience, and compared to '*all that now holds possession of the public mind*'.¹¹¹

This would be the aim of Serampore College: the training of a class of what might be termed Christian pundits, who would be well versed in Indian literature and science as well as European knowledge and Christianity, who would aide the propagation of the gospel by gaining the expertise to compare Indian and European

¹⁰⁵ Laird, *Missionaries*, p. 144.

¹⁰⁷ *First Report of the College for Asiatic Christian and other youth instituted at Serampore*, Serampore, 1819, p. 7.

¹⁰⁸ *Third Report relative to Serampore College for the year ending 31st December 1822*, Serampore, 1823, p. 7; also Anon, *The story*, p. 26.

¹⁰⁹ Laird, *Missionaries*, p. 149.

¹¹⁰ Carey et al., *Prospectus of a college for the instruction of Asiatic Children*, Serampore, 1818, p. 2.

¹¹¹ *Ibid.*, p. 3.

knowledge. Indeed, later in the Prospectus, the trio wrote of the possibility of making Serampore 'the Christian Benares'.¹¹² To this end, the teaching of Sanskrit would be central to Serampore College. The trio explained that while the Apostles did not have to counter a sacred language of the Roman Empire, in India knowledge had regressed and Sanskrit had passed into the hands of an elite. 'India almost mocks enquiry into her mysteries and doctrines, which remain concealed in works hitherto esteemed so secret, that to attempt the perusal of them, would in the common people be almost esteemed sacrilege.'¹¹³ In closing the initial summary of the aims of the institution, the trio emphasised the importance of local agency in the establishment of Christianity in India: 'If ever the gospel stands in India, it must be by native being opposed to native in demonstrating its excellence above all other systems.'¹¹⁴

In addition to Sanskrit, which would be taught by the 'ablest pundits', the Prospectus recommended that students at the College study Arabic with a view to learning 'Hebrew and Syriac'; a few should learn Chinese, and all would be instructed in the Christian scriptures. In addition to this, it was envisaged that European science would be taught, starting with elementary ideas. Under the head of science, the trio made particular note of general history and geography as a starting point, followed by a view of the solar system, the principles of attraction and gravitation, the laws of motion, the nature of mechanic powers and zoology, mineralogy and botany. A select number of scholars at the College would also be taught the English language. Here the trio revealed an important bias: they noted that English should only be taught to a student once he had 'digested everything translated into his vernacular tongue, and invigorated his mental powers by the study of Sungskrit'. So, in effect, at the College's formation, the trio outlined their preference for education in the local languages, and so aligned themselves with orientalist as opposed to Anglicist sensibility in India at this time. Despite this original intention, by 1834 the College authorities had to confess that the teaching of 'Oriental studies' had taken a decided back seat and that Sanskrit had given way to English teaching.¹¹⁵

In relation to science teaching, too, there was a steady move away from constructive and Christian orientalism. At the completion of the first year, Serampore College had already made some progress in the teaching of the Sanskrit sciences. Nine Brahmans had attached themselves to the College in order to acquaint themselves with astronomy and geography. They studied the *Lilavati*, the twelfth century treatise written by the Indian mathematician Bhaskara, in addition to an introduction to European astronomy and a treatise on geography. It was reported that '...one of the most eminent astronomers in India' was retained in order to instruct

¹¹² *Ibid.*, p. 20.

¹¹³ *Ibid.*, p. 4.

¹¹⁴ *Ibid.*, p. 5.

¹¹⁵ Laird, *Missionaries*, p. 145.

these students.¹¹⁶ It is thought that this pundit was Kaleedas, the son of Ramacandra Subhupati, William Jones' astronomy pundit.¹¹⁷ At the end of the first year, the trio also planned to publish the *Lilavati*, together with another of Bhaskara's works, the algebraic work the *Bijaganita*.¹¹⁸ It is important to stress that the dual strategy of teaching both Indian and European sciences did not indicate a balanced approach even in the first decade, when orientalism held sway. Rather, the Serampore missionaries were committed to the view that an understanding of the inadequacies of Indian astronomy would set the context for the embracing of European science. It was with this agenda that they wrote:

All the science they really have ought to be preserved, and not a particle of it lost. If they have carried the study of any branch of knowledge beyond us, this circumstance ought to be acknowledged and improved; if they have merely trodden in the same path, a knowledge of the science they really have will enable us to take it up where they fail, and carry it to its proper extent; while the ideas they now possess, and the terms in which they express them, will facilitate the communication of superior ideas.¹¹⁹

This was why the teaching of astronomy and the other sciences could not be undertaken by Indian teachers alone. By the end of the second year, the Serampore mission reported that they had appointed Rev. John Mack as Professor of the College, and it became clear that his teaching at the college would involve the sciences; Mack was eventually crucial in the move away from orientalist approaches to science teaching. He had been taught by Ryland, Carey's correspondent, and had been educated in Glasgow and Edinburgh. When first appointed, he was attending various scientific lectures in London.¹²⁰ Mack arrived in Calcutta in 1821 and began by giving a series of lectures in Chemistry there in order to raise the level of interest in Serampore College. In his first year at the College, his students committed to memory 'the first principles of the Newtonian system'. 'On a map containing the various countries and islands of Asia without their names', his students were able to 'name any country or island pointed out to them'.¹²¹ The third annual

¹¹⁶ First report, p. 10.

¹¹⁷ Young, 'Receding from antiquity', p. 191.

¹¹⁸ First report, p. 11.

¹¹⁹ First report, p. 5.

¹²⁰ Second report relative to Serampore College, Serampore, 1821, p. 11. I thank Brian Stanley for pointing out that the place of science at Serampore College ran parallel to the place of science in dissenting academies in Britain. William Yates and John Mack, who were at Serampore, were both educated at Bristol Baptist College, where Ryland was principal from 1793 to 1825. When Ryland was principal, the college had a museum with some scientific exhibits. See Moon, *Education for ministry*, p. 34.

¹²¹ Third report, p. 10.

report of Serampore College noted that Mack would give his Calcutta lectures in Chemistry at the College itself, and that a number of 'intelligent natives' would hopefully take advantage of the free admittance to gain a taste for the sciences.¹²²

These lessons in science were intended to infuse in the students a scientific mode of vision. Mack had brought astronomical instruments along with him; in addition to these instruments, the third annual report of the College published a long list of items, under the title, 'Chemical and other Philosophical Apparatus', procured from Edinburgh.¹²³ The items listed there included glass instruments such as tubes, funnels, evaporating dishes, spirit lamps, an eudiometer, a thermometer, an air pump, a furnace, a pneumatic trough, 'an elegant working model of Watt's Steam Engine with apparatus to illustrate its theory', models of crystals, scales and weights, a compound microscope, 'Apparatus to illustrate the principles of Optics', prisms, barometers, and an electrical machine.¹²⁴ These instruments were used by the missionaries to assert the physical superiority of European science. In describing the 'grand object' of Mack's lectures, the missionaries noted that it was 'the diffusion among the Natives of a species of knowledge which lays open the real nature of the material objects they so blindly worship'.¹²⁵

Those Indians who observed the scientific experiments were expected to understand that the material they worshipped was easily 'decomposed and formed again at the pleasure of man'.¹²⁶ In 1823, the missionaries wrote gleefully of the attention generated by the steam engine at Serampore: Indians travelling down the Hooghly from various parts of the country 'leave their boats, quietly inspect it at leisure, and depart convinced that all knowledge was not engrossed by their forefathers, to whose ideas they have hitherto so tenaciously adhered'.¹²⁷ The same report noted that the College's observatory was nearly complete and had cost 1,500 pounds, and that it would provide physical proof of the Newtonian system.¹²⁸ In addition to the observatory, the College had a library which included some scientific works and a museum.¹²⁹ In pursuing a course of experimentation and in using so many scientific instruments, the Serampore evangelists taught Indians how to relate to the visible and how to avoid deifying nature.

¹²² *Ibid.* p. 12.

¹²³ Some of these instruments may have been gifted to the College to the sum of £500 by James Douglas of Cavers, Scotland; see Mack, *Elements of Chemistry*, Serampore, 1824, Preface, p. ix.

¹²⁴ This follows the copy of the third report in the Angus Lib.

¹²⁵ *Fourth report relative to Serampore College for the year ending 31st December 1823*, Serampore, 1824, p. 12.

¹²⁶ *Ibid.*

¹²⁷ *Ibid.*

¹²⁸ *Ibid.*, p. 16, also *Third report*, p. 16.

¹²⁹ For the museum, see *Second report*, p. 10. For a list of items in the library, see 'College library', following *Second report*.

Among the science books used were Felix Carey's *Vidyahara Vali* (1822) on anatomy and physiology, John Mack's *Elements of Chemistry* (1824), William Yates' *Elements of Natural Philosophy and Natural History* (1825) and *Dialogue on Geography and Astronomy for the use of schools* (1824), and W.H. Pearce's *Geography, interspersed with information historical and miscellaneous* (1822). While Carey and Mack's books were published in Serampore, the other works exemplify the kinds of texts that emerged from the Calcutta Book Society. In Serampore College's prospectus, the trio had made clear their intention of using works produced by this Society.¹³⁰ Carey sat on the management committee of the Calcutta Book Society, which by the mid-1820s had become the chief supplier of elementary school books to lower Bengal.¹³¹ In addition to these textbooks, two newspapers published at Serampore also carried science, in addition to other information. *Dig-Dursun, or Magazine for Indian Youth*, first published in April 1818, was the first periodical published in an Indian language: a monthly, it appeared in English, Bengali and English-Bengali editions. It was followed by *Sumachar Durpun*, which was first published in May 1818 as a weekly news periodical. While the *Dig-Dursun* was aimed at young people, *Sumachar Durpun* was intended for adults.¹³²

To understand the manner in which science was taught through the evolving phases of the College, the importance of dialogue and simple statement of facts cannot be overemphasised. Dialogue was crucial, for instance, to the work of William Yates, who was part of the Serampore mission from 1815 to 1817, after which he started a boarding school in Calcutta and became pastor of the Circular Road Baptist Chapel, Calcutta. His *Elements of Natural Philosophy and Natural History* consisted of a dialogue between a tutor and pupil, and appeared with a page of English facing a page of Bengali. The first dialogue was titled 'Of the firmament and heavenly bodies', was 13 pages long, and included a discussion of the sun, the planets, the comets, eclipses, and the seasons. The series of questions and answers in this dialogue allowed the merging of new discoveries in astronomy with simple statements of Christian faith. For instance, the tutor noted the discovery of a new planet by 'that celebrated astronomer Dr. Herschel'. But he also taught his pupil that God had wisely devised twilight to ensure that the eye would not be damaged by the transition from day to night, and that comets did not prognosticate evil because peace, plenty and prosperity followed their appearance.¹³³ The introductory dialogue provides an insight into why this style of communication was adopted:

Pup. What may I expect from contemplating the works of nature?

Tut. Both pleasure and profit. As God has formed the eye to behold the beauties of nature, it must be both as agreeable and useful employment.

¹³⁰ Carey, *Prospectus*, p. 7.

¹³¹ Laird, *Missionaries*, p. 101ff.

¹³² Potts, *Baptist Missionaries*, pp. 101–2.

¹³³ Yates, *Elements of Natural Philosophy and Natural History*, pp. 20–30.

Pup. Is not greater learning necessary for this study that I at present possess?

Tut. By no means: the peasant as well as the philosopher may partake of this pleasure. A moderate share of knowledge is sufficient. The creation is open to the view of all: it only requires observation and reflection.

Pup. Of what is the universe composed?

Tut. Of matter and spirit.

This extract intimates how Yates hoped to change the way his students saw the material world. In contrast to Sanskrit science, which had allegedly become esoteric and privileged, Yates and the other authors consulted at Serampore College urged the accessibility of science: anyone could reflect on nature. This pedagogic style is also evident in Mack's *Elements of Chemistry*. This was not organised in dialogic form but was written as a series of numbered statements about chemistry organised under various heads such as attraction, caloric, light, electricity, electro-negative substances, etc. In explaining the form of his work, Mack noted that his primary object had been the introduction of Chemistry into Bengali literature and the domestication of chemical terms and ideas in Bengali.¹³⁴ In fact, this work has been taken as an early indicator of a move in the College towards more Anglicist tendencies.¹³⁵ This assertion may be supported from the preface to the work: Mack noted that he had been torn on the question of how to translate the terms for chemical substances. Despite being urged to translate scientific terms into Sanskrit, presumably by the older generation of missionaries, he had decided on putting the European names into Bengali.¹³⁶ Mack apologised that his style was 'bald and concise' but urged that simplicity was necessary for the communication of chemistry in India.¹³⁷

The aim of simplicity characterised both the early orientalist and later Anglicist phases of the College; the Serampore missionaries hoped that their students would commit facts to memory, which was in keeping with the style of the monitorial education that they had adopted. Indeed, the reports from Serampore College make clear that repetition of facts was crucial to the assessment of pupils. In January 1823, for instance, the students at Serampore College were examined in the presence of Colonel Krefting, Governor of Serampore, the College's pundits, several European residents in Serampore, and some 'respectable native inhabitants'. The examination was conducted by the missionaries Carey, Marshman, Mack, and Williamson. The 16 candidates who had studied geography and the solar system were said to have committed the meaning of the Newtonian system to memory: this consisted of 30 pages of text. When asked questions on this topic,

¹³⁴ Mack, *Elements*, Preface p. vi.

¹³⁵ Young, 'Receding from Antiquity', p. 193.

¹³⁶ Mack, *Elements*, Preface, p. vi.

¹³⁷ *Ibid.*, Preface, p. viii.

their answers were said to have filled the audience with pleasure. 'Afterwards they were exercised in the map of Asia, and manifested a ready acquaintance with its countries, rivers, and principal cities.'¹³⁸

Serampore College was, therefore, a site for the study of both Indian and European sciences. In devoting themselves to these traditions of learning, the missionaries at Serampore acted as mediators between European and Sanskrit sciences. However, they did not hold that both these systems of knowledge deserved equal weight. At the College's inception, they aspired to supersede Sanskrit science and to demonstrate to their pupils the efficacy of Western science, which was in keeping with the character of Christian and constructive orientalism. From this position, there was, perhaps, an inevitable move over time to a more Anglicist stance. The instruments and texts that were utilised at the College by their physicality and supposed simplicity were expected to further this agenda. In the context of limited funds, the metropolitan societies' wish that the College be devoted more strictly to the theological education of youths of undoubted piety had to be obeyed.¹³⁹

Conclusion

In 1817, the Periodical Accounts of the Serampore mission announced that 'Rammohuna-roya, a very rich... Brahmun of Calcutta' had visited the missionaries. He was said to write English 'with correctness' and to 'read with ease English mathematical and metaphysical works'. 'He has published in Bengalee, one or two philosophical works, from the Sungskrita, which he hopes may be useful in leading his countrymen to renounce idolatry.'¹⁴⁰ While the precise nature of Rammohun Roy's relations with the missionaries is in doubt, it is certain that from 1816 he worked closely with them. For instance, in the second report of the College, the missionaries expressed their thanks to Roy for the gift of a complete set of his publications to the library; Roy was the only Indian thanked here, and was listed among Europeans who had gifted a microscope, 18-inch-globes and various volumes.¹⁴¹ Indeed, Ward wrote that Roy's career demonstrated that 'the knowledge of European science and the practice of idolatry are incompatible'.¹⁴² But, in reality, Roy was essentially a syncretist who sought to combine different philosophical traditions. By the early 1820s, a virulent and public controversy had erupted between Roy and the missionaries over the divinity of Christ and the doctrine of the Trinity. In fact, one Baptist missionary left the fold and worshipped with Roy at

¹³⁸ Fourth report, pp. 14–15.

¹³⁹ Laird, *Missionaries*, pp. 148–49.

¹⁴⁰ Potts, *Baptist Missionaries*, p. 231.

¹⁴¹ Second report, p. 9.

¹⁴² Potts, *Baptist Missionaries*, p. 235.

the Unitarian chapel in Calcutta. Ward wrote: 'The heathen Ram Mohunroy converting a Missionary! How are we fallen! O Lord, help, or we perish!'¹⁴³ Central to the falling out was Roy's book, *The Precepts of Jesus* (1820), which resulted in a stream of criticism on the part of the missionaries in *Friend of India*, and responses by Roy which were titled 'Appeals' to the 'Christian public'.

Essentially, Roy appealed to reason, the very kind of reason that the Serampore missionaries hoped to teach at their College. He labelled Trinitarianism a form of Christian polytheism that was equivalent to Hindu polytheism. He urged Christian missionaries to keep the idea of the Trinity hidden because it was 'very much calculated to lower the reputation of Britons both as learned and as a religious people'.¹⁴⁴ In effect, Roy had absorbed the kind of scientific rationality that the missionaries preached and used it against them. Roy's reaction is useful in making space for an Indian response to the kind of Christian and constructive orientalism practised at Serampore. Those who took the missionaries' philosophy on board used it in a manner that the missionaries did not predict.

Rammohun Roy's reconstruction of the Serampore missionaries' scientific worldview raises another question: Where does power lie in this story? The Serampore missionaries sought to colonise the minds of their pupils, pundits and gardeners, but if Roy's response might be taken as indicative, it is possible that they did not succeed. However, Roy's reaction should not lead to the assumption that there was a mere dialogue between European and Sanskrit sciences. The fact remains that the missionaries oversaw profound changes from Serampore—in agricultural practice, in the botanical description of India, and in the teaching of the sciences; and this must speak of aggressive agency. Furthermore, even in devoting themselves to existent science, the missionaries did not seek only to recover lost knowledge, but to use such knowledge as a stepping stone to Christianity. The kind of dialogue that emerged at Serampore College in its first decades was directed towards conversion, and its orientalist credentials could quite easily give way to Anglicist ones because it was an orientalism that sought in the end to lead to Christian knowledge. All these points urge scepticism with respect to the configuration of the current debate in the history of colonial science, organised as it is around the dichotomy of power and dialogue. In Serampore, power could be exercised over dialogue, and that power could be constrained by practical realities of local agency. Since the project of scientific enlightenment followed at Serampore evolved from orientalism to Anglicism, it is necessary to be circumspect in generalising about the nature of the engagement between science, religion and empire. This brand of Christian orientalism was related to the constructive orientalism of the Company, as is demonstrated by Carey's role at Fort William College, but it was set apart by its aim of conversion.

¹⁴³ *Ibid.*, p. 234.

¹⁴⁴ *Ibid.*, p. 240.

This article has taken seriously the claim that missionaries could be men of science. Yet we must be careful in placing this science in a wider context. David Arnold, in his very recent book, has urged the importance of travel to the emergence of colonial science in India and to the tropicalisation of the Indian environment in the British imagination. Central to Arnold's analysis is a band of Romantic travellers who were concerned with an ideology of improvement, and who cultivated a scientific gaze. Arnold defines this gaze as an 'ordering, even disciplining, mechanism that edited as well as elicited information and actively meddled in the construction of the knowledge it sought to shepherd and cajole into meaningful shapes and approved scientific forms.'¹⁴⁵ Arnold's thesis is presented in order to counter-balance an emphasis on institutional histories of science in India. He argues that this attention to settled science has distracted attention from the importance of mobility in the construction of new ideologies.¹⁴⁶ However, Arnold does concede that not every man of science in India saw the importance of travel, and that there were other relationships to place.¹⁴⁷ This article does not emphasise travel as much as residence: the familiarity with the land, its peoples and languages that arose from long established contact. Carey saw his botanical work as distinct from that of mere travellers who spent so brief a time in India. In stressing residence, I do not mean to dispute the kind of vitality that Arnold has attributed to movement in the emergence of science. In India in this period, science did not take a single form or emerge from one kind of relationship to the land. Travelling and resident science served as rival genres, prior to disciplinary professionalisation. Those who were resident, however, had the wherewithal to claim that their kind of science was more effective.

In noting the distinctive features of missionary science, it has also been my intention to suggest that the network that supported the Serampore missionaries' activities had different nodes from those that usually characterised colonial botany in this period. While William Hooker did correspond with Carey, the missionary was able to assert his own ground. Carey relied more heavily on provincial collectors in the Midlands, and gathered his own specimens from across the world. Meanwhile, the kind of science teaching undertaken at Serampore, although dependent on models developed in England, was an experiment in Christian and constructive orientalism. The power of the centre, and the submission of the periphery in relation to the production of colonial science, has recently been questioned elsewhere.¹⁴⁸ However, what is important about the Serampore missionaries is how they were able to cultivate their own web of correspondence that, to some extent, operated independently of elite botany. There were, therefore, overlapping

¹⁴⁵ Arnold, *The tropics*, p. 31.

¹⁴⁶ *Ibid.*, p. 16.

¹⁴⁷ See for instance the discussion of Royle in *Ibid.*, p. 165.

¹⁴⁸ Schiebinger, *Plants and empire*.

hierarchies of locality.¹⁴⁹ In urging the independence of the science practised at Serampore, it is important to keep in mind that these missionaries followed a philosophy of self-sufficiency, and hoped to disconnect the mission from the metropolitan Baptist Missionary Society. Theologically, as well, it is reasonable to see their science as confident in its difference: they believed that a true understanding of the book of nature would emerge only in line with an interpretation of the other book, that of scripture. It is my suggestion that missionary science in India operated with boldness between the tracks of elite and indigenous science.

Following the work of Mary Louise Pratt, many historians of colonial science have attended to the role of vision.¹⁵⁰ The use of science in forging an allegedly rational sense of sight was central to why the Serampore missionaries practised science. The evangelists called on Indians to change the meanings that they attached to the material world, moving from a confusion of nature with the divine to a referential view of nature, where nature referred to the deity. William Ward's important survey of Hinduism used this philosophy of images in explaining the form of the gods worshipped by Hindus. The instruments used at Serampore College publicised the mutability of the material world. However, in practising science, the missionaries developed their own meanings for objects. For instance, Carey used his collection to remind him of distant family and friends, and the collection could encompass trophies of 'heathenism.' The missionaries' relationship to the material world had a different gloss when compared with the instructions they gave Indians on how to relate to what they saw. Rhetorically, at any rate, in the many textbooks that were used at Serampore, it was claimed that all who observed nature with care could come to a proper view of it. The dialogues that were used in teaching at the College, and the simple presentation of statements about nature in Mack's book on chemistry, for example, arose from this agenda.

Ultimately, it has been the aim of this article to point attention again to how Christianity and science were combined in early nineteenth-century India. From the post-Darwinist perspective of the later part of the century, this seems a surprising contention. But, in fact, missionaries were among the prime agents in the globalisation of knowledge. When an American supporter of the Serampore College wrote announcing that he would withhold the interest on some monies raised for the College unless reassured that it would be spent on theological training rather than on the teaching of science, Carey responded: 'I must confess I have never heard of anything more illiberal. Pray can youth be trained up for the Christian ministry without science? Do you in America train youth for it without any knowledge of science?'¹⁵¹ This exchange serves as evidence not only of the intimate

¹⁴⁹ I have taken the term 'overlapping hierarchies of locality' from David Wade Chambers and Richard Gillespie, 'Locality in the history of science', p. 229. I have applied it slightly differently here.

¹⁵⁰ Pratt, *Imperial Eyes: Travel Writing and Transculturation*.

¹⁵¹ Cited, Farrer, *William Carey*, p. 110.

connection between science and Christianity at Serampore, it also points to the fact that there was resistance to this combination of interests. With time, at least on the face of it, those who wished to segregate science and Christianity won the day. But before this came to pass, the missionaries at Serampore could practise science and, teach it, using their location at Serampore as a centre for the collection, generation and popularisation of a distinct style of science.

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