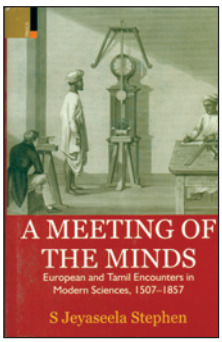
Book Review

A Meeting of the Minds: European and Tamil encounters in modern sciences, 1507–1857. S. Jeyaseela Stephen. Primus Books, New Delhi, 2016. *1120pp, ₹ 2000, US$ 189.95, £ 125.95 (Hardback)*. ISBN Hardback: 978–9384082796; ebook: 9789384092221.



Sea-faring Portuguese, the Dutch, English and French equipped with strong naval fleets entered India through the western and eastern shores of Peninsular India. The Portuguese led by Vasco da Gama arrived in Calicut in 1498. They gradually spread northward to Goa and dominated the Konkan. The Dutch led by Steven van der Hagen arrived in Calicut in 1604. The British represented by Francis Day and Andrew Cogan arrived at the site known today as the Fort St George precinct in Madras (presently Chennai) on 22 August 1639, which marks the start of colonization of India by the English.[1] Cogan and Day purchased a strip of land to build a warehouse from Pedda Venkata Raya III, of the fading Vijayanagarã (Arãvidu) dynasty, then living in Chandragiri. Thus, what commenced on a small scale, in the little known *Madarasa-pattinam*, principally a fisher-folk hamlet, lying a little north to the later-to-come Fort St George precinct, became a beehive of activity, gradually expanding into British India in the next three centuries.

With the establishment of the English-East India Company reporting to the British Crown, Calcutta (presently Kolkata) was named the capital of British India in 1772. Warren Hastings was appointed the Governor General. For administrative reasons, most of India, barring the principalities under various Rãjã-s, was divided into Bengal, Madras and Bombay Presidencies. The Madras Presidency, with Madras city as the headquarters, nearly filled the bulk of Peninsular India. In terms of development, Madras was marginalized for various political reasons with the rise of Calcutta (presently Kolkata), which had a brilliant thinker William Jones (1746–1774) on its judicial service, who led Calcutta on a fascinating intellectual path. Science and arts flourished in Calcutta. Madras, however, did not lag behind in scientific exploration. Two remarkable examples of the brilliant science Madras pioneered at this time are: (i) standardization of time by engineer–astronomer John Goldingham (Madras Observatory, today the Meteorological Office, College Road) based on Greenwich Mean Time in the 1820s;[2] and (ii) building of a 38 m tall Doric-column lighthouse by John Smith (Madras Engineers Corps), who built it employing a then novel civil engineering design using charnockite and fitting it with a then best available Fresnel lens lantern in the 1840s.[3] While these illustrate the creative originality of British engineers of Madras, considerable interaction between *Tamizh* scholars and European settlers occurred especially in the field of medicine, which relied more aggressively on natural materials.

As we sift through the pages of Indian history of this period, Madras sparkles having contributed to medical and paramedical sciences impressively. However, a wide gap presently exists in the context of a consolidated narrative of science in general and medical science in particular that evolved in the Madras Presidency. Jeyaseela Stephen fills that gap substantially by providing a generally uncompromising narrative on the science and medicine in Madras, which he refers to as the *Tamizh* country. Stephen includes the French territory Pondichéry into this landscape, which makes sense. Although Pondichéry occurred embedded in the Madras Presidency (true even today, within Tamil Nadu), science and scientific research in these territories involved different styles, scales and needs, directed by fundamental divergence in the philosophies of science subscribed to by the English and the French.[4] In spite of such divergence, the narrative offered by Stephen gelling the large Madras and the petite Pondichéry in this book is gripping, since he sees the *Tamizh* language as the bridging element and the *Tamizh* culture as the common denominator. Stephen has constructed this book on two interconnecting pivotal themes: (i) the scientific investigations made by the British, French, and occasionally, by the Dutch and Portuguese; and (ii) how the *Tamizh* people complemented their efforts by either supporting them or providing 'new' information to them. This Stephen imaginatively calls 'a meeting of the minds'.

The earliest western medicine-based dispensary-cum-hospital built by Henrique Henriques (1520–1600), a Portuguese Jesuit, arose in Punnakãyal in 1550. Portuguese Missionaries built hospitals in Kanyakumãri, San Thomé (now, Santhome), Nãgapattinam in the following decades. The Nãgapattinam Hospital—Santa Casa da Misericodia (the Holy House of Mercy)—intended as a charity, not only treated the sick but also buried the dead.[5] Differing from what we recognize as a hospital today—more as a lying-in facility where the sick are helped either *gratis* or on payment—during the 17th–18th centuries, it was more of a clinic, where a surgeon examined the sick and offered treatment, sent them home, and sometimes dispensed medicines as well. The early Portuguese Missionaries living on the Coromandel closely observed the health-management practices of the *vaidyan*-s (=native doctors), since those Missionaries were in disparate need to obtain remedies to treat illnesses (mostly infectious) they contracted living in the warm and humid country. Because helping the sick public was an approved item in their agenda, their spiritual role metamorphosed partly into exploring the science of plants for their remedial secrets relevant to humans. The Jesuits established a hospital in Pondichéry in 1693. Heinrich Plütschau and Bartholomäus Ziegenbalg, Pietist priests trained at Halle (=Salle, Sachsen Anhalt) arrived in Tranquebar (Tarangampãdi), sponsored by Frederick IV (the King of Denmark) to spread the message of Evangelical Lutheran Mission in 1706. Plütschau and Ziegenbalg maintained gardens of medicinal herbs. They used these plant materials to cure illnesses of the locals and that knowledge consolidated in their diaries, which are archived at Halle. Johann Ernst Gründler, another Pietist priest belonging to Moravian Bretheren, settled in Porayar learnt *Tamizh* language, studied local medical documents (palm leaf texts), and sent his manuscript entitled the *Malabar Medicus* to Halle.

In 1732, Samuel Benjamin Knoll (also spelt as Cnoll) arrived in Tranquebar and established a *Laboratorium Chymicum*, where he compounded medicines using locally available raw materials, but following the standard European Pharmacopœiae, which he found highly effective in curing illnesses.[6] Unlike his predecessors Ziegenbalg, Plütschau, and Gründler, Knoll rejected local medical knowledge.[7] However, Knoll's *Laboratorium Chymicum*, although

very small, impresses as the earliest, formally set up medicinal-chemistry laboratory in India. The arrival of Knoll and the establishment of *Laboratorium Chymicum* heralds as a flagging event in pioneering the connection between Tranquebar Halle Mission and ardent scientific enquiry. This moment unpacks the plethora of complex connections between medicine, science, religion and economy in southern India in the early decades of the 18th century. With the arrival of Knoll, the Tranquebar Halle Mission metamorphosed into a fountainhead, dispersing and circulating new knowledge, especially new science.[8]

In pages 307–317, Stephen speaks of the development of western medicine-based hospital facilities in Madras city and Madurai. He refers to the adoption of the Maniyakkãrar Çattiram (a community facility that offered broken-rice *kanji* free to the poor during famines), which today has grown into the Stanley Medical College and Hospital in northern Madras. The Maniyakkãrar Çattiram evolved into the Madras Leper Asylum superintended by James Dalton in 1798, and later by James Lawder.[9] Based on local medical knowledge, many trials using especially the oils from *Hydnocarpus wightiana* (Achariaceae) and *Dipterocarpus turbinata* (Dipterocarpaceae) were launched at the Madras Leper Asylum to treat patients.[10] Pages 318–324 refer to details available in reports by the Portuguese (1611–1690), Tranquebar Halle Missionaries, and Danish doctors on *Tamizh vaidyan*-s and their practices in different towns of the Madras Presidency, which kept me engaged. Stephen particularly refers to Theodor Folly, the medical doctor in the Danish Asiatic Company service, who played a key role in the medical history of the *Tamizh* country and who practised medicine in Tranquebar from 1778 until 1803, the year he died. Further to being a committed western-medical practitioner, Folly enthusiastically pursued the Indian medical system. He consulted many *Tamizh vaidyan*-s to learn the local medical practice. He brought to light the prescription laid out in Agastyã's medical treatise on how to sublimate mercury for medical use.[11] Notable that in the colonial-time Tanjavur mercury and arsenic, along with a few other deadly plants (e.g. *Aconitum ferox*, Ranunculaceae, *Calotropis gigantea*, Apocynaceae) were compounded to treat snake bites and a few other illnesses.[12]

Phlebotomy was a common practice in early 19th century France for various illnesses. Live leeches were used in phlebotomy. By the end of the 19th century, western Europe had exhausted its stock of leeches (*Hirudo medicinalis, Annelida*), encouraging Jean-Baptiste Sarlandière (1787–1838) to develop the *bdellomètre*—the mechanical bloodletting device. Harvesting of leeches, then available aplenty in Pondichéry, became a paying activity. In 1835, many Indian workers moved to Mauritius carrying some of the practices of Ayurvéda with them, including the use of leeches (*Susruta Samhitã*, Chapter 13). In high likelihood, the large *H. orientalis*, which occur abundantly throughout India, were taken to Mauritius. *Hirudinaria granulosa* (the Indian cattle leech) was used by medical practitioners of 18th–19th century Pondichéry.[13]

After Jenner's discovery of smallpox vaccination in Britain in the later decades of the 18th century, vaccination against smallpox was intensely carried out in southern India. The validity of Jennerian vaccination was debated aggressively throughout India, since in the northernmost parts of India the Oriyan Brahmins claimed to be practising variolation since long.[14] In the early decades of the 19th century, one '*Calvi Virumbon'* (read as *Kalvi Virumpan*, knowledge lover [seeker]? A possible pseudonym) of Madras in a letter to the editor of the *Madras Courier* (published on 12 January 1819) (Fig. 1) claimed that vaccination (rather, variolation) was known in ancient India. *Virumbon* quoted from *Yogaçintamani* (edited by *Harşakïrti* with Telugu commentary) and *Yukimuni Çintamani*, *Kareiçal Munnuru* (a *Tamizh* medical treatise, attributed to Agastiyã). Stephen refers to this letter of *Virumbon* (p. 341), which created ripples in the world of medical science, including distant places such as France[15] and North America[16] by citing *Virumbon*'s *Sactéya Granŧa* quote published in the *Madras Courier*. Many of the British physicians in Madras recognized that variolation had its roots in the *Tamizh* country as indicated in multiple *Tamizh* classics. James Anderson, Physician General of Madras (1739–1809) coined the term *Amarãtyam* (=cow's milk, immortality) for smallpox. Francis Whyte Ellis (1777–1819), a Madras Civil Servant and an Orientalist, wrote *Amaravãra Vilãsam* (the legend of the cowpox) consulting an old manuscript indicating that variolation was a recognized *Tamizh* practice. Some historians suspect that Ellis was *Calvi Virumbon*.

The chapter 'Study of plant chemistry and medical chemistry…' (pp. 249–300) interested me most. Whereas this chapter provides enormous information, I was however dismayed in not reading about Jules Lépine, an apothecary attached to *le Ministerè de la Santé de Pondichéry*, who pioneered in medical chemistry by isolating its active principle *vallãrine* from *Hydrocotyle asiatica* (current valid name *Centralla asiatica*, Apiaceae) and by testing

FIG 1. Facsimile of the letter by *Calvi Virumbon* published in the *Madras Courier*, 12 January 1819.
Source: Available at *https://archive.org/stream/MadrasCourier1819/MadrasCourier1819-01-12#page/n0/mode/2up*

its efficacy in treating leprosy in 1855. Lépine found that the hydro-alcoholic extracts of *H. asiatica* were helpful in the management of not only leprosy, but also elephantiasis, rheumatism, syphilis and herpetic infections. He named the principal active compound as *vallãrine* deriving it from the *Tamizh* name of *H. asiatica*, *viz. vallãrai*. The *H. asiatica* extracts were also tried in the Madras Leper Asylum by Alexander Hunter of the Madras Medical Service.[17] In pages 57–63, Stephen refers to *kãya kalpa*. Ancient Hindu scriptures explain *kãya kalpa* as the practice that provides immortality to humans, but in reality it implied providing an active, healthy, long life. Siddha practitioners in southern India explored *kãya kalpa* extensively and identified several plants and minerals as items used in this practice. Western medical men explored this concept passionately. However, Paramananda Mariadassou (1870–1947), an early graduate of *l'École de Médicine de Pondichéry* (the Medical School of Pondichéry) established in 1863, who practised as a surgeon attached to Pondichéry and Karaikãl hospitals of *Ministerè de la Santé de Pondichéry*, maintained a deep interest in Indian medicine. He has written *le Rajeunissement par le Kayacarpam* (*Rejuvenation by Kayakarpam*, 1938) commenting on *kãya kalpa*, further to contributing several other volumes on Indian traditional medicine.[17] In the context of Stephen's book, I recognize that Mariadassou's period falls beyond the time-scale Stephen has aimed to cover in this book.

I could spot quite many jarring errors and omissions in this book: 'Edward Bulkley' (or Bulkeley) of the Madras Medical Service spelt as 'Buckley' (p. 8), 'equipments' for 'equipment' (an abstract plural) (p. 11), 'Carl von Linné' spelt as 'Carl von Linee' (pp. 118, 121), 'McIvor' printed as 'Mc Ivor' (p. 176), '*Eucalyptus globulus*' (the Tasmanian Blue Gum) as '*Eucalyptus globuli*' (p. 227), the old, invalid name of '*Jatropha manihot*' used instead of the valid '*Manihot esculenta*' (p. 237), and 'Leeuwenhoek' spelt as 'Leeuwenhek', '*Mycobacterium*' indicated as '*mycobacterium*' to cite a few examples. I could not understand why the words 'endogenous' after 'Monocotyledons' and 'exogenous' after 'Dicotyledons' have been used (p. 103). In p. 121, Stephen, while referring to the 'curry leaf plant', which is biologically known as *Murraya koenigii*, which partly celebrates Johann Gerhard König, a Halle Missionary and a disciple of Carolus von Linnæus, who was stationed in Tranquebar earlier and in Madras later, indicates that Linnæus created '*koenignia*', which was news to me. Linnæus named the curry leaf plant as *M. koenigii* celebrating Johann Murray (a Swedish doctor and botanist) and Johann König. Somewhere along the line, Stephen refers to William Roxburgh as 'Roxburgh of Tãnjavur'. Roxburgh spent most of his time working in Samulkottah and Madras city. He did spend a limited time in Nãgapattinam during segments of his early career and during later segments in Calcutta as the Superintendent of Calcutta Botanical Garden. Referring to Roxburgh as Roxburgh of Tãnjavur, I felt a bit awkward, although he may have travelled to Tanjãvur, while being stationed in Nãgapattinam.

The difficulty I faced while handling this super-thick book needs to be mentioned. Handling a book of 1120 pages (23.5x14.5 cm, a near-demy octavo size) was cumbersome, although the binding quality was good and the pages opened fully and flat. Primus Books could have thought of splitting the volume into two for easy handling by readers.

Barring the above-listed and many unlisted omissions and errors, this book certainly and uncompromisingly fills the gap in our knowledge detailing the evolution of science in the *Tamizh* country between AD 1500 and 1900, presented in an elegant, easily readable prose. Stephen engagingly illustrates the connections between the science done by foreigners and how the *Tamizh* people complemented their efforts. In short, Stephen has successfully met the desired objectives. The later sections of this book deal with the non-medical science that evolved in the *Tamizh* country. Pleasing it was to see the India-ink drawing of Goldingham and his assistants Srinivasaçari and Tiruvenkataçari measuring pendulum oscillations reproduced on the wrapper and in the endpapers. Those readers interested in chapters after the 14th will experience a great read. What impressed me most is the enormity of search and research Stephen had done to bring this book to fruition. The list of references, most of them primary sources, is stunning. I am sure every future student of science history (including that of medical science) of the Coromandel will find the information supplied and the literature provided of high relevance and easy use. Stephen has done a remarkable job by compiling the literature meticulously. In conclusion, I was happy that a long-felt vacancy has been filled by Stephen. An impressive and a thorough, well-written volume.

REFERENCES

1 Love HD. *Vestiges of Old Madras*, 4 volumes. New Delhi:Government of India; 1913 (printed by John Murray, London).
2 Raman A. Looking back: John Goldingham and the Madras Observatory. *Madras Musings* 2012;XXII:6–7.
3 Raman A. The Grecian Doric column lighthouse of Madras (1840) and its builder John Thomas Smith of the Madras Corps of Engineers. *Curr Sci* 2016;**111:**1106–11.
4 Hyman A, Walsh J (eds). *Philosophy in the Middle Ages: The Christian, Islamic, and Jewish traditions*. Indianapolis:Hackett Publishing; 1973.
5 Subrahmanyam S. *The Portuguese Empire in Asia, 1500–1700: A political and economic history*. New Jersey:John Wiley; 2012.
6 Francke GA. *der Königlischen Dänischen Missionarien aus Ost-Indien eingesandte Ausführlichen Berichten: von der XXV. bis XXXVIsten Continuation; darin die Fortsetzung des Missions-Wercks bis aufs Jahr 1732 umständlich beschrieben wird*. Halle:Verlegung des Waysenhauses; 1735: Part 3, 1458 pages.
7 Krieger M. Material culture, knowledge, and European society in colonial India around 1800: Danish Tranquebar. In: North M (ed). *Artistic and cultural exchanges between Europe and Asia, 1400–1900, rethinking markets, workshops, and collections*, Surrey:Ashgate; 2010:53–72.
8 Jensen NT. Making it in Tranquebar: The circulation of scientific knowledge in the early Danish-Halle Mission. In: Fihl E, Venkatachalapathy AR (eds). *Beyond Tranquebar: Grappling across cultural borders in South India.* New Delhi:Orient Blackswan; 2014.
9 Raman R, Buckingham J, Raman A. The Madras Leper Hospital and leprosy management in 19th century India. *Curr Sci* 2012;**103:**1354–7.
10 Balfour E. *Report on the treatment of leprosy with Gurjun oil and other remedies in hospitals of the Madras Presidency*. Madras:Government Press; 1876.
11 Jensen NT. The medical skills of Malabar doctors in Tranquebar, India, as recorded by Surgeon TLF Folly, 1798. *Med Hist* 2005;**49:**489–515.
12 Raman R, Raman A, Ram Manohar P. The arsenic and mercury-containing Tanjore pills used in treating snake bites in the 18th century Madras Presidency. *Curr Sci* 2014;**106:**1759–63.
13 Raman A. When Pondicherry exported leeches. *Madras Musings* 2013;XXIII:4.
14 Brimnes N. Variolation, vaccination and popular resistance in early colonial south India. *Med Hist* 2004;**48:**199–228.
15 Husson H-M. Vaccination. In: *Dictionnaire des Sciences Médicale*, Paris:Imprimérie de C.L.F.; 1822.
16 Ducachet HW. Strictures on the late circular addressed to the citizens of the United States by James Smith, MD. Agent of the Vaccine Institution, at Baltimore. *New York Med Phys J* 1822;**1:**42–53.
17 Raman R, Raman A. Western medicine in French Pondichéry (1690–1954). *Indian J Hist Sci* 2017;**52:**287–96.

ANANTANARAYANAN RAMAN
15 Ironbark Terrace
Hammond Park
WA 6164
Australia
araman@csu.edu.au