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HISTORY NOTE

A *papier-maché* human anatomical model used in the Madras Medical Establishment in the 1830s

Ramya Raman[1] · **Anantanarayanan Raman**[2,3]

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Abstract
An untitled 2-page notice by a Madras Civil Servant John Morris sleeved under 'Scientific Intelligence' in the inaugural issue of the *Madras Journal of Literature & Science* (1834) refers to a human anatomical model built by Louis Aujoux, a French physician–anatomist–model maker. Highly likely this model was used at the Madras Medical Establishment to teach basic medicine to trainees of the Subordinate Medical Service. This was brought to Madras by Surgeon George Knox of the Madras Medical Establishment in the early 1830s, before the establishment of the Madras Medical School under the superintendence of William Mortimer. A similar model was acquired by the Calcutta Medical Establishment a little earlier. The present article, keeping the human anatomical model as the central element, refers to the development of interest in designing human models for purposes of teaching medicine in Europe. That interest stimulated using such models in India as well. The present article also refers to the medical interests of the scholar–princes of Tanjavur and Travancore of the nineteenth century India, who maintained models of full human skeletons, not of bones but made of ivory, in their Curiosity Cabinets (*Kunstkammern*). From the 2-page notice of Morris, we understand that the model that came to Madras from France was a gift to the Government of Madras for teaching purposes. No further details are traceable.

Keywords Aujoux · Knox · Morris · Medicine · Sarabôji · Nineteenth century

Introduction

An untitled 2-page note by John Carnac Morris,[1] signed 'ED.' at the end, sleeved under 'Scientific Intelligence' in the inaugural issue of the *Madras Journal of Literature & Science* [*MJLS*] (Morris, 1834) refers to a human-anatomical model in Madras (Fig. 1). Made by a French physician, Louis Auzoux, this model was noticed in the *MJLS* because of its 'interactive' endowment and near-human size. The model was unique, because it could be dismantled to view internal body parts and re-fitted snugly to its normal human appearance. Thus it was amenable for learners of medicine in an interactive manner. See http://www.sites.hps.cam.ac.uk/whipple/explore/models/drauzouxs-models/ for photographs of different models created by Auzoux.

The Madras Medical School (M.M.S.) formally commenced in February 1835 (Raman & Raman, 2016), shortly after Morris's above-referred notice. The General Hospital in Madras (M.G.H.) was operating for army personnel from 1772, which started serving the general public in the 1840s. Before the establishment of M.M.S., the M.G.H. trained Europeans, Eurasians (Anglo-Indians), and Indians in western methods of diagnosis and treatment and pharmacopoeiae for people to serve under the Subordinate Medical Service (S.M.S.) of Madras in eighteenth and nineteenth centuries. The Subordinate Medical Servants trained as either Apothecaries or Dressers were employed in dispensaries in rural and remote villages and hospitals in major towns of the then Madras

✉ Anantanarayanan Raman
ramya.raman@nd.edu.au; araman@csu.edu.au; anant@raman.id.au

[1] School of Medicine, University of Notre Dame, Fremantle, WA 6160, Australia

[2] Charles Sturt University, PO Box 883, Orange, NSW 2800, Australia

[3] CSIRO (Health & Biosecurity), Floreat Park, WA 6014, Australia

[1] John Morris, a Madras Civil Servant, edited *Madras Journal of Literature & Science* journal, from 1834 to 1836, who was succeeded by Robert Cole. Morris contributed to the understanding of Telugu language and literature. He was admitted to the Fellowship of Royal Society in 1831. He was afflicted by paraplegia at a relatively young age. He worked in Madras confined to a chair in Madras Government Secretariat.

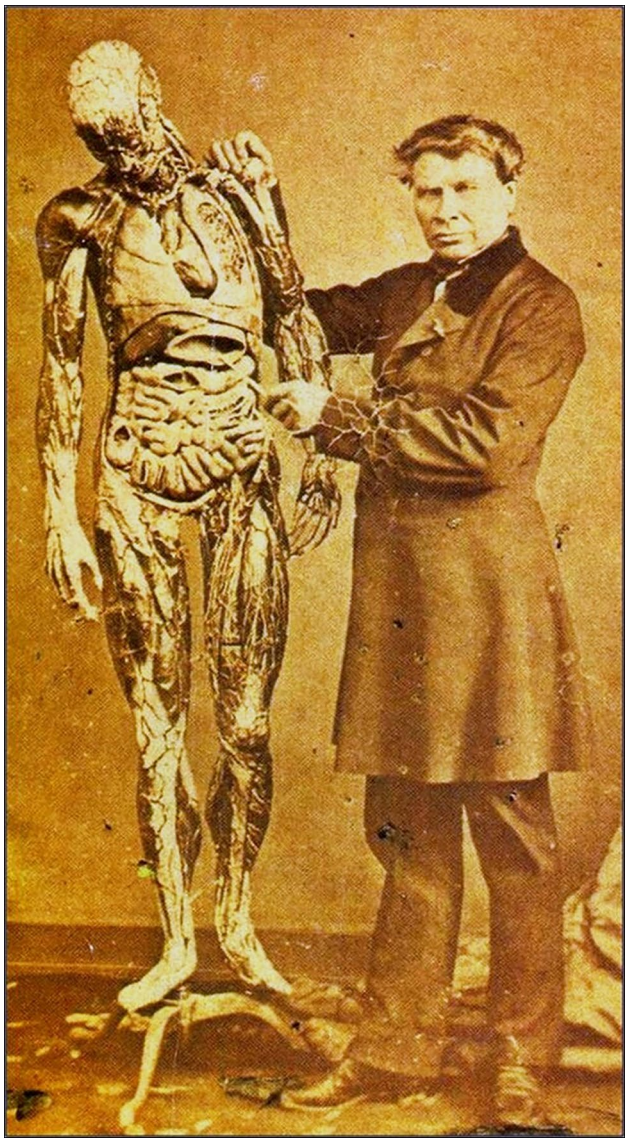

Fig. 1 Louis Auzoux and life-size human model, 1845 [Museo Nacional de Medicina, Quito, Ecuador]. Possibly a similar model arrived in Madras in 1832. [Source: https://au.pinterest.com/olilag/mm-mod%C3%A8les-anatomiques/]

Presidency as assistants to British-qualified doctors (Anonymous, 1838). William Mortimer superintended the M.G.H. from 1827, who additionally held charge of M.M.S., when it was commissioned newly in February 1835 (Anonymous, 1838; Raman & Raman, 2016). The present article refers to Morris's report on the interactive model brought to Madras in 1832, highly likely for use in training the S.M.S. candidates.

John Morris's note

Morris describes the model as an 'anatomical figure' and an 'exact model of the human body, with the skin taken off' constructed by 'Chevalier Auzoux' (Morris, 1834). He says (Morris, 1834, p. 273):

> It (the model) represents, with the greatest minuteness, and critical precision, all the details of the human structure. Each muscle and organ can at pleasure be removed and examined, with the same results that are attainable by the process of dissection. Indeed whether as regards its striking resemblance of nature, or the anatomical correctness of its construction, it may be considered one of the most extraordinary combinations of art and science, that have appeared in the present day.

This model was brought to Madras from England by one Mr Knox. An identical model was procured — may be a little earlier, date not available — for medical training in Calcutta. Morris also says that Knox published a pamphlet on the relevance and use of such models in medical schools. That pamphlet, unfortunately, is not traceable, although its bibliographic details were, shown below:

> Knox, G., 1834. Description of an artificial anatomical figure, constructed by Chevalier Auzoux, M.D. exhibited in 1832 before the King in London, Church Mission Press, Madras, pages 3–11, 19–20.

While searching for Knox's pamphlet referred to by Morris (1834), we chanced upon *The Anatomist's Instructor and Museum Companion* (1836) by another Knox — Frederick John Knox — who qualified for the Licentiate of the Royal College of Surgeons of Edinburgh in 1831, immigrated to New Zealand in 1840, and practised in New Zealand as a surgeon. The Frederick Knox volume published in 1836 also refers to Auzoux's anatomical models.

George Knox in Morris's note

The Knox referred in Morris's note was George Knox, a surgeon who worked with the Madras Medical Establishment in the 1830s. George Knox was an Indian Medical Servant (Crawford, 1914). He was a Fellow of the Royal College of Surgeons of London from 1816 (The Royal College of Physicians of London, 1845). Except a communication published in the *Royal Asiatic Society of Great Britain and Ireland* (1831), no other documented work of George Knox exists.

Louis Auzoux in Morris's note

Louis Thomas Jérôme Auzoux (1787–1880) was a qualified French medical doctor, who studied with Guillaume Dupuy and René-Alexis Baffos at the Paris Medical School in 1818 and 1820, respectively. Human anatomy attracted Auzoux. Serendipitously, Auzoux, while studying in Paris, ran into an elderly lady selling *papier-maché* dolls in Paris streets. *Papier-mâché*, as a material, impressed Aujoux as suitable for his proposed human-anatomical models, since, he considered that it would be soft and resistant, and not stick to the cast (Olry, 2000). The French Government decorated Auzoux with the title 'Chevalier'.

Auzoux pioneered in creating *papier-mâché* models casting them in lead matrix under a heavy wood coating.[2] The courses of nerves and blood vessels were articulated by gluing hemp fibres, subsequently hand painted (Olry, 2000). Auzoux called these creations as *clastics* deriving from *klastos* (Greek) meaning 'in pieces'. At *l'Académie Nationale de Médecine* (*l'ANM*, the National Academy of Medicine), Paris, Auzoux exhibited his first model of a human-lower limb in 1822. *l'ANM* constituted a committee comprising leading medical professionals of Paris, viz., Nicholas-Philibert Adelon, Anthony Dubois, François Ribes, Hippolyte Cloquet, Jean Cruveilhier, Gilbert Breschet, and René-Alexis Baffos to verify Auzoux's creations and explanations in 1825–1830. The Adelon committee submitted a formal report in 1831 (Adelon et al., 1840, p. 5) to *l'ANM*, zealously endorsing Auzoux's creations:

> Your favourable opinion, gentleman, has been confirmed by the extraordinary anxiety evinced by the public institutions of almost all civilized countries to obtain this wonderful preparation. Your elogiums and the avidity with which these specimens have been sought after by Foreigners, have given a new impulse to the zeal of ourcolle(a)gue (*sic*. Auzoux). We transcribe, with great pleasure, what was said in 1823 by the Medical Society of Emulation,[3] "We cheerfully accord to M. (*sic*. Monsieur) Anzoux the thanks due to his zeal in the cause of science." his patience, his ingenious essays, and the brilliant results accomplished by his perseverance and profound knowledge of anatomy.

The Adelon committee examined a human model measuring 5′ 6″ (*c*. 170 cm) made by Auzoux. According to them, this model delineated every minute detail of the structure of human body. The following passage from their report (p. 6) reinforces their satisfaction on Auzoux's submission:

> The representation of the Heart is exceedingly happy; by means of a section made in the inter-auricular and inter-ventricular partition, this organ is divided into two halves: upon each half are two cavities, which may be opened so as to bring into view the valves—all these parts re-unite so exactly, that the traces of division can scarcely be recognized—and in the entire they exhibit a heart of natural size, whence are seen the vessels, which originate from this organ or returned to it. All these vessels being traced from their origin to their termination it is easy to study their different branches, their numerous anastomoses, and their relation with the different organs.

Gunning S. Bedford, a senior surgeon and a gynaecologist–obstetrician attached to the Albany Medical College & Hospital, New York, translated several reports pertaining to Auzoux's efforts into English and published them in America (1840). In pages iii–iv (preface), Bedford refers to Auzoux's creations as 'excellencies'. He says,

> Dr Auzoux has succeeded in throwing a fascination around the study of Anatomy, which it never before possessed: free as he made it the loathesomeness of the dissecting room, it can be pursued by all classes of society with the fear of encountering the putrescent atmosphere of the dead.

The Bedford edition also includes comments of several other leading medical practitioners of France, such as, René Theophile Laennec[4] on Aujoux's creations. Olry (2000) indicates that Auzoux, in later years, worked on models representing human embryology, comparative anatomy of non-human animals, and plants. A short report on a life-size human frame by Auzoux exhibited in London in 1831 is available (The Athenaeum, 1832). In response to the request from Henry Halford, the personal physician to King George III of England, that such models would be highly useful as a means of instruction in British medical schools, George III requested Auzoux to supply one, newly prepared model to be given away as the King's gift to the King's College, London. During this exhibition in 1831, George Knox of the Madras Medical Establishment, on a furlough in England, saw Auzoux's exhibit, also seen by George III, ordered another piece for teaching purposes at the Madras Medical Establishment.

[2] Wood coating means application of lacquer. This practice was widely used in Europe to strengthen items made with *papier-mâché*.

[3] *Société Médicale d'Émulation de Paris*, established in 1796.

[4] René Laennec, the designer of stethoscope, died in 1826 and the Bedford volume is dated 1840.

Reasons for Auzoux's creation of models

In the early decades of the nineteenth century, in Europe in general and in Britain in particular, untrained anatomists practised selling human bodies and body parts in public for various reasons. At least two infamous incidents led to the proclamation of the Anatomy Act of 1832 by the British Parliament. The first was the William Burke and William Hare case involving the murder of 16 humans in Edinburgh to supply body parts for the anatomy classes of Robert Knox in 1827–1828 (Bailey, 2011). The second was John Bishop and Thomas Williams killing of an Italian boy for similar reasons in 1831 (Wise, 2004). The Anatomy Act of 1832 licensed doctors, teachers of anatomy, and genuine students of medicine to dissect 'donated' cadavers (Hutton, 2006). Growth of newer and more skilful surgical procedures and their relevance in treating human-health problems necessitated a better understanding of the human body, organs, and tissues, which, in turn, encouraged recognition of the validity of anatomy as a critical medical discipline. The appearance of Surgeon John Bell's multi-volume book entitled *Engravings of the Bones, Muscles, and Joints of the Anatomy of the Human Body* published in London (1810) reinforces this point.[5]

The Anatomy Act of Britain 1832,[6] ended public dissections, which, naturally, encouraged seeking of alternate pathways. One was to build precisely depicted models using various materials, including wax (Bates, 2008). It would be pertinent here to recall the elegant wax models of popular humans created by Marie Tussaud (*née* Grasholtz) (1761–1850).[7] Tussaud's creative artistry could have been one force prompting Louis Auzoux to think of designing models. But he needed to think differently, since he contemplated their easy dismantling and re-assembly. He could have thought that the amenability of his creations for that reason was critical for medical students to learn details of internal organs in an interactive manner. The other key driver was the lack of donated cadavers in European medical schools. Auzoux's creations were generally received well by medical personnel (Bedford, 1840). However, many British medical teachers shunned using models in classes and preferred cadavers. To a Parisian physician, Charles Nicholas Halmagrand, such models were fit for non-professionals only (Bates, 2008).

Concurrent similar interests in human anatomy in Tanjãvûr and Travãncôre

Sarabéndrã Bhûpala Bhôslé (1778–1832) (popularly 'Sérfôji II', 'Sarabôji'), a later titular ruler of the Tanjãvûr Marãttã kingdom (10°47′N, 79°8′E) was a multi-faceted scholar.[8] Viswanathan–Peterson (1999, 2008) and Nair (2012) speak of Sarabéndrã's life, rule, and contributions to science, arts, and medicine. The *Dhanvantari Mahal* (a hospital for general public, which included western-medicine trained doctors, Indian *vaidyan*-s, and *Unani-Tibbi*-practising *Hakim*-s), and the *Saraswati Mahal* (a library housing several book and palm-leaf collections) are remarkable contributions of Sarabéndrã. Nair (2012, p. 290) speaks of an 'artificial eye'—"an apparatus made to illustrate the application of spectacles for long and short sight with the eye completely dissectable"—held by Sarabéndra in his *Kunstkammer* (Cabinet of Curiosities) in 1805. The purpose of referring to Sarabéndra's medical skills in an article on the model received in Madras in 1834 is to remind us that Sarabéndrã possessed a complete human skeleton, not of bones, but an exact replica made of ivory. Nair (2015) provides extensive notes on the making of this skeleton in India by skilled artisans of Kerala for Sarabéndrã to acquaint himself with medicine. Nair (2015) also remarks that Ûttram Tirûnãl Martãnda Varmã (1814–1860), titular ruler of Travancore, also held an ivory skeleton, similar to what was held by Sarabéndrã in Tanjavur *c*. 50 years earlier.

Conclusion

We are aware that we have considerably deviated in this narrative from the point with which we started, viz., Morris's notice (1834) on the anatomical model brought to Madras by George Knox in 1834. We also recognize that have talked more about details other than the model that came to Madras. But we are strongly hopeful that the sidebars we

[5] Also pertinent it would be to remember the *Anatomy of the Human Body* by Henry Gray and Henry Vandyke Carter of the St George's Hospital Medical School, first published in London (1858), which has undergone several editions and remains valid even today.

[6] The Anatomy Act of 1892 was replaced by Human Tissue Act of 2004 in England and Wales.

[7] Although most of us are familiar with Marie Tussaud's life in London, we need to remember that she was born in Alsace (now in France), who moved to England a little before the Napoleonic battles and could never return to Alsace. She was inspired to create wax models by the Swiss Surgeon Philippe Curtius in Bern, for whom Marie's mother worked as a housekeeper.

[8] Christian Wilhelm Gericke trained Sarabéndrã in reading and writing German and French further to imparting knowledge of Western Classical Music and instruments. Sarabéndrã's interest in establishing a *Kunstkammer,* a fashionable European practice among the wealthy of that time, therefore, does not surprise. Further to his passion in Southern-Indian Classical Music, Sarabéndrã maintained a wind band. This interest introduced western musical instrument violin into Southern Indian Classical Music as an accompanying instrument.

have set around the human model brought to Madras will be useful.

At the end of his note Morris (1834, p. 274) indicates that the model was handed over to the Government. He continues to say,

> … we cannot but entertain hopes that the opportunity will not be lost, which from the revolting nature of its study (sic Anatomy), has hitherto, chiefly been confined, to those whose professional pursuits have obliged them to acquire it.

Hugh Cleghorn, who taught Materia Medica at the Madras Medical College in the 1850s utilized students (e.g., P. Murugesa Mudaliar) trained at Alexander Hunter's Madras School of Arts in creating artworks of human anatomy and plants (Noltie, 2016). This leaves us wondering what happened to Aujoux's model in Madras within the next decade and half. May be this model was used only during early days of Madras Medical School. Similar to several other curious objects of medical science of the erstwhile India, which have disappeared, this item too, has obviously met with an unfortunate end of being lost leaving no trace. Nonetheless, we are happy that we could at least chronicle this event and record some details of this curious object, which Morris describes as 'ingenious anatomical figure' (p. 273) and its existence in Madras in the 1830s.

Notwithstanding the above on Aujoux's anatomical model in Madras in the 1830s, what impresses us is the enthusiasm of physicians and teachers of medicine of those days in making learning of medicine as innovative as possible within the limited resources they had, differing strongly from the kinds of resources we have presently. Today, we have progressed to developing and using teaching resources involving 3-D models, both in the virtual medium and in print, constructed based on CT imaging. Refreshing to see *Anatomical Sciences Journal* (http://onlinelibrary.wiley.com/journal/10.1002/(ISSN) 1935–9780) committed to teaching of human anatomy.

References

Adelon, N.-P., Dubois, A., Ribes, F., Cloquet, H., Cruveilhier, J., Breschet, G., & Baffos, R. A. (1840). Report made to the Royal Academy of Medicine (session 10 May, 1831). In: G. S. Bedford (Ed.), *Reports on the Artificial Anatomy of Dr Auzoux.* New York: Charles Vinten.

Anonymous. (1838). The Madras Medical School (XVI. Scientific Intelligence). *Madras Journal of Literature & Science, 7*, 265–268.

Athenaeum, (1832). The 'Gift of His Majesty to King's College'. *The Athenaeum of London,* p. 98.

Bailey, B. (2011). *Burke and Hare: The year of the Ghouls*. New York: Random House.

Bates, A. W. (2008). Indecent and demoralizing representations: public anatomy museums in mid-Victorian England. *Medical History, 52*, 1–22.

Bedford, G. S. (Ed.). (1840). *Reports on the Artificial Anatomy of Dr Auzoux*. New York: Charles Vinten.

Crawford, D. G. (1914). *A History of the Indian Medical Service (1600–1913)*. (Vol. II). London: W. Thacker & Co.

Hutton, F. (2006). The working of the 1832 Anatomy act in Oxford and Manchester. *Family and Community History, 9*, 125–139

Knox, F. J. (1836). *The Anatomist's Instructor, and Museum Companion: Being Practical Directions for the Formation and Subsequent Management of Anatomical Museums*. Edinburg: Adam & Charles Black.

Knox, G. (1831). Communication to Sir George Thomas Staunton: the ceremonial of the ordination of a Burmese priest of Buddha with notes. *Transactions of the Royal Asiatic Society of Great Britain & Ireland, 3*, 271–274.

Morris, J. C. (1834). VI. Scientific intelligence. *Madras Journal of Literature & Science, 1*, 273–274

Nair, S. P. (2012). *Raja Serfoji II: Science, Medicine and Enlightenment in Tanjore*. New Delhi: Routledge.

Nair, S. P. (2015). Native collecting and natural knowledge (1798–1832): Raja Serfoji II of Tanjore as a centre of calculation. *Journal of the Royal Asiatic Society, 3*(15), 279–302

Noltie, H. (2016). *Indian Forester, Scottish Laird*. Edinburg: Royal Botanic Garden.

Olry, R. (2000). Wax, wooden, ivory, cardboard, bronze, fabric, plaster, rubber, and plastic anatomical models: praiseworthy precursors of plastinated specimens. *Journal of the International Society of Plastination, 15*, 30–35.

Raman, R., & Raman, A. (2016). Early decades of the Madras Medical College: Apothecaries. *National Medical Journal of India, 29*, 98–102.

Royal College of Physicians of London. (1845). *The List of Fellows and Members of the Royal College of Surgeons of England, 31 August 1845*. London: R. & J. E. Taylor.

Viswanathan-Peterson, I. (1999). The cabinet of King Serfoji of Tanjore: a European collection in early nineteenth-century India. *Journal of the History of Collections, 11*, 71–93.

Viswanathan-Peterson, I. (2008). *Serfoji II—Scholar-King of Tanjavur*. New Delhi: Routledge.

Wise, S. (2004). *The Italian Boy: A Tale of Murder and Body Snatching in 1830s London*. London: Metropolitan Books.