

Early Modern Medical Regimes of Knowledge: Europe and India Compared ¹

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Very Rough Draft; Do Not Quote

This paper rests on two assumptions, both of them now under discussion and challenge. First, that there were advances in science in Europe which conventionally are summed up as a “scientific revolution.” Second, that these advances preceded, and underpinned, industrial advances in the west. It is for others to debate these two matters, and also the significance or even very existence of an “industrial revolution.” In this paper I merely assume that these two claims still have some heuristic value at least. If this were the case, then the history of medicine, as one part of science, provides a useful entrée to the topic. We can delineate strongly contrasting regimes of knowledge in this area in early modern India and

¹ I have published several more or less empirical articles and chapters on Asian and European medical matters. For the present paper I've reused some of the data from some of these publications, but cast them into a new and more over arching summary. "The Thin End of the Wedge: Medical Relativities as a Paradigm of Early Modern Indian-European Relations," *Modern Asian Studies*, XXIX, I, 1995, pp. 141-70. * "Hindu Medical Practice in Sixteenth-Century Western India: Evidence from the Portuguese Records," *Portuguese Studies*, XVII, 2001, pp. 100-13. * "Social Work in the Portuguese Empire," *Campus Social: Revista Lusófona de Ciências Sociais*, [Lisbon], #2, 2005, 108-13. "First Contacts between Indian and European Medical Systems: Goa in the Sixteenth Century," in David Arnold ed., *Warm Climates and Western Medicine: the Emergence of Tropical Medicine, 1500-1900*, Amsterdam, Editions Rodopi (The Wellcome Institute Series in the History of Medicine), 1996, pp. 20-41. * "The Portuguese State and Medicine in Sixteenth Century Goa," in K.S. Mathew, Teotonio R. de Souza and Pius Malekandathil, eds. *The Portuguese and Socio-Cultural Changes In India, 1500-1800*, Fundacao Oriente, 2001, pp. 401-19. * Those marked with an * were reprinted in my collection: *The World of the Indian Ocean, 1500-1800: Studies in Economic, Social and Cultural History*, Variorum Collected Studies Series, Aldershot, Ashgate Publishers, 2005.

Europe. Two specific examples will be given. One is to look at the provision by the state of hospital care in the Portuguese colony of Goa. There is a clear contrast with what was available in India. The other is to look at the work of European healers in India, especially the French physician François Bernier, who worked at the Mughal Indian court in the mid seventeenth century. His comments show, for the first time, that there was a developing gap between European medical practice and that prevalent in India. And I leave aside yet another controversial matter, that is why did India not “advance” either in the seventeenth century or later. All I will do is present some modest empirical material to show an evolving differentiation between “Europe” and “India.” I think I can demonstrate that “Europe” was beginning to be more successful in the never-ending process of accumulating Useful and Reliable Knowledge.

Studies of the impact of imperialism on indigenous health and medicine in colonial areas have usually found a disjunction around the time when new colonialism, based on overwhelming technological and economic advantage, came on stream. Before 1800, according to Arnold, "western medicine [in India] was far less domineering in its relationship with indigenous societies, and indeed was largely confined to the Europeans themselves."² Massive intervention, an attempt to control the bodies of the subject population, dates from the early nineteenth century. Arnold writes of the important role of science in nineteenth-century India in creating authority over India.³ Adas described convincingly how western scientific advance during the eighteenth century resulted in totally new perceptions of India,

² David Arnold, ed., *Imperial Health and Indigenous Societies*, Manchester, 1988, Introduction, p. 11.

³ See generally David Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India*, Berkeley, 1993.

and indeed of Asia.⁴ More precisely, in the matter of medicine we are told that before about 1860 colonial medicine in India was not backed by the force of law, and there was no concept of state medicine or government-mandated public health. Arnold has used the late nineteenth-century plague epidemic in India to show how increasingly the colonial government tried to control the bodies of its subjects. Science and law worked in tandem as the state moved aggressively into areas hitherto under the control of local communities.⁵

Data from Portuguese Goa in the sixteenth and seventeenth centuries will serve to modify these claims. The Portuguese state, often stigmatised as being ramshackle, ineffective and essentially "pre-modern," did try to intervene rather decisively in several medical areas. Several hospitals were financed and regulated by the state, but most of them served only Europeans, and all excluded non-Christians. The dispensation of charity to Europeans was organised by a body, the Misericórdia, which while private had strong connections with the state. The notion of an enclave is most appropriate to describe Portuguese medical practice in Goa. The Portuguese brought with them quite new notions about the role of the state in health care, but applied these, by and large, only to the European population of Goa, and to a lesser extent to local converts to Christianity. In this as in other areas the majority Hindu population was left alone.

State concern with helping ill people, and secular involvement in financing hospitals, seems to have been quite new ideas in both Europe and Asia at the beginning of the early modern period. In earlier times it was

⁴ Michael Adas, *Machines as the Measure of Men: Science, Technology and Ideologies of Western Dominance*, Ithaca, Cornell UP, 1989.

⁵ Arnold, *Colonising the Body*, and David Arnold, "Touching the Body: Perspectives on the Indian Plague, 1896-1900," in Ranajit Guha ed., *Subaltern Studies*, V, Delhi, 1987, pp. 55-90.

religious authorities that sponsored most health care, sometimes it is true prompted by pious rulers.⁶ We do have accounts of what seem to be very advanced Muslim hospitals in Baghdad, Damascus and other cities during the Abbasid period (750 to c. 1000). These were financed by endowments, had large staffs (including physiologists, oculists, surgeons and bonesetters), and seem to have provided, at least for the élite, an excellent service.⁷ Gervase Clarence-Smith at an earlier GEHN provided an excellent overview of Muslim hospitals. He shows a very considerable state concern with the provision of medical facilities in many parts of the Muslim world. From the seventeenth century Muslim rulers drew on European knowledge.⁸ In India in the seventeenth century it is claimed that the state set up hospitals, and these had a staff of doctors using both *ayurvedic* and *yunani* systems, their salaries and the cost of drugs being paid by the state.⁹

⁶ See generally a succinct survey in Roderick E. McGrew, *Encyclopedia of Medical History*, London, Macmillan, 1985, s.v. "hospitals"

⁷ *Encyclopedia of Islam*, 2nd. ed., s.v. "bimaristan;" Guenter B. Risse, *Mending Bodies, Saving Souls: A History of Hospitals*, New York, OUP, 1999, pp., 125-8.

⁸ "Science and technology in early modern Islam, c. 1450-1850," at <http://www.lse.ac.uk/collections/economicHistory/GEHN/GEHNPdf/ScienceandTechnology-WGCS.pdfref>

⁹ S.M. Ikram, *Muslim Rule in India and Pakistan*, Lahore, 1966, 2nd. ed., pp. 501-2. See also R.L. Verma, "The Growth of Greco-Arabian Medicine in Medieval India," *Indian Journal of History of Science*, V, 2, 1970, pp. 347-63 and M.Z. Siddiqui, "The Unani Tibb (Greek Medicine) in India," *Islamic Culture*, XLII, 3, 1968, pp. 161-72 for two enthusiastic and uncritical accounts of medicine in India. They stress respectively Hindu-Muslim coexistence and lots of hospitals in India.

These claims seem to be very problematic, for no contemporary source describes hospitals in actual operation in our period or earlier. There is however some evidence of medical centres being attached to sufi *khanqahs*, along similar lines to the centres associated with Hindu temples.

What is interesting is that state-run or supported hospitals were new in Portugal and Europe generally when the Portuguese arrived in India. It has been claimed that the move from the "traditional religious role of the hospital" was prompted by ideas from Renaissance humanism, as seen in works by, for example, Erasmus and Sir Thomas More.¹⁰ By the end of the sixteenth century monarchs and municipalities, that is secular authorities, became more prominent as compared with religious authorities. Stroppiana has pointed to a "hospital crisis" of the sixteenth century, to do with attempts to centralise and amalgamate smaller less efficient hospitals, and with the battle for control between secular and religious authorities.¹¹ A standard text claims (though as we will see this may be questionable) that it was only in the eighteenth century that "the emphasis [in hospitals in Europe] shifted from care toward treatment and cure."¹² More generally, it was only after the French Revolution that hospitals assumed the central place in medicine that we are familiar with today. To this time, hospitals were created either for religious or for charitable motives, and had on them a stigma of charity.

§¹⁰ Guenter B. Risse, "The Encounter between Spanish and Aztec Medical Cultures: Hospitals in New Spain," in D. Arnold, ed., *Warm Climates and Western Medicine*.

¹¹ L. Stroppiana, "The Hospital Crisis of the sixteenth century and its hygienic and social aspects," in *Proceedings of the XXIII International Congress of the History of Medicine*, 2 vols, London, 1974, Wellcome Institute, I, 82-7. For a sketch of premodern English health care see John Woodward, *To Do the Sick No Harm: A study of the British voluntary hospital system to 1875*, London, Routledge and Kegan Paul, 1974, pp. 1-5, and for France, in a work which also emphasizes voluntarism, Colin Jones, *The Charitable Imperative: Hospitals and nursing in Ancien Regime and Revolutionary France*, London, Routledge, 1989.

¹² McGrew, *Encyclopedia*, p. 138.

They were not, therefore, places where the well to do went to be treated, nor were they until the twentieth century.¹³

Before the middle of the fifteenth century in Portugal there were some hospitals maintained by religious Orders, and two set up by Prince Henry in the early fifteenth century to cure "African" diseases, but apart from this only asylums and places of seclusion, especially for lepers. But under João II and Manuel in the late fifteenth century the state in Portugal began to interest itself in health care. Hospitals and a House of Mercy were established, notably the splendid hospital of All Saints, founded in Lisbon in 1492, and completed ten years later.¹⁴

We also find in Europe increasing difference in the matter of professionalism. The College of Physicians of London was founded by charter in England in 1518, and used the title "Royal" from 1682. From 1540 physicians in England were allowed to practice surgery. In this same year the Company of Barber-Surgeons was given corporate status by the English crown, but they were not allowed to prescribe medicines. Surgeons in England and France were separated from barber's guilds only in the 1740s. What is interesting here is that the College of Physicians was organised on a completely different basis from earlier medico-craft groups. Clark tells us that the College was not a craft guild, and did not have apprentices. "It was not, like the Barber-Surgeons' Company, bound by the Acts of Parliament

¹³ See especially Lindsay Granshaw, "The rise of the modern hospital in Britain," in Andrew Wear, ed., *Medicine in Society: Historical Essays*, CUP, 1992, pp. 197-218, and generally on hospitals see Lindsay Granshaw and Roy Porter, eds., *The Hospital in History*, London, Routledge, 1989, and Guenter B. Risse, *Mending Bodies, Saving Souls*.

¹⁴ C.R. Boxer, "Some remarks on the social and professional status of physicians and surgeons in the Iberian World, 16th-18th centuries," *Revista de História* [São Paulo], vol. L, no. 100, 1974, p. 200. On this hospital, see a book which reprints the "Regimento" which established it and which contains copious information on medical knowledge and regulation at this time: Abílio José Salgado and Anastásia Mestrinho Salgado, eds. *Regimento do Hospital de Todos-os-Santos [edição facsimilada]*, Lisbon, 1992.

which made the ordinances of the London crafts, guilds, mysteries, and fraternities subject to the approval of the Lord Chancellor, the lord treasurer, and the two lords chief justice or any two of them."¹⁵ In other words, it was "modern" rather than "medieval."

Over the fifteenth and sixteenth centuries in Portugal pharmacists became quite closely regulated, and had to be certified to be able to practice as druggists. They had to have five books on drugs available, and three particular measures.¹⁶ Physicians and surgeons had in theory been licensed since 1338, though until a reform in 1448 this was poorly observed. From this year certificates of proficiency were issued, and matters were further tightened up in 1515 by D. Manuel.¹⁷ In other countries also professional bodies, usually backed by the state, appeared to regulate and give solidarity to particular occupational groups. The consequences of this growing exclusiveness were two-fold: on the one hand, harmful quacks were gradually weeded out, but on the other so were non-members of the exclusive group, such as midwives once obstetrics became "professionalised."

While this was happening in Europe, in India the situation as regards regulation and state concern with medicine remained unchanged. Indeed some Europeans, reflecting this increasing state concern in Europe, were by the late seventeenth century surprised at the lack of regulation in India. Dr. John Fryer especially noted how things were still different in Surat in 1675, for medicine there was a craft, not a profession. "Physick here is now as in

¹⁵ Sir George Clark, *A History of the Royal College of Physicians of London*, Oxford, 1964-66, 2 vols, I, 61, 337.

¹⁶ A.H. de Oliveira Marques, *Daily Life in Portugal in the Late Middle Ages*, Madison, 1971, p. 151.

¹⁷ C.R. Boxer, "Some remarks," *Revista de História*, 1974, pp. 197-8.

former days, open to all Pretenders; here being no Bars of Authority, or formal Graduation, Examination or Proof of their Proficiency; but every one ventures, and every one suffers; and those that are most skilled, have it by Tradition, or former Experience descending in their Families; not considering either alterations of Tempers or Seasons, but what succeeded well to one, they apply to all."¹⁸ Similarly, a little later Ovington noted how medicine was really still a craft, and governed by caste rules. Brahmins were meant to do theology, but they also did arithmetic, astrology, and physic. "But such as addict themselves to the Practice of Physick, are bound to pay an Annual Fine to the rest of their Sect, because Physick is both Advantagious and Foreign to their Profession."¹⁹ And Fryer in Persia again commented how "Here is no precedent License of Practising, but it is lawful for any one to exercise this Function who has the impudence to pretend it."²⁰

We can now turn to the situation in the first large European settlement in India, the port city of Goa, for here we seem to find a reflection of the changes we noted occurring in Europe. The Portuguese may not have been better curers than their Indian interlocutors, but they did set up official hospitals, and they did make some attempts to regulate and control healers.

Goa was conquered by Afonso Albuquerque for the Portuguese king in 1510, and was their main town and capital during the sixteenth century and later. The town's population at 1600 was about 75,000. Of these about 1500 were Portuguese or *mestiços*, 20,000 were Hindus, and some 50,000

¹⁸ Dr. John Fryer, *A New Account of East India and Persia*, ed. W. Crooke, London, 1909-15, 3 vols, I, 286.

¹⁹ John Ovington, *A Voyage to Surat in the Year 1689*, ed. H.G. Rawlinson, London, 1929, p. 205.

²⁰ Fryer, III, 95.

were local Christians who had been converted during the sixteenth century. In the countryside the population was still predominantly Hindu.²¹

We know very little about health care in Goa before the Portuguese conquest. However, there is no doubt that in most medical matters, such as diagnosis and healing, the newly arrived Europeans had no decisive advantage as compared to their Hindu subjects.²² The only area where the Portuguese were more advanced was in the matter of state concern with medical matters, and the provision of hospitals for their Christian population.

By late in the sixteenth century there were several hospitals in Goa, but we do not yet have a definitive list of which hospitals existed when and where.²³ There was, for example, the Leper Hospital of St. Lazarus, which had been founded in 1529. The Municipal Council and the Misericórdia or House of Mercy financed it. In 1634 there were 15-20 lepers held there. Another was a hospital for Indian Christians. This was run by the Jesuits, and constitutes a most interesting phenomenon. It is generally a question of whether this is to be seen, in Arnold's terms, as a manifestation of a colonial attempt to capture the bodies of its native subjects, an aspect then of domination and imperialism, or is it merely a charitable exercise by well-meaning religious?

This hospital was envisaged in the official regulation of the Jesuit college of St. Paul in 1546. It was noted that the Jesuits needed to cure, or if they died bury, local converts, and so the hospital was decreed. It was to

²¹ For Goa in the sixteenth century see M.N. Pearson, *The Portuguese in India*, CUP, 1987, pp. 81-115.

²² See my "First Contacts between Indian and European Medical Systems."

²³ Generally see C.R. Boxer, *Portuguese Society in the Tropics*, Madison, 1965, pp. 24-6, and Silva Correia, *La Vieille-Goa*, pp. 295-300. By far the best modern survey is in Fátima da Silva Gracias, *Health and Hygiene in Colonial Goa: 1510-1961*, New Delhi, 1994, pp. 118-36.

have a native doctor, the best available, and also a barber whose duties included bleeding and shaving the patients.²⁴

This hospital, known as the Hospital of the Poor of Fr. Paulo Camerte, was set up soon afterwards thanks to the efforts of this same Misser Paulo Camerte, an elderly Jesuit who had come to India in the first party of members of this order to travel east, led by Francis Xavier.²⁵

We have a detailed account of its early days in a Jesuit letter of 1552.²⁶ Fr. Paulo looked after orphans, and was also the main person in the hospital attached to the Jesuit college of St. Paul. All ill native Christians were welcome in it, both men and women, though the sexes were kept strictly separated. It was kept scrupulously clean, and seven or eight people ministered to the patients. The hospital was supported by being given rice and some money from the College, and a grant of 300 *pardaus* from lands in Bardes and Salcette, but this trifling sum was supplemented by the good father himself, who financed most of the enterprise from his own efforts, even, for example, raising hens to be used in the hospital. At any one time there were 30 or 40 patients, and some Portuguese even used it as a hospice in order to be consoled in their last hours by the father. Governors visited it many times. Fr. Paulo also raised funds to establish a small chapel adjacent to the hospital, and he was active in baptising new converts, and hearing confessions. Another Jesuit letter three years later noted that the

²⁴ For documentation on these two hospitals see my 'Portuguese State and Medicine,' pp 405-6 and footnotes 18 and 19.

²⁵ See generally on Misser Paulo, Georg Schurhammer, *Francis Xavier: His Life, His Times*, vol. II, *India*, Rome, 1977, p. 65, f.ns. 120,121.

²⁶ Fr. R. Pereira letter of 8 Dec 1552, in *Documenta Indica*, ed. J. Wicki et al, Rome, 1948-, 16 vols to date, II, 507-9.

hospital was still attached to the College, and was for poor native Christians who had fallen sick.²⁷

The work of this hospital was clearly intricately and inextricably tied up with the conversion drive run by the Jesuits and others. It had several meanings. On the one hand it was a pious attempt to provide for fellow Christians, even if they were Indian. It also constituted a carrot with which to encourage conversions. In 1564 Goan Hindus brought their sick children to the hospital, and promised that they would allow these children to be converted if St. Paul gave them life and health.²⁸ It could, however, also be read as control. Conversion can be considered to be the ultimate imperialism, for not only bodies, but even minds (and souls?) were now bent to the norms of the imperial power. In the hospital of the poor the Portuguese looked after, and controlled, the bodies of those whose minds had already been co-opted. Finally, the hospital of the poor did get the Portuguese out into the surrounding Indian community, albeit on their own terms. This was not the case with the Royal Hospital, which remained very much an enclave.

In an Indian context the famous Royal Hospital of the Holy Spirit was very innovative. It had been founded by the conqueror of Goa, Afonso Albuquerque, to cater for Portuguese soldiers. He set up a rather primitive adobe one in 1510, when the city was first taken by the Portuguese. Late in 1512, in a major campaign, he recaptured the town of Benastarim from hostile Bijapuri forces, and then marched in triumph back to Goa, and "he immediately established a hospital of very large size, with beds and

²⁷ Fr. Antonio de Quadros, 6 Dec 1555, in *Documenta Indica*, III, 350.

²⁸ John M. de Figueiredo, "Ayurvedic Medicine in Goa according to European Sources in the Sixteenth and Seventeenth Centuries," *Bulletin of the History of Medicine*, vol. 58, 1984, p. 228.

everything that was necessary for the care and cure of the wounded, who were very numerous."²⁹

This illustrates well the prime motivation of the state towards health care. It was always recognised that it was essential that the state provide health care for its soldiers, for otherwise the existing difficulties in raising troops would have been greatly exacerbated. This need was of course more pressing than the equivalent situation at home, for soldiers in India had no families to fall back on. Rather they were single men isolated in a precarious frontier society. To maintain their loyalty (for many in fact "deserted" and sought greener pastures in neighbouring Indian states) it was important for the state to reassure them that they would be cared for if they were sick, and also could die well. The details of its funding can be left aside.³⁰

At mid century a large staff, consisting of a mordomo or chief administrator, a physician, a surgeon, a barber (who also did bleedings), a pharmacist, an orderly, chaplain, secretary, buyer, cooks, washermen and slaves, looked after some 40 patients at any one time, though the number rose greatly each year when the ships from Portugal came in with their cargoes of Portuguese ravaged by the long unhealthy voyage.³¹ It was run from 1579 by the Society of Jesus, though they later gave it up and had to be persuaded to resume their mission in 1591.³² The way the state insisted

²⁹ Afonso Albuquerque, *Commentaries of the great Afonso Albuquerque*, London, Hakluyt, 1875-84, 4 vols. III, 241, and see generally Schurhammer, *Xavier*, pp. 201-4

³⁰ See my 'Portuguese State and Medicine,' pp. 408-12.

³¹ For an extended description of the hospital in 1542 see Schurhammer, *Xavier*, pp. 201-8

³² Fátima Gracias, pp. 122-3. Linschoten described their work in the hospital in the 1580s: J.H. van Linschoten, *The Voyage of John Huyghen van Linschoten to the East Indies*, London, 1885, 2 vols, I, p. 237. For the king's attempt to get them to take over again, see king to viceroy, 21 Jan 1588, in *Arquivo Português Oriental*, ed. J.H. da Cunha Rivara, III, 115, and king to viceroy 6 Feb 1589, in *ibid*, 196.

that the Jesuits take over again the hospital in 1591 showed how concerned the state was with the hospital. This is also shown in the very large sums the state provided to keep the hospital viable. Why such a lavish establishment, apparently in advance of European equivalents at the same time? It seems that the context is important here. This grandeur had a symbolically reassuring function.

But not only the state was involved. In modern times charity has become primarily a matter for the state, but earlier it was seen mostly as an obligation on wealthy and distinguished people. Goa in the sixteenth century was perhaps in a transitional state, for while we have seen state involvement, private citizens still played a large role. The viceroy would visit from time to time, along the lines of royal family visits today. Pyrard noted how "Sometimes [the patients] are visited by the archbishop, the viceroy and many lords, who make gifts to them of large sums of money."³³ Indeed this seems to have been a genuine community effort, as Linschoten noted, albeit sourly as usual. He found not only Jesuits but also gentlemen (officials of the Misericórdia) involved, "whereof every month one of the best is chosen and appointed, who personally is there by them [the patients], and giveth the sick persons whatsoever they will desire, and sometimes spend more by foure or five hundred Duckats of their owne purses, than the Kings allowance reached unto, which they doe more of pride and vaine glorie, than for compassion, onely to have the praise and commendation of liberalitie."³⁴

Admission to the Royal Hospital was restricted to Portuguese soldiers and a few other Portuguese. Pyrard said that no women, no householders, and no servants were admitted, nor were New Christians (converted Jews)

³³ François Pyrard de Laval, *The Voyage of François Pyrard of Laval to the East Indies*, vol. II, London, 1888, p. 12.

³⁴ Linschoten, I, 237-8

allowed, though some managed to sneak in anyway.³⁵ Linschoten noted that the patients "are only Portingals, for no other sick person may lodge therein, I mean such as are called white men, for the other Indians have an Hospitall by themselves."³⁶ It could hold a very impressive 1500 patients, and descriptions of it after it was expanded and rebuilt make it sound a most grand structure indeed. Pyrard noted that "Viewing it from the outside, we could hardly believe it was a hospital; it seemed to us a grand palace . . . "³⁷ Hospitals anywhere in the world at this time had deservedly low reputations, for they seem to have been most effective in transmitting communicable disease, or at best providing care but not cure. There was also a snobbish notion that hospitals were charitable, a resort only for those who could not afford care at home. But the Royal Hospital in Goa had a very high reputation, and this meant that, unusually for the time, even rich people were happy to use it. An account from the 1580s noted that "It is no shame there to lie in the Hospitall, for many men go thether willingly, although they have wherewith to keepe themselves in their houses, and have both wife and children."³⁸ Pyrard noted similarly that "However rich a man may be, there is none but will gladly have himself taken to this hospital, to get better treatment than at his own house, as indeed he will."³⁹

Pyrard, who was a patient in 1608, has left an extended and glowing account of it. Even the beds were splendid, with mattresses and covers of silk or cotton. The meals were luxurious and ample, the plates, bowls and

³⁵ Pyrard, p. 12.

³⁶ Linschoten, p. 237.

³⁷ Pyrard, pp.3, 7 It obviously then had been considerably enlarged since 1593, when it held only 400-500.

³⁸ Linschoten, pp. 237-8.

³⁹ Pyrard, p. 11.

dishes of China porcelain or even silver. On admission the patient got a hair cut and wash, and was provided with bedclothes. There was even an out-patient facility: "He that wil not lie there, and hath any woundes or privie diseases, may come thether twice every day and be drest, and goe his way againe, without any question or deniall."⁴⁰

Why such a lavish establishment, apparently in advance of European equivalents at the same time? It seems that the context is important here. This grandeur had a symbolically reassuring function. The hospital catered mostly for Portuguese soldiers, single men isolated in a precarious frontier society. In Portugal they could expect to be cared for by their families, but not in India.

Regulation was close; thus the Indian Christian servants were very closely supervised by their Portuguese superiors. Similarly, each ward had its own officer in charge of food. This officer "keeps the key, and puts into writing the account of the contents, whereof he gives a memorandum to the principal writer, who keeps an inventory of everything, even of the sick, their names, and the days of their arrival and departure."⁴¹

Indeed, attempts to regulate the hospital, and many others aspects of Goan life, sometimes reached ridiculous levels. The general point, however, is that this shows the Portuguese state trying to impact, to govern, much more fully than had been done before. In 1595 the viceroy issued an extraordinary decree, designed to regulate many aspects of life in the

⁴⁰ Linschoten, p. 238.

⁴¹ Pyrard, II, 10. Pyrard, II, 2-17 provides the classic contemporary account of the Royal Hospital, while J.N. da Fonseca, *An Historical and Archeological Account of the City of Goa*, Bombay, 1878, pp. 228-36 gives a good overview and references to documentary sources. The location of the Hospital can be worked out from the plan of Old Goa in his book; see also *Mandelslo's Travels in Western India, A.D. 1638-9*, ed. M.S. Commissariat, Bombay, 1931, p. 70.

hospital.⁴² The viceroy considered that too many relatives and friends were visiting the hospital and bringing in food not approved by the physician or surgeon. Sometimes visitors came in to settle old scores with the patients, carrying hidden weapons. From now on the flow of visitors was to be controlled. No weapons were to be brought in, and even relatives were to be regulated, for it was unsuitable that the staff be hindered in tending their patients by having trouble with visitors. At silent times the door was to be kept firmly closed. Nor were visitors to bring in food unless they had permission, for while it often was fine food it was different from the diet approved by the hospital authorities. Hospital servants were also forbidden to buy food outside for patients. Similarly, letters were to be brought in only with permission, and no woman was to send in letters to a patient, except for the mother, wife or sister of the inmate, and even these letters were to be censored. This was because patients were not to be disturbed or alarmed by the contents of the letters they received, for this could make them even sicker. Finally, the porter was to check the various servants and hangers-on who came in with the officials of the hospital to make sure no unofficial people gained entry.

Yet it is crucial to note that while the organisation and financing of the hospital was innovative, and its clientele restricted along racial grounds, this was not the case with clinical matters. We find, to the contrary, an agreeable mixture of traditional European methods, especially copious bleeding, along with an admixture, typical in Goa at this time, of local remedies. This is best summed up in a comment from Tavernier in the 1640s: "I forgot to make a remark upon the frequent bleedings in reference to Europeans - namely, that in order to recover their colour and get themselves in perfect health, it is

⁴² This *provisão* of 25 May 1595 is printed in *Arquivo Português Oriental*, ed. J.H. da Cunha Rivara, III, 547-50.

prescribed for them to drink for twelve days three glasses of pissat de vache [cow's urine], one in the morning, one at midday, and one in the evening; but, as this drink cannot but be very disagreeable, the convalescent swallows as little of it as possible, however much he may desire to recover his health. This remedy has been learnt from the idolaters of the country, and whether the convalescent makes use of it or not, he is not allowed to leave the hospital till the twelve days have expired during which he is supposed to partake of this drink."⁴³

It is important not to try and make this hospital be “modern.” It was far from this. The generally accepted four stages of western medical practice are: *library*, where practice was based on Galen and other authorities, and the healer had little contact with the patient; *bedside*, where observations were carried out; *hospital*, in other words huge wards of people, this developing in the nineteenth century; and *laboratory*, where doctors essentially merely reveal the results of tests. What we find in Goa is a mixture of the first two of these typologies, or perhaps even of the first three. In terms of URK, the administration of the hospital, but not its practice, reveal some advances.

If, then, the Royal Hospital reflected all too faithfully the problems of contemporary medical practice (but not organisation) in both India and Europe, some of the resulting problems were alleviated by another state-supported institution, the Santa Casa da Misericórdia, or Holy House of Mercy. This organisation did excellent work for the poor and needy, providing them with food, cloths, drink and health care; to be sure, it was only Christians, indeed nearly always only Portuguese, who were served by this body. Membership of its Board of Governors was a very high honour,

⁴³ Jean-Baptiste Tavernier, *Travels in India of Jean-Baptiste Tavernier*, trans. V. Ball and W. Crooke, New Delhi, 1977, 2 vols, I, 160-1.

and the Goan élite often rotated between service on this body and on the Municipal Council.⁴⁴ The state also played a role, even if indirectly, in one other area of health care, for some pharmacies in Goa were in effect controlled by the state. The state also tried, unsuccessfully, to intervene in order to advantage European doctors over Hindu healers.⁴⁵ However, the most important systemic innovation was in the already discussed area of hospital care.

Our second case study moves away from the role of a state in medicine to show that there is good evidence by the middle of the seventeenth century that at least potentially European medicine, as represented in India by François Bernier, had moved beyond contemporary Indian practice, whether yunani or aryuvedic. As Clarence-Smith noted, Indian rulers soon tried to incorporate these European advances; clearly they became aware that traditional methods were no longer completely satisfactory. In short, they recognised that they had got behind in accumulating URK. We will discuss this matter presently.

Late in the early modern period there occurred a very wide complex of changes, indeed a true conjuncture, in the economy and society of Western Europe. These included not just technological advances, but also the intellectual and scientific developments which made possible the technology and so the Industrial Revolution. Among these were changes in medical theory and practice, and in the medical profession. David Arnold noted that his main concern "is not so much with disease and medicine as such as with their instrumentality - what they reveal about the nature and preoccupations,

⁴⁴ See my "Social Work in the Portuguese Empire," pp. 111-2 and works there cited, to which should be added Ivo Carneiro de Sousa, "As Misericórdias de Lisboa e Manila: Muito poder e algua caridade," in the same number of *Campus Social*, pp. 114-21

⁴⁵ See my "The Portuguese State and Medicine," pp. 416-19.

the ambitions and the methods of an encompassing imperialism."⁴⁶ Along similar lines, I am describing the beginnings of this process. As it happens, I can date fairly precisely when the new European medicine was first seen in India and some other parts of Asia.

I have discussed elsewhere the striking commonality in all of Eurasia in the early modern period concerning diseases and their cures.⁴⁷ I also noted earlier in this paper that the Portuguese in Goa had no particular advantage in this area, though I said that their hospitals were innovative.

Underlying European medical practice in say 1400 was the notion of the four humours or bodily fluids, which indeed remained influential in western medicine until the mid-nineteenth century. The basis of medical education at the time was humoral pathology. It can be heuristically useful to distinguish three foci in medical practice, namely care, cure and causation. In this early modern period one could argue that the emphasis was on care; studies of cure, let alone cause, at this time were still primitive, having as much to do with astrology and malignant forces as with science. Even so, an accumulation of empirical data did mean that healers at this time were comparatively much better at cures than at causes. This then seems to constitute URK, even if it did not reach what we today would consider to be scientific exactitude.

Diseases spread rapidly through Eurasia, and so did medical ideas. European medicine drew heavily on Islamic knowledge, but this in turn had been influenced by Hindu achievements as well as by Greek. India's earliest texts, the *Vedas* (c. 1500 BCE), show a very primitive medical knowledge, but by 600 BCE at least the *ayurvedic* system was established.

⁴⁶ David Arnold, "Introduction: Disease, Medicine and Empire," in Arnold, ed., *Imperial Health and Indigenous Societies*, p. 2.

⁴⁷ See my "Thin End of the Wedge," pp. 145-51.

This Hindu system thus pre-dated the classical Greek system associated with Hippocrates, who was born around 460 BCE, and Galen, who lived from 129 to 199 CE. In India, by the early centuries of the Christian era we find a fully evolved system. As in medieval Europe, the basic notion was of humours. Five elements were recognised in *ayurvedic* medicine: earth, water, fire, air and ether. Health was maintained through keeping an even balance between the three vital bodily fluids, wind, gall and mucus, to which some added a fourth, blood. A major problem was the Hindu taboo against contact with dead bodies. There was thus very little dissection, and obviously anatomy suffered as a result.

It is important to stress the way medical ideas circulated freely in the pre-modern world. In the case of India, some Hindu medical texts were influenced by Galen and Hippocrates. In the period of the Abbasid *khalifat* in Baghdad (750 CE onwards) Muslim scholars travelled to India to study medicine, and also recruited Hindu doctors to come back with them to Baghdad, where some of them became very influential physicians at court, and translated Sanskrit works on medicine, pharmacology and toxicology into Arabic. In effect some parts of the knowledge of the Greek masters were preserved in India, and copiously added to. Then the new synthesis was taken to the Muslim world and so returned to Europe.

The Arabs also found Greek medicine closer to home. As they conquered Persia in the seventh century they acquired Greek treatises. Arab doctors built on them, thus producing the *yunani* or *unani* (that is, "Greek") school of medicine, which later spread to India and was the system used by Indian Muslims.

As in the other two systems, notions of humours and elements were important. The Arab version was the same as the European one: the four humours of blood, phlegm and yellow and black bile were considered to

correspond with the four elements of earth, water, air and fire. Illness was a sign that the balance of these four was disturbed. It is often claimed that Muslims were not good surgeons, and indeed this was the received wisdom among the European commentators we will be quoting shortly. As dissection was abhorred, no advances in anatomy could be made, and so surgery was done blind. We should however remember that dissection had been considered to be antithetical not just to the Muslim tradition but also to the Jewish and Christian, though in fact some dissections had been undertaken in Christian Europe long before Vesalius. The common dislike of vivisection meant that in both Christian and Muslim areas surgeons, in terms of status, were far inferior to physicians. Great physicians like Ibn Sina disliked the very notion of surgery, and left it to surgeons and bone-setters. However, he and other scholars did deal with surgery in their books.⁴⁸

Several early modern Muslim rulers in India left valuable descriptions of disease. They reveal an often-impressive empirical interest in disease and even death, profound powers of observation, and at times an unsettling reliance on fate and magic. In certain specific areas it seems that surgery was relatively advanced at the Mughal court, though their general anatomical knowledge was inferior to Europe. Head wounds were routinely trepanned. The *Memoirs* of the first Mughal, Babur, contain some valuable empirical observations about wounds and healing. Equally valuable are the other great Mughal *Memoirs*, those of the emperor Jahangir, who reigned from 1605 to 1627. Again a curious mixture is seen, ranging from acute empirical observation to reliance on fate.

⁴⁸ See *The Encyclopedia of Islam*, 2nd ed., s.v. *djarrah* [surgery]

The beginnings of scientific medicine in Europe have been much studied. Beginning in the Renaissance, European medicine made fundamental advances, and began to transcend methods based on the Greek authorities and to escape the influence of the church. Paracelsus (1493-1541) was a key figure. He was an eccentric and controversial figure in the development of new medical knowledge in Europe. He made major advances in the field of chemical medicine and generally contributed substantially to the rise of modern medicine. It is fascinating to remember that in 1527 he burnt in public (shades of Luther!) the books of Ibn Sina and Galen, yet in fact his own work was solidly based on his profound knowledge of the ancients.⁴⁹

At first greater strides were made in anatomy and so surgery. In the sixteenth century the authority of Galen and Ibn Sina began to be questioned. The publication in 1543 of the first complete anatomy textbook, *De Humani Corporis Fabrica* by Andreas Vesalius (1514-64), marks a paradigmatic advance. While his work actually made few important changes in knowledge of human anatomy, his method was new for it was based on dissection and actual observation, and both he and Paré (1510-90) found Galen to be wrong in several important areas. The Greeks had thought that blood ebbed and flowed in the human body. In 1616 Harvey, basing his anatomy on Vesalius, gave his pioneering lectures on the circulation of the blood, and in the middle of this century a microscope was invented. A short way to see the change in medical theory in the

⁴⁹ For a good discussion see Walter Pagel, "Paracelsus: Traditionalism and Medieval Sources," in Lloyd G. Stevenson and Robert P. Multhauf, eds., *Medicine, Science and Culture*, Baltimore, 1968, pp. 51-75.

seventeenth century is to note a change "from a humoural to a chemical and/or mechanical view of the body."⁵⁰

The list could go on and on. Two points are important. First, these and other advances at the time and later mark the beginnings of scientific medicine, based essentially on empirical, testable and replicable observations, that is, essentially URK. Second, it is important not to see these changes as introducing modern medicine overnight. Quite the reverse; a major disease was mastered for the first time in human history only in the 1790s, when Edward Jenner produced his vaccination (much more effective than the widely practiced inoculation) against small pox. Harvey's ideas met with far from universal acceptance, so that Galen remained a prescribed text at the Cambridge medical school until the middle of the nineteenth century, and the notion of the four humours remained influential into the nineteenth century. Blood letting also continued. The great surgeon Paré was a ferocious bleeder. As late as the 1830s there was a bleeding craze in France, and some 20 million leeches a year were required to keep up with the demand. A connection between bodily cleanliness and good health began to be accepted only in the nineteenth century. In many areas there were fits and starts, and blind alleys. The first uses of anaesthetics in the middle of the nineteenth century actually increased mortality for a time.

⁵⁰ Andrew Wear, "Introduction," in Andrew Wear, ed., *Medicine in Society: Historical Essays*, CUP, 1992, p. 5. See also on these general changes other articles in this excellent collection, and two other compilations: Andrew Wear, Roger French and I.M. Lonie, eds., *The Medical Renaissance of the Sixteenth Century*, CUP, 1985, and Roger French and Andrew Wear, eds., *The Medical Revolution of the Seventeenth Century*, CUP, 1989. For the fifteenth century see a short useful study by Roger French: "Medicine in Western Europe during the fifteenth century," in Mario Gomes Marques and John Cule, eds., *The Great Maritime Discoveries and World Health*, Lisbon, 1991, pp. 39-54.

We can now turn to the comments of the French doctor François Bernier. He was born in September 1620 to a family of peasant-leaseholders in Anjou, received medical degrees from the University of Montpellier in 1652, and died in Paris in 1688. Bernier's remarks on the Mughal Empire, where he worked at court and also travelled widely between 1659 and 1667, are generally regarded as being thoroughly ethnocentric and biased. In particular, he was very critical of the system of land tenure and payment of the nobility which he found in the empire, and compared these unsympathetically with the prevailing practice in his native France. His version of "Asiatic Despotism," total penetration by an all-encompassing state into the lives of all its hapless subjects, unfortunately has been remarkably influential. But where he is most interesting is in the fact that he seems to be the first European doctor to represent in India the dramatic changes that were occurring in western European medicine in the sixteenth and seventeenth centuries. Unlike several other European doctors in India both before and after him, such as Manucci, who was merely a quack and knew little of the changes occurring in Europe, Bernier was well up with them.

To use accounts by Bernier, and indeed other European travellers, raises the important question of the underlying perceptions of these early European travellers. Michael Adas notes that these travellers considered themselves to be superior to Indians in most areas, including science and technology. However, until the eighteenth century this was little commented on or used as a standard to demonstrate this assumed superiority. Up to this time the key determinant and method of showing European advancement was religion.⁵¹ Nevertheless, Adas himself in his discussion

⁵¹ Adas, *Machines as the Measure of Men*, pp. 6, 21-22.

of Bernier and Fryer stresses how critical they were of Indian practice.⁵² It is unclear whether he sees them as being an exception to a usually silent observation of this matter by Europeans, or whether, as I would think correctly, he sees them as harbingers of a future intolerance and overt assumption of superiority. Certainly they had no doubts about European superiority, and were quite open in expressing this; in turn this casts doubt on David Arnold's claim that "before 1800, western medicine was far less domineering in its relationship with indigenous societies . . ." ⁵³

These scientific advances increasingly set off western medicine from all other systems. Comments from Bernier and Fryer, which we will come to in a minute, represent for the first time this change. However, we need to consider whether or not the seeds of this assumption of superiority were sown earlier, in the way in which early observers did find differences between European and Asian medicine, and diseases, even if they did not specifically find one better than the other. In other words, the difference was, as Adas notes, always there at least implicitly. Once a benign phenomenon, it later moved into the more threatening things that Arnold discusses so well, such as the notions that Indians were bodily different, and later in the nineteenth century not just different but also inferior. Similarly, while in the early nineteenth century Orientalist doctors saw parallels between the humoral pathology of ancient and modern India and recent European notions, later in this century it was considered that European medicine had advanced enormously, but the *ayurvedic* and *yunani* systems had stood still and thus were exemplars of an inert and timeless India.⁵⁴

⁵² Adas, pp. 55-6.

⁵³ Arnold, "Introduction," p. 11.

⁵⁴ David Arnold, "Occidental Therapeutics and Oriental Bodies: Bengal, 1800-1860," typescript of a paper read at a subaltern studies conference, Calcutta, December 1989.

It is my contention that Bernier in particular represents the first manifestation of an overt claim to European advancement. Several of Bernier's comments make clear how well read he was on the latest techniques in Europe. He often talked to his patron at the Mughal court of the recent discoveries of Harvey and Pecquet in anatomy, and we may note that Harvey died only in 1657, while Pecquet lived until 1674 and was more or less a contemporary of Bernier's. The former, as noted, had lectured on the circulation of the blood in 1616, while Pecquet contributed to the discovery of the lymphatic system. Bernier's attitude to Indian medicine was rather neutral,⁵⁵ but the following passage shows clearly how much more advanced he considered himself to be in anatomy and so surgery. "It is not surprising that the *Gentiles* understand nothing of anatomy. They never open the body either of man or beast, and those in our household always ran away, with amazement and horror, whenever I opened a living goat or sheep for the purpose of explaining to my *Agah* [patron] the circulation of the blood, and showing him the vessels, discovered by *Pecquet*, through which the chyle is conveyed to the right ventricle of the heart. Yet notwithstanding their profound ignorance of the subject, they affirm that the number of veins in the human body is five thousand, neither more nor less, just as if they had carefully reckoned them."⁵⁶

Similarly, Bernier represented advanced European medicine in that he considered copious bleeding to be old-fashioned, done as a result of the influence of Galen but not now considered to be very advisable. He noted that the *yunani* doctors at court "generally bleed once or twice, not in the trifling manner of the modern practitioners of Goa and Paris, but copiously,

⁵⁵ François Bernier, *Travels in the Mogul Empire, 1656-1668*, trans and ed. A. Constable and V. Smith, London, 1914, pp. 253-4, 338-9.

⁵⁶ Bernier, p. 339.

like the ancients, taking eighteen or twenty ounces of blood, sometimes even to fainting; thus frequently subduing the disease at the commencement, according to the advice of Galen, and as I have witnessed in several cases."⁵⁷ What Bernier is saying is that while he was convinced Europeans were much better on anatomy, this was not necessarily the case for medicine, where he took a pronounced agnostic attitude, making no claim as to whether or not "these [Indian] modes of treatment be judicious."

Bernier was not the only one to show that in the area of surgery a perception of a pronounced gap had appeared between India and Europe. Garcia d'Orta in Goa in the mid-sixteenth century was the first, but by no means the last, European doctor to be critical of Indians' anatomical knowledge: "As for anatomy, they do not know where the liver is, nor the spleen, nor anything else."⁵⁸ Dr. John Fryer, who was roughly on a par with his Indian peers in medical knowledge,⁵⁹ *did* in a modern way think too much bleeding was detrimental, and he noted how they knew nothing of veins: "They are unskill'd in Anatomy, even those of the Moors who follow the Arabian, thinking it unlawful to dissect Human Bodies; whereupon Phlebotomy is not understood, they being ignorant how the Veins lye; but they will worry themselves Martyrs to death by Leeches, clapping on an hundred at once, which they know not how to pull off, till they have filled

⁵⁷ Bernier, pp. 338-9.

⁵⁸ Clements Markham, *Colloquies on the Simples and Drugs of India by Garcia da Orta*, London, 1913, no. 36.

⁵⁹ See for example Fryer, I, 285-6, where he begins a long description of disease in Surat by saying "The Diseases reign according to the Seasons, the *North* blowing, Bodies are rendered firm, solid and active by exhausting the Serous Humours" In fairness however it must be noted that some diseases are seasonal in India. Cholera is most prevalent in the rainy season. Smallpox spreads better in dry weather, that is from February to May, which is also the time of much travelling for pilgrimage and weddings in India. See David Arnold, "Smallpox and colonial medicine in nineteenth-century India," in Arnold, ed., *Imperial Health and Indigenous Societies*, pp. 46-7.

themselves, and drop of their own accord. Chirugery is in as bad a plight, Amputation being an horrid thing."⁶⁰ Fryer in fact was conscious, in his ethnocentric way, that European practice was innovative, for he noted of Persian medicine that although "it be here in good Repute, yet its Sectators are too much wedded to Antiquity, not being at all addicted to find out its Improvement by new Enquiries; wherefore they stick to the Arabian Method as devoutly as to the Sacred Tripod . . . "⁶¹ Even the self-taught quack Manucci could claim that all the doctors at the Mughal court were Persians, but "Few of them know anything about, or can cure, the stone, paralysis, apoplexy, dropsy, anaemia, malignant fevers, or other difficult complaints. They follow the ancient books of medicine, which say a great deal but tell very little."⁶² In 1726 a French doctor wrote of the lack of anatomical knowledge, and the conservatism, of Indian doctors. "Les Medecins Gentils, que l'on appelle, Pandites, sont gens sans étude, sans science & sans aucune lumiere de l'anatomie, qui n'ont por toute connoissance, qu'un certain nombre de receptes que leurs peres leur ont laissé . . . "⁶³

As a consequence, by the mid seventeenth century European doctors were often in demand for surgery. These examples add to Clarence-Smith's observations quoted earlier. One French doctor "grew so famous in Persia, that the King himself profer'd him very considerable allowances, to engage

⁶⁰ Fryer, I, 287.

⁶¹ Fryer, III, 94.

⁶² Niccolao Manucci, *Storia do Mogor, or Mogul India*, Calcutta, 1966-67, 4 vols, II, 333. He notes on II, 90 that he simply took up doctoring because the demand was there: "little by little I began to turn myself into a physician . . . "

⁶³ Mr. DLF in Luillier-Lagaudiers, *Nouveau voyage aux grandes Indes, avec une introduction pour le commerce des Indes Orientales, et la description de plusieurs isles, villes, & rivières, l'histoire des plantes & des animaux qu'on y trouve; avec un traite des maladies particulieres aux pays orientaux, et dans la Route, et de leurs remedes* par Mr. D.L.F., Docteur en Medecine, qui a voyagé et sejourné dans les principales Villes des Indes Orientales, [pp. 199-236], Rotterdam, 1726, p. 213.

him to continue in that Court. Nay, he grew into such repute, after he had recover'd persons who had been given over by others, that the people began to look upon him as an extraordinary man, insomuch that they brought to him some that were lame and blind from the Birth, to recover their limbs and sight who never had had them." ⁶⁴ Fryer in Persia after describing local medicine pointed out that if a particular cure failed, "another Physician is consulted; for among such store they think it hard to miss of a Cure; and in that are so opinionated, that if their own Nation cannot give them Remedy, they think none other can. (Though as to Chyrurgery they are of another mind, thinking the Europeans better at Manual Operation than themselves.)"⁶⁵ In India the Abbé Carré in the 1670s several times commented on a local preference for European surgeons. When he himself was to be bled, one of his Indian servants was eager to do it, for "He himself (he said) had lived with a French surgeon, both at Surat and Rajapur, had witnessed many fine operations by him, and remembered what he had seen done." This servant even apparently thought he would be qualified to do an amputation, again because he had seen a French surgeon do one.⁶⁶ Later a Muslim officer approached him in Madras and "begged me first of all to send them a good French surgeon to look after one of their camp-marshals, who had been badly wounded by two musket-balls . . . " ⁶⁷ and soon after he noted how two "badly wounded Moor officers had withdrawn to the

⁶⁴ Adam Olearius, *The Voyages & travels of the ambassadors sent by Frederick duke of Holstein to the great Duke of Muscovy, and the King of Persia. Begun in the year MDCXXXIII and finish'd in MDCXXXIX*, trans. John Davies, London, 1662, p. 338.

⁶⁵ Fryer, III, 96.

⁶⁶ Abbé Carré, *The Travels of the Abbé Carré in India and the Near East, 1672-1674*, London, Hakluyt, 1947-48, 3 vols., pp. 284-5.

⁶⁷ Abbé Carré, p. 598.

suburbs of Madras, hoping to find English surgeons."⁶⁸ In the early eighteenth century we even hear of an Indo-Portuguese woman who was considered to be a skilled surgeon.⁶⁹ This prestige seems to mark a pronounced difference as compared with the situation in the previous century.

In the most general sense what Bernier and the others represent is the beginning of the process by which Europe achieved mastery over Asia. The accepted sequence, very crudely, is that for at least 250 years the Europeans did not represent an economically and technologically more advanced civilisation than the ones they saw in Asia. Only with the Industrial Revolution late in the eighteenth century did a disparity in terms of power appear between Asia and Western Europe. But the Industrial Revolution was built on, among other things, fundamental scientific advances in Europe, encouraged by the various learned societies that sprang up in several countries in the seventeenth century. Thus the seeds of later European advance and subsequent dominance must be found in scientific and other achievements, not least in the medical sphere, from at least two centuries before the culmination of the Industrial Revolution. This then is what Bernier represents; the first example in India of the medical aspect of this paradigmatic change in Europe. So also with state involvement in hospitals, where in this case it was the Portuguese who represented a Europe which was moving towards a system which demonstrated advances in URK.

⁶⁸ Abbé Carré, p. 624. Not, however, that all Europeans were particularly expert. See *ibid.*, pp. 369-70 for the story of a French quack, who did at least examine an ill Portuguese "by all the laws of Hippocrates and Galen . . ."

⁶⁹ Jadunath Sarkar, *Studies in Aurangzib's Reign*, 3rd ed., London, 1989, p. 56.