

Portuguese and Indian Medical Systems

Commonality and Superiority in the Early Modern Period

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An analysis of relations between Indian and Portuguese medical knowledge and practice in the early modern period reveals an interesting dichotomy. In some areas we find commonality and mutual exchange, in others it is clear that European knowledge and practice shows at least the beginnings of superiority. These limited areas of European advantage slowly increased in the 19th century, leading to the triumph of western medicine over indigenous Asian practice and knowledge. I will first sketch medical practice in Eurasia before the 16th century, then turn to a more focussed study of the health situation in India at this time, and then narrow the focus even more, to Goa and the diseases and healing practiced there. The second section of this essay looks at the first signs of European advantage as compared with Indian systems.

Neither Europe nor the Muslim world nor India had any particular medical advantage at this time. There was a considerable degree of interaction between the traditional systems of these three areas. Yet there was also a recognition that some illnesses were geographically specific; some Indian illnesses, for example, were seen by foreigners as “different.”

What were the main threats to health? The plague, smallpox and syphilis were three of the most threatening

diseases in Europe. Cholera was much less of a problem, for the European version was much milder than the Asiatic *cholera morbus*. We can distinguish with some confidence pulmonary plague, which was first seen in Europe in the great pandemic of 1348, the Black Death. Pulmonary plague retreated in Europe in the early 18th century, the last major occurrence ravaging Marseilles in 1720. Bubonic plague, with the characteristic symptom of buboes, was older. It was recognized that the plague was infectious. Counter measures included quarantine and isolation. As early as the 14th century, Italian cities had introduced quarantine to keep out shipborne bubonic plague from the Middle East. Once the disease appeared, affected areas were cordoned off; in the 16th century national policies evolved to achieve this. The rich, of course, could afford to flee, and did so at the first sign of an outbreak. The poor stayed behind and died.¹

As spectacular in its own way as the Black Death was the very rapid spread of what was apparently a new form of venereal disease, that is syphilis, from America, which even in the late 1490s was epidemic in areas that had contact with men returning from America. It spread all over Europe with remarkable rapidity, and possibly also to Asia, for as early as 1505 the Italian Varthema in Calicut claimed that the ruler had “the French disease [*Frangi*] and had it in the throat.”² Less dramatic maladies were endemic. Various fevers, smallpox, intestinal disorders, and skin diseases were very widespread indeed, and were more effective because of poor diet, often deficient in some vitamins.

Turning to Portugal in the period of the discoveries, that is, in the 15th and 16th centuries,

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all of these diseases were found there in abundance. There were several major plague epidemics in the 16th century. In the major one, in 1569-1570, mortality in Lisbon in June 1569 was 50 to 60 a day, in July 300 to 400, and later up to 700. In this city of about 100,000 souls some 50,000 died in this epidemic.

Medical knowledge in Portugal, as in the rest of Europe, was incapable of dealing with these diseases. As a result of the Muslim period of dominance in Portugal, which ended only in the late 13th century, Muslim authorities were widely used. Of the five books that in theory a druggist had to know before he could practice, four were of Muslim origin.³ More generally, in Portugal and indeed all of Europe medicine was a blend of Latin, Arabic, Greek and Hebrew knowledge. In Portugal the most widely quoted authors were Galen, Hippocrates, Isaac and Ibn Sina (Avicenna). But these relatively scientific authorities blended easily into folk medicine and belief in witches, astrology and sorcery. One cure for diarrhea was to rub the abdomen with egg whites, or with well-sifted goat dung, or a mixture of the two. In the 13th century Pedro Hispano, a very famous doctor and later to be Pope John XXI, said that a good cure-all was a little bag containing the eyes of a magpie, crab or wolf, worn around the neck. Badger powders were a very popular remedy.

“One began by inebriating a badger on a wine filtered through camphor and blended with a compound of gold, seed pearls, and coral. The animal then was decapitated, all of his blood drained, and his heart and liver removed. The mixture of the blood with the powders should be effected under a ‘slow sun’ or in the ‘heat of a fire’ ... Two ounces of paté resulting from pulverizing the heart, liver and even the skin and teeth of the badger completed the mixture. This compound, dissolved in wine or in water seasoned with vinegar, was given to the patient.”⁴

Underlying European medical practice was the notion of the four humours or bodily fluids, which indeed remained influential in western medicine until the mid-19th century. The basis of medical education at the time was humoral pathology. Disease was a result of an imbalance or impurity of one of the four cardinal humours: blood, phlegm, choler (red or yellow bile) and melancholy (black bile)—these in turn being analogous to the four elementary substances of earth, water, air and fire. In a healthy person the four humours were in

equilibrium. The relative balance of the four was tested by means of urine samples, which were very widely used in diagnosis. Any perceived imbalance was cured by enemas, purging, the use of stimulants, tonics and drugs compounded from medicinal herbs and plants, and especially by bleeding, which was something of a universal specific and was done not only to cure illness but also as a preventative, being done routinely perhaps every two months or so. Renaissance doctors thought that the body contained twenty-four litres of blood, and that twenty of these could be bled away without harm. The time to bleed was often determined by astrology. As we shall see, although the notion of humours was basic in Asian medical systems also, bleeding was done much more rarely in Islamic systems, and never in Hindu ones.

European medicine drew heavily on Islamic knowledge, and this points to the well-known phenomenon of a considerable exchange of medical information between Europe and Asia in pre-modern times. Europe’s main contact was of course with Muslim medicine, 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. 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. The basic texts are by Caraka (first and second centuries CE, or possibly much earlier) and Susruta (around the 4th century CE), both of which in fact merely codified existing knowledge dating back some centuries. Caraka’s work consisted of a massive eight books. Not that this was a system as static as was the European one. For example, at first Indian doctors used only drugs, mostly vegetable products, but from around the seventh century metals were used too, especially mercury but also compounds of iron and other minerals. By the 13th century the pulse was being examined, and in the 16th century an important *ayurvedic* doctor in Varanasi, Bhavamisra, identified the new form of syphilis that had been introduced by the Portuguese. Significantly, he called it “the Frank [European] disease,” and said it was usually caused by intercourse with Frank women.⁵

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As in medieval Europe, the basic notion was of humours. Five elements were recognized 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. Bodily functions were maintained by five winds. Food digested by one of these, the stomach, became *chyle*, which proceeded to the heart and thence to the liver, and so to blood, which in turn was converted to flesh. There was no clear idea of the brain because, like Homer, these Hindu doctors believed that the centre of consciousness, thought and feeling was the heart. Nevertheless, the importance of the spinal cord was recognized, and cleanliness was acknowledged to be medically valuable. There was copious use of drugs. 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. The 16th-century Portuguese botanist and doctor Garcia da Orta, whose work we will consider in detail later, noted this, claiming that the Indians did not even know where the liver or spleen were. Yet despite this some writers claim that Hindu India did have good empirical surgery in certain specific areas. Caesarian sections were performed, and bone-setting, and even plastic surgery.

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. These Indian texts in turn effected such great Muslim writers as Ibn Sina, and of course his works, in Latin translation, were standard authorities for centuries in medieval and early modern Europe. 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.

But the Arabs also found Greek medicine closer to home. As they conquered Persia in the seventh century they acquired Greek treatises, especially those of Galen and Hippocrates. Arab doctors built on them,

thus producing the *yunani* or *unani* (Greek) school of medicine that later spread to India and was the system used by Indian Muslims. Rhazes (Al Rhazi, b. 865) in the ninth and tenth centuries wrote on smallpox, measles and other diseases and challenged the authority of Galen long before this was done in Europe. His main work was a vast compilation of Greek, Arabic and Indian knowledge. A century later Avicenna (Ibn Sina, b. 980) wrote his huge *Canon of Medicine* (*Al-Qanun*), the most influential text ever written in either Asia and Europe. The mixture in Persia was briefly noted by a traveller in 1637, who said: "In Physick, or Medicine, they follow the Maxims of Avicenna and their Physicians are all Galenists."⁶

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. In 1637 in Persia a European visitor saw a man who had become gravely ill from drinking too much brandy and as he "lay a Dying, I saw a Moor-Physician, who had the sick party in hand, order a great piece of Ice to be laid on his Stomack, maintaining his procedure by this general Maxim, that a Disease is to be Cur'd by what is contrary thereto."⁷ But the Arabs were not skilled in gynaecology, because of the basic social notion of female modesty. From the *Memoirs* of the adventurer Niccolao Manucci it seems that diagnosis of Muslim women in India had to be done by touch rather than sight, or that only the affected part of the female body, say the arm, would be exposed for observation. As a variant, Sarkar says that a wife of Prince Muhammad Azam Shah died in 1705 of an abscess on the breast. It had been suggested to her that she be examined by a skilled Indo-Portuguese woman, but the Begam refused to be examined by a woman who drank wine, for her touch would be defiling.⁸ Nor were they good surgeons, as dissection was abhorred, as indeed it was in Europe until about the 14th century and in Hindu society till much later.

Working out precise flows of knowledge is thus a difficult task. *Ayurvedic* medicine in India today is very little different from Susruta except for the use of some new drugs like mercury, opium and sarsaparilla, which came to India perhaps a millenium ago with the Arabs. These newcomers to India introduced

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what became the still-influential Perso-Islamic *yunani* school of Indian medicine. Heuristically it and the Hindu *ayurvedic* system are considered to be distinct, even though there is a very substantial degree of interaction between the two. The earliest Indian book on the *yunani* tradition was written in the early 14th century and drew on Muslim authorities such as Ibn Sina and also on Hindu practitioners. Hindu knowledge continued to contribute importantly to the *yunani* system, and vice versa. But one notable divergence was over the use of bleeding, which was used occasionally in the *yunani* system, but not in the *ayurvedic*.⁹ And generally the *yunani* doctors, like the Europeans later, thought that at least some “Indian” diseases were best treated by “Indian” methods. As one practitioner wrote around 1500, “By experience I found that Unani medicine did not suit the temperament of the people living in the changed climatic conditions of India.”¹⁰ To sum up, at around 1500 neither western Europe, nor the Muslim world, nor India had any particular advantage in medical knowledge or practice. In many respects it would be accurate to write of a commonality of knowledge and a free flow of remedies and practices within all three of these regions. We can now focus on disease and medicine in early modern India.

In the 16th and 17th centuries, and indeed both before and after this, the plague was the great killer in northern India,¹¹ but in the south cholera seems to have been the greater threat. The second decade of the 17th century saw several calamitous outbreaks of the plague. As in Europe, it is clear that Indians knew the plague was infectious, and even that rodents had something to do with its spread. Several accounts mention the buboes which appeared, as the emperor Jahangir noted, “under the armpits, or in the groin, or below the throat.” He also described how a girl touched an infected mouse, and soon after the buboes of the plague appeared in her. She had a high fever, her colour changed to “yellow inclining to black,” and on her last day she vomited, had a motion, and died. The emperor, in a fuller account from Kashmir, noted of the plague that “The symptoms were that the first day there was headache and fever and much bleeding at the nose. On the second day the patient died. In the house where one person died all the inmates were carried off. Whoever went near the sick person or a dead body was affected in the same way. In one instance the dead body was

thrown on the grass, and it chanced that a cow came and ate some of the grass. It died, and some dogs that had eaten its flesh also all died.”¹² In another outbreak most of those affected died within twelve hours. The symptoms were a very high temperature, and as the patient was dying “broad spots of a black and blue colour appeared on their breasts.”

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 the 14th century Muhammad ibn Tughluq was considered to be skilled in medicine. He used to attend patients with unusual diseases in order to see their symptoms. A century later Sikandar Lodi patronized the collection of medical knowledge from India and Khorasan; the result was a book called *Tibbi-Sikandari*. The *Memoirs* of the Emperor Babur, founder of the Mughal dynasty, cover the first two decades or so of the 16th century and are full of curious medical information. Most of the memoirs relate to his time in what is now Afghanistan, which is a predominantly Muslim area. Dried Bukhara plums were said to be an excellent laxative. In 1505 his mother had a fever. Very significantly, for a Hindu doctor would not have done this, blood was let. This had no effect, so they tried Khurasan practice, and gave her watermelon; she died anyway. Later Babur himself had a fever, and was bled. After ten or twelve days his doctor gave him “narcissus mixed with wine; I drank it once or twice; even that did no good.” A good purgative was rose water, in English julep. As for antidotes for poison, the water in which the fibre of a lime had been boiled was considered to be efficacious, as was milk in which had been dissolved stamped clay [*terra sigillata*?] and the best theriac, this being a well-known antidote to poison. On one occasion he “elected to take opium because of ear-ache; another reason was the shining of the moon [which was considered to be harmful and cold].” In India he got painful boils. An Ottoman Turk, in an incident which points clearly to the transmission of medical knowledge, used a remedy which had been recently discovered in Turkey. He boiled pepper, and Babur held the sores in the steam, and then washed them with the hot water. It took two hours to do this treatment, but when he did it again a week later the water must have been too hot, for it blistered his body and hurt him.

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In certain specific areas it seems that surgery was relatively advanced at the Mughal court, though their general anatomical knowledge was inferior to Europe's. Head wounds were routinely trepanned. On one occasion a skilled surgeon was presented to Babur:

"If a man's brains had come out, he would cure it, and any sort of wound in an artery he easily healed. For some wounds his remedy was in form of a plaister, for some medicines had to be taken. He ordered a bandage tied on the wound in my leg and put no seton in; once he made me eat something like a fibrous root. He told me himself, 'A certain man had his leg broken in the slender part and the bone was shattered for the breadth of the hand. I cut the flesh open and took the bits of bone out. Where they had been, I put a remedy in powder-form. That remedy simply became bone where there had been bone before.'"¹³

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. During a plague outbreak, some learned men said it had come because there had been two years of drought, others because the air had been corrupted by drought and scarcity, and this despite the fact that the concept of infection seems to have been well understood, and even perhaps the role of rodents. Jahangir commented on this debate that "Wisdom is of Allah, and we must submit to Allah's decrees." His *Memoirs* are full of his trying new foods, and considering the effects of fever. There are many references to his doctors, some of whom rose to very high positions at court, and his taking or ignoring their advice. On one occasion he tells of a rabid dog that bit two elephants. Over a month after they were bitten, they died, one after having had water run out of its mouth for seven days. Once, Jahangir had a severe headache that went into a fever.

"At night I did not drink my usual number of cups [of alcohol, or a mixture of alcohol and opium], and after midnight crop-sickness [that is increased crapulousness] was added to my fever, and till morning I rolled about on my couch. On Wednesday, the 16th, at the end of the day, the fever diminished, and, after asking the advice of my doctors, I took my usual number of cups on the third night. Although they urged me to take some broth of pulse and rice, I could not make

up my mind to do so... When they brought food for me this day, I had no inclination for it. In short, for three days and two nights I remained fasting."¹⁴

Perhaps most interesting of all is his dispassionate account of the death of the noble Inayat Khan, an account which in the way it looks coldly at the human body, and at the actual effects of illness, can be compared to Leonardo da Vinci's similar observations. Inayat Khan was addicted to opium and, when he could get it, to alcohol. As he got sicker he became a compulsive eater, and later became dropsical. Even his bones had dissolved, we are told, and he was so extraordinary a sight that Jahangir had his portrait painted on the day before he died.¹⁵

We can also get useful information on Indian diseases and medicine from the accounts of early European travellers in the area. Christopher Farewell wrote a vivid account of his bout with "a burning fever" near Surat in 1614:

"I here suddenly fell sicke of a burning fever and (thankes be to God) as sodainly recovered. For, fearing the extremity of that raving and uncomfortable sicknesse, against his will I prevayled with our chyrurgion to let me bleed till I fainted againe, as foreseeing it to be my remedy; applyed all comfortable things to my head; tooke my bed; and, full of perplexity to dye sencelesse, I commended myselfe to God. After some idle talke to my friends about me, I fell into a slumber; but quickly wakened by a desire to ease my stomacke, and had at least a dozen vomits naturally, which gave mee a most comfortable night."¹⁶

An English chaplain in the second decade of the 17th century noted that "The common diseases of the country are bloudie fluxes, hot fevers and calentures [calentures, that is tropical delirium]; in all which they prescribe fasting as a principall remedie. That filthy disease, the consequence of incontinenzie, is common among them. The people in generall live about our ages; but they have more old men."¹⁷ Another visitor who lived in western India in the 1670s, Dr. John Fryer, noted that Indians drank very little: "Notwithstanding this Mortality to the English, the Country People and naturalised Portugals live to a good Old Age, supposed to be the Reward of their Temperance; indulging themselves neither in Strong

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Drinks, nor devouring Flesh as we do.”¹⁸ The same doctor who, as we will see, represented the new in that he was generally contemptuous of Asian surgery, this being a new attitude from Europeans, showed himself an exemplar of the old in his paean of praise to the mangoes of Goa (not that they are not delicious). They even had medicinal properties: “they make them break out, and cleanse the Blood, and Salivate to the height of Mercurial Arcanaes; and afterwards fatten as much as Antimony, or Acorns do Hogs.”¹⁹

The comments of François Bernier, a French doctor who was in India from 1659 to 1667, are very detailed. On the general matters of disease and medicine he apparently saw little qualitative difference between what he knew and what he saw done in India. Like Fryer later, he noted that Indians drink very little:

“I have no doubt that the happy ignorance which prevails of many distempers is fairly ascribable to the general habits of sobriety among the people, and to the profuse perspiration to which they are perpetually subject. The gout, the stone, complaints in the kidneys, catarrhs and quartan agues [recurrent malaria] are nearly unknown; and persons who arrive in the country afflicted with any of these disorders, as was the case with me, soon experience a complete cure. Even the venereal disease, common as it is in Hindoustan, is not of so virulent a character, or attended with such injurious consequences, as in other parts of the world. But although there is a greater enjoyment of health, yet there is less vigour among the people than in our colder climates; and the feebleness and languor both of body and mind, consequent upon excessive heat, may be considered a species of unremitting malady, which attacks all persons indiscriminately, and among the rest Europeans not yet inured to the heat.”²⁰

Later he wrote more generally on Indian healing techniques:

“On physic they have a great number of small books, which are rather collections of recipes than regular treatises. The most ancient and most esteemed is written in verse. I shall observe, by the way, that their practice differs essentially from ours, and that it is grounded on the following acknowledged principles: a patient with a fever requires no great nourishment; the sovereign

remedy for sickness is abstinence; nothing is worse for a sick body than meat broth, for it soon corrupts in the stomach of one afflicted with fever; a patient should be bled only on extraordinary occasions, and where the necessity is most obvious—as when there is reason to apprehend a brain fever, or when an inflammation of the chest, liver, or kidneys, has taken place.

Whether these modes of treatment be judicious, I leave to our learned physicians to decide; I shall only remark that they are successful in Hindoustan, and that the Mogul and Mahometan physicians, who follow the rules of Avicenna and Averroes, adopt them no less than do those of the Gentiles, especially in regard to abstinence from meat broth. The Moguls, it is true, are rather more given to the practice of bleeding than the Gentiles; for where they apprehend the inflammations just mentioned, they generally bleed once or twice, not in the trifling manner of the modern practitioners of Goa and Paris, but copiously, 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.”²¹

Bernier was writing as an expert commenting on his peers, in other words in his case the *yunani* practitioners, often Persians, who ministered at court, where he lived. But as in Europe, folk remedies and supernatural notions coexisted more or less easily in India with this relatively academic medical knowledge. Several European visitors reflected the state of folk medical knowledge in Europe when they commented on popular practice in India. Cholera was probably the most feared disease, especially on the west coast and in the south. The British in India thought it was caused by eating fish and meat together. They treated it by applying a hot iron to the ball of the patient's foot. If the patient winced, he would soon recover, but if no pain was felt the patient would soon die. Ovington, an educated man and a clergyman, noted that cholera [mordechine] is “violent Vomiting and Looseness, and which is caus'd most frequently by an Excess of Eating particularly of Fish and Flesh together. It has been Cur'd by a Red-hot Iron clapt to the Heal of him that is sick, so close that it renders him uneasie by its

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nearness, whereby it leaves a Scar behind it.”²² For fevers in general the remedy was to

“Take an iron ring about an inch and a half in diameter and thick in proportion. Then heating it red hot in the fire, extend the patient on his back, and apply the ring to his navel, in such a manner that the navel may be as a centre to the ring. As soon as the patient feels the heat take away the ring as quick as possible when a sudden revolution will be wrought in his intestines.”²³

A 17th-century Venetian quack, Niccolao Manucci, showed in some of his stories how little difference there was between his knowledge and folk medicine. In Bassein, he tells us, there was a woman of good station who produced a girl after a pregnancy of three years. The girl married at twelve years and also had a pregnancy of three years. As to rabies, a newly married man on his wedding night cut his bride to pieces, gnawing her breasts, plucking out her eyes, and biting her face and body. The reason was that he had been bitten by a mad dog three months before. The remedy for rabies was to cauterize the wound at once. Alternatively, if the bitten person went on a sea voyage he would recover immediately.²⁴

Similarly, accounts of Muslim Indian popular medical practice from the 18th and 19th centuries point to some very primitive ideas. There was still little notion of anatomy, and treatment, basically using herbal cures, was guided by the day and hour when the fever had started. An account of how to cure a fever says

“How to write a charm to cure fevers: Take some olive leaves and on a Saturday, being yourself in a state of purity, write on one of the leaves, ‘Hell is hungry,’ on another, ‘Hell is refreshed,’ and on the third, ‘Hell is thirsty.’ Put these in a rag and bind them on the left arm of the patient. Make two intersecting triangles on a sheet of paper with one continuous motion of the hand, sew this up in a sheet of cloth and tie it round the patient’s neck. When the fever has left, throw the cloth into a well or river.”²⁵

At least two European travellers in the 17th century noted a pronounced shortage of local doctors in India, the reason presumably being that most villagers relied on non-professional healers, or merely dosed themselves with local drugs and simples. Tavernier, commenting in a very valuable passage on health care in a very extensive area of India, said:

“It should be remarked that in all the countries we have just passed through, both in the Kingdom of Carnatic and the Kingdoms of Golkonda and Bijapur, there are hardly any physicians except those in the service of the Kings and Princes. As for the commonalty, when the rains have fallen and it is the season for collecting plants, mothers of families may be seen going in the mornings from the towns and villages to collect the simples which they know to be specifics for domestic diseases. It is true that in good towns there are generally one or two men who have some knowledge of medicine, who seat themselves each morning in the market-place or at a corner of the street and administer remedies, either potions or plasters, to those who come to ask for them. They first feel the pulse, and when giving the medicine, for which they take only the value of two farthings, they mumble some words between their teeth.”²⁶

A little later the Abbé Carré was sick, but a Persian noble told him, “As to providing someone who can give you remedies and treat your illness, you are aware that there is no doctor or surgeon amongst us; we hardly know what such a man is, and Europeans are only consulted when one of them happens to be passing in this country.”²⁷

This discussion of disease and curing in early modern India shows no particular advantage in knowledge or skill on the part of the newly-arrived Europeans. Rather it seems that, despite specific differences with regard to particular diseases, overall the situation was one of equality. We can now turn to the situation in the first large European settlement in India, the port city of Goa, which was conquered by Afonso de Albuquerque for the Portuguese king in 1510, and was their main town and capital during the 16th century and later. I will first sketch what we know of indigenous medical practice in Goa in the 16th century, and then deal with the interaction between the Portuguese and local systems.

We know very little about health care in Goa before the Portuguese conquest. Figueiredo claims that long before the Portuguese all branches of knowledge, including medicine, were taught in institutions of higher learning, and in settlements of brahmins. These attracted students from far and wide.²⁸ His information is so fragmentary as to be of little use, for we cannot

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distinguish between medicine and other scholarly disciplines. We can assume that healers in Goa were often brahmins, and their more book-based practice was supplemented by locally proven recipes and nostrums dispensed by village women healers. We have almost no evidence of hospitals, or of state involvement in health care, before the coming of the Portuguese. All we have is one reference (from the 11th century) to a house of mercy, which provided relief for the poor, sick, and pilgrims, established by a chief minister of a local king in Goa Velha.²⁹

This being the case, we must rely on Portuguese sources to sketch the indigenous situation in 16th-century Goa. This is not to say that Portuguese sources can be used as “objective” and “neutral” accounts. There is first the obvious and generally acknowledged difficulty of using the records of a colonial power to describe the society which it dominated. In particular, Norman Owen has reminded us of the difficulties of historical accounts of illness. All of these are of course transmitted through culture, in our case Portuguese. Also, diseases themselves are mutable, so that the sources might be describing a syndrome which no longer exists, such as the mysterious English sweating sickness which came and went in the 16th century.³⁰ Further, each account is based on assumptions about what illness meant, something very different in 16th-century Goa as compared with today. Finally, some diseases are more dramatic (cholera especially) than others. Owen distinguishes between crisis mortality and background mortality. The former, the dramatic and much-described causes of mortality, include cholera, smallpox, influenza and various “fevers,” such as malaria and typhoid. However, maybe three-quarters of deaths were in fact caused by the less glamorous background category of ailments, such as tuberculosis, dysentery and infantile diarrhoea.³¹

There is another whole category of mine-fields in the area of medical history in general. It is too easy to be overly influenced by what we think are modern medical methods, and to test the past in accordance with what we, social historians with only a spotty expertise in medicine anyway, think is “correct” and “scientific” practice today. Andrew Wear claims that in his recent edited collection of studies “the 19th- and 20th-century values of the medical profession which in past history of medicine had been applied to earlier periods to condemn empirics, quacks, magical and religious

practitioners have been discarded. In the process a much richer medical world has been uncovered.”³²

All this said, it is still my contention that several Portuguese accounts of Hindu medicine in western India in the 16th century have considerable value. However, the use of the word “Hindu” is not quite appropriate, for in fact we are dealing with sources which implicitly are describing not a unity but rather health care which varied in two ways. First, our sources often differentiate between different regions, so that we have Hindu healers in Malabar dealing quite differently with disease as compared with Canarins from the area around Goa, as compared again with Gujarati practice. Second, we are sometimes informed of “brahmin” practice, and this presumably refers to more book-based healing methods, the “Great Tradition” of Hindu medicine if one likes, as compared with a host of locally-derived techniques and drugs which could be considered to be regionally-specific folk traditions.

The prevalent diseases in Goa make up a quite familiar list. Late in the 16th century a Dutch resident, Linschoten, said the main ones were *mordexijn*, in other words cholera, the bloody flux, or dysentery, and fevers, especially malarial ones. Syphilis (meaning not the American-derived virulent strain, but rather the local version), which was treated with China root, was very common. Some people had it three or four times, apparently without being much concerned.³³ Pyrard de Laval, a visitor in the early 17th century, said burning fevers, presumably enteric fevers (typhoid), and dysentery were common, and venereal disease. The pox was widely suffered; it was found, he claimed, only “where the Portuguese are.”³⁴ But it seems that in fact a milder venereal disease was widespread in India; we can assume that he is referring to the new more virulent strain that, as we noted above, was probably introduced from America. Dr. John Fryer found this in Persia in the 1670s. He claimed only one in ten did not have this mild Asian venereal disease, but contrasted this with the horrors of the European version, known, significantly, in Persia as Frank (European) disease. In a confused passage he wrote “when it breaks out into Sores and Ulcers, after it has seized the whole Mass of Blood, and eats them up alive; while they wear theirs dormant almost to extreme Old Age, which makes them not much solicitous for Remedy, nor are there any who profess its Cure.”³⁵

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Cholera was a major killer in Goa. There were outbreaks in the town in 1543, 1563, 1570, 1580, 1588, 1610, 1635, 1639, 1670 and 1680. The first one was the worst; we are told that of those struck by it, only one in ten survived.³⁶ The Italian merchant Sassetti described it in Cochin in the 1580s: "There is current here a certain disease which kills a person in just 24 hours and which is called *mordaxi*, which is a revulsion of the stomach and of the entire body which rejects itself; all the humours quit the body and the blood too, so that one dies; and it comes from eating much sweet fruit, much pork, many preserves, and from drinking much water; whence the poor stomachs, when they have suffered much, throw themselves on the ground. It is the accident which makes it known, that suddenly the patients lose the sense of touch in their external parts, so that they feel nothing if they are struck blows or pierced with a needle."³⁷

Our two main sources for Hindu medical practice are works by Garcia da Orta and Cristóvão da Costa. These books consist of lists of simples and drugs and medicinal plants found in western India, but they both also include data much more relevant to our concerns, for they also describe how these *materia medica* were used in treatment, both by themselves, that is by the Portuguese, and also by *yunani* and *ayurvedic* practitioners.

Some background on Orta and Costa will help us to evaluate the usefulness of their information. The New Christian (that is, converted Jew) Garcia da Orta (1501-1568) is generally considered to be the greatest scholar of 16th-century Portuguese Goa. Orta was the first major naturalist to study the main medicinal plants and other therapeutic substances used in coastal Asia, and also was a doctor and historian of medicine, a pharmacist and a wide-ranging savant interested also in history and anthropology. His famous work *Colloquies on the simples and drugs of India* was the second book, and one of the very few secular books, to be printed in Goa in the 16th and 17th centuries. The rare (only twenty-four copies are known) first edition is dated 1563.³⁸

It is divided into fifty-seven chapters, each of them in the form of a dialogue or colloquy. This literary conceit means that the usual pattern is that in each colloquy Orta's interlocutor, Dr. Ruano, asked him a question, such as, "Do Hindu doctors use Portuguese methods?" Orta then provided the answer. Other

characters also appear from time to time, such as a servant girl, and a Hindu doctor, who is introduced for the sole purpose of singing the praises of Orta. Each colloquy dealt with one drug or simple. In each case he described the drug, said where it grew, and commented on its therapeutic use. Most of them were vegetable, but he also dealt with ivory and diamonds. It is an excellent, comprehensive and accurate empirical study of Indian *materia medica* and botany in general, not just medicine, although he was a famous doctor in 16th-century Goa, serving as the physician of the Royal Hospital at the time of St. Francis Xavier's stay in Goa in the early 1540s and ministering to the Portuguese elite of the town.

Even in terms of European practice of the time, Orta's medical knowledge was not advanced. This can be seen in his description of cholera. Goa was hit by a major cholera epidemic in 1543; all classes and ages were struck by it in the winter, the monsoon period, of this year. The Portuguese doctors could do nothing, and of every 100 who were affected, only ten survived. Twelve, fifteen, even twenty victims were buried each day. The governor, Martim Afonso de Sousa, even ordered an autopsy in a fruitless attempt to find the cause of the affliction.³⁹ Orta was the first European to describe cholera in India; in the *Colloquies* he mentions the Hindu and Arabic names for it, and compares what he saw in Goa with what he knew of Europe. He considered there was a toxic humour that had to be expelled. It was caused by overeating or by too much sexual intercourse. He noted that the local *vaidyas* (Hindu doctors) used rice with pepper and cardamom, cauterised the feet of the patient, tied up the patient's limbs and applied long pepper to the eyes.⁴⁰ As to fevers, Orta followed European practice and treated fevers with bleeding and purging and rich foods. Of opium he noted that its long-term use produced impotence, despite its popular use as an aphrodisiac. But he also claimed that the use of opium could help conception. This was because its use delayed ejaculation by the male by "slowing down his imagination." As women are slower in "the act of Venus," this meant "they both complete the act at one time." "The opium also opens the channels by which the genital seed comes from the brain, by reason of its coldness, so that they complete the act simultaneously."⁴¹

Clearly we must not make too much of Orta's medical expertise. He seems to have been thoroughly

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grounded in early modern European practice of the first half of the 16th century. The main influences on his medical thinking were the thoroughly predictable ones: Galen, Aristotle, Hippocrates and Ibn Sina. The basis was humoral pathology. His book goes into very elaborate detail to work out whether various simples and drugs were warm or cold or hot, moist or dry or wet. Concerning the plant *anacardo* (*Semecarpus anacardium*), he was asked, “In what degree do you place it—warm and dry?” to which he responded that some “place it in the fourth, warm and dry; others in the second part of the third; but neither of these satisfy me, for when green it is clearly not so warm and dry. It therefore does not appear reasonable to make it as warm and dry as some other spices, such as pepper, which is placed in the third degree.”⁴² Orta never went beyond the standard authorities of his time. He did correct and criticise these authorities on occasion, once for example writing “Let not any text of any author deny what my own eyes have observed ... Frighten me not with Dioscorides or Galen, for I do not say but the truth and what I know.” A similar empirical rigour is seen when his interlocutor, Dr. Ruano, quoted to him the opinion of some Italian friars. Orta replied: “I do not want Friars as reproachers except in the pulpit.”⁴³ However, he never questioned the fundamental paradigms governing pre-modern European medical practice.

A possible reason for this conservatism was the constraining fact that Orta was a New Christian, and indeed apparently a far from convinced convert. Born in 1501, he studied at the Spanish universities of Salamanca and Alcalá de Henares, where his medical training consisted of memorising Hippocrates, Galen and Ibn Sina. Subsequently, to escape the Spanish Inquisition, Orta taught at Lisbon from 1526 until he left for India. It seems very likely that his departure for Goa in 1534, as the personal physician of the later governor Martim Afonso de Sousa, was a result of increasing intolerance in Portugal. Two years after he left, the Inquisition was set up in Lisbon, and was in full swing four years later. As a New Christian he was forced to step carefully as this new age of intolerance began in Portugal. As a result, the massive compilation that was the *Colloquies* was generally ignored in Portugal, though it was widely used in other parts of Europe in the later 16th century and afterward, thanks to a pirated Latin partial translation that went through five editions, the

first one being published in 1567 in Antwerp.⁴⁴ Orta himself suffered posthumously from this intolerance. He died in 1568, but in 1580 he was condemned as a Jew by the Inquisition, and his remains were dug up and burnt at an *auto-de-fé*. A sister had actually been burnt by the Inquisition in Goa in the year after his death.

For us Orta's main value is his accounts of indigenous medical practice. He knew of *yunani* medicine from its local practitioners, or *hakims*, and had a cordial relationship with these people at the court of the Nizam Shahs in Ahmadnagar. Orta in fact claims that his cures were often more efficacious than those of the Muslims. The general point is that he was much more attuned to *yunani* methods than to *ayurvedic*, and this for the obvious reason that many of the authorities he quotes, such as Galen, Ibn Sina and al-Rhazi, are also prime texts for *yunani* medicine; indeed the second and third of these were of course Muslim healers. There was then a large degree of commonality between his European knowledge and that of the *yunani* practitioners. He had much more to learn from Hindu healers, for their system, while not totally discrete from his own, was more different than the *yunani* one. He usually appreciated the abilities of the local *vaidyas* with whom he had contact, considering their cures as often superior to those he knew. However, he had no inkling of the vast and ancient body of *ayurvedic* theory. Great names like Susruta and Caraka were unknown to him. All he knew of Hindu medicine was the actual practice of possibly not very well informed healers in Goa. He knew no Sanskrit; indeed Sassetti, for whom see below, was the only European in the 16th century to attempt to learn this language. He claimed that the Hindu doctors “are men who cure according to experience and custom,”⁴⁵ but in fact this merely shows that he was unaware of the very great *ayurvedic* scholarly tradition that was passed on through the generations by its followers.

Orta had a quite objective attitude to other medical systems. In a general passage that describes well his attitude to diverse medical knowledge, he noted how his patient, the king of Ahmadnagar, “Taught me the names of illnesses and medicines in Arabic, and I taught him the same in Latin, which pleased him very much.” The Hindu doctors often used Portuguese methods too, “But most of them not correctly. For they say there is bleeding, and they never bled before we were in the land; but they used cupping-glasses,

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sawing and leeches ... they were never accustomed to look at waters [i.e. do urinalysis]. I can tell you that they cure dysentery very well, can tell you whether there is fever or not from the pulse, and whether it is weak or strong, and what is the humour that offends, whether it is blood or heat or phlegm, or melancholy; and they give a good remedy for obstruction.” Sometimes they classify things incorrectly, he says, such as getting the heat or dryness of particular drugs wrong. It must be remembered here that Hindu medicine also depended on the notion of humours, albeit slightly different ones from those of the European and Muslim traditions, which are remarkably similar.⁴⁶ He considered that their knowledge of anatomy was very weak. However, Orta himself took many things from both *ayurvedic* and *yunani* healers. In general he would try European methods first, but if these failed he would then use “brahmin” ones.⁴⁷ Indeed he modestly claimed that he was the best informed healer in Goa, for in the *Colloquies* he has a Hindu doctor say, “Dr. Orta knows better than all of us; for we only know the Gentios [Hindus], but he knows Christians, Moors [Muslims], and Gentios better than us all.”⁴⁸

We know much less about our other authority, Cristóvão da Costa. He arrived in Goa in the year of Orta's death, and in 1569 was a doctor in the Royal Hospital in Cochin. His 1578 book is called in English *Treatises on Drugs and Medicines of the East Indies*.⁴⁹ In some ways his work is more useful for us than is Orta's. Costa has more on Hindu medicine, though less on Muslim, where Orta profited from his long association with the court of the Nizam Shahs. Costa, on the other hand, notes in a typical passage that he asked a brahmin doctor in Cochin about some local cures. This brahmin was a friend of Costa's, and very popular among both the local inhabitants of Cochin, and also the many Portuguese who lived there.⁵⁰ He says more about the healing properties of the drugs he describes, while Orta is more botanical. He also, unlike Orta most of the time, differentiates between different Hindu systems in different areas. Brahmin, Canarin and Malabar treatments are specified.⁵¹ However, Costa's general background was similar to Orta's. He also essentially relied on humoral pathology and the classical authorities. Thus canafistula (*Cassia fistula*) “in temperature is between hot and cold, and humid in the first degree” while tamarinds “are cold and dry in the second degree.”⁵²

Earlier scholars dismissed his work by claiming that he basically summarised Orta, though his book did have numerous illustrations. However, Donald Lach has shown that while he knew of and used Orta, the two books do differ widely. For example, Costa describes forty-seven plants, and of these fourteen are not mentioned by Orta, while nine of Orta's are not in Costa.⁵³ His modern editor, Jaime Walter, provides a good discussion of this matter. As noted above, he does include material based on his own experience, which differs from Orta's, especially as he travelled much more widely than did Orta. He supplements him in other ways, yet much of his work is indeed merely a copy, with additions or deletions, of Orta. For example, the discussion of opium we quoted above is reproduced by Costa, but the notion of opium delaying ejaculation and so fostering conception is left out.⁵⁴ Not that Costa tries to hide his sources. In his discussion on *turbito* (*Ipomoea turpethum*) he specifically says that he had not seen this plant, so he is relying on Orta, who had.⁵⁵ Of all the authors he quotes, Orta leads with 97 citations, followed by Ibn Sina with 55, Dioscorides with 45, Serapião with 41, and Galen with 38.

When we turn to their specific information about Hindu practice, we find most useful material on fevers, dysentery, and especially cholera. There is, however, much other curious and obscure information, which we may note briefly. One general matter that Costa noted was that Hindus—brahmins, vanias, all of them—never started the day without bathing the whole body. Muslims did this at least every three days, while Europeans notoriously would have been much more parsimonious in their ablutions. In 1569 the king of Cochin was ill, but he told Costa that even if it cost him his life, he still had to take his bath every morning.⁵⁶

The two authors generally find some differences and some similarities between European and Hindu practice. Thus for “fevers” (a very general category indeed, which could include malaria, typhoid, and even it seems cholera), Orta liked to feed people up, and combine this with bleeding and purging, but Indians starved their patients for ten or even fifteen days, and then fed them mango juice, and later whole mangoes. On the other hand, Gujarati healers “did not cure in any other way than to give nothing to eat.”⁵⁷ However, Albuquerque early in the century described quite different treatment in Malabar: “They have doctors,

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and they cure people like this. For those who are ill of a fever, they give them meat to eat, and fish, and they purge them,” and give them liquids.⁵⁸ Pires writing at almost the same time as Albuquerque said, “If they have fever they eat fish and keep washing themselves.... Our people when they have fevers eat fat chickens and drink wine and are cured.”⁵⁹

Costa noted the use of nutmeg by both Portuguese and Indians. He said that both “Indian” and “brahmin” doctors used it for all cold illnesses of the brain, and paralysis, and other nervous problems, and also for infirmities of the womb (*enfermidades da madre*).⁶⁰ We may here be getting towards folk medicine as compared with *ayurvedic*, though to say this assumes the superiority of the latter, and relegates the former to the margins, now abandoned, of medical practice. If, however, such a differentiation has any value, then the famous bezoar stone must belong on the folk end. This stone, widely described in the popular lore of many cultures, was considered to be formed by encrustations built up around a foreign body in the stomach of ruminant animals. Wild goats from Persia were especially fecund in producing these invaluable stones. They were believed to be an excellent antidote to poison, a purgative, a means of preserving one’s youth and virility, and also a cure for the plague, bladder complaints, and so on. The Jesuits jealously guarded the recipe for their cordial stone, a bezoar stone with an amazing list of other ingredients added. It was used for heart problems and was a good example of a mixture of Indian and European practice. Taken back to Portugal, these bezoar stones were widely used by the elite for their medicinal and amulet qualities.⁶¹

Aloes provide another example. Hindu healers used aloe as a purgative, and also for kidney diseases, colics, and for healing wounds. When mixed with myrrh it was called *mocebar*, and was used to cure horses and to kill maggots in human wounds.⁶² To cure wounds in general one Malabar method was to wash the wound in warm coconut oil twice a day for an hour or so.⁶³ Tabashir, or the bark milk from within the stems of bamboos, was used by Hindus to deal with over-heating, either external or internal, and also for fevers and dysentery.⁶⁴ Turpethin, the gummy part of a creeping plant, was used to reduce inflammation, and as a mixture along with other things to produce a purgative.⁶⁵ Another useful plant was *anacardo*, (*Semecarpus anacardium*). The juice of this “dry” fruit

was widely used in all of Malabar in place of caustic. It was applied to external ulcers and to rotten teeth, and was also used as a fixative when dying cloth.⁶⁶

Dysentery was a great killer, as Figueiredo says, “the dark shadow over Goa for two centuries.”⁶⁷ We have noted several nostrums to produce purging, and it seems that this was routinely done when dysentery was diagnosed. Apparently not all healers did the purging first, but regardless of this there were then several methods to cure patients and build them up. Some used a type of dog-bane, others a more complicated mixture. Neither Indians nor Portuguese gave any wine. Rather *kanji* (rice broth) was provided with chicken pieces soaked in it.⁶⁸ Costa said all doctors, brahmin, Canarin, and Malabari, used the skin or husk of nutmeg mixed with buttermilk (*leite azedo*) for all kinds of dysentery. This was given twice a day, in the morning and at night, and then the patient was given to eat some boiled rice without salt or butter (that is, *kanji*) and again chicken mixed in. If the attack was severe, opium was also given, though this was done more by Muslims than by Hindus.⁶⁹

Orta, however, differentiates between various Hindu practices on this matter. Portuguese method was different from Malabari, and it again from Malayalam. (I am not sure what this distinction is based on as Malayalam is, of course, the language of the Malabar region, now Kerala.) The Malabar treatment was much more rigorous than the Portuguese one, while the Malayalis mixed in opium with the nutmeg. On this matter Orta thought that the native methods had much to commend them as compared with Portuguese treatments.⁷⁰ Here again, however, there seem to be major differences in our sources, for two early 16th-century accounts both say that in Malabar dysentery was treated with fresh young coconut milk, which points to a much milder treatment.⁷¹ We can now leave our discussion of the general health situation in Goa and concentrate on the Portuguese.⁷²

Goa was generally considered to have a very high mortality rate. One estimate finds that no less than 25,000 Portuguese soldiers died in the Royal Hospital between 1604 and 1634; by repute 500 a year died from syphilis and “the effects of profligacy.” As a proverb had it, “Of the hundred who go to India [from Portugal], not even one returns.” Many in fact never even made it to India, such was the mortality on the voyage out from Lisbon. When the great ships from

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Portugal arrived each year in Goa, they brought on them many newcomers with bad ulcers, the result of scurvy.⁷³ Accounts of the state of health on board the great carracks arriving in Goa from Lisbon are harrowing in the extreme.⁷⁴ A contemporary list shows that in 1629-1634, a total of 5,228 people left Portugal for India, but only 2,495 completed the voyage—though to be sure some would have deserted, and two ships of the seventeen that left Portugal in this period were lost at sea. As one other indication of mortality, which reflects the mortality of the royal family at home, of fifty governors of Portuguese India up to 1656, twenty-two died during their term of office or on their way home.

Several travellers speculated on the reasons for Goa's unhealthiness. Manucci and others repeated the notion that India was healthy for men over the age of forty, but not for younger men. As Dr. John Fryer put it, "For to the Lustier and Fresher, and oftentimes the Temperatest, the Clime more unkind; but to Old Men and Women it seems to be more suitable."⁷⁵ Medical practice at the time also contributed to high mortality, a point we will return to shortly. One problem was Goa's porous soil, so that drainage sank into drinking wells, and thus fecal-borne disease spread. There seems also to have been an increase in the incidence of malaria due to stagnant waters lying around. Manucci left a vivid picture of illness and mortality in Goa. Unwholesome air in Goa was a problem. Also there was an island nearby which was a real graveyard.

"The reason is that it is full of courtesans, Mahomedan and heathen, who bear on them the unhappy poison by which they take the life of so many wretched men, after they have like leeches sucked from them every penny in their purse. It is, above all, the soldiers newly arrived from Portugal who succumb to this sad fate. Having exhausted both their bodily strength and their scantily-stored purses in the infamous dens allowed to exist there, misery and feebleness overtake them so completely that they are forced to enter the hospital. That is a place from which they hardly ever come forth alive, the number of men dying there being astonishing, every day five to twenty-five dead bodies being carried out, sometimes more, sometimes less, a fact that I have myself observed several times. By this means that island becomes the cemetery of all those newly

arrived from Europe, and I honestly believe that at the end of the year not an eighth part survives of those who landed."⁷⁶

Whatever the reason, the health situation in Goa was so poor, and declined so greatly during the 17th century, that in the 18th century the town was abandoned and the capital moved down river to the healthier city of Panaji.

While cholera was known to the Portuguese from European experience, and the virulent form of syphilis found in Goa was probably a Portuguese import, being the strain which had devastated large parts of Europe after its probable introduction from America in the 1490s, some other diseases, such as the various enteric fevers (typhoid), were unfamiliar to Portuguese doctors. The Italian merchant Sassetti noted in Malabar malaria, several sorts of apoplexy, and elephantiasis, or filaria. He also commented on different cures. Bleeding was very seldom used, nor were such standards of European pharmacopoeia as rhubarb and aloe.⁷⁷ Many other commentators also thought that Indian diseases were different, and should be treated by Indian methods. In the late 17th century an English doctor stressed the differences, and said gloomily, "We are here, as Exotick Plants brought home to us, not agreeable to the Soil."⁷⁸ However, most European visitors were more sanguine, and this in turn led to a very interesting eclectic mixture of Portuguese and Hindu medical systems.

That some Indian diseases were different and peculiar to the subcontinent was widely acknowledged, and not just by Europeans. We noted Muslim medical practice being modified in India; indeed one Muslim author considered that there were major problems in applying the Perso-Islamic *yunani* (Greek) system to Indians.⁷⁹ The eccentric alchemist and important early medical innovator Paracelsus stressed in a book published in 1537-1538 that Asian and African prescriptions did not work in Europe, and he also was not certain that his prescriptions would work outside Europe.⁸⁰ In the late 17th century a French visitor said that for local diseases European medicines were no use:

"For this reason the Physitians that go out of Portugal into these parts must at first keep company with the Indian Surgeons to be fit to Practice; otherwise, if they go about to cure these Distempers, so far different from ours after the

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European manner, they may chance to Kill more than they Cure.”⁸¹

The acceptance of this notion meant that for most of our period Indian medical practice was described, but usually without comment. Even though some of the “cures” prevalent in India at this time seem today to be bizarre in the extreme, Europeans apparently found them different but not qualitatively better or worse than what they knew. An accomplished apothecary, Tomé Pires, in his very valuable account of seaborne Asia in the early 16th century, noted the following about Malabar:

“When they are ill the patients do not eat meat; and have a diet of fish alone. The chief remedy is to play the kettle-drum and other instruments to the patients for two or three days—and they say this does good. If they have fever they eat fish and keep washing themselves; if they vomit they wash their heads with cold water and it is good, and it stops; and if they have catarrh they drink *lanha* water—*lanha* is the young coconut—and it stops at once; if they want to purge themselves they take the crushed leaves, or the juice or the seeds of the *figueira do inferno* [a plant similar to the castor-oil plant], and they are well purged, and they wash themselves; if they are badly wounded, they let warm coconut oil run over the wound twice a day for an hour or two, and they are cured. Our people, when they have fevers, eat fat chickens and drink wine and are cured. This happens to many, but those who go on a diet are used up.”⁸²

The related notions of a lack of qualitative difference and that Indian diseases were “different” meant that even governors and clerics used Hindu doctors because of their supposed better local knowledge. In 1548 an Indian brahmin doctor was practicing in the Jesuit College of St. Paul, and another *vaidya* was doctor to Governor Barreto in 1574.⁸³ Linschoten in the 1580s noted,

“There are in Goa many Heathen phisitions which observe their gravities with hats carried over them for the sunne, like the Portingales, which no other heathens doe, but [onely] Ambassadors, or some rich Marchants. These Heathen phisitions doe not onely cure there owne nations [and countriemen] but the Portingales also, for the Viceroy himselfe, the Archbishop,

and all the Monkes and Friers doe put more trust in them than in their own countrimen, whereby they get great [store of] money, and are much honoured and esteemed.”⁸⁴

As we will see later, Portuguese racism sometimes tried to limit the prestige of these Hindu doctors; in 1572 the governor decreed that Hindu teachers and doctors were not to go about on horseback or in palanquins, but the doctor who served the governor’s own household was exempt from this. The reverse of this sensible arrangement was that most governors brought their own doctors out with them from Lisbon as part of their vast retinues of relatives and hangers-on, all of them hoping to make a fortune in India during the three-year term of their patron. These newly arrived Portuguese doctors were nearly always rewarded by being made the chief doctor of the important Royal Hospital, but several contemporaries noted that this was a prime cause of mortality, for they knew nothing of Indian diseases, and just as they began to acculturate they returned to Portugal with their gubernatorial patron.⁸⁵ In 1610 the king ordered that this practice cease and that the doctors and surgeons who went out with the viceroys not be allowed to practice in the Royal Hospital, “because they have no experience of the region and its medical methods.” This order seems to have provoked a storm of complaints from Goa, and three years later it was lifted.⁸⁶

Despite this, what we find overwhelmingly in Goa is a mixture of European and Hindu practice. Goans seem to have had a quite *ad hoc* and experimental attitude to health, and tried different systems quite freely. An Augustinian friar with a very painful swelling in the testicles was cured by a poultice of stewed leaves applied by an old woman. A Hindu doctor was considered to know a perfect cure for scrofula, a swelling of the glands which was probably a form of tuberculosis. In the Portuguese settlement of Daman in the 1690s a French visitor found a young Portuguese girl with fever, whose “Indian physician, instead of letting her blood, had covered her head with pepper.” The European insisted on bleeding her with leeches, and perhaps surprisingly she recovered quickly.⁸⁷

The incident points to the major divergence between European and Hindu medicine, which was the routine use of bleeding by Europeans. As Pyrard noted, Indians, that is Hindus, did not use bleeding at all.⁸⁸ In the 1670s the Abbé Carré fell ill with a fever, and

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insisted on being bled. Great quantities were hacked out of him by enthusiastic but amateur bleeders, and “This made me so feeble that I cannot bear to speak of it. Yet, though I felt very weak, I was not surprised that the fever grew less, as it no longer had the cause [that is, excess of blood] which had kept it up; and I further reduced it by refusing for eight days to eat many little delicacies that I would have liked—sometimes one thing, sometimes another, though I must confess I refrained with very great difficulty. For eight or ten days I still had my sight, my memory, and my senses, but so feebly that I did not remember anything that happened to me.”⁸⁹ There were clearly problems with this method of dealing with fevers, especially when it was used so often; patients in the Royal Hospital could be bled thirty or even forty times.

Yet more often we find acculturation and intermingling. Ovington late in the 17th century in Surat noted a treatment for fever which is still used in India today, and did not comment adversely on it:

“Cooling Herbs and Congy [Hindi, *kanji*, rice gruel], that is, Water with Rice boil’d in it, and Abstinence, are the best Receipts they prescribe for mitigating Intestinal Fervors of the Spirits, and allaying the Heat of the Blood, which they think is better preserv’d and cool’d within the Veins than let out, if it boils too fast.”⁹⁰

In the 1750s in Malabar, Grose noted what seems to be a variant on this method, or at least the rice was apparently boiled drier than was the case in the instance just quoted.

“For bloody fluxes, the Bramins suggest a very simple, and as they pretend a most infallible remedy, consisting in a strict abstinence from everything but rice stewed dry; to which they allow no sauce of any kind whatever, and attribute to it an absorbent quality, that is excellent against that acrimony which preys on the entrails and breeds the disorder. For drink they give nothing but water, corrected by a very moderate amount of cinnamon.”⁹¹

Earlier European practice had combined bleeding with feeding up the patient. In the following extended description of medical practice in the Goa Royal Hospital from the 1640s we find that the Europeans had now decided that a much scantier diet was more appropriate, as in fact we just noted in the case of the Abbé Carré’s self-cure. And we can also note that

they were at least worried enough about the effects of bleeding to try and build up the patient, using a Hindu specific, after the bleeding was finished.

“The hospital at Goa was formerly renowned throughout India; and, as it possessed a considerable income, sick persons were very well attended to. This was still the case when I first went to Goa; but since this hospital has changed its managers, patients are badly treated, and many Europeans who enter it do not leave it save to be carried to the tomb. It is but a short time since the secret of treatment by frequent bleedings was discovered [he presumably means in Goa, for bleeding was universally practiced in Europe]; and it is repeated, according to need, up to thirty or forty times, as long as bad blood comes, as was done to myself on one occasion when at Surat; and as soon as the bad blood is removed, which is like an apostume, the sick person is out of danger. Butter and meat are to him as poison, for if he eats them he puts his life in danger. Formerly some small ragouts were made for the convalescent, but they must nowadays content themselves with beef-tea and a basin of rice. Generally all the poor people who begin to recover their health cry out from thirst, and beg for a little water to drink; but those who wait upon them, who are at present blacks and Mestifs [*mestiços*—avaricious persons, and without mercy, do not give a drop without receiving something, that is to say, unless some money is placed in their hands, and to give colour to this wickedness they give it only in secret, saying that the physician forbids it. Sweets and confectionery are not wanting, but they do not contribute much to the establishment of health, which in a hot country rather requires nourishing food.

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 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

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has been learnt from the idolators 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.⁹²

So much for acculturation and mingling. We now turn to our second theme, which is to find the beginnings of perceived European superiority. We will note two examples: one to do with state provision of health care, the other with medical knowledge, especially anatomy. The former requires a study of the famous Royal Hospital in Goa; the latter concentrates on the observations of François Bernier at the Mughal court.

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 seem to have been quite new ideas in both Europe and Asia at the beginning of the early modern period. In earlier times it was religious authorities who sponsored most health care, sometimes prompted by pious rulers.⁹³ 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) and later in the Ottoman empire. 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.⁹⁴ In India in the 17th 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.⁹⁵ These claims seem to be very problematic, for no contemporary

source describes hospitals in actual operation in our period or earlier.

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.⁹⁶ By the end of the 16th 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 16th century, to do with attempts to centralise and amalgamate smaller less efficient hospitals and with the battle for control between secular and religious authorities.⁹⁷ A standard text claims that it was only in the 18th century that “the emphasis [in hospitals in Europe] shifted from care toward treatment and cure.”⁹⁸ 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. They were not, therefore, places where the well-to-do went to be treated, nor would they be until the 20th century.⁹⁹

Before the middle of the 15th century in Portugal there were some hospitals maintained by religious orders, and two set up by Prince Henry in the early 15th century to cure “African” diseases, but apart from this only asylums and places of seclusion existed, especially for lepers. But under João II and Manuel in the late 15th 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.¹⁰⁰

We also find in Europe increasing differences 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

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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 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."¹⁰¹ In other words, it was "modern" rather than "medieval."

Over the 15th and 16th 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.¹⁰² 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 King Manuel.¹⁰³ 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, the situation in India as regards regulation and state concern with medicine remained unchanged. Indeed some Europeans, reflecting this increasing state concern in Europe, were by the late 17th 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 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."¹⁰⁴

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 Advantageous and Foreign to their Profession."¹⁰⁵ And Fryer in Persia commented, "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."¹⁰⁶

We can now return 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.

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 de 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 everything that was necessary for the care and cure of the wounded, who were very numerous."¹⁰⁷

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 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.

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 forty 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.¹⁰⁸ It was run from 1579 by the Society of Jesus, though they later gave it up and had to be persuaded to resume

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their mission in 1591.¹⁰⁹ The way the state insisted that the Jesuits again take over the hospital showed how concerned the state was with the hospital. This is also shown in the very large sums which 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.

However, the state was not the only benefactor of the hospital. 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 16th 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.”¹¹⁰ 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.”¹¹¹

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) allowed, though some managed to sneak in anyway.¹¹² 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.”¹¹³ It could hold a very impressive 1,500 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.”¹¹⁴ 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.”¹¹⁵ Pyrard noted similarly, “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.”¹¹⁶

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 dishes of China porcelain or even silver. On admission the patient got a haircut and wash, and was provided with bed clothes. 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.”¹¹⁷

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.”¹¹⁸

Indeed, attempts to regulate the hospital, and many other 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 hospital.¹¹⁹ The viceroy believed 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

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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. Instead we find the sort of mingling and cross-fertilisation which we described in detail earlier.

Mortality in the Royal Hospital reflected all too faithfully the problems of contemporary medical knowledge in both India and Europe, yet in both an Indian and a European context it was quite innovative in its organisation. It was paralleled by another state-supported institution involved in social work—the *Santa Casa da Misericórdia*, or Holy House of Mercy. Like the Royal Hospital, the *Misericórdia* reflected a transfer to Goa of a new sort of institution from Portugal, for the Goa one was closely modelled on the mother house in Lisbon, which had been founded under royal patronage in 1498, the very year of da Gama's voyage. The Goan version was established by Albuquerque, probably in 1510. This charitable brotherhood grew rapidly. The number of brothers rose from an initial 100 to a maximum of 600 in 1609. These brothers administered the work of the *Misericórdia* and raised its funds, which came mostly from private charity and legacies.

In both Lisbon and Goa this organisation did excellent work. Indeed, they played an important role in the whole colonial empire. Laurinda Abreu's excellent empire-wide study details their work in providing charity, in trying to uphold or enforce morality, as important foci of power in colonial society, and as

bodies that to an extent ensured a certain commonality all over the far-flung empire.¹²⁰ There were seven secular tasks, which read very much like the obligations of such modern bodies as the Red Cross. They were to give food to the hungry, drink to the thirsty, clothing to the naked, shelter to the homeless, and burial to the dead. Brothers were also asked to visit the sick and prisoners and ransom captives. However, it was only Christians, indeed nearly always only Portuguese, who were served by this body.¹²¹ The President, or *Provedor*, of the Board of Governors was usually a very eminent person, such as even a governor or viceroy, or archbishop. Even ordinary membership of the Board of Governors was a very high honour; only those who could demonstrate "purity of blood" (that is, no Moorish or Jewish "taint") were eligible. The Goan elite often rotated between service on this body and on the Municipal Council.¹²² Many of them also participated informally in the other arena of social work in Goa, that is, the hospitals, as was noted above. Yet this close tie with the apparatus of the state had one negative consequence. In times of crisis the state would raid the ample coffers of the *Misericórdia* and take forced loans to provide ships and other military necessities.

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. In the early years of the 17th century the dowries for one or two nuns entering the convent of Santa Monica were pharmacies, and indeed in 1618 the convent, only recently founded, already owned eight pharmacies, three on Chorão Island, four on Divar Island, and one on Juá. The right to own these properties was ratified by a royal decree of 22 March 1617.¹²³ We can assume that the nuns leased out these rights; the ownership of Goa's other pharmacies cannot at present be determined.

The matter of acculturation which we noted earlier meant that many Portuguese considered Hindu healers to be better for some diseases than were Europeans. The related notions of a lack of qualitative difference, and that Indian diseases were "different," meant that even governors and clerics used Hindu healers because of their supposed better local knowledge. Nevertheless, the Portuguese did try to limit the prestige of Indian doctors. In 1563 all Hindu doctors were ordered to be expelled, but this order was never enforced. In 1574 the governor decreed that Hindu teachers and doctors were not to go about on horseback or in palanquins.

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A first offence attracted a fine of ten *cruzados*, a second twenty *cruzados* and the loss of the offending horse or palanquin, and a third meant being sent to the galleys. However, the doctor who served the governor's own household was exempt from this, and in fact this prohibition also soon lapsed.

What we have here are unsuccessful attempts first to expel, and then to limit the prestige and patronage of Hindu doctors using Hindu, that is *ayurvedic*, methods.

Foiled in this attempt, mostly because its own élite were inconvenienced by this, the colonial state then moved to at least control and limit the numbers of its subjects who were allowed to practice European-style medicine. This licensing system then was a transference of the new European notion we noted earlier—a state concern to regulate and professionalise medical practice and practitioners, with a racist colonial dimension added. We have eight published certificates (there are over a hundred in manuscript) given by the Portuguese chief physician to allow local doctors (*vaidyas*), from their names apparently all brahmins, to practice. This was a result of a decree of the Goa Senate in 1618 that no one might practice medicine unless he had passed an examination. The decree stated that

“no person of any religion, category, or nationality can exercise the medical or the surgical profession without passing a qualifying examination given by the *físico-mor* or the *cirurgião-mor*, and they will be obliged to take out a certificate of examination, so that those found practicing without this certificate will be fined twenty *pardaus*.”

The number of Hindu healers was to be limited to thirty, and this restriction was to be enforced by the requirement that the certificate from the chief physician or surgeon was to be endorsed by the Municipal Council, in order to check the numbers. We do not know what areas of medicine were covered, or what the exam consisted of, but as these certificates gave the holders license to practice anywhere in the Portuguese empire, they must have, as one would expect, tested European medicine, not *ayurvedic*.¹²⁴ This is also shown by the fact that the examiner is described as the *físico-mor*, normally a man from Europe. It is interesting, however, that the doctors so tested trained in traditional *ayurvedic* methods outside of Portuguese Goa before coming to the town to sit the examination which

allowed them to practice this other form of medicine, that is European.¹²⁵

We have more detail from this same year concerning the attempt of the Municipal Council to regulate closely medicine in Goa. Physicians, surgeons, bleeders and pharmacists were fined twenty *pardaus* if they practiced without a city certificate. Bleeders were required to display at their door a painting of a man being bled, the object presumably being to make sure only these publicly known people engaged in bleeding. Hindu physicians were forbidden to leave Goa and travel to the mainland without a license, for fear they would engage in improper activities there. Municipal officers were to visit every pharmacy every six months and were to burn useless or adulterated medicines. The decree also controlled the prices of medicines and banned the sale of some considered to be harmful.¹²⁶ As usual, one would expect that this sort of ambitious attempt at social engineering was observed more in the breach than otherwise; the rural majority of the population of Goa would certainly not be affected by this and would continue to use their traditional healers.

These measures could be interpreted in several ways. On the one hand, they could be merely a benign attempt to ensure the quality of health care provided by Indians in Goa, but the relevant point here is that so far as I know European doctors were not subjected to this sort of regulation. More likely, these measures were a covertly racist effort designed to limit competition to these same European healers. It is in fact remarkable that pandits trained outside Goa in traditional *ayurvedic* methods could pass the examination at all, though it is true that we know of many cross-influences between *ayurvedic* medicine and the Greek-based European system. Certainly these measures mark a major intervention by the state into this area of medicine, albeit yet again an intervention which affected only the Christian population, for we can assume that only they, and indeed probably only European Christians, would use doctors, whether Indian or European, who followed European medicine. Taken together, the hospital, the *Misericórdia*, and the attempt to regulate Indian healers show the Portuguese state trying, and sometimes succeeding, to innovate, reflecting then a more modern approach to the organisation of health care.

Our second case study moves away from the role of a state in medicine to show that there is good

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evidence by the middle of the 17th century that at least potentially European medicine, as represented in India by François Bernier, had moved beyond contemporary Indian practice, whether *yunani* or *ayurvedic*. We quoted him earlier taking a quite agnostic view of *yunani* medical practice, but in some areas he was aware of major changes that had occurred in European medicine in the last 150 years.

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.¹²⁷

At first greater strides were made in anatomy and so surgery. In the 16th 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 (1514-1564), 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 (1510-1590) 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 the microscope was invented. A short way to see the change in medical theory in the 17th century is to note a change “from a humoral to a chemical and/or mechanical view of the body.”¹²⁸

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 observation. 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, and Galen remained a prescribed text at the Cambridge medical school until the middle of the 19th century, and the notion of the four humours remained influential into the 19th 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 20,000,000 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 19th century. In many areas there were fits and starts, and blind alleys. The first uses of anaesthetics in the middle of the 19th century actually increased mortality for a time.

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 that 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 which were occurring in western European medicine in the 16th and 17th 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.

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

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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. As I noted above, Bernier's attitude to Indian medicine was rather neutral,¹²⁹ 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."¹³⁰

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, 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."¹³¹ What Bernier is saying is that while he was convinced Europeans were much better with 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 da Orta in Goa in the mid-16th century was the first, but by no means the last, European doctor to be critical of Indians' anatomical knowledge. We noted above his comment, "As for anatomy, they do not know where the liver is, nor the spleen, nor anything else."¹³² Dr. John

Fryer, who was roughly on a par with his Indian peers in medical knowledge,¹³³ 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 themselves, and drop of their own accord. Chirurgery is in as bad a plight, Amputation being an horrid thing."¹³⁴

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."¹³⁵ 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."¹³⁶

As a consequence, by the mid-17th century European doctors were often in demand for surgery. One French doctor

"grew so famous in Persia, that the King himself profer'd him very considerable allowances, to engage 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."¹³⁷

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

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another mind, thinking the Europeans better at Manual Operation than themselves.)”¹³⁸

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 because he had seen a French surgeon do one.¹³⁹ 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.”¹⁴⁰ Soon after, he noted how two “badly wounded Moor officers had withdrawn to the suburbs of Madras, hoping to find English surgeons.”¹⁴⁰ In the early 18th century we even hear of an Indo-Portuguese woman who was considered to be a skilled surgeon.¹⁴² This prestige seems to mark a pronounced difference as compared with the situation in the previous century.

The conclusion then is that a study of medical interaction between Europe, especially Portugal, and

India in the early modern period shows an interesting mixture. On the one hand there was mingling and interaction, this based on the common importance of humoral pathology in all of Eurasia. Yet we have shown how in two important areas, health care and anatomy, during our period Europe was advancing, slowly to be sure, towards what we today would recognise as scientific medicine. **RC**

Author's note: The present article draws especially on several of my studies: “The Thin End of the Wedge: Medical Relativities as a Paradigm of Early Modern Indian-European Relations,” *Modern Asian Studies*, XXIX, 1, 1995, pp. 141-170.* “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, 108-113. “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*, Lisboa, Fundação 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.

NOTES

- 1 Fernand Braudel, *Civilization and Capitalism, 15th-18th Century*, vol. I, *The Structures of Everyday Life: The Limits of the Possible*, New York, Harper & Row, 1979, pp. 78-88; E. L. Jones, *The European Miracle*, Cambridge, C.U.P., 1981, pp. 140-141.
- 2 Ludovico di Varthema, *The Itinerary of Ludovico di Varthema of Bologna from 1502 to 1508*, ed. R. C. Temple, London, 1928, p. 63.
- 3 A. H. de Oliveira Marques, *Daily Life in Portugal in the Late Middle Ages*, Madison, University of Wisconsin Press, 1971, p. 151.
- 4 *Ibid.*, pp. 143-144.
- 5 P. D. Gaitonde, *Portuguese Pioneers in India: Spotlight on Medicine*, Bombay, 1983, pp. 82-88; Julius Jolly, *Indian Medicine*, 2nd ed., New Delhi, 1977 [1st pub. 1901], p. 3.
- 6 Adam Olearius [d. 1671], *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.
- 7 *Ibid.*, p. 338.
- 8 Jadunath Sarkar, *Studies in Aurangzib's Reign*, 3rd ed., London, Sangam, 1989, p. 56.
- 9 Generally on all this see A. L. Basham, *The Wonder that was India*, London, 1963, pp. 500-502 for an excellent summary, and also A. L. Basham, ed., *A Cultural History of India*, Oxford, O.U.P., 1975,

- pp. 48, 147-150, 438. Three older, classic, accounts of *ayurvedic* medicine by western orientalist still have detail of great value: Jean Filliozat, *The Classical Doctrine of Indian Medicine: Its Origins and its Greek Parallels*, Delhi, 1964; Julius Jolly, *Indian Medicine*, New Delhi, 2001; Heinrich Robert Zimmer, *Hindu Medicine*, Baltimore, Johns Hopkins Press, 1948. See also a good survey in Edwin H. Ackernknecht, *A Short History of Medicine*, Baltimore, Johns Hopkins University Press, 1982, pp. 35-43, and for a 16th-century Muslim version, Abul Fazl, *Ain-i Akbari*, trans. H. S. Jarrett and J. N. Sarkar, Delhi, 1977-1978, 3 vols., III, p. 234. For Indian Muslim medicine see S. M. Ikram, *Muslim Rule in India and Pakistan*, Lahore, 1966, 2nd ed., pp. 181-183. For a good quick survey of *yunani* literature see D. V. Subba Reddy, “The Origins and Growth of Indigenous Unani Medical Literature in Medieval India,” *Indian Journal of History of Medicine*, XIV, 1, June 1969, pp. 20-25, and continued as “The Outline of the History of the Unani Medical Literature,” in *ibid.*, XV, 1, June 1970, pp. 14-19. For an account of drugs used in India in the 17th century see Francisco Pelsaert, *Jahangir's India*, trans. W. H. Moreland and P. Geyl, Delhi, 1972, pp. 44-46.
- 10 Quoted in Gaitonde, *Portuguese Pioneers in India*, p. 101.
- 11 According to H. G. Rawlinson, the first recorded instance of bubonic plague in India was in 1616, but, given Jahangir's familiarity with it, this seems to be far too late a date. Later in the century it was a great

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- killer, raging, for example, in Surat for six years in the 1680s. It caused great mortality among Indians, but Europeans were miraculously exempt. See John Ovington, *A Voyage to Surat in the Year 1689*, ed. H. G. Rawlinson, London, 1929, pp. 203-204 and f.n. 13.
- 12 Jahangir, *The Tuzuk-i Jahangiri*, trans. A. Rogers, ed. H. Beveridge, Delhi, 1968, 2 vols. in 1, I, 442; II, 65, 66-67.
 - 13 Babur, *Babur-Nama*, trans. A. S. Beveridge, New Delhi, 1970, pp. 82, 106-109, 169-170, 246, 399, 400, 511, 543, 608, 657, 660.
 - 14 Jahangir, *The Tuzuk-i Jahangiri*, I, 330, 243; II, 12-13.
 - 15 *Ibid.*, II, pp. 43-44.
 - 16 *The Voyage of Nicholas Downton*, London, Hakluyt, 1938, p. 135. See pp. 135-136 for a morbid account of a death from the "bloudy fluxe."
 - 17 Edward Terry in W. Foster, ed., *Early Travels in India, 1583-1619*, Delhi, 1968, p. 310.
 - 18 Dr. John Fryer, *A New Account of East India and Persia*, I, p. 180, and see also *ibid.*, II, pp. 83-84.
 - 19 *Ibid.*, II, 84.
 - 20 François Bernier, *Travels in the Mogul Empire, 1656-1668*, trans. and ed. A. Constable and V. Smith, London, 1914, pp. 253-254.
 - 21 *Ibid.*, pp. 338-339.
 - 22 Ovington, *A Voyage to Surat*, pp. 204-205.
 - 24 Dennis Kincaid, *British Social Life in India, 1608-1937*, London, Routledge & Kegan Paul, 1973, p. 37.
 - 25 Niccolao Manucci, *Storia do Mogor, or Mogul India*, Calcutta, 1966-1967, 4 vols., III, pp. 114, 117. 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."
 - 26 Jafar Sharif, *Islam in India, or the Qanun-i-Islam*, ed. and trans. G. A. Herklots and W. Crooke, London, 1972, p. 243, and see also Mrs. Meer Hassan Ali, *Observations on the Mussulmans of India*, ed. W. Crooke, Karachi, 1973, pp. 235, 307 et seq.
 - 27 Jean-Baptiste Tavernier, *Travels in India of Jean-Baptiste Tavernier*, trans. V. Ball and W. Crooke, New Delhi, 1977, 2 vols, I, 240.
 - 28 Abbé Carré, *The Travels of the Abbé Carré in India and the Near East, 1672-1674*, London, Hakluyt, 1947-1948, 3 vols., p. 271.
 - 29 John M. de Figueiredo, "Ayurvedic Medicine in Goa according to European Sources in the Sixteenth and Seventeenth Centuries," *Bulletin of the History of Medicine* [Baltimore], vol. 58, 1984, p. 226.
 - 30 João Manuel Pacheco Figueiredo, "Goa Pré-Portuguesa," *Studia* [Lisbon], XII, 1963, pp. 139-259; 13/14, 1965, pp. 105-225, especially p. 160.
 - 31 Braudel, *Civilization and Capitalism*, vol. I, 78-88; E. L. Jones, *The European Miracle*, pp. 140-141.
 - 32 Norman G. Owen, ed., *Death and Disease in Southeast Asia: Explorations in Social, Medical and Demographic History*, Singapore, O.U.P., 1987, introduction, pp. 4, 12.
 - 33 Andrew Wear, ed., *Medicine in Society: Historical Essays*, Cambridge, C.U.P., 1992, introduction, p. 2. A. L. Basham wrote disparagingly of "untrained quacks and charlatans" (*op. cit.*, p. 25) in ancient India, but today we would be reluctant to use such judgemental terms. For a general account of village practice in Goa during the whole period of Portuguese rule see Fátima da Silva Gracias, *Health and Hygiene in Colonial Goa: 1510-1961*, New Delhi, 1994, pp. 157-172.
 - 34 J. H. van Linschoten, *The Voyage of John Huyghen van Linschoten to the East Indies*, London, 1885, 2 vols., I, pp. 235-239.
 - 35 François Pyrard de Laval, *The Voyage of François Pyrard of Laval to the East Indies*, vol. II, London, 1888, p. 11.
 - 36 Fryer, III, *A New Account*, p. 98.
 - 37 Alberto C. Germano da Silva Correia, *La Vieille-Goa*, Bastorá, 1931, pp. 268-307, and see also his many other publications of 1914 to 1928 listed in the bibliography of this book. For the calamitous outbreak of 1570 see João Manuel Pacheco de Figueiredo, "Goa dourada nos séculos XVI e XVII: O hospital dos pobres do padre Paulo Camerte, esboço de sua reconstituição histórica," *Studia* [Lisbon], XXV, 1968, pp. 136-140.
 - 38 See John Correia-Afonso, "On the Fourth Centenary of Filippo Sassetti (1540-1588): Scientific Observations from Cochin," a paper presented at the Fifth International Seminar on Indo-Portuguese History, Cochin, Jan. 1989, and now published in *Indica*, XXVI, 1989, pp. 15-24. The quotation is from p. 19.
 - 39 For Orta see *inter al.* Garcia da Orta, *Colóquios dos simples, e drogas he cousas medicinais de India*, Goa, 1563; Garcia da Orta, *Colóquios dos simples, e drogas he cousas medicinais da India*, ed. Conde de Ficalho, 2 vols., Lisbon, 1891-1895; Clements Markham, *Colloquies on the Simples and Drugs of India by Garcia da Orta*, [a translation of Conde de Ficalho, Lisbon, 1891-1895], London, 1913. Especially important is C. R. Boxer, *Two Pioneers of Tropical Medicine: Garcia d'Orta and Nicolas Monardes*, London, Wellcome Historical Medical Library, 1963.
 - 40 For a dramatic description, see Gaspar Correia, *Lendas da India*, Coimbra, 1921-1931, Lisbon, 1969, 4 vols., IV, pp. 288-289.
 - 41 See Orta, *Colloquies*, no. 17 for a description of "mordexim" in 1543. I will refer to Orta by colloquy number so that readers can use various editions of his work.
 - 42 *Colloquies*, no. 41
 - 43 *Colloquies*, no. 5, and cf. no. 12 for a similar learned and somewhat circular [to modern eyes] discussion.
 - 44 *Colloquies*, no. 9, 30. See especially Boxer, *Two Pioneers*, pp. 7-13, Georg Schurhammer, *Francis Xavier: His Life, His Times*, vol. II, *India*, Rome, Jesuit Historical Institute, 1977, p. 203; and M. B. Barbosa and J. Caria Mendes, "Garcia d'Orta, pioneer of tropical medicine and his descriptions of cholera in his Colóquios (1563)," in *Proceedings of the XXIII International Congress of the History of Medicine*, 2 vols., London, Wellcome Institute, 1974, II, pp. 1258-1259.
 - 45 On the spread of Orta's book see Donald F. Lach, *Asia in the Making of Europe*, Chicago, Chicago University Press, 1965-, I, pp. 192-195, and III, p. 457 [with Edwin J. Van Kley], where it is noted that the first Dutch book on tropical medicine, by Bontius, published posthumously in 1642, is closely modelled on Orta.
 - 46 *Colloquies*, no. 36. On Sassetti see Lach, *Asia*, I, p. 477, and II, book 3, p. 541.
 - 47 See, for example, "Breve relação das escrituras dos gentios da India Oriental a dos seus costumes," pp. 52-53, quoted in John M. de Figueiredo, "Ayurvedic Medicine," p. 231.
 - 48 *Colloquies*, no. 36. It is not really my purpose to pronounce on the "objective" truth of Orta's work, but I could note here that while bleeding, the great staple of European practice, was indeed not done in the ayurvedic tradition, there is evidence of Hindu doctors using urinalysis for diagnostic purposes.
 - 49 *Colloquies*, no. 54.
 - 50 *Tratado das drogas e medicinas das India Orientais*, por Cristóvão da Costa, ed. Jaime Walter, Lisbon, Junta Nacional do Ultramar, 1964, p. 125.
 - 51 Costa, *Tratado das drogas*, p. 28.
 - 52 Costa, *Tratado das drogas*, pp. 23, 28.
 - 53 Costa, *Tratado das drogas*, pp. 44, 86, 127.
 - 54 See Lach, *Asia*, vol. II, book 3, pp. 436-437.
 - 55 Costa, *Tratado das drogas*, p. 279.
 - 56 Costa, *Tratado das drogas*, p. 199.
 - 57 Costa, *Tratado das drogas*, pp. 125-126.
 - 58 *Colloquies*, no. 36.
 - 59 Afonso de Albuquerque, quoted in Figueiredo, "Goa Pré-Portuguesa," pp. 161-162.
 - 60 Tomé Pires, *The Suma Oriental of Tomé Pires and the Book of Francisco Rodrigues*, ed. Armando Cortesão, London, Hakluyt, 1944, p. 69.
 - 61 Costa, *Tratado das drogas*, p. 23.

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- 62 *Colloquies*, no. 45; Costa, p. 103; Ana Maria Amaro, "Goa's Famous Cordial Stone," *Revista de Cultura* [Macao], no. 7/8, Oct. 1988-March 1989, pp. 82-103. Many thanks to Fr. Charles Borges, now of Loyola University, for this reference. For their use in Europe see Lach, *Asia*, vol. II, book 1, p. 12.
- 63 *Colloquies*, no. 2; and see *ibid* for a detailed account of Muslim purging practice following Ibn Sina's advice (also described in Costa, p. 125).
- 64 Pires, *The Suma Oriental*, p. 69; Afonso de Albuquerque, quoted in Figueiredo, "Goa Pré-Portuguesa," p. 162.
- 65 *Colloquies*, no. 51.
- 66 *Colloquies*, no. 54.
- 67 Costa, *Tratado das drogas*, p. 143.
- 68 Figueiredo, "Goa Pré-Portuguesa," p. 176.
- 69 *Colloquies*, no. 27.
- 70 Costa, *Tratado das drogas*, p. 28.
- 71 *Colloquies*, no. 27.
- 72 Pires, *The Suma Oriental*, p. 69; Afonso de Albuquerque, quoted in Figueiredo, "Goa Pré-Portuguesa," p. 162.
- 73 Timothy Walker has written a series of excellent studies of medicine in Goa and Portugal mostly dealing with a later period than mine. On interaction see "Echoes of Indian Indigenous Medical Techniques in the Portuguese Hospitals, Infirmaries and Pharmacies of Goa, 1650-1830." In his own words, "This paper seeks to provide an overview of the hybrid medical culture found in the Portuguese colonial enclaves in India between approximately 1680 and 1830. My intent is to draw attention to the Indo-Portuguese functionaries who practiced medicine in state and religious medical institutions at this time, consider the cultural influences that shaped their diverse remedies, and look at some of the indigenous drugs they applied to patients in those institutions." A version of this same paper was published in *Ayurveda at the Crossroads of Care and Cure*, ed. Ana Salema, Lisbon, Centro de História de Além-Mar, 2002.
- 74 Pyrard de Laval, *The Voyage of François Pyrard of Laval*, II, pp. 11-14.
- 75 See Correia-Afonso, *op. cit.* For conditions on board Indian ships in the later 17th century, see A. Jan Qaisar, "From Port to Port: Life on Indian Ships in the Sixteenth and Seventeenth Centuries," in Ashin Das Gupta and M. N. Pearson (eds), *India and the Indian Ocean, 1500-1800*, Calcutta, 1987, pp. 331-349.
- 76 Fryer, *A New Account*, I, p. 180; Manucci, *Storia do Mogor*, II, p. 157.
- 77 Manucci, *Storia do Mogor*, III, p. 265.
- 78 Correia-Afonso, *op. cit.*, p. 19.
- 79 Fryer, *A New Account*, I, p. 180.
- 80 Ikram, *Muslim Rule*, p. 183.
- 81 Lach, *Asia*, vol. II, book 3, p. 424.
- 82 Careri in S. N. Sen, ed., *Indian Travels of Thevenot and Careri*, New Delhi, 1949, p. 162.
- 83 Pires, *The Suma Oriental*, p. 69. See also his list of Indian simples and drugs on pp. 512-518.
- 84 J. M. Pacheco de Figueiredo, "The Practice of Indian Medicine in Goa during the Portuguese Rule, 1510-1699," *Luso-Brazilian Review* [Rio de Janeiro], IV, 1, 1967, pp. 52-53.
- 85 Linschoten, *The Voyage of John Huyghen van Linschoten*, I, p. 230.
- 86 See Silva Correia, p. 275, and Pyrard, *The Voyage of François Pyrard of Laval*, intro. p. xii, and II, 14. For the career of one such *fisico-mor*, Dimas Bosque, who was attached to the viceroy D. Constantino de Bragança, 1558-1561, see Jaime Walter, "Dimas Bosque, *fisico-mor* da Índia a as sereias," *Studia* [Lisbon], XII, 1963, pp. 261-271.
- 87 King to viceroy, Jan. 23, 1610, in *Documentos remetidos da Índia, ou Livro das Monções*, ed. R. A. de Bulhão Pato, Academia Real das Ciências, Lisbon, 1880-1935, 5 vols., I, p. 304, and king to viceroy, Jan. 30, 1613 in *ibid.*, II, p. 300.
- 88 A. K. Priolkar, *The Goa Inquisition*, Bombay, 1961, p. 14 of Dr. Dellon's account.
- 89 Pyrard, *The Voyage of François Pyrard of Laval*, II, p. 13.
- 90 Abbé Carré, *The Travels of the Abbé Carré*, pp. 284-285.
- 91 Ovington, *A Voyage to Surat*, p. 206.
- 92 J. H. Grose, *A Voyage to the East Indies*, 2nd ed., 2 vols., London, 1772, I, p. 250.
- 93 Tavernier, *Travels in India*, I, pp. 160-161.
- 94 See generally a succinct survey in Roderick E. McGrew, *Encyclopedia of Medical History*, London, Macmillan, 1985, s.v. "hospitals."
- 95 *Encyclopedia of Islam*, 2nd ed., s.v. "bimaristan;" Guenter B. Risse, *Mending Bodies, Saving Souls: A History of Hospitals*, New York, O.U.P., 1999, pp. 125-128.
- 96 Ikram, *Muslim Rule*, pp. 501-502. See also R. L. Verma, "The Growth of Greco-Arabian Medicine in Medieval India," *Indian Journal of History of Science*, V, 2, 1970, pp. 347-363 and M. Z. Siddiqui, "The Unani Tibb (Greek Medicine) in India," *Islamic Culture*, XLII, 3, 1968, pp. 161-172 for two enthusiastic and uncritical accounts of medicine in India. They stress, respectively, Hindu-Muslim coexistence and lots of hospitals in India.
- 97 Guenter B. Risse, "The Encounter between Spanish and Aztec Medical Cultures: Hospitals in New Spain," in D. Arnold, ed., *Warm Climates and Western Medicine*, Amsterdam, Rodopi, 1996.
- 98 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*, I, pp. 82-87. For a sketch of pre-modern 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 volunteerism, Colin Jones, *The Charitable Imperative: Hospitals and Nursing in Ancien Regime and Revolutionary France*, London, Routledge, 1989.
- 99 McGrew, *Encyclopedia*, p. 138.
- 100 See especially Lindsay Granshaw, "The rise of the modern hospital in Britain," in Andrew Wear, ed., *Medicine in Society: Historical Essays*, 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*.
- 101 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. I, 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* [facsimile edition], Lisbon, 1992.
- 102 Sir George Clark, *A History of the Royal College of Physicians of London*, Oxford, Clarendon Press, 1964-1966, 2 vols., I, pp. 61, 337.
- 103 Oliveira Marques, *Daily Life in Portugal*, p. 151.
- 104 C. R. Boxer, "Some remarks," pp. 197-198.
- 105 Fryer, *A New Account*, I, p. 286.
- 106 Ovington, *A Voyage to Surat*, p. 205.
- 107 Fryer, *A New Account*, III, p. 95.
- 108 Afonso de Albuquerque, *Commentaries of the great Afonso Albuquerque*, London, Hakluyt, 1875-1884, 4 vols., III, p. 241, and see generally Schurhammer, *Xavier*, pp. 201-204.
- 109 For an extended description of the hospital in 1542 see Schurhammer, *Xavier*, pp. 201-208.
- 110 Fátima Gracias, *Health*, pp. 122-123. Linschoten described their work in the hospital in the 1580s: Linschoten, *The Voyage of John Huyghen van Linschoten*, 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, Nova Goa, Imprensa Nacional, 1862, p. 115, and king to viceroy 6 Feb. 1589, in *ibid.*, p. 196.

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- 111 Pyrard, *The Voyage of François Pyrard of Laval*, II, p. 12.
- 112 Linschoten, *The Voyage of John Huyghen van Linschoten*, I, pp. 237-238.
- 113 Pyrard, *The Voyage of François Pyrard of Laval*, II, p. 12.
- 114 Linschoten, *The Voyage of John Huyghen van Linschoten*, I, p. 237.
- 115 Pyrard, *The Voyage of François Pyrard of Laval*, pp. 3, 7. It obviously had been considerably enlarged since 1593, when it held only 400-500.
- 116 Linschoten, *The Voyage of John Huyghen van Linschoten*, I, pp. 237-238.
- 117 Pyrard, *The Voyage of François Pyrard of Laval*, p. 11.
- 118 Linschoten, *The Voyage of John Huyghen van Linschoten*, I, p. 238.
- 119 Pyrard, *The Voyage of François Pyrard of Laval*, II, p. 10. Pyrard, II, pp. 2-17, provides the classic contemporary account of the Royal Hospital.
- 120 This provisão of 25 May 1595 is printed in *Arquivo Português Oriental*, III, pp. 547-550.
- 121 Laurinda Abreu, "O papel das Misericórdias dos 'lugares de além-mar' na formação do Império português," *História, Ciências, Saúde-Manguinhos* [Rio de Janeiro], VIII, 2001, pp. 591-611.
- 122 See C. R. Boxer, *Portuguese Society in the Tropics*, Madison, Wisconsin University Press, 1965, pp. 24-25; C. R. Boxer, *The Portuguese Seaborne Empire*, Hutchinson, London, 1969, pp. 286-288; Schurhammer, pp. 168-172 for the *Misericórdia* in the time of Xavier; and for an extended, though now dated, coverage, see José Frederico Ferreira Martins, *História da Misericórdia de Goa, 1520-1910*, 3 vols., Nova Goa, 1910-1914. Another older account is F. Ayalla, "A Misericórdia de Goa," *O Oriente Português*, I, 1905, pp. 192-201. The best modern account is Fátima da Silva Gracias, *Beyond the Self: Santa Casa de Misericórdia de Goa*, Panjim, Surya Publications, 2000.
- 123 Boxer, *Portuguese Society in the Tropics*, p. 25.
- 124 "Título dos bens que tem o convento das religiosas de Santa Monica da Cidade de Goa feito no mez de Janeiro de 1618 ...," in *Documentos remetidos da Índia*, vol. VIII, p. 85. Many thanks to Timothy Coates for this reference. Also see Timothy Walker, "The Dissemination of Drugs and Healing Techniques from India through the Portuguese Maritime Empire, 1560-1830," conference paper, for an excellent study of the dissemination of Indian remedies all around the Portuguese empire and the metropole, and especially for pharmacies in Portugal. His period is the 17th and 18th centuries.
- 125 J. M. Pacheco de Figueiredo, "The Practice of Indian Medicine," pp. 53-60; C. R. Boxer, "Some Remarks," p. 207; John M. de Figueiredo, "Ayurvedic Medicine," p. 230.
- 126 *Breve relação das escrituras dos gentios da Índia Oriental e dos seus costumes*, pp. 52-53, quoted in João Manuel Pacheco Figueiredo, "Goa Pré-Portuguesa," pp. 179-180, and also quoted [in English] in John M. de Figueiredo, "Ayurvedic Medicine," p. 231.
- 127 "Livro de Posturas," *Historical Archives of Goa*, 1618, quoted in R. R. S. Chauhan, "Life in 17th Century Goa vis-a-vis Senate bye-laws," in P. P. Shirodkar, ed., *Goa: Cultural Trends*, Panaji, 1988, pp. 211-212.
- 128 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, Johns Hopkins Press, 1968, pp. 51-75.
- 129 Andrew Wear, "Introduction," in Andrew Wear, ed., *Medicine in Society: Historical Essays*, 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*, Cambridge, C.U.P., 1985, and Roger French and Andrew Wear, eds., *The Medical Revolution of the Seventeenth Century*, Cambridge, C.U.P., 1989. For the 15th century see a short useful study by Roger French: "Medicine in Western Europe during the fifteenth century," in Mário Gomes Marques and John Cule, eds., *The Great Maritime Discoveries and World Health*, Lisbon, ENSP, 1991, pp. 39-54.
- 130 Bernier, *Travels in the Mogul Empire*, pp. 253-254, 338-339.
- 131 *Ibid.*, p. 339.
- 132 *Ibid.*, pp. 338-339.
- 133 *Colloquies*, no. 36.
- 134 See for example Fryer, *A New Account*, I, 285-286, 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."
- 135 Fryer, *A New Account*, I, p. 287.
- 136 Fryer, *A New Account*, III, p. 94.
- 137 Manucci, *Storia do Mogor*, II, p. 333.
- 138 Olearius, *The Voyages & travels of the ambassadors*, p. 338.
- 139 Fryer, *A New Account*, III, p. 96.
- 140 Abbé Carré, *The Travels of the Abbé Carré*, pp. 284-285.
- 141 *Ibid.*, p. 598.
- 142 Abbé Carré, *The Travels of the Abbé Carré*, p. 624. Not, however, that all Europeans were particularly expert. See *ibid.*, pp. 369-370, for the story of a French quack who did at least examine an ill Portuguese "by all the laws of Hippocrates and Galen."
- 143 Jadunath Sarkar, *Studies in Aurangzib's Reign*, p. 56.