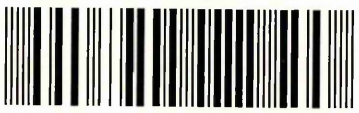

European and Non-European Medical Practices:

India and the West Indies, 1750-1900

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ABSTRACT

This thesis compares the interaction between British doctors and Indian medical practitioners with that between such doctors and African-Caribbean practitioners during the period 1750 to 1900. This in-depth analysis is contextualized within a longer time-scale and against a broader global background.

Comparison is made firstly in terms of racial and cultural attitudes and how these affected interaction. Some British doctors in India disparaged indigenous practices. In the West Indies, denigration of the African was paralleled with a lack of interest in slave medical practices. Western medicine was dominant as part of the British administration in India, by coercion at plantation level in the Caribbean. These contrasts are highlighted in this thesis.

While "rational empiricism" began to replace the humoral dogmatism of Western medicine from the 1770s, the Indian systems and slave medicine were both seen as consisting of "mere" empiricism, lacking in science or theory. Nevertheless, this thesis challenges David Arnold's view that by the nineteenth century British doctors were dismissive of Indian systems and practitioners. Conversely, Richard Sheridan's assertion that British doctors adapted their practice through learning from African-Caribbean medicine is strongly opposed in the thesis. Arnold overstates the rejection, Sheridan the acceptance.

British doctor-botanists identified the plants in indigenous Indian medicines. They could also find succedaneums directly, bypassing indigenous lore. They advised other doctors on botanical issues. Their major role in interaction in India has not been looked at previously. Sheridan's labelling those in the West Indies as "doctor-scientists" overrates their status while Arnold's calling those in India "gentlemanly" underrates it (the second has already been challenged in the literature).

Nineteenth century texts of materia medica were plant-based, including many Indian drugs; they were made obsolete in the 1870s by the advent of chemical pharmacology. This fault-line between botany and chemistry halted systematic examination of recently elucidated plant-based remedies for a hundred years from 1860. The thesis suggests that it was more important in reducing medical interaction than were broader factors such as concepts of dominance and racial superiority as put forward by Arnold.

New World drugs which had long been part of the Western materia medica, such as quina-bark and ipecacuanha, held their own and were developed chemically. Early botanists on the Indian subcontinent produced work which also lasted. In Spanish colonies, cultural syncretism between Spaniards and Amerindians included medicine; in this thesis it is contrasted with the absence of any comparable syncretism allowed by the British in India or the Caribbean between the ruling class (administrators or plantocracy) and the non-white populations.

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PREFACE AND INTRODUCTION

This thesis is concerned with the interaction between Europeans, doctors and laymen, and indigenous people. Specifically, it discusses what exchange there was of medical skills and remedies between British doctors and Indian or African-Caribbean practitioners across the chosen period of a hundred and fifty years. For the purposes of this thesis, the term "interaction" is taken to mean the meeting of such doctors; it is preferred as representing a less meaningful phenomenon than would terms such as "interchange" or "collaboration".

The thesis originated from wondering what ship's doctors made of any medical practices that they encountered. For instance, there were ship's surgeons on the voyages which James Cook [1728-79] made between 1768 and 1779. This was also true of George Vancouver's North Pacific journeys later in the same century. Such doctors usually doubled as naturalists and even as prototype anthropologists. Their studies represented one of the scientific aspects of the Enlightenment; new discoveries would mean benefits for mankind. It became clear that the peripatetic nature of these journeys meant that there could be little real interaction. Parts of the world where there was more prolonged contact included India. At Sheffield Hallam University, Dr Mark Harrison became my first supervisor. His area of interest comprised nineteenth-century India. In addition, he was working on concepts of tropical climate underlying disease, in the British West Indies as well as in India. This was a matter of global importance by the eighteenth century, even if its roots went back to Ionian Greek Hippocratic theories on the causes of illness. The main focus for the current study was developed. This was medical interaction in British India and West Indies across a period of major change,

socially and medically. My second supervisor has been Prof. Barbara Bush; her interest in the Caribbean has aided me in trying to achieve a better balance in the work.

In addition, I have felt from the outset that the narrow picture should be set against the background of interaction on a wider scale. Thus it should take in colonization from the sixteenth century onwards and that on a global scale. In particular, this has meant the inclusion of the Spanish American empire. There were changes in the cultural and social situations and in the medical practices of Britain, India and the West Indies which determined the selection of 1750 to 1900 for the narrow focus. Changes were also a factor in the choice of Spanish America, where there were two periods of particular interaction, one to do with medicine in the late sixteenth century and one involving natural sciences and exploration in the late eighteenth. To avoid distracting from the main focus of the work, this broader part of the comparative study has been confined to a final chapter.

A specific issue is that of the terms which should be used for non-European people. "Non-white" and "non-Western" are possible as generic alternatives even if they are negative terms. The word "indigenous" is inappropriate for African-born or even creole (Caribbean-born) slaves, particularly when indigenous Caribs persisted in some parts of the West Indies. Ironically, the term "slave" itself is accurate and non-polemical, though after emancipation it becomes a misnomer, despite the labouring populace of freed men (and women) remaining slaves in all but name. On the other hand, "black", or more allowably "Black", as noun or adjective, is generally avoided in the modern literature, to be replaced by the clumsier description "African-Caribbean". In India, "indigenous" is appropriate, but the generic term "Indian" is an inaccurate one; even differentiating Hindu and Muslim, with their separate medical traditions, takes no account of the many varieties of medical practices, from folk to Mogul court. In the

current thesis, the aim is to combine the most clarity and consistency with the least offence.

Most medical historians are no longer medically qualified: their training as historians is of more importance than any as medical clinicians or scientists. Indeed, the two disciplines record information very differently. Nevertheless, for the purposes of the current thesis, medical knowledge has been of some value in the consideration of such primary sources as materia medica (which comprise lists of ingredients for medicines and the usage of these). In addition, two brief periods of botanical study, one with Oleg Polunin during the 1970s in the Himalayas (notably Darjeeling and Sikkim), the other with Rodolfo Vasquez during the 1990s in the Peruvian Andes, have given a little extra insight. Aside from these, the combination of some knowledge of medicine and botany has aided the study of the manuals of materia medica by men such as the doctor-botanist John Forbes Royle (1798-1858].

The source material for this thesis is scattered. For India, the main location of primary material in Britain is London; there, individual locations include the Wellcome Institute library and the India Office Library (at Blackfriars until 1998, at the British Library, St Pancras, subsequently). For the West Indies, the Wellcome library was supplemented by that of the Royal College of Physicians at Edinburgh. Latin American sources have been available in facsimile, though most have had to be translated from the Spanish by the author (SC). Primary sources available only in India and in the West Indies have not been looked at. Any source used without being seen has been asterisked, with acknowledgment of the secondary source from which it came; (in total, there are a score of these). In general, the primary sources available have comprised medical books and journals, the memoirs of medical men, the transactions of learned

societies, treatises, letters and manuscripts and, lastly, official publications such as parliamentary papers and minutes.

Acknowledgements are made to Dr Mark Harrison, Supervisor, and Prof.M.R.Worboys, Director of Studies, with, latterly, Prof.Peter Cain, Supervisor 1, and Prof.Barbara Bush, Director of Studies, Sheffield Hallam University. The help of librarians in Leeds, London and Edinburgh has been important.

INTRODUCTION

Interaction between European or Western medical practices and those of non-Europeans has occurred for more than two thousand years. However, only in the last two hundred of these years has the Eurocentric view been held that Western medicine is superior. Before that, in Europe and Asia, for instance, there was a level table without disparity, according to M.N.Pearson [1]. Medical knowledge was even: European and Asian doctors met on equal terms.

The majority of the world's population are still dependent on non-Western medical systems. Even in the West, alternative forms of medicine are being taken up. The Western pharmaceutical industry exploits indigenous (non-Western) plant remedies for material from which new drugs can be developed. These are points which make the study of the history of interaction between Western and other medical systems one that remains relevant.

The European or Western medical system was based on the Ionian Greek one, recorded in the writings of Hippocrates [c.450-370 BC] and Galen [c.130-201 AD]. Hippocratic "humoralism" held that illness was due to disturbance in the balance of the humours. Vivian Nutton contributed a chapter on humoralism to W.F.Bynum and Roy Porter's 1993 Companion Encyclopedia of the History of Medicine [2]. There were four humours, with a mixture of these unique to each individual. A regimen of diet, sleep and exercise would help maintain the balance of these humours while imbalance could be corrected by a regimen of drugs, diet and depletive measures (bloodletting, vomiting and purgation). This was the case for illness due to fevers, still the major cause of mortality and mortality in eighteenth and nineteenth centuries.

The authority of Western medicine was therefore based on theory, originating in speculative medieval scholasticism, in turn derived from ancient Hippocratic-Galenic

dogma. Not surprisingly, the concentration on the individual patient rather than on the nature of individual diseases meant that the therapeutic armamentarium of Western medicine was sparse and circumscribed. There were few specific, empirical, remedies aimed at individual disorders, such as quinine bark for intermittent fever (malaria). Western therapeutics in the eighteenth century have been called "chaotic" by Miles Weatherall [3].

Western medicine shared the dogma of Hippocratic humoral theory with the major Asian systems, Chinese and the two South Asian (Indian) ones, Ayurvedic (Hindu) and Unani (Muslim). Given this common origin, Indian indigenous medicine could be called inferior only if it was viewed as having become degraded from its original state. By 1800, there was an additional reason for regarding Western medicine as superior. This consisted of Western scientific advances, in medicine, such as the work of William Harvey on the circulation of the blood, but, even more, in the physics of Isaac Newton, regarded as an exemplar of scientific reasoning. That the vaunted superiority rested on dogma until around 1800, on scientific observation after then, was a paradox seemingly unrecognized at the time (or highlighted by modern historians subsequently).

Contemporary Indian medicine was therefore derided as short of theory based on reason and lacking modernity given that it embraced magical and mystical elements. In the Caribbean, the medicine of African-born and creole (Caribbean-born) slaves was not viewed as having any underlying principles. Both, therefore, comprised "mere empiricism" or, in the words of one nineteenth century British doctor (Charles Morehead, who was modernist if fair-minded), "criminal empiricism", with remedies based solely on trial and error.

Nevertheless, by the 1770s, some doctors in Britain were questioning Hippocratic measures such as blood-letting and purging. In place of these they were bringing in

treatment which they had tested by observation, trial and statistical analysis. Indeed, such empirical observation and trial more than theory lay behind William Withering's foxglove or digitalis therapy and Edward Jenner's vaccination. However, their empiricism was seen as "rational empiricism" as opposed to the seemingly haphazard empiricism of non-Western indigenous medical practices. It combined reason from theory with empirical observation. It has been fully described by Ulrich Tröhler in 2000 [4]. There is irony in this double standard by which Western rational empiricism was encouraged while non-Western "mere" empiricism was dismissed. It is an issue for this thesis, in which it is highlighted by the contrasting of Western and indigenous practices. A further point of note is that many of the doctors who took part in the observationist movement obtained their medical (and botanical) training in Scotland; they held this background in common with contemporaries in both India and the Caribbean. The fact of this shared heritage is self-evident but its significance will be addressed in this thesis.

David Arnold's stance on interaction in India is that Western doctors were dismissive of the indigenous systems while aiming to use their superior knowledge to extract individual plant remedies from these systems [5]. Indeed, Mark Harrison has posed the question whether or not interaction altered European medical practice conceptually, beyond the empirical acquisition of drugs and plants [6]. There is a further irony involving the word "empiricism" in that empiricist is an alternative term used to describe modernists in India who criticized the Indian mind as imaginational rather than rational. This is a point made by Ronald Inden [7]. Such European empiricists or "positivists" perceived themselves as superior in that they accepted only knowledge based on direct experience.

Inden and Harrison have been among historians who have revised Edward Said's original 1978 concept of Orientalism [8]. That concept largely ignored the replacement

of humoralism by Western science as the main reason why Western medicine was seen as superior after 1800. The positivist trend in Anglo-Indian medicine was part of the growing relationship between Western medicine and imperial power [9]. The Orientalists did contrast the rise of Western science with the decline of Indian science. Most felt that ancient Hindu and Muslim medical texts would be more informative than dialogue in person with their Indian medical contemporaries. Said himself stated shortly before he died in 2003 that concepts such as modernity and enlightenment were by no means simple and agreed-upon [10].

Modern historians have underestimated the degree to which some doctors did work with indigenous practitioners during the hundred years from 1775. David Arnold, for instance, often appears not to see beyond disclaimers in prefaces in which the authors asserted the superiority of Western medicine and the lack of modernity in Indian [11]. Largely this is because he is advancing his monolithic theme of Western medicine as part of British dominance in India. By 1840 there was convergence of Western medicine and the aims of colonial government, of which it had become an instrument. For him, the political and symbolic significance of Western medicine is more important than what this medical system actually comprised. In his later work he does acknowledge that Western science (including medicine) as part of modernity did eventually have an input from Western-trained Indians [12]. Other historians of India, such as C.A.Bayly, view medical interaction as a complex process about which generalisations are not possible. For instance, Indian presses were producing syncretised or joint tracts of materia medica by the 1850s [13]. Clearly, there was a market for Western medicines among some Indians. The other way round, the availability of translated Indian texts to British doctors facilitated the by-passing of contemporary indigenous practitioners, according to both Bayly and Harrison [14].

Despite this, Bayly himself gives several examples of direct collaboration [15]. The current thesis looks specifically at the activities and attitudes of these British doctors and at how successful were their efforts in establishing pharmacopoeias of Indian origin or in introducing Indian drugs into British pharmacopoeias.

By contrast, in the British West Indies there was no similar systematic study of African-Caribbean slave practices or medicines by British doctors. This did not stop the economic historian Richard Sheridan suggesting in 1985 that those doctors who showed an interest in the health of slaves also studied slave medicines. In fact, the humane among them were more concerned that slaves should get the same access to Western medicine as that enjoyed by free men, of whatever race. Sheridan went on to make the gross overstatement that white doctors "melded" African- Caribbean slave medicine with Western to create a creole form of practice [16]. On the contrary, the current thesis suggests that, from the 1840s, it was the African-Caribbean people, freed by emancipation but with the health-care provisions of the plantation system withdrawn, who were forced to develop a syncretised system for themselves. The only creolisation was of African-born slaves by creole slaves, during the slave-trade and after abolition. Evidence for such a creolised system among ex-slaves is circumstantial; Michael Craton points out that before and after emancipation, there is in general "a virtual absence of material directly derived from slaves" [17].

An important aim of this thesis is comparative study. The issue of the welfare of British troops in the two arenas has been looked at by historians, as has that of climate on health, particularly the hot or "tropical" climate of both Bengal and Jamaica. However, little has been done to compare what European doctors made of local practices or why there was such a discrepancy between the considerable interest shown in Indian medicine compared with the scant one shown in African-Caribbean medicine.

A comparison will also be made on a global basis and will encompass earlier encounters, for example those of the Portuguese in South Asia and of the Spanish in the New World mainland during the sixteenth century and Cuba in the nineteenth. This will allow interaction in India and the West Indies between 1750 and 1900 to be contrasted both with interaction world-wide and with that for the whole four hundred years of European colonization from 1500 to 1900.

This is an appropriate point to state why 1750 to 1900 has been chosen as the period for the main focus. It was a matter mentioned in the Preface but will be discussed further now. In political terms, the period covers the extension and consolidation of British power in India and the anti-slavery movement with abolition of the slave-trade then emancipation in the British West Indies. It should be said that Craton has suggested that the whole of the eighteenth century is worthy of study as far as the West Indies are concerned. He also cautions against treating the British Caribbean too generically, for instance making the most important colony, Jamaica, stand for all of the colonies in the area [18].

The period from 1750 was one of major change for Western medicine in Britain. In the first fifty years of it, the rational empiricism movement then the start of pathological anatomy meant that Hippocratic dogmatism and treatment were questioned. These changes were quickly followed by the use of vaccination with cowpox in the 1800s and by the development of alkaloid chemistry in the 1810s with the discovery of the active principles of plant remedies. In turn, the latter led to the creation of synthetic drugs. By 1870, science underpinned Western medicine even if therapeutic benefits in terms of specific drugs for specific diseases remained beyond reach. These changes have been documented by Roy Porter and William F.Bynum in works of their own and by them and other contributors in the Encyclopedia which they edited [19]. Bynum's 1993

Science and the Practice of Medicine in the Nineteenth Century is particularly important in this respect. The effects of these changes on medical interaction in the British colonies have not been considered until now; it is of relevance for this thesis.

The end of the nineteenth century, 1900, has been chosen as the end-point. After that, new or altered factors came into play. In Western medicine there were real therapeutic advances. In India, there was the long-delayed registration of Indian practitioners of Western medicine. Politically, there was the rise of Indian nationalism, even if independence would come much later (for British colonies in the West Indies as well as for India). This meant that in the twentieth century there were situations which were complex for different reasons. Inclusion of a period after 1900 would have affected the important comparative aspects of this study. David Arnold has said that in the 1890s there was "a shift away from the environmental paradigm...and the emergence of new scientific ideas" [20].

Bynum has charted the gradual switch during the nineteenth century from drugs of plant origin to those created chemically [21]. However, the role of doctor-botanists in British India and the Caribbean has not been studied specifically in terms of its effect on interaction between Western and indigenous practitioners. Richard Grove pays attention to the collaboration between Portuguese and Dutch botanists and local healers on the Indian subcontinent in earlier centuries. In addition, he looks at French eco-botanists in the eighteenth century [22]. Londa Schiebinger also gives emphasis to the work of French botanists, in particular the doctor-botanists in the Caribbean who recorded the plant remedies of both indigenous Caribs and African-Caribbean slaves [23]. The botanical historian Ray Desmond does touch on the dual roles of John Forbes Royle working in India then England from 1820 for more than three decades [24].

The current thesis looks at the activities of the doctor-botanists both as botanists and as doctors, also at the extent to which they worked with indigenous practitioners including herbalists. It also considers whether their knowledge of the binomial classification of plants, introduced by Linnaeus and available in India and the West Indies from the 1770s, allowed them to select likely plants for study directly, thus bypassing indigenous knowledge whether that of contemporary Indians or in "ancient" texts. This is not an issue previously considered. It may prove a more important factor than any bypassing of Indian doctors which resulted from the translation of such ancient texts, as put forward by Bayly and Harrison. Equally, no other study has looked at how far the doctor-botanists' work fed into the mid-nineteenth century Western materia medica or whether it achieved any lasting results. This is particularly germane, given the growth of scientific pharmacology during the 1870s, with loosening to the point of severance of the links between medicine and botany.

Any history of interaction is incomplete without the work of historians originating or based in the ex-colonies being taken into account. They should have a better chance of finding out the responses of the colonized or enslaved, though there may be a paucity of primary sources beyond official documents, as pointed out for India by Mridula Ramanna [25], as well as by Craton for the West Indies. They may have access to esoteric local sources.

Late twentieth century British historians take a more radical stance over British colonialism in India and the West Indies than did those at the start of that century. Parallel to this, Indian and West Indian historians understandably may have an agenda to pursue. Thus K.K.Roy states that the British showed little interest in Indian medicine, at least until late in the eighteenth century. V.V.Krishna and Deepak Kumar are concerned with the way in which the British in the next century sought to limit the

opportunities for Indians in Western science [26]. Muslim Indian writers such as Neshat Quaiser note that Western medicine itself derived from Arab medicine, reiterating what Unani doctors in India were saying over a century earlier [27]. The London-based (though Iraqi-born) surgeon M.A.R.Al-Fallouji not only points out this common origin but stresses the superiority of Arab medicine through Europe's Dark and Middle Ages, with European medicine arising from it at the Renaissance [28].

For the West Indies, Caribbean historians such as Hilary Beccles and Verene Shepherd have described the social situation before and after emancipation; they consider medical practices only as part of that situation [29]. Michael Craton, British-born but Caribbean-based, has adopted a neutral non-Eurocentric stance which owes little to the contemporary white plantocracy in the ex-British Caribbean; indeed, on occasion he has dismayed members of this [30]. In the current work, study of primary sources has been done in conjunction with that of the works of such Indian and West Indian historians.

Interaction in the New World between Spanish and Amer-Indian medical practitioners has been looked at percipiently by historians and scientists with Spanish as their mother tongue, such as Guenter Risse and Bernardo Ortiz de Montellano [31]. They have described the major confrontation of cultures which resulted from Spanish doctors attempting to fit the Aztec remedies of *Nueva España* (Mexico) into a Hippocratic framework. The distinctive nature of Portuguese and Spanish colonization has been detailed in the works edited by Leslie Bethell [32]. Historians in both Colombia and Mexico have drawn attention to the nationalist movements which throughout the nineteenth century tried to recreate European science, including medicine, in non-European formats, notably in terms of nomenclature and classification [33]. Ethno-botanists have described the syncretism of medical practices in Andean regions also the

fact that Amazonian and Central American tropical rain-forests can still provide new drugs through liaison with indigenous people [34]. The material, from both primary and secondary sources, allows for a comparison of interaction in Latin America with that in British India and the West Indies. This is the chief gain from broadening the scope of the thesis, since there appears to be no similar comparison in the literature. However, there are also comparisons which can be made for interaction across time on the Asian sub-continent and for the actions of Western doctors of different European imperial powers.

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Some Relevant Quotations

James Hamilton Patterson: (1994) Fact, like justice, is negotiable

Edward Said: (2003) Every single empire in its official discourse has said that it is not like all the others, that it has a mission to enlighten, civilise, bring order and democracy, and that it uses force only as a last resort.

Anne Marcovich: (1988) The phraseology of the French dominant culture included "civilization over barbarism" and "to colonize is to civilize". Medical diplomacy is a form of seduction (Salvandy, 1845).

Fred D'Aguiar: (1999) Anthony Trollope [1860] confuses civilization with a...slippery lineage stretching back to Greece and Rome.

Michael Craton: (1997) The post-modernist contention [is] that all history writing is relativistic, revealing little more than the mindset and culture of the writer.

Eliot Freidson: (1979) Any coherent description is biased as it as it reflects choice by the writer of what to analyse and what ideological stance to take.

Michael Biddiss: (1997) The history of medicine is now conceived as a social history of past sickness and health within communities.

Malcolm Darling: (1908) This absurd chosen-race complex of the British is one of our worst characteristics.

Edward Long: (1774) All people on the globe have some good...except the African. Negroes are almost incapable of any progress in civility.

Jeffrey Amherst: (1763) Amerindians: the vilest race that infested the earth, which deserves riddance of it.

Theodor Billroth: (1863) Pharmacology: not enough to keep a professor busy [above] three hours a week.

Benjamin Heyne: (1814) Of an Indian treatise of medicine: a system chimerical...a banquet of absurdity.

H.H.Wilson: (1825) The statements of Hindu physicians: a singular confusion of judicious principle, and ridiculous practice.

J.Ranald Martin: (1837) It were unprofitable to pursue the native empirics, whether Hindoo or Mahomedan, in all their shameless impostures on their fellow countrymen.

CHAPTER I

COLONIALISM, RACE AND MEDICAL INTERACTION

India and West Indies, 1750-1900

The first chapter is concerned with the background to medical interaction. It considers the nature of colonial rule and how this impacted on attitudes to medical practice in the colonial context. Metropolitan government and the colonial administrations in the two poles, India and the West Indies, were motivated largely by economic considerations. This applies to the East India Company (referred to as "the Company" from now on in this chapter), the local plantocracies in the West Indian colonies and, lastly, the British government, increasingly involved in ruling India. The nature of the economy based on sugar in the West Indies has been described by Eric Williams and by J.H.Parry and P.M.Sherlock, though without reference to medical interaction. R.B.Sheridan has also been concerned with economic and social aspects rather than interaction; however, he has considered the work of Western medical doctors in preserving the health and usefulness of slaves [1]. The commercial and strategic aspects of science in India have been considered by C.A.Bayly, with medicine one branch of this science [2].

The view of David Arnold is that Western medicine in India was an instrument of government [3]. He has concentrated on the role of British doctors who worked for the authorities on subjects such as topography and public health or who were involved in projects such as vaccination. To a lesser extent, he has looked at the work of doctors studying indigenous medical plants and remedies; for much of that work, the doctors did not hold a specific brief from the administration to be carrying it out. Thus, in India there seems to have been no official policy on interaction between Western and indigenous medical systems. The health of Indians was of concern to the authorities at times of crisis, such as plague, and also because Indians comprised the work force.

In the West Indies, there were comparable reasons for official attention to the health of African Caribbean slaves. This did not extend to an interest in slave medical practices, apart from concern about those practices which were considered to be potentially destabilizing for law and order. Otherwise, they held little interest for the plantocracy.

Besides economic pressure, there are two further issues which impinge on medical interaction; these are cultural ones. The first is that of language. The question of what languages should be used in India became important in the 1830s. In particular, this was for teaching science (including medicine) to Indians; in addition, it applied to administrative communications and for education as a whole. The possibilities were English, ancient Indian languages such as Sanskrit or the vernacular languages of India. Some administrators favoured English. Orientalists, with their interest in ancient Indian texts, typically wanted Sanskrit. Junior administrators at ground level might favour use of the vernaculars. Javed Majeed has looked in detail at the attitudes of James Mill, in London, and his followers, such as T.B.Macaulay and J.Ranald Martin, in India. However, C.A. Bayly feels that any "clash" between Orientalists and Anglicists such as Macaulay was no more than "a symbolic joust", given the vernaculars were already widely in use. In the decades after Edward Said's formulation of the concept of Orientalism, Ronald Inden has been prominent among those cautioning against too simplistic a view of this [4].

The second issue is that of race; this affects medical interaction in the West Indies as well as India. Indeed, the low status of the African, including New World slave, has been considered in depth by historians, such as Chris Smaje. For India, race has been a concern to Bayly looking at almost a hundred years from 1780 [5]. For the current thesis, the most important historical figure is the lawyer-planter Edward Long (1734-

1813), in Jamaica during the 1760s. Smaje devotes only two paragraphs to Long (in what is a study on a broad, global front). However, Long more than any other individual personifies white racial contempt for Africans offset by guarded admiration for their knowledge and use of medicinal plants. There was no reverse acculturation in the West Indies, thus take-up by the ruling whites of African cultural practices, medical or other. In India, such a process became less after the 1820s, as official and individual British attitudes hardened. Also from that decade there was an increase in the participation by British doctors in societies and other organisations associated with Western medicine in India.

Starting in the 1780s but with many more by the 1820s, official medical bodies and institutions were established, such as faculties, colleges and societies with journals. This trend followed a similar one in Britain. It did not occur in the West Indies. The effect of such communal medical activities on interaction needs looking at, as does that of changes in medical practice as a whole. In the current chapter, the nature and effects of colonial rule in India and the West Indies will be considered, with particular attention to official attitudes towards medical priorities.

Government and authority

The Company in India began as a commercial concern, with a set of trading posts under its aegis, founded at the end of Elizabeth I's reign in the 1590s. It was therefore motivated by economic considerations. Any intervention it made in respect of the medical care of its personnel was largely for economic reasons. From the 1760s, the Company required its doctors to keep day-books in which they had to record formally the diseases and fate of their soldier-patients. The attitude towards doctor-botanists who carried out surveys for the Company was also a commercially-biased one: down several

decades, the Company blew hot and cold about such ventures. "Pure" botanizing for its own sake was not approved of. One individual, Francis Buchanan (1762-1829), wrote to another, Nathaniel Wallich (1785-1854), in 1817;

> "The Court of Directors [of the Company]has indeed received my collection [of dried plants] with such contempt and arrogance that I would neither ask nor receive any favour from so scoundrelly a body" [6].

When in 1838, Robert Montgomery Martin brought Buchanan's *Eastern India* to posthumous publication, he found striking the contrast between

> "the richness of the country surveyed and the poverty of the inhabitants. [The reader] may arrive at a just conclusion with me, as to the commercial injustice which England...has so shamefully inflicted on her subjects in British India" [7].

Martin commented on the low rate of imports to Britain from India compared with the high rate of exports. Ironically, James Mill (1773-1836) had regarded "the economic and cultural riches" of India as a myth. This belief was re-iterated by H.H.Wilson (1786-1860) in mid-century editions of Mill's *History*. By then there was no profit from India in most years; British rule was no longer justifiable on the grounds of trade. Wilson was saying this at a time when even the cotton textile industry, with British machinery, was failing to compete with that in Britain [8]. This was not the situation envisaged seventy years earlier in the era of Robert Clive (1725-74), when men returned with their wealth from India and went into the British parliament, the so-called "nabob" block of members [9].

The comparable West Indian lobby, composed of absentee landlords from the plantocracy, was powerful in British politics for much longer, though its heyday was in the 1760s. Even so, there was no major absenteeism by plantation owners in the eighteenth century, a point made by Hilary Beckles in respect of Barbados. In most of

the colonies themselves, there were assemblies, elected by the freeholding planters, and largely formed of such planters, "a small close-grained oligarchy", according to Parry and Sherlock. On individual plantations there was a hierarchy, with planters or their "attorneys" at the top, below them employees (overseers, skilled workers), with slaves at the bottom. Separate social identities were retained. The slaves were either African-born or creoles, with syncretism between them, Michael Craton says [10]. Particularly in Barbados, there was an increasing percentage of creoles by the 1800s, as pro-natalist policies came to fruition. Except in the domestic situation, close proximity between whites and slaves was apparent rather than real. In the nineteenth century, after emancipation in the 1830s, the form of government initially persisted. Indeed, the plantocracies instituted measures to maintain cheap subordinate labour while avoiding any involving the heath or education of the ex-slaves.

During the heyday of slavery, before the 1830s, the production of commodities such as sugar was not in competition with Britain's manufacturing; the profits went back to the mother country. Both India and the Caribbean were seen as markets for British goods. As John Jeremie, president of the court in St Lucia from 1824 to 1830, put it in 1831:

> "Colonies exchanged all they produced, save the little required for their own consumption, for what is produced at home" [11].

By late in the eighteenth century, slave welfare became economically important; the Assembly in Jamaica in 1788 ruled that plantations had to employ a doctor while that of the Leeward Islands in 1798 passed an act to ameliorate the health of ill slaves. John Quier [1767-1838] was slave owner and planter as well as physician; he worked in Jamaica for decades. Quier gave a positive view to the Jamaican Assembly in 1815:

> "[He has] always found proprietors and managers inclined to comply with his directions and recommendations of any thing that might be requisite

and necessary for the comfort of the sick" [12].

His own service was tightly run to keep down both the number of slaves not working and also the costs of their medical treatment. By 1815, it made economic sense to look into the welfare of creole slaves. The Slave Trade had been abolished; the assemblies, made up of planters, were prompted not just by outside pressures, such as agitation in Britain. The slaves themselves knew that amelioration did not work. Their unrest itself promoted change.

Quier, in Jamaica, superficially appears to embody both colonial government and medicine in one man. In reality, he was just one individual doctor-planter. As will be seen in the section on official medical organisations, these were lacking in the British West Indies, even by the 1830s. In India, by contrast, from the 1760s the Company doctors were part of its medical service while by the 1830s, hospitals, medical education and societies were being established. David Arnold's thesis of Western medicine as an instrument of colonial government can be applied to India only, of the two main areas under consideration.

In Britain itself, Western medicine was undergoing major changes from the 1770s, as will be described in the next chapter. Doctors, often those with a Nonconformist background, were bringing in medical practices and education which were derived from observation and statistics, rather than from Hippocratic/Galenic dogma. These practices were therefore observation-based rather than theory-based. In India, doctors of the Bengal service were often Noncomformists too; it was a time when Britain began to conquer and annex Indian states [13].

Arnold has called Western medicine in India "an adjunct of British military power" by late eighteenth century, "dominant" by the end of the nineteenth [14]. Its main business was the health of the troops, white and native, needed for stability. In the whole of the

Empire, including India and West Indies, this was a concern. In 1835, an inquiry was set up by Parliament in Britain because of mortality in the West Indies;

> "to look into the extent and causes of the sickness and mortality among the troops in the West Indies, with the view to founding thereon such measures as might appear likely to diminish the great loss of life annually experienced in these colonies" [15].

There were records for twenty years from 1816 available to the men who carried out the inquiry, Alexander Tulloch and Henry Marshall. The endeavour was the first of several carried out throughout the Empire.

In India, such studies included the Royal Commission of 1859 on the state of sanitation within the Army and that two years later on cholera. The dates come a short time after the rebellion of 1858 known as the Indian Mutiny. The Indian Medical Service clearly had a role in protecting the white minority. Beyond that role, Western medicine may have been more a matter of show rather than of substance. It was a symbol of rationality and progress, in David Arnold's words. Western medicine, like the English language, was part of the ideological apparatus of the conquerors.

Culture and racial attitudes

In India, the question of what languages were to be used in government and education was a matter of major concern to administrations from the 1770s to the 1840s. It was one bound up with race, power and education, including instruction in medicine. Reverse acculturation occurred when Governor-General Warren Hastings (1732-1818) learnt Bengali and Urdu and encouraged his staff to do so as part of a drive towards administrative efficiency [16]. Later civil servants might be genuine philologists as well as administrators, including the doctor and Sanskrit scholar, H.H.Wilson. In 1800, Governor-General Richard Wellesley (1760-1842) founded the College of Fort William

at Calcutta; at it, Indian vernacular languages would be studied by British entrants. The Company under the Charter Act of 1813 was to take responsibility for the education of some Indians; partly, this was intended as a counterpoise against the activities of Christian missionaries. Only a small number of boys from wealthy Indian families could avail themselves of the opportunity [17].

By the 1830s, the authorities were involved in deciding between English and the Indian languages for use in science, including medicine, in education and in the professions. John Tytler wrote to T.B.Macaulay (1800-59) in 1835 that "Science is to be diffused generally by means of the languages of the country" [18] while H.H.Wilson wanted Sanskrit, "a refined language, with accurate rules", to be used for science. Much later, Wilson testified that Macaulay wrote "ingeniously but with an evident want of experience and knowledge of the country" [19]. Macaulay, secretary to Governor-General William Bentinck, thought that the use of English would strike a blow against the Hindu religion: "No Hindu, who has received an English education, ever remains sincerely attached to his religion". His Minute to the Council stated that he wanted to see

> "a class of persons Indian in blood and colour but English in taste, in morals and intellect" [20].

The English language was the key to achieving this.

C.A.Bayly coined his term "a symbolic joust" to describe the debate over languages, given that the vernacular languages were already widely used [21]. This puts in perspective the importance of what Vasantha has called "the Oriental-Occidental controversy" in which Orientalism gave way to the Anglicism of those such as Macaulay [22]. Edward Said felt that "The Orient" was a creation which was used to justify colonial rule, a place suitable for colonial administration as well as for study. Mark Harrison suggests that Said oversimplified "Orientalism" into a single discourse,

arising from the Enlightenment and linked with imperialism. Harrison also notes that Raymond Schwab's picture of an Oriental renaissance did not include science or medicine [23].

Schwab himself pointed out that Said took no account of "Orientalists" such as the French scholar d'Anquetil-Duperron who studied Sanskrit texts in India for over thirty years; Duperron concluded that because Western ideas were universal this did not make them automatically superior [24]. Ronald Inden in his *Imagining India* of 1990 has provided a detailed analysis of these two main European responses to India. Orientalists believed that they could use their superior Western rational approach to study Indian culture, aspects of which they found praiseworthy. The empiricists, including the utilitarian James Mill, thought this culture was based on imagination not experience. Or, as David Kopf put it, the Anglicists wanted assimilation to the British system rather than shoring up of Indian systems [25]. Orientalists appropriated Indians' right to speak for themselves while empiricists regarded them as incapable of doing this anyway. They were thought to be devoid of scientific rationality. Inden's commentary is relevant for many issues in the current thesis.

Despite a diverse rather than a monolithic response by Europeans, it remains true that many tended to contrast Hindu and Muslim cultural achievements of previous centuries with the current state of Indian literature and science, which they felt had undergone degeneration. Ancient texts were admired for the possession of systems and dogma giving authority. In addition, they were sources of information, including that on plants and the uses of these as drugs [26]. Sir William Jones (1746-94), in India from 1783 until his early death, spoke of "the skills...of the ancient Indians". From contemporary Asians, hints might be picked up by virtue of the superior knowledge of the British. He warned that

> "...although we must be conscious of our superior advancement in all kinds of useful knowledge, yet ought we not therefore to contemn the people of Asia, from whose researches into nature, works of art, and inventions of fancy, many valuable hints may be derived for our own improvement and advantage" [27].

Jones appears to have envisaged a passive native community from which Europeans could extract material worth developing, given the superiority of their Western scientific knowledge. This approach differed from that of the Portuguese Garcia da Orta, in Goa (India) in the sixteenth century, or of the Dutchman Hendrik van Reede in the seventeenth. They accepted that the knowledge of local native herbalists was superior and should provide the framework of their own studies, particularly for the purposes of classification (see Chapter V). Jones' attitude to contemporary Indians whom he met will be mentioned again later in this chapter. Half a century later, in 1845, the doctor T.A.Wise came to a similar conclusion to that of William Jones: Hindu medicine had wilted, in the face of Muslim hostility. He "aims to follow the decline of Hindu medicine", going on to state:

> "The native practice of medicine may now be said to be in this lamentable state of depression all over Hindustan, but it was far otherwise, as cultivated by the ancient Hindus" [28].

Wise thus showed Orientalist leanings shortly after the Oriental renaissance had given way to the British conquerors rejoicing in their own race and religion [29]. He was unusual in that he was also ready to express admiration for the individual native physicians whom he knew (see chapter III). Many Orientalists reserved their praise for ancient Hindu culture rather than contemporary. Wise's medical contemporary John Forbes Royle was like him in valuing both. Mill and Macaulay, on the other hand, had little good to say for either ancient or modern culture.

Mill observed of the ancient Hindus that "Rude nations seem to derive a particular gratification from pretensions to a remote antiquity". Mill thought that continental

Europeans were also inferior to the British. For instance, he was dismissive towards Portuguese behaviour during the sixteenth century:

> "From Vasco de Gama...a whole century had elapsed, during which the Portuguese had enjoyed, and abused, the advantages of superior knowledge and art, amid a feeble and half-civilized people" [30].

Mill was sweeping in his condemnation of Hindu religion. To him, the Hindu concept of Providence "is evidence of the mind of a barbarian"; he warned that despite "lofty expressions of devotion...they have the lowest and meanest ideas of the Divine Being" [31]. Mill was writing in England using secondary sources; however, contemporary British and other European doctors with first-hand experience of India showed a similar disdain for the religious component of indigenous medicine. They would condemn the mystical elements while wanting to extract from the practices what might be worth taking into the Western materia medica. For instance, Benjamin Heyne (1770-1819) in 1813 objected to religious opinions being mixed up with concepts of bodily functions. For Whitelaw Ainslie (1767-1837), also in 1813, "the Sanscrit [medical] works...are but too often obscured by mystical allusions, and a blind belief in the powers of magic and enchantment" [32]. This is the voice of modernity. Despite the statement, Ainslie did admire the Indian physicians whom he met, as will be seen in Chapter III.

James Mill himself got more agnostic as the volumes of his *History* came out, up to its completion in 1817; he would have accepted the negative stance of the Company towards Christian missionaries in 1813. The Indians were to be shown Christian values but most administrators in India did not feel that the British were there to evangelize [33]. In this respect, at least, the British were consistent in their modernity.

In the West Indies, slave medical practices were ignored, unless they were regarded as a threat to the safe and profitable running of the sugar industry. This applied to the magical and mystical elements, such as the activities of the slave *Obeah* doctors, whose

"black magic" was regarded as intended to harm not to heal. This is considered in Chapter III, that on "indigenous" or non-white medicine. The local government (comprising planters) did sometimes intervene; for instance, in 1760 such behaviour by *Obeah* men was proscribed by law.

> "Any Negro or other slave, who shall pretend to any supernatural power, and be detected in making use of...Materials relative to the practice of Obeah or witchcraft, in order to delude or impose on the minds of others, shall upon conviction thereof...suffer Death or Transportation" [34].

The subject of religion is bound up with that of race, the most important issue in this chapter. In the 1780s Enlightenment defining of racial stereotypes had led to a belief in white superiority. By the 1830s, Christianity, the imperial faith, sharpened the British sense of racial exclusiveness. Nevertheless, some evangelicals believed that conversion should be the the goal. Samuel Wilberforce (1805-73), Bishop of Oxford and son of the anti-slavery campaigner, hoped that the conversion of India would help to make men equal. In 1846, he asked rhetorically

> "Am I the keeper of the Hindu, the Indian, the Hottentot?...is the savage my brother? If all have sprung from the same parents then...the barbarian is thy brother" [35].

A decade later, Wilberforce was to become embroiled in the controversy provoked by Darwin's theory of evolution, itself a subject linked to that of race. In the West Indies, Anglican clergymen were part of the plantocracy; their brand of Christianity was not offered to slaves until the nineteenth century when it was felt that it might promote good conduct. On the other hand, the evangelism of Methodist and Moravian ministers was felt to be against planters' interests. The slaves themselves did indeed adapt and use the Nonconformist versions of Christianity, even if Anthony Trollope (1815-82) in 1860 felt that "religion does not often reach their minds" [36].

Samuel Wilberforce's choice of words is a reminder that the status of the African and his relationships to ape and white man had been a matter of debate down centuries. British attitudes towards the African, whether in Africa or as transplanted slave, will now be considered, as will those towards the Indians in India. There is a lot of primary material to show that the Indian became progressively belittled in British eyes during the nineteenth century, particularly after the 1858 rebellion known as the Mutiny. Some British regarded him as no more capable of taking a meaningful part in Western civilization or the processes of modernity than was the African.

The period of this study, 1750 to 1900, therefore covers much change in issues of race. J.G.Herder in the eighteenth century believed in pluralism; he was against forced deracination, the supplanting of a people's roots and culture by the actions of a conquering one. He felt that European empires subverted a naturally plural world [37]. The German Romantics, from Herder and Goethe through to Erich Auerbach in the twentieth century, championed diversity. In an article shortly before he died, Edward Said bemoaned standardisation of culture; one aim in Orientalism was to present a sequence of thought and analysis that ran through centuries [38]. By the 1880s Social Darwinism enhanced belief in racial superiority. Not that the British in India or the West Indies were ever in tune with Herder's philosophical concepts of a century earlier. C.A.Bayly notes that in the eighteenth century "native depravity was thought common to all Indians". The lawyer-planter in Jamaica, Edward Long, felt that Africans were incapable of civility. Bayly makes the point that in India, the racial hierarchy was created by the state while in the Caribbean it was made by society. The term "Slave Society", meaning a community based on slavery, obscures the degrees to which separate social identities were retained [39].

The low status of the African went back to centuries before the capture of Jamaica by the British in 1655. Chris Smaje notes that prejudice preceded slavery; European Christianity saw the African as inferior, from a distinctive group. This was expedient for plantation slavery as was the claim that Africans sold by other Africans on the coast of West Africa were slaves already. In the Caribbean, "slave" and "race" ended up equated with each other [40]. The white elite were ethnocentric, retaining their Lockean rights as Englishmen. Their culture was superior; that of African slaves could be dismissed.

In the second half of the eighteenth century, a polygenesist view of the genus of man allowed the African to be regarded as belonging to a different race [41]. Long, in Jamaica for fifteen years until 1769, published his *History* in 1774. He brought into his work knowledge from wide reading. That on the issue of race he used to justify the enslavement of the African. This was echoed in 1808 by John Poyer, who attested that the slave system rested on the "natural" principle of white superiority.

The full quotation of Long's on the "Negroe's" lack of civility reads

> "Negroes have repulsive physical characteristics...They have a void of genius and are almost incapable of making any progress in civility and science. As the proverb goes: All people on the globe have some good...except the African" [42].

Long regarded the "Negroe" [sic] as a distinct species. He felt it a misfortune that white creole women were brought up in constant intercourse with "Negroe" domestics. Nevertheless, the man who could write that an orang utan husband would be no dishonour to a Hottentot female wife was at the same time prepared to compare favourably the medical and botanical skills of the slaves with those of white doctors (see later in this chapter and in chapters II and III).

In the same decade, the 1760s, James Lind (1716-94), in the influential "*Diseases Incidental to Europeans in Hot Climates*", was being pragmatic rather than racialist

when he regarded Africans as substitutes for British troops in menial and dangerous tasks.

> "It does not seem consistent with British humanity, to assign such employments to a regiment of gallant soldiers, or to a company of brave seamen" [43].

Lind was aware of the greater resistance to both climate and certain diseases (such as malaria and yellow fever) shown by Africans and also of the finite numbers of white troops. Nevertheless, the adjectives eulogizing the whites do make the "British humanity" seem selective towards them alone. The British were gallant and brave, the slaves expendable. Only British deaths counted. In times of peace, the troops (non-white as well as white) were needed to protect the white minority in the presence of a slave force labouring under coercion. The same was true for India, both during the period of expansion and afterwards, with a white minority in need of protection.

In India, even during the heyday of Orientalism, racist disparagement was current. This was true of prominent British, in positions of authority, such as Sir William Jones. He said of an Indian money-lender: "I was forced to borrow of a black man...it was like touching a snake or a South American electric eel". Bayly comments that any Indian, particularly the Hindu native servant, was thought deceitful. If the white man was disadvantaged, his status of superiority was threatened [44].

A quarter of a century after William Jones, British men going out to India might have been influenced by the writings of James Mill. Mill described the Hindus as frivolous, apathetic, rude with "nasty, dirty habits". Of the Arts, he allowed the Hindus weaving as one in which they had shown some improvement; even that resulted from their "sedentary nature with little bodily exertion". Both the apathy and the sedentary nature may have been due to malaria, affecting particularly West Bengali Hindus, David Arnold has pointed out. For Mill, the Muslim was no better, with "the same insincerity

and perfidy, indifference to the feelings of others, the same prostitution and venality" [45].

Francis Rawdon-Hastings (1754-1826) arrived in India as Governor-General in 1814. He thought that "the Hindu was limited to bodily functions, with an intellect no higher than a dog or a monkey". Sixty years later, Lord Salisbury, Secretary of State for India, commented that "I can imagine no more terrible fate for India than that of being governed by Competition Baboos" [46]. The term "babu" was the name used for the Indian clerks in junior posts. The fears of such administrators were self-fulfilling. Right up to Independence in 1947, the British barred Indians from senior positions, including those in medicine and science. This point will be referred to again, later in this chapter and in other chapters. It is one reason why medical interaction was rarely a meaningful interchange.

Individual British men in less important positions than Jones, Hastings or Salisbury made similar comments. Major Beavan (who was himself open-minded) recorded that his fellow officers had "feelings of repulsiveness" towards Indian customs and habits. Ensign James Welsh thought the Indians "a race of beings seemingly intended by nature to complete the link between man, the image of his Maker, and the tribes of apes and monkeys". This was sixty years before Darwin's Origins. The Army doctor Norman Chevers in 1854 warned that the sly, timid, servile Bengali possessed "absolute untruthfulness, and ruthless disregard of the value of human life", with "the varnish of civilization very thin" [47]. By the 1850s, the term "nigger" was regularly in use in print in Anglo-Indian newspapers, as if Indians were held in the same contempt as were Africans.

From the standpoint of the subjects, the Indians, a retired British magistrate who had worked in eastern Bengal observed that "the Europeans were most popular in those

parts were they were least known". Richard Cobden (1804-65), with his admittedly biased anti-colonial stance, declared in 1857 that

> "Hindoostan...will prefer to be ruled badly *according to our notions* by its own than submit to the humiliation of being better governed by a succession of transient intruders from the Antipodes" (his italics) [48].

Cobden's was a minority viewpoint; for over thirty years, there had been convergence of Utilitarian attitudes and British colonial objectives, in Inden's words.

There were some among the British who reacted like Major Beavan, more taken back by the behaviour of his fellow British than by that of the Indians. One was Malcolm Darling: "This absurd chosen-race complex of the British is one of our worst characteristics". T.W.Webber of the Indian Forestry Service, looking back in 1902 said of his men that they "were in courage, high principle, and honourable feeling...equal to educated Christian gentlemen". Another who was fair-minded was Reginald Heber (1783-1826), arriving as Bishop of Calcutta in 1823, to die only three years later. Heber referred to

> "the exclusive and intolerant spirit which makes the English a caste by themselves [with] their foolish, surly, national pride. We shut out the natives from our society, and a bullying, insolent manner is continually assumed in speaking to them" [49].

Heber nevertheless appears to have tacitly accepted the concept of a hierarchy of races. Shortly after his arrival in India he commented in his journal on the people at Banaras [sic]: they were "taller, fairer, finer and might be taken for Europeans".

The nearer a tribe was to appearing European, the nearer they came to being thought civilized, though still below Western man in the hierarchy of man. For Macaulay in India and for Samuel Wilberforce and the humanitarians "civilization" meant European culture: the latter aimed "to wash the Blackamoor white". Buxton's Report of 1837 looked at Africans in Africa itself, proclaiming "the negro race...of good average intelligence". The natives could "work, improve themselves and put on trowsers" [sic].

For missionaries, the minds of the Africans represented "a blank sheet whereon we may write as we will, without the necessity of first deleting old impressions" [50]. This must have seemed an easy task compared with the situation in India, with at least three established religions to combat. It is also an indication of the belief that the African had no culture, the West African coastal societies the least civilized of all, with little technical "advancement" [51]. Reginald Heber came to India without bigotry but was imbued with the European's innate superiority. Many British doctors showed a similar mixture of admiration for Indians while remaining conscious of their own more advanced culture, including medicine; this is taken up in later chapters.

Western science and education in British India

Belief in the superiority of Western science was evident as early as the 1780s. The exhortations to doctors which were given by Sir William Jones were general in nature rather than specific. He did, however, have a grasp of post-Linnaean botany. Arnold regards a large part of the science conducted in India before 1858 belonged to the "amateur-gentleman" tradition; Jones, at least, fits into this category. David Ludden has called Jones's Orientalist attention to Indian culture that of a scientist not an imperialist [52]. Jones's First Discourse was the inaugural presidential address to the Asiatic Society of Bengal and was given on February 24th, 1784, within a year of his arrival. Later on, in the Eleventh Discourse, he defined science as "an assemblage of transcendental propositions discoverable by human reason". He denied that in Asia "there exists one original treatise on Medicine considered as a Science" [53]. Later, empiricists such as Macaulay saw the Indian mind as imaginational rather than rational, "devoid of scientific rationality" as Inden puts it [54]. Macaulay's contemporary, the Medical Superintendent of Calcutta, J.Ranald Martin (1793-1874), felt that

> "the diffusion of European medical science...must prove one of the most direct and impressive modes of demonstrating to the natives, the superiority of European knowledge in general" [55].

So science was part of impressing the conquered though not perhaps for exalting them, given that modernity was thought to be beyond their reach. Science was also part of the means by which the British government were to control India.

Surveying and mapping were essential to that control. Lord Dalhousie, arriving as Governor-General in 1847, saw Western science as the key to progress in India [56]. However, after 1850, this meant what was economically useful, applied sciences such as coal prospecting and irrigation [57]. There was a strategic as well as a military purpose in such surveying. Francis Buchanan, the doctor-botanist who carried out surveys early in the nineteenth century, provided maps of towns and river-crossings. The Company supported the surveying in the Himalayas by the doctor-botanist Joseph Hooker because of its military importance [58]. This was using scientists to gather information as a means to an end: "knowing the country" as one step to controlling it, in the words of C.A.Bayly [59]

Recording the whole field of extra-curricular activities, D.G.Crawford, in his 1913 *History of the Indian Medical Service*, listed the non-medical work which was done for the Company. The surveying included geography, geology and botany as well as applied anthropology [60]. One doctor, William O'Shaughnessy (1808-89), the Professor of Chemistry in Calcutta, persuaded Dalhousie to let him set up a telegraph system. He was knighted for this in 1856, two years before the Mutiny, when the telegraph was held by many to have "saved" India (for the British). Yet it was in education and in the production of the *Bengal Pharmacopeia* of Indian drugs that O'Shaughnessy's main work lay.

Education provided the means of training Indians for the lesser, more junior roles in the British administration and in the professions, the higher positions of which were retained for the British. The comments by J.R.Martin given above were made on the occasion of the founding of the School of Medicine in: "The foundation of an *English* School of Medicine is 'of importance'" [his italics and inverted commas]. Even so, one editorial did regret the absence of European students, needed for their "aspiring spirit and intellectual reasoning". H.H.Spry (1804-42), also of the Bengal medical staff, published his *Modern India* in 1837, the same year as Martin's work on Calcutta. Without getting involved in the "symbolic joust" over languages, Spry recorded the effects of this, notably the bringing in of English for the teaching of science to Indians. "In reference to the Scientific Institutions of Calcutta, changes have been introduced, with the English language the tongue of instruction". The government of Calcutta had established "a new medical college":

> "Hitherto, it has been found impossible to impart scientific knowledge efficiently, owing to the greater part of the modern terms in the Sciences having no symbols in the dead languages of the East" [61].

A contemporary linguist, such as doctor and Sanskrit expert H.H.Wilson, might not have agreed with Spry's simplistic reasoning, particularly at a time when new terms were being created from Greek and Latin for European science (including the word "scient-ist" itself, by William Whewell in 1833 to contrast with "art-ist"). Inden quotes the Oxford philologist Friedrich M.Müller (1823-1900) as suggesting that all scientific knowledge rests on language so perhaps Spry's response was an appropiate one. Michael Lewis has said that medicine was important for formulations such as 'modernity' and 'progress' that stood near the centre of self-justifying imperial rhetoric [62]. The only chance that Indians had of comprehending the modern world of science was in the language of that science. In the event, they got scant opportunity to do so,

despite the efforts of some liberal administrators from the 1830s onwards. Scientific and technical subjects were neglected in the universities. The work of William O'Shaughnessy in Calcutta and Charles Morehead (1807-82) in Bombay were exceptions.

In the preface to the *Bengal Pharmacopoeia* of 1842, forerunner to the Indian Pharmacopoeia of a quarter of a century later, O'Shaughnessy stated that further studies of drugs would be assessed by a "Committee including both a European and a Native practitioner" [63]. Also in the 1840s, as Professor of Chemistry, he took steps towards the education of Indians in Western medicine, not only in India but also in London. In Bombay, the Grant Medical College, founded 1845, produced its first graduates in Western medicine in 1851. Its principal, Charles Morehead, aimed for "a wholly scientific Indian professional of medicine". Even so, the Indian graduates remained subordinate and poorly paid [64].

This education in the sciences did not lead far. V.Krishna records that late in the nineteenth century, Indians were prevented from carrying out scientific research. They were restricted to fact-gathering work, what he refers to as "low science" [65]. He calls this policy one of discrimination against Indians. It could be said that British scientists earlier in the century were "used" by the Company in similar fact-gathering; the scientists were allowed no control over what was done with their findings and reports. This is shown by the outburst of Francis Buchanan at his treatment, given earlier in this chapter. However, later in the century, if Indians did get educated as scientists, they were systematically kept out of senior positions. Control remained with the British.

British scientists and government had an uneasy relationship even before the nineteenth century. In London, Joseph Banks (1744-1820) was powerful enough in the 1790s to get the Directors of the Company to listen to him. In 1795 he persuaded them

to publish the first volume of the doctor-botanist William Roxburgh's (1751-1815) *Plants of the Coast of Coromandel.* The preface declares Banks's involvement and the aims of the work:

> "Published under the direction of Sir Joseph Banks... for the East India Company Court of Directors...with a more immediate view to utility...the admission of new plants [with] qualities and uses yet to be explored". [66]

Banks needed his powers of persuasion to promote to the Directors something which held no early prospect of economic benefit, particularly in time of war (and taxation for that war, making selling copies of the work harder). Indeed, it took until 1820, the year of Banks' death and five years after Roxburgh's, for the third and final volume to be published.

Another doctor-botanist, John Forbes Royle (1759-1858), sounds effusive about "that enlightened body" [the Company] for its munificence in distributing surplus dried plants from its London storehouse throughout Europe in the early 1830s [67]. In truth, the Company had been slow to act until it realised it could create space by getting rid of the herbarium. In addition, the doctor-botanist who did the job was the Dane, Nathaniel Wallich, for more than twenty years a much put-on employee of the Company. For Royle it remained a body to be flattered, with the aim of ensuring its future cooperation. In the 1840s the doctor-ecologist Edward Green Balfour (1813-89) could not persuade the main government of India that steps were necessary to halt and reverse deforestation. The arrival of Lord Dalhousie as Governor-General in 1847 improved matters, with his utilitarian views. Richard Grove calls Balfour unusual in taking an interest in the culture and welfare of the indigenous population [68].

For Mark Harrison, Royle exemplifies an Oriental surgeon; he does show one trait of the early Orientalists in his obsessive collecting of facts, as suggested by D.Lorenzen [69]. Edward Balfour was the same, personifying the best of colonial science; he was

committed for more than forty years to recording many aspects of India and to applying scientific knowledge for the benefit of the whole population. F.Zimmerman has called the term "colonial science" an ambiguous one, which he breaks down into research, pure and applied [70].

David Arnold uses a comparable term, "colonial medicine", which he regards as a distinctive entity [71]. His description is that of a state-controlled and dependent medicine which in India largely ignored indigenous medicine and confined itself to protecting the troops, latterly by public health measures. The professional appointments and the hospitals were both exclusive, mainly for Europeans. Western drug therapy remained ineffectual, even dangerous, and the native population benefitted from being denied it. The vast majority were still using indigenous practitioners in 1900. The value of quinine to Europeans was evident, though less striking in India than in Africa. The distinctiveness of "colonial medicine" seems to lie in the administration rather than in the substance (though public health measures were beginning to reduce British death-rates by mid-nineteenth century). Arnold's assertion will be further considered in Chapter II but government's interest in the welfare of the troops will be mentioned here.

D.G.Crawford described the re-organisation of the British medical services for India in the 1760s [72]. There were double commissions for doctors, who became army lieutenants but also assistant surgeons; they were therefore both military and civilian doctors. If promotion were offered, an individual then had to choose, between becoming military Captain or civilian Surgeon. This joint service remained in place from the eighteenth century onwards. These were the doctors who from the 1770s were ordered to keep day-books which provided statistics about illness and death among the troops [73].

However, it was the public health movement in Britain and in particular the Chadwick report of 1842 which triggered parallel measures in India [74]. Epidemics of cholera in India during the first half of the century were a further reason for the separation of Europeans from the native population. Interest in the health of that population developed from the 1850s both because it represented a pool of disease and on economic grounds as it comprised the work force.

In his *History of India*, H.H.Spry gives an overview of medical organization in 1837. He regarded the arrangements for new troops as poor, leading to "the hasty ravages" of disease. The hospitals, however, were on "a liberal footing", with a good space between the bedsteads [75]; the need for ventilation, evident to James Lind as early as the 1740s, was clearly accepted. P.Boomgard has called hospitals part of European medicine's exports to Asia, while adding that the concept of hospitals was colonial in origin [76]. Missionary hospitals aimed at the local population were a feature in Spanish America and in Africa but not in British India [77].

Another part of the colonial medical hierarchy in India was the founding of medical societies from the 1780s onwards; there was a proliferation in the publications and transactions of such societies in the 1820s. By the 1870s some had ceased publication. In his study, A.Neelameghan includes societies with a broader base than just medicine, such as the early Asiatic Society of Bengal. This was a copy of the Royal Society in England. The first issue of the *Transactions of the Medical and Physical Society of Calcutta* was in 1825. In 1827, Baboo Ramcolol Shen was invited to speak; he had been brought to the notice of the society in 1825. Introducing him, the doctor-linguist H.H.Wilson referred to him as "a respectable and intelligent member of the native community", before going on to say that "the practice he describes [in the treatment of cholera] is for the greater part the most barbarous empiricism" [78]. J.Ranald Martin,

writing a decade later, remained in no doubt that medicine was the preserve of the European and about the reasons for this:

> "The native [sic] humanity of all Europeans, and the habitual indifference to the feelings of others so often found in Asia, would of themselves go far to account for the difference in knowledge in the healing art" [79].

Martin, who left India some three years after this 1837 publication, was uncompromising. He was echoing James Mill, but with first-hand experience. Both Macaulay and Martin represent Gramscian "hegemonic agents", dictating an imperialist discourse from positions of authority [80]. William O'Shaughnessy, as mentioned above, was more constructive (as was Edward Balfour). Even so, despite his efforts only a trickle of Indian students got to London from Calcutta to take their degrees. The *Annual Report of the Medical College of Bengal* for 1845-6, the eleventh year, recorded that in that session the medical degree was first recognized by the Royal College of Surgeons of England, the University of London and the Worshipful Society of Apothecaries. Students had to travel to London for the examinations [81]. As such, it was an isolated example of Macaulay's hopes of 1835 come true: "a class of persons Indian in blood and colour but English in taste".

Such Indian doctors who were fully-trained in Western medicine formed a small minority. From the 1820s, basic medical training of Indians in India was intended to supply medical personnel who were cheaply-trained, poorly paid but possessing a better life expectancy than that of their British seniors. By the 1860s, regulation of medicine in Britain was tightened, in terms of both the qualifications and the manner of practice by doctors and also in the standardisation of the drugs they used. In turn, this was to widen further the gulf between British and Indian medical men and practice in India. The regulation of medicine meant that the status of Indian health staff within the British-run Indian Medical Service was down-graded. The standardization of drugs

meant that British mistrust of indigenous remedies increased. Equally, British attitudes also hardened towards all Indian indigenous medicine, that of Ayurvedic and Unani and other medical practitioners.

The year 1868 was that in which the *Pharmacopoeia of India* was published, a work which listed local succedaneums fit to be included in a Western medical pharmacopoeia. In the same year, an editorial in the [Western medicine] *Indian Medical Gazette* acknowledged the role of native doctors in the North-West Provinces. The quotation is given more fully in Chapter III on indigenous medicine but parts of it relate to British social attitudes so are also given here:

> "These men hold their own, and are greatly respected...Under British rule...they have little standing in European society, where they are virtually ignored". The editorial goes on: "Some may think that in encouraging native hakims and vaids, assistance is being given to the propagation of error".

The plan in medicine to educate a few in order to reach the masses had failed so now an attempt to benefit the thousands of hakims should be considered:

> "European surgeons would do well to acquaint themselves with the books used by the hakims and vaids...without...these, they can with difficulty influence the native practitioner for good".

By 1891, the door had been slammed shut on such encouragement of indigenous practitioners, an editorial now saying:

> "We question very gravely the expediency of fostering the study of a system of medicine originally established on a basis of deduction, and incapable from that very circumstance of adaptation to advancing physical and physiological science, or of progress in the true sense of the term" [82].

John Hume records a similar hardening against indigenous medicine in the Punjab, annexed in 1849. District Commissioner T.H.Mercer used hakims in medical work; an "Oriental College" in Lahore gave hakim degrees in the 1870s. By the 1880s, such endeavours were discouraged and by 1890 they had ceased [83].

The responses of indigenous Indian medicine to these measures can be seen, both Ayurvedic (Hindu) and Unani (Muslim). K.B.L.Sen and K.A.Sen in their foreword to the 1900 (Second Edition) of U.C.Dutt's *Materia Medica of the Hindus* attempted to goad the British administration into action. A Government Commission in the 1890s had dragged its feet over a duty to consider "the desirability of extending the use of indigenous drugs in India". Sen and Sen pointed out that

> "the large number of Hindu physicians in Calcutta, in competition with Allopathic [Western]...practitioners, is a standing testimony to the value of indigenous drugs" [84].

Unani medicine showed the same mixture of self-critical defiance mixed with self-assertiveness, as pointed out by Neshat Quaiser. Its protagonists observed that Muslim/Arab medicine was the progenitor of Western medicine. Some Unani practitioners wanted to update their system by including Western medical practices. Others wanted to join forces with Ayurvedic doctors in resisting the medicine of the British oppressors [85]. The issues are further considered in Chapters II and III of the current thesis.

The alteration in the relative standing of Western and indigenous doctors in India was mirrored in the changes between the 1842 and 1868 pharmacopoeias of Western medicine in India. O'Shaughnessy's earlier *Bengal Pharmacopoeia* gave way to the *Pharmacopoeia of India*, produced for the India Office in London. O'Shaughnessy was a member of the committee which was responsible for the later work, under the editorship of Edward D.Waring.

However, the work was not so much a successor to the Bengal work as one in response to the British Pharmacopoeia of 1864 and, as such, turned its back on indigenous Indian medicine. That 1864 work itself substituted for the three national pharmacopoeias (London, Edinburgh, Dublin). For it, among "Natural History Books

referred to, containing Plates of Officinal Plants" are European ones on Indian plants going as far back as van Reede's (1690s). To that extent, the British Pharmacopoeia takes a backward look as well as anticipating chemical pharmacology. Even so, indigenous medical texts are not mentioned and there is none of O'Shaughnessy's earlier highlighting of plant drugs "used in practice by Native physicians" [86].

Clearly, in India there was some interaction though by 1900 not much had been gained from this conceptually by either party, Western or indigenous medicine. A few drugs and practices were interchanged with little effect on the respective systems. Of course, there was dialogue, even if a lot of it consisted of rhetoric by doctors and by the press on the two sides. In contrast, in the British West Indies after the 1840s, there was not even dialogue. The situation there after emancipation will be mentioned briefly in order to contrast it with that in India during the same period of time. It will be considered more fully towards the end of the chapter, in the correct time sequence after the era of slavery is looked at.

British West Indies 1750-1900

For roughly the first hundred years of the period under consideration, the plantocracy system of government persisted. After 1840, there was economic stagnation, coupled with inadequate intervention by metropolitan government [87]. Eric Williams has observed that the continuation of plantocracy government in the colonies was as if these remained in the eighteenth century [88]. In what he has called "the ordeal of free labour", ex-slaves were prevented from owning land and a modified form of slavery continued in all but name. The African was regarded as of no use except on sugar plantations, which had become unprofitable anyway. He would be replaced by immigrant labour, notably from the Indian sub-continent [89].

In the 1830s, the plantation owner was officially obliged to provide medicine and medical attendance for the apprentices. Thereafter, the African-Caribbean labouring populace were abandoned, to continue with their own pragmatic blend of medical practices. William G.Sewell, visiting the British West Indies in 1859, noted that ex-slaves in many colonies had organized themselves for most activities of daily living. Nevertheless, field labourers had poorer health and higher mortality than previously, with the loss of (Western) medical care one factor [90].

Superficially, the position was comparable to that for the indigenous population in the Indian subcontinent, where the majority continued using their traditional systems, with little taken from Western medicine. Indian mortality was also rising during the latter half of the nineteenth century. Before the 1840s, of course, the position in the West Indies was radically different from that in India, in terms of government and white society's part in running this. The West Indies during that earlier period of 1750 to 1840 will be considered now.

Most of the issues which were of concern to the British authorities in India during the first half of the nineteenth century were not ones shared by the local plantocracies of the British West Indies. Comparisons have been made in this chapter of style of government, the questions of race and religion and the regulation (or lack of this) of medical services in the two poles. These and other topics will now be looked at more specifically for the West Indies in a block, with differences between the eras during and after slavery noted. Further comparisons with the situation in India will be made when appropriate.

Both peoples in the West Indies, European masters and African slaves, were not indigenous, even if an increasing percentage of both were creole-born. Caribs remained on the Windward Islands but seemingly without any ancient culture to be admired or

contrasted with their current status, as in India. The actions of the white oligarchy affected slaves through the plantation hierarchy, which formed autonomous mini-states within the larger one. The general attitudes of whites towards Africans have been given already. Quotations from the account of Edward Long towards African slave medicine show his ambivalence. The remedies which slaves used may have arisen from "chance... brutes are botanists by instinct". Despite this, their "herbs... have subdued diseases incident to their climate, which have foiled the art of European surgeons at the factories". Among British doctors, there was often

> "a total ignorance...of botanical knowledge. The Negroes are well-acquainted ...with herbs and plants, which a regular physician tramples underfoot" [91].

It will be seen in subsequent chapters how few British doctors in the West Indies had the time or inclination to look for herbal remedies, whether to be found for themselves or observed by them in use by slave doctors. There was no organization to encourage such activities, unlike the network for the studies in botany and geology set up by the Company in India.

Edward Long also inveighed against the lack of regulation or registration of white doctors in the British West Indies in the 1760s. This again contrasted with the position at the same time in India, where the Company had moved to control the appointment and deployment of its medical officers. Long invented a fictional doctor who set up in practice, only to spread "depopulation far and wide...his instruments of death [being] mercury and opium" [92]. In both India and the West Indies, there were doctors trained in Scotland, in particular Edinburgh. For the Company's service this was partly due to the patronage of Henry Dundas [1742-1811]. In the West Indies, planters' sons went to Edinburgh to be trained; they included John Lettsom and James Thomson. There was also the negative factor of Scottish doctors being ineligible for posts in and around London.

The picture in the West Indies was more like the one in Britain than that in India, with a mix of variably qualified men putting up their plates. John Williamson complained that

> "Those persons who pursue the practice of the healing art are of various grades, from the apothecary's boy to men of the greatest eminence and worth...Few, if any, countries suffer so severely owing to the admission of persons to practice medicine, surgery, who have no competent pretensions" [93].

The planter, or manager, was the authority; Bryan Edwards (1743-97), planter, declared in 1793 that "planters would no longer tolerate illiterate pretenders in medicine", a statement of intent. He was nevertheless ready to assert that slaves were indebted for

> "medical attendance and accommodation when sick. Every plantation...is under daily or weekly inspection of a practitioner in physick and surgery, who very frequently resides on the spot" [94]

Numerically, too, there was a lack of regulation. In peace-time there were too many doctors. In 1764, William Wright (1735-1819) found meagre rewards from practice as "the supply of medical practitioners in Jamaica was...above the level of demand" [95]. In the 1820s. again a time of peace, Jacob Adolphus, the deputy inspector of hospitals in Jamaica, commented

> "the profession in the Island is overstocked, and the peace by depriving so many of occupation, who during the state of war had been attached to the Army, has rendered our brethren mere drugs in the market" [96].

Nevertheless, by 1823 Cynric Williams could observe that "This is a superb country for physicians; a customary fee is a doubloon, and the inhabitants are all sick in turn" [97]. In times of war, from 1780 to 1815 for instance, there was a shortage. In 1810, Walter Train, attorney-manager, wrote to his absentee proprietor in Bath, England, that "there has been no Medical Person in this neighbourhood to attend to the sick" [98].

In Trinidad, a Crown Colony from the time of its take-over by the British in 1797, licensing of medical practitioners was set up by proclamation, issued by Governor Woodford in 1814. This required practitioners

> "to produce any permission, licence or authority by virtue of which such person or persons now practise Physic or Surgery or vend any Medicines or drugs" [99].

The proclamation had little effect. Twenty years later, in 1833, Jamaica tried to follow suit and regulate doctors but the Privy Council in London blocked the Act which the Jamaican Assembly had passed. It was "an Act for regulating the Practice of Physic and Surgery, and for establishing a College of Physicians and Surgeons on this Island" [100]. The Royal Colleges in London might have supported the aim to regulate but not the setting up of a college which was independent of them and therefore a rival. Before this, Edward Long in the 1770s and Dr John Smith in the 1820s had bemoaned the fact that there was no medical college in Jamaica. In fact, there was none in any British Caribbean colony (in contrast with Spain's policy in its New World colonies). Long felt that what was needed was not only licensing but also

> "a College, endowed with a library, lectures on physiology, pathology, anatomy, botany, and the materia medica, as well as inspection of apothecaries' wares" [101].

In his turn, sixty years later, John Smith was clear that

> "a knowledge of diseases peculiar to warm climates might be most advantageously obtained by establishing a faculty or school of medicine" [102]

At Codrington College, Barbados, a Professor of Medicine was in fact appointed; one holder, James Dottin Maycock, published in 1830 his *Flora Barbadensis*, a botanical work, as its name indicates [103]. There is no evidence that the white teenage students got any teaching in medicine and surgery. The College, set up early in the eighteenth century, did not provide a medical education, despite the aims of its founder. The

appointment of Maycock should not be seen as a similar move to contemporary ones in India, which were intended for the training in Western medicine of Indian men. Any focus on education prior to emancipation was directed entirely towards the sons of the white plantocracy.

Earlier than the 1830s, there were a few official medical posts in the West Indies apart from the informal ones in general practice (urban, or rural to plantations, or combined). Thus, Thomas Dancer (c.1750-1811) was not only botanist and superintendent of the botanical garden in Jamaica. He was also appointed physician to the hospital in Kingston, though Dancer claimed vociferously that he was prevented from taking up this post [104].

The issue of amelioration has been mentioned already. Assemblies as well as individual planters or attorneys did consider slave health and the medical arrangements for looking after slaves. The 1788 Act in Jamaica required a doctor to report on slave deaths, "with the causes of such deaths, to the best of his knowledge, judgment and belief" [105]. Officially, this meant that doctors had to be in attendance. The Act was triggered by a combination of increasing prices for slaves, humanitarian agitation and the prospect of abolition of the slave trade. One way in which the managers of plantations could pay lip service to "care" of their charges was by showing off impressive lists of imported supplies of medicines; Michael Craton considers that this was not a meaningful contribution to the welfare of slaves [106]. The system of per capita fees encouraged cursory treatment. Bad health among slaves was put down to malingering and racial inadequacy; much the same was said about West Bengali Hindus during the nineteenth century.

By that century the place of women slaves was altering. In Barbados, they were in a majority, as were creole-born slaves overall. Planters there were ready for the

impending abolition of the slave trade as they were well-supplied with creoles, whom they regarded as more rooted and less disruptive than those imported from Africa [107]. Women slaves were reviled by William Shand of Jamaica; he testified to the Select Committee on Slavery in 1832 that "the women are fully as vicious as the men, often more so". Plantation records show that women were the more persistent offenders, their acts including "exciting discontent in the [field] gang" [108]. The 1820s saw a loss of the acceptance by white society of overt sexual relationships between white men and Indian women in India and white men and slave women in the British Caribbean. In India, the brothel replaced concubinage.

The gulf between the British and their subjects, free or slaves, was widening in both the East and West Indies. As will be discussed in Chapter V, there was never such a gulf between Spanish and Amerindians in Latin America. The Jesuits might proselytize their one true religion while the Spanish laity might be overbearing but the Spanish did not appear to share the British sense of their own superiority, in their attitude to Amerindians (though not that towards Africans). The Jesuits embody another reason for British self-regard. The Anglican Protestant faith was felt to be compatible with the modernity of Britain, as the most advanced state in scientific and industrial terms by the late eighteenth century. The old rivals, Catholic Spain and France, could be seen as lagging behind.

In the post-emancipation West Indies after 1840, the British sense of their own superiority over African-Caribbeans was accentuated. The population in most islands at the time of emancipation comprised a small number of whites, a group of free people of colour and a large slave community, now freedmen. Local governments in the West Indian colonies became even more at loggerheads with central or metropolitan government in Britain than they had been during the time of slavery. The nearest

parallel in India would be the final twenty years of the Company, the commercial concern which was to lose its remaining powers in 1859. Prior to that, much of the Company's scope to rule had already been taken away by central government. In many British Caribbean colonies, the planters dragged their feet in implementing measures to make emancipation a meaningful benefit to ex-slaves. The apprenticeship system was meant to replace slavery on a temporary basis to give ex-slaves security of employment. The planters saw prolonging it as a means of holding on to cheap, subordinate labour. Eric Williams has called this "modified slavery". Parry and Sherlock write about neglect by central government at Westminster, compounded by economic stagnation in the colonies [109]. However, the records suggest that metropolitan government from a distance was determined to implement measures through its Governors on site but was frustrated by the local planters' legislature [110]. There were times when the Governor sided with the plantocracy; on one occasion this led to the brutal suppression of the Morant Bay uprising on Jamaica in 1865. Liberal opinion was outraged at the spilling of (creole) African blood but the conservative Thomas Carlyle used inflammatory language about Africans reverting to savagery [111]. In the 1860s, Darwinism had given a new lease of life to the polygenesist theory of the origin of man. Carlyle could see no good in the West Indian "Negroes". His utterances make those of Edward Long a century earlier seem balanced in comparison. The remarks of the novelist Anthony Trollope in 1860 are couched in similarly savage language to that of Carlyle. Trollope regarded the "Creole negroe" as "without any identity or pride" and someone who did not understand "the object of truth, or the results of honesty". For Trollope, "sugar and labour are almost synonymous...convertible substances": the creole African is reduced to a commodity. He commented sourly on the African's facial and general appearance. He felt that the only freedom which the Anti-Slavery Society had achieved "for the

negro" was that to be idle; he objected to the "feather-bedding of negroes". He also disapproved of the Society's suggestion that importing labour ("Hindostan Coolies") represented a return to slavery as well as affecting the interests of "negroes". Opinion was clearly polarized between people like Carlyle and Trollope and the liberal thinkers whom Trollope derided. Trollope did make some positive assertions, though it might have been mock resignation when he said that "the negro has a right to share with us the high places of the world" and that Providence intended miscenegation, with whites supplying the intellect, blacks the labour. He stated that the attachment to a master was that of a dog [112]. This was echoed in the 1880s by James A.Froude, Professor of History at Oxford, who said that "the Negroes are children", who would attach themselves to a white employer "with at least as much fidelity as a spaniel" [113].

By the second half of the nineteenth century, almost all colonies had become Crown ones, like Trinidad and St Lucia were from the outset of British rule towards the end of the eighteenth century. The plantocracy accepted the retention of metropolitan powers through the latter part of the nineteenth century on the negative grounds of colour: they felt that representative government would lead to domination by "the Negroes and mullatoes" [114]. Crown colony status did not mean that the populace gained in terms of better conditions, indeed Brereton and Yelverton have said that "the ending of slavery in the Caribbean was a prolonged trauma which lasted for almost a century" [115]. The plantocracy retained control of land and commerce and through this its hegemony.

As in the governance of their daily lives, so with regard to the Christian religion. As stated earlier, during the age of slavery, Christianity was not for African Caribbeans; whites objected to the inculcation of doctrines of equality. Slaves had responded positively to the concept of the Christian nuclear family and the white minority began to

realise that this might lead to stability. However, the Methodists and other evangelizing groups were unpopular then and after emancipation [116]. This was true in India where after 1840 Christianity was seen as the preserve of the conquerors, Nevertheless, religious instruction was the only form of education which planters would tolerate for their ex-slaves. Trollope was scathing about "the negro's religion"; he felt that the exercises (psalms, prayers, Scripture texts and doctrines) were parroted but with no effect on personal behaviour or the mind [117].

Hilary Beccles has detailed the running warfare between central government, as mediated by individual Governors, and the plantocracy, determined to deny working-class Blacks secular non-religious education. It took until 1878 for an Education Act in Barbados to allow central government to take over education from white councils and churches. The main instigator of this move, Bishop Mitchinson, was not surprisingly seen as "anti-planter" in attitude [118]. In Trinidad Governor Harrison created secular schools through the Education Ordinance in 1851 but there remained difficulties when English was the language of instruction but most of the pupils were patois-speaking [119].

Even more than in labour relations and education, the plantocracy was reluctant to act in the interests of the black majority on matters of health and welfare. The position of government, both local and metropolitan, in relation to measures to do with health will be mentioned here. The subject is considered in other chapters as well. Beckles has characterised the behaviour of the Barbadian [planters'] legislature in severe terms. It "moved slowly and reluctantly in the piecemeal establishment of public welfare facilities". In 1844, the white plantocracy held "the opinion that the poverty of the unemployed poor was self-imposed" [120]. As pointed out in more detail in other chapters, this was the attitude of J.Ranald Martin in Calcutta in the late 1830s and

contrasts with that of Edwin Chadwick (1801-90) in 1830s Britain. Chadwick felt that illness was a major factor in the poverty trap and not itself the result of fecklessness. Both Martin and Chadwick concurred on the need for public health measures but these were of little concern to West Indian planters. As Beckles puts it, "preventive measures, increasingly popular in England, did not figure prominently in government policy". What public health facilities were considered were not aimed at epidemics, which were treated as a matter of low priority. The 1840s saw epidemics of yellow fever, whooping cough, measles and notably smallpox, in the absence of the coercive inoculation and vaccination of the slavery era. As in India between 1820 and 1830, it was the arrival of cholera in the West Indies in the 1850s which galvanised local governments into action, since it affected whites, not just poor blacks. The epidemic of 1850 in Jamaica was followed by one in Barbados in 1854; indirectly, it lead to centralisation of the public health services for Barbados in 1856. William A.Green describes the problems in Jamaica with Western medical services so thinly spread by the 1850s that none were available to most freedmen [121]. William Sewell noted at the time that in Antigua there were freedman in villages who had no access to Western doctors [122]. K.O.Laurence points out that provision of medical services in Trinidad and British Guiana was made necessary as part of encouraging the immigration of indentured labourers, such as East Indians (Trollope's "Coolies" from Calcutta and Madras) [123].

Curiously, most modern historians writing from different Caribbean island states give the situations in those states for education during the second half of the nineteenth century while saying little or nothing on matters of health. Even more notable, the voice which is not heard in this commentary on government and society in the post-emancipation British West Indies is that of the Black or African-Caribbean freedman of the time on his health needs. As will be mentioned in the chapters on indigenous or non-

Western medicine and on doctor-botanists, details of medicinal plant usage have had to be obtained retrospectively. Ethno-botanical historians, acting as anthropologists and archaeologists, looked at practices extant in the 1920s and extrapolated backwards, using both word-of-mouth down generations and also their own botanical knowledge of what was a plant indigenous to the Caribbean and what was not. This situation contrasts with the increasingly vociferous proponents of the two main indigenous systems of Indian medicine during the latter part of the nineteenth century: the spirit of Indian nationalism itself grew, in the face British doctors of the Indian Medical Service monopolizing all the senior positions in Western medicine and their dismissal of the indigenous systems [124].

Issues arising from this chapter

This introductory chapter is written to give the context in which medical interaction took place. It is evident that the British, both as administrators and as individuals, believed in their superiority. The civilization of India was dismissed as long degraded, thus by William Jones, or even as an illusion, as by James Mill. The British thought that in Africa and among the Africans transferred to the Caribbean, there was no such civilization. These points are well-attested by historians such as Mark Harrison and Chris Smaje.

A period of a hundred and fifty years has been chosen for this study. The prime objective for government and for society in both India and the West Indies was economic gain. For the first half of the period, this was achievable. In India, the native population represented a cheap work-force, a market for British goods and a source of revenue from rents. In the West Indian economy, there was a slave work-force, a similar

market and the profits from the monopoly in sugar. David Arnold and Richard Sheridan have described the situation in the two arenas.

This combination of sense of superiority and economic demand meant that the British had little in the way of dialogue with their non-white subjects. By 1840, wealth was becoming a mirage, despite moves such as the textile industry in India. The West Indies entered a period of economic stagnation, the islands becoming unprofitable Crown Colonies. In India, the British role became one of containment and enclavism, with rule by British administrators who felt that their form of government was best for India. Their European culture and institutions barely touched the majority of Indians.

Racial attitudes and economic pressures affected medical interaction. In India, most white doctors dismissed the indigenous materia medica with its religious and magical elements. Even those doctors, such as A.Whitelaw, H.H.Wilson and T.A.Wise, who spoke positively about indigenous practitioners, were ambivalent; modernity obliged them to add adverse comments. As with other commodities of potential use, many British doctors felt that they could take and refine any plant remedies for the Western pharmacopoeia without much input from indigenous practitioners. By contrast, in the West Indies, there was forced interaction, in which British doctors subjected Black slaves to Western medical methods of treatment, either directly or more commonly through intermediaries. The slaves' own remedies were often safer and more effective. The lawyer and planter Edward Long admitted as much, though adding that they were used indiscriminately (by a people whom he regarded as barely human). At the same time, British doctors showed little interest in such slave remedies. Many of these facts are already in the literature, though not a comparison between the situation in the two areas of colonization. The silence about African-Caribbean slave practices will be described more fully in Chapter III.

The present chapter has indicated that a few British doctors and laymen avoided contemptuous dismissal of non-white people and their cultures. The cultural and racial attitudes of the British reduced the possibility of interaction, medical or other. They regarded the Indian and African-Caribbean populations as work-force and ever-present threat. Western medicine was part of state control in India but it was not "dominant" except in the eyes of the British. In the West Indies, if it dominated this was by coercion at plantation level, carried out indirectly by doctors.

In the chapters that follow, medical interaction will be studied through looking first at Western medicine then at indigenous medical systems. The work of British doctor-botanists will then be considered and, lastly, a comparison will be made of the world-wide picture of medical interaction, of which that in the two British poles of colonization was just part.

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CHAPTER II

THE CHANGES IN WESTERN MEDICINE, 1750-1900

The effect on interaction with non-white medicine in India and the West Indies

The preceding chapter discussed the social, cultural and administrative contexts in which Western medicine operated in India and the West Indies. The period of this study, 1750-1900, is an appropiate one for the present chapter; this is because, after 1750, Western medicine underwent major changes. Briefly, in chronological order, these changes were observational medicine from the 1770s, vaccination and pathological anatomy in the 1800s, the eclipse of Hippocratic modes of therapy in the 1820s, the public health movement from the 1830s, the growth of scientific pharmacology, with standardisation of drugs, in the 1860s and 1870s with the regulation of medical education and degrees from the same time. Lastly, there was the advent of the "germ theory" in the 1880s, with the implication this had for disease specificity, particularly for fevers. That in turn led to specific preventive measures by vaccines; this was in parallel with pharmacology beginning to yield specific chemically-made drugs. Therefore, it was not until around 1900, the date when the current study ends, that Western therapeutics began to offer more than did non-Western medicine.

Nevertheless, this did not stop Europeans regarding Western medicine as superior. In contrast, they conceptualized indigenous Indian and African-Caribbean medical practices as inferior. Before 1775, these were seen as lacking any underlying theory; this ignored the fact that the Indian systems shared a Hippocratic basis. After 1775, they could be said to possess neither science nor reason nor statistical facts. A century later, they were regarded as inadequate in terms of the qualifications and regulation of the practitioners and of the purity and standard of the drug therapy which these practitioners used. It is ironic that not until 1900 did the changes in Western medicine give much

benefit to the population of Britain itself. In the colonies, the non-Western systems continued to provide the treatment for most non-Europeans.

The effect of the changes in Western medicine on its offshoot, colonial medicine, and on indigenous medicine in the colonies will be considered in this chapter. Until the 1830s much of the therapy used by Western doctors was based on Hippocratic theory. In India, this meant that their therapy shared a basis in terms of theory with that of the two main indigenous medical systems. In the West Indies, up to emancipation during the same decade, such Western therapy was forced on African-Caribbean slaves.

In a separate Hippocratic legacy, the belief that climate and topography were responsible for disease was important through more than half the period. After 1830, the population itself, the poor in Britain or the populace in India, began to be seen as a reservoir of pollution and disease. In India, this led to distancing between the British and Indian communities. In the West Indies, where whites and domestic slaves were in proximity, the effect of this on minds and morals seems to have been of more concern than was any effect on the health of whites.

The 1770s observationist approach to medicine meant assessment and trial of therapy (which included sanitary measures, diet and drugs). It made indigenous medicine appear untested and therefore unreliable. At the same time, the approach was objective and empirical enough to allow the take-up and trial of Indian and slave remedies. The belief that science underpinned British medicine fostered a sense of superiority even at a time when scientific medicine had little to show for itself. Science by the 1780s represented modernity, in contrast to the myths and magic of non-European medical practices.

The fruits of science underpinning Western medicine did not develop until late in the nineteenth century, with pharmacology. Before this, during the 1860s, the standardisation of drugs and the regulation and registration of doctors formed ways in

which Western medicine lifted itself above indigenous Indian. Between 1825 and 1875, the establishment of official bodies, such as societies and their journals, medical boards and colleges, was a further factor in allowing Western medicine to assert its hegemony in India.

Several historians have touched on these themes. Roy Porter has written about Western medicine in general [1]. W.F.Bynum has described developments during the nineteenth century, notably those in science and therapeutics [2]. Both have mentioned colonial medicine. The *Companion Encyclopedia* (on the history of medicine), of which they were editors, has sections on colonial and Indian medicine [3]. Ulrich Tröhler has considered the "rational empiricism" or observationist movement of the 1770s [4]. This includes the work which was done for the East India Company by John Clarke and that of James Lind on the statistics of diseases in military hospitals. David Arnold has suggested that the science behind Western medicine was regarded as evidence that colonial rule stood for rationality and progress [5]. For him, medicine was part of that rule and an example of British superiority. Bynum and Porter both state that considerations of climate in the eighteenth century led to the public health movement of the next [6]. Arnold notes that eventually Europeans in India were segregated as a measure to preserve their health [7].

In contrast to the single evolving picture in India, there were two phases in the West Indies. That of slavery extended into the 1830s, after which the changes following emancipation began to impinge. Obviously, the start of the first phase was a time when many of the changes in Western medicine would not yet have affected the practice of British doctors out there. Richard Sheridan has studied social and demographic aspects in *Doctors and Slaves* [8]. He does look at interaction though misconstrues it. He highlights the variable qualifications and competence of British doctors (the situation

with Company doctors in India was very different). He gives details of the private slave hospitals on plantations. Few British doctors took an interest in the medical practices of slaves. There were no medical institutions and no medical hierarchy which could regulate the practice of individual doctors.

The second, very different, period for the West Indies was that after 1840. In one way, emancipation meant some convergence between the role of Western medicine in India and that in the West Indies. During slavery, the plantation medical set-up meant that Western medicine was forced on slaves; this was usually through intermediaries rather than by the white doctors themselves. After 1840 and the collapse of the sugar trade later in that decade, Western medicine was not available to the majority of the black freedmen population. Neither emancipation nor science meant "progress" as far as that population was concerned. The situation became comparable to that in India, where Western medicine was available to only a small percentage of the indigenous population.

After 1850, governments in the West Indies were forced to adopt similar public health measures to those followed in India, including sanitation, the draining of swamps to reduce malaria and the restarting of vaccination programmes for smallpox. As in India many of these measures were driven by the need to protect the health and welfare of the white elite; for instance, unlike the Hindu in India, the creole African was relatively immune to malaria. In the preceding chapter, the published works of local historians for different island colonies have been mentioned. Though the material they give on health and medicine is often sparse, their work will be referred to again in the present chapter.

In the current thesis, analysis of primary source material suggests that Western medicine consisted of show rather than substance during the period under scrutiny. Perhaps through (unacknowledged) insecurity, Western doctors held up a mirror to

admire their own practices and pronounced them superior to what they saw beyond that mirror, the therapy and practices of non-Western practitioners. In particular, it will be demonstrated that the Western medical pharmacopoeia stalled in the twenty-five years after 1850, creating a hiatus. This is because it jettisoned remedies of botanical origin, including most recently described indigenous remedies, in the face of scientific pharmacology but before the latter had delivered enough in the way of drugs to replace them. In Foucaultian terms, this constituted a temporal discontinuity of disciplines. Scientific Western medicine effectively turned its back on indigenous medicine, both Indian and African-Caribbean. David Arnold has presented Western medicine as a component of lofty imperialism in British India without his needing to consider what this medical system comprised in terms of therapy. W.F.Bynum has described the gradual transition from botanical drugs to chemical ones which took place in Europe across a large part of the nineteenth century [9]. For India, C.A.Bayly, among others, has pointed out that Ayurvedic and Unani doctors took some Western drugs into their own practice in a form of unofficial syncretism. For the West Indies during slavery, Richard Sheridan and Michael Craton are among those who have looked at the enforced use by slaves of Western medicine [10]. What was meant by "Western medicine" and what it actually consisted of during the period of study will now be examined.

Roy Porter has described therapeutics as "grounded in tradition" during the eighteenth century [11]. Before that, in the 1650s, Thomas Sydenham had kept to a humoral framework on diseases and the treatment for these even if he had made new observations [12]. Peter Boomgard has referred to blood-letting as "a sure sign of humoral thinking"; in Asia, including the Indian subcontinent, it was taken up by indigenous practitioners [13]. It was one of three depletive measures, the others being purging and vomiting; these removed unwanted material that was thought to have

caused imbalance of the humours. This constituted a "proper regimen", with diet, drugs, blood-letting, emetics and purgatives; belief in it persisted into the nineteenth century. Such theory-led treatment had become a panacea for all diseases [14]. In North America, Benjamin Rush (1745-1813) used heroic depletive therapy, with calomel (mercury) as the purgative; he called this the therapy of "modern physicians", contrasting it with the methods of the North American "Indians" [15]. As late as 1823, George Ballingall (1780-1855), Professor of Military Medicine at Edinburgh from 1825 (and later knighted by his fellow ex-officer, King William IV), pronounced "blood-letting, purging and mercury the most powerful resources of the healing art" [16]. He even advocated purgatives for British troops on first arrival in India so that they started with empty colons as a prophylactic against dysentery. These well-known men were dogmatists yet long before 1800 there were others who thought that such therapy should be modified or even discarded.

As early as 1768, James Lind (1716-1794) in his *Diseases Incidental to Europeans in Hot Climates*, was concerned to demonstrate that traditional Western therapy needed adjusting to allow for different climates [17]. John Clark (1744-1805), a Company surgeon, published his *Observations on the Diseases...in Long Voyages to Hot Countries* in 1773; in it he said that biliousness in Madras was mild "so that it seldom requires more than a gentle puke" [18], by which he meant forced vomiting as therapy. The second edition of 1797 shows Clark had turned against any such depletive measures; that edition is considered below. In 1788, John Hunter (d.1809) stressed the need for first-hand experience: in Jamaica, "sometimes purging for dysentery is impossible because of vomiting" (preventing the ingestion of purgatives) [19]. Such experience was amply possessed by John Quier (1767-1838), in practice for several decades. Down the years he modified his use of depletive measures, eventually

replacing them by diets, emollients and lotions, with care, cleanliness and good food, "letting Nature take its course" [20].

These men were suggesting that the usual regimes needed to be reduced in degree for Europeans in hot climates. Modification, however, could mean more strenuous measures, rather than gentler. The planter-doctor in the West Indies, David Collins, in his 1803 work on the medical treatment of "Negro Slaves" (sic), felt that their constitution could stand heavy depletive measures.

> "The most nauseous drugs...seldom ruffle the stomachs of negroes, or dispose them to vomit. Bark they retain in almost any quantity, and their bowels resist the most drastic purges, without suffering much inconvenience" [21].

The date of the work is significant, with abolition of the slave trade looming: good management of slaves made economic sense. There were also doctors who felt that, for Europeans too, the abrupt onset of illness, notably fevers, in hot climates meant that an equally sharp use of depletive measures was called for. Thus, James Johnson (1777-1845) in his *Influence of Tropical Climates* (1813) wrote of "bold venesection, purgatives, and mercurials" [22] while James Annesley, in 1828, thought "the rapidity...calls for the most decided treatment" [23]. The views of Annesley and Ballingall show that Hippocratic depletive therapy held its place for more than fifty years after it was first questioned by doctors in Britain and the colonies.

The other major Hippocratic legacy, the concept of climate and environment as causes of disease, survived even longer, as this became transmuted into the public health movement. Miasma was the Greek word for polluting agent. Caroline Hannaway states that the works of Hippocrates allowed doctors arriving in unfamiliar terrain to anticipate diseases. Changes in climate and tainted air from marshes were among the factors which Hippocrates suggested could lead to diseases. As Hannaway points out, until the germ theory, a "bad smell" was the only known fact [24]. Benjamin Moseley (1742-

1819) quoted Hippocrates and Galen at length in describing climate in the West Indies [25]. William Hillary (d.1763), writing on climate in Barbados in the 1760s, expressed a commonly held view that it was changes in air and temperature which put people at risk of illness. He felt that climatic variations in weather underlay diseases. His description of fevers on the island was laid out by the seasons, reflecting the effect of climate [26]. James Lind, in *Hot Climates*, stated that parts of Africa and the East Indies were particularly inimical to Europeans while John Pringle (1707-82) made much of the cold dampness of both climate and land in Zealand (Holland, Europe) [27]. Hillary's views persisted: during the 1830s they were repeated by William Twining (1790-1835), who was concerned with the variable humidity of the atmosphere in Bengal. H.H.Spry (1804-1842) also felt that abrupt changes were harmful. "One fruitful source of disease in Central India is the variability of the climate". Thomas Wise too, as late as 1867, felt that unseasonal rains, coupled with decaying vegetation in swamps, were factors in some diseases [28].

It was this combination of climate and topography which gave disease, with marshes and woods the dangerous features of the latter. Quoting Hippocrates, Hillary noted that Barbados was fortunate in having no marshy lands [29]. The layman Edward Long, [1734-1813] in his *History of Jamaica*, believed that "swamps, oozy banks of rivers, and stinking lagoon waters" caused poor health in troops while estates on marshy plains were the least healthy [30]. Fifty years later, his words were echoed in similarly dramatic terms by James Kennedy in Calcutta:

> "At the estuary of the River Hooghly...the sun is now gathering strength, and the malarious vapours are seen coiling themselves up from the surface of the land" [31].

James Ranald Martin (1793-1874) in the 1850s suggested draining the salt-water lake on the Hooghly to deprive the ground "of the sources of noxious exhalations" [32]; at the time this work was published, he had been back in England for fifteen years.

As late as 1856, Martin could still see woodland as well as marshland as undesirable, thus the Sunderbunds south of Calcutta had "forest and underwood, the clearing of which would tend greatly to improve the climate". By this date, however, conservation and replanting of forest were regarded by most Europeans as desirable on several grounds, including climate. Indeed, Martin himself allowed that in general "a moderate number of trees will prove...beneficial". Trees were like human beings: a few well-regulated ones along roadsides were viewed as benign, compared to hordes of them in swamps.

In both arenas eighty years earlier, woods were definitely seen as harmful to health. William Hillary thought that Barbados gained through the absence of marshes but Edward Long felt that "the healthy air of Barbadoes is owing to that island's being entirely cleared of wood" [33]. In India, John Clark saw "low-lying, wooded, wet land" as bad [34]. John Rollo [d.1809] wrote of "stagnating water, impenetrable woods and poisonous shrubs" in St Lucia, West Indies [35]. William Lemprière (d.1834), army apothecary in Jamaica, thought "decaying vegetation" a factor in the "dreadful mortality with which all our expedition have been attended" [36]. That was in 1799; Lemprière's comments were amplified in the same year by John Williamson. He was a civilian doctor in Jamaica for fourteen years, so his was not the instant impression of a military doctor. After heavy rainfall, Williamson noted

> "immense masses of vegetable matter, constantly perishing. Our atmosphere so infected, as to prove a source of many of those diseases peculiar to the fall of the year" [37].

John Williamson's use of the word "infected" is notable. As Margaret Pelling has pointed out, concepts of "contagion" and "infection" antedated the germ theory by more than a hundred years [38]. Though the facts were unknown, swamps giving off "miasma" were the breeding ground of mosquitoes, carriers for malaria and yellow fever. Attention to another source of infection, man himself, was also occurring from 1750 onwards but increased in degree during the next century. The "decaying matter" came to be seen as largely human in origin. In the 1760s, Edward Long felt that soldiers in Kingston, Jamaica, were at risk of "contracting sickness" as the ill in the military hospital there "may contaminate the atmosphere". The hospital at Greenwich, Kingston, was particularly badly-placed [39]. Long was well-versed on the issues of climate, marshes, woods and man as factors in disease, frequently quoting James Lind as the main authority on the subject. Long may have thought that white girls should not be brought up in too close proximity to black female domestic slaves but does not seem to have perceived the slaves as a threat to Europeans because of disease. However, in India this became a major consideration during the next century. The behaviour of the native population, with their lack of sanitary measures, took on new importance.

James Mill [1773-1836] led the way when he referred to the Hindus' "nasty, dirty habits"; in England, at a safe distance, he was quoting from Francis Buchanan's *Journey through Mysore of 1807-13* [40]. Mill in turn was quoted by J.Ranald Martin in his 1837 *Medical Topography of Calcutta*; as Medical Officer, Martin was concerned with the defective water and sewerage systems [41]. The bulk of this work comprises the argument that the native population brought their diseases on themselves. In the same decade, Edwin Chadwick (1801-90), lawyer and social reformer, the foremost figure in England among the sanitarians, was saying the opposite. He believed that poverty was largely the result of chronic illness and disease. In England, like Martin in Calcutta,

Chadwick wanted "drainage, the removal of refuse and the improvement of supplies of water" [42]. He regarded disease as the result of miasmata: gases from decaying matter. Margaret Pelling has said that "sanitarians were miasmatists" [43]; she thus agrees with W.F.Bynum and Roy Porter.

Bynum himself records that in the nineteenth century, fear of the poor in Britain grew because of the diseases which they might be carrying [44]. David Arnold, notably in *Colonizing the Body* (1993), has described the comparable process in India. The public health movement meant that in India the sanitary needs of the army were looked at. Avoidance strategies to protect the troops and European civilians included segregation and the use of hill-stations. By the 1850s, disease within the native community began to receive attention, as this was seen to affect the health of the white minority [45].

An example of this interest is the 1856 *Clinical Researches on Disease in India* by Charles Morehead (1807-82), Principal of Grant Medical College, Bombay. In the Preface he stated that

> "My clinical researches have been directed to disease, as occurring both in Europeans and in the Natives of India" [46].

There are descriptions, statistics and also chapters on treatment of certain disorders, notably remittent fever. Mridula Ramanna says that the work was written "primarily for the benefit of Indian graduates" [47]; it was, in fact, as much done for the authorities, as acknowledged in the preface. The main purpose was to provide information which would assist in strategic planning and in carrying out of health measures. The health of the masses mattered as they were both labour force and reservoir of disease.

It was indeed the Court of Directors (of the Company) who had asked Morehead to produce "a Diseases of India". Such fact-gathering based on observation had started much earlier. In Britain in the 1770s the "observationist" doctors, sought facts and statistics about disease, rather than simply following traditional theory. In particular,

they wanted treatment to be based on such facts, rather than on dogma. One term used for this was "rational empiricism", theory tempered by facts. This was to replace traditional Hippocratic theories and therapeutic regimens, such as those which have been described earlier in this chapter.

As Ulrich Tröhler has noted [48], the leaders of the observationist movement were mostly nonconformists. As such, they were barred from studying medicine at Oxford or Cambridge or from obtaining appointments at hospitals in or around London. They were often trained at Edinburgh, sometimes at universities on the continent, such as Leiden, Holland. From 1738, at Edinburgh one man, Charles Alston (1683-1761), Professor of Botany, gave the lectures on both the materia medica and botany. John Hope [1725-86] then held joint-chairs from 1761 until 1768 when Francis Home became Professor of Materia Medica, with Hope Professor of Botany [49]. Meanwhile, William Cullen (1710-1790) had held the chairs in medicine and chemistry jointly from 1755; when Alston died, Cullen gave the lectures on materia medica and continued to do so for many years. Edinburgh students were therefore trained in medicine, therapeutics and botany in a school which was part of the Scottish Enlightenment; most of them were dissenters who were ready to question received or traditional ideas.

The link between the observationists and doctors in both India and the West Indies has already been noted. As stated in Chapter I, many Scottish doctors joined the Indian Medical Service. Others were military surgeons with the Army or Navy in the wars affecting the Caribbean. Civilian doctors in the West Indies were often Edinburgh-trained; there was a tradition of the sons of planters going to do medicine there [50]. There was therefore a common background. This said, it was ironically in London that the observationist doctors created their main platform. Barred from the main teaching hospitals, they instituted their own hospitals and outpatient dispensaries. These

provided a framework for the collection of data; they also formed societies where their findings could be presented, discussed and subsequently published in transactions.

William Black (1749-1829) gave an oration to the Medical Society of London in which he warned against "speculative employments of philosophic drudgery"; this was to be replaced by "medical arithmetic" [51]. However, from the 1770s onwards, the strongest protagonist of an empirical approach to the evaluation of therapy was John Millar (1733-1805). He laid out his aims for "uncontestable evidence"; it required

> "recording every case in a public and extensive practice, and comparing the success of various methods of cure with the unassisted efforts of nature" [52]

Millar felt that arithmetical analysis of recorded data was the sole basis for evaluating a therapy. Statistics were to replace single case reports. James Lind was able to draw on the large numbers of cases of fever which he collected from 1758 onwards at the Royal Naval Hospital, Haslar, near Portsmouth. In 1763 he wrote that "I have often thought that publishing only one or other singular or particular cases, does more harm than good" [53]. This was echoed in 1792 by John Ferriar [1761-1815], from the Manchester Infirmary: "publishing single cases appears not well calculated to enlarge our knowledge, either of the nature or cure of diseases" [54]. Nevertheless, single case reports have continued to be published down the two centuries since then. For instance, the *Transactions of the Medical and Physical Society of Calcutta*, dating from 1825 onwards, featured numerous single case reports. In Britain, the outpatients and hospitals were vital to the gathering of statistics. In turn, these statistics meant that different forms of treatment could be compared in open trials.

These trials were on a larger scale than the pioneer one in 1747 on the treatment of scurvy, carried out by James Lind. That trial was a controlled one, though open, not blind. None of Lind's work was driven by theory, since he sought "facts without theory"

[55]. Lind's trial for scurvy was a short one, his studies at Haslar long-term. A much earlier trial, referred to in Chapter V of the current work, was that of Asian bezoar-stone by Frederick Slare in the 1680s. Slare appealed to the Royal Society

> "who do never set any value or estimate on the venerable Antiquity of an Hypothesis, or the Authority of great Names, to support an Error" [56].

This could have been William Black or John Millar speaking, a century later. In 1774, John Coakley Lettsom (1744-1815), West Indian-born, published his Medical Memoirs. He founded the General Dispensary at Aldersgate Street, London; there, he was able to show that Peruvian bark was more effective (and safer) than blood-letting and emetics for fevers. He began with misgivings about traditional depletive therapy but only with his appointment as physician at Aldersgate could he obtain the evidence against it [57]. A later trial of blood-letting was reported from the Peninsular War by Alexander Hamilton in 1816. This trial appears to have been a proper comparative one, treating alternate cases either by blood-letting or without this; the results were clearly against blood-letting, which was followed by much greater mortality [58].

Most studies comprised the simple recording of results. While this was true of the work of William Withering (1741-99) on Foxglove (Digitalis) for dropsy, his was nevertheless a thorough study. He carried it out across ten years before he would publish the results in 1785 [59]. He observed relapses if and when the medicine was stopped (a "within-patient" analysis): he also included cases in which the drug was unsuccessful. He was therefore able to work out the different kinds of dropsy and which cases were likely to respond to digitalis.

The long duration of Withering's trial contrasts with one trial undertaken in India in 1814. George Playfair thought that this was worth recording when the first issue of the *Transactions of the Medical and Physical Society of Calcutta* was published in 1825. He reported the trial of Madar, a plant used by "native physicians".[60]. At the General

Hospital eleven years earlier, the Calcutta Medical board had "made trial of *Madar*". They found it to be of no benefit. However, the drug was given for only a few days in each case and only for one disease, syphilis. There is no mention of what the Indian physicians were using it for. This was a trial barely worth the name; it would not have been accepted for publication by John Millar in London fifty years earlier. It may have been inadequate Western medical trials like this which made Fred Dunn point out in 1976 that herbal remedies from medical systems world-wide had evolved through experimentation across time. He felt that the results of this deserved as much consideration as did those of clinical trials carried out across weeks [61].

Trials performed over short periods of time needed many cases to achieve results that were meaningful, such as Lettsom's at his Dispensary and Hamilton's in the field during war. In India, there was detailed recording of indigenous remedies from the 1800s onwards; this will be described later in this chapter and in the next one. However, there appears to have been no facility for properly conducted trials. The case material would only have been European (though soldiers in native regiments and possibly prisoners might have been available, in the same way that Puerto Ricans and prisoners are "used" in the United States today). The absence of such trials was highlighted by William O'Shaughnessy (1809-89) in the introduction to his *Bengal Dispensatory* of 1842.

> "A great number [of plants used in medical practice by Native Physicians] have been identified and named, but scarcely one has been subjected to analysis,...clinical investigation...then trial in the Chief Hospitals" [62].

O'Shaughnessy obtained his doctorate from Edinburgh in 1830 and became Professor of Chemistry at the Medical College of Bengal, Calcutta. By the 1820s, Edinburgh had become a centre which rivalled Paris for the chemical analysis of plant drugs. Andrew Duncan (1773-1830), appointed to the Chair in Materia Medica in 1821, had isolated quinine alkaloids seventeen years before the Frenchmen Pelletier and Caventou, usually

credited with this [63]. O'Shaughnessy would therefore have been well aware what was needed in India.

In the West Indies there were no trials by doctors. Nevertheless, one early trial by a planter will be mentioned now, that of A.J.Alexander, who held a chemistry degree from Edinburgh. There was questioning of traditional Western therapy, particularly the use of mercury in the form of calomel for yaws, an infectious disease affecting notably the skin. This subject is considered more fully in the next chapter. Mercury was an example of a theory-led panacea, a purgative which came to be used for all conditions. Edward Long pointed out its risks.

> "[In yaws], the plantation surgeons have depended chiefly on mercurial preparations for a cure. Mercurials...either fix the disorder more rootedly, or give rise to others of the most dangerous kind" [64].

For Alexander, returning to Grenada from Edinburgh, the effects of mercury on his slaves with yaws were all too apparent. In 1773, the year before Long's *History of Jamaica* was published, Alexander wrote to the Professor of Chemistry who had taught him at Edinburgh, Joseph Black, about a trial which he himself had instituted. One group of patients continued with mercury given by the plantation surgeon, the other had a herbal preparation by mouth and ointments topically, prepared by a slave doctor. Within a fortnight the second group were well; the first group then had the slave medicine and were in turn cured [65].

This trial, done a quarter of a century after Lind's for scurvy, is a comparable, open trial, a short one but long enough to ascertain the results. It also had a within-patient analysis through the swapping over from the Western treatment with mercury to the slave remedies. In that, it had something in common with Wlliam Withering's trial on Foxglove. The difference was that Withering had a forum, indeed one in Birmingham with the Lunar Society (where Erasmus Darwin tried to steal his findings) and another

in London, both venues at which he could present his results. He also had the authority of being qualified, with his MD Edinburgh of 1766. Alexander's letter was "buried" in correspondence and he lacked any clout or authority. The same applied to the work of Rev.Edmund Stone, who observed the benefits of willow bark for aches, a folk remedy in England growing in marshy places where aches and fevers occurred. Despite the authority of Providence, the God who had placed it there, and Stone himself presenting his work to the Royal Society in 1763, doctors did not take up the the bark, unlike Withering's Digitalis. The active ingredient, salicin, remained undiscovered until 1826, receiving the name "aspirin" as late as 1899 [66].

If trials of medical preparations were few in either India or the West Indies and tended to be ignored at the time, the other major development from the 1770s, the gathering of statistics, was seen as important. Reorganization of the Indian Medical Service in the 1760s led by 1770 to a requirement that its surgeons keep day-books. In these were recorded the illnesses and mortality of the troops. The day-books were stored at India House, London. The primary aim in making the records was economic but John Clark (1744-1805), at that date a Company surgeon, was later able to use the statistics. In a retrospective trial for 1770-75, which was published in the second edition of his *Observations* (1797), Clark confirmed that Peruvian bark, given early in fevers, was attended by a more rapid recovery and less risk of mortality than were emetics such as antimonials combined with blood-letting. Clark by then had been a physician in Newcastle-upon-Tyne for a quarter of a century, continuing such observations on the treatment of fevers [67]. Fevers in Europe as well as in India remained the most important group of disorders in terms of morbidity and mortality [68].

More than fifty years after such record-keeping was begun in India, a major statistical survey was carried out on sickness and mortality among troops in the West Indies. This

was set up in 1835; it covered the preceding twenty years. The men appointed to prepare the report were Major Alexander M.Tulloch and Henry Marshall, deputy inspector of hospitals. The purpose was to find ways of diminishing "the great loss of life annually experienced in these colonies". They considered factors such as "diet, duty, and employment, the state of the barrack and hospital accommodation". Wider climatic and topographical features were also looked at. The resulting Statistical Report was published by Parliament in 1837-8. The mortality was mainly from malaria; also important was chronic dysentery, which the authors pronounced to be unmanageable. White troops were disproportionately affected by fevers, Black by bowel and chest disorders. Tulloch and Marshall did report Black morbidity and mortality since these were troops; Philip Curtin has pointed out that in many nineteenth-century evaluations only deaths of British soldiers were counted [69]. The two authors turned next to West Africa, producing a similar statistical report in 1840 on the situation there.

The collecting of data, trials and statistics was important in establishing medicine as a science, along with developments in pathology and the pathological anatomy of diseases. In the early nineteenth century, it could be shown that depletive therapy, such as blood-letting and metallic compounds, did not alter the course of disorders, for instance pneumonia; in addition, there was pathological data to back up the conclusions of any clinical trial. W.F.Bynum called his 1994 work *Science and the Practice of Medicine in the Nineteenth Century*: he believes that science was indeed incorporated into clinical practice [70]. He admits that there was little to show for this in terms of benefit to the patient (apart from vaccination). Indeed, he quotes John Bristowe, writing as late as 1887 that

> "The great aim of medical art is the cure of disease. Unfortunately, however, a direct cure (at all events a direct cure by means of drugs) in the great majority of cases is totally impossible" [71].

Even the word "scient-ist" was coined as late as 1833 (by William Whewell (1794-1866) to contrast with "art-ist"). By mid-nineteenth century, science, including biology, physics and chemistry, were part of medical teaching to all medical students in Britain. Yet, decades before this, "science" was viewed as an example of British superiority.

For Sir William Jones [1746-94], lawyer in India from 1783 till his early death, science was "an assemblage of transcendental propositions discoverable by human reason". Eastern books on "the science of medicine" did not conform to this definition; rather, they were "mere empirical history" [72]. In England, Jones had been in contact with members of the rational empiricism movement in England, such as Erasmus Darwin and Withering; reason made that form of empiricism acceptable. In India and the West Indies, a further form of empiricism was occurring, undeterred by the warning of Jones. The take-up of indigenous drugs as succedaneums by Western medical practitioners constituted practical empiricism. The rational empiricism movement facilitated such uptake; remedies no longer needed justifying in terms of Hippocratic theories of treatment. This contrasts with the mental contortions which had to be made by Spanish doctors in sixteenth century Mexico to fit Aztec drugs into a Hippocratic framework (see Chapter V). Nevertheless, works on Indian remedies such as John Fleming's of 1810 and Whitelaw Ainslie's of 1813 and 1825 missed the opportunities Western medicine now offered (see Chapter III). They were purely descriptive, without the move forward to analysis, purification and clinical trial, all possible certainly by the last of these dates. The science, therefore, was in the promise not the substance.

David Arnold states that it was by mid-nineteenth century that the science of Western medicine came to be regarded as evidence that colonial rule stood for rationality and progress [73]. Indeed, the timing does fit with that given by W.F.Bynum for science becoming important in medical education and even in the clinical practice of medicine.

Nevertheless, it was often non-scientists such as William Jones in the 1790s and T.B.Macaulay in the 1830s who contrasted the presence of science in Western medicine with the lack of it in Indian. The doctor J.Ranald Martin could be as outspoken as Macaulay. In the 1856 edition of James Johnson's *Tropical Climates*, re-written by Martin, he made a point that "the value of all scientific facts depends...on their being comparable"; by implication, this meant only Western science. Yet a few pages on, Martin appears to have

fallen below his own standards: he accepted the supposition that the magnetism of ferruginous rocks was a cause of fevers. In this, he was quoting Benjamin Heyne (1770-1819), the Moravian doctor-botanist and geologist who had joined the Madras medical service and had also been strident in his disparagement of Hindu medicine (see chapter III). Martin cited in support the case of General Morrison's army which was destroyed by malignant fever in 1825 after camping over such rocks [74]. Hindsight allows the opinion that this was pure speculation, neither scientific fact nor based on reason.

In the West Indies, the planter-lawyer Edward Long, in discussing the effect of trees on climate, quoted figures in science who were not medical doctors, such as Stephen Hales and Joseph Priestley [75]. When Long was writing, in the 1770s, superiority in science was still felt to derive from the discoveries of Isaac Newton in physics rather than those of William Harvey in medicine. The argument about the superiority of Western medicine was, in effect, a circular one: it was superior because British culture and science overall were superior, by virtue of their parts including Western medicine.

Francis Zimmermann has queried what was meant by "science" then and also what is meant today by the term "colonial science". He separates technology (such as irrigation) from pure science (such as mathematics), as well as research from education [76]. Arnold notes that one feature of colonial science was "the self-conscious adherence to

science as a rational pursuit" [77]; this has been seen in the definition which William Jones gave. Louis Pasteur, a century before Zimmermann, would have disagreed with him since he thought that there was only "science, and the application of science", with no division into pure and applied [78].

Ignoring Pasteur, basic anatomy could be called one form of "pure" science, with pathological anatomy an "applied" version. The latter developed rapidly after the work of the Frenchman François Bichat (1771-1802) in the 1790s. It meant that organ-based diseases could be identified, a further break (particularly in post-Revolutionary France) with Hippocratic tradition [79]. The perceived lack of anatomy made the indigenous systems in India a target for denigration by Western doctors as early as the 1810s (see chapter III). They overlooked the Arabic origins of human anatomy and the fact that ancient Hindu works included anatomy.

The status of another scientific discipline, botany, is discussed more fully in Chapter IV. There is irony in the fact that, in Britain, botany did not get full recognition as a science till mid-nineteenth century at a point when its importance in both medical education and for the Western materia medica was beginning to wane. Yet Edward Long in 1774 called botany "this useful science" about which regular [white] practitioners in Jamaica were ignorant. By contrast, the Black slaves were well acquainted with medicinal herbs. They lacked "any progress...in science" but "brutes are botanists by instinct" [80]. Long was pulled between his open-minded curiosity, with wide general knowledge, and the need to keep stressing the low status of the African as part of the justification of slavery.

In the Western materia medica, the branch of science to which botany eventually gave way was chemistry. This was a process which began early in the nineteenth century with the French work on extracting the active principles from herbal remedies. In their

Formulaire of 1821, François Magendie (1783-1855) and his colleagues aimed at a pharmacopoeia of chemically pure drugs. These substances, derived from plants, were called "alkaloids", from the method of extraction. Indirectly, this led to the realisation that drugs could be simple chemicals; among these were anaesthetic agents such as chloral hydrate, produced by Liebreich in 1869. W.F.Bynum says memorably that "chloral hydrate

furnished additional proof that relatively simple molecules could be pharmacologically active: the future of pharmacological research lay in the laboratory, not in the botanic garden" [81]. The date of Liebreich's discovery lies within the last third of the century. The issue now to be addressed is what impact, if any, the chemical revolution in pharmacology made during the preceding fifty years, in Britain, India and the West Indies. A further question is what was the make-up of the Western materia medica at the start of the nineteenth century.

In 1993 Miles Weatherall described eighteenth century Western therapeutics as "chaotic" [82]. Nevertheless, as early as 1741, the London physician William Heberden (1710-1801) spoke of the need for pure remedies and their assessment by use in a variety of circumstances for their reputation to be established [83]. Similarly, in 1746, Henry Pemberton criticised multi-ingredient remedies, the use of which might obscure the efficacy of an active ingredient [84]. Weatherall defines the term "materia medica" as "the study of the plants and minerals from which medicines were prepared". This makes most textbooks of materia medica published from 1800 to 1850 appropiate for their time, not behind it. They used the Linnaean binomial classification of plants and also precise chemical terminology, according to G.M.B.Bettolo [85]. However, the work on chemistry fed into pharmacopoeias only gradually and partially down the final decades of the century.

One doctor who appeared to have had foresight into the coming importance of chemistry was James Thomson (?1793-1822), working in Jamaica until his early death. He was a doctor-planter's son with medical mentors such as John Quier, his father's partner in practice in Jamaica, and William Wright, retired to Edinburgh after long periods in Jamaica. His medical training at Edinburgh will have been at the time when Andrew Duncan was lecturing on materia medica and working on plant alkaloids. Thomson began to move away from Western methods of treating diseases in Jamaica. He wanted to analyse Black slave herbal remedies. His *Observations and Experiments on the Medicinal Plants of Jamaica* was published in 1820, two years before his death. In it he mentioned that while in Edinburgh, he had tried experiments on various medicines, with other students. He felt (like Miles Weatherall does retrospectively) that the system of the materia medica lacked guiding principles.

> "No part of the science of medicine is so low in its progress as that of the Materia Medica, nor any where have we so often to retrace our steps, in consequence of our having advanced with too great rapidity. We know at present in reality but little of the real nature of the virtues of medicinal substances" [86].

The Edinburgh medical training and specialization in chemistry of William O'Shaughnessy have been mentioned already. In the early 1840s, at the Medical College in Calcutta, he saw the need to test plants in use by Indian physicians: "The next step is chemical analysis" [87]. O'Shaughnessy was concerned that the drugs available should be in as pure a form as possible [88]. He also noted that Indians were unable to get European drugs and were forced to take "the cheap poisons of the bazaar". He gave the reason for this as cost, alluding to

> "the high prices of all medical preparations sold by private European establishments in Calcutta. Little competition existing, the prices of the most indispensable articles of medicine are fixed at such a rate that rich natives will not, the humbler cannot, avail themselves of the remedies which medical science has pointed out" [89].

From this and other sources, O'Shaughnessy emerges as concerned for the native community, aware of the possibilities in local drugs and ready to test these with the assistance of practitioners of indigenous medicine. At the same time he was also teaching Western medicine, notably chemistry, to Indian students. In contrast, his contemporary, J.Ranald Martin, Medical Officer for Calcutta, personified Western medicine as part of control, distancing itself from the Indian population while planning measures to impress them with British superiority. James Thomson in Jamaica and William O'Shaughnessy in Bengal were rarer as colonial doctors in representing science, in particularly chemistry, in the empire, for all the people. The one intended a Jamaican pharmacopoeia, the other produced a Bengal one. British pharmacopoeias in the nineteenth century will now be looked at, in particular for the changes which occurred in them during the nineteenth century.

Pharmacopoeias in Britain altered considerably between 1850 and 1880. Before 1850, they were largely botanical in their content and in the descriptions given. There was then a period when botanical details persisted but in truncated form; such details were accompanied by some information on the chemical structure of drugs. By 1880, the botany had been dropped or relegated to footnotes, while chemistry, actions and usage were much expanded. By then too, both the clinical and experimental branches of pharmacology were established and there were textbooks of pharmacology in addition to pharmacopoeias of drugs. Pharmacopoeias before 1850 will be considered first. G.M.B.Bettolo has described eighteenth century pharmacopoeias as similar to medieval formularies. Early in the next century, national ones replaced individual city ones [90]; in Britain this meant three, each published by one of the three Colleges of Physicians. Alongside these, there were works by individual authors. Anthony Todd Thomson (1778-1849) called his 1810 work *A Conspectus of the Pharmacopoeias of the Colleges*

of London, Edinburgh and Dublin. The sub-title is *A Practical Compendium of Materia Medica and Pharmacy*; it looks and reads like a pocket book for students. The individual entries are less than ten lines long [91]. Thomson gained his M.D. in Edinburgh in 1799 and then gave lectures both in botany and therapeutics to medical students at the Pharmacological Society and University College, London. Authors of mid-century pharmacopoeias, such as Royle, acknowledged Thomson's work; indeed, they had usually been taught by him.

The first of these later single author works was that by Jonathan Pereira (1804-1853), published in 1837. Pereira was Apothecary to the Aldersgate Dispensary and Lecturer in Chemistry at The London Hospital where he became Professor of Materia Medica. His work, *The Elements of Materia Medica*, published in 1839, is even-handed in its balance of provenance, chemistry and clinical actions with usage. He accepted that classification by division into physiological or therapeutic actions was not possible, due to inadequate knowledge. As an example, he mentioned opium, "regarded by different physicians as stimulant, sedative, both, neither and alterative". Pereira thought that "natural-historical" and "chemical" details were necessary to make the physician a better practitioner [92]. In Volume 2, Pereira thanked Royle for "Hindoo" material [see below], Holst for Scandinavian and Wood [Pennsylvania] for American. The 1885 DNB recorded Pereira as having had an extensive foreign correspondence; he "always saw drugs when imported and paid equal attention to botanical, chemical and physiological characters" [93].

The Dubliner John Moore Neligan (1815-1863), M.D.Edinburgh 1836, was Lecturer in Medicine and Materia Medica in Dublin from 1841. His book had less on botany or provenance than had Pereira's; he managed a practical classification not dependent on theory, starting with "Antacids" and including "Emetics" and "Sedatives" in twenty one

categories. At the start of each chapter was a discussion of possible modes of action [94]. The title is "*Medicines: Their Uses and Mode of Administration*", showing that Neligan's is a pharmacopoeia for the mid-century, shorn of Hippocratic theory and short on botany and provenance. It emphasized the practical aspects and avoided a lot of chemistry at a date when much of this would have been speculative.

John Forbes Royle (1799-1858) produced the third single-author Pharmacopoeia, *A Manual of Materia Medica and Therapeutics*, first edition 1847 [95]. Royle's work is more germane to this thesis than either Pereira's or Neligan's. On the face of it, Royle was writing a British pharmacopoeia for a British market. The work "was undertaken at the request of publisher and pupils: the student of Materia Medica required something systematic to study". The manual included "the preparations of the pharmacopoeias of London, Edinburgh and Dublin". He also consulted Pereira's and Neligan's works (indeed, slipped in the Wellcome Library copy of Royle's 1847 edition is a letter from Pereira to "my dear Royle" dated Feb.4.1841). However, British doctors in India were not acknowledged in the Preface.

Despite all the above, Royle's is the most idiosyncratic of the three; it is part-medicinal Flora and part-history, particularly of Hindu medicine. As such, it will feature in Chapter III, on indigenous medicine, and in Chapter IV, on the doctor-botanists, among which Royle was prominent. In the latter chapter, the fate of several plant medicines is traced across the six editions of Royle's Manual from the first in 1847 to the last in 1876.

John Forbes Royle was born in Cawnpore, India, trained at Edinburgh and in 1819 became a company surgeon in Bengal. He was Curator of the Botanical Garden in Saharunpore in 1823. He went to London in 1831, obtained his M.D. at Munich in 1833 and became Professor of Materia Medica at King's College, London, in 1837 [96]. The

biographical detail is given here (as well as in the Appendix) to illustrate how Royle combined roles as both botanist and medical lecturer for twenty years from the late 1830s.

In the introduction to the 1847 edition, Royle referred to his

> "'Hindoo Essay', when I looked at indigenous and exotics, with the request of the Medical Board of Bengal, in order to ascertain whether the Public Service might not be rendered less dependent upon the supplies from Europe" [97].

That essay of 1837 was even more of a hybrid than the Materia Medica. It combined the subject of Hindu medicine with a lecture on therapeutics, Royle's inaugural one as Professor. His credentials as botanist and expert on "the Materia Medica of India" were given. For therapeutics, Royle stated that he had studied under A.Todd Thomson at University College, London, and Francis Home at Edinburgh. Royle recognized that there was an incongruity in the title, which was "*An Essay on the Antiquity of Hindoo Medicine* including an introductory lecture to the course of Materia Medica and Therapeutics" [98]. Royle suggested that Hindu medicine might have held primacy over Ionian Greek and Arabic medicine, rather than the other way round. On the subject of the Materia Medica he mentioned "the sciences with which they [Materia Medica and Therapeutics] are connected, and without which they cannot be understood". The lecture which followed was weighted towards botany. This is also true of the 1847 work, which is expansive on botany and history, while light on chemistry and clinical uses. That work will be further considered now.

In the Preface to this 1847 Manual, Royle said that he had difficulty in making it brief when he had to include preparations from "the three [national] Pharmacopoeias" [99]. In fact, it was botany and provenance which inflated the individual entries. Royle's experience in India, as botanist and recorder of indigenous herbal remedies, Hindu and Muslim, got free rein. As in Pereira's work, the rest of the world was also covered,

including the Americas and Africa. By contrast, the chemistry of preparations was given only briefly, while "Actions and Uses" were often restricted to a single line. The "Vegetable Materia Medica" comprised the bulk of the book, even in the third edition of 1856; by then Royle was ill, with just over a year to live, and could do little of the work himself.

For that edition, Royle did "entirely re-write the History of the Cinchona Barks"; from the 1840s, he had been urging a project to take Cinchona seedlings from the Andes to India, He also wrote "the Therapeutical Summary at the end of the work". He re-stated from the first edition that "the ultimate object...was the acquirement of a knowledge of the modes of Action and Uses of these several Drugs as Medicines". This was an unrealistic hope; he admitted that he had difficulty in grouping remedies by effect as so little was known about their actions.

> "The mode in which these effects are produced has been differently explained by different theorists. One of the oldest...humoral pathology [comprises] getting rid of some peccant humour. All medicines are stimulants or counter-stimulants. [His co-author] Dr Headland has observed that there are different ways in which in which medicines may counteract, and thus cure, different diseases" [100].

This was written in the mid-1850s, as Royle's Floral Pharmacopoeia metaphorically ground to a halt, looking backwards to botany and history, not yet able to look forwards. Pereira, Neligan and Royle all died relatively young; there were several posthumous editions, as will be seen later. Yet in the same decade, the 1850s, scientific pharmacology was developing. Rudolf Buchheim (1820-1879] worked at the German city of Dorpat (now Tarttu, Estonia) from 1847 and later in Germany itself. His 1853 textbook was critical of therapeutic empiricism. Modes of action had to be worked out scientifically in order to achieve more rational therapy. Buchheim was the founder of experimental pharmacology [101]. At Dorpat, he was succeeded in 1869 by Oswald Schmiederberg (1840-1922).

Schmiederberg moved to Strassburg when this became German again after the Franco-Prussian War. In Europe generally, pharmacology had dwindled to an antiquated discipline. The Viennese surgeon Theodor Billroth (1821-94) could say in the 1860s that "it is difficult to keep a professor of pharmacology busy. What is needed can be done in three or four hours a week" [102]. Schmiederberg, like his mentor Buchheim, knew that "without scientific pharmacology, rational pharmaco-therapeutics are impossible". In his 1883 textbook he affirmed that no doctor could be both pharmacologist and physician any longer. Pharmacology needed "a rigorous experimental foundation". All substances had to be studied experimentally; the facts provided would give a scientific approach to drug therapy. The fourth section in the introduction to Schmiederberg's textbook, *Grundriss der Arzneimittellehre*, was entitled "The Choice of Drugs on Rational Grounds" [103].

The pioneering German work did not affect pharmacopoeias in the rest of Europe until the 1880s. The *British Pharmacopoeia* first appeared in 1864; a Medical Act of 1858 decreed the replacement of the three national ones. It took six years due to

> "numerous researches in Chemistry, Pharmacy, and Natural History, and into the value of old and new remedies, carried on with the complex machinery of a Committee in each of the three divisions of the kingdom" [104].

The compilers looked backwards: they referred to botanical works as far back as those of the Dutch in the East Indies during the seventeenth century. Individual entries consist of half a page. Alkaloid chemistry of the Paris and Edinburgh schools is mentioned but as little is given on modes of action as in the third edition of Royle's work of eight years earlier.

The British work was copied in the *Pharmacopoeia of India* of 1868, edited by Edward J.Waring, with a committee of ex-Indian Medical Service doctors who met in London. This included doctor-botanists such as Thomas Thomson and Robert Wight

but also J.Ranald Martin and William O'Shaughnessy. The entries are short. O'Shaughnessy's approach to indigenous Indian medicine for the 1842 Bengal Dispensatory and Pharmacopoeia is missing [105].

There was little in either national pharmacopoeia to suggest that chemistry had yet evolved into scientific pharmacology. The main aim of both was to standardize and regulate the drugs in use, making these official. In India, this had implications for the use of indigenous remedies as succedaneums. As Dominik Wujastyk has put it, "the idea of a formal...standard for drugs...caused many British physicians to grow...critical of the crudeness of indigenous drugs". In effect, both Pharmacopeias curtailed rather than encouraged the uptake of indigenous drugs [106].

In Britain, one of the first doctors to take aboard German experimental pharmacology was Thomas Lauder Brunton (1849-1916). In 1881 he published lectures which he had given at the Royal College of Physicians in 1877. He stated that a Materia Medica written by him fifteen years earlier was so full of inaccuracies it made him determined to rewrite it. Meantime, the object of the lectures was

> "to show how the progress of therapeutics is aided by an exact knowledge of the action of drugs obtained by experiment. So great has been the advance in the study of the physiological action of drugs, that a new name, pharmacology, has been given to it" [107].

Only twenty years after Royle was still including "humoral pathology" with "some peccant humour" among possible modes of action, Brunton declared that "theorizing without data was the cause of the decline of the dogmatic schools". In his *Textbook of Pharmacology, Therapeutics and Materia Medica* of 1885 (called the second edition because of that earlier Materia Medica work) he gave

> "the methods by which the action of the drugs is determined, the manner in which each function of the body can be modified and the rationale of the use of drugs in disease" [108].

In Brunton's textbook, the "Vegetable Materia Medica" had shrunk from threequarters of the work in Royle's 1856 edition to less than a quarter in Brunton. His sharp dismissal of botanists is given in Chapter IV of the current study. He anticipated that in the future drugs would be chemical products manufactured artificially; meantime, several active principles could be obtained from a single plant, such as poppy or Indian hemp. Brunton showed racial prejudice (or was it envy?) in commenting on the latter, Cannabis indica:

> "The dreams produced by Indian hemp in inhabitants of Eastern countries are usually of a sexual character, but when taken by the more civilized people of Western nations they are not" [109].

Of Withering's dried leaf of Digitalis purpurea, "collected from wild indigenous plants", Brunton recorded that "an examination of the chemistry by Schmiederberg has shown at least five principles present in it" [110]. An Indian plant remedy used by indigenous practitioners, pomegranate root bark (Punica granata) kept its place in Brunton as "an astringent vermifuge" [111]. Yet in 1842 O'Shaughnessy had noted that "the bark of the root was analyzed by Mitouart in 1824, and found to contain only tannic acid, wax and gallic acid" [112]. It survived in the 1885 textbook as an empiric, something of an anachronism in Brunton.

Despite the advent of scientific pharmacology, the three mid-century single-author textbooks of therapeutics ran to several editions, until Pereira's fifth in 1874, Neligan's sixth in 1867 and Royle's sixth in 1876. D.G.Crawford, in his 1914 *History of the Indian Medical Service*, called Royle "a standard textbook in its day, though now forgotten" [113]. The editor of that sixth, final edition of Royle's, John Harley, King's College physician like Royle before him, had to report that

> "A large space, occupied in previous Editions by details which are to be found in elementary works on Botany, has been appropiated to an account of the actions of medicines" [114]

This is quoted again, along with Brunton's comments on botanists, in Chapter IV. Harley was less brutal than Brunton but this quotation illustrates well W.F.Bynum's comment in 1970, a century later, about the shift of pharmacological research from the botanic garden to the laboratory [115].

Bynum has also made it clear that effective laboratory-produced drugs were developed only towards the end of the nineteenth century. The germ theory yielded dividends such as diphtheria and tetanus antitoxins in the 1890s; then came aspirin in bulk by 1899 and salvarsan, the "magic bullet" for syphilis, as late as 1914. However, Bynum does see benefits earlier not only in relation to the standardisation of drugs but also in the registering of doctors, twin results of the Medical Act, enacted in Britain in 1858 [116].

The Medical Act meant a single register of doctors in Britain. By the 1880s there was standardisation of the medical examinations which students had to take [117]. Science-based training meant knowledge about the aetiology of diseases; this distinguished medical doctors from lay people (and unqualified healers). These developments were factors which affected adversely the status of indigenous medical practitioners in India. The passing of the Act in Britain coincided in time with the rebellion known as the Indian Mutiny; that event itself affected cultural interaction (see Chapter I). The tightening of standards meant that only practitioners qualified in Western (allopathic) medicine were recognized by the British authorities. To that extent, Western medicine was dominant, David Arnold's word; he calls its position a protected one [118]. Similarly, the creation of an official pharmacopoeia for India protected Western drugs and the small number of indigenous drugs accepted for inclusion; it meant a down-grading of all other indigenous remedies. These were, of course, actions taken in Britain. In India itself, registration of Western-trained Indian doctors proved too

contentious an issue up to and beyond 1900. For instance, in Bombay it was opposed and ruled out in 1881; an Act for registration was passed as late as 1912 [119].

The attitude of the British towards indigenous medicine in India is the focus of Chapter III; it reflects the entrenchment of Western medicine as the official medicine of the rulers. Western medicine, as personified by the editors of the *Indian Medical Gazette*, was largely intolerant of rival systems. In an editorial of 1867, they objected to the religious, magical and, significantly, the Hippocratic components of both Hindu and Muslim medicine. Individual authors, mostly British, had derided the magic and mysticism of Indian medicine for more than half a century before this (see Chapter III). The editorial also referred to "the unrestricted sale of poisonous drugs" [120]. This was unlike O'Shaughnessy's constructive approach of 1842, when collaboration would provide Indians with alternatives to "the cheap poisons of the bazaar" [121]. By 1867, "the unlicensed practice of Native Hakeems" was an evil to be equated with other crimes, such as Thuggee. As Charles Morehead had felt earlier, their medical practices comprised "criminal empiricism" [122].

A year later, there came the realisation that "the native hakims and vaids" were there to stay, seven thousand of them in the North-West provinces alone. A 1868 Gazette editorial accepted that the bringing of Western medicine "has failed with the masses of the people, viz., giving a very high European education to a few, thereby hoping to reach the masses". The editorial suggested that European surgeons should read the books of any local hakims and vaids, in the hope of influencing "the native practitioner for good" [123]. This was not so much a late Orientalist exercise as an early example of Foucaultian savoir/pouvoir. There was back-tracking even on this by 1891, a Gazette editorial at that date feeling that there was no gain in "fostering the study of a system...incapable of adaptation to advancing physical and physiological science, or of

progress in the true sense of the term" [124]. By then, with the germ theory yielding antitoxins and pharmacology producing effective drugs, Western medicine was indeed advancing.

If Indians (and Caribbean slaves as well) did stand to gain one thing from Western medicine, that was vaccination against smallpox, a singular practice available from around 1800. This was from English folk-lore, like William Withering's foxglove. Edward Jenner (1749-1823) started work on cowpox in Berkeley, Gloucestershire, at the same date, 1775, as Withering began his studies in Staffordshire. By 1796, Jenner felt ready to demonstrate successful protection against smallpox. As early as 1801, vaccination had reached Vienna, then Istanbul and on to Baghdad and Bombay. John Shoolbred, Superintendent-General of Vaccine Inoculation in Calcutta, wrote a report published in 1804. He recorded that the programme had proceeded by child-to-child inoculation [vaccination], with vaccinated children sent on voyages east in stages. Indians had used inoculation with smallpox material as a protection against catching smallpox spontaneously, this technique having been brought west to Europe in the eighteenth century. Shoolbred described the ploy which was used in an attempt to persuade Indians, both indigenous practitioners and people, to take up vaccination. The term "vaccine inoculation" was deliberately used instead of "vaccination" and the question was left in the air

> "whether the vaccine disease [Vaccinia, cowpox] exists among cattle in India; and of the alleged previous knowledge and practice of vaccine inoculation by the Bramins" [125].

The argument was used to counter the fact that cowpox/vaccination had originated "from the cow", which presented "a very strong objection to its adoption". In his actual report, Shoolbred was careful to distinguish between the two diseases and used the terms "inoculation" and "vaccination".

In fact, programmes for vaccination in India were opposed by Indians and often faltered during more than a century of efforts to replace inoculation by it. David Arnold records that the protection of Europeans was an important consideration, leading to the vaccination of Indians who were in contact with them. However, the procedure was also seen as prestigious for the British rulers and of potential economic benefit as well [126]. Ironically, in Britain itself vaccination programmes were inadequate, with the Royal College of Physicians of London slow to endorse the procedure and smallpox recurring throughout the nineteenth century.

In a fuller consideration than that of Arnold, Sanjoy Bhattacharya has described the problems with programmes in South Asia for a century after 1850. These were as much technical as ideological, centering on the difficulties in preserving calf lymph, the risks involved in human-to-human vaccination and the inadequate infrastructure for programmes in rural areas [127]. Ramanna records that the Western-trained doctor Ananta Chandroba Dukhle, Superintendent in Vaccination for Bombay from 1858 to 1883, helped to reduce Indian prejudice and so to get the 1877 Vaccination Act implemented [128].

In the West Indies, economic benefit and protection of the white community also lay behind the mass inoculation of slaves, by among others Dr John Quier and Dr Alexander Johnston during and after a smallpox epidemic in 1768. Dried lymph for vaccination first reached Jamaica in 1803 but, as in India, there were problems in preserving effective lymph. Indeed, Quier continued to use inoculation in preference to vaccination [128]. However, by 1816, smallpox had been eradicated in Jamaica (at least temporarily). The planter-doctor David Collins, earlier much in favour of inoculation with smallpox material, wrote in 1811 that the new technique of Dr Jenner was

> "the most valuable acquisition, the most complete and decisive, ever gained to medicine, since it was first cultivated as a science" [130].

It is possible that the earlier technique of inoculation was already familiar to African-Caribbean slaves. Inoculation was established in Africa and may have been taken by Africans to the West Indies early in the eighteenth century, independently of its introduction into Europe [131].

Vaccination programmes on plantations were one of the casualties of emancipation, economic stagnation and inadequate numbers of Western doctors from the 1840s. Smallpox made a comeback in Jamaica by the 1850s, affecting a Black population which was by then largely unprotected by vaccination. Dr Gavin Milroy reported thousands of deaths in epidemics on the island [132]. Hope Waddell, Presbyterian minister, thought that "vaccination should have been enforced and made universal... [and] the estate villages opened, and purified". The deaths were particularly among young men, unvaccinated while their white counterparts had been [133].

It is clear that in the West Indies after emancipation, showing African-Caribbean freedmen the superiority of Western medicine was of no concern to the plantocracy. This grudgingly accepted its responsibilities towards the African majority in stages across the rest of the century. Equally, Arnold sounds simplistic when he asserts that in the nineteenth century the British still believed that they were demonstrating the superiority of their medicine to Indians. The major difficulties which Bhattacharya has described are an indication that even vaccination, seen with hindsight to be worthwhile, was not going to impress the majority of Indians. In both India and the West Indies, public health measures after the 1840s seem insignificant, in terms of benefits to the indigenous population. Indeed, David Arnold himself implies that in India they comprised enclavism without consideration for the majority of Indians until as late as the 1890s. In that decade, coercive measures against plague met with similar resistance to that which had met vaccination. Arnold has suggested that Charles Morehead's

Diseases of India of 1856 integrated "European and Indian health within a single framework of analysis" [134]. The key word here is "analysis", as the work was intended for information, not intervention. Towards the end of the century the mortality figures for the Indian population were actually rising [135]. The dominance of Western medicine was seen only in the mirror into which most British doctors were gazing.

As the 1868 editorial in the *Indian Medical Gazette* admitted, the number of Indians being trained in Western medicine was in absolute terms small. A.Vasantha suggests that law, journalism and government service held more appeal for Indian students than did science [136]. C.A.Bayly has noted that around 1850 sheets on medicine, printed by Indians on their own presses, combined Western and Indian therapies [137]. From the 1870s onwards, several Western-trained Indian doctors in Bombay produced works which included indigenous medical remedies. Thus, Sakharam Arjun [1839-85] mentioned these in his 1874 *Catalogue of Bombay Drugs* while R.N.Khory and N.N.Katrak listed Western and Indian drugs with comparable actions in their 1903 *Materia Medica of India* [138].

By the 1880s, a time of increasing Indian nationalism, such Western-trained Indian doctors were protesting at their being kept in subordinate roles. Meanwhile, indigenous practitioners were promoting their own systems in the face of Western medicine. K.B.L.Sen and K.A.Sen, in their foreword to the second edition of Udoy Chand Dutt's 1877 *Materia Medica of the Hindus*, declared boldly that

> "the large number of Hindu physicians in Calcutta, in competition with Allopathic [Western[...practitioners, is a standing testimony to the value of indigenous drugs" [139].

They would not have agreed with David Arnold: for them, Western medicine was neither dominant by the end of the century nor a demonstration of British superiority. Rather, it was received by Indians with indifference, even hostility [140].

Issues arising from this chapter

Hippocratic theory-led humoral therapy remained in place as part of Western medicine until as late as 1825, in Britain, India and the West Indies, therefore throughout the first half of the period 1750-1900. Western and Asian systems shared a basis of humoralism but Indian systems were viewed as reduced to empiricism, magic and mysticism. Only a few Western doctors questioned humoral therapy outright. Others suggested modifications, both for the European constitution in hot climates and for that of the African-Caribbean slave. In Jamaica, John Quier was notable in moving away from depletive therapy, as a result of his own observations. Generally, slaves underwent such therapy, a forced interaction when they had their own, usually safer, methods of treatment. These facts are already accepted by modern historians.

Hippocratic ideas of climate and environment underlying disease were transformed into the public health movement, across eighty years from 1750. By the 1840s, man had replaced climate and the natural environment as the important pollutant, the poor in Britain, the indigenous people in India. This led to enclavism in India, with distancing of the European community from the native population. Health measures for the latter, such as vaccination and sanitation, were devised initially to protect Europeans and were not enough to benefit the majority of Indians. These points have been detailed by David Arnold and Mark Harrison, among others.

Observationist doctors from the 1770s introduced "rational empiricism", with facts, trials and statistics replacing dogma in the devizing of therapeutic strategies. Therapy was therefore empirical but underpinned by reason and scientific facts. The contrast between this new form of empiricism and what was seen as the blind, irrational even criminal empiricism of non-Western medicine has not been highlighted previously.

Indeed, the term has several meanings, since modernists such as Macaulay were empiricists rather than romantics.

Ironically, rational empiricism brought with it an increased open-mindedness towards indigenous practices and remedies, both Indian and black slave. British doctors published works on the Hindu materia medica. British textbooks of materia medica in the 1840s incorporated indigenous remedies, Hindu and Muslim as well as Latin American Amerindian. By comparison, interest in African-Caribbean slave remedies was meagre. In neither part of the empire was there any systematic study of indigenous herbal medicines, with analysis and trial. This was despite methods for chemical analysis being in place by the 1820s and trials in Britain being undertaken from the 1770s. These points have not been made previously.

By 1780, science and rationality were considered to underlie Western medicine, making it superior to other medical systems. In fact, this was without real benefit even well over a century later. Despite this, Western medicine in India was an important component of British hegemony. After 1840, there is a dichotomy between the situation in India and that in the West Indies. In India, Western medicine was part of the display of superiority. In the West Indies, services in Western medicine imploded, with small numbers of practitioners left to look after the white plantocracy, the non-white population largely abandoned. This contrast is an obvious one, once it has been made, as here.

Medical science included the pathology of diseases and the chemistry of drugs from early in the nineteenth century, pharmacology and bacteriology from late in it. Little of the results of this scientific work was transformed into therapy. Western medicine was truly superior only at the end of the period of study. W.F.Bynum has made this point clearly already.

By the 1880s, in Western pharmacopoeias, chemical analysis, purification, standardisation and trials of drugs replaced botany and provenance including history. In the 1860s, the national pharmacopoeias of Britain and India looked both backwards and forwards. They consisted of nothing more than lists, with scientific pharmacology yet to feed in facts. The aim was to make make the drugs which were included official and legally acceptable. Later editions and new textbooks of pharmacology by individuals incorporated first pharmacology and then bacteriology. In this thesis, it is argued that the mid-century materia medicas became obsolete through being largely plant-based rather than through their high content of non-European indigenous remedies. It reflects the perceived superiority of chemical pharmacology rather than of Western medicine in itself. The precise timing for individuals has been stressed in this thesis: Royle and Pereira died young in the 1850s while O'Shaughnessy, ahead of his time, nevertheless ended up trapped by it.

The standardisation of drugs did mean that indigenous remedies in India were down-graded. The status of indigenous Indian practitioners themselves was similarly affected. Syncretism between Western and Indian systems was pursued by some Western-trained Indian doctors but opposed by Indian Medical Service British ones. These facts are documented in the literature. In both India and the West Indies, non-Western systems and folk medicine remained the services available to the majority. These systems in India and the African/Caribbean slave medical practices in the British West Indies are the subject of the next chapter, Chapter III.

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CHAPTER III

BRITISH RESPONSES TO NON-WESTERN MEDICINE

British India and West Indies 1750-1900

The term "non-Western" is arguably preferable to alternatives, such as indigenous, traditional, local, folk or native. It applies equally to Indian systems and to African-Caribbean medicine. The two main strands of Indian medicine had been in contact with Western medicine from the sixteenth century but before that both had ancient links with Greek Hippocratic and Roman Galenic medicine. The Hindu Ayurvedic tradition followed humoral theory. The term "Ayurveda" refers to the knowledge for living to old age. It included a pharmacopoeia of plant medicines; it possessed surgical techniques though latterly its practitioners had avoided anatomical dissection. The Indian form of Unani Arab medicine was used by those under the patronage of Muslim nawabs. "Unani", from the word Ionian, refers to the Greek origin. It was based on allopathy, correction by opposites, such as a cooling remedy for the heat of a fever. On the subcontinent, the two systems co-existed, with interchange between them.

For centuries, the Arabic system had stretched from Andalucia, Spain, in the West, through North Africa and the Middle East to the Mogul courts of Indian states in Asia. It had developed, particularly in the tenth and eleventh centuries A.D., and ended up superior to the European Christian system in both theory and practice. However, the British followed Hippocratic medicine as modified by Galen and approved by the Christian Church in the Dark Ages. This meant that European human anatomy was based on animal dissection until the work of da Vinci and Vesalius in the sixteenth century, work which owed much to earlier Arab anatomical studies [1].

The term "African-Caribbean", though unwieldy in repetition, is usually preferred here to "indigenous" or "Black slave" in referring to non-Western medicine used by

slaves and later freedmen in the British West Indies. Over a third of its medicinal herbs were brought from Africa by Africans; indigenous herbs, new to them, were found on arrival. The preparations, some used topically on the skin, were grouped according to action, such as sedatives and anti-diarrhoeals. This represents both methodology and a system. In common with the Asian systems, African-Caribbean medicine combined medical practices with religious and magical ones. "Myalism" was benign and included herbal medicine. "Obeah" medicine was called "black magic" by the whites who feared it as disruptive. Each form was practised by both men and women doctors [2].

British doctors regarded both the main Indian systems as inferior, though many wrote about them. In the British West Indies, there was a similar disregard for African-Caribbean medicine; relatively few British, doctors or laymen, looked at or wrote about the practices of slave doctors. This is despite the larger number of general memoirs by medical men in the West Indies between 1750-1825, compared with those about India. Many of the former were by military doctors on short-term missions, whose contacts with slaves would have been limited.

If British doctors in the eighteenth century varied in their responses to non-Western medicine then so have modern historians in interpreting these responses. Some have too sanguine a view of interaction. Alexander Stewart, in his foreword to Poonam Bala's *Imperialism and Medicine in British Bengal*, paints a picture of free interchange between Western and Indian systems, with pooling of resources, during the second half of the eighteenth century [3]. He makes it sound as if systems of equal standing were undergoing syncretism, with mutual benefit. Richard Sheridan, early on in his book Doctors and Slaves, states that some British doctors propounded "theories of disease causation and cures based on empirical studies...in this effort they were aided by a knowledge of African folk medicine". He also writes of European doctors seeking "to

meld...the best elements of African and European cultures" [4]. These are overstatements even more gross than Stewart's assertion; indeed, later in the book Sheridan admits that comparatively few doctors took an interest in slave medicine and that the work of those who did was not well-publicised or influential [5]. While creolisation meant cultural and medical syncretism, this did not involve the plantocracy.

At the more sceptical end of the spectrum is David Arnold, who feels that Western doctors were critical of Hindu medicine. They called all the Indian systems irrational while at the same time they were ready to try individual remedies, such as those for cholera during the epidemics in the 1810s and 1820s [6]. His view is not fully borne out by the primary sources, indeed Arnold does mention a few doctors whose attitudes were more even-handed. That gets support from C.A.Bayly, who also sees many British as ambivalent [7]. Arnold manages to undermine the achievements of John Forbes Royle [1799-1859], seemingly a major advocate of Hindu medicine. He regards him as an inadequate figure to set alongside Alexander von Humboldt and considers that much of Royle's Himalayan (botanical) work was "taken secondhand" [8]. This is to misconstrue Royle's main aim which was to identify the components of complex plant remedies as a first step towards their safe and appropiate usage. It is an issue for the present chapter and for others. Meantime, the reasons for the dismissal of non-white practices as a whole by Western doctors need to be listed.

Both the South Asian and African-Caribbean systems might be seen as comprised of "mere" empirics". This means that there was no obvious theory underlying the medical practices and use of remedies. In fact, Charles Leslie has pointed out that the Indian systems have theory as well as therapy [9]. The herbal remedies had evolved over time, even if they had not undergone any formal trials. Of course, Alexander Stewart is right in one sense: British doctors were obliged to try local remedies empirically as

succedaneums, throughout the period of this study. There is irony not only in this but also given the development of the "rational empiricism" movement in Britain from the 1770s.

The supposed empiricism of non-white practices could be contrasted with the theory behind Western medicine. This again is ironic when Western and South Asian systems shared a common basis in Hippocratic theory. By 1840, the Hippocratic dogma underlying Western medicine had been shed; Arnold feels that this occurrence "widened the distance" between Western medicine and the Indian systems [10]. This was true, if only in the perception of Western doctors at the time: the Hippocratic basis of Western medicine symbolised superiority for them at one moment, while that of Indian showed inferiority at a later date. Also, the 1830s and 1840s public health movement owed much to the earlier miasmatic theory of disease, a Hippocratic tenet.

By the 1770s, Western medicine was viewed as being underpinned by science and reason, in comparison with Asian and the African-Caribbean systems. Yet, in terms of medical science, this rested largely on William Harvey's demonstration of the circulation of the blood in the sixteenth century. Again ironically, that owed much to the work of Vesalius whose own studies were in turn based on Arabic not European anatomical findings [11]. The lack of science in systems other than Western medicine became the main reason for viewing it as superior. In the late eighteenth century this was partly a philosophical matter, to do with reason. In the nineteenth century there was increasing evidence for science raising Western medicine above other systems, through developments in anatomy, chemistry and, eventually, pharmacology.

The British, from 1750, tended to lump Hindu and Muslim medical practices together. In what they wrote, there was often no mention of which system they were considering though usually it was the Hindu one. Most individual British doctors had a practical

approach, indeed an empirical one. They had no need to acknowledge any theory or ancient lore behind the Hindu Ayurvedic system. Nevertheless, for those who did address the subject, the seeming lack of science, theory or method was one of the main reasons for dismissing indigenous medical systems.

One man, the lawyer Sir William Jones (1746-94), was the opposite of the lowly British doctors who struggled to treat patients by empirical measures when their Hippocratic practices failed them and drugs from Europe were in short supply. Jones brought the lofty, objective gaze of eighteenth century science to bear on Hindu culture, including medicine, as seen in ancient works. The subject of science featured in many of the discourses which he delivered to the Asiatic Society of Bengal. Jones gave *Discourse 11* to the Society in the year that he died. In this, he defined science as

> "an assemblage of transcendental properties discoverable by human reason and reducible to first principles, axioms, or maxims, from which they may all be derived in a regular succession".

He went on to say that

> "I have no evidence, that in any language of Asia, there exists one original treatise on medicine considered as a science, physic, indeed...appears to have been a mere empirical history of diseases and remedies" [12].

For Jones, reason seems to be what was lacking in the Indian treatises, as opposed to Western. He was against religion being mixed with science, thus the fact that the "revealed science" in the Ayurveda had come "from a celestial physician" precluded improvement from experience. In the discourse of a year earlier, he appeared to be reaching back to ancient Indian science as a forerunner of Western science. "Part of Newton's philosophy [was] described in the ancient [Hindu] works". Mark Harrison interprets this as an attempt by Jones to locate Western science in a universal system (originating in India) [13]. The approach of Jones could be called "literary/historical" as much as philosophical. Indeed, in *Discourse 11*, he appears to admit that

the unfruitful task of going through Hindu texts was more a matter of history than of medicine.

> "We cannot expect to acquire many valuable truths from an examination of eastern books on the science of medicine; but examine them we must, if we wish to complete the history of universal philosophy" [14].

Jones may have felt weary or been playing devil's advocate, forestalling a negative approach to the subject by his listeners.

A decade earlier, in *Discourse 2*, William Jones had spoken in more sanguine and practical terms of "medical skills prized by the ancient Indians". There was a need to discover "what their old books contain without loss of time; lest the venerable but abstruse language should cease to be intelligible to the natives" [15]. At that time, at least, Jones did see contemporary Hindu scholars (though not necessarily physicians) as having a role in interpretating the medicine and science of their forebears. The absence of science was apparent to the Company medical service doctor, Whitelaw Ainslie (1767-1837). This was in both ancient and contemporary Hindu medicine. In his *Materia Medica of Hindoostan* of 1813, science appeared to be missing

> "in the sacred books of the Hindoos: ...no doubt, the great cause why Medicine, in this part of the world, is still sunk in a state of empirical darkness" [16].

The empirical use of plant remedies, however long refined over centuries, was not medical science as Western doctors understood it, or even laymen such as James Forbes (1749-1819). Writing about his twenty years in India (from 1765), he said "It appears to Europeans that the natives of India are extremely ignorant in the practice of physic [even if] they have many remedies, chiefly roots and herbs" [17]. Forbes' chief informant was also a European layman. Benjamin Heyne (1770-1819) was a Moravian physician who became a member of the Company medical service. In 1814 he echoed William Jones in deriding the mixing up of religious opinion with medical details; this

had produced "a system chimerical" in the Indian treatise which he had translated [18]. Another doctor, the maverick Charles Maclean (d.1824), who fell foul of the Company through being too outspoken, wanted to jettison all dogma, whether it was Eastern or Western. An early expert on climate and the concept of contagion in epidemic fevers, he ended up in 1817 aiming to reduce all previous theory and knowledge on causation and cure to "stupendous error" and to advance theories and regimens of his own [19]. Given that Western medicine had not yet shed bloodletting and purging, therapy based on Hippocratic dogma, Maclean was making a reasonable point. His criticisms did show that some British doctors were questioning all received medical lore.

Maclean was too iconoclastic to see Western medicine as any better than Eastern. Before him, William Jones regarded reason as an integral part of Western science, including medicine. After him, James Ranald Martin (1793-1874), in his 1837 *Notes on the Medical Topography of Calcutta*, commented on the lack of reason in Indian medicine:

> "The inductive mode of reasoning is unknown to the Brahmins; they have never been observers of common facts: there are no treatises on particular diseases: all they have of record in medicine is in the shape of diffuse general system, or systems, of which the greater part relates more to mythology than to medicine" [20]

Martin's opinion that the diffusion of European medical science would "demonstrate to the natives the superiority of European knowledge" has been quoted more fully in Chapter I. By the time he was writing, Asian mythology and religion could be contrasted with the conquerors' Christianity. Martin criticized the lack of inductive reasoning, which comprised proceeding from the particular to the general. Fifty years later, an editorial in the Indian Medical Gazette (a British journal) agreed that it was not worthwhile "fostering the study of a system of medicine originally established on a basis of deduction" [21]

A fairer critic than Ranald Martin was Thomas A. Wise, like Martin a member of the Bengal Medical Service. In his 1845 *Commentary on the Hindu System of Medicine* Wise was complimentary about "the Hindu science of medicine". He felt that medical texts had been looked at in a cursory manner by the English student of Sanskrit, who "was incompetent to judge of the real value of such professional works" [22]. As examples, he mentioned the adverse comments of William Jones and James Mill. The work of Thomas Wise himself will be quoted again on the theme of past glory but present decadence, the Orientalist view of Asian medical systems. Between 1780 and 1840 there was a plethora of British voices pointing to the deficits in the Indian systems of medicine. The comparable if lone voice in the West Indies is that of Edward Long (1734-1813). In the Jamaica of the 1760s, Long could see no system behind what the Black slave practitioners did. He regarded "Negroes" [sic] as "almost incapable of making any progress in civility and science". The fact that they possessed "wonderfully effective" medicaments was accidental. As the origin of medicine itself was unknown, "some ascribe it to chance, others to observation on the conduct of brute animals". As for their remedies,

> "the negroes generally apply them at random, without any regard
> to the particular symptoms of the disease; concerning which,
> or the operation of their materia medica, they have formed no theory" [23]

William Jones later referred to Indians receiving knowledge from a celestial being; Long considered the slaves to have done the same. He cited monkeys in Costa Rica using moss as a poultice, their skill and knowledge given "from the hands of their Creator". In a single analogy, Long demonstrated neatly not only the random usage by slave doctors but also their status on a par with sub-humans. This was to assert Black inferiority as firmly if with more subtlety than in the comments he made elsewhere in his work (and referred to in Chapter I). Edward Long was well-read; his *History of*

Jamaica shows that he was also an avid observer of all around him in Jamaica. The fact that he was a strong supporter of slavery does not prevent recognition of the breadth of his knowledge and depth of his thinking.

Like Long, many British doctors were planters and slave-owners; they included John Williamson and John Quier. Only the layman Long appears to have felt the need to emphasize what he saw as the lack of science and theory in African-Caribbean medical practices. Most British doctors said little about slave medicine; composed of empirics, it presumably appeared to them to have no system to be attacked. Apart from Obeah black magic, it posed no threat or challenge to Western personnel or medicine.

Edward Long's language about slave medicine was robustly pejorative. In India, British doctors and laymen often dismissed indigenous practices in equally harsh language to that of Long. The latter had taken pains to study slave medicine and compared it favourably with Western medicine. By contrast, the men among his later counterparts in India who spoke and wrote most vehemently against indigenous medicine were often those who had least knowledge of it.

The best exemplar of such men was Thomas B.Macaulay (1800-59), well known for his diatribe in the *Minute of Education* of 1835. He stated that the British had an obligation to spread "full and correct information respecting every experimental science" instead of "medical doctrines which would disgrace an English farrier" [24]. Macaulay had about as much knowledge of Hindu medicine as James Mill (1773-1836) would have had about Hindu arts; the low state of those arts signified to Mill a lack of progress in Hindu society [25]. Thomas Wise quoted Mill: "'Even Medicine and Surgery', says Mill, 'have scarcely attracted the rude understanding of the Hindus'". Wise may have had Macaulay in mind as well as Mill when he drew attention to ill-informed critics. Of course, medicine is not an experimental science but Macaulay's

memorandum made it clear that "correct" and "science" meant Western. Neither Mill nor Macaulay were concerned about the actual substance of Hindu medicine. The need to establish hegemony by asserting superiority is evident behind such pronouncements.

Michael Biddiss has written that what is meant by "science" varies from age to age. He was making the point by way of an antidote to the earlier triumphalist version that "science is always advancing" [26]. Language which was similar in tone to that of Macaulay was used by doctors in the Indian Medical Service when writing about non-white medicine in the sub-continent. Three of these will be quoted. All the works fulfil the point made above: the more superficial the study of Indian medicine, the more condemnatory they were. The doctors pointed out the lack of modernity in the Indian systems, given that magic and religion were mixed with empirical practices.

Benjamin Heyne has been mentioned already. His aim in translating "*An Indian Treatise of Medicine*" appears to have been to demonstrate the inadequacies of the work; he held it up to ridicule, almost for light entertainment. Nevertheless, he had a further purpose: he wanted to ensure that no British doctors took the work seriously.

> "Translation, or rather abstract" [Heyne does not make clear what he uses and what he leaves out] "will convey a more complete knowledge of their opinions and prejudices than any other method".

In his conclusions he commented that doing the translation "fatigued" him, as if a further aim in doing the job himself was to spare any other European doctor the bother. He went on

> "...the treatise itself exhibited a banquet of absurdity, [full of] the most ridiculous opinions" [27]

Heyne was brother-in-law to the Prussian ethnologist Johann Friedreich Blumenbach (1752-1840), Professor of Medicine at Gottingen, Hanover, with a British Royal connection, as John Gascoigne points out in his book on Joseph Banks [28]. As anthropologist, Blumenbach carried out studies of the measurements of human skulls,

which allowed racial differences to be quantified. He coined the term "Caucasian" for the white race; he was a monogenesist, believing that there was but one species of the genus man. It is therefore possible that Heyne's interests in indigenous medicine were as much anthropological as medical.

Henry Marshall (1775-1851) did observe contemporary indigenous practitioners at work. However, he wrote in a similar vein to Heyne when describing indigenous medicine in a nearby part of the subcontinent, Ceylon [Sri Lanka]. While giving fuller details of medical preparations than did Heyne, he warned his readers that

> "the views entertained by the Kandyans of the healing art, do not promise to be of much utility. Curiosity may, however, be gratified by a specimen of the absurd notions they profess to believe on this subject" [29].

Unlike Henry Marshall, Ranald Martin was at pains to keep well clear of indigenous practitioners, in his case in Calcutta, where public health was his main concern. Heyne attacked the treatise, Marshall the practices but Martin attacked the practitioners themselves as well. His *Topography of Calcutta* has already been mentioned in the current chapter and in Chapter I. Martin quoted James Mill's denigration of "Hindoo arts", his aim being to do the same for their medicine: "Were I to mention all the customs of the Hindoos that are injurious to health, I should write a respectable book". At least it can be said that by 1837 when Martin's work was published, his own Western medicine had at last begun to move away from injurious bloodletting and purgation. Like Heyne, Martin was concerned to inform his readers that they were not missing anything if they chose not to study either of the two main Asian systems.

> "It were unprofitable to pursue the native empirics, whether Hindoo or Mahomedan, in all their shameless impostures on their fellow countrymen" [30]

These comments date from the 1810s to 1830s, when the British felt a need to assert their superiority in medicine at a time when Western medicine in reality still offered

little beyond quinine and vaccination as effective measures. They attacked indigenous medicine specifically. However, their comments are analogous to Edward Long's broader attack on African-Caribbean culture in Jamaica in the 1760s to 1770s, itself prompted by the need to justify slavery at a time when the Abolition movement was gaining momentum. Their criticism has none of the ambivalence which C.A.Bayly has observed in some British doctors.

One medical observer who was more even-handed is Ranald Martin's contemporary, Thomas Wise, whose work has been quoted already. Half a century after William Jones, Thomas Wise followed a similar Orientalist approach, in that he regarded Hindu and Muslim medicine as having declined from their high status in the past. However, he looked further than Jones had done and criticised him and Mill, as noted above. More important, he was in contact with living "hereditary physicians" and wished to re-interpret the ancient texts for the benefit of such people. This was, of course, to appropiate the Hindu's power to speak for himself, as Inden has put it. Wise's aim was not so much to extract remedies for Western use as to re-invigorate current Hindu medicine. This is not simple Saidian Orientalism, allied to imperialism and born of both curiosity and the wish to dominate. What Wise wrote merits being quoted at some length; the situations he encountered were real and his pleas were far removed from the august paternalism of Jones.

Wise acknowledged the shared origin of European and Arabic medicine, giving credit to the "Muhammedan continuing of Greco-Egyptian medicine". Hindu medicine was part of "an advanced state of power and learning", reached at an early period. As one of the latterday Orientalists, Wise wrote of the decline of Hindu medicine.

> "The Muhammedan conquerors of Hinduism regarded with contempt the scientific knowledge and the medical science of the Hindus...More lately, the diffusion of the European system of medicine operated as a discouragement...and the prejudice against the national system grew stronger" [31].

By 1845, it appears that contacts with Hindu doctors had lessened, compared with the situation in earlier decades, such as that for Whitelaw Ainslie in the 1800s and or John Forbes Royle in the 1820s. As Wise regretted:

> "A very few practitioners may still be found...I have had the happiness of knowing a family of hereditary physicians".

Wise mentioned that he had the assistance of two Indians, with knowledge both of shastras [ancient texts] and European sciences. Greater respect for their own heritage might enhance the status of Hindu practitioners despite the advance of European medicine.

It is not clear from the 1845 work if Wise was active politically; his support for indigenous medicine does not seem to have extended to lobbying the British authorities. However, he was still championing contemporary indigenous medicine in the 1870s. Thanks and acknowledgment were given to him by Udoy Chand Dutt in the latter's commentary at the start of his *Materia Medica of the Hindus* of 1877 (referred to in Chapter I and again later in the current chapter). Another "late" Orientalist, Edward Green Balfour (1813-1889) did make representations to the authorities, on medical as well as environmental matters, as Richard Grove has shown [32].

Balfour's vast *Cyclopaedia of India* of 1857 included plants used in indigenous medicine. A single entry will suffice: *Agathotes* or *Gentiana chirayta* is

> "one of the most esteemed Indian medicinal plants...met with in every bazar of Hindustan, being a medicine in the highest repute with both the Hindu and European practitioners" [33].

J.Ranald Martin, in his 1837 *Topography of Calcutta*, had called not only for public health measures, such as the draining of swamps, but also for the dismissal of and distancing from indigenous medicine. Twenty years later, Balfour appeared to be putting the clock back, in compiling an unofficial pharmacopoeia of herbal remedies, a shared one in that it included drugs used by physicians of both Indian and Western traditions. He was concerned that adequate succedaneums should be widely known and available to all physicians. He recognized that many British doctors had no alternative but to use indigenous medicines.

In 1876, the year before Balfour left India, he published a pamphlet called *Medical Hints to the People of India*. In this, he tried to welcome both Hindu and Muslim doctors into the fold of Western medicine, which was "a system of medicine recognized throughout Europe and America but wholly different from that known to the physicians of India" [34]. If this system could be explained to them, they might regain their status. Today, this may sound naive, even patronizing, but Balfour and other British doctors were well aware that Western medicine was known to few native practitioners and reached only a small minority of Indians. Balfour saw the need to build bridges rather than increase the distance between Western and indigenous doctors. One component of Western medicine which had long been denied to Hindu (Ayurvedic) doctors was anatomy, pure and applied. This point had been picked up by successive Western observers down two centuries.

Comments on this were straightforward in the seventeenth century but by the nineteenth they became more critical. In the sixteenth century Andreas Vesalius (1514-64) had broken the Catholic Church's ban on dissection; to do so, he had to borrow knowledge from Arabic medicine. By 1800, Western doctors in India felt superior enough to deride Hindu medicine as unscientific because it lacked anatomy. They felt

that this lack of anatomy led in turn to inadequacies in surgical knowledge and technique.

Contacts between Europeans and Indians before 1750 properly are considered in Chapter V but two of them will be mentioned here. The French doctor François Bernier (1620-85), graduate of Monpellier, travelled in much of India during the 1660s. He thought that "the Hindus have no knowledge of anatomy. They open the body of neither man nor beast" [35]. The ship's chaplain John Ovington was in Surat in 1689; he noted that an English surgeon was needed at the factory there [36].

The layman, James Forbes (1749-1819), in the 1770s, understood from his informant that "they do not perform any surgical operation" [37]. By the 1800s, the tone was sharper. In 1813, Whitelaw Ainslie was moved to say that the Sanskrit works "betray a woeful ignorance of the internal economy and nicer movements of the human frame" [38]. Benjamin Heyne, in 1814, thought that it was "the ignorance of anatomy" which led to "fanciful concepts of functions of the body" [39]. More pertinently, it reduced the Hindu use of drugs to guesswork, in the opinion of William Ward in 1815. "Their ignorance of anatomy places their different remedies among the ingenious guesses of men. What are medicine and surgery without chemistry or anatomy?" [40].

The last three were highlighting the lack of anatomical and physiological studies in the healthy human body. By the date at which they were writing, they may not yet have been aware of the implications of morbid anatomy (the pathological anatomy of disease). It was pioneered by François Bichat (1771-1802) in the late 1790s in revolutionary France at a time of war. In 1844, nearly two centuries after Ovington, the administrator Sir William H.Sleeman (1788-1856) repeated Ovington's comment: the Hindus "stand in much need of our surgeons" [41]. The comments of Ainslie and Ward are the most percipient though it could be argued that William Withering did not need

knowledge of Harvey's work on the circulation for his foxglove trial, only in order to separate cardiac dropsy from other types. Of all these observers, Ainslie alone made a serious study of the Hindu materia medica, in his two pioneering works of 1813 and 1826. These will be considered now, as an exemplar.

Whitelaw Ainslie's 1813 *Materia Medica of Hindoostan* was expanded to form the 1826 *Materia Indica*. This second work received praise from later writers, such as Royle and O'Shaughnessy, providing the basis for their own publications in the 1840s. In the 1826 work, Ainslie aimed to give "a description of those medicines which are almost exclusively employed by the Hindoos and other Oriental nations". Ainslie acknowledged help from the doctor-botanist Nathaniel Wallich; the metaphor for the introduction was appropriately floral:

> "The path which I pursued was...overgrown with innumerable useless and noisome weeds, yet occasionally adorned by flowers of rare beauty, and others possessing still more valuable qualities. If I have been so fortunate as to cull a few that may ultimately prove of real utility to mankind, I shall regret neither the time nor labour bestowed" [42].

Over-ornate introductions which emphasized the authors' own labours were typical of the period. This one by Ainslie embellishes his concept of the Western doctor selecting items from the native materia medica, using his superior knowledge and that of his botanist colleague. His 1826 work represents the most complete on Indian medicine to that date. Despite the overgrown path, Ainslie's points of criticism were in fact minor. He found Indian physicians obliging, learned, liberal-minded and humane. His works were among a few by British doctors, in either the Indian sub-continent or in the West Indies, which provided information in an unbiased form. One aim was to make available as succedaneums for British doctors remedies in use by indigenous practitioners: these were Ainslie's "flowers of beauty". A higher aspiration was to find or develop new drugs, those "flowers" with "still more valuable qualities".

The ascendancy of the botanical entrepreneur Sir Joseph Banks towards the end of the eighteenth century coincided with the new era of drug trials and chemical analysis. This meant that the first half of the nineteenth century was a time when fresh drugs were sought after. The attempts to extract remedies from the indigenous materia medica forms the subject of this section of the chapter. In the event, it led to relatively few important drugs from either East or West Indies being added to the Western pharmacopoeia. In the Caribbean in particular, African-Caribbean practices might be tolerated and exceptionally be recognized as safer and more effective than Western methods. However, such an acknowledgment was rarely followed by examination of the actual remedies. The same was true of life-style. British doctors commended Indian habits as appropiate for the hot climates of both India and the West Indies, without reference to any African-Caribbean ones. Caribbean whites ventured little into the grounds and quarters of their slaves and therefore knew correspondingly little of their culture, despite the seeming proximity.

In Chapter II, that on Western medicine, it was noted that many doctors felt that their regimens of treatment needed modification given the hot climates of both South Asia and the Caribbean. Some pointed to the measures of local inhabitants as preferable. Two doctors, Charles Curtis and James Johnson (1777-1845), looked at life-style in India. Curtis was in Madras in 1782-3, publishing his Account of the Diseases of India in 1807. In an appendix, he gave hints on preserving health in India. He suggested early conforming to local diet, with rice, fruits, stews and sauces but a reduced proportion of meat. Europeans "should avoid contempt for local practices", thus they should not exercise in the heat of the day or go out without an umbrella. A siesta was desirable [43].

James Johnson's "*The Influence of Tropical Climates...on European Constitutions*" was more famous than Curtis's work. It went through several editions, the first being in 1813. Johnson was unusual in having been to both India and the West Indies. He gave a similar but more methodical list of appropiate measures. While praising the native watermen in India for their nakedness, he pointed out that higher castes protected themselves with light, flowing robes of cotton and similar materials. The "Hindoo model" for diet meant less animal food, with light meals and fruit. There should be temperance in drinking. Exercise in the tropics was best avoided. Bathing was much used by the Indians, compared with in the West. For sleeping, the native "simple bed" was appropriate also an afternoon siesta [44].

Well before either of these doctors, Edward Long in Jamaica showed an awareness of Eastern dress and diet: "the loose, cool, easy dress of the Eastern nations...is much easier and better fitted for use in a hot climate, than the English dress" [45]. John Quier (1767-1838), physician in Jamaica, based his advice to Europeans on his own considerable experience. He suggested a dry location, temperance and a diet with more vegetable than animal matter in it. Exercise should be in the early morning; the heat of the day should be avoided, also the night damps [46]. Clearly, this advice was similar to that given for India, even if it derived from personal observation not from non-white practices.

Advice such as that given by Quier could be put down to no more than common sense but the two works on India did contain complimentary remarks about the lifestyle of the Indians, which was compared favourably with that of Europeans. Similarly, a few authors did comment positively on the drug regimes of non-whites, Indians or African-Caribbean slaves. A few examples have already been mentioned. Some British doctors did not mention indigenous practices at all while others looked at these in some depth.

Most of the latter, such as Ainslie, were writing in the first half of the nineteenth century. The whole spectrum of writers will now be considered in order, starting with those who for varying reasons involved themselves little.

In India, doctors were employed by the Indian medical service and held military commissions, either short-term with a civilian component, or long-term by choice. This situation was outlined in Chapter I. The position in the West Indies was different. The Caribbean was intermittently involved in wars for more than sixty years from the 1740s. Military doctors came and went; the majority would have had no opportunity for observing African-Caribbean use of herbal remedies.

In the eighteenth century, military doctors wrote memoirs on returning home. John Clark (1744-1805) in 1775 described mainly the illnesses occurring at sea on long journeys to various places in the East Indies. However, he was no lightweight figure, being concerned to ensure that the Company day-books on the illnesses and mortality of their soldiers produced meaningful statistics, as noted by Ulrich Tröhler [47] and discussed in Chapter II. Benjamin Moseley (1742-1819), publishing in 1789 about his experiences in the West Indies, admitted candidly: "I have not increased the volume of the Materia Medica by any new medicine" though he mentioned "Barbadoes Tar" (which had proved no good for tetanus) [48]. John Rollo (d.1809), writing in 1781 on *Diseases of the Army in St Lucia*, recorded that

> "St Lucia is not destitute of medical productions; among the chief of which are...zinziber [ginger], cassia...the castor nut: ipecacuan, jallap, sarsaparilla, and even bark, are said to be found here" [49].

Rollo was a typical West Indies army doctor, interested in climate, local disorders and plants but without time to find out much for himself. His information was second-hand but it is not clear from whom he obtained it. The list of plants includes medical ones mentioned by Edward Long and William Wright (1735-1819). The latter talked about

them being used by "the common people"; by this he meant whites, coloureds and freedmen in the towns. Some of Rollo's plants were known to the Spanish for more than two centuries, indeed it is worth repeating that the Caribbean plants in Western materia medicas had gained their places in these very early, not through the agency of the British.

Military doctors in the West Indies might be birds of passage. In India they might not interest themselves in what their sepoys obtained from non-white doctors. For some doctors, such as William Hillary in Barbados and George Ballingall in India, their adherence to Hippocratic medicine was overriding and constituted a barrier. Most British doctors in India were of low standing and a third died on service [50]. Other doctors might be present intermittently; William Wright in Jamaica is an example. For others, medicine came second to botany: Thomas Dancer in Jamaica and William Roxburgh in India are among those.

George Pinckard (1768-1835) is representative of the British doctor who passed through the West Indies on his travels. In 1806 he produced three very full volumes of his journeys. Like Edward Long and John Williamson before him, he noted that many doctors in Barbados were "more illiterate than you would believe, and the very Negro doctors, of the estates, too justly vie with them in medical knowledge" [51]. An itinerant doctor was unlikely to discover what those slave doctors were actually using in terms of herbal remedies. However, many doctors who were better placed failed to record much; Long regretted that "local Jamaican physicians do not publish the fruits of their knowledge" [52].

William Hillary (1697-1763) was in Barbados at the same time as Long was in Jamaica (1760s). He made no mention of local methods but believed in the "same chemicals-based treatment for strangers and natives"; his ideas for yellow fever

involved an increase in the usual regimen of purging [53]. Despite this adherence to Western depletive measures, Hillary did mention the slaves' own treatment for yaws; this will be considered in a separate section later in this chapter.

Another doctor of intermittent importance in West Indian medicine, William Wright, wrote little that was published and gave tantalizing glimpses of local uses, as in two examples:

> "*Amomum Zinziber*: the common people employ it in baths and fomentations" [and] "*Convolvulus brasiliensis*", Sea-side Scamony, the root is employed as a drastic purge, in dropsy, by the common people" [54].

The common people used purging, a Western medical treatment. In India, the indigenous doctors had taken up blood-letting with alacrity but African-Caribbean slaves preferred their own, gentler methods. The work of William Wright will be referred to again later in this chapter.

There is an anomaly in the case of Thomas Dancer (1755-1810). The 1809 and 1819 editions of his *Jamaica Practice of Physic* followed the usual European regimen of bloodletting, emetics and purgatives. The appendix of medicines includes no local or slave ones yet the introduction to the third edition of 1819 mentions that "reviews in 1802 of the first edition [not available] praised the inclusion of diseases and remedies of the African race" [55]. This was said correctly to be unusual for such works; if it were a selling point, it is odd that nothing on the subject was retained in the second and third editions. Dancer was a maverick, more botanist than doctor in most of his activities; he was often at odds with the authorities and his fellow doctors. Benjamin Heyne was an equivalent maverick in India. He singled out metallic compounds among the drugs used by the Hindus, mentioning zinc, iron and copper [56]. Given he was a Company botanist in Madras in 1802, it is odd that herbal remedies did not interest him more.

Far removed from the likes of Dancer and Heyne were senior administrative figures, civilian or military, such as J.Ranald Martin and George Ballingall. Martin became James Johnson's co-author for the Sixth Edition of *Tropical Climates* in 1841 then took over in 1856 for what he chose to call a "New Edition" [57], as he re-wrote all but the first chapter. Predictably, Johnson's details of Hindu lifestyle and medicine were swept away.

Two more Western doctors who published on reaching home are representative of those who wrote as if Indian indigenous medicine had held little relevance for them. Sir George Ballingall (1780-1855) wrote his *Fever, Dysentery and Liver Complaints* "on ship on the way home", publishing it in 1818, second edition 1823. His beliefs were given in Chapter II: he thought "blood-letting, purging and mercury the most powerful resources of the healing art" [58]. James Annesley, "Late of Madras", publishing in 1825, did look at "Hindoo medical writings" for evidence on the prevalence of cholera in the past, finding nothing to suggest that similar epidemics to those of the 1810s and 1820s had occurred in earlier times [59]. For most British doctors, the world of the Indian populace and their medicine impinged only at a time of crisis, such as cholera spilling over to affect the troops.

Given this fear of infection spreading to the European enclaves, the health of "the Natives" had assumed importance by mid-century. Charles Morehead (1807-82) was "Principal of Grant College, Professor of the Principles and Practice of Medicine and of Clinical Medicine and Surgeon in Bombay". When he went home on sick leave in 1854 he was asked by the Court of Directors [of the Company] to produce the work which became *The Clinical Researches on Disease in India* (published 1856). He was particular that these researches had "been directed to disease, as occurring both in Europeans and in the Natives of India". Health measures for the latter were to be

sanitary, not therapeutic. Morehead was more constructive in his approach than Ranald Martin but just as dismissive of indigenous medicine, which he regarded as "a glaring blemish" and "criminal empiricism"; the medical practices of vaids and hakims were unscientific [60].

The timing of the Company's request to Morehead is significant, with the public health movement important in India as well as in Britain, the uprising of the Mutiny only a short time away and, after it, direct rule from Westminster. According to David Arnold, this is the period when Western or colonial medicine became a major part of British power for the control of India. The issue was not one of the relative values of the Western and indigenous therapeutic armouries. Morehead's book was analytical, concerned with the epidemiology of "native" diseases, not their treatment by indigenous doctors. Searching for "useful" indigenous drugs was not part of his remit.

Those British doctors who did look at indigenous herbal medicines were usually searching for succedaneums, substitutes on which they could fall back when the Western drugs of choice were in short supply, travelled badly or were exorbitantly expensive. Thus they were looking for local plants, preparations from which could be taken into the Western materia medica. The most notable need was for "bark", to substitute for *Cinchona*, Jesuit's or quina-bark. The search for a local bark continued despite the isolation of the active principles of *Cinchona*, including quinine, in the 1810s (see chapter II); that breakthrough did not yield a therapeutic dividend till later. For the doctor in hot climates, any bitter bark was worth trying; he could cite the belief that there were local remedies for local diseases, placed there by Providence. The local people did not themselves use bark for fevers, indeed Indians disliked its heating properties. Therefore, European doctors either found suitable barks independently or

took ones that natives were using for other purposes. This point is one which is considered in the chapter on doctor-botanists, Chapter IV, but will be touched on here.

James Grainger (?1721-66) needed such succedaneums in Jamaica. He was concerned about the welfare of slaves but barely looked at their own remedies. Rather, he regretted the lack of succedaneums for a few important Western medicines "which no plantation ought to be without" [61]. Among these (with a metaphor that mixed plant species), Grainger said that "the bark unquestionably merits the palm". Ironically, it was part of Grainger's humanity that he wanted slaves to have access to the same treatment as free men and that meant Western medicine. The slaves understandably preferred their own forms of treatment. William Wright edited Grainger's work for the second edition in 1802. He himself felt that he had found a substitute bark; botanist as well as doctor, he called it *Cinchona Jamaicensis* [62]. There is no evidence of any African-Caribbean involvement in his discovery. The same is true of William Roxburgh's *Swietenia febrifuga*, a relative of satinwood, its species name *febrifuga* given it in hope. John Fleming (1747-1829), in his Indian Medical Plants of 1810, recorded its entry "into the Edinburgh Pharmacopoeias as an effective substitute for *Cinchona*" [63]. Roxburgh was able to bypass local knowledge through his combined knowledge of medicine and botany. However, he was someone who consulted local physicians, as will be seen later.

Besides Ainslie Whitelaw, three other doctors in India during the nineteenth century did consider Hindoo medicines as possible succedaneums in some depth. This was with, or without, official backing by the Company. The first, John Forbes Royle (1798-1858), was important as a doctor-botanist in the first half of the nineteenth century. He is one of the most significant figures in this thesis, except as botanist for David Arnold [64]. Royle became a Company surgeon in 1819; he returned to England in 1831. His career

combined not only working in both India and Britain but also covered the subjects of botany and therapeutics. As such, his role is considered in all chapters from I to IV.

Royle's *Essay on the Antiquity of Hindoo Medicine* resulted from "the request of the Medical Board of Bengal to investigate the Materia Medica of India". He stated that he had made collections, in bazaars, tracing the plants to their origins and also had the native works "collated by competent Hakeems and Moonshies" [65]. He referred to Ainslie Whitelaw's regard for Hindoo physicians. This work was the forerunner of a much larger work published a decade later but it gives a better picture of the way in which Royle had collected his information during the 1820s, reliant on his indigenous contacts and their knowledge.

This larger work was Royle's *Materia Medica* of 1847. In the Preface (as opposed to individual entries), the author did not highlight the role of Ainslie and other British doctors who wrote about Indian medicine; rather, he referred to other contemporary British pharmacopoeias. Royle was intending the work as a British pharmacopoeia for use in Britain. Nevertheless, as mentioned in Chapter II, the work was both a medical flora and a historical one on the origins of medical preparations. Indian herbal remedies featured prominently (as well as New World ones, such as *Cinchona* bark and ipecacuanha).

Why the *Materia Medica* work was a white elephant almost from the outset has been considered in Chapter II. Its floral component, including plant nomenclature and pioneering phytogeography (the study of the heights at which different plants will grow), is a matter for Chapter IV. As a commentary on Hindu (and Muslim) medicine, ancient and current, the work is remarkable in its detail. His predecessors and contemporaries as doctors in India were quoted as authorities in such entries. Thus, of arsenic:

> "The Hindoos are well acquainted with all three substances [yellow, red and white preparations]. They were probably the first to prescribe it internally, as in leprosy (Professor H.H.Wilson)" [66].

To take another example: the drug narcotine, from Indian opium, "has been largely employed in India for arresting the paroxysms of...fevers by Dr O'Shaughnessy and others" [67]. The entry on *Coculus indicus*, from which picrotoxine was derived, a chemical causing convulsions, is given in full in Chapter IV. Royle's Indian experience coloured the whole book. The entries were strong on provenance and botanical taxonomy. Born in Cawnpore, Royle had several personae, one of which seems to have approximated to that of an indigenous Indian doctor, so involved did he become. Compared with Royle, the next figure, R.H.Irvine, was more ambivalent in his attitudes; nevertheless, like Royle he felt that the indigenous doctors should be listened to rather than just have their preparations taken for analysis.

R.H.Irvine, Surgeon in Rajasthan, sifted hakim and vaidya remedies for those he considered worth having a place in his account of 1841; he was concerned that what the indigenous practitioners themselves said should be heard by the British. He noted that these practitioners believed that combinations of drugs were the key to effectiveness [68]. Nevertheless, these "prescriptions are often of the most incongruous materials" [69].

Royle and Irvine were contemporaries; Edward Waring belonged to the next generation. His work *Bazar Medicines* was specifically intended to provide succedaneums in India. It came out relatively late, the first full edition being in 1874. Before that it had been a pamphlet issued for use by the "District Vaccinators of Travancore", who found themselves called on to advise on conditions outside their remit. In the Preface, Waring hoped that the revised work would prove

> "useful for missionaries, also officials (European and Anglo-Indian) miles from medical aid, and 'educated' natives, and even qualified medical officers when

[there is a] failure of the supply of European drugs" [70].

The work is more relaxed and inclusive in approach than Waring's other work of the same period, the official (and formidable) *Pharmacopoeia of India*. With William O'Shaughnessy on his committee for that work, Waring would have been well aware of the need for standards. In the *Bengal Dispensatory* O'Shaughnessy had referred to the fact that Indians were obliged to take "the cheap poisons of the bazaar" due to the inflated prices of European medicines [71].

Royle, O'Shaughnessy, Balfour and Waring between them served India for fifty years from the 1820s. They were relatively rare as doctors who took note of indigenous medicine, attempting to converse with and support Hindu and Muslim practitioners. At times, they had the ear of the British in authority, whether this was the Company or the Government (in India or Britain). Royle joined the medical hierarchy in London and later advised on the problem of obtaining *Cinchona* plants for India from South America (see Chapters IV and V). O'Shaughnessy was part of the medical establishment in Calcutta and later in London. Balfour, nonconformist and radical, was nevertheless recognized in India as someone of stature and influence. Waring's chairmanship for the Pharmacopoeia shows his credentials even if there is no entry for him (or for Thomas Wise) in the DNB. There were no comparable medical figures in the British West Indies, even in the era of slavery.

Instead, there was Edward Long, distinguished mainly for his massive *History of Jamaica* of 1774 and his crude racism. The other notable planter-writer, Bryan Edwards (1743-97), was more sympathetic towards slaves but did not consider their medical practices. There were important doctors such as John Quier and John Williamson, but none showed the combination of an interest in slave medical practices and a role in the oligarchy that ruled his colony. Perhaps such a joint engagement was impossible. These

two doctors were percipient enough to modify their Western medical regimens but in the main they adhered to them for both whites and Blacks. Their interest was in slave health rather than in slave medicine.

A frustrating figure is that of William Wright. Wright's endeavours had little consistency, affected by war, even capture by the French at one point. Botanist in his spare time on Jamaica in the 1770s, he became Physician to the Army in the West Indies in the 1790s. Like the physician William Heberden in England, he published barely at all and his periods in the West Indies produced remarkably little on the slave herbal remedies about which he did know.

Wright does at least provide a link between James Grainger and James Thomson (?1793-1822). Thomson was a doctor-planter's son who met Wright while doing his medical studies at Edinburgh. Wright advised him "to institute inquiries into the nature of the disorders to which the negroes are liable" [72]. Thomson objected to the Obeah magical element in African-Caribbean medicine as not subject to reason. He wanted to apply scientific methods, including chemical analysis, to Jamaican herbs, whether in use by slaves or found independently. His 1820 *Treatise on the Diseases of Negroes* had a subsection on medicinal plants. Among the plants were aloes: "With the negroes it is a sovereign remedy...and they have every reason to place great confidence in its virtues" [73]. Had he lived, Thomson might have achieved in Jamaica what O'Shaughnessy tried to do later in India. The observations of several doctors in India across fifty years from 1790 will now be considered, with the aim of filling in the background to Whitelaw Ainslie's works of 1813 and 1826, already mentioned.

William Roxburgh did more in India than James Thomson managed to do in Jamaica, though mainly in the fields of geography and botany. He was, however, interested in the plant remedies of indigenous doctors, as is shown by a letter of 1796:

> "...*Myrobalana citrina*: before, I said nothing of these nuts because I had nothing of my own to offer, by the best writers on the Materia Medica they are expunged from their list, and the College of London as well as that from Edinburgh have now rejected them from their Catologue of Officinal Simples, I have therefore only to conjoin what the Indian physicians say of them..." [74].

The letter is torn off at that point but Roxburgh appears to have been supporting the opinion of the Indian doctors against what he saw as arbitrary decisions by Western medical doctors in Britain.

Roxburgh had connections to Patna and may have advised on the *Patna Pharmacopoeia* of 1795, a compilation of indigenous herbal remedies, spices and culinary products. In having such a broad mixture, that work reads like comparable Hindu texts [75]. In the same year, he published Volume I of his *Plants of the Coast of Coromandel*, written "with a more immediate view to utility" (a sop to the commercialism of the Company). The work shows knowledge of what indigenous doctors did, and of the individual tribes or races, as three examples will demonstrate:

> "*Oldenlandia umbellata*...the Malabar physicians say that the roots cure poisonous bites".
> "*Semecarpus anacardium*...the Telinga physicians employ it in the cure...of venereal disease".
> "*Bambos arundinacea*...the Tamul physicians pretend that the root is a diluent".
> [pretend=claim] [76].

This period of fifty years from 1790 was one of opportunity not grasped. At its start, Roxburgh was describing plants and their uses. More than twenty years later, James Thomson in Jamaica pointed out the need for chemical analysis of such herbal remedies. After a further period, William O'Shaughnessy had to report no advance, with systematic study still to be undertaken in India. He was echoing Thomson in asking for analysis to define the active principles of indigenous plant remedies, followed by clinical trial, before any could be considered for admission to the Western pharmacopoeia.

If Roxburgh emphasized the botanical aspects, Fleming and Ainslie produced works of some substance medically. Both of these doctors have been mentioned already, indeed Ainslie's work has been highlighted. Roxburgh helped Fleming "with his usual liberality" in providing Linnaean names to pair with Hindustani and Sanskrit ones. Fleming's *Indian Medical Plants* (1810) remained a work to consult as late as the compilation of the *Pharmacopoeia of India* of 1868. At least one local remedy held its place in British Pharmacopoeias later than that. This was bark from the pomegranate tree; Fleming recorded that its use in tapeworm infestation was "brought to our knowledge through a Mussulman Fakir" [77]. (Intriguingly, it appears in Edward Ayensu's 1981 *Medicinal Plants of the West Indies* as a folk remedy for tapeworm, the root bark and fruit rind being used. Unfortunately, Ayensu is not concerned with provenance [78]). Ainslie's *Materia Indica* also remained consulted; in 1842, William O'Shaughnessy called it

> "the best work yet published on Indian Materia. Ainslie catalogues several hundred plants, the products of which are used in medical practice by Native Physicians. The majority are highly celebrated for their medicinal values. A great number have been identified and named, but scarcely one has been subjected to analysis, and very few have been made the object of clinical investigation" [79]

Ainslie's *Observations on the Cholera Morbus* were written in response to the epidemics of the 1810s and 1820s; by 1825, when it was published, he had been back in England for ten years. His description of some Hindu prescriptions shows how difficult was the task facing doctor-chemists such as O'Shaughnessy. The remedies were complex: one had herbs but also sulphur, mercury and soda, another nine herbs each specially prepared as well as the ground-up concretions from the gall-bladders of cows [80]. Also publishing on cholera in the 1820s, Robert H.Kennedy, Medical Officer in Bombay, felt that the indigenous doctors' draughts of salt and water for

cholera might cause inflammation. Vomiting and diarrhoea (aided by emetics and purgatives) were the body's natural way "of casting off noxious principles" [81].

In contrast, W.G.Maxwell's 1838 work on the treatment of cholera is more considered; he looked at both ancient texts and current indigenous practices. He was against violent forms of therapy, whether Western depletive or fiery indigenous spices, preferring fluids containing vegetable extracts, as used by native doctors [82]. In Ainslie's case, the detailed amount of information which he gave suggests that he was recording remedies so that they could be subsequently teased out for analysis. His contemporary, Henry Marshall, in his book on the Kandyans of Ceylon, also gave details of indigenous preparations but the result nevertheless reads as if it were part of a travelogue rather than a materia medica. Marshall noted that medicines were given as decoctions, powders or pills. He described the care of wounds.

> "Fresh wounds are commonly stuffed with a powder of resin. Sores are covered with chopped leaves and bark of trees. As a poultice they use wild onions and chopped leaves of the datura stramonium" [83]

Marshall at least noted the actual plants used in such topical applications. In many works, these were called "simples" or herbs and left unnamed. For instance, this was true of the comments made on the remedies of slave doctors in the West Indies for the disorder yaws.

In 1769, Thomas Trapham saw the high incidence of yaws as due to "an animal people with an unhappy jumble of the rational with the brutal". Sheridan has re-examined the management of it [84]. Yaws was a spirochaetal infection easily spread by skin contact (unlike the related disorder syphilis). From the 1740s to the 1830s, there was a string of reports about its treatment by slave doctors. Several British doctors and laymen commented on how much better and safer the slave doctors' treatment was in comparison with that of their Western counterparts. In 1748, James Knight, planter,

noted that the herbs applied topically to the skin by black doctors worked better than the treatment given internally by white doctors [85]. William Hillary, in the early 1760s, reported that the slaves' own methods were effective [86]. The planter A.J.Alexander, in 1773, conducted his own trial which showed that a black "healer" did better with his simples than did the white doctors with their mercury [87]. John Stewart, planter, in 1823 stated that the blacks had "many simples", some of which worked for yaws [88]. The doctor James Maxwell, in 1839, felt that the blacks' treatment was preferable to the use of mercury, still in use even at that late date [89].

These accounts said much the same thing; nevertheless, they were isolated reports, none building on the earlier ones. One could hardly expect the three planters to look at specific herbs for active principles; anyway, except in the cases of Stewart and Maxwell, the dates were well before the era of chemical analysis. All the same, there were a few British who suggested that slave remedies as a whole should receive the attention of Western doctors. The first chronologically in the list of those writing about yaws, James Knight, certainly saw the potential of slave medicine; he wrote that

> "I am of the Opinion, that many Secrets in the Art of Physick, may be obtained from the Negro Doctors, were proper Methods taken, which I think is not below our Physicians to enquire into, as it may be of great Service to themselves, as well as to mankind" [90].

Knight was echoing what the Dutchman Willem Bosman had said about African medicine in West Africa itself half a century earlier. This was repeated again by Thomas Winterbottom in Africa a century after Bosman (both these sources are considered in Chapter V). Edward Long, planter in Jamaica during the 1760s, said, as Knight had done, that Western doctors could learn from black healers:

> "The chief medicaments among the Negroes are lime juice, cardamoms, the roots, branches, leaves, bark, gums of trees, and about thirty different herbs. The latter have been experienced in many cases wonderfully powerful, and have subdued diseases incident to their climate, which have foiled the art of European surgeons". [91]

This description is similar to Henry Marshall's later one about Kandyan practices; however, Long does add a comparison with the efforts of Western physicians. Both men were critical of what they saw as a lack of reasoning behind the native practices which they described; as a Western doctor Marshall was unlikely to add that the indigenous healers could achieve better results.

In the West Indies, right up to emancipation in the 1830s there were British doctors who aimed to follow the lead which Knight and Long had given but none got round to it. Thus, Richard R.Madden, in 1835, admitted that

> "I had intended to have given you some account of the medical plants ...but I find it would be impossible to enumerate them even in any reasonable limits...I am, however, so thoroughly persuaded that a variety of very valuable plants are known to the negroes, whose medical uses we are unacquainted with, that I think any person who would undertake an account of the popular medicine of the negroes, would bring to light much information serviceable to medical science" [92].

Throughout the period of this thesis, doctors in the West Indies worked and wrote in isolation. By contrast, in India from the 1780s onwards, doctors joined in group activities. Doctors met to present papers, subsequently published along with the discussions which followed (see the preceding chapter, Chapter II). In the West Indies, there were connections, like the one already mentioned that linked James Grainger from the 1760s through William Wright to James Thomson sixty years later. However, there was no forum comparable to that of the medical and scientific societies which were formed in India from the 1780s onwards (see Chapter I). From 1825, *The Transactions of the Medical and Physical Society of Calcutta* reported on indigenous remedies. Thus, George Playfair noted that "madár" was one plant remedy which had been looked at earlier as part of an exercise "ascertaining the medical properties of plants used by native physicians" [93]. In the same issue, the Sanskrit scholar Horace H.Wilson (1786-

1860) gave a history of the use of the nut plant, *Croton Tiglium*, commenting on "the singular confusion of judicious principle, and ridiculous practice" in the writings of Hindu physicians on the subject [94]. Also in 1825 (though published in 1826) Wilson, like Ainslie at the same date, commented "on the Native Practice in Cholera". This was "in order that we may avail ourselves of any such [means employed] as may be beneficial" [95]. Some preparations were very simple though others were concoctions of several vegetable substances.

These are physicians describing herbal remedies. In 1832, the surgeon W.W.Raleigh described the

> "Oriental operation of couching for cataract, as practised by the native oculists of India. If it works, it does so well, giving a more complete lens removal than do European methods" [96].

Here, at least, was one surgical procedure for which a Western doctor was accepting that the Eastern method might be superior.

Evident in the *Transactions* is the consultation between doctors, with experts called on to comment, such as Horace Wilson on the history of Eastern medicine and Francis Buchanan, John Forbes Royle or Nathaniel Wallich on the botany. Experience was pooled: Royle, in recommending "the Hill Rhubarb (*Rheum emodi*)", added that "Mr Twining and other medical officers have...found this an effective substitute for the foreign rhubarb" [97].

This succedaneum for "the foreign rhubarb" was found (by Wallich) independently of indigenous practitioners. Nevertheless, William Twining (1790-1835), like Royle, was ready to learn from the latter. In his *Diseases of Bengal*, published three years before his early death in a carriage accident, he wrote that

> "The natives...use remedies in disease, from practical knowledge of their efficacy, without much reasoning; therefore I would not reject any of their therapeutical expedients, without an enquiry into their modus operandi, and an experimental investigation of their utility" [98].

Edward Long's comment on the lack of reason in non-Western medicine is repeated, half a century later; in the meantime, humoralism had been replaced by science as the theory behind Western medicine. David Arnold has called Twining "one of the most original and influential medical writers of early nineteenth century India" [99]. In fact, Twining's book itself seems unexceptional, covering familiar ground in its descriptions and attitudes. However, if he had lived, might he have been another Edward Balfour? Arnold's plaudit to Twining leads on to consideration of this important historian's list of the major medical figures in British India.

David Arnold looks at Western medical doctors largely for their role in establishing the dominance of British rule. His list will differ from that of doctors who concerned themselves with indigenous Indian medicine. For Arnold, Ainslie's work was pioneering, though "the motive was new drugs that could be incorporated into the allopathic pharmacopoeia or...substituted for imported drugs" [100]. Arnold also singles out Horace Wilson, who read Ayurvedic texts in the original, and William Twining. He marks down John F.Royle [101], as noted earlier in this chapter. Ainslie, Wilson, Royle and Thomas Wise are lumped together by Arnold with Benjamin Heyne as showing "a critical attitude toward Hindu medicine" [102]. The evidence given in the current chapter suggests that this quintet make an curious set of bed fellows. William O'Shaughnessy and Edward Balfour barely feature in Arnold's work. In a further publication, Arnold has talked about the British avoiding dialogue with indigenous medicine, their interest being only in extracting anything of use while they expressed disdain for the actual Indian practices, failing to separate Ayurvedic and Yunani medical systems from each other, or from simple folk medicine with no system [103].

For a similar list in the West Indies, one must look to Richard Sheridan. Sheridan does make a list, indeed he calls it that. It comprises British doctors whom he considers

to have been genuinely interested in slave welfare and culture. He includes John Quier, John Williamson, William Wright, Thomas Dancer, James Thomson and James Maxwell [104]. As said in the present chapter, Quier and Williamson appear to have believed that they had a duty to slaves under their care to treat them with Western medicine. Perhaps for this reason, their memoirs show little interest in slave practices [105]. William Wright's presence was intermittent, his body of work insubstantial. Thomas Dancer and James Maxwell did describe local herbal preparations, some of them slave ones. Dancer went as far as to say that books of the Western materia medica were inappropriate in Jamaica. However, only James Thomson wanted to question both Western and slave remedies, subjecting both to scientific (chemical) analysis and clinical trial. Sheridan says of Thomson, along with James Grainger and Wright, that they "sought to meld what they regarded as the best elements of African and European cultures into a Creole society" [106]. This is fabrication, far too positive a description of what was actually happening on the ground.

If Thomson had lived, he might have gone some way to achieving what Sheridan suggests. It is doubtful if anything he did would have affected the situation after emancipation, during the decades when Western medical care for the African-Caribbean populace barely existed. Indeed, it is uncertain that the medical work of Royle, Balfour or O'Shaughnessy in India then England achieved anything lasting, except in education. Rather, Balfour is remembered as an ecologist, O'Shaughnessy for the setting up of a telegraph system in India.

Royle was a spent force by the mid-fifties, unable to do the work for the third edition of his *Materia Medica* and dying in the New Year of 1858. O'Shaughnessy lived until 1889; he did participate in drawing up the 1868 *Pharmacopoeia of India*. Balfour died the same year as O'Shaughnessy; his well-meaning but naïve *Hints to the People of*

India is an illustration of the gulf between British and Indians and their medical systems.

Such distancing of the British from their non-white subjects increased after 1850. Thomas Metcalf says that the Indian Mutiny of 1857-8 and the 1865 Black labourers' revolt in Morant Bay, Jamaica, emphasized British notions of difference between them and Indians or Blacks. In India, the introduction of foreign systems was cut back; Christianity, for example, was part of the intrinsic superiority of the British and not to be shared [107].

Despite this distancing of themselves by the British, Indians from 1850 onwards made printings of books which combined Western and indigenous practices, as C.A.Bayly has pointed out [108]. The Indians themselves were doing the melding, "Indianisation" as a parallel to Sheridan's Caribbean "Creolisation". Mridula Ramanna has described some of the initiatives in Bombay. In the 1870s, when Balfour was enlightening Indians about Western medicine in his *Hints*, Sakharam Arjun (1839-85), Western-trained doctor, was publishing his *Catalogue of Bombay Drugs*, describing indigenous medical plants. Later, in the 1883 *Transactions of the Medical and Physical Society of Bombay*, Arjun recorded the lengthy training needed for both Ayurvedic and Unani medicine, refuting Morehead's earlier gibe that the training comprised no more than sitting in with a relative. At the end of the century, R.N.Khory and N.N.Katrak produced their *Materia Medica of India*, with its pairing of indigenous and Western drugs [109].

In 1877, reflecting the growth of Indian Nationalism, a Hindu materia medica was published. There was a second edition in 1900. The new authors, K.B.L.Sen and K.A.Sen, did not compromise in championing Hindu against Western medicine:

> "The large number of Hindu physicians in Calcutta, in competition with Allopathic (Western), Homeopathic and Yunani practitioners, is a standing

testimony to the value of indigenous drugs". [110]

Their nationalism was pro-Hindu, not embracing Muslim medicine as well (though, of course, the book itself was about Hindu medicine). Metcalf talks of the British in 1900 retreating to their clubs and hill-stations [111]. Poonam Bala suggests that Nationalist pressure and a desire to appease may have been behind the pronouncements of Sir Charles Pardey Lukis (1857-1918), Director-General of the Indian Medical Service. In the 1912 Proceedings of the Service he wrote that

> "There is much that is good in the Ayurvedic systems, and there can be little doubt that for many years to come the majority of Indians will continue to be treated by this method" [112]

In 1917 he called for improved teaching of Ayurvedic medicine, with examinations to ensure standards were met. D.G.Crawford, his contemporary, recorded in his *History* that Lukis edited the sixth (1901) edition of Edward J.Waring's *Bazar Medicines* [113].

In the second half of the nineteenth century, Unani medicine was ready to assimilate some scientific Western medical practices; it viewed this as taking back what had come from Arabic medicine anyway. Such developments are described by Neshat Quaiser. In 1889 the Madras-e-Tibbia medical school was founded in Delhi; one aim was to reform Unani medicine in conjunction with Western medicine [114]. The hakim Ferozeuddin, publishing in 1915, felt that Western therapy could be given for immediate relief but should be followed by Unani treatment on a broader base [115].

In the British West Indies, little appears to have been documented about African-Caribbean medicine after slavery and the apprenticeship system ended. With the disintegration of the plantation system and implosion of medical services, European doctors and Black labourers were less in contact (see Chapter II). Richard Sheridan's Doctors and Slaves is a demographic as well as a medical history, as the full title shows; his epilogue of only five pages at the end of the book concentrates on the demographic

changes [116]. Others, such as Eric Williams and Michael Craton, do not address the state of African-Caribbean medical practices after emancipation. Indeed, Craton says that in general there is a "a virtual absence of material directly derived from slaves" before as well as after emancipation [117]. Michael Biddiss has made the general point that medical practices seem no longer important for the history of medicine, which is now conceived as "a social study of past sickness and health within communities" [118].

Presumably, doctors and doctresses continued to minister to the freedmen in the villages which these created after the ending of the plantation communities. The loss of access to vaccination against smallpox was important. However, the African-Caribbean community was at least now spared the depletive measures of Western medicine. The relative immunity of the African to malaria made quinine less vital, one of the few effective remedies Western medicine had to offer.

Beyond this, it is a matter of inference and conjecture. The Quaker Joseph Gurney, as an opponent of slavery, may have been over-inclined to compare favourably the way of life of freedmen after emancipation with that during slavery. His description suggests a community which was well-organized and living in relatively good health [119]. Gurney was visiting Jamaica in the 1830s, before the epidemics of the 1840s and the 1850s. By inference, their medical care must have been obtained from their own healers with African-Caribbean herbal remedies. Western medical drugs probably represented only a small fraction of the African-Caribbean materia medica.

Unlike in India, where John Forbes Royle and others recorded indigenous herbal remedies, the drugs in use by the West Indian peasantry have had to be ascertained retrospectively. The ex-slaves become objects, their practices guessed at by historians. During the middle decades of the twentieth century, ethno-botanists laboured to obtain

the names of plants that were used in medical remedies. The major work was that of G.F.Asprey and Phyllis Thornton on the medicinal plants of Jamaica [120]. A third of the 160 species of plants which they listed had probably originated in West Africa and been brought by the slaves. Such a transfer of plants by slaves during the Middle Passage from West Africa to the Caribbean is also regarded as probable by Edward Ayensu, writing in the 1980s. He states (without giving the sources) that "historical accounts indicate that the use of introduced and indigenous plants in the Caribbean was deeply rooted in slavery originating in West Africa" [121]. His modern flora is a medicinal one but he himself gives nothing on the history or provenance of the herbal remedies which he describes. He lists present-day usage in order that the Caribbean states can exploit the remedies for their own benefit, financially and socially. The historical accounts to which he refers are in the Caribbean and not generally available.

Western and non-white medicine: summary of interaction

In India, the average British doctor was a lowly military man who was in contact with both native troops and practitioners of indigenous medicine. He would use empirically what came to hand and appeared to be worth trying. K.K.Roy may be correct when he says that British doctors showed no interest in the Indian systems of medicine; however, they were interested in the products. By 1800, some British doctors were attacking what they saw as inadequacies in those systems, particularly the Ayurvedic system of the Hindus. They viewed them as mixed up with religion and lacking a scientific basis. Nevertheless, a few doctors looked hard at the remedies used by their Indian counterparts; Royle's *Materia Medica* was largely fuelled by Hindu plant remedies. O'Shaughnessy recognized the need for study to be systematic, with chemical analysis and clinical trial, but done in collaboration with the Indian doctors themselves. In the

West Indies in the 1810s, James Thomson had hoped to do much the same with the African-Caribbean remedies of the slaves, an ambition unrealised with his premature death.

David Arnold's bleak analysis of the overall actions and attitudes of British doctors in India is correct on one level. They derided the Indian systems while they were ready to take and develop drugs used in those systems. However, that is to overlook or misconstrue the work of individuals such as Ainslie, Royle and Irvine or the approach of those such as O'Shaughnessy, Wise and Balfour. Studies which are multifaceted, such as those of Mark Harrison, have demonstrated how complex the situation was, thus for Orientalism. In the current thesis, the depth of interest and rapport shown by individual doctors (and occasionally laymen) has been demonstrated; this has challenged the Arnold theme of overriding derision and dismissal. The difference in conclusions may partly be due to Arnold concentrating on themes, this thesis being more biographical, looking at those Western doctors and laymen. Ross Danielson, in his *Cuban Medicine*, felt obliged to use a biographical approach on account of what material was available to him. He admitted that this might "twist social history into a succession of feats by great men" [122].

More intriguing is why the endeavours of those doctors failed. There was some interaction but little actual interchange and not much by way of end-product. Sometimes, the British doctors who took an interest were individuals following their own bent, without support from the administration. Obviously, all of them lacked the power of the late twentieth century conglomerates who have moved in to extract and refine the drugs in indigenous use for their own profit. More likely a cause was the discontinuity between the old botanically-based materia medica of the 1840s and the

new scientific pharmacology of the 1870s. This point has been made in Chapter II, will come up again in Chapter IV and is one major conclusion of the current thesis.

Of course, British domination through superiority, the Arnoldian theme, is a factor, acting in tandem with the down-grading of the botanical Indian materia medica in the face of chemical pharmacology. In addition, the British belief that their scientific medicine was the only way to advance will have hindered the further examination of Indian medical drugs after 1850. This is shown by the stance of Morehead though not by that of Balfour or Waring. Arnold's concept of a struggle between Western and Indian systems is itself Eurocentric. Michael Craton suggests that a post-modernist view is that all history-writing is relativistic, revealing little more than the mindset and culture of the writer [123]. This makes the work of historians such as Neshat Quaiser and Mridula Ramanna of particular importance, even if stronger on facts than on analysis. Beyond the mirror into which the British gazed at themselves, over ninety per cent of the Indian people (and West Indian non-white labouring class) continued with their own systems, with syncretism adding some items from Western medicine. The current thesis has contrasted the approach of sympathetic British doctors in India late in the nineteenth century with the increasing antagonism towards indigenous medicine shown by their medical colleagues in senior administrative positions. As the preceding chapters have shown, it was a time of polarisation between British and Indian indigenous or Western-trained doctors.

In the West Indies, many doctors from 1750 onwards recognized that their European materia medica might need modifying but few felt that the practices of African-Caribbean slaves offered an additional way to achieving that. Richard Sheridan's eye is trained on economic and social conditions and on the politics of slavery. He gives many details of medical practices yet does not seem to appreciate that social interaction was

not the same as medical interchange and did not necessarily lead to it. The customary handing over of Western medicines for use on estates did not constitute meaningful medical interaction. The current thesis corrects this aberration in Sheridan's ground-breaking and thorough work, the 1985 *Doctors and Slaves*. Astute planters, such as James Knight, Edward Long and A.J.Alexander, saw the benefits and potential of African-Caribbean remedies. Apart from James Thomson, no-one medically qualified attempted to follow their lead. Some planter-doctors, such as James Grainger, John Quier and John Williamson, were determined on humanitarian grounds to treat slaves with the same Western medical measures as they gave to their fellow whites. Overall, the culture was doubly set against interchange: white doctors had no wish to study slave medicines while slaves wanted to escape the heroic depletive measures of Hippocratic Western medicine. The point is original to this thesis.

While not looking directly at the issue, Michael Craton makes several remarks which are relevant to the lack of interaction. Despite variation between different colonies, there was a pattern. The white plantocracy's siege mentality meant that there was little syncretism between it and the rest of society. The vast majority of slaves did not acquire the language of the whites. There was, however, visible syncretism of nonconformist Western religion [123]. Medical creolisation is not a theme taken up by any historian based in the West Indies. That task was left to mid-twentieth century ethno-botanists, as the next chapter will point out. It has proved hard to study for the purposes of the current thesis, despite the primary sources available and the work done by historians with first-hand experience, such as Williams, Sheridan, Beccles and Craton.

With hindsight, some of the failure in interchange, or in developing what was exchanged, can be put down to the vagaries of timing, which led to lost opportunities. This point was made at the end of the preceding chapter. Royle's health and influence

were declining by the 1850s. O'Shaughnessy channelled his energies into setting up the telegraph. Balfour, similarly, got caught up with battles in ecology, conservation and education for Indian women. The last two were old men long retired by the time scientific pharmacology became established in Britain. William Wright shuttled back and forwards between Britain and Jamaica; he became a correspondent, not a publisher of his work, while James Thomson was dead before he was thirty, more than a decade before emancipation.

The next chapter, Chapter IV, considers the British doctor-botanists; among these, William Roxburgh, John Royle and William Wright, all referred to in the current chapter, are prominent. In India, the authorities had a commercial interest in finding "useful" plants, medical or otherwise, and also had a military interest in exploration. The doctor-botanists could examine plants used in indigenous or non-white remedies. In addition, they could bypass local healers by looking at "new" plants, even if as a group they tended to be more sympathetic towards native practitioners than were most British doctors. As such, they had a potentially crucial role in medical interaction. In addition, they had an important if sometimes unwitting part to play in the British annexation in India. In the Caribbean, they sometimes ran botanical gardens but were more likely to be gentlemen-amateurs in their botanical studies, in the usual eighteenth century tradition, failing to relate their botany to their materia medica or that of the slaves.

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CHAPTER IV

DOCTOR-BOTANISTS IN BRITISH INDIA AND WEST INDIES 1750-1900:

Their Input on Medical Interaction

From 1750 to 1850, British, and other European, doctors were taught botany as part of their medical curriculum. Indeed, in Edinburgh it was regarded as of major importance; for a period there, Botany and Materia Medica were combined in a single professorial chair. This is not surprising, considering that the Western materia medica was largely made up of plant-based remedies. Medical graduates from the Scottish universities such as Edinburgh often had difficulty obtaining posts south of the border; in particular, the Royal College of Physicians of London could thwart them from practising near London. In addition, their training and their patronage were positive reasons in making them appear suitable to the East India Company.

These, therefore, were among the factors which led doctors well-trained in botany to take posts with the Company medical service (after 1859, the Government Indian Medical Service). Extracurricular or non-medical activities were undertaken by some of these doctors; of these activities, botany was the usual one and that with most bearing on medical practice. The Company expected the botany to be applied, with the prospect of a commercial dividend, for industry as a whole, not just in medicine.

From 1790 for two decades, the President of the Royal Society in London, Sir Joseph Banks, was in a powerful position, able to coerce the Board of Directors of the Company into funding ventures such as Botanical Gardens, the transfer of plants between colonies and the publication of floras of colonial plants. In addition, Banks was interested in agriculture. This was a form of applied botany and zoology: such "improvement" through knowledge of natural history would help create and control the

Empire, notably in India but also elsewhere. Banks's aims extended to the Caribbean as well. He personified the imperialism of improvement, a member of "Nature's Government".

The position for botanizing in the West Indies differed from that in India. For most of the eighteenth century it was more a matter of individuals pursuing "pure" botany (as opposed to applied) as a hobby, though sometimes with an eye to the possibility of new plant remedies. The British tradition of doctor-botanists went back further in the West Indies than it did in India, notably in the person of Sir Hans Sloane, who spent fifteen months there from late in 1687. Botanical gardens were also created earlier there than in India, that on St Vincent's being instituted in 1765.

By the 1780s, as in India, Banks was involved in initiating such gardens and in plant transfers (one of which led to the mutiny on the Bounty in 1789). Again as in India, many of the doctors, both military and civilian, were Edinburgh trained, indeed there was a tradition for the sons of planters to study there, obtain their doctorates then return home to practise. They would act as doctors on the family plantations where they were also slave-owners. While some doctors looked for plants as possible succedaneums for European remedies, virtually none of them studied African-Caribbean herbal remedies.

The Western materia medica was plant-based and remained largely so until even late in the nineteenth century. Non-white materia medicas, including South Asian and African-Caribbean, were also plant-based. This placed European doctor-botanists in a privileged position with regard to medical interaction. In addition, advances in botanical classification during the eighteenth century allowed them to find plants of potential benefit to Western medicine by searching for these themselves. In doing so, they could bypass the lore of indigenous or slave doctors. This subject has been addressed only

tangentially by modern historians. Thus, the key secondary references rarely touch on these questions, since the main thrust of such works lies elsewhere.

Several historians consider the global picture. Botanical mercantilism in the late eighteenth century is important to John Gascoigne in his books on Joseph Banks and Science in Empire [1]. At the time, the West Indies had been an important part of that empire for over a century. The acquisition of territories in the Indian sub-continent and the discovery of Australia and New Zealand offset the loss of the North American colonies. Banks saw opportunities for botanical ventures between all these regions.

Richard Grove's *Green Imperialism* comprises a comprehensive study in space and time [2]. As the title implies, the development of concerns about ecology and conservation is its principal subject. Like Gascoigne, Grove mentions the formation of botanical gardens in India and the West Indies during the eighteenth and nineteenth centuries. He also describes the early nineteenth century surveys by doctor-botanists and the mid-century measures in forestry conservation in India.

From the 1770s, doctor-botanists were active on the sub-continent, indeed Richard Drayton has called India "a powerful instance of colonizing by gardening" [3], in much the same way that David Arnold has talked about colonizing by medicine [4]. Exploration of India by European botanists is the subject of Ray Desmond's book. He looks at the European discovery of the Indian flora both before the British hegemony and during it. He talks of "Green Medicine", in referring to John Forbes Royle (1799-1858) as one doctor-botanist who respected indigenous medicine [5]. Therefore, while Desmond's theme is botanical, he does go a little way to considering the role of botanists in medical interaction. Conversely, Arnold, in his work on science in nineteenth century India, views Royle as a relatively minor figure in botanical exploration and geography [6].

Marika Vicziany, in an article, looks specifically at the surveys in India of Francis Buchanan (1762-1829] [7]. As with Grove's work, this has little to do with indigenous medicine and medical interaction. These and similar surveys were carried out on the instructions of the Company. Satpal Sangwan has studied the relationship between the Company and its doctor-botanists in India [8]; most of these regarded themselves as naturalists while the Company saw them as agents for obtaining commercial and strategic advantages.

With no East India Company promoting (if attempting to control) their activities, doctors in the West Indies practised botany on their own initiative, apart from the few involved in running botanical gardens. This point was made at the start of the chapter. Indeed, Richard Sheridan, in *Doctors and Slaves*, describes such gentlemanly activity without relating it to any possible medical interaction [9]. The work of Londa Schiebinger does to small extent fill the gap. Schiebinger considers many of the issues of botany and empire: pure and applied botany, doctor-botanists, botanical nomenclature, for instance. However, when it comes to medical interaction, she looks at French, rather than British, contacts with Carib or African-Caribbean medicine [10]. This is not surprising nor is it a defect in her methodology: the British got rid of any remaining Caribs and showed little interest in African-Caribbean herbal remedies. The second fact is evident from a reading of Sheridan's work, even if he does not acknowledge it himself. Schiebinger is following in the steps of Richard Grove, who points to the French rather than the British as the pioneers of conservation in their overseas colonies from the mid-eighteenth century onwards [11].

The doctor-botanists held a key place, with their dual knowledge. They could liaise or interact with the indigenous herbal practitioners of their day. They could also use their botanical knowledge independently. Those who, like John Forbes Royle, were also

experts on Western therapeutics, were positioned to bring their findings from empire into metropolitan medicine. Yet what they achieved seems to have been less than it might have been. This may have been with research moving from the botanic garden to the laboratory from mid-nineteenth century onwards [12]. These points have been made in the two preceding chapters but are relevant for the current one as well. The botanically-based materia medica, with its plants from Asia and South America, was shunted aside. The work of the European doctor-botanists appears to have had little long-term effect on the Western materia medica and even less on the two main Indian indigenous and the African-Caribbean materia medicas.

Botany meant different things during the period of this thesis. Pure botany consisted of the study of plants for its own sake. The professorial chair at Cambridge was held from 1762 to 1825 by the Rev.Thomas Martyn, who recalled that in his undergraduate days he and his fellow students "were looked upon as no better than cockle-shell pickers; butterfly hunters and weed-gatherers" [13]. In fact Martyn was a distinguished botanist, "one of the earliest exponents of Linnaean classification" according to the 1897 DNB [14].

The Swede Linnaeus (Carl von Linné, 1707-78) was the originator of the binomial classification (which consists of generic name followed by specific name and is based on the reproductive organs of flowers). He believed in applied botany, an economic science. As early as the 1740s, he advocated the global transfer and acclimatization of "useful" plants. A doctor-botanist (as well as a paediatrician, naval doctor, professor of medicine), he followed the Hippocratic/Hartlib idea that plant remedies for diseases would be found where those diseases occurred. Linnaeus aimed at a syncretic "new science" between high and folk knowledge world-wide; this included medicine [15].

Besides economic botany, another form of applied botany was ecological botany. For British colonies, this began in the 1780s, thus in the West Indies through the work of Alexander Anderson. It became of economic importance in India by the 1840s, for instance when Edward Balfour persuaded the Madras government that deforestation was detrimental [16].

The status of botany as a science fluctuated during the period; it was held in low esteem from 1750 to 1780 and again from 1820 to 1840. The dismissive attitude towards Thomas Martyn's botanizing which was quoted above belongs to the first of these periods. At a broader level, all natural history was regarded by the scientific establishment in Britain as inferior to "pure" mathematics or sciences such as physics. Isaac Newton was looked up to rather than the doctor-botanists Hans Sloane or Linnaeus; he was regarded more highly than even William Harvey, the discoverer of the circulation of the blood. The physician Sir William Browne [1692-1774] declared in 1772 that

> "The eighteenth...century...most justly deserves the appelation [sic] of the Mathematical Age". Even in Natural History, "No person, who is not a Mathematician, is qualified to take the Chair of Natural Knowledge" [17].

It is ironic that botany was so disregarded, particularly by a physician, at a time when the Western materia medica was plant-based; it is a further irony that medicine had so much more in common with natural history than with mathematics. Sir Joseph Banks, like Sloane before him a long-term President of the Royal Society, worked hard to reduce such prejudice.

After the death of Banks in 1820, botany, pure and applied, underwent a further period of eclipse. Botany was for long regarded by many as the preserve of amateurs and women, who collected plants for pleasure (in the same way as Thomas Martyn had been thought to do as an undergraduate). After Martyn's long tenure, the chair of botany

at Cambridge was under threat, with James Moule, Professor of Greek, arguing that "natural history is a pursuit which demands little exertion of the highest powers of intellect" [18]. In 1823 and again in 1830, Kew Gardens, London, had to recall its collectors, due to a lack of official funding. The father and son doctor-botanists, W.J.Hooker (1785-1865) and J.D.Hooker (1817-1911), had little prestige, with low salaries; they got Kew Gardens re-established and refurbished by 1850 only through intense, prolonged lobbying.

Botanists in the colonies who were the equivalents of the Hookers, such as John Forbes Royle and Nathaniel Wallich in India, were under continual pressure from the authorities to curb their activities and run down the botanical gardens there [19]. The standing of doctor-botanists in India will be considered more fully later in this chapter as will the relationship between botanists in the periphery and their counterparts in the metropolis. However, it can be said here that Royle practised applied or economic botany in a way similar to that of Sir Joseph Hooker later. This is shown by Royle's *Essay on the Productive Resources of India* of 1840 and his work on the transfer of *Cinchona* trees to India in the 1850s [20].

The varying status of botany as a branch of natural history or as a science was linked to the quality of its teaching at universities in Britain. In the 1760s, Joseph Banks, as a student at Oxford, found that he had to teach himself botany, with the help of tutors he sought out for himself. Erasmus Darwin was at Cambridge but he did also study at Edinburgh. There, John Hope (1725-86) was appointed in 1761 Professor of Botany and of Materia Medica. Among his pupils were William Wright, doctor-botanist in Jamaica, William Roxburgh, the first and one of the foremost in India, and William Withering, the discoverer of *digitalis*, in the Midlands, England. When Hope died, Wright was offered the chair in botany but declined it.

The Edinburgh tradition of botany as part of medicine followed that of the University of Leiden, Holland. Linnaeus spent three years at Leiden in the 1730s; both it and Edinburgh had botanical gardens for teaching and for the cultivation of medicinal plants. It was not uncommon for individuals to get training at several medical schools. Some doctors who later worked in the West Indies or India spent time in Leiden; among them was the Quaker planter-doctor John Coakley Lettsom (1744-1815), born in the West Indies. Richard Sheridan gives statistics on the number of Edinburgh graduates who worked in the Caribbean [21]. Many of these doctors were nonconformists like Lettsom, unable to study at Oxford or Cambridge, or to work at recognized hospitals in England. Lettsom, however, did become a fashionable doctor in London, though without a hospital appointment, having to set up his own dispensary, like John Millar. He had, in fact, been a medical student at St Thomas's Hospital, London, then studied in Edinburgh, finally taking his degree as Doctor of Medicine at Leiden in 1769, aged twenty four.

Lettsom's interest in botany was horticultural; he was a friend of two famous Quaker horticulturalists, Dr John Fothergill (1712-1780) and Peter Collinson (1694-1768) [22]. Joseph Banks wrote of Fothergill's garden at Upton, West Ham, London that "he had procured from all parts of the world a great number of the rarest plants, only equalled by...the botanic gardens at Kew" [23]. Like Banks, both Collinson and Fothergill promoted plant exchange for mercantile reasons, not just horticultural [24]. Banks became President of the Royal Society in 1778; he highlighted one aim, which was "to improve the knowledge of natural things, and all useful arts" [25].

The transfer of plants within an empire and the use of botanical gardens for this began with the Portuguese who linked Goa, West Africa, Brazil and the Caribbean during the sixteenth century. This was followed by the Dutch in the seventeenth century, with their

gardens at the Cape and at Leiden [26]. These forerunners of British and French endeavours in the eighteenth century are considered in Chapter V. Richard Grove has contrasted the mercantile small-mindedness of the British with the far-sightedness of the French doctor-botanists [27]. In 1754, "The Society for the Encouragement of the Arts, Manufactures and Commerce" was formed in Britain. John Gascoigne says that it was patriotic and mercantilist: the Colonies were not to be manufacturers but suppliers of raw materials.

In 1762, eight years after its formation, the Society offered awards; one was used to initiate the St Vincent's Botanical Garden in the West Indies, for "the cultivation of plants, useful in medicine, and profitable as articles of commerce" [28]. In 1791, another award was made by the Society, this time to Dr Thomas Dancer at the Bath Botanical Garden, Kingston, Jamaica.

The best-known director of the St Vincent's Garden was Alexander Anderson (?1748-1811) who was there from 1785 till shortly before his death. Anderson saw the Garden as a repository for plants from everywhere. Thus, he not only "collected plants from all over the island" but felt that the garden should become

> "a nursery for supplying all the other islands with the useful
> plants that can be obtained from the different climates of the world" [29].

This is from an undated manuscript of around 1795. The singular figure of Anderson will be described in more detail later.

While Anderson was re-organizing the Garden at St Vincent's, the Calcutta Botanical Garden was founded, in 1791. By 1793, Joseph Banks had managed to get William Roxburgh (1751-1815) transferred there as Superintendent. Banks gave support to Alexander's work on St Vincent's but had less influence in the West Indies than in India. Even so. the enthusiasm of the (East India) Company's Court of Directors in London for Banks' plans was fitful, as not all of these had obvious commercial

potential. In 1806, Banks reiterated to them in a letter what he regarded the Calcutta Garden as being intended for:

> "An increase of resources in food, in raw material and luxuries... receiving from the West such useful plants...and sending to the West; for extending the science of natural history and more particularly that of Botany...and to the learned world discoveries, as are made in the regions of the East" [30]

The second half of this exhortation is pure not applied botany but the Company kept making it clear that they wanted the Garden used for "profitable" plants only, with any scientific function kept to a minimum. Before his transfer to Calcutta, Roxburgh had been Superintendent of the Salmakot (Samulcotta) Botanic Garden, Northern Circars, two hundred miles north of Madras. There, he had acres of "useful" plants, such as coffee, breadfruit and peppers; such an enterprise may have helped secure his appointment at Calcutta in 1793. This was part of what Banks wanted: the transfer of plants gathered from all over the Empire. It was something that required knowledge of botany and climate but not much input from the Empire's indigenous subjects in India, except for their labour.

Such gardens did have some value as show-pieces and for recreation. Reginald Heber (1783-1826), the short-lived Bishop of Calcutta, visited the garden there in 1823, when Nathaniel Wallich (1785-1854) was Superintendent. He wrote in his journal that

> "The Botanic Garden is a very beautiful and well-managed institution, enriched, besides the noblest trees and most beautiful plants of India, with a vast collection of exotics, chiefly collected by Dr Wallich himself...Dr Wallich has the management of another extensive public establishment at Titti-ghur... appropiated more to the introduction of useful plants into Bengal" [31]

Heber seemed to look beyond the decorative aspect and to recognize the main purpose of any Garden, as a commercial enterprise, particularly a Garden of the Company.

The Company from the 1780s to the 1850s blew hot and cold about its doctors' activities. Sometimes, it changed its mind about surveys which were under way,

recalling the doctors to resume service duties. The reports of such surveys might get buried in files, without any action or intent to publish. Satpal Sangwan has referred to "the compromise...reached between the...Company and the naturalists" [32] but it was more of a confrontation, with periods of truce. Francis Buchanan resigned within months of being appointed to the Calcutta Garden in 1814. He was succeeded by Nathaniel Wallich but only after attempts were made to appoint instead of him a plantsman without qualifications, someone who could be paid less. Banks and others in London got Wallich reinstated [33]. Buchanan wrote to Wallich from Scotland objecting to what he saw as the cavalier handling by the Company of his dried herbarium of plants [34]; the letter is quoted in Chapter I of this study. Edward Balfour, in the 1840s, persuaded the Madras presidency that steps were needed to reverse deforestation, only to have the central government of India reject the recommendations from Madras [35].

The doctors in India were servants of the Company and later of the Indian Medical Service. The history of the service was written by D.G.Crawford and published in 1914. Of the extra-professional work recorded by Crawford, surveying and "Natural Science" formed a major part [36]. The two might be combined, notably in the surveys during the 1800s by Francis Buchanan, who provided information of military and commercial value to the Company while pursuing his own botanical interests [37]. The information gathering from surveying and other activities was part of control, since it helped in the taking over of Indian lines of communication [38]. Buchanan's purer botanical pursuits were clearly of no aid in this and were unofficial.

Doctors in the periphery also had problems in their relationships with their opposite numbers in London. They were often jealous of them yet needed them for support, lobbying and advice when they themselves came home. We have seen Joseph Banks

intervening for Roxburgh in the early 1790s and again for Wallich in 1815. In 1797, Francis Buchanan wrote from Calcutta to his Edinburgh contemporary and friend, the London doctor-botanist Sir James Edward Smith (1759-1828), that

> "I want books and I want a wife, and as long as I continue in my present situation, I must continue to want them" [39].

When Wallich was in London in the early 1830s to distribute the herbarium, owned and housed by the Company, he found British botanists were "either incapable or too busy (as Lindley or Hooker), or would do nothing, like Brown". He therefore distributed some of the duplicates to botanists outside Britain, to the chagrin of many British botanists [40]. As late as the 1840s, Wallich was accused of promoting "scientific" interests to the detriment of more commercial ones [41].

Long before this, in 1815, the date when Wallich was appointed to take over the Calcutta Garden after Buchanan's resignation, he had declared in a letter to Buchanan that "I wish to be employed henceforth solely in Natural History" [42]. This was indeed wishful thinking, since there were no financial rewards for "pure" botany; it was an activity which the Company wanted to keep hard-pruned. However, the point does allow the next major issue to be flagged: there were not only variants of botany, pure and applied, but also different sorts of botanists.

There were gentlemanly botanists and salaried "pure" botanists (such as Buchanan and Wallich aspired to be). In addition, some applied their botanical knowledge, for instance towards the study of indigenous medical remedies and the search for entirely new drugs. As Wallich found out, most doctor-botanists might aspire to discover and classify plants as an academic exercise but were forced to combine doing this with practising some form of applied botany in order to get a living.

The gentlemanly botanists were a phenomenon of the early eighteenth century onwards. They were amateurs in the sense that their living was not made out of their

botanizing. Historians have shown a curious dichotomy in the names they apply to these men. Sheridan calls those in the British West Indies "doctor-scientists" while David Arnold regards a large part of the science conducted in India before 1858 as "gentlemanly". Satpal Sangwan disagrees with Arnold, charting the change from gentlemen to professionals from the 1780s to the 1840s [43].

Men who did get paid for botanical work were mere plantsmen; Banks did not regard such men as scientists (he himself had a large private fortune). Others were professional scientists or naturalists in all but name. They included those, such as Roxburgh and Buchanan, who had become fully botanists (while still on the payroll of the Company medical service as doctors). However, some of the "amateurs" in England and in the colonies had expertise which went beyond haphazard plant-collecting. The two Quakers, the merchant Peter Collinson and the doctor, John Fothergill, have been mentioned already. Sir Hans Sloane (1660-1753), was an acquaintance of most of them in his long life. Across the years he added to his Jamaican collection of 1688 by obtaining specimens from other places. While in Jamaica he met the doctor-botanist Henry Barham (d.1721) and subsequently corresponded with him. Barham did mention the use of plants in medicines; these were from his own observations and those of other European doctors. His *Hortus Americanus* was not published until 1794 [44]. As with many later memoirs from the West Indies, the book makes no mention of any African-Caribbean usage. Other doctors produced purely botanical works on Caribbean natural history; usually, these men had studied at Leiden or Edinburgh or both [45]. The medical practices of the slaves were no part of such works.

However, when the position of William Wright (1735-1819) is considered, the distinction between "pure" and "applied" botany seems blurred. The one between the amateur and the professional or paid botanist stays intact, since Wright was never the

latter. In a career much affected by war, Wright had one prolonged period of peace on Jamaica from 1771 to 1777. Lecturing in Edinburgh on his return, he wrote about plant-hunting in Jamaica: "In this delightful walk of science, I discovered and ascertained many hundreds of new plants which had escaped the diligence of former botanists". To do this he had "spent all my spare hours examining the plants" [46]. This is Wright as pure or gentleman-botanist.

In 1779, after a year in Britain giving papers to learned societies on medical and botanical matters and becoming an FRS, Wright set off back to Jamaica; he got captured by the French on the way. He returned to Britain and did not get to Jamaica until 1782. He stayed only one year, but managed to restore his *Hortus siccus* (collection of dried plants) with the help of a Swedish botanist called Schwartz, a pupil of Linnaeus (this could have been the Olf Swartz whom Banks wanted for India in 1787, despite the different spelling).

In 1787 Wright published "*An Account of the Medicinal Plants Growing in Jamaica*". In the preface, he wanted to demonstrate accuracy: "Descriptions of plants were made on the spot". This also makes it clear that he was acting directly as a botanist. He went on to say that he had made "discoveries, new and important, which have escaped the notice of Sloane, Jacquin and Browne" [47]. The actual medicinal plants, though spread over around a hundred and fifty pages, comprise an curiously sparse group; the difficulty in working out any African-Caribbean contribution to the work has been referred to already in Chapter III.

In the Preface to the *Memoir*, Wright is said to have begun his collection in 1771 "walking round with his 1764 copy of Linnaeus's *Species Plantarum*" in one hand. He was a scientific botanist, as was William Roxburgh in Madras during the same period. Botanical knowledge, particularly the Linnaean classification, allowed them to pick out

likely plants. The difference between them was that Wright worked as a doctor, while Roxburgh was superintendent of a botanical garden. However, in Chapter III on indigenous medicine, it was shown that Roxburgh provided not just botanical advice to colleagues but also information on Indian herbal remedies.

Alexander Anderson (?1748-1811), the second director of the Botanical Garden at St Vincent's, West Indies, was botanist first, doctor a poor second. Indeed, his medical qualifications were suspect; he attended classes at Edinburgh but took no degree. (This was not unusual: the poet John Leyden (1775-1811) did the same for six months. He got an instant degree at St Andrews which allowed him to go out to Madras as an assistant surgeon but with no medical duties). After imprisonment by the French on Martinique, Anderson turned up on St Lucia in 1783; once St Vincent was returned from French occupation in 1785, he got the garden back in order.

Anderson wrote of the original "yellow Caribs" and the "black Caribs", escaped slaves who might have learnt about indigenous plants from the yellow Caribs. The Lesser Antilles, Dominica, St Lucia, Tobago but especially St Vincent, had retained an indigenous Carib population throughout the eighteenth century. The remnant of Caribs on St Vincent were then forcibly expelled to Ruatan, Honduras; Anthony Trollope, in 1860, felt that "having got rid of them out of St Vincent, we can afford to get rid of them altogether" [48]. Anderson was intrigued by plants shared with mainland Guiana despite the distances and differences in climate.

> "Had these plants common to both been all fruit-bearing or medicinal, then introduction into St Vincent might have readily been supposed to have been by the aborigines, [for instance] Carapa and Allamanda, for they are Indian medicines" [49].

Alexander was practising phytogeography (the sites at which plants grow) before Francisco Jose de Caldas and Alexander von Humboldt did so in mainland Nueva Granada (Colombia) [see chapter V] or Royle in India. He did his best to discover the

sites of original Carib habitations on St Vincent in the hope of finding "useful" plants still remaining there. This was ethnobotany, a century before the term was coined by John Harshberger in 1896 [50]. Today, botanists are undertaking similar searches for culinary, medicinal and dyeing plants in the vicinity of ruined abbeys and medieval houses in Yorkshire, such as Fountains Abbey and Markenfield Hall, Ripon. We are doing this, of course, as no more than an historical exercise while Anderson hoped for some practical benefit from it, medical or other.

Anderson was interested in more than indigenous medical plants. Like Francis Buchanan in India, whose mapping of river crossings and other strategic spots helped the British gain control, Anderson surveyed the rivers of Guiana in a covert act of spying which facilitated the British seizure of Demerara, Dutch Guinea. He was also an early ecological botanist, recognizing the need for reforestation and the use of crops other than sugar cane. He had a broad perspective for the Caribbean in time and space, feeling that the planters on St Vincent

> "are acting the same inconsiderate and improvident part as did the first settlers of Barbados and Antigua by the total extirpation of all the natural woods within their bounds" [51]

This was at a date when many doctors still saw trees as injurious to health (see Chapter II). Even in the 1840s, when Edward Balfour was crusading for forests, many in authority would prove hard to persuade.

There is some risk in regarding a doctor-botanist as more doctor or more botanist solely on the basis of his publications. This is true of James Dottin Maycock, with his *Flora Barbadensis* of 1830. The introduction mentioned "long professional residence" and that Maycock was "A member of His Majesty's Council in Barbados"; he also became Professor of Medicine at Codrington College, Barbados but without a medical school (see Chapter II). However, the work is one of pure botany; even the cultivated

plants do not have their uses given as John Forbes Royle was to do in his *Materia Medica* of a decade later.

Maycock referred to two of his predecessors as doctor-botanists, Hans Sloane and Patrick Browne (1720-90), observing "how time has meant that botany has moved on since their day" while acknowledging that "Dr Browne was held in high estimation by Linnaeus" [52]. In Chapter III, a chain was noted linking James Grainger, William Wright and James Thomson across sixty years. Here is a similar chain of twice the length, linking doctor-botanists. Despite such awareness of what their predecessors had achieved and published, there was no comparable forum for the reassessment of earlier studies or debate on current work, such as existed in India. For example, the seventeenth century Dutchman van Reede's *Hortus malabaricus* for the West Coast of India was used by Francis Buchanan in his work on plant taxonomy. Van Reede provided Sanskrit names more intelligibly than did Sanskrit texts with what Buchanan called "the terrible confusion and uncertainty" in their naming. The *Hortus* was used again by the committees for both the 1864 British and the 1868 Indian official pharmacopoeias [53].

Buchanan and Wallich aspired to be salaried naturalists, with no other commitments, whatever their employers demanded. The work on taxonomy was done in retirement, after Buchanan left India in 1815. This comprised bringing the earlier Dutch work into line with Linnaean taxonomy; Buchanan's work was not appreciated at the time (even at Linnaean Society meetings) but remains valuable today. The reports of his surveys which he made for the Company avoided mentioning the botanical work that he had done unofficially. Ironically, this was despite the instructions for the survey of Mysore exhorting Buchanan

> "to take every opportunity of forwarding to the Company's Botanical Garden at this Presidency whatever useful, or rare, or curious plants and seeds you may

be enabled to acquire in...your researches" [54]

This seems to give latitude for "pure" botanizing but Buchanan guarded his material, which he was not prepared to cast as "pearls before swine" (by swine he meant the Company).

More puzzling is the scantiness of the references to indigenous practitioners in Buchanan's reports. In that on Dinajpur (carried out in the 1800), a province of Bengal, he stated that

> "No person teaches medicine in this district, and indeed proper physicians are very few in number" [55]

In that on Behar and Patna (1807), he wrote of teaching by Pandits and listed medical plants, some of which had been taken to Patna by William Roxburgh. However, he does not refer to the existence of the 1795 *Patna Pharmacopoeia* of indigenous products or any work which Roxburgh might have done towards that. At first glance the apparent paucity of practitioners in Dinajpur seems comparable to Thomas Wise's 1845 statement that "A very few [Hindu] practitioners may still be found" [56]. However, modern historians of surveying, such as Matthew Edney, have been sceptical about the quality of Buchanan's surveys, pointing out the short-comings [57]. Of them, Marika Vicziany is the most even-handed, regarding Buchanan as thorough in his botany but suspect with his socio-economic data [58]. Buchanan's reports were concoctions to satisfy his masters. Botanizing was dearer to him than seeking out indigenous doctors.

Buchanan's younger colleague Nathaniel Wallich was born in Copenhagen, learning his medicine and botany there. In 1807 he became a surgeon at the Danish settlement at Serampore. When this was captured by the English a year later he transferred to the Company's medical service. By the 1840s, he was teaching botany to Indian medical students at the Medical College of Bengal, where he was Professor of Botany, alongside William O'Shaughnessy in Chemistry [59].

Wallich's published comments on indigenous medicine seem to have been restricted to those in Transactions, reporting debates in which he had taken part. His own publications were strictly botanical, such as the 1832 *Plantae Asiaticae Rariores*. Yet, as said already, such publications do not necessarily indicate that a doctor-botanist's activities were narrow. The 1834 *Contributions to the Botany of India* by Robert Wight (1796-1872) is entirely in Latin, like botanical treatises of earlier centuries. He was the most important doctor-botanist in India during the 1830s and 1840s. His interest in indigenous plant remedies is shown in comments made in 1837:

> "It is a desideratum to know how the natives have treated the subject of medicaments. Our medical practice pays, perhaps, too little attention to vegetable remedies, of which the Orientals possess an infinite variety, many inert but many active, and many also quite unknown to Europeans" [60].

Thomas Thomson accompanied Joseph Hooker to the Western Himalayas in 1847 and wrote purely botanical works. Both Wight and Thomson were on Edward J.Waring's committee which drew up the *Pharmacopoeia of India* in 1868, Wight supplying details of plants for this.

Joseph Hooker himself managed to sustain a career in botany, with world-wide surveys then work at Kew Gardens. He travelled to India in 1847 with the new Governor-General, Lord Dalhousie, so was well-placed to reinforce Edward Balfour's stand on forest conservation. Hooker found "the flora of British India more varied than that of any other country in the globe" [61]. Hooker's *Himalayan Journals* make no mention of the covert military or strategic purpose of his travels, as well as the obvious botanical one [62].

Wight and Hooker were medically qualified botanists. Some doctors in both India and the West Indies took some part in medicine though more in botany. The case of Thomas Dancer, superintendent at the Bath Garden, Kingston, Jamaica, has been mentioned in Chapter III; the first edition of his *Jamaica Practice of Physic* (1801) had a section on

the African-Caribbean medicine of the slaves [63]. William Roxburgh may have been instrumental in the early (1795) *Patna Pharmacopoeia*. It is clear (and has ben described in Chapter III) that Roxburgh identified many plants used by Indian doctors and recorded the ways in which they used them. In addition, his knowledge of Linnaean taxonomy allowed him to find possible plant succedaneums, for instance his febrifuge, *Swietenia*. However, he remained more botanist than doctor, without opportunity or inclination to try out any of the plant drugs in proper trials.

Such a trial was undertaken in England by a fellow Edinburgh medical graduate, ten years Roxburgh's senior, William Withering (1741-99). In 1767, the slow growth of his medical practice in Staffordshire gave him time to produce his *Botanical Arrangement*, first published in 1776 [64]. David Elliston Allen feels that this Flora alone is enough for Withering to be remembered, the first accessible non-specialist guide in English. This contrasts with Wight's later Indian work, written in Latin. The earlier binomial classification of Linnaues was equally an act of "democratizing accessibility", using simple self-instruction, according to Lisbet Koerner [65].

The *Botanical Arrangement* was indeed famous for many decades but today Withering is better known for his 1785 *An Account of the Foxglove* [66]. In this, he acknowledged the empirical benefit of an old woman's "folk medicine" remedy in reducing dropsy. His botanical knowledge allowed him to identify *digitalis* or foxglove leaf as the active ingredient. His medical training enabled him to prepare this as ground-up leaves in measured doses. His practice among the poor of Stafford and Birmingham meant that he was able to try out his preparation for its diuretic effect across ten years. In doing this, he worked out different kinds of dropsy depending on the cause and which of them *digitalis* would reduce. He published only when these trials were complete. Withering's success therefore depended on five things, including the training

in medicine (William Cullen), that in botany (John Hope), suitable patients for trial (the poor) and the time for an adequate trial. The last requirement was an audience of fellow doctors who also believed in "rational empiricism", observation supported by theoretical knowledge, as described in Chapter II.

It is clear straightaway that such methodical work as that of Withering was not possible in India or the West Indies, even for doctors who were botanists as well and were in practice there for periods of years. In India, the doctors were Company employees. As doctors they had military or civilian commitments, or both. As botanists they were expected to make the official gardens purposive and profitable or undertake surveys with military and strategic aims. In the West Indies their practices might be large, even if the work of dosing slaves was often handed over to plantation employees. The situation there was not conducive to their learning of a slave remedy, working out the likely active ingredient, finding and preparing the herb, conducting trials and finally publishing the results.

In the West Indies, white doctors (and planters) went some way with their observations on the Black slave topical treatment of yaws (see the preceding chapter, Chapter III). The planter A.J.Alexander had the open-mindedness or common sense to allow the African-Caribbean methods to be tested against the Western methods [67]. He lacked any knowledge of botany or status as a doctor; therefore, he could not conduct a proper trial which might have persuaded medical men to take up the herbal remedies which the slave doctors were using.

Even qualified doctors in the West Indies were rarely competent botanists like William Wright or James Maycock. The lawyer-planter Edward Long regarded medicine and botany as belonging together, both with a vital role.

> "...commerce stands so largely indebted indebted to physic, and its sister botany, not only for materials of import and export, but the abilities of men

employed in collecting those materials" [68]

In the Jamaica of the 1760s the knowledge of natural history possessed by most doctors did not impress Long. He suggested that

> "planters' sons going for education in physic and surgery should have botany as a principal branch of their study. Botanical knowledge seems particularly requisite to their practice in a country that teems with vegetable remedies for most of the distempers incident to the climate. A total ignorance of this useful science is a most contemptible defect in the practitioners here. Many of the Negroes are well acquainted with the healing herbs and plants, which a regular physician tramples underfoot, with no other idea of them, than that they are no part of his materia medica, nor any better than useless weeds" [69]

Long went on to say that Hans Sloane and Patrick Browne had "paved the way" but "thorough work on known plants is what is needed...superadded to this will be endeavours to introduce exotic plants for their medicinal qualities".

Long showed himself to have been no mean botanist in Volume III of his *History of Jamaica*. In Chapter VIII, he gave more than a hundred pages of plants with their medical uses, the effects put in Hippocratic terms, with no obvious input from Black slave doctors. One plant which had no medical use was important in having a biblical origin: "The leaves [of the Banana] are supposed to have furnished our first parents with the modesty-pieces mentioned in Scripture" [70]. The banana-tree could be appropiated as part of the European Christian tradition as well as representing the civilized behaviour of Europeans.

The equivalent to Long, as lawyer and gentleman-botanist in India, was Sir William Jones. His *Treatise on the Plants of India* quotes several Indian texts of medicinal plants. Texts were the source which Jones preferred to living Indians. Jones favoured Indian names over Linnaean. He described five plants fully "by way of example", with "native medical uses". He approved of van Reede who a century earlier had used the Sanskrit names [71]. In one Discourse, he asserted that

> "unless we discover the Sanskrit names of all celebrated vegetables, we shall... not be able to find accounts of their tried virtues in the writings of Indian physicians" [72].

Jones and his fellow Orientalist Henry Colebrooke had an additional objection, a prudish one, to the Linnaean classification, based as this was on the reproductive organs of plants. The genus *Polyandra* was for them particularly unseemly, referring as it did to twenty males or more in bed with one female [73]. As laymen, the pair rank among the third of botanists in India up to 1840 who were not medically qualified [74]. Francis Buchanan disliked Jones for his "Brahminical" interpretation of Indian society but in turn Buchanan needed van Reede's Indian-based classification for his taxonomic work of 1815 onwards. More to the point, Jones was showing his Orientalist colours in searching for plant remedies in texts, rather than through direct contact with Indian herbalists.

However, one thing William Jones did achieve was to create a forum for meeting and discussion; the Asiatic Society of Bengal was one of the first such organisations. In the *Transactions of the Medical and Physical Society of Calcutta* (1825 onwards), the doctor-botanists can be found contributing papers and giving the botany of indigenous plant remedies in the papers presented by others. This has been mentioned already in respect of Nathaniel Wallich. In one instance, Wallich described Nipal camphor wood, in another he commented on oil from an aromatic grass, referring to what William Roxburgh had said of it. More dramatically, he identified a dried plant sent to him as

> "*Phlomis*, now *Leucas Indica*, used by the natives after snake bite and also for headache. I cannot withhold the expression of my strong doubts, as to the alexipharmic [acting against poison] virtues ascribed to the plant in question" [75]

Wallich was equally trenchant in his opinion on "Nipal Ginseng": "It is highly probable, that the root possesses as little claim to a place in our Materia Medica as the real ginseng" [76].

Wallich commented on the botany and the likely effects, beneficial or harmful, of plants used by indigenous practitioners and brought to the notice of the Society. The work of other botanists would be referred to in their absence. Details of the plant madár was presented by George Playfair in an 1825 meeting (see Chapters II and III). Playfair noted that in 1814, Francis Buchanan had given "a botanical description". The active part was the root, powdered; Buchanan himself had tried it [topically] in small amounts over long periods for skin ulcers, combined with "*Jezam*" [77].

The Sanskrit scholar, Horace H.Wilson, sounds like a botanist in his description of the Hindu and Muslim uses of *Croton tiglium*, Molucca pine nuts, but the details were from Indian texts, not botanical [78]. However, John Forbes Royle gave a full botanical description of the medical garden being developed at 6,500 feet, on the northern face of the mountains at Mussoorea. This was for growing "Northern" [temperate] plants, not all medical. He mentioned one local plant, a rhubarb: "Most important of the medical plants is the Hill Rhubarb (*Rheum emodi* of Dr Wallich)" [79]. Rhubarb was an astringent and cathartic purgative, a Western medical staple. Wallich had recognized the plant as an indigenous rhubarb which might prove a succedaneum, like William Roxburgh had done with his febrifuge, *Swietenia*. As will be shown later in the current chapter, Royle would most likely have given any provenance in terms of the particular tribes who were using it. Indeed, it could be said that Royle took provenance to excess. Royle's status as a doctor-botanist will be considered later in the current chapter.

The doctor-botanists were thanked by authors of books on Indian medicine. John Fleming (1747-1829), in his *Catalogue of Indian Medicinal Plants* (1810), was Edinburgh-trained enough to cope with Linnaean nomenclature but for new species depended on William Roxburgh [80]. Whitelaw Ainslie, for the 1813 *Materia Medica of Hindoostan*, frequently quoted the seventeenth century van Reede but also

acknowledged "aid from Botanist, the Reverend Doctor Rottler"[81]. Johann Peter Rottler (1749-1836) was a member of the Moravian Mission at Tranquebar, like the doctor-botanist Benjamin Heyne [1770-1819]. Both joined the British service in Madras. Heyne took over the Bangalore Garden when William Roxburgh moved to Calcutta in 1793; later, Lord William Bentinck, Governor of the Madras Presidency 1803-7, questioned Heyne's plant-collecting tours when he would be better occupied cultivating useful plants in the Garden [82]. Heyne's derogatory remarks about Hindu medicine have been given in the preceding chapter, Chapter III; no material relating to his botanical work has been found for this thesis.

Both in the West Indies and in India, individual British doctors with botanical expertise saw the opportunities but could not grasp them. Thus, William Wright, in his more tranquil periods in Jamaica, botanized as a hobby; he did not take the next step, looking at slave herbal remedies. He had too little material (or energy) to put together a Jamaican materia medica during his long retirement. Friends published the scrappy Memoir a decade after his death.

Wright's young friend during that retirement, James Thomson, had a section in his book of 1820 on "the Medical Plants of Jamaica" and hoped to study these systematically. Several were used "by the negroes", thus *Adrue* "was pointed out to me by a sensible negro" as stopping vomiting. *Zanthoxylum* (Prickly Yellowwood) was "dramatic by mouth: hallucinating, but is used by the negroes on infected ulcers to remove slough" [83]. But by 1822 Thomson, not yet thirty, was dead. The doctor Richard Madden excused himself, writing in 1835 that the plants of Jamaica "whose medical properties were known to the negroes" were beyond his capacity to enumerate [84]. This is tantalising, given that Madden was concerned about slave welfare to the point of being disliked by the Jamaican plantocracy for his anti-racist views. In the

same year he was despatched to Havana as British Consul responsible for the welfare of *emancipados* there [85]. John Hancock, also writing in 1835, said of British Guiana, where he worked for a quarter of a century till 1828, that it was "a country most rich in medicinal plants" while not describing any [86].

In India, William Roxburgh was involved in routine commercial propagation at the Calcutta Garden and in seeing through to publication works which were mainly botanical. The febrifuge he found, *Swietenia*, was left to William O'Shaughnessy to study chemically fifty years later. O'Shaughnessy himself and Nathaniel Wallich, Professors of Chemistry and Botany, never carried through their planned systematic study of indigenous medical plants. This was the intent, with the *Bengal Dispensatory-cum-Pharmacopoeia* to be the forerunner of a more comprehensive pharmacopoeia [87]. O'Shaughnessy turned to more pressing work on a Telegraph system for India, while Wallich went home in 1847 to follow pure botany until his death seven years later.

For nearly forty years Wallich lived to keep to his 1815 declaration to Francis Buchanan that he intended to be employed "solely in Natural History". His fellow professor in Calcutta, O'Shaughnessy, lived long enough to be part of the London-based Committee which drew up the Pharmacopoeia of India in the 1860s. But what of John Forbes Royle? His life of less than sixty years (1798-1858) was divided between India and England, botany and medicine. His career and his publications lead one to pose the question of what was the value or staying power of the botanically-based materia medica.

Royle himself certainly saw his botany as applied; in particular, the medicinal plants used by the Indians had a place in the Western pharmacopoeia. He was also Orientalist enough for the history of their use by Indians to be important to him. His work looked

backwards and was becoming out of date even before he died. Nevertheless, he seemed aware of the concerns of the 1840s and 1850s: conservation, improvement in agriculture, the exploitation of plant products, the need to refine the active principles of herbal remedies and the specific requirement to grow *Cinchona* (for quinine) in India for financial and logistical reasons. It would therefore seem wrong to label him as behind the times. The case of Royle provides the opportunity to recap the issues which have been looked at in this chapter in respect of the roles of the doctor-botanists.

Royle became Curator of the garden at Saharunpur (Serampore) Garden in 1823. He noted that many medicinal plants sold in the bazaars had also been used by the ancient Greeks. He raised the possibility that the Hindu medical system had preceded the Ionian Greek one. Returning to Britain recreated as an academic, he became the Foundation Professor of Materia Medica and Therapeutics at King's College Hospital, London, in 1837. It was a quarter of a century before the era of chemical pharmacology; a man with expertise in Indian herbal remedies must have seemed ideal for such a chair. Transformation from Curator at Saharunpur to Professor of Therapeutics in London was logical, given the links between botany and the materia medica remained as strong as ever. Royle's publications over the next twenty years comprised medical, historical and works of botany (both applied and pure). He was Secretary to the Horticultural Society of London from 1851 until his death in the New Year of 1858 [88].

As was the case with many British doctors who wrote books about their colonial experiences, Royle's publications date from after his return to England. This is apart from his contribution to the *Transactions* of 1829, concerning high altitude plants. Royle returned to the mountains for a purely botanical work, his 1839 *Illustrations of the Botany and other Branches of the Natural History of the Himalayan Mountains*, a work which Joseph Hooker acknowledged in his own book [89].

Royle's interest in applied botany extended to non-medical matters. His *Essay on the Productive Resources of India*, of 1840, and his work *The Fibrous Plants of India*, of 1855, described plants which might prove useful in industry, such as the paper and cloth ones [90]. The first of these works gives a description of the Calcutta Garden at the time when William Roxburgh was running it. Royle then moves on to the contentious issue of Nathaniel Wallich's distribution of the dried herbarium owned by the Company. It seems that even as late as the 1840s. Wallich still needed defending from patriotic British botanists for his action in sending plants abroad a decade beforehand:

> "The duplicates were ordered to be distributed to the various scientific societies of Europe by the Court of Directors [of the Company]" [91].

Royle aimed to draw the fire of the complainants while praising the Court's magnanimity. Inclusions of this nature make the Essay a conglomerate work.

Royle's 1837 essay on Hindu medicine was another hybrid one, as its full title shows: *An Essay on the Antiquity of Hindoo Medicine including an introductory lecture to the course of Materia Medica and Therapeutics*, delivered at King's College, London. In this work, Royle combined his two main interests. He felt obliged to explain "the incongruity between the title and the course of lectures" by outlining "the objects of Materia Medica and Therapeutics, and the sciences with which they are connected" [92]. There then follow sixteen pages of pure phyto-geography, of doubtful relevance to either Hindu medicine or the Western materia medica. Royle must have read von Humboldt's 1807 definition of himself as *botaniste physicien*, concerned with Nature as a dynamic equilibrium of forces. Royle justified including the phytogeography because of the importance of "the physical and medical properties of plants and their geographical distribution, especially as connected with climate". This is straight out of von Humboldt. Later ecological botanists found these pages illuminating. The medical historian David Arnold is not so impressed, calling Royle an inadequate scientist, when

set against von Humboldt, the pioneer of phytogeography. Von Humboldt's work is mentioned in Chapter V. Of course, as Antonio Lafuente and Nuria Valente have pointed out, the Amerindians of the Andes had been expert medical phytogeographers for centuries [93].

The quotation from Royle about the properties of plants continues:

> "...properties of new and unknown plants, whether as food, medicine or for any of the arts of life...there certainly is no other method by which we may so readily find a substitute for a medicine or an equivalent for an article of trade, as by seeking for it in the families of plants, which are already known to contain some [species] possessed of such properties as we desire". [94]

In this declaration, Royle seems to have been hinting how post-Linnaean scientific botany could make Western culture independent of Hindu or any other pre-existing repository of knowledge. The role of the Western scientific doctor-botanist was spelt out. It was one in which superior knowledge would enable succedaneums to be found. Indigenous practitioners might be called on to assist but for the Linnaean-trained botanist they were not essential. It is remarkable that this statement appears in the preface to an essay on Hindoo medicine. It is also notable that modern medical and botanical historians have not picked up the point.

At this moment in the preface, Royle appears to have remembered himself and the subject that was his main concern. He gave his credentials as a lecturer on therapeutics, which were his training under A.Todd Thomson of University College, London, and Francis Home at Edinburgh (see Chapter II on Western medicine). In India,

> "at the request of the Medical Board of Bengal to investigate the Materia Medica of India,...I was induced to turn my attention to the subject" [95]

He described making collections in the bazaars then tracing what he found to its origins, with the help of his "competent Hakeems and Moonshies". He worked out the family [the genus of the plant] and the Linnaean name. He stated that he arranged the plants by

their medical properties as he had done in his "*Flora of the Plains and Mountains of Northern India*".

John Forbes Royle's main work, certainly in terms of size, has been referred to in other chapters but has a place here. This is because it is another hybrid, cornucopia-cum-pharmacopoeia. Thus it is part Botany or Flora as well as part History (of Indian medicine) and part Therapeutics (which is what it is officially). In many ways it grew out of the 1837 Essay (on Hindoo Medicine). *The Manual of Materia Medica and Therapeutics*, first edition, 1847, is an example of the interface between botany and indigenous medicine. However, the Preface suggests that the work is going to be a mainstream book of Western therapeutics, a British one like the three national Pharmacopoeias which it acknowledges. The object (for those using the work) was "the acquirement of a knowledge of the modes of Action and Uses of these several drugs as Medicines". Royle also salutes two other contemporary Pharmacopoeias by individual British doctors, those of Jonathan Pereira (1839-40) and of James Moore Neligan (1843). All three works, Pereira, Neligan and Royle, have been discussed in Chapter II on Western medicine. Pereira's work is balanced while Neligan's is practical, concerned with chemical analysis and usage, ironically the one that comes closest to Royle's own stated aim [96].

Royle, the last to publish, did not need to lend to his work a different slant from theirs. The remarks he made in the preface of the 1837 inaugural lecture, given above, indicate why he chose the format he did, that of an applied botanical and historical flora. As in his other works, it showed Royle using his botanical knowledge for the development of plant products, medical and non-medical. Compared with the other two doctors, Royle had a more crusading belief in "Nature's Governance": the idea that the knowledge of nature would allow the best possible uses of resources. This was a belief

he brought from India; it was shared by Edward Balfour, who stayed out there to offer in person his knowledge to the people of India.

British doctors in India were not acknowledged in Royle's Preface. The doctor-botanists do, however, feature prominently in the individual entries. The work includes plants with commercial and culinary uses, thus in tanning, dyeing and cooking. In that it resembles a Hindu-based medical text, like the 1795 *Patna Pharmacopoeia*. The botanical section, that on "Vegetable products", spreads over four hundred pages, with the other two of Royle's "Kingdoms", Animal and Mineral, occupying only small sections.

A single entry may take up several pages, with a description of the plant, its provenance, the various names, the uses by natives and their names for it, the European doctor-botanists associated with the plant and, last but definitely least, any Western medical work on action and usage. One example, in abbreviated form, is enough to illustrate the mixture:

> "*Cocculus indicus* is the fruit of a climbing plant common in the mountainous parts of the Malabar Coast...formerly, these berries reached the Red Sea, whence they were called *Grana Orientis* by Ruellius, 1536, *Coque de Levant* by Pomet, [etc.]. It is probable that they were known to the Arabs. The plant yielding these berries was known to Roxburgh. It was named *Anamirta paniculata* by Colebrooke, and subsequently *A.cocculus* by Wight and Arnott. It was the *Menispermium coculus* of Linnaeus. The name cocculus is probably derived from the Tamil *Kakacolle*, which signifies *crow-killing*, as does the Sanskrit *kakmare*".
> [There follows a description of the plant and berries].
> "The kernels were analysed most recently by Conerbe and Pelletier, who obtained *picrotoxine*. A bitter extract is used in tanning.
> Taken orally, it produces giddiness, convulsions and coma; applied externally, it is useful in scabies, ringworm and porigo" [97]

By the time of the second edition of Thomas Lauder Brunton's *Textbook of Pharmacology* in 1885, the botany got one line:

> "picrotoxin (the active principle of *Anamirta cocculus* or *C.indicus*) [is] an experimental convulsant used in animals, no longer used

topically in man" [98].

Royle was clearly aware of the work by the Frenchmen Pierre Pelletier (1788-1842) and Joseph Caventou (1795-1877), discoverers of quinine in 1820 and later of many plant alkaloids, including picrotoxine. In giving such botanical detail throughout the work, he may have aimed to create a reservoir of the plants from which drugs came in order to facilitate further analysis in the future. In the 1840s, he may have had no inkling that the chemical revolution in pharmacology was soon to create not only new alkaloids from long-established plant ones but also entirely synthetic drugs with no botanical provenance. The Calcutta Professor of Chemistry, William O'Shaughnessy, in his isolated colonial position during the 1840s, saw the direction in which the materia medica was developing. However, there is no indication in the works of Royle, his contemporary, that he too was aware.

O'Shaughnessy had already laid William Roxburgh's febrifuge to rest; this was *Swietenia febrifuga*, common name Rohun, a possible substitute for *Cinchona* bark [99]. In the *Bengal Dispensatory* of 1842, he wrote:

> "The bark of this tree has enjoyed much celebrity as a substitute for *Cinchona* ...The Editor [O'Shaughnessy] has made several ineffectual attempts to obtain an alkaloid principle from the true Rohun. It is necessary to add, that when subjected to the usual processes for preparing sulphate of quinine it yields...merely sulphate of lime. It was not an adequate succedaneum. It should be used instead of quinine only in mild intermittent fever" [100]

The committee for the *Pharmacopoeia of India* (1868) included O'Shaughnessy among its members; botany and medical history were truncated. Individual entries were confined to chemical analysis, actions and usage (100].

In 1914, D.G.Crawford, in his *History of the Indian Medical Service*, referred to Royle as "author of the Manual, now forgotten" [101]. In the preface to the sixth and last edition of Royle's work [1876], the editor, John Harley, wrote, somewhat

apologetically as if Royle's ghost was at his shoulder, that

> "A large space, occupied in previous Editions by details which are to be found in elementary works on Botany, has been appropiated to an account of the actions of medicines" [102].

Even so, "medicinal Plants" still take up 422 pages. Roxburgh's Rohun bark appears in the index as being on page 698 but neither this page nor any other has any mention of it. O'Shaughnessy had done his job properly. It was the generations that followed who failed to emulate him in his objective to look systematically at indigenous Indian plant medical products, so laboriously listed by Royle in "the Manual, now forgotten".

If John Harley was diplomatic, Thomas Lauder Brunton in his 1885 *Textbook of Pharmacology, Therapeutics and Materia Medica* had no qualms about sidelining botanists as just a nuisance:

> "*A mere knowledge of the names* of species, genera, or natural orders is *perfectly useless*, for the names are liable to be changed at the whim of botanists, but a knowledge of the botanical relationships of plants may be a useful indication in our search after new remedies" [103].

The italics are Brunton's own. He seems to admit grudgingly the point which Royle had made in 1837 about botanical taxonomy being useful. Chemistry had not quite ousted botany, with botanists reduced to Thomas Martyn's status in the 1750s as cockle-shell picker and weed-gatherer. Brunton does echo Royle's words of 1837. Nevertheless, from the 1880s onwards, much of the botanical cyclopedia was to be overlooked, certainly by British doctors in India. As for the contribution of botany to indigenous Indian medicine, by that decade it was Western-trained Indian doctors who were showing interest in this.

In Bombay, Bhan Daji edited a Gujarati work by Kata Dhat on Indian plants. Sakharam Arjun (1839-85) acted like Royle had done fifty years before him. He established a botanical garden at Girgaum. In his 1874 *Catalogue of Bombay Drugs* he

described medicinal herbs available in the bazaars and grown locally near the city. K.R.Kirtikar, whose Western-training included some in Britain, had many responsibilities in Bombay, among them the Chair in Anatomy and Medicine. In the 1880s, he was also secretary for botany in the Bombay Natural History Society and was a Fellow of the Linnaean Society of London. These activities, described by Mridula Ramanna [104] (and not studied directly for this thesis), demonstrate Indians ready to take up the cause of melding the botanical and medical knowledge of Western and Indian systems. These were men who at the same time were angry at being looked down on, underpaid and denied promotion by the British medical hierarchy. Despite this, cooperation still occurred at a personal level, as is shown by the acknowledgements in Udoy Chand Dutt's 1877 *Hindu Materia Medica*. This was an uncompromising work later re-edited to support the claims of indigenous over Western medicine (see earlier chapters). However, the frontispiece records the inclusion of "a Glossary of Indian Plants by Dr George King, MB, F.Linnaean S., Superintendent, the Royal Botanical Garden, Calcutta, and the author" [105]. This is in addition to giving thanks and acknowledgment to Dr Thomas A.Wise for his Commentary. British doctors were still working with Indian doctors, both Western-trained and trained in Ayurvedic or Unani practices.

Issues raised in this chapter

The doctor-botanists facilitated the study of indigenous medicines by identifying the plants contained in these and by knowing from which families those plants had come. In India they often worked closely with indigenous practitioners. In addition, not only could they look at the plants used by Indian and African-Caribbean practitioners, they could also bypass such individuals by finding succedaneums for themselves, using their

own botanical knowledge. In India, the botanists were prominent in advising other Western doctors who studied and presented papers on Hindu or Muslim plant remedies. This role has not been highlighted previously.

In the West Indies, there was no such forum for the exchange of information. However, there was a long tradition of British doctors looking at the flora, particularly in Jamaica. This was largely "pure" rather than applied botanizing. The expertise as herbalists of black slave doctors was acknowledged by only a few white doctors and laymen. Not even those British who were competent as botanists recorded slave herbal remedies systematically. Doctor-botanists of the previous century made some attempt, such as Hans Sloane and Richard Towne (see next chapter). This thesis challenges Sheridan's elevation of doctors whose hobby was botany to the status of "doctor-scientists". It is as inappropriate as Arnold going the other way and labelling European doctor-botanists in India as "gentlemanly" (a point already challenged by Satpal Sangwan). In calling Royle's Himalayan botany second-hand, Arnold was downgrading Royle's status even further.

By the 1820s, alkaloids, the active ingredients of plant medicines, were being isolated by chemical analysis. In India, attempts were made by O'Shaughnessy to set up a programme for similar analysis of the medicinal plants of Hindus and Muslims. This was during the 1830s and 1840s, a period which marked the implosion of Western medical services in the West Indies and the end of scholarly interest in plants or plant remedies there for the rest of the century.

The doctor-botanists in India usually did not show the sense of superiority which some white doctors felt, an exception being the Moravian Prussian Benjamin Heyne. C.A.Bayly, in his *Empire and Information*, may have had them in mind when he said that crude disparagement was not the dominant mode [106]. Nor did they enjoy an

assured place in the hierarchy of Western medicine as this fought for ascendancy during the nineteenth century, a theme for David Arnold. Ray Desmond has used the phrase "Green Medicine" about John Forbes Royle. He does not expand its terms of reference to cover all activities which combined botany and medicine. By comparison, Richard Grove's "Green Imperialism" takes eco-botany and empire as its main theme. Also, it is not within Desmond's remit to follow through by considering the significance of Royle's medical, rather than botanical, work. Londa Schiebinger was not referring to Royle but might have been doing so when she said that economic, medical and theoretical traditions of botany could be embodied in a single botanist [107].

John F.Royle himself cannot be said to have much effect on medical interaction. After all, his professional life in India ran for little over a decade. Perhaps this is why Arnold belittles him in comparison to von Humboldt, though von Humboldt's own monumental *Travels to America* resulted from a period of less than five years in the New World (see Chapter V). A better candidate for Schiebinger's accolade might be William Roxburgh, in India from 1776 to 1813, with a few breaks. Roxburgh recorded the medicinal herbs of individual tribes as well as searching for plant succedaneums of his own. However, Roxburgh, like the short-lived James Thomson in Jamaica, practised before the era of chemical analysis, though Thomson knew it was imminent. Comparisons between the medicine of a "slave society" West Indies and that of India logically should look at parallels in India only for the period before the 1830s. In India, by 1815 Nathaniel Wallich had turned himself into a natural scientist, his medicine left behind. Royle and William O'Shaughnessy, however, continued in their attempts to use their respective botanical or chemical knowledge for the study of indigenous herbal remedies.

Royle's *Materia Medica* (and Edward Balfour's *Cyclopaedia of India* as well) provided a wealth of information which could have been built on by the generations

after them. Instead, the fault-line or discontinuity of disciplines between the botanical materia medica and the chemical was not bridged over for more than a hundred years from 1860. During this period the West failed to study the plants of indigenous medicine in a systematic way. It seemed that scientific pharmacology would invent new purely chemical drugs (albeit some of plant origin) to replace dubious herbal remedies. Refining and testing of such herbal remedies were not seen as a part of this revolution. Rather, variants were created from a relatively small number of plant drugs which had been long known, such as opium and *digitalis*. Chemical pharmacology represented "British science" (in fact German) as opposed to the empiricism of Indian herbal remedies. It is unlikely that what Darling called the "absurd chosen-race complex of the British" was a factor in keeping open the fault-line. As stated in the previous chapters, Bynum's concept of a switch from botany to chemistry was more significant than Arnold's one of racial dominance. Today, twenty per cent of all drugs are plant-based but this rises to sixty per cent for anti-mitotic (cancer) drugs. As anti-cancer agents are all relatively new, this is an indication of the long hiatus which occurred in the search for plant-based remedies, used by indigenous doctors or found without their help.

The failure has been critical in the rain-forests of South and Central America. The expertise of the tribes inhabiting these was ignored until both they and the forests had been decimated (a process which continues). The Manuals of both Royle and Pereira were global in their scope, so included the botany of those areas. In addition, there were botanists practising out there, such as the British Richard Spruce in the Amazonian and Ecuadorian jungles during the 1850s and 1860s and earlier the criollo Spanish Francisco José de Caldas in Nueva Granada (now Colombia) in the 1790s and 1800s. Their work is considered in the next chapter, Chapter V, which aims at a comparison between the British and other European colonies. It also allows a comparison in time.

Thus it contextualizes interaction in India and the West Indies within a broader framework.

In the current chapter, the seventeenth century Dutchman Hendrik van Reede has been mentioned. He was a soldier-botanist, not a doctor, but his attitude to Indian doctor-botanists showed much greater humility and understanding than did that of most British doctors later. His work and that of the Portuguese Garcia da Orta in South Asia will be considered. Richard Groves and Londa Schiebinger have described the roles of the eighteenth century French doctor-botanists. Study of doctor-botanists in Spanish territories from the sixteenth century to the eighteenth allows a further comparison. How and why medical interaction varied between different European powers and different areas of colonization comprises the broader theme of this final chapter.

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CHAPTER V

COMPARISONS IN SPACE AND TIME

The wider context of European colonialism and interaction between Western and other medical systems

Before 1750, the British on the Indian subcontinent had trading posts; the East India Company and its individual operatives made money rather than wielded power. This contrasts with the position in the 1780s and, even more, that from the 1830s onwards. Other European powers, such as the Portuguese and the Dutch, also had trading posts from the sixteenth and seventeenth centuries but these powers exercised more control by their metropolitan governments. The term "East Indies" covers some other South Asian outposts, from Ceylon to Sumatra.

In the West Indies, the British plantocracy, with its assemblies on most individual islands, such as Jamaica, was well established by the start of the eighteenth century. In colonies which were taken over later, such as Trinidad from the Spanish in 1797, there was a greater degree of control by central government; for Trinidad in the eighteenth century, that meant the Court in Madrid. This arrangement persisted under the British, with Crown colony status and control from London by Parliament. The adjacent Spanish colonies in Central and South America remained under such metropolitan control until independence in the nineteenth century, later in the case of Cuba. Also nearby was Brazil, the Portuguese empire in the West.

The Portuguese, the Dutch and the British were involved in Africa, largely through the slave trade but also in possessing colonies. Most of these colonies were unsuitable for white settlement, an exception being the Cape. It was also true of India that the British never intended it as a settler colony. In this study, nineteenth century colonies of

other European powers, such as the French and German in Africa and the French in Indo-China, will be mentioned briefly, if at all. However, there were pioneering French medical and botanical activities during the eighteenth century in both the Indian Ocean and the Caribbean. These will be looked at. The singular position in Australia and New Zealand, where there was settlement with marginalization of the relatively small indigenous populations, is outside the scope of this thesis.

Western medicine before 1750 was dominated by Hippocratic dogma on the causes of illness, with theory-led treatment for it. This was true for all European countries. However, in Spain and Portugal, this had been filtered by the Arabic (Moorish) presence which had lasted for centuries; the start of colonization by both powers coincided with the original Greek texts becoming available in printed form. These Hippocratic beliefs and practices were taken to the colonies. In Asia, the Chinese, Hindu and Muslim systems shared a Hippocratic basis with Western medicine. European physicians in trading-posts were empiricist in their taking up of succedaneums for their own drugs. When no obvious system could be discerned behind indigenous practices, attempts were sometimes made to fit the use of native remedies into a Hippocratic framework. This was particularly the case with the Spanish in Mexico, *Nueva España*, when they were faced with Aztec remedies in the sixteenth century.

European doctor-botanists played an important part in medical interaction from the sixteenth century onwards. Before 1750, they were ready to adopt the nomenclature and classification of indigenous herbalists. After that date, the binomial classification of Linnaeus became widely available; the British doctor-botanists who worked in India from 1780 to 1850 paid less regard to the knowledge of local experts than had their European predecessors. This contrasted with the position for the same period in Spanish

America, where the nationalist fervour of creole botanists, whether full-blooded Spanish or *mestizo*, meant that they championed an Amerindian classification of medicinal plants against the European Linnaean one.

The literature contains few studies which compare medical interaction world-wide, on a global basis, or across time, from sixteenth century to nineteenth. Indeed, Roy Macleod in 1988 called for such work to be comparative throughout the world, with what he called "vertical" comparisons across time and "horizontal" across space [1]. David Arnold has also suggested a trans-national approach; he poses the question how far the networks of individual powers and their colonies were transcended [2].

Portuguese, Dutch and British activities in Asia have been looked at by M.N.Pearson, Richard Grove and Peter Boomgard. Dominik Wujastyk has considered indigenous medicine in India from the time of first encounter with Europeans [3]. For the West Indies, J.H.Parry and Philip Sherlock have described the social background from seventeenth century onwards; Richard B.Sheridan has considered the work of doctors there, before and after 1750 [4]. Leslie Bethell and S.B.Schwartz have edited general studies of Brazil and the Spanish American colonies. Guenter B.Risse has compared metropolitan and colonial Spanish medicine [5]. The doctor-botanists in Asia have been described by Ray Desmond while Londa Schieberger has looked at botanists in the Caribbean islands and adjacent colonies [6]. There are accounts in Spanish of naturalists in Latin America, notably the writings of Luis Arboleda and Jeanne Chenu; in most of these cases, the material has had to be translated for the purposes of this study [7].

This chapter will consider the effect of different eras and of several European and non-white/indigenous cultures on medical interaction. It will set in a wider context interaction as seen in British India and West Indies during the period 1750 to 1900. It will look at interaction itself in various arenas at different times. It will also consider the

work of doctors and botanists world-wide and across time in studying indigenous herbal remedies. It will use the format of the preceding four chapters in the same order, by considering cultural background, Western then indigenous (non-white) medical systems and lastly the work of doctor-botanists.

Colonial culture, government and society

In the Indian sub-continent, the British had only trading-stations before 1750, answerable to the East India Company. There was no formal colonial rule. Therefore, there was no official response to Hindu or Muslim culture, including medical practices. John Ovington was chaplain on a Company ship; he published his Voyage to Surat in 1689. He described the "factory" for trade in Surat:

> "There are cellars, warehouses, a water tank and humhum (Turkish bath).
> The factors [British operatives] do well from their free trade advantages.
> The whole [is] maintained in considerable state" [8].

The Dutch at the Cape of Good Hope also ran a commercial concern: Ovington commented on their "Famous Garden, which supplies ships with Roots and Green Herbs, which contribute not a little to the Health, and even Preservation of Life" [9]. However, this Dutch enterprise was more under metropolitan control than was the case at the British outposts. The British approach of individual entrepreneurism was different to that of other European powers, such as the Dutch and the Portuguese.

The twentieth century writer, Fernando Pessoa, Portuguese but brought up in Durban so fluent in English, declared teasingly that "Portugal was the first to systematize the discovery and revelation of the world" [10]. In mid-sixteenth century Goa, the Portuguese doctor Garçia da Orta (1490-1570) in writing his Coloquios attempted to achieve a balance between accepted European beliefs and those he encountered in Goa [11]. Da Orta was a New Christian, a Jewish man forced to convert; as such, his status,

politics and medicine lay outside the Portuguese hierarchy. In this respect, his position was comparable to that of the Nonconformist doctors in Britain who led the revolt against authoritarianism in medicine two centuries later.

Fifty years after da Orta was in Goa, the Portuguese government in the early decades of the seventeenth century brought in restrictions which "effectively outlawed Hindu physicians", according to Wujastyk [12]. This diminished any exchange which had been taking place, along the lines of that by da Orta. During this and the next century, the Dutch exercised a similar degree of control in the East Indies. They supported their traders by force, asserting their monopoly in cinnamon and other spices [13]. Their provisioning base at the Cape was pivotal, encouraging transfers, such as those of plants, wood and medicines, with Dutch colonies to both its east and west [14]. Towards the end of the eighteenth century, the Dutch Political Council in Ceylon (Sri Lanka) was appointing "native physicians" to its hospitals there [15]. The date, 1793, was shortly before the British take-over of Ceylon. At that period, on an official level the British were doing nothing similar in their Indian possessions. Prominent figures in the administration, such as the lawyer William Jones, had been studying ancient Sanskrit medical texts while ignoring current indigenous medical practices. The British hegemony was achieved by the nineteenth century, more than two centuries after the heyday of the Portuguese and one after that of the Dutch. By then, the table was no longer level: the British regarded themselves as superior, in administration, science and medicine.

Like the Dutch after them, the Portuguese had developed an empire-wide system of interchange. This, however, excluded Brazil, the main part of their western empire; the monarchy did not want to endanger its own monopoly of drugs and spices from its eastern empire. This control continued even after the decay of that eastern empire.

However, in the eighteenth century a protective attitude towards the products of Brazil was redeployed to ward off competition and aggression by other colonial powers. José Pedro Sousa Diaz, contemporary Portuguese historian, contrasts this with the attitude of the Spanish monarchy [16]. Spain searched for New World commodities, both for the purposes of trade and to make Spain independent of Portuguese, later Dutch, exports from the East Indies. Both Portuguese and Spanish empires were ruled by monarchical absolutism, persisting in the Spanish colonies in the Caribbean and in the mainland American colonies up to their loss or independence. This contrasted with the confederate arrangements of the French and British in the Caribbean [17].

The Jesuits were an important component of Portuguese colonial order. In Brazil, they were ready to take indigenous drugs into their pharmacopoeia while at the same time discrediting and excluding the local or native doctor, the *page* [18]. This had a basis in religion, the aim to convert. The British in India during the first half of the nineteenth century showed a similar ambivalence; then, dismissal of indigenous doctors was because their practices were regarded as lacking theory and science. Ronald Inden has contrasted the Spanish-Portuguese imperial formation with the later Anglo-French one. The former was one in which theological discourses held sway while for the latter discourses on science were an important component of imperial knowledge [19]. Christianity became part of demonstrating British superiority only around 1840 (at which point it was not officially on offer to Indians). Brazil and the Indian sub-continent had in common being heavily populated; initially, therefore, both were suitable only for trading posts.

The Jesuits in Brazil made attempts at acculturation of the Amerindians. Unlike in India, the tribes had no hierarchy with which they could be fitted into that of the Portuguese kingdom. When they resisted conversion, this changed them from being

"heathen" (suitable for conversion) to being "infidel" (to be exterminated). Indeed, the population was reduced from two and a half millions to half a million in three centuries. John Hemming quotes Afonso de Castro in 1670 as saying that "only after being completely destroyed do they, this public nuisance, become quiet". This was echoed by Jeffrey Amherst (1717-97), British general in North America, who in 1760 called the North American Indians "the vilest race that infested the earth and whose riddance from it [would be] a meritorious act". Anthony Trollope, another century on, said the same about the Caribs who earlier had been expelled from St Vincent to Honduras: "we can afford to get rid of them altogether" [20]. Indigenous human beings were a nuisance if they ceased to be a usable commodity; this applied to the European poor as well as to non-Europeans.

Clearly, the Portuguese had attitudes to empire and to indigenous races which were unusual; Brazil was large enough for isolationist even idiosyncratic policies to be tenable. This was not true of the nearby West Indies, which David Arnold has called "the other pole of European commercial and maritime rivalry" (to the East Indies) [21]. Except in the Lesser Antilles, most of the indigenous Carib people died out within a century of the 1492 voyage of Columbus. The Spanish settlers in the largest colony, Jamaica, lived an urban life, with overseers in the country; the British who succeeded them in 1655 were rural-living. Parry and Sherlock have asserted that colonization needed both the economic urge and the directing policy by government. The Dutch in the seventeenth century were prepared to do such directing whereas the French and the British were not. In 1621 the Dutch set up a West Indies Company, with links to Africa through the slave-trade. In British-owned islands, the system of local government by an oligarchy of mostly planters was established early [22]. Therefore, the situation for resident or visiting British doctors before 1750 was similar to that after this date.

Indeed, the earlier period was in many ways the more settled, without as frequent if short-lived periods of war alternating with peace and without the agitation about the slave-trade. This fact needs remembering when comparisons are to be made with the adjacent mainland colonies of Spain. Such comparisons are made easier by the static nature of central government by Spain from sixteenth to late eighteenth century.

The strong control by the Spanish crown has already been mentioned. How to exert and maintain this control was a preoccupation from the outset. At the early date of 1492, de Nebrija told Queen Isabella that "language is the instrument of Empire" [23]. The Jesuits did accept native languages and records for court purposes; however, the Crown and the regular clergy equated Christianity with the Spanish language. It was felt that "nativization" might contaminate the incoming (Spanish) culture. The confrontation took place across more than a century. The native languages ended up being outlawed in 1727. A similar process was undertaken in British India in the 1830s under Governor William Bentinck and his administrators. The matter was resolved more swiftly in India but in both cases the outcome was the same, with the European language ending dominant as the official language of government.

From the 1800s, the British in India were interested in exploration to discover resources, as well as for military purposes. From the sixteenth century onwards, the Spanish Crown was directly involved in such exploration and in the search for new resources. In 1575, the Crown appointed Francisco Hernández (1517-78) as medical envoy for the King, the Royal instructions reading "*Enviado por Felipe II*". Philip II took a personal interest in the botany and its applications. Hernández was directed to go to both Mexico and Peru to study "*...las altas culturas de Mesoamérica y los Andes*" though never reached the latter. He was expected to work on a broad canvas; as well as medicinal plants, spices were needed to replace Eastern imports. There were therefore

economic considerations [24]. The work which Hernández carried out did cross national boundaries, thus was examined by two Italians, Recchi and Ximenez, in the seventeenth century [25]. Nevertheless, his mission was carried out solely for the Spanish Crown.

More than two centuries later, the unchanging role of such royal patronage can be seen underlying the instructions given in 1783 to José Celestino Mutis, doctor-botanist (1732-1808) in Nueva Granada (later Colombia, South America). The Botanical Expedition there followed similar ones to the Philippines, Peru and *Nueva España* (Mexico). The decree was signed by King Carlos III on 1 Nov 1783. The expedition was based

> "upon the example of the Botanical Expedition...undertaken in equatorial America [Peru]". It was to involve "the methodical examination of the natural products of my dominions in America, not only to promote progress in the physical sciences but also to banish the doubts and quarrels that are found in medicine, dyes and other important arts, and to augment commerce".
> [Among the aims were] "to enrich my collection of natural history and the botanical garden at Court, and send to Spain seed and live roots of the most useful plants and trees, signalling those that are used...as medicine and for naval construction" [26].

Royal authority and royal prerogative had changed little since the time of Phillip II. The important requirements remained the same: plants for medical use and wood for ship-building. Yet the protegés of Mutis, who was himself Spanish-born, were to be the *criollo* (creole) revolutionaries of the next generation. This is not surprising, given the existing tensions in Spanish colonial society. The Spanish government was prejudiced against creoles, even those of pure Spanish blood. Hipólito Unanue in Lima, Peru, had difficulty obtaining official backing for his work as a naturalist; many of his associates were *mestizos* or mulattoes (part-Black) and had their career prospects severely curtailed. Unanue, in turn, claimed in 1805 that even the climate was exclusive to Lima, not regulated by Spain: "*No conoce nuestro clima*" ("you do not understand our

climate"). This was Unanue's nationalist riposte to the Spanish interlopers: local conditions required local knowledge [27].

The explorer Alexander von Humboldt (1769-1859), in Hispanic America from 1799 to 1804, confirmed that the society was hierarchical. There were creoles, American-born Spanish, whose families had often held "great stations; the other class of nobility is composed of descendants of the conquistadores". There was equality based on free ancestry: "the system of equality is among all men whose blood has not been mixed with that of the African race" [28]. As Chris Smaje records, it was these colonial elites, with their ranking hierarchies, who were in conflict with the metropolitan government [29]. Most Spanish colonies were secessionist by the end of the eighteenth century; the British Caribbean colonies were in perpetual conflict with their metropolitan power but needed its military protection against other European powers and possible internal revolt by slaves.

These African-Caribbean slaves were regarded as inferior in both British and French Caribbean colonies; to that extent, there was a comparable divide between Africans and other races in British, French and Spanish colonies. The prejudice against Blacks by "free" Spanish Americans was something to which von Humboldt objected, albeit tacitly. He and his travelling companion Aimé Bonpland (1773-1858) were joined at one point by

> "a vicar who insisted on the necessity of the slave-trade, on the innate wickedness of blacks, and the benefit they derived from their state of slavery among the Christians!" [30]

However, official Spanish attitudes to the indigenous Amerindians and their culture were almost as harsh in terms of the status accorded to them.

The pre-Colombian culture had to be subsumed, buried or even lost in the Spanish European one, "*absorbse y enfrascarse*" as Francisco Guerra has put it [31]. The

Spanish one was part of the Western tradition, which included religion, medicine and much else. Anthony Pagden says that the conqueror needs to transform the customs and beliefs of the ruled. He quotes Montesquieu (1689-1755) as saying that "the Spanish Empire destroyed all to preserve all" and also J.G.Herder (1744-1803), who said that "European empires subverted a naturally plural world" [32].

The aims of Spanish metropolitan government seem to have been to change the local population and culture fundamentally. This is clearly different to the position in India in the 1830s. There, the British intended English to be the official language, for administration, education, law, medicine and science. This would involve a relatively small Indian elite; it was realised that diffusion out to the masses would be slow and partial. As Pagden has said, India was to have indirect rule and was never intended to be a settler colony; that approach persisted despite what he calls "the belligerent militarism" of the mid-nineteenth century [33]. Despite the presence of missionaries, there was no official proselytization of Christianity as part of British rule, compared with the approach of Catholic Spain. For an attitude towards indigenous culture comparable to that of Spain, one has to look to France as late as the twentieth century. The French legislated in abstract, with programmes conceived for the colonies by the central, metropolitan government. In the 1950s, the dominant French culture was pitched against the indigenous Algerian one, with slogans that included "Civilization over Barbarism" and "To Colonize is to Civilise" [34].

France and Britain denied independence to their colonies until the twentieth century, except for white settler ones. By contrast, the Spanish territories gained independence through revolution in the early nineteenth century. The Spanish empire was a rarity, in the opinion of John Lynch, since the colonial economy was dependent on an underdeveloped metropolis. The confrontation was not between races but between those

of Spanish blood, Spanish-born against *criollos*, creole American-born Spanish (including *mestizo*, mixed Spanish-Amerindian). The creoles wanted to set up Latin American states, independent of Spain. The same was true in Portuguese Brazil. The Enlightenment, "*Las Luces de la Europa*", came late to Latin America and coincided with nationalism: the scientific revolution was to be American, not a secondhand one borrowed from Europe. The creole Enlightenment comprised "reason over authority, experiment over tradition, science over speculation"; the Latin Americans "glorified their countries, acclaimed their resources and appraised their people" [35].

In using these stirring phrases, John Lynch may have been thinking of Francisco José de Caldas (1768-1816), as the latter personified such attitudes and actions. De Caldas trained as a lawyer in order to support his family but became in turn geographer, botanist and astronomer in Nueva Granada (which became Colombia after the independence which he did not live to see). For him, delineating the geography of his country had a political aspect to it. His journal *Semanario*, founded in 1809, was officially for "the utility of the Viceroyalty and to manifest the state of Our territory" [36]. Within a year revolution broke out; in 1816 de Caldas was shot after a brief counter-revolution. In *Nueva España*, Mexico, the years 1795 to 1810 were also a period when Royal initiatives in science were subject to creole re-interpretation of science within a local framework [37].

By contrast, the confrontation in India was between races, the British rulers and the Indian nationalists. Nationalism grew among Indian scientists towards the end of the nineteenth century, stifled by British political and military control. The low ceiling for the advancement of Indians in Western science (including medicine) provided a further means of domination. British denial of opportunities for Indians continued right up to

the granting of independence in 1947. There were inadequate numbers of experienced Indians to take over senior posts, in medicine as in other disciplines.

In the British West Indies, the islands which were not already Crown colonies became so by the second half of the nineteenth century. Independence there did not occur until the 1960s; it was accompanied by racial tension, notably in Guiana and Trinidad, with their mixture of whites, Blacks and East Indians. The mid-nineteenth century stagnation in Jamaica contrasted sharply with the boom in the neighbouring island Cuba but most things about Cuba were unique.

The awakening of the Spanish colony of Cuba to the outside world was triggered by the brief British occupation of Havana in 1762 but owed more to the enlightened policy of decentralisation carried out by Carlos III (r.1759-88) [38]. By the nineteenth century Cuba had become the richest colony in the world, with sugar, coffee and tobacco all profitable. The slave trade to Cuba grew as it waned elsewhere; this is shown by slaves and free people of colour outnumbering whites for fifty years, thus in the 1841 census. Cuba went from placid paternalism to brutal slave-ocracy between 1790 and 1830 [39]. The last known importation of slaves was in 1867; emancipation followed in 1886 [40]. By then, there had been more than twenty years of war, coupled with the sugar depression of the 1880s [41]. There were some features typical of Spanish colonies; the *criollo* aristocracy was urban-living, as were its doctors. As for the Catholic faith, the Blacks, slave or free, were baptized, but "all attention to religion ends with their baptism", according to Trollope. This meant that the slaves, without religious teaching, were "much nearer to the brute creation" [42].

On mainland Latin America, the post-revolutionary situation meant a creole population thrown back on its own resources, often in a situation of economic stagnation. This was conducive to reverse acculturation. In medicine in particular there

was continuing syncretism between Western medicine and Amerindian systems. This was also true of the British West Indies, where the vacuum after Emancipation encouraged the use of creolised African-Caribbean medicine alongside what Western medicine was available. The status of that Western or allopathic medicine both in time from the sixteenth century onwards and on a global basis will now be looked at.

Western medicine

Hippocratic medicine formed the shared basis of the "Mediterranean" medical systems of all European countries. Before 1750, the degree to which its dogma was questioned by doctors varied from country to country. After 1750, such querying was more evident in Britain than in other parts of Europe, for instance Holland. It was also apparent in British colonies, where doctors faced new challenges in terms of their concepts of diseases and the appropriate treatment for these.

The major challenge which Hippocratic dogmatism underwent in Britain after 1750 has been described in Chapter II. Before that, illness was regarded as a disturbance in the balance of the four humours; this was a belief which was little changed since it had been formulated by Hippocrates. In Europe, as elsewhere, fevers were the commonest form of illness. Thomas Sydenham (1624-89) was known as "the English Hippocrates". He explained the malarial epidemics of the early 1660s in marshy Westminster by referring to Hippocratic texts [43]. Nevertheless, he was able to balance his Hippocratic beliefs with an observational approach. Thus in clinical medicine he emphasized observation by the bedside rather than theory away from it. He was also innovative enough to use Jesuit bark for fever, a treatment new in Europe. Clearly, he had something in common with the rational empiricists, such as John Millar, of a century later (see chapter II).

Frederick Slare (?1647-1727) was another London physician who was before his time in preferring observation to theory. He was against any hypothesis being valued simply as part of tradition: he did not want "venerable Antiquity...or the Authority of great Names, to support an Error" [44]. In the 1680s, he carried out a trial which showed that there was no medicinal value in bezoar-stones, a panacea obtained from the stomachs of Oriental goats. After giving the results in a paper to the Royal Society, Slare "waited for correspondents giving information from the Indies" before publishing in 1715. The DNB of 1897 suggested that despite Slare's efforts, "the superstition persisted for nearly a century longer" [45]. The use of the word "superstition" in hindsight was appropriate, since this panacea belonged to magic rather than being any part of treatment based on Hippocratic theory. Such theory in Western manuals of materia medica was concerned with the humours, with blood-letting and purgation to remove unwanted material [46]. The first pharmacopoeia of the London College of Physicians came out in 1618; it was little different from a medieval herbal.

Hippocratic tradition also underlay the obsession with climate and topography. This concern was based on *Airs, Waters, Places* by Hippocrates; the Greek word miasma meant "polluting agent". Theory weighed more heavily than observation in medical practice; this was truer for medicine (physic) than for surgery [47]. In the 1730s, the influential Dutch physician, Hermann Boerhaave (1668-1738) of Leiden, taught (and wrote) in aphorisms rather than through the use of facts. In Britain, medical training was informal, with no licensing or regulation of practitioners. The Western medicine that was taken to the Indian sub-continent was based on Hippocratic theory which was held in common with both the Hindu and Muslim systems.

Details are scanty about the practice of Western medicine in the sub-continent before 1750, according to D.G.Crawford. Some doctors worked alongside indigenous

counterparts at courts. Others were just visitors, like John Fryer (d.1733), English physician, who travelled in Persia and India, being at Bombay in 1672. Fryer got the impression that European practice was more innovative than Eastern [48]. It is not clear whether he meant Western practice back home or this transported as colonial medicine to the East, where such doctors had to be pragmatic and use succedaneums. John Ovington, at Surat in the 1680s, noted the combination of "an Indian Doctor of Physick and an English Surgeon for disease or accidents in the factory" [49]. This suggests a logical and equitable division of duties. Western surgery, for wounds and fractures, was more advanced than Eastern while the local knowledge of remedies for local diseases would be superior. Compared with the material on "early" India, there are much fuller accounts for the British West Indies, though these tend to lack any specific mention of African-Caribbean medical practices.

Two doctors who were long in practice in the Caribbean, Thomas Trapham and Richard Towne, held traditional views on both climate and treatment of diseases. Thomas Trapham published his work on Jamaica in 1679, with a sub-title including the words "air, place and water" to show his Hippocratic credentials. He stated firmly that "the ordinary English way of living is no ways suitable in most Southern Countries" [50]. Richard Towne, writing in 1726, was also concerned with climate; in his preface he saluted "the divine Hippocrates" while emphasizing his own lengthy experience on more than one island. Towne felt that variations in climate made certain diseases worse. Moisture condensing from vegetation rendered "the Damps of the Evening...highly injurious" [51]. Towne had seven years of practice in Jamaica but in addition had worked on the much drier, deforested Barbados.

Both these doctors also applied Hippocratic principles in their methods of treatment. Thomas Trapham used emetics for fevers, indeed "bleeding and vomiting are the most

general and proper Remedies for Fevers". He did temper the severity of such treatment, believing that "Nature is the curer of all her diseases" [52]. Richard Towne acknowledged local medical expertise, mentioning

> "the assistance of such Practitioners as have been bred up in the Island, Barbadoes [sic], and have never had the Advantage of passing thro' a regular Course of Studies, or enjoying an Academical Education" [53]

There is no evidence that these practitioners included African-Caribbean doctors; however, if some of Towne's sources were white overseers on plantations, then part of their knowledge could have come from slaves. Like the Africans, Europeans brought herbs with them; in addition, they found local plants which they could use along Hippocratic lines. Thomas Trapham mentioned some of these. For fevers, China root was a suitable "sudorifick", to be used after "emeticks". For dropsy, he used a plant "called the Dumb Cane, as whosoever toucheth it with his tongue becoming dumb some hours after". However, worms were treated by "bitter things, with Mercury", which was a Western medical staple. Yaws was "cured by a Methodical use of Vomits, Purging and Bleeding" [54]; this standard Hippocratic combination continued in use for yaws for another hundred and fifty years, despite being challenged by individuals from the 1740s onwards [see Chapters II and III].

Towne dedicated his work to Hans Sloane (1660-1753), his more famous contemporary who was in the Caribbean for fifteen months from December 1687. This was a short period and Sloane was "fettered by the duties of the place he enjoyed under the Duke of Albemarle", as Edward Long observed in 1774, referring to inaccuracies in Sloane's work [55]. Nevertheless, Sloane's energy and curiosity brought him a mass of information in the same way as happened with Alexander von Humboldt more than a century later in Hispanic America (see later in the current chapter). Unlike Fryer or Ovington in Asia, Sloane was an active participant in all he was observing.

Sloane was only in his late twenties and his medical experience in England cannot have been extensive. Nevertheless, publishing in 1707 and 1725, he felt able to state with hindsight that "I never saw a Disease in Jamaica, which I had not met with in Europe". Thomas Trapham confirmed that there were fewer diseases than in England. Yellow fever, brought from Africa, had not yet established itself as it was to do later so devastatingly; malaria and typhus were known in England [56]. Sloane did question Hippocratic beliefs. Thus "quina-bark" reduced fever, cooling the body, when it was not itself cooling by nature. This was against the concept of allopathic medicine which regulated the body by the giving of remedies perceived as "opposites" to the symptoms being treated. As Sloane put it: "Quina-bark, one simple medicine,...overthrew all the Hypotheses and Theories of Agues" [57].

Sloane intended a two-way process. He would use his botanical knowledge "to teach the Inhabitants" where useful plants could be found; at the same time he would obtain "the best Informations I could get from...the Inhabitants, either Europeans, Indians or Blacks" [58]. These were not realizable aims in a year with "too many duties"; Long was right. In the event, Sloane's endeavours came down to the gathering of specimens for the collection which he took home with him and used for his Natural History writing.

There seems to be little difference between these seventeenth century doctors in the West Indies and those of a century later. The latter still accepted Hippocratic theory about climate and therapy, paid little attention to slave medical practices and often scarcely had time to record the natural phenomena around them. They had the uncertainty of intermittent war, with the supply of doctors in excess one moment and inadequate the next. There was still a mixture of trained and untrained men practising medicine.

Indeed, consideration of Western medicine between late seventeenth and mid-eighteenth century does raise the question of the correctness in choosing 1750 as the start of the period for this thesis. It is arguable that, for the West Indies pole at any rate, the period should have been from 1700 to 1850 or the period for both poles should have been the full two hundred years from 1700. However, the fifty years from 1700 to 1750 form a relatively blank period in terms of changes in the practice of Western medicine. It is significant that when Mark Harrison chose 1670 to 1770 as one phase in his chapter on medicine and Orientalism, he jumped from looking at Slare's work (done in the 1670s) to considering events after 1750 (59). Changes did occur in Western medicine after 1750 in the West Indies as well as in Britain and India. Many of the doctors in all three areas were non-conformists who belonged to the rational empiricist movement, discussed in Chapter II. In addition, there are parallels between the seventeenth century work of Sloane (published later) and that of the Portuguese and Dutch doctors of sixteenth and seventeenth centuries, making it appropiate to consider them together. The way in which those doctors took Western medicine to their colonies will be considered now.

The circumstances of the Portuguese Garçia da Orta's eclecticism have been mentioned already. His *Colloquios* of 1563 shows him accepting local remedies. The Muslim and other systems which he encountered were like Western medicine in having a base in Hippocratic theory. However, Richard Grove has made a case for da Orta having formulated a classification of Goan remedies which owed little to Western or mainstream Asian medical systems [60].

The Dutchman Jan Bondt or Bontius (1597-1631), at Batavia from 1627 till his death in 1631, praised da Orta's work and was critical of those who wrote about the Coloquios from Europe, such as Monardes of Portugal and Clusius of Holland. He called their

work "secondhand accounts". Yet his own *De medicina indorum* made frequent references to the humours and described his discussions on Hippocratic concepts of "Diet and Air" with a doctor from Scotland, one Andrew Duraeus [61]. This said, most of his work described local practices, making no attempt to reconcile these with Hippocratic methods of treatment.

Another Dutchman, Willem Bosman, while not a doctor, appears to have known about Hippocratic concepts of climate, miasma and variations in temperature as factors in causing fevers. Bosman published his work on Guinea, Africa, in 1705. He worked as Chief Factor at the Castle of St George d'Elmina and saw the effects of climate on Europeans on the Coast of Guinea.

> "The Unwholesomeness of this Coast, in my opinion, seems chiefly owing to the Heat of the Day, and coolness of the Night. The Gold Coast so greatly abounds with high mountains, a thick, stinking and sulphurous Damp or Mist riseth, especially near Rivers or Watry-places: which mist so spreads itself, and falls so thick upon the Earth, that it is almost impossible to escape the Infection while we are fasting and our Bodies more susceptible to it than the Natives. We daily see the most temperate and regular Men seized with dangerous and too often Mortal Diseases" [62]

Such was Bosman's graphic description of the problems encountered by Europeans in hot climates. These remained a concern during the centuries that followed. Indeed, the Bahian Tropicalista School in nineteenth century Brazil questioned whether the tropical climate might be intrinsically harmful to whites. The existence of this movement in the former Portuguese colony has been documented by Julyan G.Peard [63]. Salvador da Bahia, on the north-east coast of Brazil, was the venue for a group of Western doctors working between 1865 and 1890. They looked at the geography of disease, racial differences and acclimatization. Their interest in climate was political rather than Hippocratic: if the area was indeed inimical to whites then there could be no progressive Brazilian nation. They had contacts among medical scientists in Europe. In a post-independence situation, European science will not have represented the threat

which was felt by de Caldas and other creole nationalists in Spanish colonies fifty years earlier. The group were mostly creole whites of European descent, with a few European-born. Their form of nationalism was clearly different to that of those Indian scientists who later in the century attempted to develop Western sciences independently of the British scientific establishment; the Indians were calling for Indian institutions not subordinate to the British. The Bahia group wanted to enhance the status of Western medicine against that of the faith-healer. However this was not through a sense of European superiority, as was the case with Western medicine in British and French colonies at the time. The Bahia group got little support from government and their efforts petered out.

In the early 1800s, creole scientists of Spanish descent had rebelled in university departments as well as on the battlefield. They wanted a new curriculum which was not Eurocentric. Until then, Western medicine in the Spanish colonies of Central and South America was static, adhering to Hippocratic doctrine. This will now be shown for New Spain in the 1570s.

At the time of Francisco Hernández in the 1570s, Hippocratic and Galenic writings had only recently become available directly from the Greek, in printed books, rather than filtered through Islamic authors. Hernández, a contemporary of the Portuguese Garçia da Orta in Goa, was less free to interpret what he observed without invoking Hippocratic theory. When sent out by Royal Command in 1574, Hernández had the title *protomedico por Nueva España*: "the first doctor to New Spain". This was comparable to the post of first doctor (and personal physician to the king) in Spain itself. There, doctors were strictly regulated, the protomedico charged with assessing doctors, both before they could qualify and subsequently. In the New World, Hernández found this part of his duties difficult to fulfil, so he abandoned it for the more scientific aspects of

them [64]. These are described in the third section of this chapter, that on indigenous medicine. Hernández was an important figure, made the more so in retrospect by the slowness of change in Spanish colonial medicine during the next two centuries.

Even in the 1800s, those changes were greater in the basic sciences which fed into medical practice rather than in medicine itself. These included subjects such as botany in *Nueva Granada* (later Colombia) and chemistry in *Nueva España* (Mexico). Thus José Celestino Mutis of Nueva Granada, with a Spanish medical degree, made his aim listing the different species of Cinchona, quina-bark. He did not consider taking the next move, clinical trials of the barks to see which was the most effective. Indeed, he handed over even the basic task of botanical classification to his non-medical protegé, de Caldas [65].

In 1802, de Caldas himself briefly joined the entourage of the Prussian traveller, Alexander von Humboldt; in his journals, the latter made several reflections on Western medicine. On the voyage west in 1799, he observed a sick sailor recover after transfer to an airy place. The man had been in an enclosed one

> "with an atmosphere heated, stagnant, and filled with miasma". The doctor put the recovery down to "bleeding, evacuating and all the asthenic remedies. It often happens in Medicine that the same facts are cited in support of systems diametrically opposite" [66]

Theories without statistics meant that diametrically opposed views could be held, encouraging polemicism. In Europe as a whole theory still dominated medical practice.

Von Humboldt was inevitably concerned with climate on his journeys. Arriving at Cumana from Caracas, Venezuela, he noted that "the miasmatic fevers" there were treatable by Angostura bark, in keeping with the belief in local remedies for local disorders:

> "The tree grows in the same valleys, and on the edge of the same forests that send forth the pernicious exhalations" [67].

He noted that typhus fever affected

> "persons from a cold climate arriving in a torrid zone, though M.Baily, chief physician, St Domingo, is of the opinion that typhus is very often, but not always, contagious" [68].

Von Humboldt was non-medical but his observations show that Western medical doctors still held Hippocratic beliefs in respect of the causes of diseases while therapy remained based on Hippocratic principles of correcting imbalance. He was enquiring enough to question such beliefs at the same time that many doctors in Britain were doing so, with statistics and trials to provide facts instead of theory.

One doctor in Spanish Cuba was also challenging traditional scholasticism from the moment he qualified in 1793. This was Tomás Romay y Chacon (1764-1849); his family was part of the sugar-slavery oligarchy [69]. He was chief among those instrumental in bringing in clinical empiricism, as well as vaccination, quarantine and public sanitary measures. He protested about the conditions of the slave trade (though not those of slaves working in Cuba). He created the Junta Central la Vacuna as conservation of vaccine and distribution in the interior proved difficult. The curative orientation of traditional medicine meant that vaccination was popularly believed to be a cure for smallpox once caught. New slaves (and household slaves) were vaccinated. Danielson says that Romay's approach, in hindsight, was elitist, voluntaristic and top-down [70].

Romay also overhauled medical education in Cuba, desecularizing it and removing ancient and Catholic texts. He instituted record-keeping and teaching. He wanted "no theory, with the only texts the cadaver, the patient and observation" [71]. Attempts at regulation failed, with a varied assortment of practitioners persisting. Many doctors were immigrants or Cubans trained abroad. In uncertain times after 1860, young men from the elite went into medicine as a safer alternative to public service or the law [72].

Mutual aid societies for prepaid Western medical treatment excluded free Blacks from participating.

For over a century from before 1800, British doctors in the West Indies had felt the need to modify Western medical theory and therapy in a different climate and environment. Before them, in Asia, Portuguese and Dutch doctors were ready to jettison Western therapy in favour of indigenous remedies, with Providence on their side for this. In Mexico, Hernández was hidebound by Hippocratic beliefs concerning the ways in which such remedies acted but was nevertheless impressed by indigenous doctors and their herbal pharmacopoeia. The next section looks at that indigenous medicine world-wide, comparing interaction in different colonies and across four centuries.

Indigenous Medicine: its interaction with European medicine:

In the Indian sub-continent and in South-East Asia, the most thorough observations of indigenous practices were carried out by men who were botanists as much as doctors. The Portuguese Garçia da Orta was one of the most important of these. It is therefore appropiate to describe his work first and consider the other primary sources roughly in chronological order, regardless of the European country of origin. Da Orta had better access to Muslim than to Hindu practices; however, his classification of medicinal plants in the *Colloquios* of 1563 owes little to either system and nothing to Western medical theory. Both plants and remedies are grouped according to usage as determined from his contacts with local tribesmen in Goa itself [73]. By Charles Leslie's standards, these would have been folk medical practitioners, not part of any traditional system such as Ayurvedic and Yunani medical systems [74]. However, Fred L.Dunn has pointed out that the herbal remedies will have evolved over time; only if looked at narrowly will they appear merely curative [75]. The implication is that there will have

been theory, system and classification underlying usage; into this da Orta tapped, to produce a work written and printed in the West but independent of any of the great medical systems. His work was known to subsequent European doctors in India, thus was acknowledged by the British John Forbes Royle and Horace H.Wilson in the 1830s and listed as a reference book for both the 1864 British and the 1868 Indian Pharmacopoeias. Yet no subsequent European writer followed da Orta in regarding indigenous medicine as worthy to replace Western medicine, with jettisoning of the latter's theories and classification of how drugs worked. Indigenous remedies were there for the taking in that there was no "incommensurability". This is the term used by A.de Zoysa and C.D.Palitharatna to refer to a situation in which the theories and accumulated knowledge of two systems prove mutually unintelligible. Ronald Inden objects to the concept as implying that an observer can know enough of two cultures to perceive the differences [76].

Jan Bondt, at Batavia in the 1620s, incorporated an encomium to da Orta in his own work. Despite his adherence to Hippocratic ideas, mentioned in the previous section, Bondt was a pragmatist in recording local treatment for local disorders. He neither attempted to explain the efficacy of these in Hippocratic terms nor did he state the sources from which the knowledge had come. The therapy nevertheless has the same safety and appropriateness as were occasionally recognized in Hindu medical practices by later European doctors, such as Horace H.Wilson in 1825 and W.G.Maxwell in 1838. They recorded the treatment of cholera by copious fluids containing vegetable extracts [77], with Maxwell enthusiastic. Bondt described a fluid "concoction of rice" for dysentery, syrup and fruit juices for cholera "which can kill in hours". Bathing with emollient herbs was used for tenesmus [a rectal problem]. He mentioned leaves, fruits, roots, aromatics and spices. The medical practices which he described mixed together

items of diet and medical remedies [78]. This remained the case in the practice of native doctors who were part of the nineteenth century British army in India. Such a seemingly random mixture, with its apparent lack of Hippocratic logic, may have been a factor in such methods not being adopted by Europeans before 1800. After that date, belief in the superiority of Western medicine as part of science became a further factor.

Earlier British doctors on the Indian sub-continent during the seventeenth century were "keen to learn from vaidyas and hakims", according to Dominik Wujastyk [79]. They had no need to justify the use of local remedies, such as the tortuous theorizing gone through by Hernández in *Nueva España* in the 1570s. Even in Europe, doctors were ready to employ Eastern remedies. T.J.S.Patterson has stated that seventy per cent of the drugs used in Europe in 1669 were imported, most coming from India and the East Indies [80]. In India itself, this was a period of dependence on indigenous doctors and their remedies, when European drugs travelled poorly and the lifespan of European doctors out there was short. An indication of this is the comment quoted by D.G.Crawford

> "It is the opinion of Dr Winston [Thomas Winston, London physician] that the last Surgeon's chest sent to Surat had a much greater provision than was necessary; the Indies hath drugs in far greater plenty and perfection than here" [81].

This was in 1622; sixty years later, the chaplain John Ovington was in Surat. Like Bondt in Batavia, Ovington described spices, fruit and medicaments as if they were the same. As with Bondt, Ovington did not make it explicit that he was describing indigenous remedies. "Snake-stone" and bezoar were used for snake-bite; as both were porous, Ovington wondered if they worked by absorbing venom. The Maldive coconut, *coco de mer*, was another antidote. Mangoes were the commonest fruit; many medical qualities were attributed to them. Tea, with lemon and sugar, was used against several disorders. He mentioned "a white powder for fevers which was sent to England by

Indian physicians" [82]. This powder sounds like a panacea, of uncertain provenance or worth, though it must be remembered that Ovington was a layman, even if a good observer.

Assuming that the information in Patterson's workshop presentation of 1985 is correct, a great many Asian drugs were coming from India besides Ovington's white powder. Miles Weatherall has called eighteenth century therapeutics "chaotic", with no standards for the preparation of drugs [83]. In that case, any drug could become a panacea, to be used indiscriminately. The bezoar stone which Slare condemned remained one such panacea throughout the eighteenth century. This was the also true even in the nineteenth century for William Withering's *digitalis*, despite his own precise work across ten years from 1775 onwards showing its specific effect only for the cardiac form of dropsy [84]. There were Hippocratic depletive measures such as blood-letting, emetics and purgatives, including poisonous metals such as mercury and antimony. In addition, there was a mass of herbal preparations in use, many imported from abroad. These were the product of entrepreurial activity by factors or merchants, who did not depend on any medical interaction between European and native practitioners to furnish them with commodities.

But were the native practitioners as indiscriminate as their counterparts in Britain? Later, British doctors would accuse Hindu doctors of systemless prescribing. The works of da Orta and Bondt suggest that there were collections of herbal remedies which had been found to work empirically in particular disorders. Unlike these two, who stayed in Asia to work, travelling doctors obtained only impressions. The Frenchman Charles Delon (sometimes spelt "Dellon") met Ayurvedic physicians; the 1698 translation of his work included the comment that the Indians "use the same remedies promiscuously". The adverb sounds stronger than "empirically"; if Delon had used that term, it could

have simply meant with no obvious principles or theory. It may well be that this is what Delon did mean, as he goes on to say of the same physicians that

> "they have made such observations concerning certain distempers peculiar to these countries, that they practise with better success than the most learned foreign physicians, who upon certain occasions must follow in their footsteps, if they expect to succeed in their cures in this climate" [85].

The indigenous doctors used pocket Materia Medicas, as another Frenchman described in 1670. This was François Bernier, trained as a doctor at Montpellier. He referred to interchange between Hindu and Muslim doctors:

> "The Hindoos have small books, comprising recipes for different disorders. Mogul Physicians in Hindoostan use these, alongside the Rules of Avicenna" [86].

Avicenna (980-1037) was an important Arab physician who lived in Persia and interpreted Greek medicine in several works. Ayurvedic and Unani systems borrowed from each other down centuries, indeed in the 1890s, nationalist doctors from both disciplines might join forces against the hegemony of British Western medicine. Back in the sixteenth and seventeenth century, the accounts suggest that indigenous physicians in the Indian sub-continent and the East Indies were more discriminating in their use of remedies than were their Western medical contemporaries at the time in Britain.

This is an appropriate moment to mention the attitude of British doctors in the West Indies before 1750. Unlike Asia, the West Indies were not a source of medical remedies; the New World had already provided Europe with a score of drugs, through the Spanish, and there were few additions to these. The Western doctors who were long in residence, such as Thomas Trapham and Richard Towne, did not single out African-Caribbean remedies specifically, a point which has been made in the previous section. The visiting Hans Sloane, on the other hand, was eager to collect information about slave practices among many aspects of life and nature in Jamaica and other islands. In

this, he was as much anthropologist and naturalist as doctor searching for succedaneums.

Sloane made an observation about slave medicine which was to be repeated later in the century by Edward Long and by European doctors about indigenous practices in India in the nineteenth century:

> "Their ignorance of Anatomy, Disease or Method, renders [their] knowledge of the Vertues of Herbes, not only useless, but sometimes hurtful to those who employ them" [87].

This is the same cavil as Charles Delon made about the "promiscuous" use of drugs by Indian physicians. In the 1760s, Edward Long was also to observe of the slaves in Jamaica that their remedies were applied at random with no theory [88]. All three, Sloane, Delon and Long, considered that the mere empirical use of herbal remedies was inadequate, even dangerous. Theory was needed for method: in Western medicine this was Hippocratic before 1800, science after it. What people like Sloane obtained were the equivalent of snapshots; unlike da Orta, who had worked closely with indigenous healers, they neither expected nor looked for any method or system underlying the forms of treatment.

Sloane recorded the methods of preparation. The Blacks

> "usually take (their) Herbs in substance". Roots were ground then "stirred with Lime Juice till it is pretty thick...they make the Patient take it morning and evening for some time". For fever, "they boil Bay leaves and Wild Sage in water in one of their Pots; when boiled tie a Fascicule [bundle] of these to put into the Decoction then sprinkle their bodies all over with it" [89].

Sloane's account mentioned specific shrubs, bay and sage, which were endemic in southern Europe; they might have been taken out to Jamaica by the Spanish. Alternatively, the plants might have been Jamaican but resembled the European ones; the adjective "wild" before sage is a pointer to that possibility.

The Dutchman, Willem Schouten, in Ceylon in 1661, said much the same as Sloane, without mentioning specific plants.

> "The medical men have very little knowledge of Anatomy. Thus, their principal knowledge rests upon experience. Their medicines consist of freshly plucked herbs and flowers, of which they know how to make decoctions and the like" [90].

C.G.Urogoda records that in Ceylon both the Portuguese and the Dutch respected and used local medical knowledge, compared with the British after their take-over in 1797 [91].

The point made by both Schouten and Sloane about anatomy demonstrates that as early as the seventeenth century, Europeans saw the absence of anatomy in systems other than their own as detrimental to the understanding and treatment of diseases. Anatomy, through Andreas Vesalius (1514-64), had become symbolic of science underpinning Western medicine. This overlooked the fact that Vesalius' own anatomical work was based on that of Arab doctors [92]. More important, while anatomy was vital to surgeons, it was of less importance to physicians until early in the nineteenth century, when the pathological anatomy of diseases was first demonstrated (see Chapter II).

Like Willem Schouten, his younger contemporary (1705) and fellow Dutchman Willem Bosman was non-judgmental about the use of plant remedies, saying that African ones on the coast of Guinea worked, even when to Westerners they appeared to have no logic:

> "The chief medicaments here in use are fruit and more especially Limon or Lime-Juice, Malaget, otherwise called the Grains of Paradise, or the Cardamom, the Roots and Branches, and Gummes of Trees. About thirty several sorts of Green Herbs, which are impregnated with extraordinary sanative Virtue. A violent Cholick, a good Calabash of Lime Juice and Malaget next. How contradictory and improper soever these medicines may seem, yet I have seen several of our country men cured by them, when our physicians were at a loss what to do.
>
> The Green Herbs, the principal Remedy in use amongst the negroes, are of such wonderful efficacy, that tis much to be deplored that no European

Physician has yet applyed himself to the discovery of their Nature and Virtue" [93].

Another layman, Edward Long, chided Western doctors in similar fashion over their ignorance and lack of interest in applied botany in Jamaica during the 1760s [94].

Dutch doctors later in the century are said to have shown little interest in the herbal remedies of the indigenous people at the Cape, though the settlers themselves would use them as succedaneums. Up-country Boer-trekkers used the herbal remedies of the veld. By mid-nineteenth century, Carl Pappe (1802-62), German doctor-botanist, could record over a hundred medicinal plants at the Cape; he was scathing about his fellow doctors' disregard for these [95]. Portuguese laymen in Africa also turned to local herbal remedies, thus in Angola; as in India, European drugs (and doctors) were often in short supply [96].

The British doctor Thomas Winterbottom (1765-1859) made a strong plea for a systematic study of native medicines in Sierra Leone. Winterbottom obtained his MD at Glasgow in 1792 and was sent on a medical mission to the country, where he stayed seven years, publishing his account in 1803. He was concerned to facilitate the entry of local plant drugs into the European materia medica; to this end he obtained their native names, hoping that the Linnaean binomial ones could be attached to these later.

> "We have some reason to hope that as Africa has already enriched many European arts by its productions, so it may have in store for future observers some articles which may become important acquisitions to the materia medica.
>
> Considerable pains have been taken to discover those remedies upon which the natives place their chief dependance [sic]for the cure of diseases; and to prevent ambiguity arising in default of scientific names, as many of the native names of vegetables, as could be procured, have been inserted" [97].

Winterbottom commented on the religious and mystical components of African medicine but without the denigration shown by his contemporaries in Asia towards

indigenous medicine there, for instance by Benjamin Heyne in Bengal or Henry Marshall in Ceylon (see Chapter III).

> "The notions respecting the effects of medicine are, in Africa, so much blended with a regard to magical ceremonies and incantation, that it is often difficult to discover on which they chiefly rely for success" [98].

The religious and magical elements of African medicine were feared by whites in the artificial slave society of the West Indies, with African-Caribbean slaves outnumbering whites.

Winterbottom was no botanist but like William Roxburgh in India he looked for a succedaneum for Peruvian bark:

> "The high price of Peruvian bark, the uncertainty of obtaining a constant and regular supply of it during time of war render it an object of importance for us to increase the number of substitutes" [99].

Despite Hans Sloane's observation about *Cinchona* bark, there was still the Hippocratic belief that *any* similar bitter bark might do. Winterbottom thought that the bark of the *Bellenda* tree might be one such succedaneum; this may have been *Crossopteryx kotschyana*, as far as modern Floras of Africa allow identification. Winterbottom survived his seven lean years in Sierra Leone, when many Europeans did not. However, his plea for further studies was ignored.

William Daniell, British military surgeon, published in 1849 his work on the Gulf of Guinea, West Africa. His aim was not to adopt the role of anthropologist, thus native modes of life were to be mentioned

> "only for the elucidation of the origin, and native system of treatment of those diseases to which they are incident". Remedies included "*Indigoferae*, commonly administered by the natives for the cure of diseases. It is administered in enteritic infections and as a vermifuge. The leaves of the baobab tree, *Adansonia digitata*, are used for rheumatism. Many of the plants which are grown are valued for their medicinal properties. From *Raphinia*

vinifera, a wine palm, may be obtained one of the most valuable of tonics" [100].

West Africa appears to have been too inimical for consolidation of work like this by the formation of gardens, carrying out of plant transfers and other schemes. Much of Africa was like the Indian subcontinent a century earlier, with only the fringes approachable by whites. British racial attitudes may have been a factor, the belief that no good could come from the African himself. Before the British, the Dutch population at the more temperate Cape was involved in a considerable mixing of cultures. However, the British Pharmacopoeia took only two plants from there; even one of those two, aloes, was axed from it before the end of the nineteenth century [101].

As in India and Africa, in Portuguese Brazil the country itself initially formed a barrier so that at first there were only trading-stations. However, settlement and expansion did follow. According to S.B.Schwartz, by the eighteenth century there was "major cultural fusion" between Portuguese and Amerindians in the Sao Paulo region, with Amerindian material culture widely adopted. Forest lore in the interior of north (Amazonian) Brazil was copied from the Amerindians. The drugs from the wilds, *droges do sertáo*, included cacao, vanilla, sarsparillo and anatto. Such "drugs" comprised herbs, spices and foodstuffs [102].

In Spanish *Nueva España* (Mexico) there was major settlement from the outset. In South America there were far fewer Spanish though in both areas there was miscenegation. This meant early engagement with Amerindian medicine. In the case of Francisco Hernández in 1574, this was by Royal decree as Envoy for Philip II in *Nueva España*. The quotations from his works have been taken from the Spanish, reprinted in *Chronicas de America* 28 [103].

In Mexico City, Hernández found a moderate climate "*un clima intermedio entre frío y caliente*", though somewhat humid by the lake. It allowed for plants and animals in

abundance. As for *los mercados*, markets where vegetable produce was on show, Hernández waxed rhetorical:

> "*¿Y qué diré de las yerbas, de las hojas, flores, raíces y semillas que emplean en las medicinas?*" : herbs, leaves, flowers, roots and seeds used in medicines [104].

In the *Libro segundo*, Book II, he recorded the practices of physicians called "*Titicl*". His observations were detailed. In the following paragraph (not inset), excerpts of them are given in translation, with occasional phrases in Spanish for authenticity. Hernández' curiosity is evident but also his puzzlement at the lack of any obvious method or Hippocratic basis underlying the way medicines were used.

"Among the Indians, medicine is practised by both men and women without discrimination. They do not appear to study the natural history of illnesses or the differences between them nor do they know the cause of any illness. They therefore tend to use their medicaments following no particular method to obtain a cure, thus are mere empiricists: "*son meros empíricos*". Those who are injured treat themselves with simple medicaments or poultices made with flour. However, many remedies are compound mixtures: "*compuestos o mezclados*". Some preparations are violent and poisonous, with no single way of preparation apparent by which the poisonous element is inhibited. No examination is made of the ill before medicines are given". [It should be said that in Western medicine until late in the eighteenth century, general appearance and examination of the pulse was as far as examination went [105]]. "This means that medicines which might have corrected a humour or given a purge are not exhibited (*medicinas que digieran el humor o lo hagan idóneo para la evacuatión*). Nor do they understand or adapt the various kinds of remedies for the different humours which need removing. They use cold or astringent preparations indiscriminately. While there abound wonderful differences in their healing herbs, they do not know how to use these properly, in order to make them reliable" [106].

In dismissing the seemingly indiscriminate usage of herbal medicines, Hernández was no mere observer, such as Delon in Asia or Sloane in Jamaica. Just as his contemporary da Orta had done in Goa, he was sitting down with the Aztec medical men and women for long periods, examining what herbs they used and what they did with these [107]. Few nineteenth century British doctors in India got this close to indigenous medicine; among them one would include Roxburgh, Ainslie, Royle and Wise. His work was detailed enough to allow Bernardo Ortiz de Montellano, Professor of Chemistry in

modern America, to publish in 1975 an examination of the Aztec drugs which Hernández had described four centuries earlier.

De Montellano notes the difficulty which confronted Hernández in trying to classify Aztec drugs and to define the ways in which they were used in terms of his Hippocratic beliefs. Hernández grouped the plants for Hippocratic actions such as warm, cold, moist, while adding information from the natives about their use [108]. De Montellano has taken thirty seven "white medicine" or "*iztac-patli*" plants, for which Hernández had added place-names. Twenty five of these plants could be identified, with a chemical composition available. Sixteen of these contain substances which have the effects which were claimed for them in native sources. For Hernández, empiricism without theory was a stumbling block in his attempts to understand Aztec practices; for de Montellano, it is a positive feature, suggesting a "strong empirical underpinning" of Aztec medical practices, alongside the magical and religious elements [109].

The overall picture in *Nueva España*, Mexico, is given in several secondary sources. G.Schendel records the legacy from Mexico as about twenty drugs [110]. This may seem a meagre haul but most were important. C.S.Kidwell considers that in general there was significant reverse acculturation in the sixteenth century [111]. The total of drugs is higher than the comparable legacy from British India and West Indies combined. Guenter Risse describes the taking over of the medicinal garden at the Aztec rulers' retreat at Huaxtepec. He agrees with Kidwell that Aztec remedies were incorporated as succedaneums, in reverse acculturation. He records Martin de la Cruz writing on traditional remedies in 1552 and Agustin Farfan listing sixty indigenous medicinals in 1579 [112]. De la Cruz's herbal, written by him in the Nahuatl vernacular, was later translated into Latin as a gift to Carlos I of Spain [113]. The Spanish Crown

often did little with the works it received from its empire; the British East India Company behaved in much the same way during the nineteenth century.

It is also significant that the Spanish Crown made few initiatives during the two hundred years between the Decree of Philip II instructing Francisco Hernández as *protomedico* in *Nueva España* (Mexico) and those of Carlos III, including the one instructing José Celestino Mutis as "my first botanist" in *Nueva Granada* (Colombia). As mentioned in the first section of this chapter, the Church, in particular the Jesuits, played a major role in acculturation and reverse acculturation in Latin American colonies. Their power was retained until late in the eighteenth century, with the sequestration of church wealth as late as 1804 in Spanish colonies [114].

Almost a state within a state, the Jesuits were responsible for the system which supplied the most spectacular plant remedy to Europe (or, at least, to Catholic Europe, given Protestant prejudice against it). The Jesuits were ready to adopt indigenous drugs, providing they could marginalize the native healers (see the first section). However, Peruvian or quina-bark, *Cinchona*, while coming from an Andean endemic tree, was not strictly an indigenous medical drug in use by native doctors for fever. It is uncertain how a few Spanish individuals chanced on its use. It was even more fortuitous that it should have contained four alkaloids, including quinine which was a genuine specific against malaria, the cause of the intermittent fevers.

At the 1623 Vatican enclave, some important participants died of malaria. This may have been one factor underlying the subsequent action of two Spaniards, Cardinal de Lugo and Vatican physician Luis Fonseca. In 1649 they obtained Peruvian bark from the Eastern slopes of the Andes and brought it to Italy [115]. This was one initiative, possibly the sole one, or perhaps the bark got its Linnaean name, *Cinchona*, with justification (apart from the mis-spelling by Linnaeus himself). Another Spanish doctor,

Juan de Vega, physician to the Countess Chinchon [sic] in Peru, is said to have brought some bark back to Spain in 1648. Whatever the case, within a remarkably short period, it was seen as a specific for intermittent fevers, thus by Thomas Sydenham in London during the 1650s [116]. Its success encouraged him to think that there might be other drugs which were specifics for individual diseases. Another famous Englishman (and Protestant) of that decade, Oliver Cromwell, refused to take what he called "the powder of the devil" [117] and remained debilitated by malaria until his death in 1758.

As malaria was universal, the effectiveness of Peruvian bark contradicted the concept of local remedies for local diseases. It also cut across the Hippocratic method of using "opposites", the correcting of an imbalance of the humours by a remedy opposite in effect to the symptoms of fever, as pointed out by Hans Sloane. The bark is strongly bitter, "hot" rather than "cool"; this made Indians reluctant to take it in nineteenth century British India. Given the customary inaction of the Spanish Crown, the marketing of powdered bark was conducted by the Jesuits. Not only Cromwell suffered because of this [118]. Protestant European nations avoided the bark even when they moved into malarious countries as late as the nineteenth century. In the Caribbean, the failure to use it was one reason for the West African becoming the preferred quarry for enslavement, with his (as yet undiscovered) genetic sickle-cell trait giving relative resistance to malaria [119]. In Africa itself, in particular, the absence of the bark restricted the opening up of the country by Europeans until late in the nineteenth century. All this was quite apart from scarceness in time of war, referred to by Thomas Winterbottom, and the prohibitive price, given a Spanish monopoly until the 1860s. These were among the factors which encouraged the search for succedaneums for the bark, in India, Africa and the Caribbean, by amongst others William Roxburgh, Thomas Winterbottom and William Wright.

Malaria was unknown to Amerindians before Columbus. The British botanist Richard Spruce (1817-93), in the Andes in 1860, found that the Amerindians would not accept what they called "*quinquina*" (bark of barks) as a febrifuge: it did not fit with their concept of remedies "of the opposite complexion" to the disorders for which they given [120]. Henry Hobhouse sees no reason why this should have been Hippocratic theory handed on by the Spanish and asserts that there is universal logic behind a "cold/wet" remedy for a "hot/dry" condition. He adds that malaria, with its three phases, baffled the natives, as did the fact that quinine increased fever initially before reducing it [121]. Neither malaria nor its remedy, quinine, were part of indigenous medical practices. We shall now return to the subject of the continuing interaction of these practices with European medicine.

The syncretism of indigenous practice with incoming systems in South and Central America is the subject of present-day medical anthropological work on the area. As well as Western medicine, Black slave practices have meant a three-way fusion in some places, such as Mexico and Brazil, as pointed out by G.A.Beltrán, who has looked at the Black contribution in Mexico [122]. D.Pedersen and V.Baruffati, in 1985, described "a complex hybridization of medical knowledge" between Spanish and Meso-American medical traditions from Columbus onwards in the Caribbean and Central America. In the Andes, a similar syncretism occurred throughout the colonial period and after independence. This persists despite Western medicine and the pharmaceutical industry introducing their model of health services which disregard traditional medicine [123]. Indeed, Joseph W.Bastien states that in rural Andean areas Western medicine has never been fully incorporated. For instance, in Bolivia traditional medicine still has collectors of many herbs, with specialists for different altitudes from 6,000 to 19,000 feet [124].

The Qollahuaya communities procure more than a thousand plants for distribution to ethnic groups throughout the Andes.

Of course, as Bayly, Quaiser and Ramanna have pointed out, such syncretism did occur in British India, on the part of Indians themselves. This has been referred to in Chapters II and III. World-wide, this syncretism continues; for example, in Nigeria, Africa, traditional and Western medicine are practised side-by-side, according to T.A.Lambo [125]. Western-trained Nigerian doctors are still culturally rooted in traditional explanations. They use empirical herbal remedies and Western medical drugs. For them, as in Latin America, Western medicine is just one more form of medical practice to be incorporated and to provide extra alternatives. If this is true of the majority of the world's population, then only the most Eurocentric observer would call Western medicine "dominant" in the long run.

The "botanical-pharmacological" approach to health and traditional medicine in Latin America and the Caribbean is the one which has generated the most literature, according to Pedersen and Baruffati. They list it as the first of several approaches (including folk, anthropological, historical and comparative trans-cultural). Initially, there was an interest in discovering plants with therapeutic properties. This "empirical search" was succeeded, with the advent of modern chemistry and pharmacology, by "an interest in isolating the main 'active' principles of plants". The authors go on to say that "We cannot separate plants and their therapeutic properties from popular knowledge of disease...from the social context" [126]. In the Caribbean, it was French doctors and laymen who throughout the eighteenth century demonstrated interest in indigenous remedies and in applied botany. This contrasts with the fitful interest of the British in African-Caribbean medicinal herbs and with the pursuit of botany purely as a hobby by British doctors.

On *Saint-Domingue* (later Haiti, after a cataclysmic upheaval that terrified colonial powers) in the first part of the eighteenth century, Carib people remained, as on St Vincent. There were therefore indigenous Amerindian medical practices available for study and for finding succedaneums. This was unlike the situation in important British colonies nearby, such as Jamaica, where only African-Caribbean traditions were extant. The doctor Jean-Baptiste-René, Pouppé,-Desportes (1704-48) died young, with his *Histoire des Maladies de Saint Domingue* not published until 1770. However, he was in *Saint-Domingue* for sixteen years from 1832 until his death. The last of the three volumes of his *Histoire* is concerned with medicinal plants in use on the island. Desportes states that

> "If illness is unknown to Western physicians, then they would have recourse to those which were in use by the natives of the country who are called savages" [127].

Desportes gives not only both the French and Latin names (pre-Linnaean binomial) but also the vernacular Carib ones for plants. He observed, as did Charles Curtis and James Johnson in India later in the century, that the indigenous way of life was appropriate to the climate. He advised his countrymen to live frugally and tranquilly like the savages; Europeans were prone to eat and drink alcohol to excess.

Later in the century Nicolas-Louis Bourgeois was in *Saint-Domingue* (from 1770 to 1776). His attention was to African-Caribbean medicine there. He noted that the slaves avoided bleeding and purging (as they also tried to do in British colonies) but he found them reluctant to hand over details of how they produced their own remedies from plants which appeared to him toxic. Nevertheless, the Europeans were ready to take these preparations, in which they had confidence [128].

The picture is of a much more open approach by the French towards non-white medical practices than that shown by the British. One feels that Hans Sloane might have

achieved more in studying such practices if his stay in the Caribbean had been longer, his interests more channelled and his time not so occupied with his duties as a doctor. The French had lost most of their colonies by the end of the eighteenth century, including Haiti. Their record in South-East Asia and Algeria in the subsequent two centuries (referred to earlier) does not suggest that cultural syncretism would have been encouraged on an official basis. However, at the grass roots level, they seemed willing to assimilate local medical practices in the same way as Spanish emigrants did. The British attitude, in India and the New World, was much more dismissive. It is repeated in the response of the (ex-British) American, Benjamin Rush, late in the eighteenth century.

> "We have no discoveries in the materia medica to hope for from the Indians in North-America. It would be a reproach to our schools of physic, if modern physicians were not more successful than the Indians, even in the treatment of their own diseases" [129]

In Chapter II, Rush was noted as persisting with heroic depletive measures when many English-speaking doctors were modifying or questioning these.

It is curious that Londa Schiebinger should go to some trouble to study French initiatives in the Caribbean while opting out of considering Spanish interchange, in either the island or mainland colonies. She does this on the grounds of not having the required background, while admitting that her main focus on abortifacients in use in the Caribbean should include Spanish-speaking colonies as well as French and British [130]. What Schiebinger does do is contrast the development of "creole science" in Spanish colonies with its absence in those of other European powers; she states that there was no organized science in Dutch, English or French Caribbean islands [131]. The role of European doctor-botanists and other "natural scientists" world-wide from the sixteenth century onwards will now be considered.

Doctor-botanists and medical interaction

Botanists of all European colonizing powers were often medically qualified. Even when laymen, they searched for "useful" plants, of which new medical herbs were among the most important. Their botanical knowledge could be used to bypass indigenous lore, particularly once the binomial classification of plants became available after 1750. Nevertheless, most of the European botanists worked closely with native healers, tribesmen and plantsmen.

There were exceptions to this picture of cooperation, for instance the British in the Indian sub-continent before 1776. This was the year that William Roxburgh (1751-1815) joined the Madras Medical Service. John Fryer mentioned the vegetation around Surat in his 1698 work (see the second section of this chapter). In the same decade James Petifer, wealthy London collector, had men obtaining specimens for him on the sub-continent [132]. However, this had no bearing on any interaction between British and indigenous doctors.

The picture was somewhat different in the West Indies where British doctors were resident for long periods; these included Thomas Trapham and Richard Towne. Despite that, the doctors did not work with their slave counterparts. Trapham believed that Providence provided "a balm near at hand" [133]; he described local medicinal plants without referring to slave usage. He showed no particular interest in botany. Towne, however, claimed a role as a botanist. As mentioned already, he dedicated his 1726 work to Hans Sloane, who had himself brought home from Jamaica in 1689 a herbarium of almost a thousand plants. Towne noted plants in both Jamaica and Barbados. He gave an encomium to Sloane, who

> "has with indefatiguable Industry and as great Accuracy brought to Light an Immense Number of Plants growing in the West-Indies" [134].

By 1726 Sloane was established both at the Royal Society and at the centre of a web of science in Britain and an important source of patronage. As Richard Drayton puts it, Sloane "stood at the centre of an informal empire of gentlemanly knowledge" [135].

In the West Indies, the doctors were mainly interested in "pure" botany. There is no evidence of any detailed study of African-Caribbean herbal remedies. Another correspondent of Sloane, Henry Barham (d.1721), was in practice in Jamaica in the 1680s; his *Hortus Americanus*, published long after his death, combines knowledge of plants and their uses but again without reference to slave practices [136].

In summary, compared with the position in Asia, British doctors in the Caribbean before 1750 did act as naturalists. Of Sloane it can be said that his trip catapulted him into prominence not only as doctor but also as botanist and scientist (terms not yet in use). However, as a group, their botanical activities did not increase interaction between Western and other forms of medicine. Before 1750, no British doctor or layman expressed admiration for the botanical knowledge of the slaves; indeed, very few did later, apart from Edward Long.

To the French, botany meant applied botany, not the hobby of (British) gentlemen-amateurs. This was even before the Enlightenment and *l'Encyclopédie*, which spelt out utility as the purpose of science. In 1720 a doctor-botanist took coffee plants from Paris to Martinique. Jean-Baptiste Christophe Fusée (1720-78), in Guiana during the 1770s, coined the term *botanistes voyageurs*. Thirty years later, von Humboldt invented further types of botanistes: he himself was a *botaniste physicien*, with higher philosophical aims than Linnaeus had possessed as a *botaniste nomenclateur* [137]. French activity elsewhere in the world during the eighteenth century will be mentioned shortly.

In contrast to the British in Asia, individual Portuguese and Dutch on the Indian sub-continent had earlier shown an all-consuming interest in both the botany around them and the use made of plants by indigenous practitioners. The Portuguese Garçia da Orta did not retain ties to Portugal comparable to those of John Forbes Royle to Britain in the nineteenth century. Both developed botanical gardens. That of da Orta at Goa was his own; Royle's at Saharunpur was Company property. Da Orta's *Colloquios* remained influential for centuries; Royle's work on therapeutics was made an anachronism within forty years of its genesis by the revolution in pharmacology (see earlier chapters).

Da Orta maintained correspondence with Charles de Lécluse, also known as Clusius (1525-1609), French botanist who worked at the Leiden Garden in Holland. Da Orta felt that his own countrymen were

> "not desirous of knowing anything about the countries they visit. If they see a product they do not seek or learn from what tree it comes, and if they see it they do not compare it with one of our Indian trees, nor ask about its fruit or what it is like" [138]

This was true of many Europeans, travelling through Asia, like John Ovington and John Fryer, or based in Europe, like Clusius. Da Orta was rooted in Goa, obtaining his botany and his medicine from indigenous co-workers in these fields, as well as by direct observation.

Like da Orta, the Dutchman Hendrik van Reede tot Drakenstein (1636-91) worked on the Malabar Coast from the 1650s, an area south of Goa, part of what is now South-West India. His *Hortus Malalabaricus* was published across fifteen years from 1678. He was botanist not doctor. He found so many plants on waste ground, forest, marsh and even tidal ground, it was as if they had been grown deliberately.

> "...plants, trees of every kind, such fertility: every piece seemed to have been cultivated. There was no place which did not display some plants" [139]

Van Reede's work complemented that of da Orta as his contacts were mainly the Ezhavas, a Sudra caste, Ayurvedic physicians with their own knowledge and classification of medicinal plants. Da Orta had stronger Mugal connections, as well as those to tribal folk healers. Like da Orta, van Reede rejected European knowledge in adopting the Ezhava practices. His classification, descriptions and engravings of plants were accepted by the greatest British botanist before William Withering, John Ray (1627-1705), and later by Linnaeus himself [140].

In the 1820s, the doctor-botanist Francis Buchanan used van Reede's *Hortus* in his own taxonomic work on Indian plants; he re-classified the Hortus using the Linnean binomial system, thereby marrying the Ezhava and Western ways of classifying. Van Reede's was an important reference work for the British and Indian Pharmacopoeias of the 1860s. The direct line of doctor-botanists on the subcontinent ran from da Orta to van Reede and then to the British from 1775 to 1835, figures such as Roxburgh, Buchanan, Royle and the Dane, Nathaniel Wallich. Roxburgh and Royle were the two of these four who came closest to da Orta and van Reede in working alongside their indigenous counterparts in the study of medicinal plants. The place, India, and the plants were the unifying factors; the fact that there were men from four different European nationalities was immaterial.

Another place at which Europeans from different countries met was the Dutch East India Company's Garden at the Cape of Good Hope, founded in 1654 and visited by van Reede in 1656 on the way to Malabar and thereafter by him at intervals up to 1685. For the Dutch, it was a staging post in plant transfers between East and West Indies and the Leiden garden in Holland itself [141]. British doctors at the Cape two centuries later left doctor-botanizing to the German Carl Pappe, who identified the medicinal plants used by the Boers and coloured people [142]. The Dutch also drew botanical knowledge

from the Amerindians in Brazil and Surinam, indeed Hans Sloane recorded plants in Jamaica which the Dutch had brought from Surinam [143].

The British chaplain John Ovington saw the Garden in the 1680s; he noted its initial and more immediate role in supplying ships with fresh produce (long before the cause of scurvy was identified) [144]. This was the heyday of the Dutch botanical empire, which in turn had supplanted the Portuguese one of a century earlier. It was the British who took over such activities from the Dutch late in the eighteenth century, notably through the advocacy of Joseph Banks.

Mid-eighteenth century, before the British enterprise got under way, the French developed an official policy towards botanical exploration in her colonies. Indeed, despite wars and the French Revolution, Banks maintained a close correspondence with his French counterparts. Doctor-botanists were amongst those in France who saw applied botany as necessary for conservation, plant transfers and agriculture. The outstanding one was Philibert Commerson, doctor-botanist on de Bourgainville's 1766-9 voyage to the Pacific, leaving the ship to stay on Mauritius late in 1768. The search for medicinal plants was only one of his aims. He had been trained at Montpellier with its faculty of medical botany and had close connections with Linnaeus in the 1750s. He depended for support on doctors high in the administration, such as the royal physicians Quesnay and Poissonier, the latter also Inspector-General of Medicine in the Colonies [145].

The Enlightenment approach to science and natural history spread from France not only to Britain but belatedly to Portugal and Spain. The Portuguese developed an interest in Brazilian plants in a spirit of scientific discovery. This was after two hundred years of the sort of neglect about which Garçia da Orta had complained while in Goa. José F.de Mello, of the University of Penambuco, Brazil, states that the Guarani

Indians in the sixteenth century had a better knowledge of plants than had Europeans. In saying this, he gives support to the sweeping statement of John Hemming that "the Indians beyond (Portuguese influence) were often the more civilized" [146]; this begs the question what is civilization and civilized behaviour. De Mello does add that individually, Portuguese settlers did learn about plant drugs from the Indians.

Just as the Portuguese had a hiatus in developing pure and applied botany between the late sixteenth and the late eighteenth, so did the Spanish. Francisco Hernández, in Toledo, Spain, in 1567, obtained connections at Court and studied the botanical garden at Aranjuez. He gained responsibility for the royal pharmacy and garden at L'Escoril. The decision by Philip II to send him out to *Nueva España*, Mexico, was partly due to "the interest which Hernández has demonstrated *por la botánica*" [147]. The sense of wonder which Hernández showed towards the flora which he found has been described earlier; it was akin to that of van Reede in Malabar. Hernández was unique among contemporaries in the country in being interested in pure as well as applied botany; he went beyond studying the use of plants by Aztec healers simply in order to take these into the Spanish herbal.

The Spanish-born doctor-botanist José Celestino Mutis (1732-1808) was in Nueva Granada (Colombia) from 1760; he was field-worker and organiser of botanical exploration. Indeed, von Humboldt, on meeting him in 1801, likened his position to that of Joseph Banks in England, with a library to match. Mutis was both "pure" botanist and one interested in medicinal plants. During thirty years of work, he amassed data on over 20,000 plants, with illustrations of 6,000 of these. He handed over the delineating of the different species of Cinchona, the tree of Peruvian bark, to his protegé Francisco José de Caldas [148].

De Caldas (1768-1816) knew the political importance of map-making. His work ran parallel to that of his contemporary in British India, Francis Buchanan. Buchanan's work was done for the Company, whereas de Caldas saw his as part of Nueva Granadan nationalism. He wanted a balance between vernacular language with indigenous names and latinization by foreign botánicos such as Linnaeus [149]. The Linnaean classification was seen as "linguistic imperialism" by the creoles [150] The same demands were made by creole botanists in Mexico in the 1800s, as described by Thomas Glick [151]. José Mariano Moziño (1757-1820) creole botanist in Mexico, felt that

> "every single medicinal substance, with the exception of some three or four, can be abundantly supplied by our land. It produces, if not the same medicinal botanical species, others that are of equivalent or perhaps of superior efficacy" [152].

De Caldas would have understood such nationalist sentiments. With succedaneums like these, who needed the Mother Country?

De Caldas and his doctor-zoologist cousin Jorge Tadeo Lozano (1771-1816] were both shot in the brief counter-revolution in Colombia of 1816. When the Frenchman Jean Baptiste Boussaingault (1802-87) was invited to Bogotá by Simón Bolivár (1783-1830) in 1823 to study the chemistry of plants he found a country shorn of its professionals: lawyers, doctors and scientists. Jaime Gonzalez records that the works of the dead men went unpublished and no meaningful scientific work was done for more than a century [153]. In the 1860s and 70s, a liberal elite held power in Colombia with a policy of free trade, resulting in "a febrile search for export products" to be discovered by scientists, according to Diana Obregón [154].

Botanists from other European countries besides Spain explored rainforest and Andean parts of South America from Venezuela to Peru. The most prominent was von Humboldt in the early 1800s. He referred frequently to plants which were used in

medical practice; such usage was likely to be result of syncretism by this date, though the author did not spell this out. One example is the following: "*Unona, fruta de burro*, is an aromatic fruit, the infusion of which is a powerful febrifuge" [155]. This is given both its proper name and also a vernacular one ("burro" is donkey). A febrifuge was a Western remedy, one without an explanation as to how it acted, as von Humboldt himself pointed out. He did note that the Indian porters "distinguished the leaves [in identifying plants] rather than the corollae [flowers] or the fruit" [156], their botanical classification being inadequate by Western standards.

In mentioning *Unona*, von Humboldt added that "the use of aromatics is generally preferred to that of the astringent bark of *cinchona*". Ironically, this was only twenty years before the isolation of quinine from that bark. Young *Cinchona* trees were the quarry of another botanist, the British Richard Spruce, in the Amazon and Orinoco areas, the Andes of Peru and Ecuador and on the shores of the Pacific from 1849 to 1864. In 1860 he collected plants and seeds of *Cinchona succirubra* for Kew, for subsequent transfer out to India. He found that

> "the *Cascarillos* [Amerindians] have found out that the bark is worth money...the prevalent opinion is that the use is as a dye" [157].

Peter Raby says that Spruce had exceptional knowledge of the medicinal properties of plants, giving as an instance of this his sending coca to Albert Niemann (1834-61) in Berlin, which led to the isolation of cocaine [158].

Earlier, the botaniste physicien Von Humboldt felt that with more European input, plant uses would increase:

> "These discoveries will be multiplied. European civilization shall flow in a great measure towards the equinoctial regions of the New Continent" [159].

This sounds like a New World form of Orientalism: it would take the West to show the Amerindians their own riches. The Amerindians and the *criollo* de Caldas practised

phytogeography but it needed a European to systematize it, with cross-sectional mapping and European scientific standards [160].

In reality, the Amerindians were better off without Western civilization, except perhaps for vaccination (after the West had brought them smallpox). The rain forests and mountain slopes of Central and South America contained more potential medicinal plants than did those of Asia and Africa. Despite von Humboldt's declaration, this potential was ignored until the last fifty years of the twentieth century. Both native expertise and the forests themselves have dwindled at an accelerating rate. James Duke and Rodolfo Vasquez said in 1994 that the rain forest species most likely to be lost are those which are least likely to have been studied [161]. In 1997, in Cuzco, Peru, Vasquez showed me massive notebooks in which he had listed the disappearance of habitats and plants over twenty five years. When I asked him why exploration for medicinal herbs had ceased a hundred years earlier, he shrugged and answered in one word: "Politics". Maybe he should have said "Chemistry". Edward J.Ayensu has described the Caribbean as an area of drug colonization, with raw materials taken and turned into products which are then sold back at high cost [162]. Sir Ghillean Prance, an ex-director of Kew Gardens, has written in 1999 of the poisons and narcotics in use by the Indians of the Amazonian rainforest. Each tribe has its array of plant derivatives. Documenting the material is a matter of urgency. He demands that any gain should be for the indigenous people themselves, rather than leading to patents by large drug companies [163].

Summary of interaction for different eras and European powers

Reports of travellers in the Indian sub-continent before 1750 suggest informal interaction between British and indigenous practitioners, with sharing of duties and

knowledge. In the West Indies, before (and after) 1750, few British doctors showed much interest in African-Caribbean medical practices, despite white doctors' responsibilities to plantations. Among British doctors was Hans Sloane, who found a lack of method in the medicine of the Black slaves, a familiar criticism of Hindu medicine a century later. Sloane is often held up as an early exemplar of the enquiring doctor abroad; this thesis supports the opinion of Edward Long that Sloane had too many duties and too short a period in the Caribbean to play much part in any form of interaction. He consolidated his reputation later back home.

The Portuguese gave no official attention to indigenous medicine in their colonies. Individually, Garçia da Orta and later the Dutchman Hendrik van Reede fused their own medical and botanical knowledge with that of indigenous doctor-botanists in South-West India. Da Orta remained a significant figure for British doctors over two hundred years later. This is also true of van Reede, though more for his botany than for medical interaction. This thesis has provided a contrast between the nativization of da Orta, who met indigenous doctors more than half-way, and even the most sympathetic of British doctors later, held back by their belief in the rationalism and science underlying their own system. An additional contrast is that between da Orta and Hernández, as sympathetic as da Orta but shackled by his own humoralism. Despite this handicap, Hernández did make sense of Aztec medicine, often with longer-lasting results than resulted from the efforts of British doctors looking at Indian remedies from 1800 to 1830. More drugs entered the Western materia medica from the New World before 1600 than did from India in the nineteenth century. They held their place, to be developed during the revolution in chemical pathology, when the relatively new Indian entries in works such as Royle's got side-lined. This point from the wider comparison allowed by this chapter has not been made previously.

The Dutch developed Botanic Gardens, including that attached to the Medical School at Leiden where Linnaeus worked for three years from 1735. While French policy on botany was enlightened, that on colonial medicine was Eurocentric, inhibiting medical interchange. In West Africa, individuals, Dutch and British, called for African herbal remedies to be investigated; their pleas went unheard with European powers unable to open up the continent until late in the nineteenth century. This thesis has brought together these facts, already available in the literature, to contextualize the main focus, interaction in British colonies within a narrower time-frame.

In Spanish colonies there was cultural syncretism. The Spanish took a major, official interest in Aztec medicine for about seventy five years from c.1575. In Peru, individual Spaniards obtained "quina-bark", Cinchona, to treat malaria. Interest in the natural history and raw materials of the Spanish colonies was revived around 1775. This was the start of the period when science eventually began to overtake the Catholic religion as a dominant force. The scientific study of resources was fanned further by the nationalism of creole full-blooded Spanish or *mestizo* scientists. By the twentieth century, complex syncretism of Western and Amerindian medical systems had occurred. The singular position of Spanish Cuba from 1790 to 1890 has been mentioned, in which the position of Black, coloured or Amerindian traditional or folk medicine remains obscure, while Western medicine was not generally available to such people.

Similar syncretism to that in mainland Spanish America took place more covertly in India, fostered by the exclusion of Indians from senior medical posts and by the non-availability of Western medicine to most Indians. It became more open towards the end of the nineteenth century with the rise of Indian nationalism. The British combination of aloofness and tight control discouraged syncretism and indeed was a factor in delaying

the nationalists achieving independence. This forms a sharp contrast to the situation in Mexico or Colombia.

In the British West Indies, there was syncretism following the collapse of the plantocracy's medical service after emancipation. This did not involve plantocracy whites, who maintained their isolated position and their Western doctors, as in Cuba. By mid-nineteenth century, in both the West Indies and the ex-Spanish mainland colonies, economic stagnation and political uncertainty meant that the people had to pick up what medical care they could find. The unique exception was Cuba, with a successful slave society and sugar industry during the first half of the nineteenth century. Cuba differed from those neighbouring Caribbean islands and mainland states which by then had become independent of Spain. However, the lack of access to Western medicine meant that interaction was as minimal as in neighbouring Jamaica during the same period. There is a clear parallel between the problems with vaccination programmes in India and those in Cuba; however, in the case of the latter, resistance was not bound up with issues of race and nationalism, more with poverty and access.

Lastly, as stated in Chapters II and IV, the marginalization of botany by chemistry, when the one should have looked to the other, has meant the loss of potential plant medical products, notably from the Latin American rainforests.

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CONCLUSIONS

Overall, in the nineteenth century the British saw themselves as superior to Indians. David Arnold has been concerned with the status and power of Western medicine. He makes more of the disdain shown by British doctors towards Hindu and Muslim medical practitioners and their practices than of any admiration these doctors might have expressed. For Arnold, J.Ranald Martin represents the archetypal British doctor, a modernist with little good to say about Indian practitioners. In the terms used by Ronald Inden, Martin can be said to have deployed his knowledge as a hegemonic agent of British power. The current thesis has suggested a more complex situation, with many British doctors showing interest and admiration for Indian practitioners both in their practices and in the remedies which they used.

Like Arnold for India, the economic historian Richard Sheridan for the West Indies has been more concerned with colonial rule and society than with medical interaction itself (in this case between British and African-Caribbean slave doctors). The current thesis has questioned the correctness of Sheridan's assertion that African-Caribbean slave medicine facilitated the adaptation of Western medicine to local conditions by British doctors. Indeed, the layman Edward Long in the 1770s, for all his crude racial attitudes, came closer to the real situation when he chided those doctors for their lack of interest in slave remedies. He also felt that, if more Western doctors were to acquire skill as botanists, they would transcend rather than emulate slave doctors in the use of plants. Sheridan appears to misconstrue interest in slave welfare for one in slave

medical practices: doctors such as John Quier wanted to extend to slaves Western medical regimens modified for local conditions.

The terms "empirical", "empiricist" and "empiricism" have been used in different ways during the past two hundred years. In Britain, India and the West Indies there were protagonists of the rational empirical movement which developed during the 1770s. However, the trials of drugs and therapeutic regimens which were undertaken in Britain were not matched by comparable ones in the two colonial arenas. The short trial conducted by the layman A.J.Alexander for the West Indian disease of yaws is evidence that such trials were feasible. In the 1810s James Thomson hoped to bring in trials of slave medical remedies and to undertake chemical analysis of such remedies. William O'Shaughnessy in the 1830s and 1840s wanted to do the same for indigenous Indian drugs. This thesis has looked at why such aspirations came to little.

Hippocratic depletive measures survived to be mentioned in John Forbes Royle's *Materia Medica and Therapeutics* as late as the third edition of 1856. By 1867 they were derided in an Indian Medical Gazette editorial and again in T.Lauder Brunton's 1877 pharmacology lectures. Even so, the demise of humoral medicine is less significant in seeming to reduce any debt owed by Western medicine to Indian medicine than David Arnold and Mark Harrison suggest. The switch from a botanical to a chemical materia medica is a more concrete factor, less theoretical or convoluted.

Ironically, Hippocratic tenets about the importance of climate and topography did lie behind the widening of the barrier between rulers and ruled. This comprised the belief in miasmata as the cause of diseases. With man himself increasingly seen as the most important polluter, this belief led to the public health movement of the 1830s. Edwin Chadwick saw the poor of Britain with their illnesses as victims of their poverty. This contrasted with the attitude of J.Ranald Martin, who felt that the poor of India brought

their ill-health on themselves. This is a striking dichotomy between the opinions of these two leading contemporaries. The public health movement meant further distancing of itself by the white establishment in Britain, India and the West Indies, enclavism in all three arenas.

There is also irony in Greek Ionian medicine having provided the basis of Arabic as well as Western (European) medicine. In particular, human anatomy was borrowed by European from Arabic medicine at the time of the Renaissance. John Forbes Royle, in his role of nineteenth century historian, even wondered if Hindu medicine might have been the forerunner of the Greek and Arabic systems. It has required modern historians from a Muslim background to re-iterate these facts. The major advance in Western anatomy over Eastern came through pathological anatomy at the start of the nineteenth century. Indeed, advances in Western medicine as a whole did not occur until later in that century, certainly in terms of therapeutic benefits.

William F.Bynum has described the switch from plant-based to chemically-created drugs which began early in the nineteenth century. As stated above, James Thomson and William O'Shaughnessy were aware of this development but John Forbes Royle, working in India then in Britain, did not get involved in it. Rather, his aim appears to have been one of providing a botanical encyclopedia for other doctors to utilize. In their publications on India, Whitelaw Ainslie before him and Edward J.Balfour afterwards had much the same approach.

The efforts of doctors such as these were negated by the advent of scientific pharmacology. That discipline developed in Greater Germany in the 1850s to reach Britain a quarter of a century later. By the time of T.Lauder Brunton in the late 1870s, the botanical materia medica had been relegated to footnotes in textbooks of therapeutics and pharmacology, such as Brunton's own. David Arnold is too dismissive

of the status of Royle; in general, Anglicists are of more importance than Orientalists for the purposes of Arnold's discourse. On the narrow issue of phytogeography, it is true that Royle's ideas were based on those of von Humboldt. Mark Harrison has called Royle an "Orientalist surgeon" and he fits D.Lorenzen's point about the empiricism of Orientalists in the amassing of facts rather than the making of generalizations. Their attitude differed from that of men such as J.Ranald Martin. Royle's work in India was telescoped into a decade and his subsequent activities in Britain dwindled after less than a further three decades. Nevertheless, his place in medical interaction in India has been asserted in the current thesis.

Royle's *Materia Medica* and Edward G.Balfour's *Cyclopaedia of India* both give credit to local practitioners in their deployment of plant remedies, as well as to the British doctors who studied and tried the remedies themselves. This is true of many other works published by British doctors in India. The individual entries for such drugs often include positive comments about their use by contemporary indigenous practitioners. These belie any critical stance in the preface or Orientalist statement about the degraded position of nineteenth century Indian medicine. This is true, for example, of Ainslie in the 1820s and Thomas A.Wise in the 1840s. Indeed, Wise and later Edward Balfour advocated both acculturation and reverse acculturation. Neither Wise nor O'Shaughnessy get much attention from modern historians of India. Their approach does not fit David Arnold's thesis of British doctors dismissing indigenous systems while aiming to extract remedies from these. It is correct to add that Mark Harrison does give a more balanced view of the position of Wise. Wise can be labelled a "late Orientalist" but he did engage with contemporary Indian physicians. It should also be said that, in his *Science, Technology and Medicine* of 2000, David Arnold does

exonerate Royle from displaying a largely negative attitude towards Ayurvedic medicine.

Mark Harrison has been among those who like Ronald Inden have broadened the debate over Edward Said's original concept of Orientalism. What is clear is that there are several strands of argument. The assertion of superiority of ancient texts over current practices can be called "Orientalist" in one narrow definition. The particular issue of the 1830s about languages for the instruction of Indians in Western science has already been put in perspective by C.A.Bayly. The opposite to an Orientalist can be labelled a positivist or modernist, to use terms mentioned by Inden. Such a person is also an empiricist, in that he accepts only facts which have been observed directly. The difference between Royle and Martin is that Royle sought the facts in Indian medical practices while Martin was too dismissive of these to undertake such a search.

Therefore, in India, through successive decades from the 1770s, the British doctors William Roxburgh, Ainslie, Royle and Wise worked with indigenous practitioners. William O'Shaughnessy, a contemporary of Wise in India in the 1830s and 1840s, wanted a "Native physician" to be on his committee for the examination of indigenous remedies. The positive approach of these individual doctors has been attested in this thesis and contrasted with the attitude of J.Ranald Martin. He was more concerned with topographical issues and public health measures to combat the risks which he saw as emanating from the Indian population.

Interaction means more than one party. The take-up of Western medicines by indigenous doctors in India is exemplified by the hybrid pamphlets on materia medica produced by Indian presses in mid-nineteenth century. Later in that century, factors such as regulation of Western medicine and the start of Indian nationalism made many Ayurvedic and Unani authors begin to reject Western medicine. As was the case for the

activities of British doctors, the situation was complex, with some Western-trained Indian doctors using that medical background to study indigenous remedies, such as several doctors at Grant Medical College, Bombay, from mid-nineteenth century onwards, as Mridula Ramanna has described.

During the same period, after 1840, the African-Caribbean population in West Indian colonies continued with their own medical practices. They were freed not only from slavery by name but also from Western medical Hippocratic regimens, including mercury preparations. For the latter deprivation they were better off, though the smallpox epidemics are an indication that there were losses for them as well as gains. Direct evidence about what medical services they had is scanty, compared with the information available on topics such as their political activities, their relationship to British Nonconformist churches and the situation in education. Michael Biddiss's comment about medical history is apposite. Thus, matters concerning the ex-slaves' health, their morbidity and mortality, have repaid study in terms of results but little has been revealed of their actual medical practices. These practices would have been creolized, with indigenous Carib, African, African-Caribbean and, no doubt, some Western practices combined together. This was interaction but not one that involved the white plantocracy. Though obviously it was not recorded in printed form, it was equivalent to the hand-sheets of mixed Western and indigenous materia medica produced on Indian presses during the same period (C.A.Bayly). It has needed modern ethno-botanists to work out retrospectively what medicinal herbs were brought by slaves from Africa and what were indigenous Caribbean plants and either found by Africans on arrival or used before them by the Caribs. Before these botanists, only Alexander Anderson had addressed this issue.

In India, the nineteenth century Western doctor-botanists tended as a group to be more sympathetic to Indian medicine than most of their colleagues. Ironically, their knowledge of Linnaean classification allowed them to bypass native practitioners in identifying potential herbal remedies. This point was made by Royle in his 1837 Essay but has not been picked up and developed by modern historians subsequently, not even by Ray Desmond. Roxburgh and Royle did combine their dual interests in both botany and indigenous medicine. Later doctor-botanists in India such as Thomas Thomson and Ralph Wight appeared to have acted more as "pure" botanists though Wight did provide details of medicinal plants for the 1868 Pharmacopoeia of India. They were among the compilers of this, part of the curiously composed committee which also included J.Ranald Martin and William B.O'Shaughnessy, all old India hands retired to England.

Western doctors who pursued an interest in botany in the West Indies have been labelled "doctor-scientists" by Richard Sheridan. This is despite the term "scientist" not being coined until 1833. A more important point is that their botany did not feed into their medical practice or lead them to look at the herbal remedies of the slaves. Only James Thomson in the 1810s tried to combine work in botany, chemistry and slave medicine for the study of local remedies. His predecessors as doctor-botanists were more doctors who practised botany in the eighteenth-century gentlemen-amateur fashion. The other way round, Alexander Anderson was more scientific botanist than doctor, while Thomas Dancer managed a dual role. Overall, even in the next century few British doctors achieved full professional status as botanists; among them was Joseph Hooker, who abandoned medicine to do this. These issues of status have needed clarification, despite the work of Desmond.

Pre-Linnaean doctor-botanists included the sixteenth-century Portuguese Garçia da Orta, who freed himself of any Western medical nosology or botanical classification.

This has been contrasted in the current thesis with the position of his contemporary, the Spaniard Francisco Hernández. The latter was constrained by Hippocratic principles in their original Ionic Greek form without the overlay of later Arabic reinterpretation, characteristic of Spanish doctors at the time. His work was under as strict government control as medicine itself was in Spain.

The Spanish Crown in the 1590s saw language as a means of control in their colonies, much as the British were to do in India during the 1830s. Exploration under government auspices was also common to both Spain in the New World and Britain in South Asia during their respective periods of colonial expansion. However, in Spanish colonies there was miscenegation, with acculturation and reverse acculturation. This resulted in cultural syncretism on a broad front, including medical practices. In addition, Catholicism was part of the Spanish imperial discourse, with the Jesuits as hegemonic agents. For the British, science (including medicine) took the place of religion. In Latin America, science became important only when the role of the Church was curtailed around 1800 by metropolitan government, which in turn was itself rejected by the nationalists. Clearly, there is a striking contrast between British and Spanish colonization, with the effect that any comparisons by medical historians have tended to be piecemeal or made in passing.

The nationalism which led to independence for Spanish colonies in the 1800s was in the hands of creole full-blooded Spanish or *mestizos*. A century later the aspirations of Indian nationalists were held in check by the British. The latter exerted tight control right up to independence a further fifty years after that. Around 1800, New World medical scientists worked to develop nomenclatures, nosologies and materia medica which were locally based, freed from the language and layout of any European systems while incorporating material from these. By contrast, in India, the nineteenth century

was a period of subordination for those Indians who took up Western medicine and of discouragement over any attempts to rejuvenate their own indigenous systems or create Indian forms of Western systems.

Universally, both in Africa and in the New World, the African was regarded as inferior by Europeans from all countries. Any Amerindian system might have appeared mysterious to Hernández. There was no such problem with African medicine as the African was thought incapable of creating a discernable system; certainly, that was the view of Edward Long in Jamaica. However, as in the case of the tribal healers with whom da Orta and Reede worked in South-West India, there were systems, based on long-standing knowledge and use of plant remedies. In West Africa, Willem Bosman and Thomas Winterbottom, a century apart, were clearly impressed by the empirical systems of the indigenous people.

To summarize, this dissertation has established that individual British doctors, particularly the doctor-botanists, worked with Indian doctors and admired them. This was not true in the Caribbean, with the exception of James Thomson in Jamaica. British medicine was a matter of show in India, coercion in the West Indies; this was largely the case, even with effective measures such as vaccination and the use of Cinchona preparations against malaria. Developments in Western medicine did not lead to systematic study of Indian remedies in terms of chemical analysis and trial. British pharmacopoeias of the mid-nineteenth century included Indian and New World plant remedies but during the 1870s were side-lined by scientific pharmacology, which looked to chemistry for new drugs. Medical syncretism took place openly in the New World; this includes the British Caribbean (excepting the white plantocracy). In South Asia, it was carried out more circumspectly by Indians under repressive British rule.

The degree to which Western doctor-botanists worked with indigenous practitioners world-wide deserves further study. Chemistry and pharmacology were used to produce new preparations from existing plant remedies (such as Cinchona quinine and Papaver opium) and also metallic drugs (such as those containing arsenic). Why newly recorded indigenous plant drugs (such as those of Royle from India) were not taken up for similar development should be looked into in greater detail. Such take up has occurred on a meaningful scale only during the second half of the twentieth century. At present, while twenty per cent of drugs in general are plant-based, as high as sixty per cent of anti-cancer ones are. This is an indication that most plant-based drugs are recent in origin since such anti-cancer agents are a new development. Though largely beyond the scope (and resource availability) of this thesis, the covert medical syncretism in India and post-emancipation syncretism in the Caribbean need further examination. The Arab contribution to both Western and Asian medical systems also warrants more acknowledgment and study by Western historians. Finally, the late eighteenth-century observationist or rational empiricist movement in Britain had links to Western medicine in both British India and West Indies, in terms of personnel and aims; this deserves further examination. The varying gloss put by British doctors on the word "empiricism" would be part of such a study.

Appendix I: Biographical Details

AINSLIE, Whitelaw, 1767-1837. b.Duns, Berwickshire; Edinburgh,1785; EIC service, 1788; surgeon, 1794; president, committee on epidemics, 1809; left India, 1815; knighted, 1835.

ANDERSON, Alexander, 1748?-1811. b.Scotland; Edinburgh; Chelsea Physic Garden; surgeon, New York, 1774; orderly, St Lucia, found a source of quinine; medical aide, Grenada, 1783; Superintendent, St Vincent Garden on liberation from French, 1785; plant-collecting Trinidad, 1786 & 1803, Guyana (Rivers Demerara & Essoquibo), 1791; grew breadfruit from Bligh, 1793; concerned with deforestation; MD Edin. & FRSEd., 1791.

BALFOUR, Edward Green, 1813-89. b.Montrose; LRCS Edinburgh, 1833; examined deforestation Mauritius, 1834; surgeon, Madras, 1836; ecological concerns, India, 1840s.

BALLINGALL, George, 1780-1855. b.Forglen, Banffshire; St.Andrew's & Edinburgh; India, 1806-14; Prof.Military Surg., Edinburgh,1825; knighted, 1830.

BANKS, Joseph, 1743-1820. b;London; Oxford, 1760; arranged botany lectures, 1764; FRS, 1766; James Cook's 1st expedition, 1768; PRS, 1776-1820; Bt.

BONDT Jacob (Bontius), 1592-1631. b.Leiden; medicine and botany, Leiden; Batavia, East Indies, 1626-1631; De Medicina Indorum publ.posth.1642.

BRUNTON, Thomas Lauder, 1844-1916. b.Hiltonhill, Roxburghshire; MB Edin.1866, MD 1868; Vienna, Berlin, Leipzig for chemical pharmacology; Lecturer, Middlesex & St Barts, 1870-1; amyl nitrite for angina; FRS, 1874; Textbook, 1885; knighted, 1900; Bt, 1908; aimed "to leave therapeutics as a science not an art"

BUCHANAN, Francis, 1762-1829. b.Branziet, Perthshire; MD Edin., 1783; EIC ship's surgeon, 1784; Bengal, 1794; Burma survey, 1795; Mysore, 1800; Bengal survey, 1807; Superintendent, Calcutta Garden, 1814; left India 1815; changed surname to Hamilton.

BUCHHEIM, Rudolf, 1820-79. MD, Dorpat (now Tarttu, Estonia),1847; Leipzig; founded scientific pharmacology with study of mode of action and experimental work, 1853-6.

De CALDAS, Francisco José, 1768-1816. b.Popayán, Nueva Granada; lawyer, 1789; barometric thermometer, 1797; met J.C.Mutis, 1801, A.von Humboldt, 1802; Phytogeography during Botanical Expedition, 1802-6; founded journal Semanario, 1809; Revolution, 1810; executed in counter-revolution, 1816.

CLARK, John, 1744-1805. b.Prior Law, Roxburghshire; medicine, Edinburgh/London; EIC ships surgeon, 1766; surgeon, Bengal, 1768; MD St.Andrews, 1773; physician, Newcastle-upon-Tyne, 1775.

DANCER, Thomas, 1750?-1811. MD Edin., 1771; Jamaica, 1773; physician, Bath waters, Jamaica, 1781; Curator, Botanic Garden, Bath, Jamaica, 1798.

FLEMING, John, 1747-1829. Edinburgh, 1766; IMS, 1768; Acting Superintendent, Calcutta Garden, 1805.

GRAINGER, James, 1721?-1766. b.Duns, Berwickshire; MD Edin., 1753; St Kitts, 1759.

HERNANDEZ, Francisco, 1517-87. b.Toledo; MD Alcal ; medical botany, Guadalupe, 1560; court physician, Toledo, 1567; Aranjuez Botanical Garden, 1569; proto-médico, Nueva España (Mexico), 1571-7.

HEYNE, Benjamin, 1770-1819. b.Döbra, Germany; MD; Moravian Mission (Halle university, Saxony, founded 1702), Danish E.I.C., Tranquebar, 1792; entered British Madras service; Superintendent, Bangalore Garden, 1802; left India for England, 1813.

HILLARY, William, 1697-1763. b.Birkrigg, Hawes; Quaker; MD Leiden 1722; Ripon till 1734; Barbadoes, 1747; consulted by George Washington; London, 1859.

HOOKER Joseph Dalton, 1817-1911. b.Halesworth; MD Glasgow, 1839; Himalayas, 1847-9; Director of Kew, 1865; PRS, 1873; KCSI, 1877.

HUMBOLDT, Alexander von, 1769-1859. b.Berlin; mining studies,Berlin, Freiburg; South and Central America, 1799-1804; pioneer in phytogeography; Paris, 1807-27; Central Asia, 1829.

JENNER, Edward, 1749-1823. b.Berkeley; pupil of John Hunter, London; catalogued Joseph Banks' collection from Cook's voyage; doctor, Berkeley, 1772; cowpox hypothesis and testing, 1770s; vaccination, 1790s; MD, St Andrew's, 1792; Royal physician but not knighted as close to Queen Caroline.

JOHNSON, James, 1777-1845. b.Ballinderry, Co.Londonderry; 1798, LRCS London, 1798; India, 1802-6.

JONES, William, 1746-94. b.London; Oxford; knighted, judge in India, 1783; Asiatic Society and Researches, 1784.

LINNAEUS (VON LINNE) Carl, 1707-78. b.Rashult, Sweden; medicine, Lund; botany, Uppsala; paediatrician, lecturer, Uppsala, 1730; MD Leiden, Holland, 1735; Systema Naturae (botanical classification), 1735; Stockholm, 1738; Professor of Medicine and Botany, Uppsala, 1741; binomial classification, 1749.

LONG, Edward, 1734-1813. b.St.Blazey, Cornwall; legal studies; Jamaica, 1757-69.

MACAULAY, Thomas Babington, 1800-59. b.Rothley, Leics.; BA Camb.1822; MP, 1830; India, 1834-8; barony, 1857.

MARTIN, James Ranald, 1793-1874. b.Kilmuir, Skye; St.George's, London; Bengal Medical Service, 1817; Presidency Surgeon, 1830; left India, 1840; knighted, 1860. "James" was his paternal grandfather's given name, the second name, "Ranald", his own given name.

MOREHEAD, Charles, 1807-82. b.Edinburgh; MD Edin., 1828; Bombay, 1829; founded Grant Medical College, 1845; Principal Medical Officer, Bombay hospitals, 1845-54 & 56-59; left India, 1859.

MUTIS, José Celestino, 1732-1808. b.Cádiz; medicine, Cádiz; MD Seville; Botanical Garden, Madrid, 1758; Nueva Granada, 1760; Medicine, botany, astronomy, mining; first botanist and astronomer to Carlos III and Director of Botanical Expedition, 1783; Cinchona spec. found, 1784-7; further Cinchona studies, 1802; met von Humboldt, 1802; instructed de Caldas, 1802-6.

NELIGAN, John Moore, 1815-63. b.Clonmel, Co.Tipperary; MD Edin., 1836; Dublin, 1840; committee for British Pharmacopoeia.

Da ORTA, Garçia, 1490-1570. b.Oporto; New Christian (forced conversion from Judaism); medicine, Lisbon; Goa, 1540s; own botanical garden, Goa, 1550s; Coloquios, 1563.

O'SHAUGHNESSY, William Brooke, 1808-89. b.Limerick; MD.Edin.1829; Study of cholera patients, Newcastle-upon-Tyne, 1831; Bengal, Professor of Chemistry and Medicine, Calcutta, 1833; Laid telegraph wire, 1837; FRS, 1843; H.H.Wilson as patron for 1852 Telegraph; knighted, 1856; left India, 1861.

PEREIRA, Jonathan, 1804-53. b.London; LSA, 1823; Chemistry, Materia Medica Lecturer, 1826, 1828; F.Linnaean Society; LRCS, MD Erlangen, 1840; physician, 1841, Professor, The London Hospital; FRCP, 1845; pharmacology work, 1849.

Van REEDE tot Drakenstein, Hendryk, 1636-91. Sergeant-Major, Ceylon, 1667; Commander of Malabar, 1660-77; botany, Malabar Coast (now South-West India) working with Pietro Foglia, medicine Naples; with Paul Hermann, botanist, 1775; Batavia, 1677; Cape, 1685; Holland, 1688; Malabar, 1691, dying at sea on way to Surat.

ROXBOROUGH, William, 1751-1815. b.Underwood, Ayrshire; MD Edin.,1773; Madras, 1776; surgeon, 1780; Superintendent, Samulcotta Gardens, 1781; Calcutta Gardens, 1793; left India, 1813.

ROYLE, John Forbes, 1798-1858. b.Cawnpore, India; Edinburgh, London, pupil of A.Todd Thomson for natural history, botany; surgeon, Calcutta, 1819; Superintendent, Saharanpur Gardens, 1823; left India, 1831; MD Munich, 1833; Professor of Materia Medica and Therapeutics, King's, 1837; FRS, 1837, later Vice-Pres.; F.Linnaean Soc.; Secretary, Brit. Assoc. Advanc. Science; plans for Cinchona plants for India, 1840s-50s.

SCHMIEDERBERG, Oscar, 1838-1921. b.Dorpat (now Tarttu, Estonia); MD, Dorpat, 1861; worked with Rudolf Buchheim in experimental pharmacology, Dorpat; Professor, Dorpat, 1869; Leipzig with Buchheim, 1870; Professor, Strassburg (German again),

1871; forty pupils became professors of pharmacology in Europe and America (including Edinburgh and London).

SLARE, Frederick, 1646/7-1727. b.Old, Northamptonshire; Heidelberg, 1666; chemistry with Robert Boyle, 1670s; MD Utrecht, 1979; FRS; 1680.

SLOANE, Hans, 1660-1753. b.Killyleagh, Co.Down; MD Orange, 1683; West Indies, 1687-9; physician, London; Chelsea Physic Garden, 1721; FRS, Secretary, later President; Royal physician to George I.

SPRUCE, Richard, 1817-93. b.Ganthorpe, Yorks; botany, Yorkshire, 1833; sent by Hooker and Bentham to South America, 1849; collected Cinchona plants for Kew/India, 1860-1.

THOMSON, Anthony Todd, 1778-1849. b.Edinburgh; med. Edinburgh,1795; MRCS London, 1800; Chelsea Dispensary, 1812; F.Linnaean Soc.; Lecturer, Botany, Medicine, Pharmaceutical Soc.; MD St Andrew's, 1824; Professor, Materia Medica, London, 1828.

THOMSON, James, 1793?-1822. b.Jamaica; MD Edinburgh, 1813; protegé of John Quier and William Wright.

THOMSON, Thomas, 1817-78. b.Glasgow; MD Glasgow, 1839; EIC surgeon; botany Afghanistan, 1841; Kashmir, 1847; Sikkim with Joseph Hooker, 1850; left India, 1851; F.Linnaean Soc., 1852; FRS, 1855; India for solar eclipse, 1871.

TWINING, William, 1790-1835. b.Nova Scotia; Guy's, 1810; Peninsula War, Waterloo; Bengal, 1823; his Diseases of Bengal addressed health of Indians, 1832; leading anti-mercurialist.

WALLICH, Nathaniel, 1785-1854. b.Copenhagen; MD Copenhagen, 1806; botany under Martin Vahl; Serampore Danish Mission, 1807, captured by British, 1808; Superintendent, Calcutta Gardens, 1815; F.Linnaean Soc., 1818, Vice-President; MD Aberdeen, 1819; FRS, 1829; Professor of Botany, Calcutta, 1839; left India, 1849.

WIGHT, Robert, 1796-1872. b.Milton, East Lothian; MD Edin.1818; EIC surgeon, 1819; naturalist, Madras, 1826; Botanical works, 1831 & 1839; left India, 1853; F.Linnaean Soc., 1832; FRS, 1855; Committee for Pharmacopoeia of India, for Indian plants, 1868.

WILSON, Horace Hayman, 1786-1860. b.London; MRCS, St Thomas's, 1805; Calcutta, 1808; Sec., Asiatic Soc., 1811; Assay Master, 1816; opposed required Christian instruction in India so elected by only a narrow margin as Professor of Sanskrit, Oxford, 1832; FRS, 1834.

WINTERBOTTOM, Thomas, 1766-1859. b.South Shields, Co.Durham; Edinburgh, 1787; MD Glasgow, 1792; Sierra Leone, 1792-99; described trypanosomiasis; South Shields, 1803; oldest practising physician on publication of first Medical Register, 1859.

WITHERING, William, 1741-99. b.Wellington, Salop; Edinburgh, 1762; Stafford, Birmingham, largest practice outside London, 1775; foxglove work, 1773-85; FRS, 1785; Linnaean Soc. sec. 1789.

WRIGHT, William, 1735-1819. b.Crieff; medical, Edinburgh, 1756; ship's mate, 1758; MD St.Andrew's; Jamaica, 1764-77; Surgeon-General, Jamaica, 1774; Plant collector for Banks and John Hope; discovered Cinchona spec.; FRS, 1778; P.O.W. of French, 1780; Jamaica, FRCPEd., 1782; Physician to Army, Barbados, 1796; PRCPEd., 1801.

APPENDIX II: BIBLIOGRAPHY

1. Manuscripts

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Wallich, Nathaniel, 1815. Letter to Francis Buchanan. 25.02.1815. SRO GD 161/19/4. Natural History Museum, London.

2. Personal Communications

Deacon, Harriet. E-mail: hdeacon@its.uct.ac.za. 15.07.1997. Cape plants in British pharmacopoeia. E-mail to Dr José Pedro Sousa Dias, E-mail: gehsf@mail.telepac.pt

Sousa Dias, José Pedro. E-mail: gehsf@mail.telepac.pt. 14.07.97. Portuguese use of indigenous drugs in Brazil and Africa. E-mail to Dr Harriet Deacon hdeacon@its.uct.ac.za.

3..Official Publications

West Indies

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