THE EASTERN PORTUGUESE EMPIRE: FRONTIERS AND CONTACT ZONES IN KNOWLEDGE PRODUCTION CONTEXTS

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Resumo: Ao longo da Era Moderna os universos coloniais portugueses fizeram parte de intensas dinâmicas de construção, extensão, e reconfiguração de conhecimento científico. Nesses espaços, ocorreram diversos e complexos processos de composição sincrética de saberes, ao mesmo tempo profundamente relacionados com as muitas especificidades e idiossincrasias locais e estreitamente conectados aos canais de circulação de conhecimento estabelecidos pelas instituições imperiais. Estes eram diretamente influenciados pelo universo macro das configurações estruturais, conjunturais, políticas, econômicas e sociais. Sobre isso trata essa tese, cujo objetivo é contribuir para o estudo da História das Ciências – especialmente Medicina, Farmácia e Filosofia Natural – no complexo do Império Português no século XVIII. Neste capítulo discutirei, em termos teóricos, os aspectos relativos à constituição das articulações de longa duração entre as diversas componentes humanas do Império. Procurarei definir a forma como compreendo a permeabilidade das fronteiras culturais estabelecidas dentro do complexo imperial.

Palavras-chave: História das Ciências; Goa; Índia Portuguesa; História da Farmácia; História da Medicina.

Abstract: The 18th century Portuguese colonial spaces can be understood as places of intense and dynamic processes of construction, extension, and reconfiguration of scientific knowledge. Within these spaces, multiple sets of complex processes of syncretic production of knowledge

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occurred, which were at the same time profoundly related to the many local specificities and idiosyncrasies and strictly connected to the circulatory channels stablished by the Imperial institutions, and these were directly influenced by the macro universe of the structural, conjunctural, political, social and economic factors. This is the main subject of this thesis, whose objective is to contribute to the field of the History of Sciences – especially for the History of Medicine, Pharmacy and Natural Philosophy – in the complex of the 18th century Portuguese Empire. This chapter intends to discuss, in theoretical terms, some aspects related to the effects of the long-term historical processes between the diverse human components of the Empire. I will try to define, in a more comprehensive way, the permeability of the cultural frontiers stablished in the imperial complex.

Keywords: History of Sciences; Goa; Portuguese India; History of Pharmacy; History of Medicine.

INTRODUCTION – KNOWLEDGE PRODUCTION CONTEXTS AND THE INTERSECTIONS OF LONG-TERM PROCESSES

In 18th-century Portuguese India, the historical processes underlying the development and production of medical, pharmaceutical and natural philosophical knowledge and texts should be analysed on the basis of long-term perspectives, of permanencies and continuities. Such an analysis should take into account their structural, political, economic and social environments, without which it would be contextually alienated and open to interpretative gaps. In this chapter, I intend to follow one of many possibilities for a wide-ranging examination of the phenomena, from the broadest perspective possible. The aim is to show where some permanencies and continuities can be identified, which I feel are important to this narrative.

The approach proposed should encompass the majority of the elements which I intend to address in this chapter, at varying degrees depending on their specificity. The idea is to provide a contextual outline which can cover several dimensions of a specific process, in order to obtain a broader understanding of knowledge production in Portuguese India. Historical circumstances at the turn of the 18th century were connected to several processes that, although different, had considerable influence on the sciences, particularly on Natural Philosophy and its major branches, Medicine and Pharmacy. The permanencies and continuities, identifiable during colonial expansion, endowed the social dynamics of Portuguese India with special features. In this study, I intend to show that a number of elements must be taken into account, such as the state's policies for the colonies, the action of religious orders, the conflicts of ethnic and religious origin, and the political and social environments, both Asian and European. Contrary to an analysis centred on advances and discoveries, the aim is to locate the individuals in their relationship with contexts and environments. Although geographically situated, this approach assumes that no place of knowledge production, whether a city, state, hospital, pharmacy, office or laboratory, is in itself a hermetically closed environment, isolated from its social milieu[1]. A History of the Sciences in Portuguese India should con-

[1] LINDEMANN, 2002.

tain, or rather, has to contain elements from a Social, Political and Economic History of Portuguese India and – why not? – of the Empire itself.

INTERSECTIONS AND PERMANENCIES

The arrival of the Portuguese and other Europeans in India was not, obviously, an isolated event. Some of the most defining configurations of the establishment and consolidation of Portuguese presence in Asia can be related to, for example, the characteristics developed during the early times of maritime expansion. In relation to the History of Sciences, this same perspective should be considered valid. Maritime expansion is an extensively studied field. The amount and range of excellent studies is so monumental that any disclaimer I may make about having no intention of covering them all is almost superfluous.

The sequence of events which historians tend to group under the narrative of maritime expansion is related to many different yet correlated circumstances. Generally speaking, fundamental importance can be given to three factors which, interconnected, drove the Europeans beyond the boundaries of their continent, towards faraway oceans and lands, known or unknown, deserted or inhabited. Trade, faith and war, on equal scales of importance, were the engines of expansion.

Over the second half of the 20th century, historians were absorbed by the tendency to begin their narrative on expansion, in search of answers which could allay the desire for comprehensive explanations, such as, for example, centuries-old processes dating back to the Christian *Reconquista* (Reconquering) of the Iberian Peninsula. This tendency eventually eclipsed the classical narrative, which said the expansion was owed to the alleged adventurous spirit of the first explorers. According to John K. Thornton, from the 1940s and the works of historians such as Duarte Leite (1864-1950) and Vitorino Magalhães Godinho (1918-2011), new perspectives of analysis became hegemonic in relation to the studies of this process[2].

Part of the historians whose work was, in various forms, tributary to this tendency, contended there were close connections not only between the Iberian *Reconquista* and maritime expansion, but also between its multiple facets and some of the most important features of the expansionist process[3]. To the meaning of the *Reconquista*, in the territorial sense, another was added, of a religious order, a war that could be undertaken by any Christian in any place. The Christians who resisted the Muslim advance, to the North of the Cantabrian Range and back turned to the Atlantic, regarded themselves as legitimate heirs of the ancient Visigoth kings, and this undoubtedly applied to their dominant classes. From this perspective, the war waged against the Moors was considered as the legitimate retaking of lost ancient lands.

Towards the end of the 12th century, Aragon, Castile and Portugal, kingdoms formed over centuries of erratic wars, had consolidated the idea that they had the right to the lands immediately south

[2] THORNTON, 2010: 166.
[3] BOXER, 2011; THOMAZ, 1994: 207; BETHENCOURT & CURTO, 2010; FARINHA, 1998: 118-136.

of their territories. Ultimately, this idea would come to include what is today Morocco, as well as other areas of Northern Africa[4]. If from the religious prism the *Reconquista* was legitimised and, from the perspective of faith, knew no bounds, its territory was undefined and could be under continuous expansion[5].

It would be naive to think the borders of the two sides at war, both territorial and cultural, were hermetic systems, closed off to mutual influence. A number of movable *contact zones*[6] were established, in constant displacement as winds of fortune shifted in the *middle grounds*[7]. Taking into consideration the specific features of each time and place, my hypothesis is that there is the continuous creation of different *frontier*[8] complexes during the process of expansion and the consolidation of colonial domains. This undoubtedly applies to the Iberian Peninsula. In terms of knowledge, for example, exchanges did not merely take place, but were often actively encouraged by intellectual authorities linked to works of medicine, pharmacy, alchemy, engineering, agriculture, philosophy, mathematics and astronomy[9]. The Christian and Muslim systems of knowledge shared common roots sustained by ancient works of Greek and Latin philosophy. In a wider sense, the two cultural complexes, including the conventionally called popular culture, fed off each other constantly and reciprocally. In terms of written traditions, the translation and interpretation of these works was one of the most important activities among scholars on both sides. It was, for example, based on Arabic translations of Greek texts that were initially not available to the western Christians, that many elements of what later formed the core of humanist Aristotelianism were incorporated by European

[4] In 1291, the kingdoms of Aragon and Castile established an agreement, which delimited the areas in Northern Africa to which they could extend their intentions of conquest. In fact, after the conquest of Algarve by the Portuguese in 1249, even though the Kingdom of Granada remained as the last Muslim bastion in the Iberian Peninsula, those were lands to be claimed by Castile or Aragon. In this perspective, an almost natural path had opened up for Portugal, the North of Africa was a continuation of Algarve. The west, in Arabic, *al Garb*, extended thus, like Portugal, overseas, on the shores of the Atlantic (FARINHA, 1998: 118; DISNEY, 2010: 101-127; THORNTON, 2010; THOMAZ, 1994).

[5] MARQUES, 1998: 11-139; CLIFF, 2011: 23-87.

[6] The concept of contact zone is here based on the definition of Mary Louise Pratt: «space of colonial encounters, the space in which peoples geographically and historically separated come into contact with each other and establish ongoing relations, usually involving conditions of coercion, radical inequality, and intractable conflict» (PRATT, 1992: 6).

[7] In 2001, in the commemorative issue of the first edition of his book, *The Middle Ground: Indians, Empires and Republics in the Great Lakes Region, 1650-1815*, White elaborated more precisely on the «topos» he called the «middle ground» of intercultural relations. Accordingly, this metaphorical space, in which intercultural exchanges took place, would be the place of confrontation between «imperial or state regimes and non-state forms of social organization, a rough balance of power, a mutual need or desire for what the other possesses, and an inability of one side to commandeer enough force to compel the other to do what it desired». Hence, there are continuous processes of exchanges, appropriations and redefinitions, profoundly influenced by degrees of imbalance between the forces at the frontier complex. There is an understanding of development, in which it is clear that «force and violence are hardly foreign to the process of creating and maintaining a middle ground, but the critical element is mediation» (WHITE, 2001: 8). However, mediation should not be understood as a type of isonomy of the relations between both sides, but rather that there is, as an interpretative possibility, some degree of reasonability in assuming that the coloniser cannot take all the spoils, much as the colonised will resist, surrendering as little as possible (WHITE, 2001).

[8] The term «frontier» is frequently used by historians and its use can be very specific. For example, in Peter Burke's definition, a frontier is not necessarily a place, as it can be the boundary of a cultural encounter in which both sides are clearly defined, but at the same time, endowed with a selective permeability, whose nature is shaped by specific factors and historical dimension (BURKE, 2008).

[9] GRANT, 2002: 239.

universities[10]. At each time and place in which a *frontier* was established, there would be shifts in the balance of power between the two sides in contact. The specific dynamics of the conflicts, of the tensions and clashes, would vary according to that balance.

Trade exchanges would also take place, although frequently shrouded in an atmosphere of bellicosity. Merchants were often important agents in the production of knowledge[11]. The patterns that were later established during the expansion may, indeed, be derived from this form of trade, in which the boundaries between trade and military action were not clearly defined, a factor that would later contribute to the relative superiority of the Europeans with regard to their Indian Ocean counterparts[12]. The war was waged both in the name of faith and in the name of business. Despite restrictive dispositions, expounded in the *Holy Canons*[13], trade exchanges between Christians and Muslims were frequent, in times of war and peace, despite fluidity by which the parameters were understood on both sides. Although human beings and precious metals were the most sought-after «merchandise», the roster of goods exchanged was considerably varied, including a rather dynamic exchange of medicinal drugs, under the generic term of spices, some coming from the distant Far East by way of the many land routes of the time[14]. Knowledge of these drugs circulated to the same proportion[15].

We can also assume that the use and understanding drugs changed, and were substantially redefined, at each stage of their trajectory[16]. At several levels, from merchants, apothecaries and pharmacists, to other types of activities, the drug trade was undoubtedly an important and lucrative business. The processes of redefinition and change expanded at the same rate as the geographical range of the frontier complexes. As each turn, new environmental and climatic conditions, as well as variations in human behaviours, conferred peculiar characteristics on the processes of circulation. However, one aspect suffered little change: the disposition of the Europeans to take up arms (although they did not hold the exclusive on this).

The medical issue played a fundamental strategic role in the process of overseas expansion. At least from the beginning of the 16th century, despite difficulties in terms of logistics and human resources, warehouses had been established throughout the Atlantic and Indian routes to supply ships with provisions and remedies[17]. In fact, from the end of the 15th century to the last decades of the 18th, every Portuguese fort had an infirmary, often no more than a ramshackle facility built next to the main building, which was complacently called a hospital[18]. Throughout this network, on account of a multitude of factors, there was a lack of physicians, surgeons and apothecaries, as well as medications

[10] GRANT, 2002: 239.
[11] RAJ, 2010.
[12] BERNSTEIN, 2009.
[13] MARQUES, 1998: 26.
[14] MARQUES, 1998: 27-28; BERNSTEIN, 2009.
[15] DIAS, 1999: 90-103.
[16] In line with James Secord, who contends that the circulation of knowledge possesses, in itself, transformative properties (SECORD, 2004: 654-672).
[17] MENEZES, 1987: 9-23.
[18] MENEZES, 1987: 5.

supplied by the kingdom[19]. We can assume that, throughout the period of the Portuguese discoveries, expansion and colonisation, a medical practice applied to the tropics was developed by individuals who often did not have the required academic training, but were motivated by an acute sense of investigation of an empirical nature[20].

In line with other European powers, the Portuguese crown gradually assumed more responsibilities in the provision of charity and assistance and sought to have greater control over strategic questions related to caring for the sick. It should, however, be noted that this did by any means imply estrangement from the Church and religious orders. On the contrary, a path had been opened to new ties between the State – or Crown – and the Church[21]. This relationship was to play a decisive role in the development of Medicine and Pharmacy, as well as other sciences, in the colonial world over the 16th, 17th and 18th centuries.

THE EXPANSION OF THE *FRONTIER* IN THE EAST

War, faith and trade were the winds that filled the ships' sails, now beyond the Cape of Good Hope, to the Indian Ocean dominated by the monsoons[22]. In the words of Charles Ralph Boxer, on what the Indian historian, Kavalam Madhava Panikkar (1894-1963), called the *Vasco da Gama Epoch in Asian History, 1498-1945*:

> *nothing is more remarkable than the way in which the Portuguese managed to secure and retain for virtually the whole of the sixteenth century a dominant position in the maritime trade of the Indian Ocean and an important share of seaborne trade to the east of the Straits of Malacca*[23].

Indeed, India or the East meant to the Portuguese all that lay between the eastern African coast and Japan[24]. The term East Indies covered the entire region surrounding the Indian Ocean, through which ships sailed according to the ebb and flow of the monsoons. From the perspective of the Europeans, the East Indies ranged from the myriad of ports and states of the Indian subcontinent, to the kingdoms and sultanates of the islands of the Malay Archipelago[25]. Other outposts should also be considered, mostly under the rule of Arab governors or merchants, located between the Strait of Hormuz and the eastern coast of Africa[26]. The region was populated by a large number of trade communities. Their ports, some autonomous, some governed by distant empires, bustled with the daily activity of Asian, African and European traders. Some were important centres of production,

[19] MENEZES, 1987: 5.
[20] COSTA & LEITÃO, 2009: 35-56; ALMEIDA, 2009: 78-92.
[21] ABREU, 2004; ABREU, 2007: 9-13; ABREU & SHEARD, 2013; ABREU & SHEARD, 2016: 19-39.
[22] BOXER, 2011.
[23] BOXER, 2011: 55.
[24] THOMAZ, 1994: 207; BOXER, 2011: 55.
[25] BETHENCOURT & CURTO, 2010.
[26] PEARSON, 2010: 93-114.

although many were only marketplaces or outposts[27]. The definition by Luís Filipe Reis Thomaz of the State of India illustrates clearly this idea:

> *In the 16th century, the State of India did not refer to a well-defined geographical space, but rather a number of territories, establishments, goods, peoples and interests, administered, managed or governed by the Portuguese Crown in the Indian Ocean and neighbouring seas, and in coastal territories from the Cape of Good Hope to Japan*[28].

These regions were densely populated, packed with large markets and filled with people from many different places. Generally speaking, these populations were not greatly affected by the diseases introduced from Europe. The contrast with the situation experienced in the New World is striking[29]. The difficulties the European communities faced in the Indian subcontinent and surrounding areas are clearly expressed in the words of Felipe Fernández-Armesto, who said that, during the 16th century and most of the 17th, the Europeans «merely scratched the surface of the Asian continent»[30].

Regardless of where they settled, transposing the European way of life to the tropics was a constant challenge[31], a problem the Portuguese were particularly sensitive to. With an Overseas Empire established on three continents, they came into contact with the biotic diversities of the tropics on both sides of the Atlantic and throughout virtually the entire Indian Ocean seaboard. Those who departed the extreme west of Europe in search of riches or to propagate the faith, were often confronted with ailments they or their physicians, surgeons or pharmacists, when available, had very little knowledge of[32].

From the eastern coast of Africa to the Strait of Malacca, Muslims, Swahilis, Persians, Indians and Malays dominated the areas of trade and counted on well-established communities in practically all the major ports. The Tamil, largely Buddhist, from what is today Sri Lanka, and Hindus from several places, also had an important presence. The Chinese had considerably retracted their expansionist movement, which had been extremely active the century before. The Malabar Coast was dominated by a number of small Hindu potentates, the most important of which Calicut, which lacking the capacity, or perhaps the will, to overthrow its closest rivals. By European standards, trade among almost all the agents of the complex stage of the Indian Ocean took place pacifically. The Portuguese immediately understood that if they intended to remove the primacy of trade in the Indian Ocean from the Muslims, they would have to do so by force[33].

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[27] PEARSON, 2010: 93-114.
[28] Original quote: «O Estado da Índia designava, no século XVI, não um espaço geograficamente bem definido, mas um conjunto de territórios, estabelecimentos, bens, pessoas e interesses administrados, geridos ou tutelados pela coroa portuguesa no Oceano Índico e mares adjacentes, e nos territórios ribeirinhos, do Cabo da Boa Esperança ao Japão» (THOMAZ, 1994: 207).
[29] DIAMOND, 2008; CROSBY, 2011.
[30] FERNÁNDEZ-ARMESTO, 2010: 491-524.
[31] CROSBY, 2011.
[32] DEBUS, 2002: 45-47.
[33] PEARSON, 1976; PEARSON, 1998; PEARSON, 2005; PEARSON, 2010: 93-114; BOXER, 2011: 55-61.

They did so with remarkable success, partially by reason of their technological superiority, namely in terms of naval power, but also because they were better armed. The Portuguese ships were, indeed, floating fortresses in comparison to their South Asian counterparts[34]. It is also true that they arrived in the East at a propitious moment. Apart from not having the naval power to confront the Portuguese, the region's most powerful states were also deeply involved in their own affairs and rivalries. Generally speaking, three factors favoured the consolidation of Portuguese power in the Indian Ocean: the lack of a coordinated strategy of resistance able to unite local forces; the aforementioned naval superiority; and tolerance, essentially pragmatic, on the part of local governors[35]. On this relatively condescending attitude, A. J. R. Russell-Wood wrote, referring to the differences in patterns of settlement in the Portuguese Empire:

> *In terms of settlement, there was a crucial difference between Portuguese Asia and America. In the former, the Portuguese were tolerated by indigenous leaders and Portuguese policy and action could not take place isolated from indigenous concerns and prevailing circumstances. The Portuguese presence would be tolerated or terminated according to the whims of local leaders. In some cases, the Portuguese were only able to establish a basis for colonisation because factionalism and dissidence among local rulers stopped them from forming a united front against the intruders. At other times, the Portuguese exploited local rivalries, such as those between the sultans of Mombasa and Malindi, or between the king of Calicut and the rajah of Cochin*[36].

Far from meaning only the need to employ a degree of diplomatic pragmatism, this situation raised a number of specificities related to the establishment of the Portuguese in Asia. It was decisive, although not the only factor, in determining the fragmentary, frequently fragile, position of the Portuguese, who only managed to dominate a small portion of the territory, despite having built almost a hundred forts. Around 1580, the State of India counted on an extensive network of fortified posts, from Nagasaki to the Cape of Good Hope, but in terms of contiguous territories, only Goa, the Northern Province and substantial parts of Ceylon[37]. Although important, other settlements, like Malacca and Macau, were limited to the control the Portuguese were able to exert over the inland or neighbouring territories.

The peculiar features of the Asian territories raised other challenges to the colonial powers. An age-old, dense trade network operated in the Indian subcontinent and other parts of Asia, which

[34] DORÉ, 2008: 91-116.
[35] RUSSELL-WOOD, 2010: 171-206.
[36] «No que diz respeito à colonização houve uma diferença crucial entre a Ásia e a América portuguesas. Na primeira, os portugueses foram tolerados pelos líderes indígenas, e as políticas e ações portuguesas não podiam ocorrer isoladas das considerações indígenas e das circunstâncias prevalecentes. A presença portuguesa podia ser tolerada ou terminada em função dos caprichos dos líderes locais. Nalguns casos, os Portugueses só conseguiram estabelecer uma base para colonização porque o facciosismo e as dissidências entre os governantes locais os impediam de formar uma frente unida contra os intrusos. Noutras alturas, os Portugueses exploraram as rivalidades locais, como as que houve entre os sultões de Mombaça e Melinde, ou entre o rei de Calecute e o rajá de Cochim» (RUSSEL-WOOD, 2010: 176-177).
[37] RUSSEL-WOOD, 2010: 171-206.

relied on many trade communities. Although Arabic was an important language, the number of languages spoken and accepted in trade exchanges was as broad as the variety of ethnic groups involved. There were also huge, institutionally sophisticated states, as well as a large amount of local powers whose forms of governance were not very complex. These states, big or small, were home to countless centuries-old religions, creeds, and cults, endowed with written canons and sacerdotal classes firmly enrooted in the regional structures of power. There were also many centres of production and dissemination of technological innovation, within extensively stratified societies, organised into complex, long-established labour relations and a myriad of embedded ethnic distinctions, divisions and hierarchies[38].

Consequently, the Portuguese authorities were confronted with the need to establish the most varied negotiation strategies, which were never able to achieve the same level of unilaterality as in the Americas, where states and local rulers did not exist. The pressure to take into account the customs of the native inhabitants was also substantially lower in the Americas than in Asia[39]. These strategies usually meant almost as many compromises as impositions. A good example is the manner in which the peace treaty that put an end to hostilities was negotiated between the Portuguese and the governor of Calicut, ratified by King Manuel I in 1513. Although the treaty completely submitted the Zamorin to Portuguese authority, the Indian sovereign was to continue to receive a variety of *tensas*, ritual presents and funds, which often exceeded the usual customs tariffs[40]. Thus, the *frontiers* resulting from the *contact zones* of Portuguese settlement in Asia differed substantially from that of Brazil, where the ability to resist of the indigenous populations was considerable different.

The impact of this circumstance can be seen in the way in which contacts were made, for example, between the western medical practices and those of Asia upon the arrival of the Portuguese. If the peoples of the Brazilian coast did not have written medical traditions or institutionalised elites with a monopoly over the arts of healing, they existed in Asia in abundance and variety, in a large majority of the places the Europeans wanted to settle[41]. This does not mean the South American coastal peoples did not possess complex systems of understanding of illnesses and cures. It means that in Asia, the social structures detaining such knowledge were often incomparably more resistant to external pressures[42].

Over the course of their long involvement with the tropics, the Portuguese gained a wealth of knowledge, of both illnesses and medications. Such knowledge, indispensable to the expansionist enterprise, ranged from detailed descriptions of many different ailments in each tropical environment, to colleting large amounts and varieties of plants, animals, minerals and other elements which offered a wide range of options to fight diseases, known or unknown[43]. This investigative drive was a fundamental part of the expansion. Far from being a privilege of learned men, it was also shown

[38] RUSSEL-WOOD, 2010: 176; PEARSON, 2005; PEARSON, 2010.
[39] RUSSELL-WOOD, 2010: 177.
[40] BETHENCOURT, 2010: 213.
[41] PEARSON, 1987: 20-41.
[42] BRACHT, 2013.
[43] FRADA, 1989: 63-73.

by individuals of various social standings and duties. There is news of a report written in 1507, mentioned by João José Cúcio Frada[44], in which a pilot of Cabral's fleet made some observations as to effect of fresh food on mitigating the symptoms of scurvy. Other authors highlighted the role played by individuals, versed or not in the arts of Medicine or Natural Philosophy, who contributed decisively to the development of European *Materia Medica* in the 16th and 17th centuries[45].

On the cusp of the Modern Age, one of the main goals of Natural Philosophy in the innumerable descriptions of animals and plants in Africa, Asia or the New World was the identification of elements of the natural world as possible panaceas[46]. The flora and fauna of the New World were practically all unknown to the Europeans, as well as their applicability to Medicine. The same cannot be said of the plants and animals of Asia[47]. The use of Asian spices in fighting diseases and other medical purposes was widely disseminated. The theories, practices and traditions historians usually group under the term *Galenism*, which strongly influenced medicine until at last the end of the 18th century, understood the healing predicates of medications based on their organoleptic features, namely, flavour and smell[48]. Hence, the four primary tastes were related to the four pairs of fundamental qualities of humoral theory, i.e., hot and dry, dry and cold, cold and moist, and moist and hot[49]. Accordingly, the strong smell and taste of spices not only contributed to their classification as medication but also corroborated their presumed efficiency[50]. European contacts in the East Indies did not by any means remain restricted to spices, in natural-philosophical terms. In the first decades of the 16th century, many individuals were dedicated to more than understanding the medical applications of Asian plants, animals and minerals within the Galenic structure. Despite language barriers, these individuals also wanted to learn about the medical knowledge that had been produced in the East for centuries. In Asia, encounters took place between the limits of the Hippocratic-Galenic theory and the practices and theories of oriental medicine[51].

DYNAMICS OF DIALOGUE AND CONFLICT IN THE ENCOUNTER OF TWO WORLDS

In Asia as in Europe philosophical-natural traditions existed, and often coexisted, based on collections of written canons. There was also a wide and complex variety of characters who practiced some type of healing art of a popular nature. These ranged from the village healer, who had empirical knowledge accumulated over generations, to the highly qualified professional herbalists. Many centuries before the conquest of Goa by Afonso de Albuquerque (1510), India had developed extensive

[44] FRADA, 1989: 63-73.
[45] GOUVEIA, 1985; FRADA, 1989; DEBUS, 2002; DIAS, 2005: 5-39.
[46] CARNEIRO, 1994: 47-65; DEBUS, 2002: 45-54.
[47] GOUVEIA, 1985; FRADA, 1989; DIAS, 1999: 90-103; DEBUS, 2002: 49-50.
[48] DIAS, 1999: 93; DIAS, 2005: 13.
[49] DIAS, 1999: 93.
[50] DIAS, 1999: 93.
[51] DEBUS, 2002: 48-49.

systems of knowledge on illnesses and their cures. In Macau in China, a diversity of complex systems in medicine and pharmacy flourished, both erudite and popular[52]. India was home to several different systems, which were permeable to each other and to many external influences, especially the Hindu tradition of *Ayurveda* medicine and the Muslim systems, the latter relatively closer to western tradition.

A more detailed examination may reveal that Muslim medicine was also highly nuanced, but, generally speaking, we can say their normative systems tended to derive from two major traditions, the Graeco-Arabic and the Indo-Persian, or *Unani*[53]. Both traditions shared many of their principles. The Graeco-Arabic system was widely known to the Europeans. In *Unani* medicine, its practitioners were known as *hakim*[54]. Despite many similarities to Arabic medicine, few references were made to *Unani* physicians in hospitals, authorities or religious orders. We know that, in India, the Muslims were largely neglected in favour of the Hindus by the crown, and even those were considered secondary in relation to the local Christian populations[55].

Similarly to Europe, although those learned traditions counted on a large number of practitioners, the care of the sick was made largely by individuals who had never attended institutions which could award qualifications or the equivalent. Popular medicine, the knowledge of men and women of the most varied origins, formed the basis for much of the medicine practiced throughout Asia. In India, specialised healers were very popular, professionals who usually had no type of higher instruction and who offered their services as fairs and markets[56]. However, the boundary between popular and erudite knowledge, as was the case in Europe at the time, was not clearly defined. Both areas tended to sustain each other, whenever necessary or convenient. Even religion was not in itself a barrier. Dialogue among practitioners of several traditions was common, within the same geographical space[57].

Without disregarding their respective place, what we can consider the Hindu equivalent to academic learning in Christian and Islamic universities is an epistemological collection taught at higher education schools called *Agraharams*. There, the principles of the sacred texts, the *Vedas*, were taught, amongst which *Ayurveda* medicine, whose origin is attributed to the god, *Brahma*, the source of all knowledge[58]. In fact, *Ayurveda* is a chapter of *Atharvaveda*[59], one of the four Vedic books. Many other medical books were in use in India when the Portuguese arrived, including the *Bhava Prakash*, written in the 16th century by a Brahmin called *Bhava Mishra*[60].

Ayurveda medicine, practiced mainly by the Brahmin caste, was not comprised of only one canonical body taught at specific institutions according to strict rules. It was much more a range of interpretative traditions and religious precepts which, in practice, counted on a large capacity and free-

[52] HINRICHS, 1999: 287-325; NEEDHAM, 2000: 38-66; HSIA, 2009.
[53] PEARSON, 2001a: 100-113; PEARSON, 1996: 20-41.
[54] GRACIAS, 1994.
[55] LOPES & MATOS, 2006: 15-70.
[56] PEARSON, 2001a: 100-113.
[57] PEARSON, 2001a: 100-113.
[58] FIGUEIREDO, 1967: 51-60.
[59] In *Atharvaveda*, medicine possesses a supernatural character. It is assumed that illnesses are caused by malignant entities, which could be cured by sacred formulas and procedures (FIGUEIREDO, 1967: 51-60; BASHAM, 1976: 18-43).
[60] FIGUEIREDO, 1967.

dom to accumulate and produce empirical knowledge. More than at the *Agraharams*, its teaching was done at home, passed down from generation to generation[61]. Much of the learning was done by trial and error[62]. Generally, the children accompanied their fathers in the profession, and when they died, their inheritance would be their private collection of books, texts and remedies. Partially due to being able to easily incorporate empirical knowledge, the physicians, called *Vaidya*, retained a vast amount of knowledge on the healing properties of local plants, animals and minerals. Immediately after their arrival in India, the Portuguese started calling these physicians, mainly from the Brahmin caste, *Panditos* (*Pundits*). *Pundit* is Sanskrit, although found in many of the Indian subcontinent's languages, and meant initially a wise, educated or learned man, or even philosopher[63]. The term was usually used for those with higher education, a majority from the Brahmin caste, who were connected to the practice of *Ayurveda* medicine and to knowledge of medicinal drugs. In Portuguese writings from the 16th century, the term *Pundit* refers almost exclusively to *Vaidya* physicians, who practiced medicine of a distinctly popular nature, having amassed empirical knowledge over thousands of years of medical practice, but which was also influenced by ancestral principles of the *Ayurveda*[64] and Islamic systems.

The first Portuguese authorities in India rapidly understood the *Pundits* were better informed than their European counterparts on the arts of treating tropical diseases[65]. There is ample evidence of the influence of *Ayurveda* in the way European physicians absorbed and learned about the remedies and illnesses of the Indian subcontinent[66].

Partially due to difficulties in answering to the need for physicians and medications that could effectively treat diseases in the East Indies, many physicians, apothecaries, surgeons, herbalists, and natural philosophers, contributed greatly with what they learnt from Indian medicine, to the development of knowledge on plants, animals and diseases. This essentially took place in two ways. The first, and most frequent, occurred through the many Indian *Vaidya*, herbalists and apothecaries who worked for hospitals and the Portuguese authorities[67]. The information was largely absorbed by watching the daily practices of these healers. The second, less frequent but equally important, arose from dialogue and the exchange of information among the European agents and the Indian physicians. Many Portuguese physicians, apothecaries and even merchants established an extensive network of contacts, through which they received, perhaps involving payment, information on the healing properties of local drugs[68]. We can assume such networks were not built without considerable amounts of energy, dialogue, negotiation and effort, on both parts.

The Europeans who were able to establish these networks entered an extremely restricted universe. Permission to do so must have meant exchange of services, favours or even payments in money.

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[61] FIGUEIREDO, 1967.
[62] GRACIAS, 1994: 153.
[63] DALGADO, 1919: 155-157.
[64] DALGADO, 1919: 155-157.
[65] PEARSON, 2001b: 401-419.
[66] WALKER, 2002: 74-104.
[67] WALKER, 2002: 74-104.
[68] PEARSON, 1996: 20-41.

In a manuscript of over 100 pages and 82 medical prescriptions used at the Royal Hospital in 1696, there is information that there were «just in this town of Goa over eighty masters or pundits»[69]. According to the author, João dos Reis, they were not inclined to share their prescriptions and knowledge[70]. A dynamic of conflict can be apprehended from Reis' manuscript. The chapter called *Uso e prática dos Panditos do Oriente* (Use and Practice of the Pundits of the East)[71] is a description of their methods, in which the author describes some aspects of the nature of the daily relationships between the Europeans and Indians at the Royal Hospital.

> *they say they went to get some news of the simples on which they give very little news, because they do not give version of anything at all, no matter how easy, because if asked about the version of the doctor, which they gave on bleeding or another medication, they answered that it seems they could not give us the version, by which I understood that they did not study the craft and that they only take advantage of the manuscripts which are handed from one to the other*[72].

Perhaps João dos Reis, of whom we know very little, had difficulties in establishing a network of his own to access to Indian medications and prescriptions.

The Royal Hospital of Goa, established by the Crown in the 16th century, was initially run by the Brotherhood of the *Misericórdia* and then by the Society of Jesus at the end of the 16th century[73]. The managerial positions, both administrative and medical, were mostly occupied by Portuguese until the mid-18th century. Many natives worked at the hospital but usually in subaltern positions[74]. Notwithstanding, the services of Indian physicians and healers were often requested, even within the hospital[75]. In João dos Reis' manuscript, there is mention of the patients clandestinely receiving treatment from the *Pundits* who worked at the hospital in exchange for payment.

The hospital and the practice of medicine were in themselves *frontiers, contact zones* and, as such, the stage to conflicts among colonisers and native populations. According to Michael N. Pearson, when talking of the field of medicine, the only area in which the Portuguese had a clear advantage, when comparing their practices with those in India, was in the attention the state paid to the care of the sick[76]. Consequently, when implementing the models of healthcare they knew, the colonial authorities often sought to weaken or even supress the social importance of the local physicians and healers.

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[69] BNP – *COD 2102*.
[70] BNP – *COD 2102*.
[71] BNP – *COD 2102*.
[72] Original quote: «dizem elles forão buscar algũa noticia dos simples de que dão mui (muj) pouca noticia porque não dão versão de couza algũa por fácil que seja porque (se) preguntava pela versão do douto, que davão sobre sangria ou outro medicamento respondião que asim parecer se não nos podem dar versão, pelo que entendi que não forão a estudar este oficio e que só se aproveitão dos manuscritos que ficão de uns a outros» (BNP – *COD 2102*, fl. 5).
[73] BASTOS, 2010b: 188.
[74] BASTOS, 2010a: 61-79.
[75] PEARSON, 2001b: 401-419.
[76] PEARSON, 2001b: 401-419.

An order to expel all the Hindu physicians was actually issued in 1563. Although never enforced, there are no records it was ever repealed, which undoubtedly meant it became an efficient tool of pressure and coercion. A prohibition was issued in 1574, forbidding Hindu physicians from being carried on palanquins or from riding horses in the streets of Goa, under penalty of fines or confiscation of the animal. In 1618, the Goa Senate authorised the *Vaidya* physicians to practice medicine, as long as they were duly examined and authorised by the Physician General[77]. However, the permits were issued to no more than thirty individuals, with large numbers on waiting lists. Legally, this determination was not altered until the end of the 18th century. It is thus reasonable to assume that among the eighty *Pundits* working in Goa around 1700, the majority did not have the licence to practice as physicians. Tensions flared regarding the demand for credibility or even clientele. Apparently, having a licence from the Physician General did not give the Portuguese physicians any advantage. As noted by João dos Reis, the *Pundits* at the Royal Hospital:

> *they lernt like others in this town, how any Novice, is known as a practitioner, without a hint of beard, and he is already a master with another two apprentices behind him and in less than a year, they already heal and already sign prescriptions and they give him more credit than the Portuguese physician* […][78].

The daily conflicts, although often mediated by the colonial power in favour of the Europeans, did not necessarily bring any advantages to those under the protection of the authorities. Disputes flared almost daily, causing considerable unrest, and the accusations usually tended to discredit the opponents' abilities:

> *It is those pundits, very ambitious and mordant* […] *but others, however, are more cowardly and untrustworthy, such that each of them holds themselves in the highest esteem, which just goes to prove they do not understand much of other uses and practices, but who bring ridiculous things of little importance and, thus, I will leave them in silence* […] *(the Pundits) easily give them to the patient who asks*[79].

However, this did not prevent appropriations and reconfigurations from being produced within the sphere of dispute. Daily life at the Royal Hospital, described in João dos Reis' manuscript, provides valuable insights on this matter. Among the 82 prescriptions described, forty are composed of at least one type of herb or ingredient named in the language of Goa. Of these, nineteen are broths based

[77] PEARSON, 2001b: 401-419.

[78] Original quote: «aprenderão como outros nesta cidade como praticantes por que vai qualquer Mestrinho, sem ponta de Barba, e já he Mestre com dois outrez aprendizes detraz de Si e em menos de hum anno já curão, e já ass. Místicas E dão a eles mais Credito que ao medico portuguez» (BNP – *COD 2102*, fl. 6).

[79] Original quote: «São os taez panditos muy ambiçiozos, e mordazes […] pera outros porem mais covardez e pozilanimos, de sorte que cada qual se tem por iminente na faculdade o que só mostrão em provarem que não entendem muitos outros uzos e praticas trazem porem couzas Rediculas e de pouco momento e por iço as deixo em silençio […] (os Panditos) facilmente as concedem ao doente que pede» (BNP – *COD 2102*, fl. 6).

on one of the most important components of *Ayurveda* therapy, rice. To treat fever and an illness called *mordexim* (identified as cholera by some authors, among whom Michael N. Pearson), the most common remedy was a broth of rice, meat and chicken fat. This remedy was described in the 16th century by Portuguese chroniclers and physicians, called *Kanjii*, or *Canji*[80]. João dos Reis dedicated an entire chapter to this remedy, its preparation, variations and uses. Divided into two parts, the first is a brief dissertation on rice, its virtues and uses in the East, and the second focuses on the preparation of the remedies themselves, starting with the topic, «Canja, what is it and how is it used in this India»[81]. The *Canjas*, he says, are «the main diet in this Hospital of Goa». The variations presented were all duly classified according to the Galenic theory, reconfigured and revalidated as remedies by certified physicians, who were more trustworthy, according to the author, than the *«mordant» pundits.*

PHYSICIANS, APOTHECARIES, MERCHANTS AND MISSIONARIES

This process, inferred here from the reading of João dos Reis's manuscript, written at the turn of the 18th century, can be understood as one among many, within the long-term confluences that shaped the development of *frontier complexes*, taking place long before the Europeans arrived in Asia. Hundreds of individuals were involved, acting within, on the fringes or even outside the structures established by the official policies of expansion. Many left written legacies of this process, veritable reports of the *contact zones*. Amongst these, some stand out for the importance, excellence or range of their works, like Simão Álvares and Tomé Pires, both apothecaries, who travelled to India in 1509 and 1511 respectively[82]. Intended as detailed reports on the places where spices came from to be sent to King Manuel I (1469-1521), Tomé Pires provided information on the medicinal properties of many of the drugs he described[83]. Years later, in 1547, Simão Álvares wrote his *Informação de Todas as Drogas que vão para o Reino* (Information about All the Drugs that Go to the Kingdom), more extensive and complete than the work of Pires[84]. The manner and purpose with which Pires and Álvares wrote their works are sufficient to confirm the ordered and methodical way, according to historians dedicated to the theme, in which Portuguese expansion took place in the tropics[85]. Subsequently, some similar works defined the medicinal use of oriental drugs, not only in Portugal, but throughout Europe and, later, in the American colonies.

One of the most important contributions to *Materia Medica* in the 16th and 17th centuries also came from Portuguese settlement in Asia. The work, *Coloquios dos Simples, e Drogas e Cousas Mediçinais da India* (Conversations on the Simples, Drugs and Materia Medica of India), by Garcia de Orta (1501-1568), was published and printed for the first time in Goa in 1563[86]. Orta's work influenced

[80] PEARSON, 2001b: 401-419.
[81] BNP – *COD 2102*, fl. 6.
[82] FRADA, 1989: 69; FERRÃO, 1993; FERRÃO & LIBERATO, 2001: 91-192; DIAS, 2005: 29.
[83] GOUVEIA, 1985: 7; DIAS, 2005: 29.
[84] GOUVEIA, 1985: 7; DIAS, 2005: 29.
[85] DEAN, 1991: 216-228; FERRÃO, 1993.
[86] GOUVEIA, 1985: 20; FERRÃO & LIBERATO, 2001: 92-93; DIAS, 2005: 30.

physicians, apothecaries, surgeons, and natural philosophers throughout Europe. It became one of the most celebrated works of the Renaissance, due to the thorough and detailed manner in which a vast and rich world of oriental drugs was described, researched and analysed[87]. Originally published in Portuguese, Orta's work was translated, summarised, and adapted numerous times until the end of the 17th century. Its importance is not restricted to its standing as one of the most complete treatises on the healing powers of oriental drugs. It may be considered a forerunner of European medicine adapted to the tropics, in other words, knowledge produced from contacts between the reigning medical fields in Europe, associated to thorough investigation and assimilation of a vast amount of autochthon knowledge. We know Orta maintained close contact with Indian physicians and herbalists for many years, from whom he received the wealth of information contained in his *Conversations*[88]. Much of the discussions in Europe in the following two centuries on the oriental medicinal drugs were undoubtedly centred on information filtered by Garcia de Orta's collaborators.

Profoundly influenced by Garcia de Orta, Cristóvão da Costa (1515-1594) also contributed decisively to the body of work on the healing powers of Indian drugs and remedies[89]. Costa, who met Orta while in India, wrote upon his return to Europe the work, *Tractado de las Drogas y Medicinas de las Índias Orientales* (Treatise of the Drugs and Medicines of the East Indies), in Castilian, published in Burgos in 1578. Costa confirmed many of Orta's positions, incorporating excerpts from his texts and added a number of illustrations[90].

In terms of knowledge of medicine and oriental drugs or any other natural-philosophical aspect, the complex of the East Indies constituted a frontier area of immense permeability, a stage to the encounter of two distinct universes, Asia and Europe. There were cases of natives who opted for the paths of western Natural Philosophy, adding epistemological elements of both European and Eastern origin[91]. Many of these individuals were *Topazes*[92], such as Manuel Godinho de Erédia (who was in fact Malay), who wrote a herbarium at the beginning of the 17th century. It contained illustrations of a range of Asian plants, as well as precise descriptions of their medical applications[93]. Among the *Topazes*, many were bilingual or polyglots. They knew Portuguese and one or more Eastern languages. In Erédia's herbarium, the plants are named in Konkani, the native language of Goa[94].

These encounters between East and West did not involve only India and Europe. To varying degrees, all the regions contacted by the Portuguese during the expansion participated in this system of exchange. Cultural experiences, knowledge and material products circulated within it. This process was mainly represented by the systematic, organised and methodical transplant of plants across the

[87] GOUVEIA, 1985: 20-21.
[88] GOUVEIA, 1985: 21-24.
[89] FRADA, 1989: 70; FERRÃO & LIBERATO, 2001: 92-93.
[90] DIAS, 2005: 30.
[91] THOMAZ, 1994: 9-22.
[92] «Topaz» is the term used in the 16th and 17th centuries to call the «mestizo» resulting from the crossing of the Portuguese and the people of Goa (THOMAZ, 1994: 13).
[93] FERRÃO & LIBERATO, 2001: 96-156.
[94] THOMAZ, 1994.

many tropical domains of the Empire as it expanded[95]. A good example can be found in the many plants originating in Portuguese America which illustrate Erédia's «oriental» herbarium[96]. To some extent, the history of Medicine and Natural Philosophy – particularly its Botanic branch – resulting from these encounters is also the history of an anthropogenic process of the natural world. Indeed, it was the medicinal value of certain plants that motivated their transplant and acclimatisation among Asia, America, Europe and Africa[97].

The difficulties the establishment and development of the colonies had to face and the conditions related to tropical climates and their illnesses, changed very little in the transition from the 17th to 18th century. On the contrary, in Asia, America and Africa, the participants of the colonising processes and imperial authorities suffered significant losses, among settlers, soldiers, sailors, workers and slaves, between 1700 and 1800. In a recent article, Timothy D. Walker stated that the percentages of losses due to factors including tropical diseases were still considerable high in the last few decades before 1800[98].

At the beginning of the 18th century, the difficulties in treating illnesses, both on board the ships of the India run and in Goa, can be illustrated by the correspondence exchanged between the King and his direct representative in India. In March 1700, King Pedro II (1648-1706) wrote two despatches to the Viceroy, António Luís Gonçalves da Câmara Coutinho (1638-1702). The first ordered that the ships of the run should always have two clerics of the Order of St. John of God on board, accompanied by four nurses, to care for the sick during sea voyages[99]. The second despatch, more urgent in tone, asked the Viceroy for information on the Royal Hospital of Goa, the problems of its administration and the lack of nurses[100]. The logistics operation related to healthcare, during voyages and in the colonies, must have certainly consumed a considerable amount of human and financial resources. Among the many affairs of the Empire, this problem was invariably the order of the day.

In economic terms, the issue of healthcare was undoubtedly crucial, especially considering that, for these and other reasons, the mortality of workers and slaves persisted at very high rates throughout the 18th century[101]. A sense of urgency gradually grew with regard to the needs of the Empire, to make the most appropriate use of the available resources in its many domains. Consequently, measures were taken by the Crown. A piece of information may corroborate this idea. From 1777 onward, the Overseas Council started to commission native physicians and natural philosophers, who were sent to many parts of the Empire, to catalogue and investigate the medicinal potential of plants and other items[102]. At the same time, under official incentive, the contingents of physicians, nurses and apothecaries, natives from the colonies, especially Goa, increased rapidly. Following a similar trend

[95] FERRÃO, 1993.
[96] FERRÃO & LIBERATO, 2001.
[97] FERRÃO, 1993.
[98] WALKER, 2013: 1-29.
[99] BNA – *COD 51-VII-24*.
[100] BNA – *COD 51-VII-24*.
[101] WALKER, 2013.
[102] WALKER, 2013; WALKER, 2009: 247-270.

in public administration, military posts and even religious orders were occupied by the children of Catholic Goan families, who assumed several positions in the institutions charged with healthcare and the production of medications[103]. In fact, at the end of the 18th century, even the position of Physician General of the State of India, invariably a royal privilege since the 16th century, was occupied by Ignácio Caetano Afonso, a Brahmin *Vaidya*, who had never studied at a European institution[104]. Many works were produced over this time, many of which never published, but which are important resources for an understanding of the History of Medicine in the Asian settlements.

The circulation of written texts was quite intense in almost all the regions the Portuguese came into contact with. At the dawn of the Early Modern Age, there was an increase in the demand for exotic medicinal drugs in Europe. It is not surprising, then, that a large number of merchants conducted business in Asia, interested in entering a market which offered considerably attractive profits. The merchants were often themselves physicians or apothecaries, or the contrary, once in Asia, physicians and apothecaries became merchants. Regardless, the search for information was equally high and the interest in translations of oriental medical texts garnered considerable efforts.

RELIGIOUS ORDERS AND THE DEVELOPMENT OF A EUROPEAN MEDICINE APPLIED TO THE TROPICS

As we have seen earlier, information, whether written or not, could only be obtained through considerable doses of negotiation and the establishment of solid personal relationships, patronage and/or trust[105]. Apart from the prospect of profit, many Europeans believed the Asian diseases were different and the treatments employed by their physicians were perhaps not the most appropriate. Around 1620, the Malay-Portuguese, Manuel Godinho de Erédia, wrote in his *Advertencia ao Pyo Leitor* (Notice to the Pious Reader) of his *Suma das Plantas da Índia intra Gangez* (Summary of the Trees and Plants of India intra Ganges):

> *The Philosophers will try to discover the virtues of all the plants of the world; but they will only achieve the virtues of those described from Europe and some foreign ones from Africa and Asia which Dioscorides mentions, as of remote plants. And now with experience, we declare other plants and trees of India intra Ganges or Hindustan in this summary for the universal good. And if there is any inadvertence in this work, it will not be for that reason that all will not appreciate this service, as it is for the curious to take advantage of this work, and especially to help the sick with the miraculous and medicinal virtues of these roots*[106].

[103] LOPES & MATOS, 2006: 41-43.
[104] WALKER, 2002: 74-104.
[105] RAJ, 2013: 337-347.
[106] Original quote: «Os Philosophos intentarão escodrinhar as virtudes de todas as plantas do mundo; e somentes alcançarão as virtudes daquelas do descrito de Europa e algumas extrangeiras de Africa e Asia de que faz menção Dioscorydes como de plantas remotas. E agora com a experiencia declaramos outras plantas e arvores da India intra Gangez ou Indostan nesta summa pera bem universal. E havendo alguma inadvertência na obra, nem por isso deixem de agradecer este serviço, pois he pera os coriosos se aproveitarem deste trabalho, e mormente os enfermos se ajudarem das virtudes miraculosas e medicinaes destas rayses». The text by Manuel Godinho de Erédia can be found in facsimile edition and also transcribed in EVERAERT *et al.*, 2001.

Knowledge of the medicinal virtues of drugs from outside of Europe expanded rapidly, to the same extent as the geographical horizons were expanded by the navigations. Practical and everyday problems had to be resolved constantly. This may have been one of the factors which led individuals, from authorities to merchants and soldiers, to seek the treatment of local *specialists*. Although quite frequent, these contacts were regularly the source of conflict[107]. During Portuguese rule in Goa, as we have seen in João dos Reis' manuscript, these interactions often led to tension and friction. The existence of elites who ensured the defence of local canons, solidly rooted in written traditions, may perhaps be one of the most striking differences between the circumstances the Portuguese encountered in Asia and that of other regions of world, especially the coast of South America. Among other aspects, the attempts to convert the locals to Christianity are a good example of this difference.

In historiographic terms, only from the 1530s is it safe to talk of a strategy of conversion of the native populations to Christianity[108]. There was a strong Muslim presence in the Indian Ocean, of many ethnic origins and different cultures. At least in the first three decades of the 16th century, this encouraged a spirit of crusade in almost all the Portuguese military actions of that period. Changes came about following the decisive influence of the Counter-Reformation movement, when the emphasis shifted to evangelisation as the highest purpose of Christian mission, encouraged furthermore by the papacy. Additionally, from the mid-14th century, the «Padroado Régio» (Royal Patronage) was instated in Portugal, which more easily explains the almost symbiotic convergence between the colonising interests of the Crown and systematic attempts to convert the Asian peoples to Christianity[109]. The religious orders played a central role in the processes of evangelisation. The first to establish on the eastern coast of Africa, in India and Southern Asia were the Franciscan monks, followed closely by the Dominicans. The Jesuits came on scene a little later, only in the 1540s. The latter, though, by reason of their impressive organisational ability and available resources, came to occupy dominant positions in practically every region of Portuguese presence, regardless of how small[110]. The first decades were stage to several episodes of mass conversion of Hindus to Christianity, particularly in Goa and further south, on the Malabar Coast, even though not much prior indoctrination had taken place[111]. However, a wide range of other strategies was employed. Some were dedicated to the conversion of the most humble, especially the mendicant orders, like the Franciscans on the *Coast of «Pescaria»*[112], as well as efforts to seduce the local dominant classes, an enterprise in which the Jesuits were particularly successful[113]. Nevertheless, even at the height of Portuguese power in Asia (approximately from 1550 to 1620), although the native Christian communities became quite numerous, they were low in number when compared to those professing the local faith[114].

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[107] PEARSON, 2001a: 100-113.
[108] SÁ, 2010: 265-292.
[109] SÁ, 2010: 265-292.
[110] SÁ, 2010: 265-292.
[111] XAVIER, 2008: 118-133.
[112] Corresponding to the southern part of the Coromandel Coast.
[113] SÁ, 2010: 265-292.
[114] BOXER, 2011: 89-91.

Evangelising efforts also increased as transformations were taking place in Portugal from the beginning of the 16th century, and more particularly during the reign of King João III (1521-1557). The connection between the two processes was convincingly illustrated by Ângela Barreto Xavier. According to the author, at the end of his reign, King João III initiated a number of profound political and social reforms, both within the kingdom and in the colonies. To some extent, the reforms in the colonies tended to converge on standardising and transforming certain aspects of the life of the local populations, so they would more closely resemble that of the kingdom, in organisational, legal and religious terms[115]. This principle may also be applied to the analysis of the standardisation operated on the medicine practiced in the settlements in this same period. In Asia, two processes started to develop at the same pace. The first involved the gradual legal subordination of local practitioners to rules which gave primacy to European physicians and their knowledge within the colonial structure[116]. The second was the systematic inclusion of medical practice and other related healthcare activities within the conversion strategies of the religious orders, especially the Society of Jesus[117]. Throughout the 16th century and at the beginning of the 17th, this process is evident in practically all the Portuguese settlements in Asia. Over the 17th and 18th centuries, the consolidation of this action concentrated increasingly on Goa, and from there, spread to other areas of the Indian Ocean. Part of the explanation resides in the retraction of Portuguese maritime power and the concurrent consolidation of Goa as a regional political force.

At the beginning of the 18th century, the times in which the State of India played a fundamental role in the control of Asian trade were long gone. However, Goa managed not only to survive but to maintain its standing as a political and military power. Even though it was no longer the protagonist, it was still a force to be reckoned with. It had suffered significant retraction in the range of its influence and military power, but this did not mean that the individuals it was connected to, as well as its activities, did not continue to thrive. Stuart B. Schwartz, on the decline of the State of India's political, economic and military power, reminds us of what is, in my opinion, essential. Despite the enormous losses:

> *this does not mean private traders did not continue to thrive, nor that the thousands of Portuguese mercenaries, merchants and missionaries from Macau to Siam and Abyssinia had lost importance in the local societies*[118].

Here, mention must be made of a factor that is primordial to this text. Mercenaries, merchants and missionaries should be understood as an extremely wide spectrum of agents. In the case of the missionaries, particularly the Jesuits, many were from other European nations and many others were Portuguese. However, in relation to other orders, from the second half of the 17th century, a growing

[115] XAVIER, 2008: 41-43.
[116] PEARSON, 2001b: 401-419.
[117] XAVIER, 2008: 242-269.
[118] Original quote: «isso não quer dizer que os comerciantes privados não tenham continuado a prosperar, nem que os milhares de mercenários, mercadores e missionários portugueses existentes de Macau ao Sião e a Abissínia tenham perdido importância nas sociedades locais» (SCHWARTZ, 2010: 21-51).

number were native clerics, a majority of them Goan, descendants from both Portuguese and Indian families. This was largely due to the establishment of congregations and brotherhoods, still at the end of the 17th century, whose members were mostly native[119]. These missionaries, together with merchants, interpreters, apothecaries, and other individuals, many native to Asia, contributed to the huge network of social relations which involved, to lesser or greater extent, Portuguese agents or speakers of Portuguese.

Portuguese persisted as a type of *lingua franca* in trade, diplomacy and other activities, until at least the beginning of the 19th century[120]. A similar development occurred in Natural Philosophy, as in Pharmacy and Medicine. A good example was the preparation of the *Hortus Indicus Malabaricus*[121], a work by the administrator of the Dutch colony of Batavia, Hendrik Adriaan Van Reede tot Drakenstein (1636-1691), published in Amsterdam between 1678 and 1693. It contains descriptions of 720 medicinal plants from South and South East Asia and was compiled based on the collection of information and cooperation from a large network of local collaborators. Among these, the Portuguese-Indian interpreter, Emanuel Carneiro, translated to Portuguese a majority of the information, originally in many local languages and dialects. From the Portuguese, the descriptions were translated to Latin, the language in which the work was published[122].

The *Hortus Indicus Malabaricus* was not the first or last work on the botany and medicinal properties of Asian plants to be compiled in this manner. There had been great interest in the theme since the 16th century. The collaborative manner, depending on intense negotiation and intercultural exchange of knowledge and information, with which van Reede's work was produced was the rule, rather than the exception. To produce knowledge on plants, animals, minerals, drugs, illnesses, geography, languages, or other matters, the Europeans had to negotiate with the local agents, in varying degrees depending on the specific space and spheres of power. Often, the knowledge acquired from this process was initially passed through the filter of local discernment, which would determine what was worthwhile or even what the Europeans were allowed to understand[123].

During the 18th century, for a number of reasons, Lisbon operated changes in the imperial administrative structure. This strongly influenced two aspects of the history of knowledge production in the colonial world. First, although quite erratically, periods of greater or lesser incentive would alternate, amplifying the promotion of scientific activities, largely motivated by the need to restructure the economic viability of the colonies. These promotion policies became considerably more systematic, a longstanding aspiration on the part of the intellectual metropolitan elite, particularly at the end of the reign of King João V (1706-1750)[124]. Another dimension to this process was the grow-

[119] LOPES, 2006: 134-135.
[120] AVELAR, 2012.
[121] REEDE TOT DRAKESTEIN, Hendrik van – *Hortus Indicus Malabaricus: continens regni Malabarici apud Indos cereberrimi onmis generis plantas rariores, Latinas, Malabaricis, Arabicis, Brachmanum charactareibus hominibusque expressas*. Amstelaedami: sumptibus Johannis van Someren, et Joannis van Dyck, MBG – QK349.7.R4. Available at <http://botanicus.org/title/b11939795>.
[122] RAJ, 2010: 27-47.
[123] RAJ, 2010.
[124] FURTADO, 2012; DOMINGUES, 2001: 823-838.

ing integration of the local populations, as beneficiaries of these chains of incentive. Even though by reason of structural rigidity in the Empire's racial relations, it was the whites born in the kingdom or the colonies who benefited more from these promotion policies, there were cases of mestizos and, in India, of natives who participated actively in this new dynamic[125]. These transformations, which intensified under the rule of the Marquis of Pombal (between 1750 and 1777), encompassed several aspects of colonial life, provoking changes at educational, military, scientific, administrative, economic and religious level[126].

FINAL CONSIDERATIONS

This chapter intended to understand the connections between certain long-term processes in the construction of the Portuguese colonial empire, regarding their relations with the history of knowledge production in the fields of Medicine and Natural Philosophy. In the 18th century, the History of Sciences in the Eastern Empire is embedded in the wider context of the Portuguese Overseas Empire, which, in its turn, is part of the process of European maritime expansion and the consolidation of colonial empires in the Early Modern Age. These connections should not, of course, be ignored. The process is marked by a wide range of features, some intrinsic to overseas expansion itself, among which two in particular are of fundamental importance. The first derives from the biogeographical complexity of the empires that spread between the Atlantic and the Indian Ocean in countless morphoclimatic domains[127]. The second is related to the need which should guide any historian who ventures on the paths leading to the History of the Portuguese Empire: the approach must be as wide in range as possible. In other words, it should be understood as a complex of interconnected and intersected components[128]. From the beginning, dating back to the 15th century, the Empire was built as a complex system of frontiers, which expanded at the same rate as the reach of its caravels.

Insofar as a human culture cannot be disassociated from its environment, the dynamics of frontier permeability is strongly influenced by the relative variability of the physical environment in which they take place[129]. In the specific case of the Portuguese empire, this variability was particularly large, due to its geographical and, consequently, climatic and biotic range. It encompassed an immense system of exchanges, in which natural and cultural elements went beyond the barriers imposed by distances which became increasingly shorter, as the trade routes opened during the first decades of expansion were consolidated.

Finally, during the Early Modern age, among the factors that influenced the production of Natural Philosophical knowledge, and of its related branches, such as Medicine and Pharmacy, few were more important than the large variability with which intercultural relations[130] were established

[125] LOPES & MATOS, 2006.
[126] PATACA, 2006; BRIGOLA, 2009; LOPES & MATOS, 2006: 15-70.
[127] CROSBY, 2011; DIAMOND, 2008.
[128] BETHENCOURT & CURTO, 2010.
[129] SANTOS *et al.*, 2013: 59-76.
[130] RAJ, 2010: 10-11.

within the expansion of the colonial empires[131]. These relations cannot be disassociated from their related conflicts, and their results, in terms of strategies of domination, resistances, appropriations, redefinitions, reconfigurations and struggles, need to be seen as roads with many directions. In terms of the circulation of knowledge, the colonial spaces can be defined as frontier regions, moveable, dynamic and mutable, but still, frontiers, with established boundaries which were, at times, difficult to overcome.

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