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### 'Surveying Angola, São Tomé and Timor: Experts and Transnational Practices'

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*Abstract:* The surveys produced by John Gossweiler, on the coffee-producing regions of Angola, by Paul Drousie, on São Tomé's cocoa plantations, or Ruy Cinatti, on the wealth of Timor's forests, inspired our reflection on the importance of those accounts for both the history of science and the history of empire. We believe that what makes them significant is not their singularity, but, on the contrary, how they reveal the norm of imperial relations. But strangely enough colonial surveys have been neglected in the literature. The reasons are partly historiographical, partly historical. On the one hand stories about these surveys are not as obvious as stories about experimental stations or development schemes to standardize agricultural commodities, on the other hand actors themselves tend to understate inventory activity. This paper has two goals. Firstly, we want to investigate the institutional context in which these surveys were organized. We propose to do this within the Portuguese and the Belgian colonial administrations. Secondly, we also want to analyze the content of these surveys and bring to light some those factors that though less visible also played an important role in the process of imperial building.

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## 1. Introduction

Historiography of science in colonial contexts has provided us of several stories about colonial experiment stations and a variety of studies about the development schemes elaborated by colonial States. Common to these investigations is the search for ‘the laboratory’ or merely the moments when an ‘experimental approach to nature’ is put in place. This is particularly obvious in studies following the ‘emergence the genetic rationality’ (the expression is taken from Thurtle, 2007), which in these cases tend to be focused on the genome of seeds and on their trajectories from metropolitan institutions to colonial stations (Headrick, 1981; Brockway, 1979, Drayton, 2000; Bonneuil, 2002) – indeed no other stories have been so successful in relating the history of plant sciences and the beginning of the modern world, including the construction of the late European empires. But this is also obvious in studies aimed, for instance, to study the organization of agricultural settlements, in which not plants, but men (Africans or Europeans), were the scientists’ experimental subjects (see, for instance, Bonneuil, 2000). The same pattern can be observed in the historiography of science of the Portuguese empire, which has primarily privileged development schemes around colonial laboratories (see Saraiva, 2009 and 2014) or agricultural settlements (see Castelo, forthcoming).

The standard narrative in the history of modern life sciences played here a fundamental role. Constructed on the assumption that the end of the 19<sup>th</sup> century was marked by a decline of natural history and the rise of experimentalism, this narrative focused the attention of both scholars and non scholars on the history of experimental sciences. But it had also prevented historians from looking into other scientific activities – such as missions, expeditions, trips and travels – with the same degree of analytical sophistication. Moreover, this narrative also had a reflexive impact on the actors themselves. As this paper shows, inventory activity is often described with an emphasis on individual initiative (Cinatti), detached from colonial institutions (Gossweiler) and with an unproblematic approach to international relations in between empires (Drousie).

Recently, this standard narrative started to be called into question. There were multiple efforts in this direction. Robert Kohler’s discussion about the nature of the practices in field-sciences in the end of the 19<sup>th</sup> century, as well as the model he proposed to explain how these practices evolved from the golden times of natural history until the early 20<sup>th</sup> century, was *the* key contribution (Kohler, 2007 and 2013). Jeremy Vetter and others focused (2011) also on the work of field scientists in modern times, and managed to draw scholars’ attention to the synchronic advantages of following these actors, particularly nowadays when the project to restore global history is so present in the academia. Finally, historians interested in understanding the data-driven research nowadays, namely the phenomenon of bio-databases and its proliferation in present societies (see Strasser, 2011), have also took naturalist practices to the foreground. It has to be said that, in this effort, they were heavily indebted to those scholars of the early modern period who were responsible for tracing important historical continuities between the 20<sup>th</sup> and previous centuries (see, for instance, the work of Müller-Wille and Charmantier, 2012).

This turn in the historiography of life sciences inspired us to look to colonial history with different eyes. Instead of approaching colonial scientists in terms of their areas of expertise, we tried to look to them in terms of the *nature* of their practices. Cinatti, Gossweiler and Drousie came from different backgrounds and lived in different periods of the 20<sup>th</sup> century. But, they were also above all ‘naturalists’, or, in other words, scientists relying primarily on the practices of natural history – i.e. collecting, listing, classifying, naming, describing, mapping, etc. Secondly, we propose to look to a particular output of their inventory activity – the agricultural surveys –, and to look to them not as punctual missions, organized by a large array of disparate actors, but as a reliable and confined unit of analysis ready to be used in colonial

history. Common to these surveys seems to be their trans-disciplinary nature and tendency to see plants as both natural specimens and agricultural commodities, as well as their ability to integrate pending political questions such as labor regimes.

This paper has two goals. Firstly, we want to investigate the institutional context in which these surveys were organized. It is our contention that these apparently ‘normal science’ initiatives are critical to understand more fully the relation between science and empire. We propose to do this within the Portuguese (Gago and Castelo) and the Belgian (Macedo) colonial administrations. Secondly, we also want to analyze the content of these surveys and bring to light some of those factors – whether local (Gago), regional (Castelo) or international (Macedo) – that though less visible also played an important role in the process of imperial building.

## 2. Surveying Angola: John Gossweiler

Born in Zurich and educated in Switzerland and Germany, John Gossweiler moved to London in 1896 to continue his studies, concretely at the Kew Gardens (Exell, 1952, p. 257). It was here, while attending a course of Sir William Thiselton-Dyer, that he first knew that the Government of Angola was looking for a botanist to launch an ‘acclimatization garden’ in this colony (Mendonça, 1952, p. 1). William Thiselton-Dyer, director of the Kew Gardens, had been informed about this vacancy through Júlio Henriques (1838-1928), director of the Botanic Garden of the University of Coimbra. Soon Henriques received a letter of presentation from Gossweiler – and, at the age of twenty-six, the Swiss botanist was departing to Angola. Gossweiler worked for almost half century in Angola and he is a crucial actor to understand the relation between science and the colonial state in the first half of the 20<sup>th</sup> century.

The pace and time of Angola during the first two decades Gossweiler lived in this colony were marked by the pacification campaigns (*campanhas de pacificação*) aimed at transforming the formal sovereignty obtained in the diplomatic circles into effective rule in the field. Started right after the Berlin Conference and intensified after the British Ultimatum (1890), these military operations had as their first target the definition and control of the boundaries and the occupation of certain territories considered strategic for the expansion of the Portuguese rule. Depending on the region, their size and duration varied considerably: if in some parts of Angola they ended around 1914, in others they lasted until the 20s (according to Pélissier (1986), until 1926).

Two years had passed since the day Gossweiler disembarked in Luanda and he had no instructions regarding the ‘acclimatization garden’. This impasse would remain until the mandate of Paiva Couceiro as General Governor of Angola (1907-1909), when a new strategy of coordination and planning of the expansion of the Portuguese rule was implemented. Though his project suffered several constraints, it had nevertheless concrete repercussions in the field. One example was the launch of the promised ‘acclimatization garden’ (in 1907) and the publication of *Boletim de Agricultura, Pecuária e Fomento* (in 1908) (from now on, *Boletim*) – two central institutions of the emerging Agriculture Department (*Serviço de Agricultura*).

The place chosen to launch the ‘acclimatization garden’ (synonymous of ‘botanical station’ and ‘experiment station’) was an old *fazenda* known as Granja de São Luís, located in Dallatando, in the region of Cazengo. Gossweiler moved from Luanda to Cazengo to be the head of the project, but in 1911 an agricultural scientist (*agrônomo*) was sent from Lisbon to replace him. Several years later, in 1907, when the ‘system of mandatory crops’ (*sistema das culturas obrigatórias*) was about to be tested for the cotton case, he would be again invited to be the head of a botanical station – the Cotton Experiment Station. But he would not stay long here either. So, what was he doing when he was not occupying these prominent *places of science* within the colonial administration?

From the pages of *Boletim* we realize that most of his time was passed on missions and expeditions to various regions of Angola. But, contrarily to the project of the first botanical station in Angola – which, for instance, led Gossweiler to Lisbon in 1902 to meet with high mandarins of the colonial empire in Lisbon (such as *Conselheiro* Ramada-Curto) in order to discuss the reasons of the Portuguese inertia –, the political backstage of this inventory work is subtle and barely mentioned. Instead it is often presented (by himself and others) as punctual episodes, with no top-down orientation and political framing. A detailed analysis of his reports, and also of the correspondence to Júlio Henriques, arrives at a more nuanced picture of this inventory activity.

Before the end of the Great War, Gossweiler was entrusted with survey missions, often called *campanhas* at the time. But, it was during the interwar period that the inventory activity promoted by the Agriculture Department increased significantly. During this time Gossweiler and many other agricultural scientists were commissioned to conduct ‘missions of agricultural survey’ in several parts of the colony. These were small initiatives, conducted by one plant expert, who in the end produced a report that was published on the department’s journal. Such orchestrated State attempt to survey Angola’s agricultural landscapes went along with the reformation of the Agriculture Department, a phenomenon that was happening all over Africa (see Tilley, 2011; and Hodge, 2007).

It was based on these agricultural surveys that Gossweiler gathered the enough botanical and ecological data to materialize his long-time project of writing a vegetation map of the colony. This project ended with the publication of *Carta Fitogeográfica de Angola* in 1939, together with of F. A. Mendonça of the Botanical Institute of Coimbra’s University. As it would be expected this scientific project soon attracted the attention of politicians, namely in the metropolis, who found in it an important ‘tool of empire’, not only in economic terms (to be used in development schemes), but as a demonstration of Portuguese supremacy within the international scientific elite. It’s not the output of this inventory activity (‘the map’), but the reports produced during the survey missions that gives us more insight into the process of imperial building. This paper zooms in to those missions conducted to the coffee-producing regions. Coffee, one of the oldest agricultural commodities of Angola (cultivated since 1830), became after WWII the centre of this colony’s economy.

On 20 December 1917, Gossweiler met with General Governor Acting in Luanda. The Governor wanted to instruct the botanist of the Agriculture Department on the goals of his next mission: a three-months mission to the coffee-producing region of Encoje (in Congo) to start just right in the next month. From 1918 January until March Gossweiler explored the region using the military post of Uige as the base and with the help of ‘lieutenant Tomás’ (Gossweiler, 1918, p. 3). Agricultural survey and indigenous taxation went hands in hands. The day Gossweiler and his men left the military post of Uige to visit the region of Condo, lieutenant Tomás, not being able to accompany Gossweiler’s, sent his ensign so that he could ‘benefit from the occasion to enrol [arrolar] the natives for the hut tax’ (Gossweiler, 1918, p. 10). The excursion to Punde, on the other hand, could count with the presence of lieutenant Tomás’, who ‘insisted on accompanying us to this region (...) since he had never had the occasion of acquainting himself with its people, who, in the previous year had presented themselves voluntarily to pay the hut tax, without being enrolled’ (Gossweiler, 1918, p. 15).

In the conclusions of his report Gossweiler expresses unequivocally his opinion about Bakongos’ agricultural practices: ‘The [coffee] *lavrás* from those regions are in such a good shape that, rather than criticizing the native methods of culture, one should on the contrary learn from them’ (Gossweiler, 1918, p. 16). One particularity about coffee plants here was that they grew slower during the first years of the cultivation cycle. According to him the reason for this was pruning – a surprising statement since colonial agricultural science often criticized

indigenes for their resistance against this particular practice. The main critic to coffee industry in Congo was the diversity of coffee varieties found in one plantation – ‘which is not observed in the *lavras* of Cazengo or Golungo Alto, or in the new plantations made in Portuguese Mayombe’. This fact was the most important devaluation factor of Congo coffee in the markets, and a concrete disadvantage of this district in relation to Cuanza-Norte and Cuanza-Sul, where European farmers had already imposed in their *fazendas* (and neighbouring African populations) practices of standardization of coffee beans – in these districts this meant to have women and children to pick the ‘bad’ coffee beans, a process that agricultural scientists know exactly for the name ‘picking’.

Later, during the 1930’ s decade, Gossweiler produced the most detailed and complete reports about the coffee-producing regions in terms of their ecological and land use for agriculture, as the result of missions to Seles, Malange, Cazengo and Amboim. In these reports he is concerned in giving settlers and colonial officials two fundamental advices: *where* to set up a coffee *fazenda* – and therefore explaining how lands suitable for coffee cultivation can be identify – and *how* to set up one, that is, clarifying which agricultural practices are proper for these kind of plantations and which aren’t. In Angola coffee was traditionally planted in the middle of the forests, which implied the ‘partial destruction’ (not the ‘total destruction’) of the forest – that is the cut of the lower and medium level of plants (including old and wild coffee bushes) and the saving of some of higher trees, so that new coffee seeds or seedlings could be planted under the same conditions of shadow, humidity, soil, etc. as coffee growing in the wild.

One conclusion he repeatedly writes in his reports is simple: plantations that were not set in places where *C. canephora* grew spontaneously were destined to failure. This was precisely what he observed in his trip to the district of Seles in 1920, where he visited several *fazendas*, namely the ones from Seles Company (Figure 10a and 10b). Only where the abrupt elevation of the terrain causes precipitation ‘from the condensation of vapour brought by the Atlantic winds’, coffee plants are successfully cultivated, ‘sheltered by the *higrófila* forest’ [humid and high forests]. The repeated attempts to cultivate coffee in places ‘thick with *sub-xerófila* forest’ [forests with a more dried environment, exposed to the sun and winds] have failed and the ‘vestiges and remains of failed plantation experiments signalled the limit zone for expansion’, he concludes (Gossweiler, 1930, p. 213). Once again Gossweiler reveals a particular interest for the African side of the story. According to his view ‘settlers are wrong when they say that banana trees [which they use in coffee plantations as ‘shade trees’] are wild from the region’. ‘Probably, long before the settlers arrived, they were planted by the indigenes, who inhabited this region’, he argued. However, contrarily to the 1918 report to Encoje, one notes some reluctance in commenting the ‘positive features’ of African agriculture, an aspect possibly related with the increase of censorship in official publications the 1920’ s decade.

The major critique to white settlers’ agricultural practices came in his report on Amboim, when in 1932 he visited the region to investigate a disease that was affecting coffee plantations. According to him, one of the main problems was that many plantations were ‘too thinly spread’. ‘Sometimes one has the impression that the aim was not to achieve an economic method of planting but to occupy hectares’, he writes. Shadow was necessary in order to ‘maintain a fitting environment for the proliferation of microbial fauna and flora, in which symbiosis the Angolan coffee may reach a secular age’. According to his view, the reasons coffee plants were diseased was because they lacked shadow. Gossweiler urged settlers to ignore the advices of ‘horticulturalists’ and their ‘catalogues of fruit trees’ because the way agriculture was done in the ‘countries in the North’ (for instance, the use of chemicals) or in Brazil (with no shadow) was very different and ‘would lead the Angolan farmer in the wrong path’. Instead he pushes settlers to ‘take their clues from Nature’s orientations’, just like the first settlers and Africans did when coffee cultivation started in the beginning of the 19<sup>th</sup>

century.

### 3. Surveying São Tomé: Paul Drousie

Paul Drousie survey of São Tomé (Drousie, 1912), contrary to Gossweiler's surveys of Angola, is a minor work that resulted from a quick incursion into those obscure islands. But the duration of his mission and the small length of his text do not diminish its importance. Drousie's survey is crucial to understand how the intertwined relation between two different imperial territories in Africa around a specific commodity and production system - the cocoa plantation - was enacted. Moreover, this survey allows us to discuss two important topics in the history of science and empire: the relation between state and private initiative and the relations between plants and labor.

Since its creation in 1885, the Congo Free State began supplying Europe with rubber. Rubber profits were sufficiently high to discourage a serious investment in agriculture. But the extreme violence exerted over the indigenous population associated with the "pacification campaigns" to enforce rubber quotas, tainted Belgium's reputation as a colonial power and placed the kingdom under international scrutiny. The Congo became a symbol of backward colonization based on non-technological commodity extraction, at odds with the "civilizing mission" European governments claimed for themselves in the Berlin Conference. If Africans were supposed to be "rescued" and taught the virtues of work, in the Congo, rubber-tappers should give place to agricultural laborers running under the guidance of the white man. Drousie's mission was just one piece of a broader campaign to reinvent the Congo, in the pursuit of the respectable attributes of a plantation colony.

Despite the overall lack of interest in agriculture, timid initiatives to develop plantation schemes in the Congo were already in place in 1885. The most important ones evolved around coffee. Initial expeditions showed the abundance of native coffee varieties, growing wild in several Congo regions. Emile Laurent, professor at the Gembloux Agricultural Institute, conducted two important surveys in 1893 and 1895 confirming the economic potential of exploring such crop (Laurent, 1900). The excitement grew after the Universal Exhibition of Antwerp in 1894. There the quality of Congo's coffee was paired with that of Santos, driving colonial state officials to sponsor the expansion of coffee cultivation in the state outposts. In 1894 there were already 250.000 coffee trees in the Congo. Coffee was seen as the new rubber and the Congo as the new Brazil in Africa (Laplae, 1914).

To cope with coffee growing, Belgian colonial government abided by a simple practice: in order to quickly learn the specificities of tropical agriculture, and educate colonial experts to master this crops, Congo should "imitate the best examples" of foreign colonies. This implied travels of learning, in the form of missions and subsequent written surveys. Luckily the source of inspiration for the new Congo was only 35 hours away by steamer, in the middle of the equatorial Atlantic. Since Congo's early days, officials had been paying close attention to what was happening in the neighboring colony of São Tomé. In less than half a century, those islands had evolved from a slave outpost into a burgeoning plantation economy. From the 1850s onwards, coffee trees, and then cocoa trees, were grown on large plantations, with indentured labor, and intense monoculture. A specific network combining science, technology, capital, and labor politics had created both a stable commodities and a stable colonial power, making it a precocious successful plantation story in Africa and the main reference for foreign colonialists (Macedo, forthcoming).

Little wonder that it was in São Tomé that Belgian consuls secured the first seeds of Arabica coffee and the first cocoa planted in the Congo region. And of course, it became a standard practice to send "several officers and state agents (...) to the island of São Tome, to get familiar with the agronomic methods in place" (Leplae, 1914). Already in 1894 Oscar Michaux, a

military involved in the “pacification campaigns” and charged of the development of the plantations in the Kassai district went to São Tomé to study the plantation system. Norbert Diederich, a civil and mining engineer, followed his route in July 1898, at the peak of cocoa harvest season. Diederich was no other than the founder, organizer and first director do the Agricultural Service of the Congo Free State, responsible for the installment of the agricultural stations of Lenghi and Temvo, devoted to coffee and cocoa. After them many more crossed the ocean: Alex Delcommune, Albert Thys and Valere Mabbile in 1899, Theodore Masui, in 1900, August Joseph Jacques in 1901, Pierre Danco in 1902, Louis Joseph Royaux in 1908, and the baron Charles de T’Serclaes de Wommersom in 1911. We know that this list is far from exhaustive. When, in 1898, the Belgian crown decided to grant land in the Mayombe along the newly built railway, all those capitalists, state experts, or colonial officers, led the way in establishing the region’s first cocoa plantations (Vellut, 1996).

Rewarding commodities, such as coffee or cocoa, did not only depend on specific trees and expertise, but it also required the plantation system and its administrative apparatus. This implied that in the Congo, the crown had to seduce Belgian capitalists and entrepreneurs. Besides providing them with infrastructures and labor, it also supply them scientific expertise. After 1908, when the Congo was put under the direct administration of the Belgian government, the Agricultural services were reorganized with a simple mission: “to form a nursery of good colonial agronomists, in which settlers and companies may choose their directors.”

Once again the Agriculture Department invested heavily in sending its officers to foreign colonies. It is in this context that we must read Paul Drousie survey. He was part of a second wave of missions, aimed at educating experts for the private industry, after a first wave of exploratory ones, with the goal of planning the economic development of Congo. In 1911, this agronomic engineer born in 1873, graduated from the Leuven Ecole Supérieure d’Agriculture, and sub-director of the Agriculture Department in Boma was the living example of this new trend. In 1933 when he died at Tshoa, in the Mayombe, he occupied the position of head-administrator of the Mainbika Plantation. Back in the 1910s, in order to train Drousie for this higher posts, the state sent him to the most important centers of tropical agriculture: Java, Ceylon, Malaysia and, for coffee and cocoa, São Tomé.

“Notes on São Tomé’s agriculture” (Drousie, 2012) is an importance source for historians interested in studying the role of science in the transcolonial relations between imperial territories in Africa. Drousie’s text allows us to understand what was needed to transplant São Tomé’s plantation model to the Congo. By reading “Notes” we can unveil the main interests of those Belgians visiting São Tomé and the kind of information they strived to collect. We can also understand how actors themselves contributed to diminish the scientific value of this kind of work, regardless of its pervasiveness and significance in the colonial context. Drousie presented his text was no more than a collection of “personal impressions”. He claimed that its usefulness resided in the fact that it resulted from first hand experience, allowing for a direct translation of the knowledge gathered from “experienced growers”. Drousie also emphasized the informative power of the photographs he took and collected.

Just like Diederich, Drousie left to São Tomé during cocoa harvest season. We know how he traveled, through where, and whom he met. We also know how he obtained recommendation letters, an important currency at the time. All this information is condensed in a 10 pages introduction, along with a brief description of the history of the island of São Tomé, its geographical location, administrative organization, population, and the specificities of the its climatic zones. In the following thirty pages Drousie explores his main object and subject of interest: the plantations. Besides brief incursions into Agua Izé, and Porto Alegre, it was mostly from Boa Entrada’s administrator, Silvestre Tomé da Costa and his assistant Gaspar Rodrigues

that Drousie learned about cocoa. The text can be read as an anatomy of a model plantation, describing its structure and all the procedures needed to transform the cocoa plant into a valuable commodity. Labour issues are a crucial theme. Drousie describes in detail how workers were lodged, clothed, feed, treated, and, most importantly, how much they were paid. Beside labor, cocoa processing techniques like drying and fermenting are also scrutinized. Learning how to perform these operations was crucial for new planters, as they determined cocoa's final quality and, consequently, its price. The detailed description of drying machinery was particular important in the Mayombe, because there the harvest season coincided with the rainy season. Drousie also pays attention to cultural practices, cocoa varieties selection, and, in the last section, to the strategies in place to combat cocoa diseases.

Drousie's conclusion is particularly interesting. Here we understand that his hidden agenda was to compare the development of Mayombe plantations with those of São Tomé. He proudly claims that private owners in the Congo had been able to secure quality plantations and quality cocoa just like their Portuguese counterparts. Drousie mentions Urselia. We know that this anonymous Belgian society, founded in 1900 with the aim of exploring cocoa in the Mayombe, was put, in 1903, under the direction of no other than Norbert Diedrich. With no exception, all other Urselia administrators had also visited São Tomé at some point: Auguste Jacques, Pierre Danco, Louis Joseph Royoaux. Implicitly he confirms that in order to make plantations in the Congo, missions and surveys were a precondition.

#### 4. Surveying Timor: Ruy Cinatti

Ruy Cinatti lived in Portuguese Timor in three periods and performing different roles: as secretary of the governor (1946-47); as agriculture engineer of the Technical Office of Public Works and Development and, after the extinction of this office, chief of the new Technical Office of Agriculture, Veterinary and Animal industry of the province of Timor (1951-55); and as researcher, doing fieldwork for his PhD thesis in Social Anthropology (1961-62).

Cinatti, a Portuguese citizen born in London in 1915, died in Lisbon in 1986. He graduated in Agriculture by the Lisbon Agriculture High Institute (1950), and had a Master of Arts in Ethnology and Social Anthropology (Oxford University, 1958). Besides colonial officer, he was also naturalist collector (by his own during first stay in Timor) and researcher of the Portuguese Overseas Research Board after 1957. He is especially known as poet.

In this paper we will focus on his preliminary forestry survey of Portuguese Timor during his first stay in the colony (eighteen months). However, it is important to explain that in the field his collecting and surveying practices included materials others than wood samples (plants, minerals, malacological fauna, and soils) and in his own words "had a single goal: a phytogeographical survey".

"Portuguese Timor" (today East Timor) was the most distant and peripheral territory of the Portuguese empire from the beginning of the eighteen century until 1975. Located in the eastern half of the Timor Island and including the enclave of Oecussi-Ambeno in West Timor, Ataúro Island and Jaco Small Island, its border with the Dutch Timor was formally decided in 1859 but the Portuguese and the Dutch wouldn't formally resolve the matter of the boundary until 1914.

Portuguese Timor remained little more than a neglected trading post until the late nineteenth century. Public investment in infrastructure was minimal. Portuguese ruled through a traditional system of *liurai* (local chiefs). Sandalwood was the main export crop but in the mid-nineteenth century coffee exports gained relevance. The governor Celestino da Silva (1894-1908) tried to accomplish military control and initiated an economic exploitation programme with measures for increasing agricultural production of maize and wheat and new cultures



(such as rubber, cinnamon, cacao, tobacco, fruit trees and particularly coffee) which would be continued during the First Republic (implemented in 1910), especially during Filomeno da Câmara government (1911-1913/1914-1917), and the military dictatorship, during Teófilo Duarte government (1927-1928). Nevertheless Teófilo Duarte claimed that there was still a lot to do regarding the “civilisation” of the Timorese and the development of the colony in terms of basic infrastructures and agricultural production. The economic crisis of the late 1920s and the lack of technicians did not allow any true change.

Although Portugal was neutral during World War II, in December 1941, Portuguese Timor was occupied by Australian and Dutch troops to prevent an expected Japanese invasion, which actually occurred in February 1942. Australian and Dutch forces and Timorese volunteers resisted the occupying forces for one year. After the allied evacuation in February 1943 the East Timorese continued fighting the Japanese. The Japanese occupation resulted in material destruction, villages burned, food shortage, and a high number of deaths. Portuguese Timor was handed back to Portugal after the war.

Cinatti went to Timor with the first governor that reassumed the Portuguese control after the end of the Second World War. According to Cinatti during and immediately after the transfer of power from a military to a civilian administration – composed of colonial officials who had come from Angola – the Portuguese also committed a lot of injustices against the Timorese, namely unfair accusations of collaboration with the Japanese. He stated that the post-war administration had an arrogant and arbitrary behaviour, revealed no knowledge of or sensitivity for the Timorese people and culture, and took one-off policy measures guided by their previous colonial experience in another context. Regarding agriculture and forestry there was no autonomous service in the colony.

Cinatti field trips were of three different types: 1) the official travel undertaken with the governor, that is to say within Cinatti’s professional duties; 2) the field trips undertaken with the Dutch forestry engineer and botanist Dr. Ebertus Meijer Drees (1909-84), assistant of the Forestry Institute of Buitenzorg (Java), during his visit to Portuguese Timor; and 3) the explorations that Cinatti has made on his own in his spare time and/or with the governor’s permission.

In the first case, during successive official trips, Cinatti surveyed almost all the Portuguese part of the island by plan, car and horse. But during those trips he could just observe nature. Only once, during the visit to the administrative *posto* of Huato-Builico and the climbing to the Mata-Mai-Lau, he was able to collect plants that turned out important material to the knowledge of the dominant elements of the mountain vegetation. Nevertheless, he would later consider that those panoramic views were necessary as initial synthesis, and should precede any survey.

With the governor’s permission, Cinatti invited Meijer Drees to visit Portuguese Timor. The visit occurred in April 1947. During eight days, Cinatti toured several regions with the Dutch botanist, who helped him to develop a systematic observation of Timor landscape and over the identification of species. Cinatti later affirmed that it was worth more than a year of work on his own (1950a, p. 53).

During his autodidact field trips, negotiated with the governor with the argument that it was important to the colony to undertake the systematic study of its agricultural and forestry potentialities, Cinatti was able to collect and preserve botanical material and wood samples, identified with its indigenous names. At the same time, he did bibliographical research and made contacts with foreign scholars and experts, in order to raise awareness of the Portuguese Timor flora within the international academic community, and obtain orientation and feedback on his collecting and surveying practices. He visited the National Herbarium of

Melburne and the Council for Scientific and Industrial Research of Melburne, and sent duplicates of the collected materials to these institutions and to the Forestry Institute of Buitenzorg. He corresponded with the above mentioned Dr. E. Meijer Drees, but also with Dr. H. E. Dadswell of the Council for Scientific and Industrial Research of Australia, Dr. H. W. Yaping, director of the Forestry Research Institute of Buitenzorg, Dr. A. Kostermans, botanist of the same institute, Professor Elmer D. Merrill, director of the Arnold Arboretum of Harvard University, a worldwide recognised expert in the tropical flora of Southwest Pacific, and Dr. C. G. van Steenis, of Rijksherbarium (Leiden), Botanical Institute of Buitenzorg, and *Flora Malesiana* editor. From those contacts he could perceive the interest aroused by Timor, “not only from a botanical point of view but also as a potential producer of essential resources for the industry of the nearby countries” (1950a, p. 42).

Back to Portugal, Cinatti organised the botanical and wood material that he had brought with him: a herbarium with 100 specimens and a collection of 60 wood samples and the information necessary to its systematic classification, macroscopic analysis and industrial utilization. His phytogeographical survey of Portuguese Timor was the empirical base for his graduation final report in Agronomic Engineering (intituled *Reconhecimento em Timor*, 2 vols, 1950), and three written works, driven from that academic report, and published by the Colonial Research Board (*Esboço histórico do sândalo no Timor português, Explorações Botânicas em Timor, and Reconhecimento preliminar das Formações Florestais no Timor Português*).

Cinatti deplored the inexistence of an official effort to systematize a minimum set of elements necessary to achieve an initial colonization programme. He stressed that there was no inventory of the economic wealth of Portuguese Timor, true development plans and other studies that contribute to an assemblage vision and effective governance; only sparse elements had been collected thanks to individual efforts mainly of foreign travellers. In his voluntarism, Cinatti aimed to contribute to Portuguese Timor reconstruction in the agriculture, reforestation and nature protection fields, and envisaged a “development that combined ethics and science” (Stilwell, 1995, p. 176). Through his forestry preliminary survey he tried to conciliate pure scientific goals and utilitarian ones, “contributing to the study of a problem of maximum importance to the future of the Portuguese province of Timor” (1950b, p. 8-9).

Cinatti divided Portuguese Timor in the more commonly accepted divisions – coastal forest, mangrove, primary mixed forest, secondary forest and savanna – in accordance with the proposal of Elmer D. Merrill in *Plant Life of the Pacific Ocean*. He identified the dominant species, and established comparisons with other islands of the Malaysian region. The species mentioned in his text are classified according to the norms of systematics proposed by Engler and Prantl, in *Die Natürlichen Pflanzenfamilien*.

In his final report and in *Reconhecimento preliminar das formações florestais no Timor Português*, Cinatti presents a sketch map of the forestry formations of Portuguese Timor that intended to give an idea of its quantitative and qualitative dimension (1950b, p. 76). That work was done bringing together his fieldwork, his photographic register and the aerial photographic survey done by the USA Air Force during the Second World War. The photographic mosaic gave him a global framework view, especially important regarding data that escaped to the observer on the ground. From the sketch map, Cinatti concluded that in Portuguese Timor important forest cover was scarce, never achieving the density and abundance of the islands of Sumatra-Java-Flores-Moluccas-New Guinea. This was due mainly to climate, geology constitution of the island and also to the damage caused by human occupation (burnings and clearing).

Cinatti’s phytogeographical survey of Portuguese Timor illustrates the negotiation between an expert in-the-making and the colonial government regarding development policy priorities and

particularly agricultural development. Despite tensions, in his second stay in Timor, Cinatti would achieve to be nominated director of the Agriculture Department and later on in charge of drawing the Timor agricultural development plan within the Second Overseas Development Plan (1958).

This case study also shows that opening and connecting Portuguese Timor – a peripheral Portuguese colony at the southern end of Maritime Southeast Asia – to the international research community was a strategy to assert its national “scientific occupation”. Cinatti, a willful and cosmopolitan middle level intellectual and second-line technician – had to balance his scientific nationalism with his need to learn from foreign scholars. His commitment to make knowledge of the vegetation of Portuguese Timor more widespread had favourable reception in scientific institutions of the nearby countries (Australia and Dutch East Indies) and experts in East Asia flora (from Netherlands and United States of America). This must lead us to look more closely to regional, trans-imperial and transnational scientific connections.

## 5. Conclusions

Hereby we present some of the preliminary conclusions of our paper:

### *Surveying Angola*

If we look to the history of science in Angola from the perspective of experiment stations the conclusion is rather disappointing. Though the idea of making an experiment station appeared in Angola at the same time as in others European empires in Africa (in 1898), this was only launched in 1907 and under very feeble conditions. But if we look to the history of science in Angola from the perspective of the survey missions our insight is very different. Gossweiler’s trajectory indicates inventory activity as crucial to understand the complex relation between science and the colonial state in the first half of 20th century (particularly in the interwar period). But Gossweiler’s agricultural surveys are also important sources to rethink the historiography of colonial Angola in a more generic sense; namely, in what coffee – the most important commodity in the colony in the post-war period – is concerned. Two sets of causes had been used to explain coffee’s economic success in this colony: economic historians have stressed the rising of prices of tropical commodities in the global markets and the window of opportunities opened for Robusta coffee after WWII; the historiography of colonial Angola has focused on the labour history of the Portuguese colonial empire, particularly on how the colonial state helped the European owners of coffee *fazendas* to have access to the African workforce. Gossweiler’s reports centre our eyes on the sustainability of coffee production systems in Angola, namely on the role that Africans and the environment had on this story.

### *Surveying São Tomé*

Paul Drousie’s survey sheds new light on the relation between science and empire. Drousie was a chief colonial officer working for the reformed Agriculture Department in the Congo. In 1911, Congo’s Agriculture Department employed an impressive number of experts – 143 – able to advise and superintend different economic activities, from cattle raising to rubber forestry, from coffee growing to cocoa plantations. As soon as Drousie’s assumed the post of sub-director of the Agriculture Department in Boma he was sent in a mission to the Portuguese islands of São Tomé. Drousie’s mission is particularly relevant to understand how the Belgian colonial state organized its research agenda around cocoa. In fact, private estates such as the ones of São Tomé had since the late 1890s been growing cocoa for export, and since those early days several experts had been surveying the equatorial islands to gather *in loco* knowledge about this commodity. Considering that São Tomé had no state funded experimental station or botanical garden, it was in the plantations that Belgian officers learned about the new and old technologies in use. Drousie’s survey allow us to understand how state

officers related with plantation administrators, and what were the specific questions – labor regimes, processing techniques, cultural methods – allowing for the circulating of cocoa plantations in Africa.

### *Surveying Timor*

As we have seen earlier, Portuguese Timor was a peripheral territory within the Portuguese colonial Empire. Moreover, when Cinatti arrived there it had just come out the Japanese occupation, which had a tremendous devastating impact on human and material terms. The first Portuguese colonial government after 1945 had to recover political authority and rebuild state apparatus. Although in the early 1930s there had been an Agricultural office in Portuguese Timor and one agriculture technician in charge, by the late 1940s there was no agronomist working on the ground. This case study shows that regional context could be more important than the imperial connection to the metropole. Cinatti realised that he had to study Portuguese Timor botany and forests within its Southeast Asia framework, and had to make comparisons with the vegetation of the neighboring territories. Therefore his preferential interlocutors had to be natural history experts of Australia and Netherlands East Indies. He has also understood that Timor economic development depended mainly on regional partners.

### Bibliographic References

- Alexandre, Valentim (2000) *Velho Brasil, novas Áfricas: Portugal e o Império (1808-1975)* (Edições Afrontamento)
- Birmingham, David (1978) *The Coffee Barons of Cazengo*, *Journal of African History*, 19 (4), 523-38.
- Bonneuil, Christophe (2000), 'Development as Experiment: Science and State Building in Late Colonial and Postcolonial Africa, 1930-1970', *Osiris*, 15 (1).
- Bonneuil, C. (2002) *The manufacture of species: Kew Gardens, the empire and the standardisation of taxonomic practices in late 19th century botany*, in: M. N. Bourguet, C. Licoppe and O. Sibum (eds.), *Instruments, Travel and Science. Itineraries of precision from the 17th to the 20th century* (Routledge), pp. 189-215.
- Brockmann-Ierosch and Rubel (1930), ref.
- Brockway, Lucile H (1979) *Science and colonial expansion: the role of the British Royal Botanic Gardens*, *American Ethnologist*, 6 (3), 449-65.
- Cardoso, António Monteiro (2007) *Timor na 2.ª Guerra Mundial: O Diário do Tenente Pires* (Lisboa: CEHCP-ISCTE-IUL)
- Castelo, Cláudia (forthcoming)
- Couceiro, Paiva (1908), *Boletim*, refHeadrick, Daniel R. (1981) *The tools of empire: Technology and European imperialism in the nineteenth century* (New York: Oxford University Press)

- Drayton, Richard Harry (2000) *Nature's government: science, imperial Britain, and the 'Improvement' of the World* (New Haven: Yale University Press)
- Dias, Jill (1998) Angola, in: Alexandre, V. and J. Dias (eds.), *O Império Africano 1825 – 1890*, volume X (Nova Expansão Portuguesa, dir. Joel Serrão and A. H. de Oliveira Marques), 320-556.
- Drousie, Paul (1912) "Notes sur l'agriculture à Sao Thomé", *Bulletin Agricole du Congo Belge* 3, 867-910.
- Exell, A. W. (1952) *Obituaries: John Gossweiler (1873-1952)* (ref)
- Freudenthal, Aida (2005) *Arimos e fazendas: a transição agrária em Angola* (ref)
- Gomes, Ruy Cinatti Vaz Monteiro (1950a) *Explorações botânicas em Timor* (Lisboa: Junta de investigações Coloniais)
- Gomes, Ruy Cinatti Vaz Monteiro (1950b) *Reconhecimento preliminar das formações florestais no Timor Português* (Lisboa: Junta de investigações Coloniais)
- Gossweiler, John (1918), 'Um reconhecimento fitogeográfico á região produtora do Café Encoje: publicação da repartição do gabinete do govêrno geral de Angola', *Imprensa Nacional de Angola*, ref
- Gossweiler, John (1930) *Relatório sobre a viagem à região do Seles*, BDSAC, ano III, (nº 8-12) ref.
- Gossweiler, John (1932a) *Reconhecimento agronómico no Distrito de Malange*', BDSAC, ano V, nº 16-19.
- Gossweiler, John (1932b), *Relatório sobre o estado actual da cultura do algodão no Planalto de Malange e na Baixa de Cassange*, por John Gossweiler, Luanda Maio 1931 BDSAC, ano V, nº 16-19, 5-14.
- Gossweiler, John (1933) 'Relatório sobre as doenças do cafeeiro na região do Amboim', 31 de Março de 1933, BDSAC, Publicação extraordinária, nº 1
- Gossweiler, John and F. A. Mendonça (1939) *Carta fitogeográfica de Angola: memória descritiva dos principais tipos de vegetação da colónia determinados pelos seus aspectos fisiográficos e caracteres ecológicos segundo a nomenclatura de Rübél* (Lisboa: Ministério das Colónias República)
- Hodge, Joseph Morgan (2007), *Triumph of the expert : Agrarian doctrines of development and the legacies of British colonialism*, (Athens: Ohio University Press)
- Lepiae, Edmond (1913) *L'Agriculture du Congo Belge. Rapport sur les années 1911 & 1912* (Bruxelles: Imprimerie Industrielle et Financière)
- Laurent, Emile (1900) *Conferences sur le Congo* (Gembloux: L. Berce-Hettich)
- Kohler, Robert E (2007), 'Finders, keepers: collecting sciences and collecting practice', *History of Science*, 45 428-53.
- Kohler, Robert E (2013), *All creatures: naturalists, collectors, and biodiversity, 1850-1950*, (Princeton University Press).
- Macedo, Marta (forthcoming) 'Standard Cocoa: Transnational Networks and Techno-Scientific regimes in Western Africa', *Technology and Culture*

- Mendonça, F. A. (1952) John Gossweiler, *Boletim da Sociedade Broteriana*, 26 (2nd séries), 9-19.
- Müller-Wille, Staffan and Isabelle Charmantier (2012), 'Natural history and information overload: the case of Linnaeus', *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences*, 43 (1), 4-15.
- Pélissier, Renné (1986) *História das Campanhas. Resistência e revoltas, 1845-1941*, 2 vol. (Lisboa: Editorial Estampa)
- Saraiva, Tiago (2009), 'Laboratories and landscapes: the fascist new state and the colonization of Portugal and Mozambique', *Journal of History of Science and Technology*, 3 1646-775.
- Saraiva, Tiago (2014), 'Mimetismo colonial e reprodução animal: carneiros caracul no Sudoeste angolano', *Etnográfica. Revista do Centro em Rede de Investigação em Antropologia*, 18 (1), 209-27.
- Stillwell, Peter (1995) *A condição humana em Ruy Cinatti* (Lisboa: Editorial Presença)
- Thurtle, Phillip (2007), *The Emergence of Genetic Rationality: Space, Time, and Information in American Biological Science, 1870-1920*, (Washington: University of Washington Press)
- Tilley, Helen (2011) *Africa as a living laboratory: empire, development, and the problem of scientific knowledge, 1870-1950* (Chicago: University of Chicago Press)
- Vellut, Jean-Luc (1996) 'Le cacao dans l'économie politique de l'ancien Congo Belge', in E.Collet (ed.) *Chocolat: De la Boisson Elitaire au Bâton Populaire*, 123-42 (Brussels: CGER)
- Vetter, Jeremy (ed.) (2011), *Knowing Global Environments: New Historical Perspectives on the Field Sciences*, New Brunswick, New Jersey and London: Rutgers University Press)