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Imperial Networks, Colonial Bioprospecting and Burroughs Wellcome & Co.: The Case of *Strophanthus Kombe* from Malawi (1859–1915)

Abstract

Recent research has begun to highlight the complex connections between colonialism, medical and scientific knowledge-production, and commercial interests. This article analyses colonial 'bioprospecting' through a case study of *Strophanthus kombe*. Used locally as an arrow poison, *Strophanthus* was 'discovered' in Malawi during David Livingstone's Zambesi expedition. After investigation and experimentation it was subsequently used to produce a cardiac drug. The Malawian case study complements previous work on *Strophanthus* from West Africa. It uncovers the early Scottish-Central African networks that linked the Shire valley, (the source of Malawian *kombe* seeds) with medical research in Edinburgh and Burroughs Wellcome and Co., the first commercial manufacturer of drugs derived from *Strophanthus*. The article also analyses Burroughs Wellcome's use of scientific and local knowledge in the early marketing of its first original drugs.

Keywords: bioprospecting, Burroughs Wellcome, colonialism, knowledge-production, Malawi

Introduction

On 30 March 1859, the Scottish physician and botanist John Kirk shinned up a tree in what is today southern Malawi¹ in order to gather a sample of a poisonous climber. His specimen of *Strophanthus kombe* was gathered from banks of the river Shire, close to the village of Chief Chibisa. Kirk, the official botanist of David Livingstone's Zambesi expedition, had been trying for weeks to find the source of the arrow poison used by Mang'anja hunters. It had not been easy to obtain information about the plant. Perhaps intentionally, Kirk had received several false samples. During one of the expedition's visits to the village of Chibisa (whom Livingstone had earlier befriended), Kirk spotted a plant that reminded him of a poisonous climber he had seen in Sierra Leone in 1858. The Mang'anja who had accompanied Kirk on his walk refused to gather the plant for him. As the botanist reached out to take a sample, he was warned to be careful: the plant's 'juice' could prove fatal if ingested or applied to a wound.

According to Kirk, it was only at this point that his companions admitted that the plant (*kombe*) was indeed the active ingredient in the Mang'anja arrow poison. The poison was prepared by mixing *kombe* with another plant, *kalabiremako* (which Kirk believed he had been given during an earlier visit to Chibisa's village).²

¹ In this article, 'Malawi' is used refer to the region that was the British Central Africa Protectorate from 1893 to 1907 and the Nyasaland Protectorate from 1907 to independence in 1964.

² Kirk's diary entry for 30 March 1859, in Foskett (ed.) 1965, pp. 171–2. Kirk later gave an account of events at the 1890 British Pharmaceutical Conference. Quoted in Perrédes 1900, pp. 241–6. See also the diary entries of Livingstone in Wallis (ed.) 1956, pp. 91–3. The

Livingstone's expedition had arrived in the Shire region at a time of war. The Mang'anja were under attack from the Yao and the Portuguese. As they had few firearms, poisoned arrows were an important part of the Mang'anja arsenal. Unlike many other chiefs, Chibisa had sought an alliance with the British, hoping to secure a military ally and access to guns.³ Although the chief did not directly assist Kirk in his inquiries (his people were clearly reluctant to provide Europeans with information about *kombe*), arguably it was Chibisa's friendship that enabled expedition to obtain samples of the plant at a time when it might have been regarded as an important secret.⁴

Kirk took *kombe* samples with the intention of sending them to Kew Gardens, the heart of the British imperial botanical enterprise. On joining the Zambesi expedition he had received instructions both from David Livingstone and from Joseph Hooker, then Assistant Director of Kew. Kirk's duty as the expedition's official botanist was to search out, identify and gather samples of useful African plants that could yield dyestuffs, fibres, rubber, medicines or other potentially valuable commercial produce.⁵

etymology of the word *kombe/kombé/kombi* in early British usage was confusing: Kirk clearly stated in his diary that it was the name used for the plant by the Mang'anja, but in 1872 Fraser suggested that *Kombé* referred to a place 'on the west coast near the equator'. Fraser 1872, p. 141. According to Williamson, *kombe* is the general name for this plant in Malawi (in chiChewa it is called *mbolo*). Williamson 2005, p. 237. In this article, following Beentje 2006, *kombe* is written without acute e.

³ Wallis (ed.) 1956, pp. 91–3; White 1987, p. 47.

⁴ It is unclear whether *kombe* was used against humans. Livingstone claimed that it was only used to poison game and that the arrow poison used to kill men was obtained from a small caterpillar. Fraser 1872, p. 140. It appears that in early Euro-African discussions in Central Africa, poisons were treated as secretive substances, and discussion of them was characterised by rumour and deliberate disinformation.

⁵ Livingstone to Kirk 4 January 1858, in Foskett (ed.) 1964, p. 30; Dritsas 2010, pp. 71–3.

Kirk also collected a number of poison-tipped arrowheads. According to Livingstone Kirk kept his toothbrush in a pocket that contained 'a little of the poison'. After brushing his teeth one day Kirk experienced a bitter taste in his mouth and soon noticed that his pulse had slowed. This was not an unwelcome outcome as he had been suffering from a 'cold' and his pulse rate had been rapid. By the next day he had recovered, but the incident led him to suspect that the ingestion of *kombe* could result in beneficial stimulation of the heart. Kirk contacted Professor Sharpey of University College London (a friend of Kirk's father) and in 1863 provided him with samples for analysis.⁶

Horace Waller (of the UMCA mission to Shire) also gave Sharpey samples of *kombe* that had been obtained from an unidentified chief. Sharpey's early experiments on Kirk's and Waller's samples indicated that *kombe* acted as a cardiac poison or medicine. By 1865 it was believed that an alkaloid resembling strychnine had been isolated from *kombe*.⁷ In Europe, the process of developing a cardiac medicine from *kombe* was under way.⁸

This article discusses how *Strophanthus kombe* (a climbing plant that has been used as a source for arrow poison in eastern and southern Africa since prehistoric times⁹) was 'discovered' by Europeans in Southern Malawi,

⁶ Livingstone and Livingstone 1865, pp. 465–8; Perrédes 1900, pp. 241–6. On Sharpey, see Foskett (ed.) 1965, p. 167, footnote 1. Sharpey, 'the father of British physiology', was an Edinburgh University graduate. Bynum 1994, p. 112.

⁷ Livingstone and Livingstone 1865, pp. 465–8; Perrédes 1900, pp. 241–6. It is conceivable that the chief was Chibisa, to whose village the UMCA moved in early 1862. However, Chibisa himself was killed in early 1863, and Waller's diaries from the period do not mention the poison. White 1987, p. 47; Waller papers, Rhodes House MSS. Afr. 16.4.–5.

⁸ Subsequently it was discovered that the active agent was not an alkaloid but a glycoside. The pharmacological family of digitalis and digitalis-like glycosides was established in the 1880s by Oswald Schmiedeberg. Bonah 2010, p. 206.

⁹ Beentje 2006.

invented as a source for cardiac medicine in Scotland, and turned into a modern mass-produced drug by Burroughs Wellcome & Co. It explores the process by which *S. kombe* was appropriated from Malawi through a network that linked the Shire Valley with medical research in Edinburgh and with the London-based Burroughs Wellcome. Finally, the article discusses the use of both scientific and local knowledge in Burroughs Wellcome's early marketing of drugs derived from the plant.¹⁰

In Cori Hayden's words, 'Bioprospecting is the new name for an old practice: it refers to corporate drug development based on medicinal plants, traditional knowledge, and microbes culled from the "biodiversity-rich" regions of the globe'. Coined in 1992, current usage of the term encompasses an 'ethical' dimension: companies have 'a fragile obligation' to provide compensation to communities whose valuable leads have resulted in pharmaceutical and biotechnological profits.¹¹

As Londa Schiebinger has noted, in terms of plant resource acquisition, today's bioprospecting is similar to the early modern European search for new, profitable drugs. However, before 1992, under international law, global plant resources were generally considered to be 'there for the taking' by whoever had the means to do so. The use of the term bioprospecting in a

¹⁰ At this time, '*Strophanthus*' was frequently used by the British to refer both to various *Strophanthus* plants and to the drugs derived from it. The term *kombe* tended to be used in the 1860s, but from the 1870s most writers referred to *Strophanthus*. The distinction between *S. kombe* and *S. hispidus*, established in 1890, was rarely made in common use.

In this article, '*kombe*', '*Strophanthus kombe*' or '*S. kombe*', refer to the plant from Malawi, whilst '*Strophanthus*' refers to the plants of the *Strophanthus* genus more generally. The early Burroughs Wellcome drugs are referred to as '*Strophanthus* drugs' (the first crude preparation sold by Burroughs Wellcome was called 'Tincture of *Strophanthus*'). 'Strophanthin drugs' is used to refer to all Strophanthin-based drugs.

¹¹ Hayden 2003, p. 1.

historical enquiry therefore requires care: in the nineteenth century (as was the case in the early modern era), ‘the spoils of green monopolies fell to those who could police them.’¹² Following Abena Dove Osseo-Asare, in this article ‘bioprospecting’ is used ‘retrospectively to describe earlier forms of exploration for new medicines and crops similarly dependant on remote biological resources, scientific research, local knowledge and market-driven outcomes.’¹³

Strophanthus plant seeds from Africa were first introduced to Europe around 1800. *Strophanthus kombe*, its use as an arrow poison and its stimulant effects on the heart became known after Livingstone’s Zambesi expedition.¹⁴ This article focuses on this particular strand of the history of *Strophanthus* plants and the substances derived from them.

In her fascinating study of *Strophanthus* from Ghana, Osseo-Asare has pioneered research into colonial ‘bioprospecting’ in Africa. Ghana (Gold Coast) became, for a period in the 1910s and 1920s, the most important centre in the British *Strophanthus* trade. This was, in part, due to the temporary halt in *Strophanthus kombe* exports from Malawi in 1915 that resulted from the Chilembwe Rising. In Ghana, unlike Malawi, poisoned arrows had played an important part in African resistance against colonial occupation, and at an early stage the colonial administration in Ghana had banned African possession of poisoned arrows.¹⁵

¹² Schiebinger 2004, pp. 16–17, 73.

¹³ Osseo-Asare 2008, p. 272.

¹⁴ Bonah 2010, p. 206.

¹⁵ Osseo-Asare 2008.

Christian Bonah has written an important micro-history of Strophanthin (the active ingredient of *Strophanthus*) as part of the processes of evaluation and standardization of drugs in the early twentieth century. Strophanthin was not a ‘magic bullet’: it was a valuable, ‘normal’ drug for Western medicine and pharmacology. However, from the 1870s, (while it was being developed as a cardiac medicine) it became ‘a standard preparation for studying the pharmacological and physiological action of the digitalis group on the hearts of frogs and higher mammals’ and an ‘indispensable tool for laboratory experiments on isolated heart function’. Strophanthin retained its importance in cardiac investigations for two generations of physiologists.¹⁶

In the economic history of Malawi, *S. kombe* features as a minor export.¹⁷ However, in order to understand the history of the plant and the medicines derived from it, one needs to move beyond narrow economic assessments and consider its place within broader contexts, particularly the histories of colonialism, medicine, and ‘bioprospecting’. This article seeks to consider these contexts through a case study of imperial networks, knowledge-production and the question of ownership of *Strophanthus kombe* from Malawi. It considers the operation of colonial knowledge-production and acquisition of resources: how useful substances were named, appropriated and transferred from Africa to the West, how they were transformed into products, and what roles various agents played in these processes.

¹⁶ Bonah 2010.

¹⁷ Baker 1971 in Smith et al (eds), pp. 96–7.

Pharmaceutical anthropologists have provided valuable insights into the social lives of drugs.¹⁸ Inspired by these approaches, historians can follow the trail of invention, production and use of medicines in the past. In the history of colonial medicine, attention to such trails may prove useful in enabling us to cross many boundaries of historiography.¹⁹

The concepts 'mobility' and 'network' require particular attention. In science studies, as Hayden points out, there has been a focus on the ways in which 'knowledge is constituted *in travel* across domains both geographic and institutional'. The idea of a network, in turn, comprises 'more or less robust constellations of people, things, institutions, and interests that literally constitute scientific knowledge and artefacts.' In her seminal study of bioprospecting in Mexico, Hayden argues that 'it is the job of ethnographers of science to make them [the networks] visible...to trace outward the webs of relationships and objects through which knowledge about nature is granted the status of fact.'²⁰

Colonial knowledge was essentially constructed and constituted '*in travel*'. This article, following Hayden's lead, will trace the particular historical network (with notable Scottish and Malawian elements) that made possible the acquisition of *S. kombe*, the isolation of Strophanthin and the commercial production of Strophanthin drugs. This network connects the history of local-level colonial 'bioprospecting' in Central Africa with the developments in medical research and pharmaceutical enterprise in the West. For its part, this

¹⁸ Whyte, van der Geest & Hardon 2002; Whyte and van der Geest 1988.

¹⁹ See, for example, Hokkanen 2010, p. 154.

²⁰ Hayden 2003, p. 9.

article can be read both as a prequel and as a companion piece to recent studies by Osseo-Asare and Bonah.

Medicine, Imperialism and ‘Bioprospecting’: European Expansion and the Hunt for Medicines from the Tropics

The commercial search for exotic medicine has a long history. The European appetite for medicines, dyestuffs and foods from the tropics was clearly evident from the early modern era.²¹ In the early nineteenth century, French scientists distinguished themselves by isolating active ingredients from known poisons and medicines (which were largely of tropical origin). These active agents were then further refined in laboratories and eventually utilised in more effective forms. Francois Magendie and Pierre-Joseph Pelletier isolated strychnine from an Indian tree (*Strychnos nux-vomica*) and emetine from ipecacuanha (a medicinal plant from Brazil that had been used to treat diarrhoea). Morphine was isolated from opium and quinine from the ‘Peruvian bark’.²² Of these alkaloids, quinine was to have particular significance for imperialism during the second half of the century.

In the nineteenth century, malaria presented a major obstacle to European attempts to reach the African interior. Quinine was to provide a crucial solution to this problem.²³ However, quinine was more than just a simple ‘tool of the

²¹ Drayton 2000, pp. 67–77; Schiebinger 2004.

²² Weatherall in Porter (ed.) 2009, pp. 255–7.

²³ Headrick 1981.

Empire': it was, in Richard Drayton's words, 'a European fetish, a symbol of the power of science to put nature on the side of imperialism'.²⁴

The relationship between the development of western medicine and nineteenth-century imperialism is by no means straightforward, but medicine and imperialism were intertwined in important ways.²⁵ Imperialism and medicine were mutually beneficial both ideologically and politically. The idea that Christian western countries were more advanced and civilised than other societies was crucial to the justification of imperialism. Science and technology were, alongside Christianity, seen as the most important proofs of this superiority. Medicine was particularly valuable in this respect, as it seemed to provide irrefutable evidence of how western countries could (and would) advance the well-being of their colonial subjects.²⁶

Western medicine was usually represented as vastly superior to that of other cultures, and African medicine was arguably most seriously denigrated of all.²⁷ However, at the same time, many Europeans in Africa were also extremely interested in local medicines and other useful plants and sought to identify, collect and send samples back to the metropole for further research. Imperial hubris did not eradicate the western tradition of searching out and appropriating medicines from indigenous populations.²⁸

²⁴ Drayton 2000, p. 208.

²⁵ The marked decrease in the mortality rate among western troops in the tropics during the nineteenth century was largely the result of medical and public health advances. Curtin in Arnold (ed.) 1996, pp. 99–107.

²⁶ See, for example, Bynum 1994, pp. 146–148; Cunningham and Andrews 1997.

²⁷ The popular western image of the African healer as a 'witch doctor' was a prime example of this. See, for example, Hokkanen 2004.

²⁸ Arnold 1993, pp. 58–60; Hokkanen 2007, pp. 357–60; Osseo-Asare 2008, pp. 270–1.

The 'discovery' of *Strophanthus* and the development of Strophanthin took place in an era of accelerating change in Western medicine and pharmaceutical production. In the 1870s, most apothecaries' prescriptions were based on medicinal plants. Research into morphine and other alkaloids, as Church and Tansey have pointed out, 'signalled the origins of modern pharmaceutical investigation and manufacture'.²⁹ The discovery that coal tar yielded medicinal chemicals, and that these could be synthesised, was another major discovery for modern pharmaceutical production. Further revolutionary change took place in the 1870s and 1880s as a result of research into micro-organisms. The germ theory of disease, together with major developments in chemistry and laboratory methods, fundamentally altered medical and pharmaceutical research during the period in which Strophanthin drugs were developed.³⁰

From Arrow Poison to Cardiac Medicine: *Strophanthus*

***Kombe* from Malawi**

In 1870 Thomas Fraser (Professor of Materia Medica, the University of Edinburgh) began research into *kombe*, or *Strophanthus* as it was now commonly called. (Fraser initially believed that his samples from Central Africa were *S. hispidus*. However, by 1890 it was established that they had been *S. kombe*.) After fifteen years of experiments, Fraser introduced 'Strophanthin' as a potential cardiac medicine in 1885. Fraser's work had been delayed, in part, by the difficulty of obtaining more *kombe* from the Shire

²⁹ Church and Tansey 2007, pp. 14–15.

³⁰ Bynum 1994, pp. 164–168; Church and Tansey 2007, pp. 14–15.

valley. However, he was eventually able to secure access to *kombe* seeds through Scottish business and missionary connections in the Malawi region.

Fraser received samples of *kombe* from John Buchanan, a former missionary and the first European settler in the Shire highlands. It seems probable that the Moir brothers, directors of the Glasgow-based African Lakes Company (later African Lakes Corporation; hereafter ALC), also sent him supplies. Both Buchanan and the Moirs were involved in Burroughs Wellcome's subsequent attempts to secure supplies of *kombe* from Malawi. In 1886 the company sent a 'trustworthy agent' to the Shire river. He secured a consignment of *kombe* pods and seeds from a village in which they had been stored. This was the first shipment of *kombe* for commercial use. The same year, Burroughs Wellcome's *Strophanthus* tincture was sold in Britain and the US at 7 shillings an ounce.³¹

Following Fraser's early publication of his research in 1885, *Strophanthin* became widely accepted in the West as a cardiac medicine which operated in a similar way to *digitalis*. However, the number of species of *Strophanthus* proved confusing, and acceptable species included in official pharmacopoeias varied. During the 1890s, only those medicines prepared from *S. kombe* were deemed acceptable by the *British Pharmacopoeia*. *S. kombe* was principally obtained by the British from the Shire valley (which formed part of the British Central Africa Protectorate from 1893). It seems that this region remained the principal source of *Strophanthus* imported into Britain until 1915. For the first

³¹ Fraser 1885; Perrédes 1900, pp. 241–6; Church and Tansey 2007, p. 48.

Consul-General of the Protectorate, Sir Harry Johnston, the rapid 'discovery' and appropriation of *S. kombe* provided a model example of the largely untapped commercial potential of Central African plants.³²

The annual exports of *kombe* seeds from the British Central Africa Protectorate (Nyasaland Protectorate from 1907) fluctuated greatly. Although a record total of sixteen tons of seed (worth £8,000) was exported in 1906, *kombe* remained uncultivated and its significance was minor in comparison with the principal exports of the Protectorate (coffee and, later, tobacco).³³

Malawi–Scotland–London: Imperial Networks in the Search for *Strophanthus*

The 'Scottish connection' in the history of *Strophanthus* began with Livingstone and Kirk. John Kirk (1832–1922) studied medicine at the University of Edinburgh, distinguishing himself in botany at an early stage.³⁴ In Edinburgh, Robert Christison (Professor of Materia Medica and one of Kirk's teachers) and his successor Thomas Fraser showed great interest in medicinal plants and poisons, many of which were obtained from the tropics. Christison studied the effects of poisonous beans obtained from Calabar (which, like the Shire highlands, was a centre of Scottish mission interests) on

³² Johnston 1897, pp. 442–3; Osseo-Asare 2008.

³³ Baker 1971 in Smith et al (eds), pp. 96–7. The market value of *Strophanthus* seeds was extremely variable. Circa 1910, the seeds were reportedly sold in London for about 2/- per lb. *The Handbook of Nyasaland* (1910), p. 33.

³⁴ Liebowitz 1999.

his own heart and circulation. He later wrote an influential study of poisons. Christison, like Sharpey in London, received early *Strophanthus* specimens from Horace Waller. These specimens were passed on to Christison's successor, Fraser, who eventually isolated Strophanthin from *Strophanthus* (and the alkaloid eserine from the Calabar bean).³⁵ In his 1872 paper on *kombe*, Fraser pointed out that the explorers of 'uncivilised tropical regions' had reported the use of various arrow poisons, the most famous of which was South American curare. For Fraser, the investigation of tropical poisons had proved 'of great value' to both physiology and practical medicine. He observed that at least one poison had already been recognised as an 'important medicinal agent'.³⁶

Kirk's recruitment to the Zambesi expedition in 1857 marked the beginning of his imperial career.³⁷ The expedition received the backing of many from British scientific and commercial circles with an interest in the appropriation of any African plants that showed commercial potential. As the expedition's botanist, Kirk was the principal agent in this respect. Among the plants 'discovered' by Kirk during the expedition were a variety of cotton cultivated by the Mang'anja, the *mukundukundu* tree related to *cinchona* (the bark of which was used in the treatment of fever), and *kombe*. An important part of Kirk's work relied on local, usually anonymous, indigenous informants.

³⁵ Fraser 1872, pp. 139–40; Weatherall in Porter (ed.) 2009, pp. 260–1. In late nineteenth-century Britain, the discipline of pharmacology (first called 'experimental therapeutics' by Claude Bernard) developed more slowly than was the case in Germany (Dorpat and Bonn were major centres). Thomas Fraser (1841–1920) was one of the few British professors of therapeutics and materia medica who emphasised the importance of experimentation. Bynum 1994, p. 166.

³⁶ Fraser 1872, pp. 139–40.

³⁷ Dritsas 2010, pp. 62–4.

However, despite this anonymity, traces of local knowledge can nevertheless be found in Kirk's research, as Lawrence Dritsas has pointed out.³⁸

The Zambesi expedition ended ingloriously in 1863.³⁹ Kirk, however, returned to Britain as a successful botanist and hardened African explorer. After working at Kew Gardens for a short period, he was appointed physician to the British consulate in Zanzibar in 1866. He rapidly moved into the political sphere and was appointed Consul-General in 1873. Throughout his career in Zanzibar, Kirk maintained an active interest in botany, cultivating his own botanical garden on the island.⁴⁰

In Britain, *kombe* was viewed as Kirk's 'discovery' and Strophanthin as Fraser's invention. However, the conversion of an arrow poison into a popular drug required pharmaceutical involvement. When Fraser reported the findings of his research to the 1885 British Medical Association annual meeting in Cardiff, his audience included the American businessman Henry Wellcome. Wellcome and his fellow-countryman Silas Burroughs had established the Burroughs, Wellcome & Co. pharmaceutical company in London a few years earlier. Wellcome was keen to find an original product for his new company. After hearing Fraser's lecture, he believed that *Strophanthus* could be that product.

Wellcome (1853–1936) had himself been a 'plant hunter' in the tropics. In the 1870s, as a young representative of an American pharmaceutical firm, he had

³⁸ Dritsas 2010, pp. 122–32.

³⁹ Dritsas 2010; Jeal 1973.

⁴⁰ Dritsas 2010, p. 145; Liebowitz 1999.

spent some time in Latin America searching for *cinchona* trees. (Quinine was to become an important product for Burroughs Wellcome during the following decade, when it was heavily marketed to explorers, missionaries and the colonial armed forces.) Wellcome maintained a keen personal interest in new developments in medicine, pharmacology and botany, and was well aware of potential of the tropics to yield new medicines. After a long conversation with Fraser, he wasted no time in ordering *Strophanthus* pods from Zanzibar. When this shipment was spoiled in transit, Wellcome sent an agent directly to the Shire in 1886. The Zanzibar sample had been sent to Wellcome by Kirk, who also passed on contact details for the Moir brothers. For his part, Fraser provided Wellcome with the formula for producing Strophanthin and advised him on further development of the drug.⁴¹

Malawi of 1886 was still largely under African control. Only a handful of Europeans, mostly Scots, operated in the country, primarily in the service of two Scottish missions (Livingstonia and Blantyre) and the ALC (run by the Moir brothers).⁴² In order to accomplish his task, Wellcome's agent must have depended not only on the assistance of Kirk in Zanzibar and existing Scottish networks in Malawi, but also on British–African relationships that had been cultivated within the Shire valley since the departure of Livingstone's expedition.

⁴¹ Henry Wellcome to Thomas Fraser 19 June 1885. Wellcome Archives (hereafter WA), AMS/MF/161, Henry Wellcome Letter Book 1. Wellcome Library, London; Church and Tansey 2007, pp. 13–14, 47–48; James 1994, p. 125.

⁴² The African Lakes Company – whose early aim was to replace the Central African slave trade with 'legitimate' trade in ivory and other goods – was founded in 1878. The ALC was initially closely connected to the Scottish missions in Malawi. McCracken 1977; MacMillan 1970.

Although Wellcome's agent could have received *kombe* from the Mang'anja (or the Yao), it is probable that it was obtained from – or with the assistance of – Makololo chiefs. They had entered the region with Livingstone in the 1850s, settled in the Shire valley and, with the assistance of firearms, carved out their own chiefdoms. The Makololos called themselves 'the English' and proudly maintained their ties with the British. During the 1870s and 1880s, they assisted many Europeans who arrived in the area. By this time, the valley was effectively under Makololo control – the old Mang'anja chiefdoms having collapsed – and ivory and oil seeds were being traded with European companies. Prominent amongst these companies was the ALC, which had established a dozen trading stations from the mouth of the Zambesi to the north end of Lake Malawi.⁴³ The trade in *kombe* seems to have been linked with the ivory trade – *kombe* was associated primarily with hunters – and Chibisa, the Makololos and the ALC all traded in ivory.

It is possible the agent employed by Wellcome in 1886 was John Buchanan, a central figure in Scottish networks in Malawi. Buchanan was certainly mentioned in the early correspondence between Wellcome and Fraser. Formerly a mission horticulturist who first arrived in the region in 1876, Buchanan's lay missionary career had ended in the early 1880s when he was implicated in the 'Blantyre Scandal'. In 1886, Buchanan began to experiment with coffee and various other crops in Zomba (where he and his younger brothers subsequently established the Buchanan Brothers Company). Buchanan was a key figure in the establishment of a British Protectorate in

⁴³ White 1987, pp. 75–7.

the region and advised Harry Johnston, the first Commissioner, in various capacities. (In fact, it was Buchanan who, acting upon Johnston's instructions, first declared a Protectorate over the Shire highlands in 1889.) Buchanan was appointed Acting Consul, Vice-Consul, and magistrate, and signed the first British treaties with African chiefs in Malawi (including a treaty with the Makololo chiefs in 1892).⁴⁴ By 1886, Buchanan had some knowledge of local conditions and competence in two vernacular languages (chiNyanja and chiYao) of Southern Malawi. His comparatively advanced local knowledge made Buchanan a valuable agent for both imperial and pharmaceutical interests.⁴⁵

Buchanan certainly provided *Strophanthus* seeds to Burroughs Wellcome. In the late 1880s his *Notes on Strophanthus* was used as a circular to support the company's marketing of the drug. This pamphlet was a printed copy of a letter originally addressed to Wellcome that was reproduced and distributed in order to highlight the authenticity of the drug. Significantly, Buchanan wrote about local perceptions and usage of *kombe*. He argued that it was 'the most powerful poison the natives possess'. He believed that there were several species, or at least varieties of the plant, but admitted that

At present, information relative to these varieties is scant and unreliable, I have not been able to see the varieties in their native

⁴⁴ Johnston to Sir Percy Anderson 24 March 1896. NA/FO 2/106, 197–199. Buchanan organised the early customs, revenue and postal arrangements in the Protectorate. Baker 1970, pp. 19, 28. The 'Blantyre Scandal' ensued when the news of missionaries' use of corporal punishment (including floggings and in one case, execution) reached Britain. Hokkanen 2007, pp. 258–260.

⁴⁵ In Buchanan's obituary he was hailed as 'almost the best Yao linguist that this country has yet produced'. *British Central Africa Gazette*, 1 April 1896.

habitat, and the natives themselves do not agree – many of them maintaining that there is no toxic difference between them.⁴⁶

Buchanan revealed that he had no first-hand knowledge of the varieties of *Strophanthus*. As far as he knew, the plant only grew at low altitudes and not in the highlands.⁴⁷ This was arguably a significant factor in limiting European knowledge of and access to *S. kombe* (and conversely meant that African intermediaries would be crucial in its appropriation): low ground was regarded as being extremely unhealthy for Europeans, who as far as possible established their bases at higher altitudes. (Buchanan, for instance, established his plantation on the slopes of Mount Zomba.) It seems that from the 1860s to the 1910s, *kombe* seeds were still being gathered from the area that had formerly surrounded Chibisa's village. During the early 1900s the seeds were reportedly obtained largely from 'Chief William's country', part of West Shire (later Chikwawa) district, an area with little direct European presence. More specifically, it seems that in 1901 the main supply for exported *S. kombe* came from Katunga village, which lay on the Shire. The plant was known to grow in abundance on the opposite side of the river from Katunga, forty miles from Blantyre (the site of the ALC headquarters).⁴⁸

⁴⁶ *Notes on Strophanthus* (n.d.), a pamphlet in Wellcome Foundation papers (hereafter WF), WF/M/GB/01/03, Circular Books 2, 54. This printed letter is anonymous, but it is almost identical to a quote by Buchanan included in *Reports from H.M. Diplomatic and Consular Officers Abroad on Trade and Finance*, 1888 [C.5252], Command Papers, Nyassa/Central Africa, pp. 3–4. Available online via House of Commons Parliamentary Papers Online <<http://parlipapers.chadwyck.co.uk>>.

⁴⁷ By 1910, it had been established that at least three species of *Strophanthus* grew in Malawi: *S. kombe*, *S. ecaudatus* and *S. courmontii*. *Kombe* rarely thrived at altitudes above 1,500 feet. *The Handbook of Nyasaland* (1910), p.100.

⁴⁸ Holmes 1901, pp. 486–8 (Newspaper cutting in the Kew Archives ECB/2/1 Africa Arrow Poison 1876–1901); *The Handbook of Nyasaland* (1910), p. 100.

Buchanan described how *kombe* was prepared and employed as an arrow poison. He claimed that game wounded by poisoned arrows died ‘at once, seldom being able to run over 100 yards’. Despite the efficacy of the poison, it was claimed that flesh could be safely eaten after sap from baobab tree bark was squeezed into the wound. As far as Buchanan knew, *kombe* was used only to poison game, not people, though he reported that the locals thought that ‘the people of England are pretty far gone in insanity when they have taken to using “kombé” as a [therapeutic] medicine.’⁴⁹ Whilst Buchanan’s African informants and contacts remain anonymous, they must have played a pivotal role in European acquisition of *kombe* knowledge and seeds. Such contacts may have included the Makololo chiefs based along the Shire, mission associates who spoke English and people directly employed by Buchanan.

Was *S. kombe* used as a curative medicine in the Malawi region? According to Osseo-Asare, *S. hispidus* had both medicinal and poisonous uses in Ghana.⁵⁰ However, it seems that the evidence from Malawi is scanty. Jessie Williamson’s *Useful Plants of Malawi*, which lists a number of plants with medicinal uses from southern Malawi, only refers to the use of *kombe* for poisonous arrows, as do most other sources.⁵¹

There is, however, one fascinating case in the colonial records that suggests that *kombe* was used a powerful *mankhwala* (medicine) in Malawi, although it was not used to heal. When imprisoned by the British during the colonial

⁴⁹ *Notes on Strophanthus* (n.d.), WF/M/GB/01/03, Circular Books 2, 54.

⁵⁰ Osseo-Asare 2008.

⁵¹ Williamson 2005, p. 237.

campaigns of 1892, Chief Msamara attempted to walk out of his prison hut apparently 'quite naked'. It was reported that he had been provided with a powerful medicine, a 'blackish powder contained in an antelope's horn', that was supposed to make him invisible. The medicine horn was confiscated from him, but his attendants later managed to smuggle it back to him. Some time later Msamara was found dead and naked in his hut, clutching his right shoulder. Traces of the powder were found at the scene. Dr Watson examined the body and declared that the cause of the chief's death was a poison that had affected his heart. Msamara's people and the British alike concluded that his death was the result of an overdose of the medicine that had been in the horn. The chief's associates refused to agree to a post mortem examination, insisting that the body should be taken home so that their people would be able to see that Msamara had not been violently slain. However, Watson was able to analyse the remaining traces of medicine and reported that it appeared to have been made from *Strophanthus* seed.⁵²

Assuming Watson's analysis was accurate, it seems that *kombe* was used in Malawian medicine, but in ways that were hidden from the Europeans. *Mankhwala* used to provide invisibility could be seen as an ambiguous medicine in local interpretations, belonging as it did to secretive 'medicine men' or 'witches'.⁵³ However, one cannot fully discount the possibility that this local use of *kombe* as a potent *mankhwala* for invisibility was itself a recent

⁵² *Africa. No.5 (1892). Papers relative to the suppression of slave-raiding in Nyassaland.* [C.6699] Available online via House of Commons Parliamentary Papers Online <<http://parlipapers.chadwyck.co.uk>>.

⁵³ See, for example, Hokkanen 2007, pp. 54–7, 394–9 for further discussion of *mankhwala*.

invention, inspired by the knowledge that *Europeans* were using *kombe* as medicine.

Nevertheless, it is abundantly clear that at the time the British thought that there was no possibility that any African had used the plant medicinally, and this 'fact' compounded the glory awarded to Fraser, the inventor of Strophanthin. As the *Lancet* put it,

It must be satisfactory to him [Fraser] to reflect that he has been enabled to add to our list of remedies an agent which hitherto has been employed only as an instrument of destruction.⁵⁴

Although the African origins of *Strophanthus* were not erased, the assertion that it was the British who (seemingly acting alone) had transformed it into a therapeutic agent fitted extremely neatly into contemporary imperial medical discourse.

Selling *Strophanthus*: Knowledge, Authority and Advertising

Wellcome's search for *Strophanthus* was successful but expensive. In addition to the agent's salary, the pods themselves cost over £20 per lb. For a period, Burroughs Wellcome claimed to enjoy a complete monopoly over the new drug, having bought up all the Central African *Strophanthus* that came onto the market. Burroughs Wellcome's flagship original product was produced under the label 'Tincture of Strophanthus'. However, the drug

⁵⁴ *The Lancet*, 126, 15 August 1885 (No. 3233). Reproduced in WF/M/GB/01/01, Circulars 1884–1891.

required further testing and so, as Burroughs Wellcome did not yet have its own laboratory, it made its tincture freely available internationally to doctors and hospitals for experimental purposes. The initial results in the treatment of cardiac diseases in Britain and the United States were so positive that within a year 'Strophanthine' was officially accepted first in America and then in Britain.⁵⁵

In February 1887, Silas Burroughs wrote to his partner, expressing his excitement about the new drug. By this time, their company had secured control over the supply of *Strophanthus*, and Burroughs was convinced that any residual supplies on the market would run out quickly. In the meantime, Burroughs Wellcome began to place adverts for its tincture in numerous medical journals. Burroughs expressed his view that the tincture (sold in both ½ and 1 ounce bottles) was both reasonably priced and yet still capable of making the company 'a very good profit'. He was keen to capitalise on Fraser's scientific expertise within their advertising and argued that a cheaper alternative to full-page advertisements would be to offer to supply a copy of Fraser's 1885 paper from the *British Medical Journal* (hereafter *BMJ*) to interested physicians. The company had already employed several chemists to produce Strophanthin. The speed and international scope of Burroughs Wellcome's action is remarkable. Channels for sales of the new drug in Germany had already been established in early 1887, and Burroughs was optimistic that the French 'Pharmacie Central' would agree to manufacture the tincture and sell it under the Burroughs Wellcome label. However, he also

⁵⁵ Church and Tansey 2007, pp. 47–8; James 1994, p. 125; Osseo-Asare 2008, p. 280.

highlighted the risks involved in the production of the tincture: there had been an explosion in one laboratory during the process of extracting fat from *Strophanthus*. Burroughs concluded that the work was ‘too dangerous’ and was more than happy to let quinine manufacturers, including a Mr Whiffin, take care of the fat extraction process.⁵⁶ The early manufacture of *Strophanthus* drugs was closely linked to the production of quinine – one of Burroughs Wellcome’s main products at the time.

Burroughs Wellcome made extensive use of medical and scientific literature, above all Fraser’s articles, in their advertising. From early 1886, excerpts of Fraser’s 1885 paper were printed for circulation and were accompanied by reprints from the *Lancet* and the *BMJ*. (One advertising circular ended with a note that, ‘at an extravagant cost’, the company had secured a limited supply of *Strophanthus* from Central Africa. Although the price of the tincture was not specifically mentioned, a promise was made that this would be reduced once further supplies were received.) The company later used Buchanan’s ‘Notes on *Strophanthus*’ alongside further quotes from other scientific papers.⁵⁷ Burroughs Wellcome constructed the reputation of its drug on scientific and local knowledge from Scotland and Malawi. Within its early advertising, the Central African origin of the drug was, in fact, highlighted rather than erased. This seems to reflect the potency of tropical arrow poisons within the popular medico-scientific imagination of Europeans at the time, a preoccupation that largely disappeared in the later colonial era.

⁵⁶ Burroughs to Wellcome 17 February 1887. WF/E/02/01/02/10. Box 71, Correspondence with John Wyeth & Brother 1886–1887. Letter Book 50, Folio 579.

⁵⁷ WF/M/GB/01/01, Circulars 1884–1891, Box 1, 10.

In 1887 a new and improved tincture and tabloid of *Strophanthus* were released onto the markets, having been tested and approved by Fraser. These new products were advertised as being safer, not least because dosage could be regulated more easily. In its marketing materials, Burroughs Wellcome linked itself to Fraser's scientific authority (whilst at the same time making him responsible for the drug). Considerable emphasis was placed upon the use of the same original Central African source which Fraser had used in his research. The use of extensive quotations from medical journals remained part and parcel of selling *Strophanthus*. For example, a four-page pamphlet issued in 1891 contained no less than five references to comments and articles in British journals.⁵⁸

As a novel drug, *Strophanthus* was used to treat a variety of other ailments, in addition to its principal function as a cardiac medicine. Sweetened with syrup, it was given to children suffering from 'nervous asthma' and pneumonia, among other complaints.⁵⁹ One of the more curious uses of the drug was in the treatment of alcoholics. In the early 1890s, a Scottish doctor reported how he had used an injection of 'strychnia' and *Strophanthus* in order to provide relief to recovering whisky addicts.⁶⁰

Strophanthus was Burroughs Wellcome's first original drug, and its launch and success bolstered the company's rapid growth during the late nineteenth

⁵⁸ *Strophanthus*. 9 June 1891. WF/M/GB/01/03, Circulars Book 2, 98. The journals were *The Practitioner*, *British Medical Journal*, *Edinburgh Medical Journal* and *The Lancet*.

⁵⁹ Church and Tansey 2007, pp. 47–8; James 1994, p. 125; Osseo-Asare 2008, p. 280.

⁶⁰ *Departmental committee on habitual offenders, inebriates &c. (Scotland). Report from the departmental committee on habitual offenders, vagrants... 1895. [C.7753-1]*, p. 334. Command Papers. Available online via House of Commons Parliamentary Papers Online <<http://parlipapers.chadwyck.co.uk>>.

century. According to Wellcome's biographer, R.R. James, the experience of working with *Strophanthus* 'emphasised again to Wellcome the necessity of having his own research laboratories'.⁶¹ Whilst there had been some research within Burrough Wellcome's factory from the outset, separate, advanced laboratories were established only after Wellcome assumed sole control of the company. The first of these, the Wellcome Physiological Research Laboratories, were established in 1894 in order to develop the serum anti-toxins, the 'wonder medicines' of the era. The research laboratories (a total of four were founded during Wellcome's lifetime) were the first of their kind within the pharmaceutical business, and they played a crucial part in the rise of Burroughs Wellcome to a leading position in the British pharmaceutical market.⁶²

Seizing and Identifying *Strophanthus*: Concerns and Contests

The early response to *Strophanthus* drugs, whilst often enthusiastic, was not unequivocally positive. Many doctors who experimented with *Strophanthus* found shortcomings in its use or efficacy and so digitalis retained its place as the leading cardiac tonic.⁶³ In December 1886, the *BMJ* warned that 'distressing symptoms' had been reported in a number of cases in which *Strophanthus* had been administered. The journal emphasised the importance of using the same species of *Strophanthus* as had been investigated by Fraser.⁶⁴ A major problem with *Strophanthus* was the varying quality of the seeds, further complicated by the discovery that the *Strophanthus* genus was

⁶¹ James 1994, p. 125.

⁶² Church and Tansey 2007, Chapter Six and *passim*.

⁶³ See, for example, Dr Pope's assessment in the *BMJ*, 1889, 1, 23 February (No. 1469), p. 419; Osseo-Asare 2008, pp. 281–2.

⁶⁴ *BMJ*, 1886, 2, 25 December (No. 1356), pp. 1277–8.

far more diverse than had previously been thought. In 1887 Burroughs Wellcome felt the need to reassure its clients that it only used seeds (rather than other parts of the plant) of the same species and from the same source as those used by Fraser.⁶⁵

In 1890 E.M. Holmes (Lecturer of Materia Medica in the University of London and Curator of the Museum of the Pharmaceutical Society) emphasised the difference between East (Central) African and West African *Strophanthus* seeds. As it was established that *S. hispidus* (West Africa) and *S. kombe* were distinct species and as the West African seeds had not been tested by Fraser, it was argued that *S. hispidus* should not be used in preparation of the drug.⁶⁶

Consequently, of all the species of *Strophanthus*, only the seeds of *S. kombe* were officially recognised in Britain as being a legitimate source of Strophanthin. This arguably was to the advantage of Burroughs Wellcome, who retained its connection to the 'original' source of the drug in Malawi. The company went on to employ Holmes, now the leading authority in the field, to analyse different varieties of *Strophanthus*. For a time, particular value was attached to Malawian *S. kombe*, which the ALC was in a strong position to export. (Buchanan and his younger brothers had died in the mid-1890s.) In 1901, the ALC offered its own 'Strophanthus Mandala Brand' to Burroughs

⁶⁵ In 1886 some druggists, including Christy and Co., were apparently using the whole plant. *BMJ*, 1886, 2, 23 October (No.1347), p. 769.

⁶⁶ *BMJ*, 1890, 2, 4 October (No. 1553), *Supplement to the British Medical Journal*, pp. 6–7. Holmes was given credit for distinguishing *S.kombe* from *S.hispidus* in 1890. Today it seems that *S. kombe* occurs naturally in large parts of eastern and southern Africa. The genus *Strophanthus* comprises 38 species, 30 of which occur in Africa. Beentje 2006.

Wellcome. Although very interested in the seeds, Wellcome was anxious that their quality should be carefully assessed by Holmes.⁶⁷

The early history of Strophanthin drugs has to be placed in the context of increasing standardisation and evaluation of therapeutic agents in the late nineteenth and early twentieth century. The late nineteenth century witnessed a gradual shift in the responsibility for the quality of the drugs from individual apothecaries to pharmaceutical businesses, disciplinary communities of scientists and the state. From the 1890s onwards, government institutions were increasingly interested in the efficacy of drugs, and various regimes of quality control, both private and public, were developed.⁶⁸

S. kombe from Malawi was a problematic source for Western pharmaceutical companies. There were many similar-looking varieties of the plant, and it was difficult to ensure that the seeds in a given shipment were indeed *kombe*.⁶⁹ As a poisonous substance, it required careful regulation and control. Concerns about the early Strophanthin drugs were twofold: a given dose could either be ineffective or have harmful effects.

Whilst the origins and quality of *Strophanthus* seeds continued to be a concern in the metropole, contests emerged between colonialists in Malawi over the access to the plant. In 1901 the ALC was taken to court in British

⁶⁷ Henry Wellcome to F.M. Moir 3 January 1901. Burroughs Wellcome & Co. WA, AMS/MF/180, Private Letter Book 5, 820.

⁶⁸ Gradmann and Simon 2010, pp. 1–10. The development of diphtheria antitoxin (introduced in 1892–1894) was a crucial part of these processes.

⁶⁹ In 1904, a chemical analysis identified different types of Strophanthin (k-Strophanthin, g-Strophanthin and h-Strophanthin) that derived from at least three subspecies (*S. kombe*, *S. gratus* and *S. hispidus*). Bonah 2010, p. 218.

Central Africa by two businessmen settlers, Pettit and Cox. Pettit had sent his African subordinates to obtain *kombe* from land controlled by Chief William. However, his four *kapitaos* were arrested by ALC men and driven out from the area. During the court hearing, the ALC claimed that it had agreed a contract with Chief William (dated 2 August 1900) under which they were guaranteed right of monopoly over the gathering of *kombe* from William's land. The judge ruled that such rights had never been the chief's to relinquish in the first place. It is just possible that the contract could have been found valid had it related to cultivated produce, but Chief William was certainly not seen to have any rights over *kombe*, a wild, gathered plant.

Thus, in principle, Pettit or any other resident of the protectorate had the right (guaranteed under English common law) to 'purchase or otherwise obtain' *kombe*. Although Chief William was a descendant of the Makololo, in the judge's eyes this merely weakened his case – the Makololo were themselves regarded as recent invaders.⁷⁰

The Makololo chiefs had ceded their sovereign rights and the legal ownership of their lands in the treaty with John Buchanan in February 1892. In what today seems a bizarre ruling, the judge held that 'a native of the British Central Africa Protectorate is neither a British nor a British protected subject and apparently is in theory a foreigner'.⁷¹ Thus, the common law right to buy *kombe* in Malawi actually applied only to the British.

⁷⁰ Kew Archives. Miscellaneous Report (MR) Nyasaland: Botanic Station c. 1878–1905.

Newspaper cutting dealing with the case from *The Central African Times*, 27 July 1901.

⁷¹ *British Central Africa Gazette*, 31 July 1901.

Conclusion

Strophanthus plants were known to yield effective poisons in both East-Central and West Africa. Europeans – with the help of Africans – appropriated the plants, partially renamed them and processed them into pills, injections and laboratory preparations.⁷² During this process, African agency and local knowledge of *Strophanthus* plants were largely eroded.

However, elements of local knowledge and the origin of *kombe* can be found in Burroughs Wellcome's early advertising. Arrow poisons were acknowledged exotic products, and Burroughs Wellcome built on this exoticism as well as the scientific expertise of Fraser. The company emphasised the Central African source of its seeds, the supply of which had been secured thanks to the 'Scottish connection'. When doubts were raised about the quality and efficacy of varieties of *Strophanthus* seeds, the British policy of recognising only *S. kombe*, as valid for pharmacological purposes, arguably served the interests of Burroughs Wellcome over those of its competitors.

By tracing the particular network surrounding *Strophanthus kombe* we can link mobile imperial agents with colonial relationships in the Shire valley, medical

⁷² A fuller history of varieties of *Strophanthus*, their medicinal uses, and colonial pharmaceutical knowledge-production would require a broader study of major European imperial powers and their respective African colonies. In the early 1900s the Germans became increasingly powerful in the *Strophanthus* market. Meanwhile, the range of Strophanthin products diversified. Before the First World War, German scientists developed a Strophanthin injection that could be used in the treatment of cardiac and circulatory disorders. Osseo-Asare 2008; Bonah 2010. The use of various Strophanthins as cardiac medicines reached its peak between 1950 and 1970. Beentje 2006.

scientists from Scotland (and elsewhere) and Burroughs Wellcome. Making this network as visible as possible, enables us to contextualise the plant, the poison and the medicine through the people, institutions, sites and actions that (in the sense used by Hayden and others) ‘constituted’⁷³ *kombe*, *Strophanthus* and Strophanthin. Hopefully, this case study has opened up some new avenues for further historical exploration of colonialism, medicine and ‘bioprospecting’.

Through this network, we have located new agents and more well-known actors (Kirk, Fraser and Burroughs Wellcome) and highlighted the connections and relations between them. It would be an exaggeration to claim that the development of *Strophanthus* alone was crucial for the later commercial success of Burroughs Wellcome. However, it is important to place the company’s successful development of its first original drugs in the contexts of both colonial ‘bioprospecting’ and the new, emerging connections between medical research and pharmaceutical businesses that made the innovation of *Strophanthus* drugs possible.

In Burroughs Wellcome’s enlistment of the medico-scientific community (in advertisements for *Strophanthus* drugs and in discussions in the medical press) we can trace connections between experimental science, medical practice and pharmaceutical business. In this process, the Central African origin of the drug remained important, but the site of origin was increasingly confirmed in the laboratories of the West.

⁷³ Hayden, 2003, p. 9

In Malawi, John Buchanan and the ALC were crucial colonial intermediaries for early *Strophanthus* acquisition. Buchanan benefited as an early agent of Burroughs Wellcome, a potentially lucrative sideline for the new planter. He also secured some of the early contracts which ensured that in Malawi questions of ownership of *Strophanthus* (like other economic resources with global market value) were, in the end, governed by British legislation.

The ALC, which had been struggling in the 1880s, also benefited. The company played an important role in the export of *kombe*, building on its pre-existing trade relationships in the Shire valley, particularly with the Makololo. Subsequently, it strove to establish a monopoly over the plant and resorted to force to maintain its control. In early colonial Central Africa, the question of plant acquisition rights was largely determined by ability to seize and police territory. Although in 1901 the ALC lost its short-lived monopoly, the same legal proceedings seem to have buried any possibility of African ownership rights over *kombe* within colonial Malawi. The issue of right of access to *kombe* in British Central Africa was a question of physical property and natural resources: the issue of 'intellectual property' was not involved.

In public images of colonial healing, Europeans always treated Africans, never vice versa – even though under some circumstances early European colonialists had been known to use African medicines.⁷⁴ However, the question of whether *kombe* was used as a therapeutic medicine in pre-

⁷⁴ For examples in Malawi, see Mackenzie 1925, pp. 270–1.

colonial Malawi remains open. From a modern point of view, if the plant had no medicinal use before Fraser's invention, any indigenous claims for intellectual property rights would be weakened (although, with justification, the colonial seizure of plant resources could be retrospectively called 'biopiracy'). Thus far, there is no evidence of arguments between Africans and Europeans about the ownership of *kombe* or about local knowledge of it in Malawi.

Significantly, in the colonial court, the British noted and chose to capitalise on the Makololo's status as recent invaders of the Shire valley. Several nineteenth-century African invasions had preceded the European one. Arguably, in the case of *kombe*, African struggles over resources in Southern Malawi precipitated, in part, the European acquisition of the plant. The 'discovering' and seizing of *kombe* must be placed in the context of the conflicts in the region during the 1850s and 1860s and the ascendancy of the Makololo as a local elite that thrived on increasing trade with Europeans. The Makololo connection can be traced in the earlier history of *kombe*; they allied themselves with Chibisa, whose people knew of the poison, and went on to succeed him and Mang'anja chiefs as the rulers of the valley. They traded in ivory with the ALC from the late 1870s, and in all probability early Malawian networks for *kombe* collection were built on these pre-existing connections. The chiefs of the Shire valley and various *kapitaos* were clearly involved as intermediaries of the *kombe* trade around 1900. It is harder to establish the identities of the people who actually gathered the poisonous plant, let alone establish what payment (if any) they received for their services.

In this study of a historical network, many agents remain nameless. Only traces of African knowledge and experience surface in this narrative – such as the name *kombe* and Chief William’s discredited rights. Chiefs William and Chibisa are, thus far, the only Malawians that we can positively identify as having been involved in the early acquisition of *kombe*. Otherwise, in the colonial sources, African involvement has been largely relegated to the exotic and sensationalised image of the poisoned arrow.

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