

Endogenous Colonial Borders: Precolonial States and Geography in the Partition of Africa

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Abstract

We revise the conventional wisdom that Africa's international borders were drawn arbitrarily. Initially, ignorant Europeans sought to unilaterally carve up Africa. However, amid negotiations that spanned decades, Europeans interacted with African rulers to learn about and adjust to realities on the ground. The rough boundaries of precolonial states and salient geographical features (especially rivers and lakes) created focal points for self-interested Europeans to form borders and settle disputes among themselves. To test our new theory, we compiled continent-wide spatial data on precolonial states, and we substantiate our hypotheses with a statistical analysis of grid cells. We also examine treaties and diplomatic correspondences for every bilateral border and precolonial state. We conclude by suggesting that the common focus on borders misunderstands why colonial state formation was harmful. Colonial and contemporary states combine numerous peoples without a shared political history and are largely artificial, although the borders between these states are not.

Keywords: Africa, borders, colonialism, geography, precolonial states

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1 INTRODUCTION

Western colonial rule shaped contemporary political dynamics in Africa. One widely discussed legacy was to create the continent’s modern political map. To this day, the colonial borders are almost entirely intact. As Herbst (2000) contends, “the boundaries were, in many ways, the most consequential part of the colonial state.”

The conventional wisdom is that Europeans unilaterally drew arbitrary borders that reflected their ignorance of local conditions. For this reason, colonial state formation in Africa contributed to negative post-colonial outcomes such as frequent conflict (Englebert, Tarango and Carter 2002; Michalopoulos and Papaioannou 2016; Goemans and Schultz 2017), low economic development (Alesina, Easterly and Matuszeski 2011; Michalopoulos and Papaioannou 2013), and divisive political identities (Posner 2004; Robinson 2016).¹ Existing accounts of and references to European colonialism in Africa routinely make two specific claims about arbitrary borders:

Claim 1. Process. The seminal event for African border formation was the 1884–85 Berlin Conference. Self-interested European powers, who lacked knowledge about local conditions, carved up the continent with the primary goal of minimizing conflict among themselves.

Claim 2. Outcomes. This process resulted in arbitrarily designed borders that neglected local features. Ethnic groups and historical states were partitioned via an as-if random process, and many borders were straight lines.

For example, Michalopoulos and Papaioannou (2016) provide the most rigorous statistical evidence to date and conclude: “With the exceptions of the land mass of the historical ethnic homeland and the presence of lakes, there are no significant differences between split and non-split homelands along a comprehensive set of covariates . . . These results offer support to a long-standing assertion within the African historiography regarding the largely arbitrary nature of African borders, at least with respect to ethnic partitioning.” Consequently, they interpret the Scramble for Africa as a “‘quasi-natural’ experiment” (1803). A recent textbook cites Michalopoulos and Papaioannou’s

¹Braun and Kienitz (2022) review the broad literature on the political consequences of borders.

evidence as establishing “the arbitrariness—statisticians would say as-if randomness—with which borders were drawn in Berlin ...” (Christensen and Laitin 2019). Herbst’s highly cited work on colonial border formation in Africa supports the view that “[t]he arbitrary division of the continent by the European powers [exhibited] little or no respect for preexisting social and political groupings, or even, sometimes, for ‘natural’ geographical features” (Herbst 1989, 675; see also Herbst 2000, ch. 3). Englebert (2002, 85-88) asserts that cases in which precolonial kingdoms and states were partitioned were “not exceptional,” and lists various examples.²

In this paper, we revise the conventional wisdom that Africa’s borders were, in general, drawn arbitrarily. Despite intense interest in African border formation and its consequences, the literature exhibits a crucial gap: the absence of systematic evidence about how colonial borders were actually formed. We begin by highlighting that the Berlin Conference of 1884–85 determined general spheres of influence but few specific borders. Instead, the process of African border formation entailed intense deliberation across multiple decades. European powers were undoubtedly pernicious and self-interested. However, we provide a new alternative theory that contrasts with conventional characterizations. We argue that selfish motives incentivized Europeans to *learn about and adjust to realities on the ground* in order to defend and extend territorial claims. This process yielded borders that routinely incorporated local features, and are thus more predictable than commonly alleged.

In our theory, we explain how precolonial states and major water bodies (rivers and lakes) provided salient features that Europeans could use as focal points to settle disputes over where to draw borders. To minimize intra-European conflict, European powers agreed on the principle of suzerainty: a power that signed a recognized treaty with an African ruler gained *all* the territory within their domain. This encouraged drawing borders around, rather than partitioning, major precolonial states. And because African rulers had greater knowledge of their claimed domains, they sometimes gained openings to influence European deliberations. Elsewhere, European states-

²For similar claims, see Touval (1972); Asiwaju (1985); Englebert, Tarango and Carter (2002); Abraham (2007); Alesina, Easterly and Matuszeski (2011).

men could use salient geographic features as focal points, most commonly major rivers and lakes. Straight-line borders were expedient only in areas that lacked discernible features, in particular low population density areas such as deserts.

We empirically support these hypotheses using a multi-method approach. Quantitatively, we conduct a statistical analysis using square grid cells. We analyze which cell characteristics (e.g., territory governed by a historical state, presence of a river) increase the probability that a border segment lies in that cell. Grid cells enable us to be agnostic about the proper unit of analysis for studying border location, although we also analyze statistical correlates of ethnic partition.

To quantitatively assess hypotheses about precolonial states, we compiled an original spatial dataset based on detailed maps of African regions from Ajayi and Crowder (1985) and numerous additional historical maps for individual states (Appendix A.2 provides details).³ We show that cells containing the edges of a precolonial state are significantly more likely than non-state cells to form part of a colonial border, whereas the interior cells of precolonial states are significantly less likely to contain a border. Finally, we show that cells with rivers and lakes are significantly more likely to contain a colonial border.

Qualitatively, we provide various types of evidence to substantiate our core theoretical contention that European statesmen treated precolonial states and major water bodies as focal points when settling borders. We examined treaties and diplomatic correspondences for every bilateral border in Africa to demonstrate that precolonial states and major water bodies were the main determinant of 62% of borders. We compiled additional evidence about precolonial states. Europeans not only referenced historical states in treaties, but often engaged in diplomatic exchanges to debate the territorial extent of these states. This evidence establishes that colonizers extensively interrogated the limits of historical states, which in turn created agency for African actors to influence the process (see Appendix A.3 for detailed case notes). Furthermore, we assess that the core area

³Our new data represent an important improvement over the commonly used map of ethnic groups from Murdock (1959). We contend that the Murdock data cannot be used to assess the relationship between precolonial states and borders (see Appendix D).

of a precolonial state was partitioned across international borders only in five of the forty-six precolonial states in our dataset. We also demonstrate myriad ways in which water bodies shaped borders.

Our findings reject both a strong and weak version of claims about arbitrary border formation in colonial Africa. The strong version is that local features do not predict the location of African borders. The weak version is that the only features that systematically predict borders are orthogonal to human experiences on the ground. Our findings about precolonial states reject both. The results for major water bodies clearly reject the strong version, and we contend that they reject the weak version as well. In contrast to astronomical lines, major water bodies were intimately related to lived experiences. Some served as bedrocks for precolonial states and civilizations in Africa whereas others delimited their reach. In many stateless areas, water bodies shaped long-distance trade networks for centuries and determined the human and social ecology of the area.

The idea that Africa's international borders are unusually arbitrary is foundational in the literature. Overturning this conventional wisdom provides new insights into a touchstone historical epoch that influenced domestic and international political institutions. Regarding African colonialism and its consequences, many examine how precolonial states affected the directness of colonial rule (Gerring et al. [2011](#); Letsa and Wilfahrt [2020](#); Müller-Crepon [2020](#)). Colonialism is a key intervening period in related studies of the long-term consequences of precolonial states for outcomes such as economic development (Michalopoulos and Papaioannou [2013](#); Dasgupta and Johnson-Kanu [2021](#)), civil war (Wig [2016](#); Paine [2019](#)), and democracy (Baldwin [2016](#); Neupert-Wentz, Kromrey and Bayer [2022](#)). By showing that major precolonial states were very rarely partitioned across different countries, we can better account for their persistence as important elements of colonial governance (indirect rule) and for affecting post-colonial outcomes.⁴ Furthermore, our new geo-referenced dataset of African precolonial states should be a useful resource for scholars.

⁴Although most scholars doubt the relevance of precolonial states for influencing African border formation, some historians explicitly critique this claim and present contrarian examples that resonate with our analysis (Nugent [2019](#), 19-21; Hiribarren [2017](#)).

Our findings are essential for a related strand of colonialism research: many studies leverage the as-if randomness of African borders to assess political and economic legacies.⁵ Although scholarship on individual bilateral borders is usually careful to scrutinize continuities in covariates across their boundary, in general, we cannot evaluate the consequences of a colonial intervention if we do not understand the process that brought it about. This is an important contention in methodological research on natural experiments (Dunning 2012; Kocher and Monteiro 2016) that is sometimes overlooked.⁶ Within Africa, only 20% of bilateral borders are primarily straight lines that neglected local features, mostly in desert areas. Only for these cases can the exact location of the border be safely considered as-if random. This carries implications for empirical research designs, which we discuss in the conclusion. In Appendix B, we provide an extended discussion of the determinants of *each* bilateral border. This provides an important reference for researchers to consult and to make informed decisions regarding whether and how to leverage a particular border for a natural experiment.

In cross-regional perspective, our findings establish that the features used to determine African borders were not exceptional. In this sense, we build on existing international relations research on border formation (Carter and Goemans 2011; Green 2012; Goemans and Schultz 2017). As in Europe, existing states were paramount for determining African borders. Historical states influenced fewer bilateral borders in Africa only because large-scale states did not cover the entire continent. Major water bodies (and mountains) routinely determined borders not only in Africa, but also in Europe and in the United States (both international and state borders). Low population densities are the common denominator between African regions with straight borders (e.g., the Sahara desert) and North American regions with straight borders (e.g., western parts of the United States and Canada). The broader *state formation process* in Africa was undoubtedly different than that in Europe (Herbst 2000), in particular because of greater external influence. The *border formation*

⁵McCauley and Posner (2015) provide a recent review, and Cirone and Pepinsky (2022) review broader research on historical persistence.

⁶See also Jedwab, Meier zu Selhausen and Moradi (N.d.) and Becker (2021) on the non-random allocation of Christian missionaries in Africa.

process, by contrast, was fundamentally similar.

Distinguishing border formation from the broader process of externally imposed state formation offers a new perspective on the harmful legacies of Western colonialism in Africa, a point we develop in the conclusion. European colonizers created artificially large states with fixed borders in a region historically characterized by small-scale polities and territorial fluidity. By combining numerous peoples that lacked a common political history into shared states, the colonial project ensured deleterious human and political consequences. Nonetheless, the borders between African states reflect a negotiated and systematic process that scholars and popular accounts have largely overlooked and misunderstood.

2 IT DIDN'T HAPPEN AT BERLIN

The conventional wisdom on the process of African border formation is simple: it happened at Berlin.⁷ We contest this assertion. We provide quantitative evidence that almost all borders were formed after the Berlin Conference of 1884–85. Instead, the main consequence of the Conference was to spur European powers to sign treaties with African rulers. This required Europeans to learn about and to confront on-the-ground realities. Understanding the *process* of African border formation is crucial because it links directly to *outcomes*. In the remainder of the paper, we establish that Europeans' self-interest in fact led them to systematically take into account various local features when drawing the borders.

According to much existing scholarship, the seminal event for African border formation was the Berlin Conference of 1884–85. Self-interested European powers, who lacked knowledge about local conditions, carved up the continent with the primary goal of minimizing conflict among themselves. For example, Christensen and Laitin (2019) posit that “The infamous Berlin Conference of 1884-85 set administrative boundaries in Africa and granted vast territories to the leading European powers . . . Berlin set the colonial boundaries and determined, in large stretches, the bor-

⁷Katzenellenbogen (1996) inspired the header for this section.

ders of contemporary African states. . . . In Berlin, borders were drawn without regard for existing social groups and, thus, lumped together and partitioned Africa's ethnic groups." Michalopoulos and Papaioannou (2016) extend the timeline for border formation somewhat but offer a qualitatively similar claim about the arbitrary process of African border formation: "During the 'Scramble for Africa,' that starts with the Berlin Conference of 1884–1885 and is completed by the turn of the twentieth century, Europeans partitioned Africa into spheres of influence, protectorates, and colonies. The borders were designed in European capitals at a time when Europeans had barely settled in Africa and had limited knowledge of local conditions. Despite their arbitrariness, boundaries outlived the colonial era." Herbst (1989, 674) summarizes the process similarly: "the borders demarcated by 1904 firmly established the outline of the boundary system that is used in Africa today. The overwhelming importance of imperial military and geopolitical interests in the scramble for Africa meant that the Europeans necessarily ignored factors that are generally considered relevant to the partitioning of land."

The Berlin Conference was undeniably an archetype of European imperialism. At the Conference, "there was no African representation, and African concerns were, if they mattered at all, completely marginal to the basic economic, strategic and political interests of the negotiating European powers" (Asiwaju 1985, 1). Indeed, Europeans were ignorant about basic facts on the ground in this early period, which they admitted themselves. Lord Salisbury of Britain lamented that "We have been engaged in drawing lines upon maps where no white man's foot ever trod; we have been giving away mountains and rivers and lakes to each other, only hindered by the small impediment that we never knew exactly where the mountains and rivers and lakes were" (quoted in Anene 1970).

The problem with the conventional account is that the Berlin Conference was less important than typically claimed. The Conference, in fact, determined few African borders. Several historians have characterized the belief in the importance of the Berlin Conference for determining borders as "a stubborn myth" (Nugent 2019, 18). "Africa was not only not divided at Berlin, but the

subject was not even on the agenda; indeed, the partition of Africa was explicitly rejected by the conference” (Wesseling 1996, 126). The goal of the Conference was instead to keep in check the “fierce race” for colonies that had already begun, which it largely failed to do. “On reflection, the much vaunted Berlin Conference did not really accomplish much of lasting significance beyond international recognition of the Independent Congo State” (Katzenellenbogen 1996, 31).

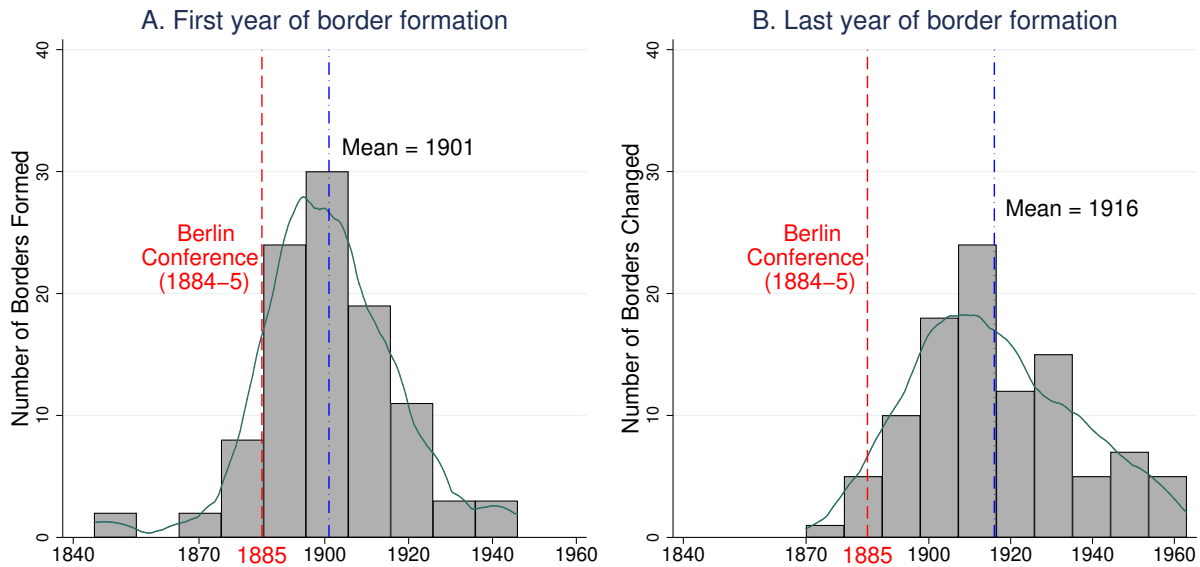
We document quantitatively the later-than-realized timing of border settlements in Figure 1. For every bilateral border, we present data from Goemans and Schultz (2017) on the first year a border was formed and the last year a major revision occurred.⁸ Half of all African bilateral borders were not initially conceived until 1899. On average, the first treaty delineating a bilateral border occurred in 1901, fifteen years after the Berlin Conference (Panel A). On average, the final major revision to each border occurred in 1916, more than thirty years after the Conference (Panel B; median year is 1912). Furthermore, over half of the bilateral borders (54/102) were not settled after the first treaty. On average, it took fifteen years to settle a border (median duration is seven years), and fifteen of the 102 borders took forty years or longer to settle (see Figure E.2).

The Berlin Conference represented *the beginning rather than the end* of the process of border formation in Africa. The Conference carved out some general spheres of influence, but *exactly* where each power would separate their territories remained an issue for future consideration—in part *because* European powers knew so little about the interior of Africa.

The most immediate consequence of the Conference was not to form definitive borders between possessions, but instead to spark a “scramble” to sign treaties or reaffirm relationships with African rulers. This enabled European powers to establish their claims on the basis of what they termed “effective occupation.” “[T]he importance of these treaties lay, for European governments, not in the exchanges between Africans and Europeans but in the documents’ value for European diplomatic relations. These treaties provided the legal cover for European powers to show other European powers that they maintained effective control over certain inland territories, even if the document

⁸We also counted the number of European documents pertaining to African boundaries in each year using data from Brownlie (1979). This exercise yields a similar conclusion as Figure 1 (see Figure E.1).

Figure 1: Timing of Border Formation



Notes: Data on major border changes from Goemans and Schultz (2017). Their dataset contains 168 border segments. We aggregate their border segments into 102 bilateral borders and record the first and last years with major revisions.

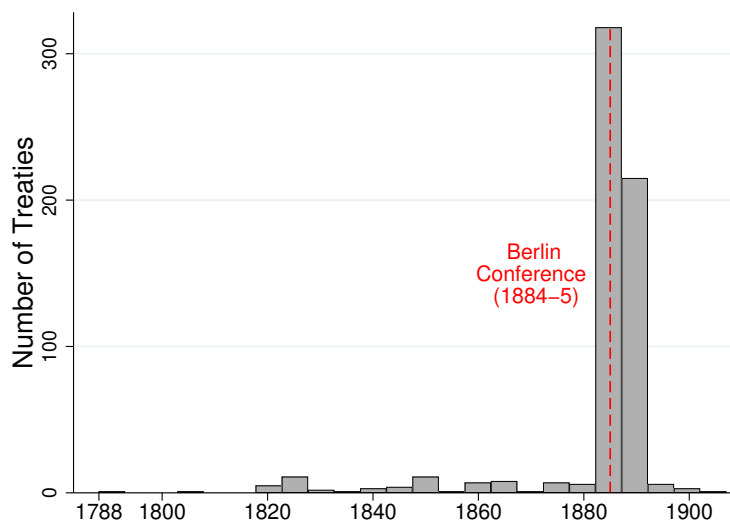
did not accurately describe the situation on the ground” (Carpenter 2012, 116; see also Wesseling 1996, 127-28).

We provide novel quantitative evidence of the frenzy to sign treaties immediately after the Berlin Conference in Figure 2. Britain had engaged in some treaty-making with African rulers between 1808 and 1883, averaging 0.9 treaties per year. This activity spiked in the next decade (59 treaties per year between 1884 and 1893), including a burst in 1884–85 (131 treaties per year).⁹

Europeans gathered information about conditions on the ground while signing treaties, which also enabled Africans to influence the process. We next provide a theory for how this process affected border formation.

⁹Each of the four British colonies with the highest total volume of treaties exhibited a huge spike in treaties during this period (Nigeria, Sierra Leone, Gold Coast, Kenya; see Table E.3).

Figure 2: Anglo–African Treaties, 1788–1907



Source: Hertslet (1909), written in consultation with the British Foreign Office, contains every treaty between British agents (officials or members of trading companies) with African rulers between 1788 and 1907. We averaged these treaties by year. We are unaware of a comparable source for other European powers.

3 A NEW THEORY OF AFRICAN BORDER FORMATION

“It happened at Berlin” is not a compelling model of African border formation. Yet other key pieces of the conventional account are undoubtedly correct: European statesmen were mainly motivated by self-interest, and they sought to minimize prospects for intra-European conflict (see, e.g., Christensen and Laitin 2019). We present a new theory of African border formation that emphasizes how these premises created incentives to draw borders *conscientiously*, rather than haphazardly.

After the Berlin Conference, as European powers carved out their territories, they faced a coordination problem over exactly where to draw the borders. To make this idea concrete, consider an interaction between two state leaders determining where to draw a boundary between vaguely delineated territories. Each state prefers more territory, and decides between accepting a possible border or fighting. Avoiding conflict was a key concern of European statesmen, who agreed that the costs of inter-European warfare exceeded the benefits of colonizing most areas of Africa (Herbst 2000, ch. 3; Christensen and Laitin 2019, ch. 8). Combining each state’s goal of maximizing

territory with the costliness of conflict created a classic coordination problem. On the one hand, a territorial division that gives one side too little territory is not an equilibrium because that side would rather fight than accept. On the other hand, if each side receives enough territory to satisfy their reservation value, then both will accept the border—but many possible borders lie within the set of mutually acceptable territorial divisions.

In general, state diplomats often use focal points to coordinate on which border to choose among the set of mutually acceptable divisions (Carter and Goemans 2011). We argue that the boundaries of precolonial states and major bodies of water served as focal points in African border formation. Europeans learned about these local features in the late nineteenth century through interactions with African rulers, which sometimes facilitated African agency in negotiations. Our alternative theory yields testable hypotheses about which local features should influence border formation.

3.1 PRECOLONIAL STATES

The territorial limits of precolonial states created focal points to draw colonial borders. Europeans leveraged treaties with Africans to claim large swaths of territory via the principle of suzerainty. This enabled Africans to influence the border formation process and created incentives against partitioning historical states. We also contend that precolonial African states typically had well-defined territorial limits.

A British official explicated the principle of suzerainty in a dispute with France over the border between Nigeria and Dahomey (Benin) in 1896: “We could not abandon the principle of suzerainty. This principle was recognized in all international negotiations and we held that, in treating with a suzerain, the rights conferred [...] extended to the whole of the territory under his dominion” (quoted in Anene 1970, 220). Nugent (2019, 20) suggests broadly that “where existing states controlled territory, European actors would appeal to treaties or conquest—in either case seeking to inherit the entire territory attached to the kingdoms in question.”

The principle of suzerainty implied that borders would often reflect the limits of historical states be-

cause one power's claim ended there. This idea had precedent in European history, where borders were largely shaped on the basis of claims about the limits of historical political entities (Abramson and Carter 2016). Europeans took precolonial states into account not out of benevolence, but instead because this local feature provided a convenient bargaining chip for maximizing territorial divisions. Furthermore, preserving precolonial states also reduced governance costs because colonizers could use the existing political infrastructure to rule indirectly, exemplified by British Native Authorities, German and Belgian rule in Ruanda-Urundi (Rwanda/Burundi), and French rule in Dahomey.

In practice, capitalizing on the principle of suzerainty required European powers to scrutinize the boundaries of historical states. Europeans were largely ignorant about Africa when they convened the Berlin Conference. However, afterwards, learning about conditions on the ground enabled European powers to maximize their territorial claims—which were based, in part, on treaties with African rulers.

Gathering intelligence necessitated continual interactions with local rulers, which facilitated African agency. Many rulers were strategic and sought to preserve areas they controlled, in contrast to their typical characterization as hapless actors who signed treaties they did not understand. The territorial boundaries of precolonial African states were often contested and changed over time because of external wars and secession. Local rulers influenced colonial negotiations by supplying information about their boundaries. They often exaggerated their territorial claims, usually by claiming to control areas that had slipped away by the late nineteenth century. On occasion, they used military force.

Eager to maximize their own territory, European statesmen favored claims by rulers with whom they signed treaties and contested those by others. This competitive process provided Europeans with detailed information about the domains of African rulers. Whereas competing European powers contested territorial claims based on fanciful descriptions of reality, they usually accepted territorial claims with unambiguous empirical backing. Overall, this process encouraged European

powers to use the limits of states to draw boundaries, rather than to partition states.

By contrast, we anticipate that colonial borders will often divide peoples in areas without major states. There, a European power would be hard-pressed to argue that treaties among loosely affiliated rulers constituted a basis for gaining control over an extended area. “European strategists’ preoccupation with the major African powers in drawing up spheres of influence meant that less powerful tributary or independent peoples were mostly ignored: their political uses of the landscape mattered only insofar as they could be used to claim greater territorial limits for major African powers” (McGregor 2009, 57; see also Miles 2014, 22-29). Broadly defined cultural areas could not serve as focal points given the “intermingling and flexibility of these human groupings” (Mills 1970, 19). The Yoruba in modern-day Nigeria and Benin exemplify this consideration. Yoruba speakers were fractured into numerous states and stateless areas, which meant that gaining a treaty with any one ruler did not establish suzerainty over all of Yorubaland.

Historical notions of territoriality. One reason that existing scholarship overlooks the importance of precolonial state boundaries for influencing colonial African borders is the widespread belief that African states lacked basic notions of territorial delimitation. More recent historical research suggests instead that precolonial African rulers cared deeply about the specific tracts of territory they controlled.

Establishing the conventional wisdom, Herbst (2000) analyzes the broad consequences of low population density in Africa: African rulers sought to control people, not specific pieces of territory; and it was difficult to broadcast power over large, sparsely populated territories. Specifically with regard to the territorial limits of states, he contends: “The absence of buffer mechanisms is most obvious when examining territorial boundaries. Societies without maps were hardly in a position to create hard territorial boundaries. In fact, the notion of the ‘frontier as boundary,’ was largely unknown in precolonial Africa” (52). His main premise that state capacity weakened over distance is undeniable. However, as the following examples show, rulers nonetheless cared about territorial claims.

Herbst's main example, Asante, in fact underscores the present contention that rulers cared about boundaries. He discusses how *Asantehenfo* (Asante rulers) conceived of their territorial control based on concentric circles that represented the number of days of travel time from the capital. However, even the outer provinces of Asante were "administratively maintained." The state used control posts to levy customs taxes on caravans and slave traders, and to regulate the migration of persons and arms. "Despite the changing status of various provinces, it is possible nevertheless to determine with reasonable accuracy the extent of Greater Asante at certain fixed points in time" (Wilks 1975, 53-55; see also Nugent 2019, 17).

In his study of Borno, Hiribarren (2017, 17) explicitly "disput[es] Jeffrey Herbst's assumption that political domination was not territorial in precolonial Africa." He instead argues that "Borno was a bounded territory with a codified relationship with its vassal states." As one piece of evidence, he cites a correspondence between Borno and the neighboring rival state of Sokoto:

"Between our kingdoms are the pagan Bedde tribes, on whom it is permissible to levy contribution: let us respect this limit: what lies to the east of their country shall be ours: what lies to the west shall be yours. As for Muniyo, Damagaram and Daura, they will continue to be vassals of the Sultan of Borno, who in return will surrender to you all his claims to Gobir and Katina" (20).

Another example of territorial boundaries is the "Lost Counties" that Britain transferred from Bunyoro to Buganda in the 1890s.¹⁰ This decision created a territorial dispute within Uganda that persisted until after independence. Nor are these cases unique. As we discuss later, and in more detail in Appendix A, African states typically had concrete territorial limits (albeit with boundaries that changed over time, which is not unique to Africa), and African leaders routinely made claims about specific pieces of territory they controlled.¹¹

¹⁰Beattie (1971, 254) describes Buganda as having "sharp edges; one was either in it or outside it."

¹¹For other critiques of Herbst's claims about the territorial nature of African states, see Dobler (2008) and Mathys (2014, Ch. 2).

3.2 RIVERS AND LAKES

Salient geographic features such as rivers and lakes created another source of focal points for drawing borders. Consequently, we anticipate that colonial borders should appear more frequently in areas with these features.

Rivers and lakes were central to European ambitions from the onset of African colonization. An important goal of early European penetration was to control rivers, which generated numerous disputes. A scramble among Belgium, France, and Portugal to control the Congo River inspired the Berlin Conference. Britain and France each strove to control the Gambia, Niger, and Nile Rivers. Germany joined their later competition over Lake Chad. When the British South Africa Company colonized Southern and Northern Rhodesia (Zimbabwe and Zambia), their instructions mentioned the Zambezi river to circumscribe their jurisdiction.¹²

Major water bodies were salient local features for border formation because of this intense focus. European statesmen were unaware of the exact location of inland portions of rivers and lakes when they discussed spheres of influence at the Berlin Conference. However, as with precolonial states, they faced strong incentives to learn more about these geographical features to stake their claims, and sponsored numerous expeditions. Incorporating water bodies into borders also followed precedents established within Europe.

Our theoretical expectation for water bodies clearly defies a strong version of the arbitrary borders thesis. If Europeans systematically incorporated local features, then the borders are not as-if random. However, we contend that our expectation also defies a weaker version of the arbitrary borders thesis. Choosing borders that follow rivers or lakes is not orthogonal to human experiences on the ground. Geographic and environmental features create ethnic and socioeconomic differences across space (Davis and Weinstein 2002; Fenske 2014; Michalopoulos 2012). A large

¹²“None questioned the border status of this section of the river ... it was a ‘natural border’ simply because it was a feature of the landscape ... It was thus legitimized through its grounding in the supposed territorial limits of precolonial African states. Finally it was seen as the ‘natural’ limit’ of white settlement, partly for its reputation for unhealthiness, and partly because of the pragmatic need to limit imperial ambitions somewhere” (McGregor 2009, 58-59).

body of work in economic geography shows that locational fundamentals, such as water bodies, are important to explain human and economic activity in Africa and elsewhere (Davis and Weinstein 2002; Alix-Garcia and Sellars 2020; Ricart-Huguet 2022).

Some major water bodies influenced the formation of historical states, either by serving as the core area of a state or as a “natural frontier” for its limits. Within Africa, Reid (2012, 2-3) explains that “several riparian systems have shaped Africa’s history in the most fundamental of ways: The Niger, Benue, Senegal, Congo, Nile and Zambezi rivers are central to the histories of the regions through which they slice. The same is true of the major lacustrine clusters, notably Lake Chad in the western savannah and the lakes of the Great Rift chain, including Turkana, Albert, Victoria, Tanganyika, and Malawi.”

Rivers and lakes shaped the precolonial development of stateless peoples as well, including where they settled and the trade patterns among them. Population settlements in western Equatorial Africa, for example, corresponded neatly with rivers and vegetation zones in the precolonial period (Curtin et al. 1995, 217). In East Africa, rivers and lakes facilitated trade within East Africa and between it and the Indian Ocean world before Portuguese arrival in 1500. Most of today’s Tanzania, Mozambique, Malawi, and Zambia did not have precolonial states. Nonetheless, rivers (e.g., Zambezi, Rovuma, Rufiji), lakes (e.g., Malawi), and natural harbors (e.g., Kilwa in modern-day Tanzania) facilitated precolonial East African trade. Arabs, Indians, and Portuguese bought gold, ivory, and slaves while Africans bought cotton cloths, beads, and other products (Rangeley 1963).

The ways in which water bodies affected human and political development in the long-run are complex and variegated. However, all reject the contention that borders incorporating such geographic features are irrelevant for social realities on the ground.

3.3 STRAIGHT-LINE DESERT BORDERS

Some parts of Africa lacked clear focal points, in particular deserts and other areas of low population density. Europeans should be more likely to draw artificial borders, often based on parallels

and meridians, that disregard conditions on the ground in areas that lacked focal points. However, the stakes of border placement were lower because the territory was rarely valuable. Therefore, although the exact placement of a straight-line border is typically arbitrary, the decision to draw a straight-line border should be conscious and strategic—and, consequently, relegated to areas with low population density.

4 STATISTICAL ANALYSIS OF THE PARTITION OF AFRICA

To test our theory, we present multiple forms of evidence. The quantitative evidence in this section comes from analyzing African borders using square grid cells and assessing correlations with (a) original data on precolonial states and (b) geographic features. We also summarize results from the statistical analysis of ethnic partition.

4.1 VARIABLES

Precolonial states. We compiled new spatial data on precolonial states. Ajayi and Crowder's (1985) atlas provides the most extensive and detailed maps of which we are aware containing the territorial location of precolonial polities on the eve of European colonization. The atlas contains eight detailed regional maps for the nineteenth century, each of which is produced by a leading scholar on a particular region of Africa.

We do not classify every polygon from the Ajayi and Crowder (1985) maps as a precolonial state. Instead, we consulted additional sources to assess which candidate cases meet Fortes and Evans-Pritchard's (1940, 5) criteria for "Group A" societies, meaning they have "centralized authority, administrative machinery, and judicial institutions—in short, a government." This distinguishes cases in which a polity had a discernible ruler with whom Europeans could sign a treaty and whose political authority extended over a broader area corresponding with the territory in Ajayi and Crowder's (1985) maps, as opposed to petty chieftaincies or areas where rulers exerted autonomous rule in individual villages. We consulted three sources that provide a continent-wide list of states in the

nineteenth century: Stewart (2006), Paine (2019), and Butcher and Griffiths (2020).¹³ Some cases are unambiguous because all three sources identify the polity as a state. For cases with disagreement among the three, we consulted additional sources to make our coding decision (Appendix A.1 provides details). Finally, we restrict the sample to states that originated before 1850. Later states often emerged as reactions to early European colonization, which differs from our aim of assessing how European powers reacted to pre-existing states.¹⁴

For each of the forty-six polities that we classified as a state, we consulted Ajayi and Crowder’s (1985) atlas and at least one historical monograph with a map and qualitative description of historical boundaries. In most cases, we digitized a polygon from Ajayi and Crowder (1985), although in a handful of cases we digitized an alternative map. We use maps that capture African states on the eve of colonization, that is, roughly between the 1850s and the 1880s depending on the region. Figure 3 depicts every precolonial state in our dataset, and Appendix A.2 provides extensive supporting evidence.

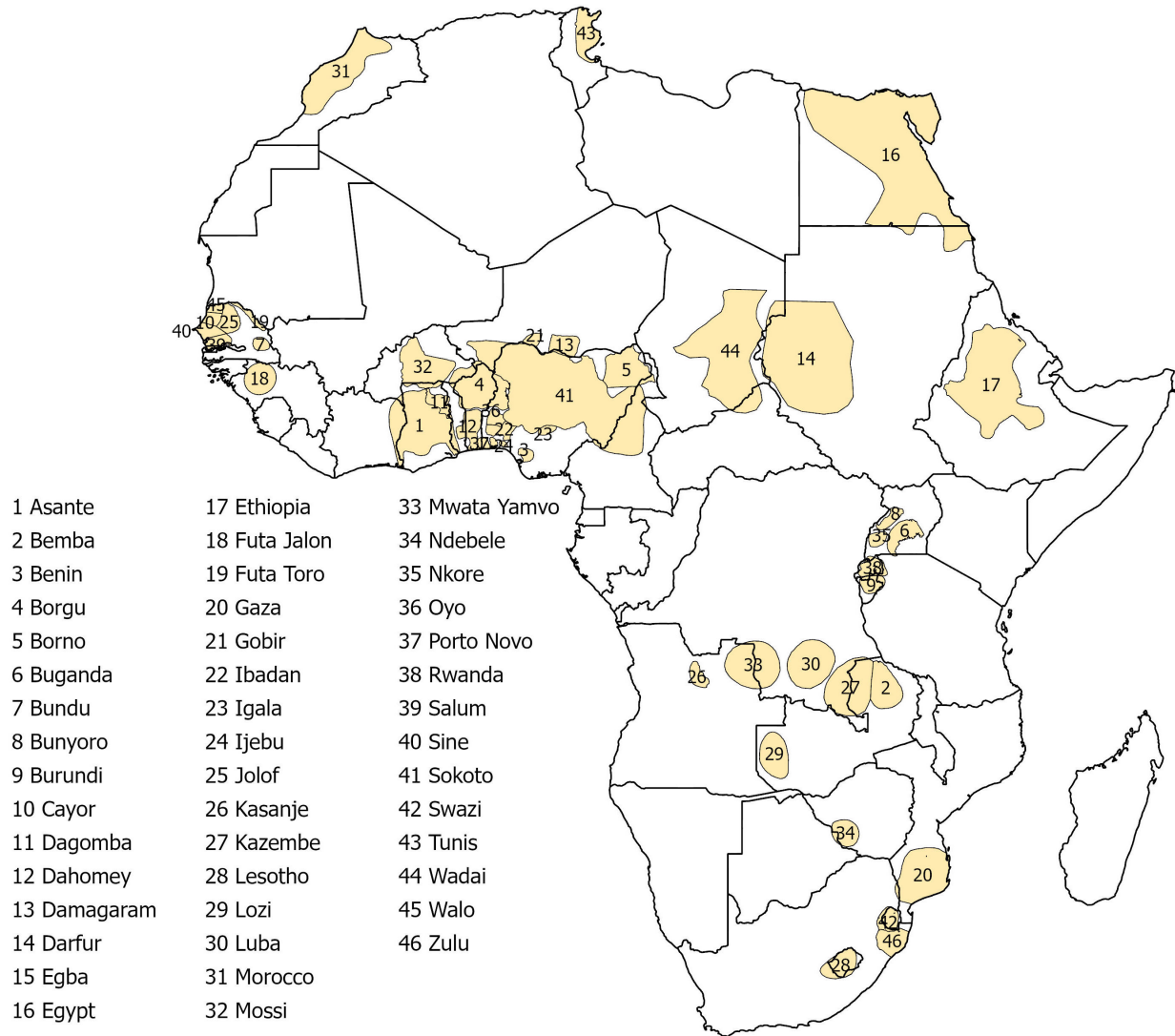
Water bodies and deserts. We assess three measures of rivers: all rivers, the ten longest rivers on the continent, and navigable rivers. These different measures allow us to capture rivers of varied importance and to conduct a more comprehensive assessment of their role in border formation. Navigable rivers are closely related to economic activities and colonial interests, while international borders often involve segments of smaller rivers that are locally salient. For similar reasons, we assess all lakes as well as the ten largest lakes. Finally, we examine desert areas. We provide the sources for each variable in Appendix C.

International borders. We use international borders around the time of independence and exclude post-independence border changes. As we demonstrated in Section 2, colonizers constantly adjusted the borders during their rule (see Appendix A.3 for examples of later changes to reflect

¹³These sources also confirm the comprehensiveness of Ajayi and Crowder’s (1985) maps. See Müller-Crepon (2020) for another use of Stewart (2006) to indicate precolonial states across the continent.

¹⁴Examples of endogenous “pre”-colonial states include the Mahdist state that overthrew Anglo-Egyptian rule in Sudan (prior to Britain’s re-imposition of colonial rule in 1899) and the Samori and Tukolor states that grew in response to French penetration in West Africa.

Figure 3: Map of Precolonial States and Boundaries



Notes: This map depicts all forty-six polygons of precolonial states in our dataset.

the boundaries of precolonial states). We capture the end result of this protracted process. Furthermore, for many research questions, the end product of colonialism is the most relevant map for studying the post-colonial legacies of borders.

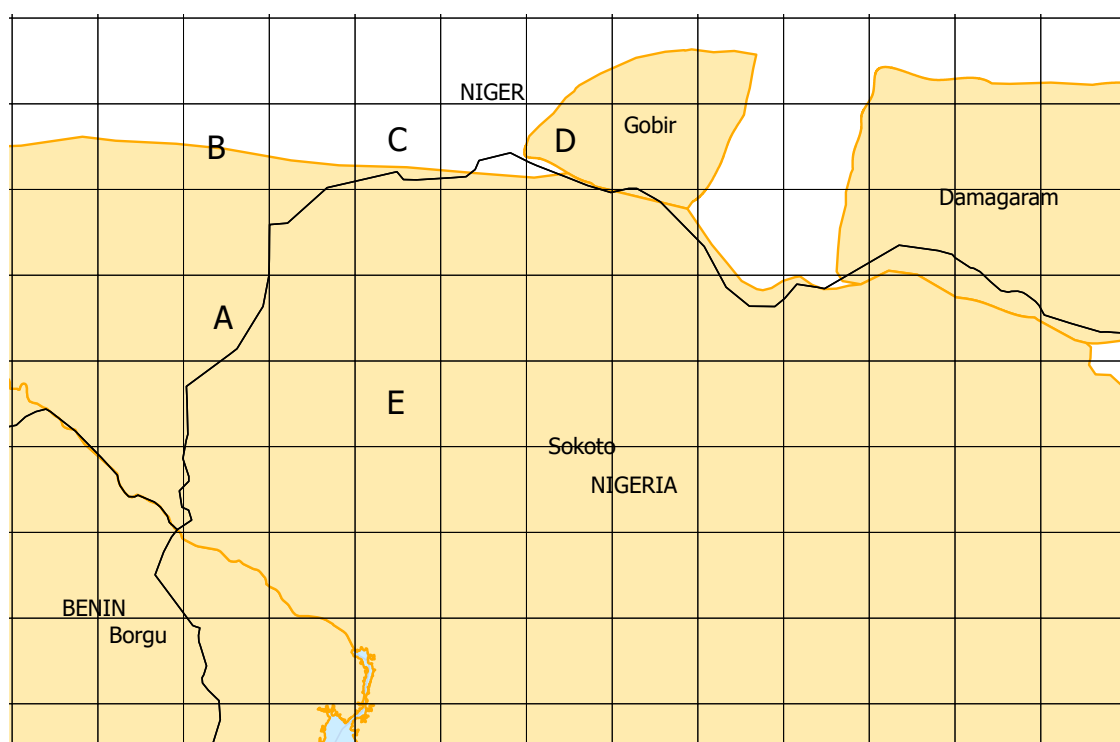
4.2 UNIT OF ANALYSIS: GRID CELLS

Our unit of analysis is square grid cells. Each cell is 0.5 by 0.5 decimal degrees (approximately 55 km. at the equator), following standard practice (Michalopoulos [2012](#)). This procedure yields

more than 10,000 grid cells across the continent (excluding islands). To score the variables for each grid cell, we combined the grid cells with the spatial data described above. Most are indicator variables, for example, whether a cell includes any part of a river.

We code two variables for precolonial states (PCS). First, we code whether each grid cell includes a PCS border, PCS BORDER IN CELL. Second, we code whether a cell falls entirely within a PCS, CELL INSIDE PCS. Figure 4 provides a visual example of how we code grid cells using the Nigeria-Niger border. Although our precolonial state polygons have high face validity, measurement error is inevitable because of often-shifting territorial control throughout the nineteenth century and the general imprecision of frontier areas. For robustness checks, we create a 0.25° buffer on each side of the border (thus 0.5° in total) that “thickens” the border and thus accounts for the uncertainty.

Figure 4: Niger–Nigeria Border with Overlaid $0.5^\circ \times 0.5^\circ$ Grid Cells



Notes: This map illustrates the overlay of grid cells over precolonial states (orange coloring and borders) and countries (black borders). Our outcome equals 1 whenever a country border exists in the cell (e.g., cell A in the map). PCS BORDER IN CELL = 1 when a PCS border exists in the cell (B). In some cells, both variables equal 1 (C and D). Finally, CELL INSIDE PCS = 1 when a cell is fully within a PCS (A and E).

4.3 REGRESSION RESULTS

For the grid-cell analysis, we specify our hypotheses as follows:

1. Grid cells with PCS borders (PCS BORDER IN CELL=1) should be more likely to have country borders.
2. Grid cells contained within a PCS (CELL INSIDE PCS=1) should be less likely to have country borders.
3. Grid cells with rivers and lakes should be more likely to have country borders.

To assess these hypotheses, we estimate the following models with OLS:

$$\text{Border}_i = \beta_0 + \beta_1 \text{Geog}_i + \epsilon_i \quad (1)$$

$$\text{Border}_i = \beta_0 + \beta_1 \text{PCS}_i + \text{Geog}_i^T \beta_2 + \mathbf{X}_i^T \beta_3 + \eta_j + \epsilon_i. \quad (2)$$

In every regression, the dependent variable indicates whether the cell contains part of a country border. The index for grid cells is i . We use Conley standard errors (Conley 1999; Hsiang 2010) to account for spatial autocorrelation. The distance cutoff is 300 km. (approximately 6 grid cells at the equator) in our main results, although the findings are robust to altering the cutoff.¹⁵

We use bivariate models to assess each geographic feature, our various measures of rivers, lakes, and deserts. We purposely do not control for “posttreatment” variables such as the existence of a precolonial state. However, the results in Figure 5 are robust to their inclusion and to including multiple geographic variables in the same model.

We estimate multivariate models for each PCS indicator, PCS BORDER IN CELL and CELL INSIDE PCS. We include a vector of “pretreatment” geographic variables as controls. We also add a vector of variables ($\mathbf{X}_i$) to control for European interest in the area, including latitude, longitude, size of the ethnic group in cell, distance to the coast, historical natural resources, slave exports, suitability

¹⁵See Appendix C.3 for results with different cutoffs.

for European settlement, and agricultural intensity. We add region fixed effects (indexed by j in the estimating equations) to compare similar areas within Africa.¹⁶ The multivariate models reflect our attempt to recover the following *ceteris paribus* claim. All else equal, we claim that colonizers were less likely to draw borders that cut through historical states. Yet areas with precolonial states were generally more desirable and attracted more European competition. This made drawing *any* border in those areas more likely, hence biasing away from finding an effect for cells inside PCS.¹⁷

We summarize the regression estimates with a coefficient plot in Figure 5. The top part validates our third hypothesis. Across different measures of rivers and lakes, areas with major bodies of water are more likely to have a nearby country border. The coefficient estimates are particularly large in magnitude for the longest rivers and largest lakes. The presence of a top 10 river in a cell increases the predicted probability that a border will exist in that cell from 13.8% to 32.7%, a 135% increase. For top 10 lakes, the probability increases from 14.3% to 38.2%, a 167% increase. Desert areas are less likely to have a country border, which reflects the typically large size of colonies in thinly populated areas (see also Green 2012).

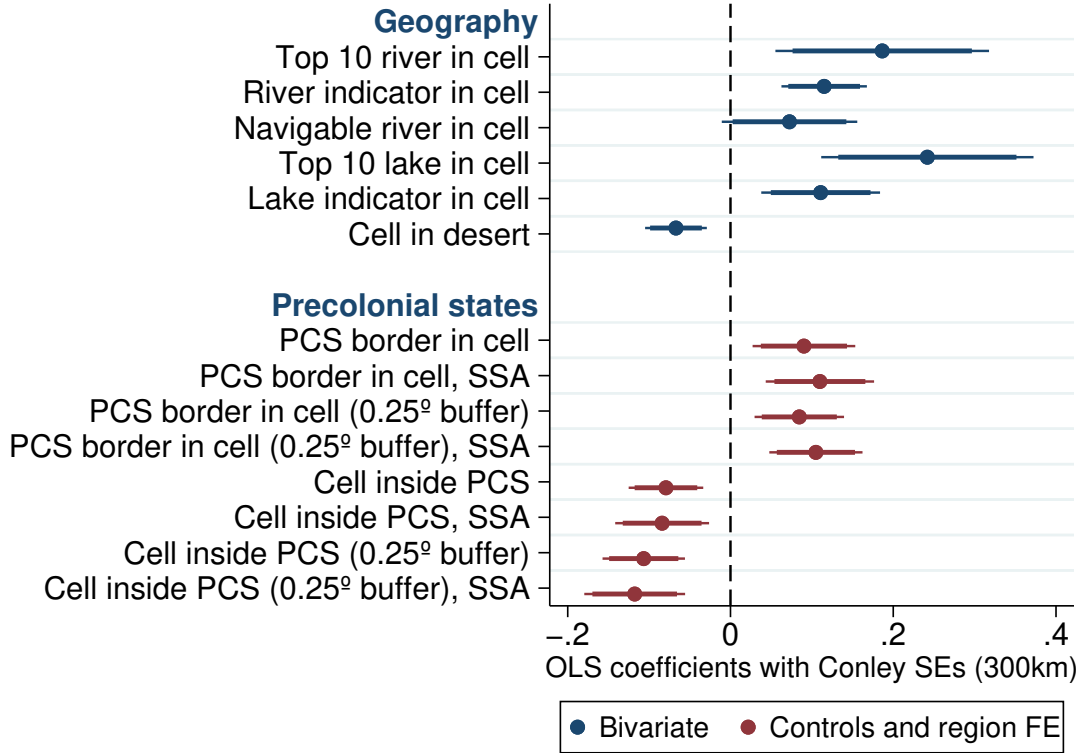
The bottom part of Figure 5 supports our first and second hypotheses. First, cells containing PCS borders are more likely to contain country borders. Second, cells in a PCS are less likely to contain country borders. With other variables held at their means, the presence of a PCS border in the cell raises the predicted probability that a country border will exist in that cell from 14.2% to 22.7%, a 60% increase. For cells inside PCS, the predicted probability decreases from 15.8% to 8.5%, a 46% decline.

Figure 5 also presents various robustness checks for the PCS variables. We restrict the sample to Sub-Saharan Africa (SSA, cells south of 18°N) and/or create a 0.25° buffer on each side of PCS borders. The findings are qualitatively unchanged and the coefficients increase in magnitude for the SSA sub-sample, which excludes large Saharan areas of minimal European interest. In

¹⁶Because our dependent variable is country borders, we construct five regions across Africa based on latitude and longitude—rather than using conventional regions based on existing country borders.

¹⁷Despite this confounding concern, the results are qualitatively similar in regressions that include the PCS indicator but not the battery of covariates (not reported).

Figure 5: Correlates of African Borders



Notes: The figure summarizes coefficient estimates and confidence intervals for the main explanatory variables. See Tables C.1 and C.2 for the full regression results. We estimate each model using OLS and present confidence intervals at the 95% and 90% levels based on Conley standard errors (Conley 1999; Hsiang 2010), which account for spatial correlation. All models use 0.5°x0.5° grid cells as the unit of analysis ($n = 10,338$ for the full sample and $n = 7,135$ for the SSA sub-sample). The outcome is 1 in the presence of a border in that grid cell and 0 otherwise.

Every geography model in the top part is bivariate. Every model in the lower part controls for geography (every variable in the top part), latitude, longitude, logged area of the ethnic group in cell, distance to the coast, historical natural resources in cell, logged area-adjusted slave exports of the ethnic group in cell, suitability for European settlement, agricultural intensity of the ethnic group in cell, and region fixed effects (FE).

Appendix C, we report additional robustness checks using probit models and with standard errors clustered by country or by ethnic group.

4.4 ETHNIC GROUPS AS THE UNIT OF ANALYSIS

Using square grid cells to assess correlates of border location differs from the state of the art in the literature, in particular the pioneering approach of Michalopoulos and Papaioannou (2016) to use the map from Murdock (1959, 1967) to assess correlates of ethnic partition. Our approach is more general by remaining agnostic about the correct unit of analysis. In Appendix D, we run additional

results to assess ethnic partition specifically, and also discuss the limitations of this approach.

The findings for water bodies are largely the same as in our main analysis, although the results for precolonial states are null. We contend that these null findings arise mainly because of measurement error in Murdock’s polygons and his assignment of jurisdictional hierarchy scores, as well as the conceptual mismatch between precolonial states and ethnic groups (Appendix D provides details). These concerns further substantiate the value-added of our new data collection and approach to statistical analysis.

5 EVIDENCE FROM COLONIAL TREATIES

Our statistical findings demonstrate that Africa’s international borders are systematically related to precolonial states and major water bodies, contrary to the conventional wisdom that the borders are arbitrary. We now provide various types of qualitative evidence to substantiate our core theoretical contention that European statesmen treated these features as focal points when settling borders. In this section, we analyze colonial border treaties by coding the determinants of every bilateral border in Africa. Most borders are determined by a combination of attributes that we categorize under physical geography (e.g., rivers) and political geography (e.g., precolonial states), consistent with our theory.¹⁸ We also demonstrate that straight-line borders are less prevalent than commonly claimed.

Our data source for bilateral border treaties is Brownlie’s (1979) encyclopedia. He provides extensive primary sources including treaties, conventions, agreements, and letters. Table 1 summarizes the determinants by general categories and specific features. The first set of counts and percentages code all determinants of each bilateral border—that is, all features that are explicitly mentioned in one or more primary documents for that border. The second set codes the main characteristic that determined each bilateral border, that is, the feature that explains the largest share of that border. This forces us to make the number of coded features equal to the number of borders because mul-

¹⁸The importance of these features is also reflected in the names of colonies, e.g., Nigeria and Niger for the Niger river, and Uganda for the kingdom of Buganda. See Table E.5 for a continent-wide assessment.

multiple features determine each border.¹⁹ For example, although western Rwanda borders Lake Kivu (Figure 7), we code the historical limits of the Rwanda Kingdom as the main determinant of the DRC–Rwanda border.

Table 1: Determinants of African bilateral borders

Category	Feature	All determinants		Main determinant	
		Number	Percent	Number	Percent
Physical geography	Rivers, oueds	83	81%	41	40%
	Water bodies: lakes, oasis, wells	41	40%	6	6%
	Watershed/drainage divide	17	17%	5	5%
	Topography: mountains, hills, valleys	54	53%	4	4%
	Desert	27	26%	0	0%
Political geography	Precolonial states (PCS)	22	22%	16	16%
	Non-PCS ethnic groups	18	18%	2	2%
	Cities, towns, high population density	36	35%	6	6%
	Infrastructure: roads and routes	21	21%	2	2%
Straight lines	Parallels and meridians	29	28%	14	14%
	Other straight lines	37	36%	6	6%
Other	Bay, cape, or islands	3	3%	0	0%
Total		385	-	102	100%

Notes: In total, there are 102 bilateral borders. For “All determinants,” we count every feature that appears in treaties for each border. For example, a bilateral border affected by a precolonial state and by a meridian is counted for both categories. The sum of total features is 385, or 319 excluding straight lines. Under “Main determinant,” we code only one feature for each bilateral, bringing the total number of features to 102.

Bilateral borders reflected numerous local features, on average, 3.1 per border.²⁰ Rivers are the main geographic determinant and precolonial states the main political determinant. Rivers stand out as the most common determinant: they influenced 81% of borders, and were the main determinant in 40% of cases. Other bodies of water, such as lakes, are rarely the main determinant but are mentioned for many borders (40%).²¹ Other features that appear regularly in treaties are topographical (mountains, hills, valleys) and cities and towns, although these are rarely the main determinant.

¹⁹We do not code the borders segment by segment. Coding the main determinant also forces us to make some choices. For example, we prioritize political geography over physical geography when both are similarly relevant.

²⁰This count excludes straight lines.

²¹Our findings are similar when we restrict the sample to inland, coastal, inter-imperial, or intra-imperial borders (see Tables E.1 through E.4). Inland borders provide a hard case for finding evidence of systematic determinants because Europeans lacked any detailed knowledge of these areas prior to the 1880s.

Many border treaties, twenty-two in total, mention precolonial states. Such mentions are less frequent than water bodies simply because some parts of African did not have precolonial states and because Brownlie's encyclopedia focuses on intra-European negotiations, rather than on negotiations between European and African states.²² For example, the inter-imperial treaty between Britain and France in 1889 mentions the Asante Kingdom:

“The French Government shall undertake to allow England full liberty of political action to the east of the frontier line, particularly as regards the *Kingdom of the Ashantees*: and the English Government shall undertake to allow France full liberty of political action to the west of the frontier line” (our emphasis; quoted in Brownlie 1979, 215).

Finally, only 20% of bilateral borders are primarily defined by straight lines. Supporting our hypothesis that straight borders should be drawn where little is at stake, most are concentrated within the Sahara desert, an area of low geopolitical relevance around 1900.

Our finding for the relative infrequency of straight-line borders is striking when contrasted with a commonly cited statistic, originally calculated by Barbour (1961, 305), that the plurality of African borders were astronomical lines (44%), as opposed to mathematical lines (30%) or relief features (26%).²³ Our calculation differs for three reasons. First, Barbour (1961) uses Hertslet (1909) as his source, which reflected borders only as of 1909. Many boundaries were subsequently adjusted to incorporate local features; and his map does not include boundaries within French West Africa or French Equatorial Africa, nor does it distinguish Ruanda-Urundi from German East Africa. Second, his map includes only tropical Africa, hence excluding northern and southern Africa. Third, Barbour explicitly qualifies his calculations as “very approximate.”

²²To the extent that Brownlie is incomplete, the count of total border determinants is even higher than the 385 we report.

²³For citations, see Herbst (2000, 75); Englebert (2002, 88); Abraham (2007). Alesina, Easterly and Matuszeski (2011, 246) appear to combine Barbour's calculations for astronomical and mathematical lines when they assert that “Eighty percent of African borders follow latitudinal and longitudinal lines.”

6 QUALITATIVE EVIDENCE FOR PRECOLONIAL STATES

Precolonial states were rarely partitioned across colonial borders. Among our list of forty-six precolonial states, only in five cases was the core area of the state dismembered into two or more colonies (by our qualitative assessment): Borgu, the Lunda states Kazembe and Mwata Yamvo, Lesotho, and Swaziland. In some cases, historical sources demonstrate that a border was purposely drawn along the boundaries of the state (e.g., the Nigeria–Niger border shown in Figure 4) even if, visually, imperfections with digitizing historical maps make it appear that part of the historical state was chopped off. This motivates our robustness check, described above, of using buffers for the statistical analysis. In other cases, peripheral areas of loose or disputed control (yet still contained within our polygon) were severed from the core state. Instead, colonial borders often coincided with the territorial limits of precolonial states, hence their frequent reference in European treaties (see above).

Here we go beyond the treaties to provide even more direct evidence that the limits of historical states served as focal points in border formation. We present case evidence to highlight three ways in which precolonial states influenced deliberations over borders: (1) Europeans debating the territorial limits of historical states, (2) lobbying from African rulers to revise unfavorable borders, and (3) lobbying from African rulers to retain favorable borders.²⁴

Debating territorial limits. In many cases, European powers extensively debated the territorial extent of historical states. A treaty between Britain and France in 1889 distinguished the upper limits of the Sokoto Caliphate as part of the Nigeria–Niger border, which recognized Britain’s treaty with the Sultan of Sokoto (Appendix A.3.14). However, for more than a decade, Britain and

²⁴Appendix A.3 provides more detail on every case for which we uncovered documentary evidence of a precolonial state affecting country borders. In some cases, we uncovered minimal evidence beyond the treaties because the powers did not dispute who acquired what. For example, Ashanti (Gold Coast/Ghana) was unambiguously British (Appendix A.3.1) and Futa Jalon (Guinea) was unambiguously French (Appendix A.3.8). In both cases, the international treaty set the frontier for one colony along the territory controlled by the historical state. Many other precolonial states do not appear even in treaties because they were unambiguously within a single power’s sphere of influence, such as the states south of the Senegal River (Appendix A.3.13).

France debated where exactly that edge lay and revised the border several times (see Panel A of Figure 6). Eventually, Britain gained all the towns that had been controlled by Sokoto, and France gained all the towns north of these (including Zinder, capital of Damagaram).

In southwestern Nigeria, Britain gained a loose sphere of influence in Yorubaland, and France with Dahomey (Appendix A.3.7). But France disputed Britain's claim that it should gain control over all Yoruba-speaking peoples, who were fragmented among many polities. Eventually, Britain limited its claims to specific Yoruba states of interest, in particular Egba. Consequently, the southern part of the Benin–Nigeria border did not partition any *historical states* despite partitioning members of the broader Yoruba *ethnic group* who lived in the frontier region between rival states.

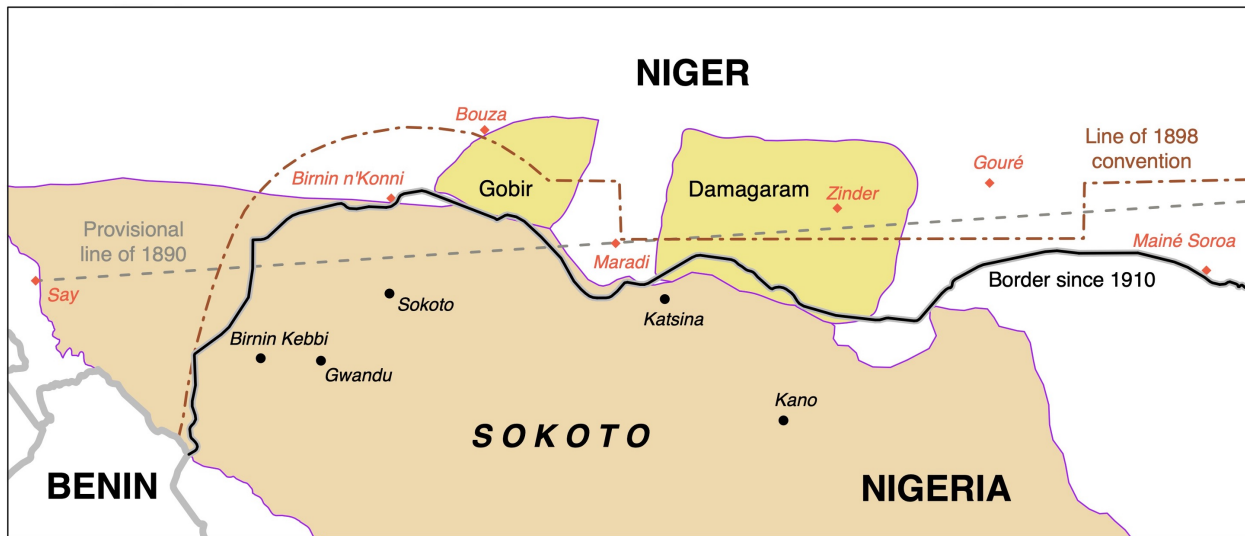
The Chad–Sudan border provides a stark example of debating the limits of historical states (Appendix A.3.5). European treaties distinguished Darfur as British territory and Wadai as French territory, but the historical boundary between the kingdoms was disputed. The Sultan of Darfur retained his army and fought France to enforce his claimed control over petty sultanates in the frontier region. The border was settled only after Britain deposed the Sultan, with Britain and France dividing the disputed petty sultanates between their empires (Panel B of Figure 6).²⁵

However, learning more about historical borders did not always prevent partition. Although historical territorial limits were focal in bargaining over borders, the boundaries of some historical states were too ambiguous to enable the principle of suzerainty to settle the dispute. European powers were loathe to relinquish territory that was ambiguously controlled by a rival traditional ruler. For the northern part of the Nigeria–Benin border, Britain claimed control over the “Borgu” state on the basis of a treaty with the ruler of Bussa (Appendix A.3.2). France challenged the territorial domain of Bussa, and signed a competing treaty with the ruler of Nikki. Upon gathering more information, it became clear that the “Borgu” state in fact consisted of several independent polities. Eventually, Britain and France partitioned this area on the basis of their treaties with distinct rulers.

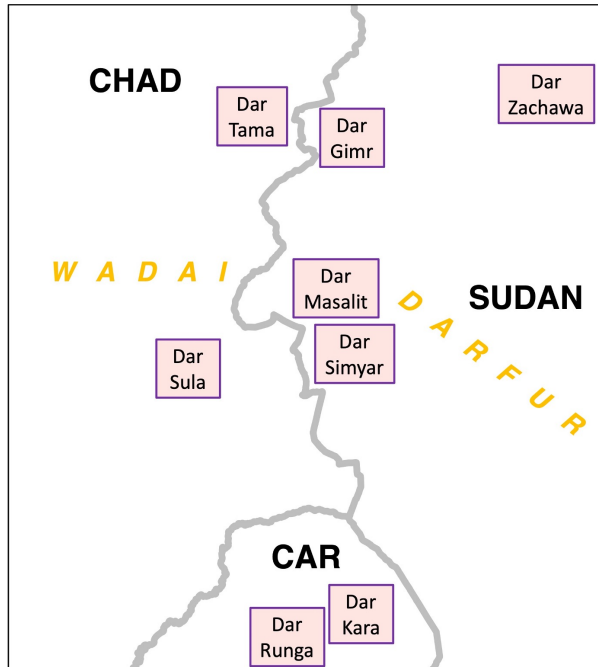
²⁵For another example of debating territorial limits, see the settlement of the Angola–Zambia border (Appendix A.3.10).

Figure 6: Borders Shaped by Precolonial States

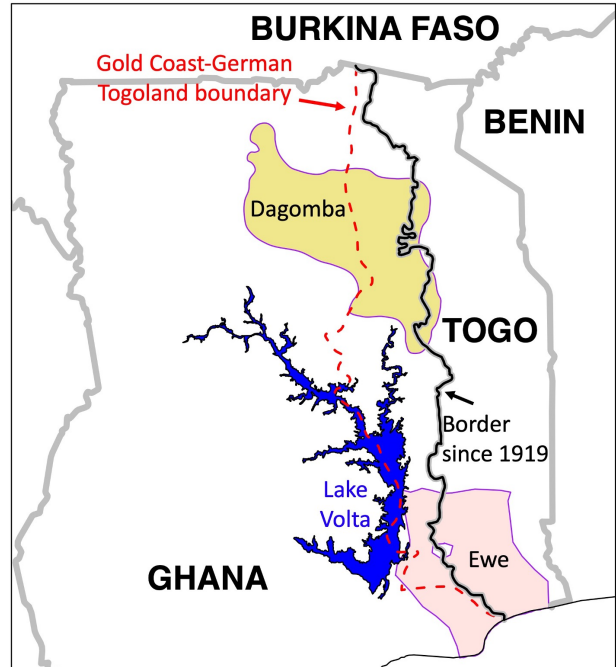
A. Nigeria-Niger



B. Chad-Sudan



C. Ghana-Togo



Precolonial states

Acephalous groups

Revising partitions. African rulers sometimes successfully pressured Europeans to revisit borders that partitioned a historical state. The original border between British Gold Coast (Ghana) and German Togoland (Togo) partitioned the kingdom of Dagomba (Appendix A.3.6). After World War I, Britain and France reallocated territory within Togoland among themselves. In response to a petition by the *Ya Na* of Dagomba, the kingdom was reunited within the British Empire and then, after independence, Ghana (Panel C of Figure 6). By contrast, an acephalous ethnic group, the Ewe, remained partitioned after these negotiations.

The Borno Emirate provides another example of revising a partition (Appendix A.3.3). Britain and Germany originally partitioned Borno between Nigeria and Cameroon. Yet the kingdom lived on, as Britain reinstated the ruling dynasty of Borno to implement the Native Authority system there. Encouraged by assistance from the *Shehu* of Borno during World War I, Britain pushed to gain control over the former German territory following the war. Borno was effectively reunited into Northern Nigeria (although officially part of British Northern Cameroons), and formally rejoined Nigeria upon independence.²⁶

Retaining favorable borders. In other cases, African rulers exerted successful pressure to *retain* borders that preserved their traditional influence. These cases typically involved intra-imperial borders, as the colonizer decided how to map territories into governance units. For example, Anglo–Bugandan treaties provided the foundation for the Protectorate of Uganda. Early choices to delegate significant governing autonomy to the *Kakaba* of Buganda and to rulers of neighboring kingdoms influenced decisions over the Uganda–Kenya border (Appendix A.3.4). For example, in the 1920s, petitions by Bugandan officials (including the *kabaka*) influenced Britain’s decision to not incorporate all of Uganda into a federation with Kenya.

Similarly, lobbying by the *Moro Naba* of Ouagadougou (a Mossi king; see Appendix A.3.11) and by rulers of the Basuto and Swazi in British Southern Africa (Appendix A.3.9) helped to pre-

²⁶Later we discuss the case of revising the Rwanda–Tanzania border (see also Appendix A.3.12), which involved a river.

serve historical states within smaller colonies. These decisions determined the borders between the smaller colonies and their neighbors. However, white settlers nonetheless gained control over significant tracts of land within Basutoland (Lesotho) and Swaziland, leading to their partition.

7 QUALITATIVE EVIDENCE FOR GEOGRAPHICAL FEATURES

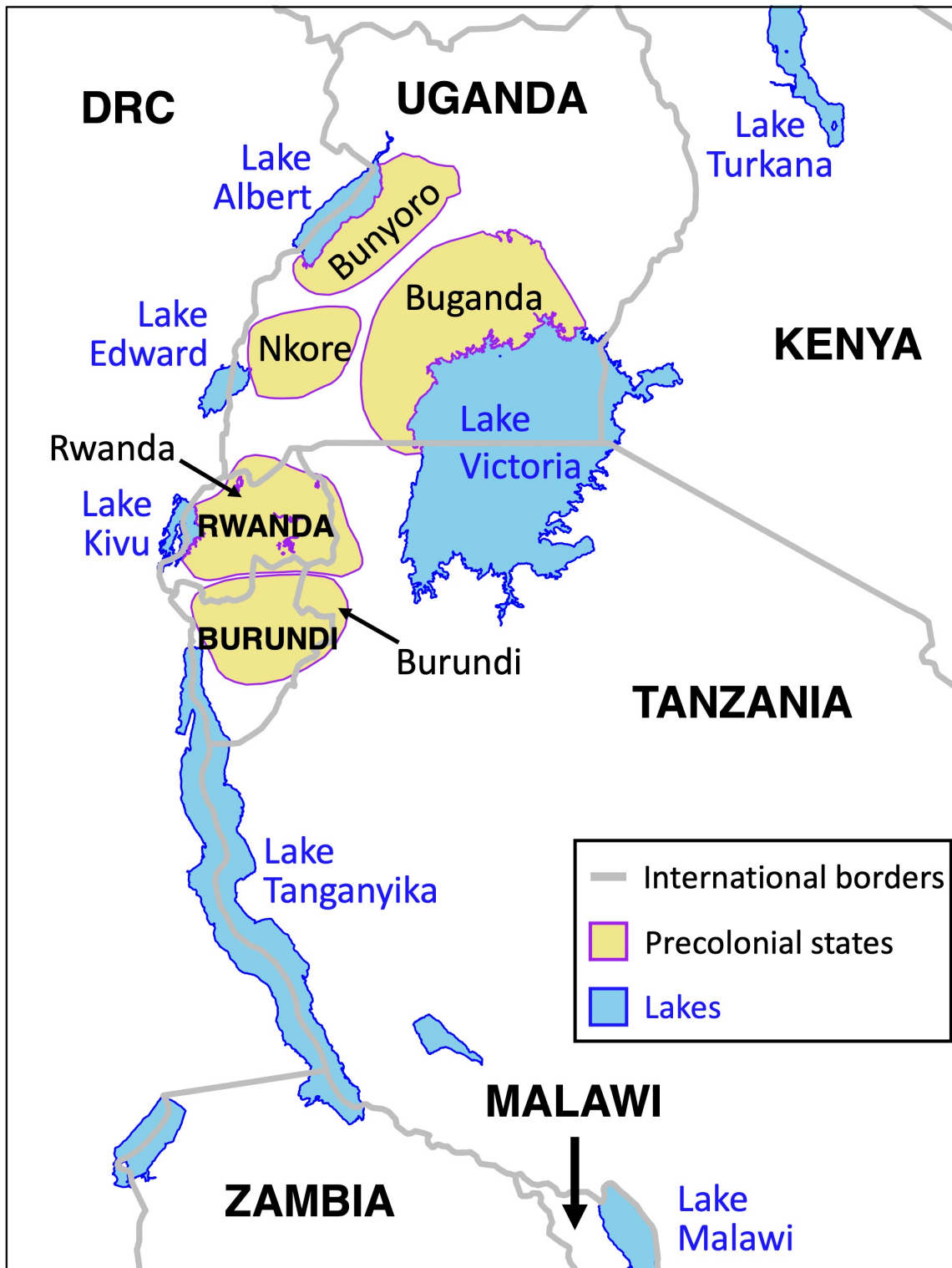
Major water bodies not only shaped colonial borders; they were rarely orthogonal to social realities on the ground. The clearest example is the Great Lakes region, where colonial borders mimicked key aspects of the precolonial regional system. River borders varied in their social and political consequences because they united peoples in some cases (Rwanda–Tanzania border) whereas they divided peoples in others (Chad–Central African Republic border). Either way, river borders typically related to the local human and social ecology. Straight-line borders are the exception because their exact placement is arbitrary, but the general location of straight-line borders is predictable and mostly confined to desert areas.

7.1 GREAT LAKES REGION

The Great Lakes region of Africa provides clear evidence of water bodies influencing historical states and colonial borders. Economic transformation through farming and agriculture in the fertile forests of that region began centuries ago as a result of favorable altitudes, adequate rainfall, and water bodies (Curtin et al. 1995, 107, 132). “Lake Victoria was criss-crossed by a network of trade ties” (370), and the most important nod in the network was arguably the Kingdom of Buganda. Reid (2002, 227) discusses “the enormous significance of Buganda’s lakeside location,” including the invention of sophisticated canoes in the nineteenth century to foster trade and, with it, economic and political development. As Figure 7 shows, every major state in the region clustered around a Great Lake.

The consequent colonial borders reflected the geography and the political economy of the region. Originally, three European powers were present in the region. Lakes Albert and Edward separated British Uganda from the Belgian Congo; Lakes Kivu and Tanganyika separated German East

Figure 7: Borders in the Great Lakes Region



Africa from the Belgian Congo; and Lakes Victoria and Nyasa (Malawi) separated British Uganda and Nyasaland, respectively, from German East Africa. These borders remained even after Britain and Belgium partitioned German East Africa, with Belgium gaining control of Ruanda-Urundi and Britain of Tanganyika. As we document below and in Appendix [A.3.12](#), attempts to revise the borders of Ruanda-Urundi or to combine these states into the Belgian Congo met resistance from the League of Nations.

7.2 RIVERS CAN UNITE OR DIVIDE

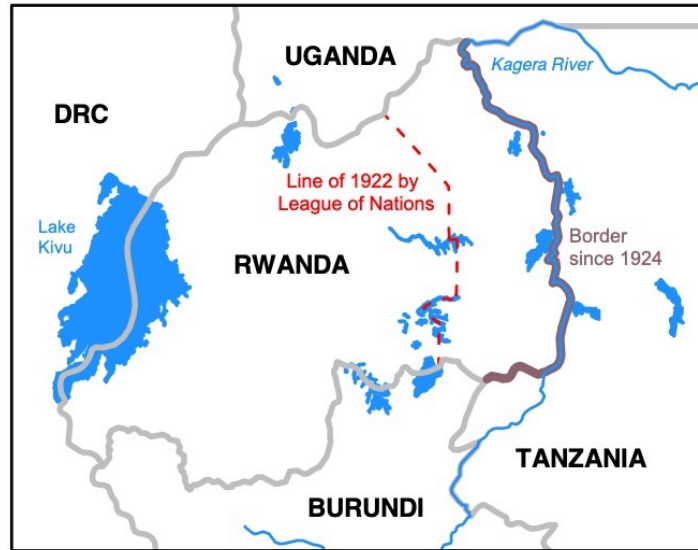
River borders are rarely orthogonal to human experiences on the ground, but they vary in their human consequences. We provide examples of how river borders could either unite or divide.

The Rwanda–Tanzania border (Panel A of Figure 8) provides a clear case in which a river served as a focal point and recreated the boundaries of a precolonial state. Therefore, this river border united people with historical ties. The Kagera river had been central to the region’s political and economic development. Following World War I, the League of Nations allocated the formerly German territories of Ruanda-Urundi (Rwanda/Burundi) and Tanganyika (Tanzania) to Belgium and Britain, respectively. Thus, what had been an internal administrative border (and hence more flexible) became an inter-imperial border subject to concerted negotiations.

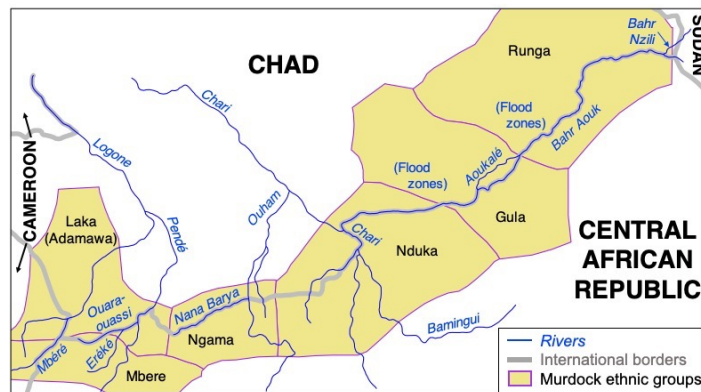
The problem was that the proposed border in 1922 incorporated the district of Kissaka (alternatively, Gisaka), traditionally claimed by the *mwami* of Rwanda, into British territory. Britain’s specific goal was to use this territory to construct its vaunted Cape-to-Cairo railroad. However, “an alliance between Musinga [the *mwami*], the Belgians and the Catholic Church (especially Cardinal Classe) defended the re-annexation of Gisaka to Rwanda” (Mathys [2014](#), 155). They “emphasize[d] the social, political, and economic harm caused by the imposition of this arbitrary division and they urge[d] the eastward extension of the boundary to the ‘*natural frontier*’ of the *Kagera River* [emphasis added]” (McEwen [1971](#), 154-5). When the League of Nations’ Permanent Mandates Commission reviewed the claims, they highlighted that the agreement separated “one of the *richest and most civilised tracts* [emphasis added] of the Kingdom of Ruanda” and

Figure 8: Rivers Can Unite or Divide

Panel A. Rwanda–Tanzania border



Panel B. Chad–CAR border



Notes for Panel A: Rivers and international border lines from authors' digitization of McEwen (1971). *Panel B:* Polygons for ethnic groups from Murdock (1959). Rivers and international border lines from authors' digitization of Brownlie (1979, 588).

decried the “deplorable moral effect” that the present arrangement had on the local population and their strong protests.” In September 1922, the President of the Council wrote letters to British and Belgian officials, who agreed to alter the boundary to follow the Kagera River.

By contrast, rivers divided peoples in cases where they became artificial disjunctures that created new divisions where none existed previously. Panel B of Figure 8 shows that seven rivers divide

Chad and the Central African Republic (whose colonial name was Obangui-Chari, two of the rivers that comprise its borders). The figure depicts various stateless ethnic homelands that were partitioned. Yet even in cases such as this, it is erroneous to consider the Chad–CAR border as random. As our border-by-border analysis shows (Appendix B), this border depended on existing routes and small villages, in addition to rivers. Therefore, it was determined by at least three observable features, in addition to features of which we may not be aware.

7.3 DESERTS AND STRAIGHT-LINE BORDERS

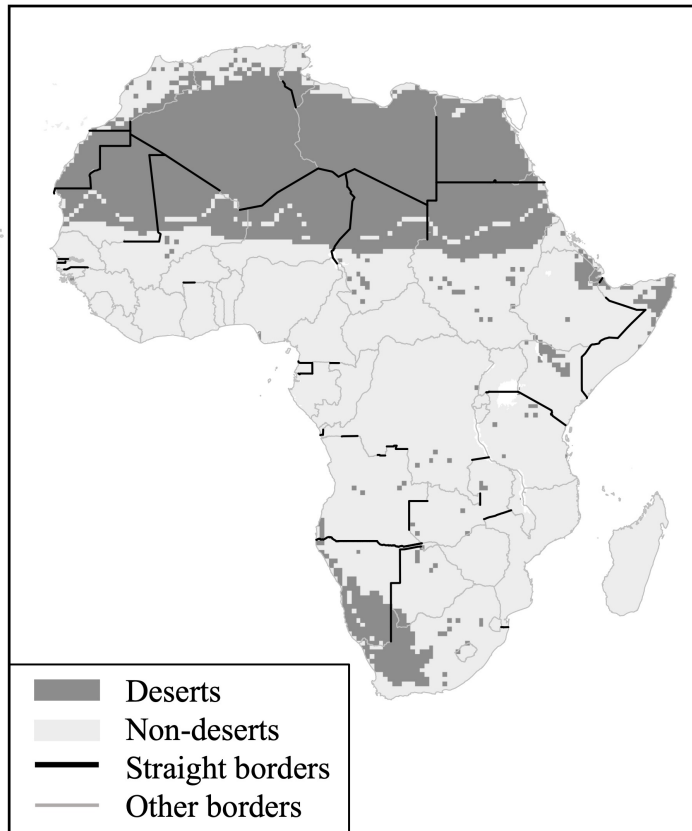
We can safely conclude that the exact placement of borders was arbitrary only where European powers drew straight lines. Yet even straight-line borders reflected a systematic element because they were mostly confined to desert areas (Figure 9). Among bilateral borders in desert areas, treaties were less specific and, on average, mentioned fewer features than elsewhere. Although the exact placement of a straight-line border might have been as-if random, the decision to draw a straight-line border was not.

By contrast, non-straight borders are almost never entirely arbitrary. Examining colonial treaties reveals numerous additional ways in which geographic features shaped borders that are difficult to account for quantitatively. For example, a close analysis of the seemingly arbitrary Central African Republic–Congo border reveals that drainage divides—a derivative of a river—determine the border (Appendix Figure E.4). We found seventeen such cases among all bilateral borders (see Table 1). Drainage divides can correspond with broader human ecological divides, and thus of other characteristics that may differ on either side of a border that incorporates this feature.

8 CONCLUSION

According to conventional wisdom, the Berlin Conference of 1884–85 largely determined the contemporary map of Africa and created mostly arbitrary borders. We overturn this convention. Motivated by the observation that most African borders were not in fact settled for decades after the Berlin Conference, we provide an alternative theory to explain why European statesmen used the

Figure 9: Deserts and Straight-Line Borders



boundaries of precolonial states and major water bodies as focal points for settling border disputes. Statistically, we show using grid cells that these features predict the location of borders, including results based on an original spatial dataset of precolonial states. Qualitatively, we demonstrate that these features arose frequently in European treaties and are the main determinants of 62% of African borders. In many cases, Europeans learned about and intensively debated the limits of precolonial states, and often revised the initial borders after gaining more knowledge. Straight-line borders are somewhat infrequent (20% of all bilateral borders) and mostly confined to desert areas.

We conclude by discussing two broader implications. First, our findings raise important questions about the growing research agenda that exploits as-if randomness in African borders for regression discontinuities and related research designs (McCauley and Posner [2015](#) provide a recent review of

this literature). We heed Kocher and Monteiro’s (2016, 952) call that “qualitative historical knowledge is essential for validating natural experiments” (see also Dunning 2012). We do not question the findings of any particular study here. Many authors carefully motivate a natural experimental or regression discontinuity research design by demonstrating that relevant covariates are continuously distributed across the border. However, we suggest caution for the general characterization that African borders are as-if random. Future quantitative research on borders should treat detailed qualitative historical knowledge as central to their inquiry, rather than as appendix material for the validation (or rejection) of a purported natural experiment. For example, our border-by-border historical analysis shows why using the post-independence borders as natural experiments is problematic: over half of all African bilateral borders were changed or otherwise revised after 1915, when European knowledge of the continent was far greater than during the 1885 Berlin Conference. By describing the determinants of every bilateral border in Appendix B, accompanied by more detailed notes for every bilateral border involving a precolonial state in Appendix A.3, we aim to advance and improve this important research agenda.

Second, we suggest that the predominant focus in the literature on *border formation* specifically misunderstands why the broader process of *externally imposed state formation* was harmful. We revisit the distinction between “dismemberment,” or partitioning groups across international boundaries, and “suffocation,” or forcing disparate groups that lack a shared history into the same country (Englebert, Tarango and Carter 2002; see also Christensen and Laitin 2019, Ch. 9).

Many scholars focus on the frequency with which colonial borders dismembered ethnic and cultural groups across international boundaries (Asiwaju 1985; Miles 2014). Borders clearly created deleterious human consequences in these cases, even if they incorporated natural features. Our contribution with regard to dismemberment is to demonstrate that which groups were partitioned was predictable, contrary to existing findings. Areas with precolonial states were rarely dismembered because their territorial limits created focal points for self-interested Europeans to settle disputes over territorial control. Furthermore, frequent migration and intermingling among peoples of dif-

ferent ethnicities, cultures, and languages ensured that *any* regional system that enshrined fixed territorial borders would divide groups whose homelands did not create focal points.

Suffocation was another inevitable consequence of colonial state formation, although one that receives too little attention relative to dismemberment. European powers imposed exploitative foreign rule on Africans and artificially divided their land. A key component of this project was for Europeans to delineate fixed borders to manage conflict among themselves and for administrative reasons. The consequence was the creation of artificially large states with fixed borders in a region historically characterized by small-scale polities and territorial fluidity (Vansina 1990; Reid 2012). Precolonial states were too small in number and in size to form the basis of colonial states across the continent. European administrators focused on creating economies of scale and wanted to use wealthier parts of their territories to subsidize poorer and less heavily populated areas (Gardner 2012; Green 2012). These goals ensured that disparate peoples lacking a shared political history would be merged into the same colony. Artificially large polities created difficulties for post-independence rulers to broadcast power throughout their national territory (Herbst 2000). Furthermore, combining precolonial states into larger countries with stateless groups against whom they had previously fought wars and raided for slaves created conditions for post-colonial conflict (Paine 2019).

The conventional wisdom on “bad borders” suggests the following counterfactual: had Europeans been more careful when drawing Africa’s borders, certain negative outcomes would have been less likely. However, imposing *any* set of fixed borders would have suffocated precolonial states within larger colonial states (at least without creating hundreds of states) and dismembered acephalous groups across international borders. Therefore, colonial *states* in Africa were largely artificial with respect to historical antecedents and geographic features, but the *borders* between these states were not.

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Main Appendix

We split our lengthy appendix into three main sections. The main appendix is Appendix A (25 pages), in which we provide supporting information about precolonial states: coding, digitization, and documentary evidence for border formation. The remaining sections are not required for reviewers, but provide supporting information for various results presented in the text. In Supplemental Appendix I (Appendix B), we present summaries of the features that influenced every bilateral border (32 pages). In Supplemental Appendix II (17 pages), we present supporting information for our grid-cell regressions (Appendix C), supporting information for our statistical analysis of ethnic partition and our critique of Murdock data (Appendix D), additional tables and figures (Appendix E), and all references for the appendix.

A SUPPORTING INFORMATION FOR PRECOLONIAL STATES

In Appendix A.1, we provide details on how we compiled our list of 46 precolonial states. In Appendix A.2, we provide notes on how we digitized each polygon. In Appendix A.3, we provide documentary evidence on how precolonial states influenced borders.

A.1 CODING PRECOLONIAL STATES

We use the seven regional maps of continental Africa in the atlas edited by Ajayi and Crowder (1985) to create a list of candidate precolonial states. We consulted three sources to determine which cases to code as states in our data set: Stewart (2006), Paine (2019), and Butcher and Griffiths (2020). We included in our data set any polity listed as a state in all three sources: Asante, Benin, Borno, Buganda, Bunyoro, Burundi, Cayor, Dahomey, Darfur, Ethiopia, Futa Jalon, Jolof, Kazembe/Lunda (E), Lesotho, Luba, Mwata Yamvo/Lunda (W), Nkore, Rwanda, Sokoto, Wadai, Walo, Zulu.

By contrast, we omitted any polity that none of the three sources identify as a state. Finally, for other polities identified in the Ajayi and Crowder maps, at least one but not all three sources listed it as a state. We consulted additional sources to assess which of these to include in our data set. Paine (2019) provides a detailed case-by-case appendix that helps to adjudicate some disputed cases. Based on his notes, we code the following cases as states: Bemba, Bundu, Kasanje, Lozi, Ndebele, Porto Novo, Salum, Sine. His notes also justify coding the following cases as non-states: Ovimbundu, Tio, Zande. We additionally include Egypt, Morocco, and Tunis; there is no ambiguity about their status as states, and they are omitted in one source, Paine (2019), because he includes only Sub-Saharan Africa. For the handful of remaining cases, we provide brief notes to justify our coding choice (all of which we code as states except Adamawa, Calabar, Ondo, Other Christian Ethiopian states, and Unyanyembe):

- Adamawa: This was not an independent state. Instead, it was founded as an emirate within the Sokoto Caliphate in 1806 (Hogben and Kirk-Greene 1966, 428-446; Stewart 2006, 7).
- Borgu: There were several main states of the Bariba people, including Bussa, Nikki, and Kaiama. Whether these states were unified or autonomous is subject to uncertainty. In the 1890s, the British and French each sent expeditions in an attempt to claim as much territory as possible (see Appendix A.3.2). Overall, it is clear that these polities were states in the sense of having ruling dynasties and control beyond the village level.
- Calabar: The polygon from Ajayi and Crowder is Old Calabar, centered at Duke Town (modern-day Calabar), in contrast to New Calabar. The latter is the entry in Stewart (2006), the only source that mentions this polity, and hence no sources list the Ajayi and Crowder polygon of Calabar as a state.

- Dagomba: ruling dynasty that dates back to the 14th century, although the state became tributary to the Asante between the 1740s and 1874. We code this as a state because the ruling dynasty survived throughout 1874 and afterwards (Stewart 2006, 68). Owusu-Ansah (2014, 88) provides details on political institutions.
- Damagaram: “Powerful precolonial state centered around Zinder and encompassing the current south-eastern corner of Niger ... Damagaram eventually controlled eighteen chieftainships and emerged as the dominant power north of Kano ... It remained independent of Fulani control during the Fulani jihad and even lent assistance to other Hausa elements driven out of their lands, helping found Maradi” (Decalo 1997, 108-9). Although nominally a vassal state of Borno, Damagaram was de facto independent. Following a civil war in Borno over a disputed leadership succession in the mid-nineteenth century, “the tendency on the part of vassal Zinder to assert its independence and even to dominate the outlying principalities of Munio, Gummel and Machena gathered momentum ... Zinder and the north-western vassal state practically ceased to have any political relations with Kukawa” (Anene 1970, 259-60).
- Futa Toro: Ruling dynasties in this area date back to at least the end of the fifteenth century. A jihad defeated the Denianke dynasty in 1776 and established an Imamate that lasted until defeated by France in the 1860s. See Suret-Canale and Barry (1971) for details on the pre-jihad political institutions.
- Gaza: Military leader Soshangane consolidated a ruling dynasty in the 1830s. The territorial reach of the state shifted over time, as Soshangane’s grandson Ngungunhane “succeeded to the throne [in 1884], moving the capital southward to Manjacaze in what is now Gaza province, closer to Portuguese centers of power” (Darch 2018, 171).
- Gobir: Historical Hausa state. Extensive fighting with Sokoto in the early nineteenth century caused it to move its capital several times, although its king list persisted (Stewart 2006, 112; Cahoon n.d.). Sometime between 1835 and 1860, “Gobir’s independence was reasserted at Tibiri” (Decalo 1997, 153), which corresponds with the polygon in Ajayi and Crowder (1985). A dissent faction seceded in 1860 that was “eventually conquered by the legitimate forces of Gobir in Tibiri” in the early twentieth century (Decalo 1997, 153).
- Igala. This was a notable state in the Niger-Benue confluence. The *Ata*, or divine king, sat atop a hierarchy of officials. Armstrong (1955, 86-8) provides details on Igala institutions.
- Mossi. Although the Mossi people were not unified into a single state, there were four main kingdoms (Zahan 1967). This included Ouagadougou, the entry in Butcher and Griffiths (2020).
- Other Christian Ethiopian states: A&C’s maps for North East Africa list various states prior to the 1890s. For reasons described in Appendix A.2.12, we include only Ethiopia in our data set.
- Swazi: The Swazi people were organized under a single state in 1770, also known as the Dlamini kingdom. See Kuper (1963) for details on their political institutions.
- Unyanyembe: Coded as not a state. Discussions of Unyanyembe in existing research focus mainly on Mirambo, the warlord who created a brief empire in modern-day Tanzania (we do not code his polity as a state given our criterion of including only states formed before 1850). See Oliver and Atmore (2005, 90-96) and Stewart (2006, 160).
- Yoruba states (Egba, Ibadan, Ijebu, Ondo, Oyo): See the description in Appendix A.2.28. We found no evidence that Ondo was an important state, and thus do not include it in our list of PCS.

A.2 DIGITIZING PRECOLONIAL STATES

We digitized numerous historical maps to georeference in ArcGIS the set of African precolonial states. For most precolonial states, we use the maps in Ajayi and Crowder (1985), which we refer to throughout as A&C, and for each we consulted at least one verification map. In some cases, we deemed that the A&C map missed important details, and digitized the verification map instead. Our replication folder includes every map we discuss below. To the extent possible, we use maps that capture African states on the eve of colonization, that is, roughly between the 1850s and the 1880s, depending on the region.

To maximize accuracy when georeferencing precolonial states, we used shapefiles of geographic features, such as rivers, lakes, coastlines, towns, and cities. For most maps, we used about ten control points for digitization, although the exact number depended on how easily the digitized image mapped onto the shapefiles. We used the World Geodetic System from 1984 (WGS 1984), which is standard in GIS.

In a few cases, two neighboring polygons (A and B) partially overlap if we use one map for polygon A and another map for polygon B. We split the difference in cases of overlap unless there was clear evidence that one map is more precise than the other.

A.2.1 Asante (and Dagomba)

Overview. We use the polygon for Asante from the A&C map “West Africa c. 1850,” and that for Dagomba from the A&C map “West Africa c. 1884.” We verified the validity of the Asante polygon using the map from Wilks (1975, 45); it corresponds with what he labels as the “Greater Asante” region. We verified the validity of the Dagomba polygon using the map from Manoukian (1952).

Details. We chose the earlier date for the Asante polygon because colonial interference in the southern part of what became the Gold Coast Colony contributed to imperial breakup (Nugent 2019, 113). Farther north, and without support from Britain, Dagomba reclaimed its independence in 1874 following subjugation as an Asante tributary state since the eighteenth century (Manoukian 1952, 15). Hence, we use the polygon with the later date for Dagomba, which reflected its boundaries on the eve of imperial partition. For these reasons, the A&C polygons for Asante and Dagomba that we chose overlap. We altered the Asante polygon to exclude the territory that Dagomba governed independently post-1874.

Regarding the boundaries of Asante, Wilks (1975) provides extensive details on the structure of the empire and its boundaries. He provides a detailed history on attempts by European explorers and administrators in the nineteenth century to record the extent of Asante influence, including areas that paid tribute. “Despite the changing status of various provinces, it is possible nevertheless to determine with reasonable accuracy the extent of Greater Asante at certain fixed points in time. Thus both Bowdich and Dupuis showed a high measure of agreement about its composition in the second decade of the nineteenth century, though neither was able to distinguish methodically between inner and outer provinces ... While the boundary between inner and outer provinces cannot be determined with great accuracy, sufficient evidence is extant to show that, like that of the metropolitan region, it was an administratively maintained one” (53-54).

Regarding the boundaries of Dagomba, “The Dagomba state occupies all the Dagomba Administrative District except a small area in the south-east occupied by the Nanumba state” (Manoukian 1952, 3). The location and shape of Dagomba in the accompanying map is nearly identical to that in A&C, except A&C appear to include also the small amount of territory that belonged to Nanumba. The Dagomba State Council represented title holders from thirteen different chiefships (who each controlled various villages) within the kingdom. Manoukian (1952) indicates no ambiguity about which chiefships belonged to the Dagomba state.

A.2.2 Benin

Overview. We use the polygon for Benin from the A&C map “West Africa c. 1884.” We verified the validity of the polygon using the map in Bradbury (1967).

Details. The A&C polygon corresponds closely with the core territory of the Kingdom of Benin depicted in Bradbury (1967, 4), including the specific detail that the western boundary corresponded with the Ose River. Bradbury describes the decline in Benin’s territory and influence during the 19th century. Indeed, the A&C polygon for Benin in their map “West Africa c. 1850” is larger than the one in 1884. Bradbury (1957, 18) provides additional details: “For the purposes of this Survey the Benin kingdom is regarded as being coterminous with the present-day Benin Division, the unit over which the authority of the Oba (king) was recognized after the restoration of 1914. The Edo of this area represent the solid core of the old Benin empire and, apart from minor revolts, they have given allegiance to the Oba over a period probably not less than 450 years—and possible for very much longer.”

A.2.3 Borgu

Overview. We use the polygon for Borgu from the A&C map “West Africa c. 1884.” We verified the validity of the polygon using the map in Crowder (1973).

Details. Crowder (1973) discusses the misunderstood relationship among the different Borgu/Bariba states. Prior to setting foot in the area, Europeans had heard almost as much about the state of Bussa as about Benin, and thus were shocked when they traveled to its capital to find a very small village (19). Instead, Nikki was the largest and most important of the five major Borgu states. The core of Nikki ended up in the French colony of Dahomey, although some of its dependencies were partitioned into Nigeria. Overall, Dahomey gained roughly 300,000 Borgu inhabitants compared to only 40,000 in Nigeria, which gained the other four states: Bussa, Illo, Wawa, and Kaiama (23). The myth of Bussa supremacy arose because it was the first of these states and held the most important relics (29). Overall, “This confusion as to who was sovereign in Borgu seems to have arisen from a failure to distinguish between the actual political power of the individual Borgu states, which fluctuated during the nineteenth century, and the reverence in which they held Bussa as the original Kisra foundation” (30). Nor was Nikki paramount among the states: “the position of the monarchs of Bussa and Nikki was not a strong one. With little authority over their dependent rulers, and always subject to challenge by rival claimants, their control over their ‘states’ was in no way comparable to that of the emirs of the Sokoto caliphate. In the case of Bussa, both Wawa and Illo, which paid him tribute, were in practice usually autonomous” (34). The distinct Borgu states labeled in the A&C map are identical to those in the Crowder (1973) map, which he attributes Mallam Musa Baba Idris. This is an extra validity check because our polygon jointly encompasses all the Borgu states. The map is accompanied by detailed notes about boundaries and the relationships among the states.

A.2.4 Borno (and Damagaram)

Overview. Our polygon for Borno comes from Figure 4 in Hiribarren (2017, 44), which depicts “Borno ca. 1850–1893.” We use the area that he labels as “Borno Proper.” For Damagaram, we use the polygon from the A&C map “West Africa c. 1884.” We verified its validity using the aforementioned map from Hiribarren (2017). In Appendix A.1, we explain why we code Damagaram as an independent state despite nominally owing vassalage to Borno.

Details. In A&C, Borno appears in the Central Sudan map (and is mentioned in the West Africa maps). Because of fluctuating boundaries throughout the nineteenth century, the A&C map for the “19th century”

(unlike most of their maps, they do not specify a year) does not reflect the political realities at the end of the century. Indeed, the A&C West Africa map contradicts the A&C Central Sudan map, as the former depicts Damagaram as independent whereas the latter depicts it within Borno. The A&C Central Sudan map is also problematic for depicting Borno's eastern boundary far east of Lake Chad, which yields our preference for the map from Hiribarren.

We use Hiribarren's polygon for "Borno proper" because Borno lost effective control of most of its tributary states, which comprised its outer provinces, during the nineteenth century. The outer provinces in Hiribarren's map include Zinder, Machina, Muniyo, Bedde, Kerri Kerri, Margi, Kotoko, and Logone; below, when these names arise, we mark them with an asterisk as a guide for readers. Hiribarren's map also labels Sokoto, Adamawa, Mandara, Bagirmi, Kanem, and Manga as distinct neighboring states.

In the early 19th century, Borno controlled various vassal states even after military defeats against Sokoto. "The vassal states to the west and north of Bornu included Bedde*, Munio*, Manga, Gummel, Damagarin (Zinder)* and Kanem . . . To the east of the Chad lay the states of Bagirmi and Wadai, which acknowledged a vague sort of subservience to Bornu" (Anene 1970, 258). However, Borno lost effective control of most of this territory during the 19th century: "Bornu never recovered Hadeija and Katagum from the Fulani [see the Sokoto entry for details] . . . Bornu virtually lost Wadai. In Bagirmi the curious situation developed in which Bagirmi paid tribute to both Bornu and Wadai. Shortly after the assertion of independence by Wadai, Kanem was also wrested from Bornu by the Tuareg . . . The civil war which involved Umar and his brother on the one hand, and Umar and the surviving member of the Sef dynasty on the other, did not help to arrest the shrinking of the frontiers of Bornu. Under Umar the tendency on the part of vassal Zinder* to assert its independence and even to dominate the outlying principalities of Munio*, Gummel and Machena* gathered momentum . . . Kanem fell under the suzerainty of Wadai. Zinder* and the north-western vassal state practically ceased to have any political relations with Kukawa" (Anene 1970, 259-60).

During the nineteenth century, in a correspondence over boundaries sent by the Shehu of Borno to the Sultan of Sokoto, the Shehu labeled Bedde* as a buffer region between the two states: "Between our kingdoms are the pagan Bedde tribes, on whom it is permissible to levy contribution: let us respect this limit: what lies to the east of their country shall be ours: what lies to the west shall be yours" (quoted in Hiribarren 2017, 20). In 1900, the Shehu of Borno signed a boundary agreement with the Sultan of Bagirmi. The English translation of this treaty states that the rulers "fixed the river Shari, the well-known river, as a common boundary between their territories" (Hiribarren 2017, 66). The Shari River corresponds exactly to the edge of what A&C's Central Sudan map labels as a contested area between Borno and Bagirmi, with the area to the west of the river corresponding with territory that unambiguously belonged to Borno, and to the east was the contested area. The contested area, in turn, corresponds with the provinces that Hiribarren labels as Kotoko* and Logone* (each of which lie between the Logone and Shari rivers).

In sum, this evidence establishes the Borno lacked control over almost every outer province in Hiribarren's (2017) map, which justifies our choice to include only Borno proper in our polygon for Borno. Similar maps of Borno as that shown in Hiribarren appear in Crowder (1966, 79) and Hogben and Kirk-Greene (1966). By contrast, maps for earlier periods show a larger territorial extent of Borno, such as that in 1800 from Lovejoy (2016, 70).

A.2.5 Buganda

Overview. We use the polygon for Buganda from the A&C map "East Africa 1885." We verified the validity of the polygon using the maps in Fallers (1960) and Beattie (1971).

Details. The A&C polygon for 1885 is larger than the one for Buganda in the A&C map "East Africa

1800,” which reflects Buganda’s expansion during the nineteenth century. “Buganda was perhaps the largest and most powerful of [the interlacustrine] kingdom-states at the time of the arrival of Europeans, extending from its centre at the ruler’s court on the northern shores of Lake Victoria to the east to extract tribute from southern Busoga, across the lakes to control at least partially the Sesse Islanders, to the north to the borders of powerful Bunyoro, and to the south through Buddu” (Fallers 1960, 13). The eastern frontier depicted in the maps from Fallers (1960) and Beattie (1971) was the Victoria Nile River, adjacent to Busoga. This connects into Lake Kyoga to form part of the northern border. The remainder of the northern border (when including the Lost Counties) is the Kafu River, which connects to Lake Albert. Bunyoro is to the north of this boundary. The map in Fallers (1960) includes the “Lost Counties” that Buganda gained from Bunyoro in the 1890s, whereas the map in Beattie (1971) does not. The A&C map does not include the Lost Counties. However, it does include Busoga, which neither of these two maps include as part of Buganda proper. Specifically, the A&C map extends east of the Victoria Nile River to encompass this tributary area to Buganda.

A.2.6 Bundu and Futa Toro

Overview. We use the polygons for Bundu and Futa Toro from the A&C map “West Africa c.1850.” We verified the validity of these polygons using the map from Suret-Canale and Barry (1971, 410).

Details. The eastern boundary of the Futa Toro polygon is not immediately obvious from the A&C 1850 map, and all of Futa Toro is eclipsed by early French colonization in the 1884 map. Our verification map makes clear that the A&C polygon for Futa Toro has its eastern boundary at Bakel, a town that coincides with the split in the Senegal River. We thus use the lower portion of the river (eastward of the split) and the trade route shown in the map as the western boundary of the polygon. As Suret-Canale and Barry (1971) describe, “The Futa-Toro or Senegalese Futa extends along all the central valley of Sengal from Bakel up the river and down as far as the delta. It is a sort of oasis between the semi-desert region of Mauritania to the north and the Ferlo to the south, an area, which is deprived of water throughout the dry season” (409). For Bundu, “Bundu grew at the expense of its neighbors, the Malinke of Bambuk, who were driven back onto the right bank of the Faleme or else forced to migrate to Gambia” (431-32).

A.2.7 Bunyoro

Overview. We use the polygon for Nyoro from the A&C map “East Africa 1885.” We verified the validity of the polygon using the map in Taylor (1962).

Details. Describing the kingdom in the 1950s after it had been subsumed into Uganda, Beattie (1971, 9) writes: “The kingdom was bounded on the west by Lake Albert, beyond which lies the Congo; on the north and east by the Victoria Nile [north of which are] the Acholi and Lango districts, and until 1964 [when the Lost Counties were returned to Bunyoro] its southern boundary was the Kafu-Nkusi river system, which separated Bunyoro from the neighbouring Buganda kingdom.” The A&C polygon corresponds perfectly with the river and lake boundaries. The border with Buganda is less precise and indicates a buffer region (there is an arrow from Buganda pointing to Nyoro, indicating Buganda expansion).

The Bunyoro kingdom shrunk over time, which a comparison between A&C’s 1800 and 1885 maps picks up. “Banyoro believe, and so far as the evidence goes they are certainly correct, that in former times their kingdom was very much larger than it was in its last years. Even as late as Speke’s visit in 1862 it was a great deal more extensive than neighbouring countries. But in historical times its territory was much reduced by the incursions of their traditional enemies the Baganda, latterly aided by the British, and there is reason to

believe that this diminution had been going on for some generations earlier. Even after the recovery from Buganda in 1964 of the two ‘Lost Counties’ of Buyaga and Bugangaizi, Bunyoro was only a small residue of the former Kitara empire” (Beattie 1971, 27-28).

A.2.8 Central Africa

Overview. We use the polygons for the following states from the A&C map “Central Africa 1800–1880”: Bemba, Kasanje, Kazembe/Lunda (E), Luba, Mwata Yamvo/Lunda (W). We verified the validity of these polygons using maps from Vansina (1966, 167), Whiteley (1951), and the *Encyclopaedia Britannica* entry for “Luba-Lunda states.”

Details. Vansina’s (1966) map “The Peoples of Kasai and Katanga Around 1890” has polygons for Kazembe, Yeke, and Luba Katanga. His map writes “Lunda” in words farther west than the location of Mwata Yamvo’s kingdom, but he does not provide boundaries. His map “Western Central Africa Around 1850” has Imbangala/Cassange (Kasanje). Whiteley (1951) provides additional detail on the Bemba: “The Bemba occupy an area on the north-eastern plateau of some 20,000 square miles, between latitudes 9°–12°S. and longitudes 29°–32°E.: an area which includes virtually the whole of Kasama administrative district and much of Mpika, Chinsali, Luwingu and Mporokoso . . . At the time of the establishment of the British South Africa Company in 1899 at Kasama, the Bemba Paramount Chief held sway over the whole of the area between Lakes Mweru, Bangweulu, Nyasa, and Tanganyika, and southwards into the present Lala and Lamba country. There is still a small group of Bemba near Tabora in Tanganyika” (1, 8). Because the Bemba and Kazembe polygons overlap, we split the overlapping area in half and assigned the western half to Kazembe and the eastern half to Bemba.

A.2.9 Dahomey

Overview. We use the polygon for Dahomey from the A&C map “West Africa c. 1884.” We verified the validity of this polygon using the map in Lombard (1967, 71).

Details. “On the eve of European penetration the Dahomey kingdom stretched from the important coastal ports of Whydah and Cotonou to the eighth parallel, excluding Savé and Savalou. Savalou formed a small allied kingdom. East to west, it extended from Ketu, on the present Nigerian border, to the district around Atakpame in modern Togo. Towns like Allada (the capital of the former kingdom of Ardra), Zagnanado, Parahoue (or Aplahoué), and Dassa-Zoumé came under the suzerainty of the Dahomean kings. Even the Porto Novo kingdom was at one time threatened by Dahomean forces at the time of the treaty agreeing to a French protectorate. The Dahomey kingdom thus stretched almost two hundred miles from north to south, and one hundred miles from east to west. Its population has been estimated roughly at two hundred thousand” (Lombard 1967, 70). Based on the map from (Lombard 1967, 71), Atakpame appears to correspond with the part of the Dahomey polygon that juts westward into modern-day Togo. “Atakpame appears to have existed for much of the nineteenth century in a sort of neutral zone between Asante and Dahomey, though this did not protect it from attack by the one when the influence of the other over it disturbed the balance of power” (Wilks 1975, 57-58).

A.2.10 Darfur and Wadai

Overview. We use the polygons for Wadai and Dar Foor from the Africa Map of 1890 from the *Americanized Encyclopaedia Britannica Vol. 1* (1892), available at <https://maps.lib.utexas.edu/maps/historical/>

[history_africa.html](#). We verified the validity of this map using the maps and qualitative description of boundaries from Theobald (1965).

Details. The boundaries between our polygons for Darfur and Wadai correspond closely with the limits of the tributary areas shown in A&C inset map “Wadai and Darfur in 1850.” However, we cannot directly use that map because it does not provide the entire outline of each state. The larger A&C map “The Central Sudan in the 19th Century” also contains polygons for Wadai and Darfur. However, this map is insufficiently detailed about the boundary region between the two and it depicts the boundary of Wadai as much farther west than is described in historical sources (as well as in A&C’s own inset map).

Theobald (1965, 1) describes the fluctuating western frontier of Darfur, which “historically extends from about latitude 10°N. to 16°N., and from longitude 22°E. to 27° 30’E., forming a rectangle some 450 miles long and 350 miles broad and its widest limits, and enclosing an area of nearly 140,000 square miles . . . its distinct natural frontiers; for to the north, the Libyan desert stretches for a thousand miles to the Mediterranean; to the east, a broad belt of sand-hills provides a barrier against Kordofan; and to the south, the tsetse fly limits the movements of animals beyond the Bahr El Arab. Only to the west is there a continuation of the same geographical conditions; and thus it is *only in that direction that the frontiers of Darfur have substantially varied*, and have been decided by political events, rather than by factors of soil, vegetation and climate” [our emphasis].

Later, Theobald describes “the debatable border lands of Dars Tama and Gimr in the north, Dar Masalit in the centre, and Dar Sila in the south . . . ‘the old frontier between Darfur and Wadai’ [did not] mean anything . . . [because] there was not, and never had been, any stable, clearly defined, and generally recognized frontier between Darfur and Wadai” (64, 69). Theobald (1965, 53) presents a map of Darfur in 1904 that shows the western frontier with Wadai and shows the petty sultanates on the frontier.

A.2.11 Egypt

Overview. We use the polygon for Egypt from the A&C continent-wide map “European Colonies and African States on the Eve of the 1884–1885 Berlin Conference,” with one alteration. The problem with their polygon is that the southern frontier of the Egyptian state was too far south relative to the territory that Britain gained in 1898, given gains by the Mahdist empire in the preceding decade. To fix this, we incorporated the map from Milner (1894). He depicts the northern frontier of the Mahdist state in Sudan, which we use as the southern border for Egypt. We verified the validity of our polygon using the map in Holt and Daly (2014); note that Wadi Halfa lies just above the northern boundary of the Mahdist state in both.

Details. The boundaries of the modern Egyptian state created by Muhammed Ali originally extended well beyond the Egypt polygon we use in our dataset; see the A&C polygon for Egypt in their continent-wide map or Holt and Daly’s (2014) map of Egyptian Sudan. However, the emergence and rapid expansion of the Mahdist state in Sudan in the 1880s conquered much of this territory, including victory at the Battle of Khartoum of 1885 and then expansion northward. This is an unusual case in which Britain nominally established colonial control over Egypt in 1882, but victories by a non-European state eroded the colonial territory. Consequently, when joint Anglo-Egyptian forces defeated the Mahdist state in 1898, the territorial realities of Egypt differed from seventeen years prior. Hence, for our purposes of measuring the territorial reach of states on the eve of a period in which a colonial border could have been drawn, it would not be appropriate to use A&C’s polygon for Egypt in 1884 without alteration. Britain was unable to draw boundaries in a region in which it was militarily defeated, whereas the A&C map includes Khartoum as belonging to Egypt rather than the Mahdist state. By contrast, the map from Milner (1894) accurately portrays the later

stabilization of the frontiers between Egypt and the Mahdist state. The natural geographic boundaries of the Mediterranean Sea, Sinai peninsula, and Red Sea form the northern and eastern boundaries, and the western boundary is in the Saharan desert.

A.2.12 Ethiopia

Overview. We use the polygon for Ethiopia from A&C’s map “North East Africa 1890–1896.” We verified the validity of our polygon using the map and accompanying description in Zewde (2001, 17).

Details. Modern Ethiopia emerged from a cluster of Christian Ethiopian states, which had themselves arisen from the fragmentation of the old Ethiopian Empire. Thus we code a single precolonial state in this region, rather than distinct Christian states (e.g., Shawa despite appearing on A&C’s maps and receiving mention in Stewart 2006). Shawa had a separate ruling dynasty until it was incorporated into the Ethiopian Empire in 1856 (despite retaining its own local negus, or king). In 1889, the king of Shoa became the Emperor of Ethiopia (Stewart 2006, 201-2). For our polygon, we include the solid purple and pink areas from A&C’s map, which indicate Menelik’s Empire in 1890, and do not include the additional areas of conquest in the 1890s. The accompanying text in their atlas details the specific events that yielded new pieces of territory.

A.2.13 Futa Jalon

Overview. We use the polygon for Futa Jalon from Carpenter (2012, 75). This is closely related to the polygons presented in A&C for Futa Jalon. However, in the A&C West Africa maps, the northern frontier of Futa Jalon is combined with the Senegalese state of Wuli. See also the map in Person (1974, 264-65).

Details. “The periphery of Futa Jallon in the late nineteenth century consisted of a number of small, politically and culturally independent polities, federations, and communities. Some had long been frontier communities, even before the emergence of the Futa federation, and had historically resisted impositions by larger states. Some had been pushed to the periphery during the Fulbe consolidation of power in Futa Jallon in the eighteenth and early nineteenth centuries. Others, while perhaps once part of one of the larger federations, nevertheless maintained substantial independence, an autonomy that became more pronounced after the weakening of Kaabu and Futa Jallon. In the nineteenth century these communities came to define the territorial limits of Futa Jallon. When the centers of power shifted after 1850 with the collapse of Kaabu and the decline of Futa Jallon, this frontier became territory contested by the likes of Alfa Yaya and Musa Molo—individuals in control of peripheral territory and looking to extend their control by pushing into the frontier. The small communities on the frontier, using the resources available to them, resisted the regular incursions from these individuals and, in the case of Coniagui and Sangalan, remained independent during this dynamic period in the history of southern Senegambia . . . At the periphery of northern and northwestern Futa Jallon lay a corridor of small and independent communities. From northeast to southwest these communities included Sangalan, Bassari, Badiar, Coniagui, Bedik, Pachessi, Landouman, and Nalou. The corridor formed a crescent running northeast to southwest crossing the upper Faleme, upper Gambia, upper Kuluntu, upper Geba, upper Corubal, upper Cacine and upper Nuñez rivers” (Carpenter 2012, 67-68, 73).

A.2.14 Gaza

Overview. We use the polygon for Gaza from the A&C map “Southern Africa 1798–1848.” We verified the validity of the polygon using the map from Julien (1977, 181).

A.2.15 Igala

Overview. We use the polygon for Igala from the A&C map “West Africa c.1850.” We verified the validity of the polygon using the map from Armstrong (1955).

Details. The historical Igala state corresponds with the Igala Division of British Nigeria, the boundaries of which Armstrong (1955, 77) describes. See also Armstrong (1955, 81) and Imoagene (1990, 20-1, 39-41). The A&C polygon for Igala in 1850 is nearly identical in shape to the polygon in the 1884 map, however, a small portion of the Igala polygon is cut off in the latter map because of British encroachment on the Niger River.

A.2.16 Lesotho

Overview. We use the polygon for Lesotho from the A&C map “Southern Africa 1798–1848.” We verified the validity of the polygon using the map from Sheddick (1953).

Details. Qualitative details on the boundaries: The A&C polygon extends farther west than the modern-day country of Lesotho, which is consistent with descriptions of the partition of the Sotho: “The Southern Sotho are located in a compact territory centred about the Colony of Basutoland. To the west of Basutoland lies what the Basuto know as the ‘Conquered Territory,’ that is, the eastern Orange Free State. Basuto are distributed over this latter region, most of them being tenants on European farms” (Sheddick 1953, 9). The accompanying map shows the dispersion of Sotho west of the boundaries of the country of Lesotho.

A.2.17 Lozi

Overview. We use the polygon for Lozi from the A&C map “Central Africa 1800–1880.” We verified the validity of the polygon using the map from Turner (1952).

Details. The boundaries of the Lozi kingdom, especially in the west, are uncertain. The A&C polygon appears largely accurate, if a somewhat too small (arrows point outward from the territory shaded by the polygon, which indicates expansion during the century). Treaties with Britain “retained for the Lozi the land lying west of the Zambezi which the Portuguese had claimed, but in fact the Lozi rule had extended farther to the west than the international boundary laid down by the King of Italy. The Lozi also withdrew from the present Caprivi Strip to the north bank of the middle Zambezi in the face of German colonisation and they had already abandoned their holdings toward Wankie before Ndebele threats ... The Barotse Province of today is considerably smaller than the area of the old kingdom. The Ila, Tonga, Toka, and Lyeba countries were taken over by Government, as well as the Kaonde district of Kasempa. In 1941 a Commission decision excised from Barotse Province the northernmost district of Balovale, after the local peoples had asserted their independence. The grounds of the decision were not made public” (Turner 1952, 13-14).

A.2.18 Morocco

Overview. We use the polygon for Morocco from the A&C map “North Africa c. 1870–1890 A.D.”

Details. For our polygon, we include only the Bled el-Makhzen region (which is solid-colored on the A&C map), and not the Bled el-Siba (which is dashed-colored). As the accompanying text from A&C states: “As late as the end of the nineteenth century [the Morocco Sultan’s] spiritual primacy was recognised as far away as Timbuktu and parts of Libya, but the actual area that he controlled was very much smaller. The territories were generally divided into two parts: the Bled el-Makhzen, where the Sultan could collect

taxes and appoint officials; and the Bled el-Siba (literally the Land of Wild Beasts), where his influence was almost purely religious. These areas varied according to the power of the Sultan, but generally the plains of the Atlantic seaboard were bled el-Makhzen, and the mountains of the Atlas and the Rif were Bled el-Siba.” The polygon for Morocco is the same in the three earlier periods depicted in A&C’s maps (both Bled el-Makhzen and Bled el-Siba), which suggests the stability of this territorial arrangement.

A.2.19 Mossi

Overview. We use the polygon for Mossi from the A&C map “West Africa c.1884.” We verified the validity of the polygon using the map from Zahan (1967).

Details. The A&C polygon corresponds closely with the detailed map of Mossi kingdoms in Zahan (1967, 153). Both list the four major kingdoms: Ouagadougou, Tenkodogo, Fada-n-Gourma, Yatenga. Zahan depicts internal boundaries that correspond roughly with the divisions among Mossi kingdoms in the A&C map. This is an extra validity check because our polygon jointly encompasses all four Mossi kingdoms. Zahan briefly describes the origins of each kingdom and then states: “Within five generations, according to these traditions, the Mossi kingdoms and principalities attained the form they possess today, and since that distant epoch interconnexions have been maintained among them and are still recognized in terms of kinship” (154).

A.2.20 Ndebele

Overview. We use the polygon for Ndebele from the A&C map “Southern Africa 1798–1848.” We verified the validity of the polygon using the map from Hughes and van Velsen (1955).

Details. The Hughes and van Velsen (1955) map lacks precise boundaries for Ndebele. However, the rough area depicted for Ndebele corresponds with the A&C polygon, and the town of Bulawayo is in the center of each. “Before their conquest by the B.S.A. Company the Ndebele used to occupy an area extending roughly from Lat. 19° 00’ S to 20° 30’ S and from Long. 27° 30’ E to 29° 30’ E. On the north and north-west the largely waterless country of sandveld forest, the so-called Gusu country, formed an effective if indeterminate frontier to the zone of permanent Ndebele settlement. On the south there was little permanent settlement beyond the Matopos and Malungwane ranges, while on the east their country ended at the hills of Mashonaland, the so-called Amaswina mountains. On the west Ndebele rule extended farther than serious Ndebele settlement, as there were numerous chiefs who had been left in control of their own people but who admitted the overlordship of the Ndebele king. In those days Ndebele rule extended well into what is now the Bechuanaland Protectorate” (Hughes and van Velsen 1955, 43). The boundaries of the A&C polygon are similar, extending from Lat. 19° 6’ S to 21° 5’ S and Long. 27° 3’ E to 29° 2’ E.

A.2.21 Nkore

Overview. We use the polygon for Nkore from the A&C map “East Africa 1885.” We verified the validity of the polygon using the maps from Karugire (1971).

Details. “Ankole [the colonial district] is a larger geographical area than Nkore, with which this study is concerned. It includes areas that were formerly independent of Nkore. The principal districts that were incorporated in the traditional kingdom of Nkore by the British at the beginning of this century were Buzimba, Budweju, Bunyaruguru, Igara, and the other parts of the former kingdom of Mpororo represented by the modern counties of Kajara, most of Rwampara, and most of Sheema” (Karugire 1971, 33). Generally,

the location, shape, and size of the A&C polygon is accurate. However, based on Karugire’s description and the accompanying maps in his book, the A&C polygon appears somewhat too large. The A&C polygon stretches to Lake Edward. By contrast, the only part of Karugire’s map that abuts Lake Edward is Bunyaruguru, which is one of the areas that he describes as not traditionally part of Nkore.

A.2.22 Porto Novo

Overview. We use the polygon for Porto Novo from the A&C map “West Africa c.1850.” We verified the validity of the polygon using the maps from Mills (1970, 11, 36).

Details. The kingdom of Porto Novo does not appear in A&C’s 1884 map for West Africa because it had already been colonized by France. The polygon for Porto Novo in 1850 is not clearly distinguished from that for Dahomey. However, by comparing the 1850 and 1884 maps, we can discern that the trade route depicted in the 1850 map (which itself follows the Oueme River up to the north point of the Porto Novo kingdom) forms the eastern boundary of Dahomey. Hence, we created the polygon for Porto Novo by using the area east of the Oueme River. Mills (1970) does not provide a detailed description of the boundaries of Porto Novo, but his discussion supports the boundaries depicted in these maps. On pg. 38 he refers to the “Porto Novo kingdom on the coast,” which is intuitive because the town of Porto Novo is, as its name suggests, a port. When discussing the map shown on pg. 36, he states that “the present-day boundary traverses an area which appears to have been devoid of any tribal unit North of the probable limits of Porto Novo” (35), hence indicating that he believes this map properly captures the northern boundary of the kingdom.

A.2.23 Rwanda and Burundi

Overview. We use the polygons for Rwanda and Rundi from the A&C map “East Africa 1885.” We verified the validity of the polygons using the map from d’Hertefeldt and Scherer (1962).

Details. Each polygon is larger than the corresponding one in the A&C map “East Africa 1800,” which reflects the expansion of each state during the nineteenth century. Regarding Rwanda, since the 1920s, when the colonial borders of Rwanda were finalized, the West of Rwanda has been delimited by Lake Kivu and the Ruzizi River right below it; the South by rivers Lua and Akanyaru (and the Kingdom of Burundi), and the East by the Kagera River. The Northern border is partly defined by the Kirunga mountains but is overall less well delimited. “On the one hand, the current Rwanda [1962] does not comprise all the regions upon which the authority of the central government extended in the past nor those where the king had less support/less authority. On the other hand, it comprises regions where, until the beginning of the 20th century, the authority of the king was very nominal. This is the case particularly in the northwest and the north” (15; translated from French to English by the authors). Regarding Burundi, “The current limits of Burundi are more or less arbitrary. Multiple regions like l’Imbo, the plain of the Ruzizi River and the Moso River used to be more or less independent. On the other hand, the Bugufi, region situated in the northeast of the ancient kingdom, was attached to the Tanganyika Territory in 1922” (119).

A.2.24 Sokoto (and Gobir)

Overview. We use the polygon for Sokoto from Smaldone (1977, Map 3). We use the polygon for Gobir from the A&C map “West Africa c. 1884.” The A&C polygon for Sokoto from the map “Sokoto Caliphate and Borno in the 19th Century” is reasonably accurate. However, our assessment is that the map from Smaldone (1977) better captures specific details of the boundaries.

Details. Regarding the northwestern boundary, in the early 19th century, the Sokoto Caliphate spread across what is now Northern Nigeria in a series of military conquests, many of which defeated traditional Hausa states. In three Hausa states, following military defeat, the ruling dynasty fled and formed a new state: Katsina founded Maradi, Gobir formed a new state centered at Sabon Birni, and Kebbi formed a new state centered at Argungu. The Caliphate founded Sokoto within the traditional Gobir state and Gwandu within the traditional Kebbi state. The resistant Hausa states fought continually with Sokoto and maintained their independence. We code Gobir as a distinct precolonial state, and its A&C polygon is located in the area described by historical accounts of these breakaway Hausa states.

Elsewhere in the northwest, the Caliph maintained friendly relations with the Tuareg in Air, but did not control them militarily; and Lord Lugard claimed incorrectly that Sokoto's influence extended as far west as Timbuktu. Anene (1970) stresses the lack of political allegiances by the many long-distance traders in the region. He asserts that "It is probably that it was the Fulani control of the trade centres of the Niger bend that partly contributed to the wrong assumption that the Sokoto-Gwandu empire was extensive in that direction" (264). Extensive slave raiding within the frontier areas between major states further undermined any hard political loyalties in these areas. Anene (1970, 256) concludes: "On the basis of the evidence provided by Dr Barth, it is reasonable to suggest that the frontiers of the Sokoto-Gwandu empire to the north and to the west did not lie far from the Fulani strongholds of Katsina, Wurno, and Gwandu. . . the situation seen by Barth remained more or less unchanged from 1855 to the end of the century." These are indeed in the southwest corner of our polygon.

In the east, Sokoto military victories gained territory from Borno. Although they were unable to conquer Borno permanently, they did seize two of Borno's western provinces and transform them into emirates at Hadejia and Katagum. These towns are in the northeast corner of our polygon.

A.2.25 Swazi

Overview. We use the polygon for Swazi from the A&C map "Southern Africa 1798–1848." We verified the validity of the polygon using the map from Kuper (1952).

Details. The polygon extends farther west than the modern-day country of eSwatini. This is consistent with descriptions of the partition of the Swazi: "only approximately three-fifths of all Swazi live in the High Commission Territory of Swaziland and approximately two-fifths live [west of that] in the adjoining Union of South Africa" (Kuper 1952, 7).

A.2.26 Tunis

Overview. We use the polygon for Tunis from the A&C map "North Africa 1848–1870 A.D." The polygon is the same in the two A&C maps covering earlier periods, and Tunisia was colonized by France during the time period of the next map (1870–90). We verified the validity of this polygon using the map from https://commons.wikimedia.org/wiki/File:Tunisie_-_Carte_allemande_1844.jpg.

A.2.27 Wolof states

Overview. We use polygons for the following states from the A&C map "West Africa c.1850": Cayor, Jolof, Salum, Sine, Walo. We verified the validity of the polygons using the map from Gamble (1967, 18).

Details. Gamble (1967, 11-21) describes the territorial extent of the Wolof people and the history of the different states in the region. His map clarifies that an unlabeled polygon in the A&C map is Baol and

that this should be combined into the polygon for Sine. Each of the states has largely the same shape as in A&C's 1884 map for West Africa, but early French colonization in the area obscures the limits of some of the polygons. See also the coding appendix for Senegal's precolonial kingdoms in Wilfahrt (2018).

A.2.28 Yoruba states

Overview. The Yoruba states in our data set are Egba, Ibadan, Ijebu, and Oyo. For Egba and Ijebu, we use the polygons from the A&C map "West Africa c.1850." For Ibadan and Oyo, we use the polygons from the A&C map "West Africa c.1884." We verified the validity of these polygons using the map in Mills (1970, 21), derived from that in Forde (1951).

Details. Although our preference would be to use the same date for each state, this is not possible with A&C's maps. In the 1884 map, Egba and Ijebu appear only in an inset that zooms in on the Ibadan Empire and surrounding states, which we found was too inaccurate to properly geolocate. Instead we use the polygons for Egba and Ijebu from the 1850 map, as these polygons are a similar shape and location as in the Ibadan Empire inset for 1884. For Ibadan and Oyo, we use the polygons from the 1884 map because their territories changed over time.

Until the nineteenth century, Oyo was the most important Yoruba state, and the lesser states of the Ife, Ijebu, and Egba were south of Oyo (Forde 1951, 4). The classic distinction was between "Metropolitan Oyo" and "Provincial Oyo," the latter of which stretched as far as to include Dahomey in the eighteenth century. Following the collapse of the Oyo Empire in the early nineteenth century, its ruling dynasty relocated the capital to New Oyo. Ibadan and Ijaye became newly powerful states and took over territory previously controlled by Oyo; and later in the nineteenth century, Ibadan destroyed Ijaye. Egba also became a powerful state in the nineteenth century (Morton-Williams 1967; Mills 1970, 21-43). Note that the aforementioned state of Ife is not included in A&C's maps because it was incorporated into the Ibadan Empire in the 19th century (Awe 1965). Talbot (1926) details the political institutions in Oyo, Ibadan, Egba, and Ijebu.

We provide additional description about Egba because it is located close to the Benin-Nigeria border. Based on qualitative descriptions of the boundary, this polygon is mostly accurate, although is somewhat too large because it extends too far west. "There is abundant evidence to show that the effective western frontier of the Egba state was the Ogun River" (Anene 1970, 154), upon which the capital Abeokuta is situated. Anene describes the annual raids by Dahomey that reached as far east as the Ogun River and that "neither Ketu [a Yoruba state] nor any of the Yoruba towns west of the Ogun were effectively protected from Dahomey" (155). The most intense assaults by Dahomey on Abeokuta occurred between 1851 and 1864 (Anene 1970, 166; Mills 1970, Fig. 11 on pg. 33). Other maps, such as Fig. 12 in Mills (1970, 35), extend the boundary of Egba even farther west than the A&C polygon. The western boundary in this map appears to encompass the Egbado towns of Ilaro and Ijanna that Egba raided periodically (see Fig. 11 in Mills 1970 and (Anene 1970, 153). However, according to Anene's description, Egba did not permanently control these areas.

A.2.29 Zulu

Overview. We use the polygon for Zulu from the A&C map "Southern Africa 1798–1848." We verified the validity of the polygon using the map in Thompson (1996, 82).

Details. "By the mid-1820s, Shaka's Zulu had established control over most territory from the Pongola River in the north to beyond the Tugela River in the south and from the mountain escarpment to the sea" (Thompson 1996, 83). One confusing aspect of the A&C map is that they label the rivers incorrectly. What

they label as the Tugela River is in fact the Pongola River. Correcting this mistake clarifies that their Zulu polygon is correctly located.

A.3 DOCUMENTARY EVIDENCE FOR PRECOLONIAL STATES

The following presents documentary evidence for various precolonial states. In some cases that we do not discuss, the colonial state directly reflected a discernible precolonial state whose territorial integrity was mostly unquestioned (Egypt, Ethiopia, Morocco, Tunisia). For other precolonial states, we did not uncover any evidence that they influenced a border.

A.3.1 Asante: Ghana–French West Africa Border

Overview. European treaties distinguished Ashanti as British territory. There is no evidence of intra-European disputes.

Details. Distinct treaties between Britain and each of the Netherlands and France explicitly assign the Asante territory to the British sphere of influence. An 1867 Convention with the Netherlands yielded an exchange of territory in the Gold Coast. “In this Convention the boundary between the possessions of Her Britannic Majesty and those of the King of the Netherlands was defined as being a line drawn true north from the centre of the mouth of the Sweet River as far as the boundary of the then existing *Ashantee kingdom*” (Hertslet 1909 Vol. 1, 65; our emphasis).

The main arrangement that determined British and French possessions in West Africa was signed in 1889, which mentioned: “The French Government shall undertake to allow England full liberty of political action to the east of the frontier line, particularly as regards the *Kingdom of the Ashantees*: and the English Government shall undertake to allow France full liberty of political action to the west of the frontier line” (Brownlie 1979, 215; our emphasis).

A.3.2 Borgu: Nigeria–Benin Border

Overview. Britain claimed control over the Borgu “state” on the basis of a treaty with the ruler of Bussa. France challenged the territorial domain of Bussa, and signed a competing treaty with the ruler of Nikki. They eventually partitioned the area of Borgu between Nigeria and Dahomey (Benin) on the basis of treaties with distinct rulers within what was originally believed to be a unified state.

Details. Britain established a broad presence in this part of West Africa before France. Britain sought to obtain all of Borgu for itself, mainly to secure its control over the navigable part of the Niger River. It initially proceeded under the assumption that Borgu was a unified political unit under paramountcy of the ruler of Bussa. They based this claim on (self-admitted) uncertain intelligence from Royal Niger Company agents, who signed a vague treaty with the ruler of Bussa in 1885 (Hertslet 1909, 128).

In 1894, France challenged this claim on two grounds, although without providing its own evidence. First, Borgu might not have been a unified state. Second, if any Borgu ruler was paramount, it was the ruler of Nikki (another Borgu ruler) rather than of Bussa. The dispute between Britain and France over the territorial status of Borgu induced a “race for Nikki” to secure new treaties. Ironically, the immediate result of this race was not to settle the border, but instead to gain new information about Bussa that prolonged the negotiations. British and French officials each gained compelling evidence that the rulers of Bussa, Nikki, and other Borgu states were de facto independent of each other, and none paid tribute to others. Because this reality was inconvenient for British claims to all of Borgu, its officials continued through 1896 to speak of the unity of Borgu. This case also prompted an explicit defense of the principle of suzerainty, which we quoted in the paper: “We could not abandon the principle of suzerainty. This principle was recognized in

all international negotiations and we held that, in treating with a suzerain, the rights conferred . . . extended to the whole of the territory under his dominion” (quoted in Anene 1970, 220).

However, likely because the unity of Borgu was inconsistent with reality, as negotiations continued, “[t]he compromises progressively ignored the earlier British contention that Borgu was one nation. The need to soothe ruffled national feelings and reconcile imperial interests became, in the view of the Powers, more important than the territorial integrity of Borgu” (Anene 1970, 221). By 1897, the powers had agreed on a new interpretation of the political structure of Borgu in which there were separate Bussa and Nikki states, which would be assigned to Britain and France, respectively. The Anglo-French Convention of 1898 explicitly contains provisions that “leav[e] Nikki and the surrounding district within the French sphere” and “leav[e] within the British sphere all territory belonging to the Province of Boussa and the district of Gomba” (quoted in Anene 1970, 226). Borgu is mentioned again in a 1900 report of “the British and French Commissioners for the Delimitations of the Boundary in Borgu, on the West of the Niger River (Southern Nigeria and Dahomey)” (Hertslet 1909, Vol. II, 797), and in various subsequent treaties.

A.3.3 Borno: Nigeria–Cameroon Border

Overview. The original border between British Nigeria and German Kamerun partitioned the Borno Emirate between these empires during a period in which the historical state was conquered and governed by a foreign warlord. Following World War I, German Borno was incorporated into British Northern Cameroons. Despite its status as a Trust territory, Britain governed all of Northern Cameroons as an extension of various provinces of northern Nigeria, and the old German Borno (which had become the Dikwa Emirate) as part of the Borno province. Both parts of Borno were formally reunited within the same country in 1961 when residents of Northern Cameroons voted in a plebiscite to gain independence and join Nigeria rather than Cameroon.

Details. Britain and France each sought to sign a treaty with the Shehu of Borno, but the existing ruling dynasty was overthrown by the foreign warlord Rabih before either reached Borno (Hiribarren 2017, 46-47). Amid the complicated tripartite negotiations among Britain, France, and Germany over the area near Lake Chad, Borno was partitioned between British Nigeria and German Kamerun in a treaty signed between the two powers in 1893 (62). Yet the powers were aware of the historical limits of Borno. Britain and France signed their own border treaty in this area in 1904, which ensured that all Borno territory west of the border with Cameroon would be British. They “readjust[ed] the boundary to the Komadugu Yobe . . . [so] that the whole of Borno would be British . . . this new border was chosen by the British and French because it already was the boundary of Borno” (78). The British subsequently repurposed the parts of the Borno state it controlled to create an eponymous province. “The kingdom of Borno became a ‘province’ and metropolitan Borno an ‘emirate.’ Its former vassals were turned into ‘divisions’ whereas its former fiefs were called ‘districts’ (99). Between 1902 and 1914, Britain engaged in four different revisions of the provincial borders to incorporate pieces of territory that previously paid tribute to the historical state of Borno (100-1).

During World War I, Britain and France negotiated over how to divide German Kamerun among themselves. “It was agreed that the British should obtain the German province of Borno, ‘Deutsch Bornu.’ On 24 February 1916 the British Foreign Secretary, Sir Edward Grey, sent a telegram to Francis Bertie, the British ambassador in Paris: ‘We would, therefore, accept M. Picot’s proposals, asking only that the territory of the Emir of Bornu should not be divided, and should go to us for administrative reasons’ (134). Britain succeeded in this aim, and “The former region of ‘Deutsch Bornu’ became part of the British Northern Cameroons which . . . was directly administered by the Northern Region of Nigeria and the province of Borno” (137). Britain was influenced in part by the assistance with which the Shehu of Borno provided

during World War I; as the Shehu proclaimed in a letter sent to Lugard, Governor-General of Nigeria: “I have assisted the Resident with all that has been required, horses, donkeys, bullocks, carriers and corn, and everything that he asked for . . .” (137). Territorial unification also reflected the Wilsonian ideals of self-determination espoused after World War I (138-39). Britain partially joined the Borno Division (Nigeria) and the Dikwa Division (Northern Cameroons) by unifying the Shehu title in 1937 (144-46), although these divisions could not be formally combined because Northern Cameroons was a British Trust Territory. “The plebiscites of 1959 and 1961 finally restored to Nigeria the effective frontiers of the former kingdom of Bornu” (Anene 1970, 284).

A.3.4 Buganda: Uganda–Kenya Border

Overview. Britain signed various treaties with the kabaka of Uganda. There is no evidence of intra-European disputes. British officials thought of Buganda as the core of Uganda. This influenced their decision to move Uganda’s original Eastern Province (home to acephalous groups) to Kenya. Later, petitions by Bugandan officials influenced Britain’s decision to not incorporate all of Uganda into a federation with Kenya. During these episodes, Buganda influenced the Uganda-Kenya border.

Details. The historical kingdom of Buganda was the core of Uganda (Ingham 1958, Ch. 2 and 3). Britain originally established a colonial presence in modern Uganda through missionaries and, for a short period, corporate governance by the Imperial British East African Company in Buganda. The Company signed several treaties with Mwanga, the kabaka of Buganda (see Hertslet 1909 Vol. 1, 392-6 for these treaties). In 1894, Britain declared a protectorate, which also referenced the neighboring states of Ankole and Bunyoro: “This Protectorate comprises the territory known as Uganda proper, bounded by the territories known as Usoga, Unyoro [Bunyoro], Ankoli [Ankole], and Koki” (395). These historical kingdoms were also referenced in the boundary documents of the Uganda Protectorate. By the time that Britain and Germany signed a treaty in 1898 to divide their spheres of influence in East Africa, the kingdoms were not specifically mentioned because they were already well-established as belonging to British Uganda. The Buganda Agreement of 1900 reinforced Buganda’s position at the core of the colony. Britain granted the Baganda high levels of internal autonomy and made the Buganda Province a “separate unit” (Ingham 1958, 92) within the Uganda Protectorate.

Britain’s arrangement with Buganda affected colonial borders during two distinct episodes: first in 1902, and later in the 1920s/30s. First, in 1902, Britain transferred territory from eastern Uganda to British East Africa (later, Kenya) instead of amalgamating the two colonies. The main goal of British officials was place the entire Uganda Railway under a single administration; by moving the border for British East Africa westward, the terminus of the railroad (which began in Mombasa) now lay entirely within British East Africa. One permissive condition for transferring this territory was that Britain had established minimal administrative presence in what was, until 1902, the Eastern Province of Uganda. This was itself endogenous to low precolonial political development in the area. British officials exerted minimal effort to collect hut taxes because there “seemed to be no chiefs . . . there was nothing approaching the centralized, quasi-feudal government of the Uganda kingdoms” (Matson 1958, 47). The Foreign Office preferred this plan over an alternative to create a federation between Uganda and British East Africa, two colonies with fundamentally different geographical orientations. Even the main proponent of federation, Ugandan governor Harry Johnston, “recognized that Uganda was still centred upon the kingdom of Buganda while the affairs of the East Africa Protectorate radiated from the Arab coast” (Ingham 1957, 44).

Second, a plan emerged in the 1920s to amalgamate Uganda, Kenya, and Tanganyika into a larger federation, although this ultimately fell through. Bagandan officials repeatedly stated their opposition to a federation,

and the evidence suggests that British officials were receptive to these complaints. The core fear by Ugandans was that Kenya would be the senior partner in the arrangement, which would subject Uganda to rule by the influential community of European settlers in Kenya. Amid a commission in 1924 to gather opinions, “The Kabaka and Lukiiko [council] of Buganda addressed a memorandum opposing closer political union lest the special position guaranteed to their kingdom by the 1900 Agreement should be jeopardized” (Ingham 1958, 180-1). They similarly protested to British officials in 1927 and 1929 (183-5). The final serious discussion over federation occurred in 1931, during which a Joint Select Committee sat to debate the proposal. “The Committee was particularly impressed by the authority and skill with which the African witnesses, led by Mr Serwano Kulubya, Omuwanika [Treasurer] of Buganda, stated their case . . . [and] convinced their hearers that the British Government in the past had tended to underestimate the abilities of the leaders of African opinion” (187).

A.3.5 Darfur and Wadai: Sudan–Chad Border

Overview. European treaties distinguished Darfur as British territory and Wadai as French territory. They disputed the limits of Darfur’s territory. The Sultan of Darfur retained his army and fought France to enforce his claimed control over petty sultanates in the frontier region. The European powers settled the border only after Britain deposed the Sultan, and each side gained some of the petty sultanates.

Details. In 1899, Britain and France agreed to divide Darfur and Wadai: “The line of frontier . . . shall be drawn as far as the 15th parallel in such manner as to separate, in principle, the *Kingdom of Wadai* from what constituted in 1882 the *Province of Darfur*” (Hertslet 1909 Vol. 2, 796; our emphasis). However, within the frontier region between these previously warring states lay various petty sultanates of disputed control. “There now lay only the debatable border lands of Dars Tama and Gimr in the north, Dar Masalit in the centre, and Dar Sila in the south . . . ‘the old frontier between Darfur and Wadai’ [did not] mean anything . . . there was not, and never had been, any stable, clearly defined, and generally recognized frontier between Darfur and Wadai” (Theobald 1965, 64, 69; see Panel B of Figure 6 for the location of these petty sultanates).

This case is unusual because Ali Dinar, the Sultan of Darfur was only nominally under British control. He had his own army and repeatedly demonstrated his willingness to use force if the border was not settled to his satisfaction. Britain deemed it too expensive to rule Darfur directly, and instead allowed Ali Dinar to govern Darfur as long as he was friendly to British interests. Ali Dinar had considerable agency, and between 1899 (when he gained undisputed control within Darfur) and 1916 (when Britain militarily defeated and killed him), he fought a series of battles against Mahdist rulers, neighboring tribes, and France.

The Sultan of Darfur’s disputes with France arose in 1909 when French troops moved eastward to conquer the Wadai empire. Ali Dinar claimed the disputed petty sultanates as Darfur’s historical tributary states. Between 1909 and 1912, their control fluctuated between France and Darfur through a series of battles—ultimately resulting in French control in 1912. In diplomatic communications with France, British officials repeatedly stressed that they lacked the direct military presence in the area to prevent Ali Dinar from attacking French positions if he did not gain control over these territories, specifically, Dar Tama and Dar Masalit (Theobald 1965, 98, 109). This, in turn, prompted Britain to seek to settle the border with France (94). Each side then sought to persuade the other with evidence regarding which sultanates were controlled by either Wadai or Darfur in 1882 (in reference to the Declaration between Britain and France from 1899).

Neither power gave in. Although they had agreed in principle to let a neutral party arbitrate the dispute, when World War I broke out, they agreed to revisit the matter after the war. During the war, Britain’s uncertain relationship with Ali Dinar soured and, ultimately, they launched a military expedition to depose

him in 1916. Given the pressure he placed on Britain to press territorial claims of which they were unable to convince France—despite Britain placing fairly low value on the territory—his removal cleared the way for settlement. At the Peace Conference in Versailles in 1919, during a Supplementary Convention, the British Governor-General of Sudan stated in a private letter to the British High Commissioner in Egypt: “The main point is that we have let the French keep Tama and they are letting us keep Masalit and Gimr” (Theobald 1965, 220). A Convention signed in 1919 confirmed this division: “From this point [the boundary] shall be drawn in such a manner as to separate in principle the countries of Dar Kouti, Dar Sula (Sila), Wadai, and Dar Tama from the countries of the Taaisha and other tribes subject to Darfur and from those of Dar Masalit and Dar Gimr” (Hertslet 1909, 626).

A.3.6 Dagomba: Ghana–Togo Border

Overview. The original European borders partitioned the kingdom of Dagomba. Britain and France divided German Togo after World War I. In response to a petition by the ruler of Dagomba, the kingdom was reunited within the British Empire and then, after independence, Ghana. An acephalous group, the Ewe, remained partitioned after these negotiations.

Details. Togo was originally a German colony, and a series of agreements between Britain and Germany between 1886 and 1904 determined its borders with the Gold Coast (Brownlie 1979, 251). During World War I, Britain and France invaded and occupied the territory. They subsequently divided the colony among themselves, with British Togoland in the west and French Togoland in the east. The new border purposefully contained within the British territory members of precolonial states that were previously divided between the British Gold Coast and German Togoland, but now would be administered entirely by the Gold Coast. In return, France received control over the port of Lomé and the Palimé railway (Nugent 1996, 43).

Bourret (1949, 96-7) provides additional detail on the World War I negotiations: “In the northern part of [German] Togoland there were several native states that were split by the Anglo-German boundary. Among these the Dagomba kingdom was the largest. Its ruler or ‘Na’ had his capital at Yendi, in German territory. After the British invasion, he signed a treaty acknowledging their sovereignty, and asking that his former state be reunited. Mamprussi and a small part of Gonja had likewise been separated by the former frontier. With this situation in view, it was decided at the Paris Peace Conference that Togoland should be divided in such a way as to reunite these tribes . . . for the same reason, the British were allowed, by Section 9 of the mandate, to administer the area as an integral part of the Gold Coast Dependency.”

In 1956, residents of British Togoland participated in a plebiscite over whether to join the Gold Coast or French Togoland. They chose the former, and hence the prevailing international boundary reflects the post-World War I alteration that reversed the partition of Dagomba. Yet the border continued to divide ethnic Ewe in the south. “Some sympathy was expressed for the plight of the Ewe peoples to the south, but since they had never constituted a single political unit it was felt that their case was less pressing” (Nugent 1996, 43). This supports our general contention that colonizers largely ignored acephalous ethnic groups when drawing borders.

A.3.7 Dahomey and Yorubaland: Nigeria–Benin border

Overview. A European treaty in 1889 set the boundary between French Porto Novo and British Lagos in the frontier region between the frequently warring kingdoms of Dahomey (whom France fought wars with in 1892 and 1894, and after whom they named their protectorate) and Egba (explicitly mentioned in the treaty as within the British sphere of influence). Although members of the broader Fon and Yoruba *ethnic groups* were partitioned across the colonies, the major *states* were not.

Details. Britain's broad goal was to secure control of Yorubaland against French encroachment (Anene 1970, 176-89). British officials characterized the state of Dahomey (which consisted of ethnic Fon and was located west of Yorubaland) as a barbaric slave-raiding state, and did not interfere with France's ambitions there despite having established earlier treaty relations with the Ahsu of Dahomey. Thus, "[t]he desideratum, from the British point of view, was to separate Dahomey from Yorubaland. The French were agreeable" (184). Britain originally argued for expansive limits to Yorubaland. They based their arguments on claims by the Alafin of Oyo that he was the "Head of Yorubaland, the four corners of which are and have been from time immemorial known as Egba, Ketu, Jebu, and Oyo, embracing within its area that inhabited by all Yoruba speaking peoples" (186). However, these claims were inconsistent with reality, as French officials pressed. Earlier in the nineteenth century, Oyo was indeed the pre-eminent state in Yorubaland, but its collapse enabled other Yoruba states, such as Egba, to gain independence.

A treaty in 1889 outlined Britain and France's spheres of influence throughout French West Africa. They specified the southern portion of the border between Nigeria and Benin in terms of areas along the coast: Porto Novo for France and Lagos for Britain (Hertslet 1909, 732). The treaty specifically mentioned that Egba laid within the British sphere of influence: "French traders shall be guaranteed full liberty of trade with such districts as shall not be included in the French sphere of influence, and especially as regards the *Egbas*" [our emphasis]. Therefore, although Britain ultimately ceded control over some ethnic Yoruba to France, they succeeded in gaining control of Egba, which was "the most effective Yoruba state in the boundary zone ... The international boundary therefore in no way affected the western frontier of Egbaland" (186).

Rather than partition any major states, the Benin-Nigeria border coincided with the buffer zone between the states of Dahomey and Egba. Frequent warfare between these rival states depopulated the region, in particular territory occupied by Egbado groups. Among the tribal areas partitioned by the border, only the Ketu kingdom was a distinct political entity. However, Mills (1970) shows that by the time of the partition, warfare between Dahomey and Egba had already essentially destroyed the kingdom (which we do not code as a state in our dataset). Overall, the Yoruba language group was partitioned, but not any major states in the area. "By placing a line of demarcation through this are the colonial powers were to a large extent replacing a frontier zone with a specific boundary line ... the colonial boundary-makers cannot be accused of disregarding existing political conditions" (35, 43).

A.3.8 Futa Jalon: Guinea–Guinea-Bissau Border

Overview. European treaties distinguished Futa Jalon as French territory, which no European country disputed. The border between French and Portuguese Guinea reflected the frontier of the state.

Details. A French diplomat signed a treaty with the Almaty of Futa Jalon in 1881 (Carpenter 2012, 112-13). France's domain over the area controlled by the state was confirmed at the Berlin Conference (115). France and Portugal negotiated their African claims in a convention in 1886, which explicitly mentioned Futa Jalon when determining the borders for each: "Art. II.—His Majesty the King of Portugal and Algarves recognizes the French Protectorate over the territories of Fouta-Djallon, such as it was established by the Treaties concluded in 1881 between the Government of the French Republic and the Almamys of Fouta-Djallon" (Hertslet 1909 Vol. 2, 674). Carpenter (2012, 118-19) demonstrates that the border they chose corresponded with the outer region of Futa Jalon:

"Indeed, the 13°39'46.05"W demarcation outlined as the eastern border of Portuguese territory coincided precisely with the limits suggested by Bayol and Noirot during the mission. Though Bayol's initial reports do not cite a specific astronomical demarcation, he does suggest as territorial limits areas that correspond to the astronomical limits given in the treaty. Noirot,

in an 1885 description of Futa Jallon wrote that although the almamys claimed their rule extended to the coast, those peripheral communities paid tribute to Futa Jallon only as a means of securing peace. He gave as a western limit of Futa Jallon the longitude of 13°39'46.05"W, the limit given the following year in the Portuguese–French convention. *Here, the eastern boundaries of Portuguese Guinea, while seemingly arbitrary in their specificity, were informed by the perceived limits of Futa sovereignty in the 1880s*" (our emphasis).

A.3.9 Lesotho and Swazi: Borders with South Africa

Overview. The Lesotho and Swazi states were unambiguously in British territory. Each lost major tracts of their traditional territory to South Africa. However, they nonetheless influenced borders in southern Africa simply because they survived as distinct territorial entities, contrary to Britain's original plan to amalgamate them into South Africa. When white South African officials refused to guarantee the rights of traditional rulers, British officials—who also faced protests from African rulers to prevent agglomeration—ultimately decided against a territorial transfer.

Details. Britain incorporated the traditional Lesotho and Swazi states into its empire as High Commission colonies in the 1870s and 1880s. In both cases, their rulers looked to Britain for protection against incursions by white settlers. Yet Britain's original plan was to incorporate both into the white settler-dominated South African colonies (Hailey 1963). This plan reached an impasse when the Afrikaaner colonies refused to implement non-racial franchise rules similar to those in Cape. Despite this snag, during South Africa's National Convention in 1907, many of the delegates thought it was "inevitable that in time the government of these areas must be entrusted to the people of South Africa" (28). However, by the 1920s, the attitude of British officials had changed. "In 1909 it had made no secret of its intention to hand over their administration to the Union; it was in fact only a question of time when this was to take place. It now had to face the fact that the outlook on Native policy held by the majority party in the Union was not at all that to which it had looked forward in 1909. In 1909 it had shown that it would only cede the Territories to the Union if its Government agreed to abide by the spirit of these conditions in view of increasing proofs of the hardening of majority opinion in the Union regarding the treatment to be given to the Native people" (59-60).

Given their earlier proclamations in favor of union, British officials could leverage the sentiments of traditional leaders against incorporation to defend their new position. Unsurprisingly, leaders in Swaziland and Basutoland consistently opposed incorporation into South Africa. In 1893, in response to attempts by Boers to govern Swaziland, "The Swazi Queen Regent and her Council dispatched a deputation to England to plead that the British should take Swaziland under their protection" (13). Amid discussions of the National Convention for South Africa in 1907, the Basuto "sent a deputation to England which asked for an assurance that their country should not be incorporated into the projected Union" (31). These leaders maintained their opposition to incorporation in subsequent decades. In 1953, the Queen Regent of Basutoland sent a petition to the King of England that stated the "Basuto detest[ed]" the idea of incorporation. In Swaziland, the Paramount Chief Sobhuza II and his people "have proved themselves to be very vigilant in protecting their rights, but nowhere in those proceedings was there any indication of a feeling that their position could be improved to their benefit by incorporation into the Union" (101).

A.3.10 Lozi: Zambia–Angola Border

Overview. European treaties distinguished Lozi (alternatively called Barotse) as British territory, but Portugal disputed the limits of its territory. They agreed to arbitration by the King of Italy to determine the limits of the kingdom, and hence the location of the border.

Details. Article IV of the main treaty (1891) dividing British and Portuguese spheres of influence in Central Africa granted the Barotse kingdom to Britain: “It is agreed that the western line of division separating the British from the Portuguese sphere of influence in Central Africa shall follow the centre of the channel of the Upper Zambezi, starting from the Katima Rapids up to the point where it reaches the *territory of the Barotse Kingdom*” (Brownlie 1979, 1041; our emphasis). However, diplomatic communications between Britain and Portugal later questioned: “What are, within the meaning of . . . Article [IV] of the Treaty of 1891, the limits of the territory of the Barotse Kingdom?” They submitted their dispute to arbitration by the King of Italy, whose “award and definition of the western limit of the Barotse Kingdom was based upon an assessment of the territorial extent of the effective authority of the Barotse ruler” (Touval 1966, 289). Relative to the originally proposed border, this alteration “moved the southern sector westward from the Zambesi to the River Kwando” (Brownlie 1979, 1043). Yet despite concerted attention paid to not partition Barotseland, the border chosen by the King of Italy was nonetheless 390 miles of astronomical lines (Griffiths 1986, 207), a rare instance of drawing a straight-line border for a precolonial state. Turner (1952, 13-14) contends that “Lozi rule had extended farther to the west than the international boundary laid down by the King of Italy. . . . The Barotse Province of today is considerably smaller than the area of the old kingdom.”

A.3.11 Mossi: Burkina Faso–Cote d’Ivoire Border

Overview. European treaties created a French sphere of influence that unambiguously included the traditional Mossi states. These were located within Upper Volta/Burkina Faso, which existed as a separate colony from 1919–32 and from 1947 onwards. We discuss the two episodes in which France detached Upper Volta from Cote d’Ivoire, in which the Mossi influenced French decision making.

Details. France gained control over the Mossi territory without facing armed resistance (Thompson and Adloff 1958, 173). France preserved the indigenous Mossi political structure to facilitate indirect rule, including leaving intact their supreme ruler, the Moro Naba (Skinner 1958, 125). Following a revolt in Niger in 1916, France established the territory of Upper Volta for administrative reasons “to introduce greater reliance on traditional institutions” (Touval 1966, 12).

As of 1946, most of Burkina Faso was part of the Ivory Coast. When France instituted elections across all its colonies, the most prominent inter-territorial political party was the Rassemblement Démocratique Africain (RDA). “When asked by Houphouët-Boigny [of the RDA], who later became the Ivory Coast’s long-time president, to collaborate in the naming of an Ivory Coast candidate for election to the Constituent Assembly in 1945, the Moro Naba [Mossi king] chose a loyal servitor who proceeded to campaign exclusively on the issue of reconstituting a separate Mossi state. The large vote that he rolled up—only slightly smaller than Houphouët’s—was clear evidence of the Mossi people’s wish to be separated administratively from the Ivory Coast . . . the Moro Naba had a one-track mind, and when French President Auriol visited French West Africa in 1947 he took advantage of this occasion to press successfully the Mossi claim for separate territorial status. There is little doubt but that it was the desire to curtail R.D.A. expansion that moved France to accede, and on September 4, 1947, the Upper Volta once again became a territory in its own right” (Thompson and Adloff 1958, 174-5). Crowder and O’Brien (1974, 676) elaborate upon how the Mossi leader’s desire for a separate Upper Volta state aligned with French colonial interests: “The French had already made inroads into the R.D.A.’s power based in the Ivory Coast by detaching the enormous and populous hinterland of Upper Volta which was once again made into a separate colony. Though ostensibly this move was said to reflect the wishes of the Mossi people, it in fact suited the French Government’s purpose of weakening the R.D.A. as well as their plan to extend the Abidjan railway from non-Mossi Bobo Dioulasso to Mossi Ouagadougou. The Mogho Naba promised electoral support and labour to France in return for the re-creation of Upper Volta.”

A.3.12 Rwanda and Burundi

Overview. Germany deliberately kept these kingdoms separate from the rest of German East Africa. After World War I, the League of Nations blocked Belgium’s attempt to amalgamate them into the Belgian Congo. During this period, the Rwanda’s border with Tanganyika was extended eastward to reflect Rwanda’s traditional boundaries, in part influenced by lobbying from the *mwami* of Rwanda.

Details. Germany governed Ruanda-Urundi from the 1890s until World War I as a district within German East Africa (which included Tanganyika, the mainland part of modern-day Tanzania). German officials “constant[ly] fear[ed] that too much interference with traditional Tutsi authority might incite an uprising that would be disastrous for German rule. The Tutsi could not be bullied and intimidated with the same success the Germany had had with Africans in other parts of the colony. And the German administration was flexible enough to recognize that different circumstances demanded different policies” (Louis 1963, 128-29).

During World War I, Belgium militarily occupied Ruanda-Urundi and surrounding areas with the goal of using it as a bargaining chip. The Belgians sought to gain land in Portuguese-governed Angola where the Congo River meets the ocean, which would augment the Belgian Congo’s narrow outlet to the ocean. They proposed a three-way trade of territory that also included Britain, who would have gained Ruanda-Urundi, and Portugal, who would have gained territory from Britain farther south in Central Africa. This ultimately fell through. Then Belgium sought, but failed, to amalgamate Ruanda-Urundi into their neighboring colony of the Belgian Congo. “The Belgians thought it regrettable that they would not be allowed simply to absorb Ruanda-Urundi into the Congo. Ruanda-Urundi was to become a mandate of the League of Nations. ‘This invention is no doubt unfortunate; ... the ideas of President Wilson had a great influence’” (Louis 1963, 256).

Finally, in the paper, we discuss how pressure from the Rwandan *mwami*, Belgian statesmen, and missionaries led to a post-WWI border revision to re-attach to Ruanda-Urundi a district that the *mwami* claimed had historically belonged to his state.

A.3.13 Senegalese states: Senegal–Mauritania Border

Overview. In the second half of the nineteenth century, France subjugated various states upon expanding its territorial control over Senegal, where its sphere of influence was unquestioned by other European powers. France drew the intra-imperial border with Mauritania to correspond with the Senegal River, which was the northern boundary of this cluster of states, including Waalo.

Details. France initially settled at St. Louis in the seventeenth century because its harbor, river, and nearby precolonial states facilitated exporting enslaved persons and legitimate trade. When France drew the intra-imperial border between Senegal and Mauritania in 1905, its internal documents did not mention any pre-colonial states (see, for example, Brownlie 1979). However, France had already subjugated these states and was not bargaining with other European powers. Thus, France did not face the same incentives to explicitly delineate the territorial limits of these states as it would if bargaining with another European colonizer. A key episode occurred in the 1850s when France defeated the Trarza, who were centered in Mauritania but whose power stretched south of the Senegal River. “To consolidate their ‘sovereignty’ over the river the French had to defeat the Trarza ... The French-Trarza war ended Trarza power in Waalo and *established the Senegal River as the colonial border* between desert and savanna societies. The Trarza defeat led to the annexation of Waalo in 1855 ...” (Searing 2003, 191; our emphasis).

A.3.14 Sokoto: Nigeria–Niger Border

Overview. European treaties distinguished Sokoto as the northern limits of Britain’s sphere of influence. However, Britain and France contested the boundaries of Sokoto, and revised the colonial border several times such that Britain gained all the towns that had been controlled by Sokoto, and France gained all the towns north of these (including Zinder, capital of Damagaram).

Details. Prior to European takeover, African actors contested the northern frontier of the Sokoto Caliphate (Anene 1970, 233–67). The Sokoto Caliphate itself was the product of a Fulani jihad that spawned numerous Muslim-controlled emirates, mainly but not entirely in areas occupied by ethnic Hausa. Many areas accepted the new order of Fulani rule by acknowledging the suzerainty of Sokoto and paying an annual tribute of goods and slaves. All the core emirates within the empire became part of Nigeria, including Sokoto, Kano, Daura, Zaria, Bauchi, Gwandu, Nupe, Yauri, and Ilorin. However, the empire lacked control over remnants of certain older Hausa states (Gobir, Maradi, Kebbi, Konni), with whom it frequently warred. This caused the frontiers of the empire to fluctuate. Nor did the Sokoto Caliphate control the Tuareg in Adar, or the Borno empire or its associated vassal states, including Damagaram (Zinder); we provide additional details above on Borno and Damagaram.

Britain signed a treaty with the Sultan of Sokoto in 1885 that formed the basis of its sphere of influence. Although France accepted Britain’s claim over Sokoto, they contested the northern reach of the Caliphate. The subsequent negotiations, after several border revisions, yielded control for France over many of the aforementioned frontier states that had successfully resisted conquest by the Sokoto Caliphate. In 1890, Britain and France concluded their first treaty pertaining to the border, which explicitly mentioned Sokoto: “The Government of Her Britannic Majesty recognizes the sphere of influence of France to the south of her Mediterranean Possessions, up to a line from Saye on the Niger, to Barruwa on Lake Tchad, drawn in such manner as to comprise in the sphere of action of the Niger Company all that fairly belongs to the *Kingdom of Sokoto*; the line to be determined by the Commissioners to be appointed” (Hertslet 1909 Vol II, 739; our emphasis).

Britain and France revised the border in 1898, and again in 1904, as Panel A of Figure 6 shows. France’s goal was to gain “a water route to connect its eastern and western African holdings and in particular a viable corridor from Niamey to Zinder” (Miles 1994, 67). The revised border in 1898 failed to solve the problem that “almost all the populated areas of Hausaland came under British sovereignty, including Maradi, Birnin Konni, Tibiri, and Magaria,” all of which France gained for Niger in the 1904 negotiation. Following the failure of the new border to satisfy its desires, “France proposed that the boundary be redefined to coincide with local political conditions. Observing that the Sokoto Arc [a arc around Sokoto that was a new feature of the 1898 agreement] cut through greater Damagaram, Adar, and Gobir, France asked for changes that would leave these indigenous polities intact,” to which Britain agreed (Miles 1994, 68). Zinder/Damagaram and the smaller neighboring polity of Maradi were mentioned in Article VI of the 1904 British-French Convention regarding West and Central Africa: “In order to avoid the inconvenience to either party which might result from the adoption of a line deviating from recognized and well-established frontiers, it is agreed that in those portions of the projected line where the frontier is not determined by the trade routes, regard shall be had to the present political divisions of territories so that the tribes belonging to the territories of Tessaoua-Maradi and Zinder shall, as far as possible, be left to France” (Hertslet 1909, 819). See also Prescott (1971) and Thom (1975) for more information about Nigeria’s borders.

Finally, Figure 3 demonstrates visually that the eastern-most region of Sokoto is partitioned between Nigeria and Cameroon (which was originally a German colony). This area corresponds with the Adamawa Emirate, the eastern-most emirate within the Caliphate. Given its distance from the town of Sokoto (located in the

northwest of the empire), Adamawa enjoyed a high degree of autonomy in the precolonial period. Britain and Germany realized that their original border severed the capital of the emirate, centered at Yola (located within the British sphere), from the hinterland (located within the German sphere). However, although the powers engaged in diplomatic communications and contemplated transferring all of Adamawa to one side or the other, the ambiguous limits of Adamawa ultimately impeded using its frontiers as focal points for drawing borders. Anene (1970, 128-9) argues that there was no “coherent political entity known as Adamawa.” The scope of control from Yola was ambiguous, and many pagan tribes in the hills maintained their independence. Overall, for our qualitative exercise of counting for which precolonial states the core area was partitioned across colonial borders (see the text), we do not count Sokoto despite the large bloc of eastern territory located in Cameroon.

Supplemental Appendix I

B SUPPORTING INFORMATION FOR BILATERAL BORDERS

In Appendix B, we provide supporting details about the features in every bilateral border. We use contemporary country names and organize the entries alphabetically.

B.1 ALGERIA–LIBYA

Summary: rivers, other water bodies (oases), topography (rock formations), cities/towns, deserts

Most important: cities/towns

Details. This border is an undemarcated, non-straight desert border aligned with historical trade routes. It was delimited by multiple conventions and treaties signed by France, Italy, and independent Libya between 1910 and 1955. It is useful to outline this border in three parts from north to south.

The northernmost, shortest segment consists of twenty miles from Fort Saint (the southernmost city in Tunisia, currently named Borj El Khadra) to southwest Ghadāmis (a Libyan oasis village) and is based on the 1910 Franco-Turkish Convention.

The middle segment between Ghadāmis and Ghat (a Libyan oasis village) is based on agreements between France and Libya in the Treaty of Friendship of 1955 and the 1956 Exchange of Letters. In the latter agreement, this segment is outlined using sixteen defined points from A to P that reference villages, infrastructure such as a landing strip and tracks, thalwegs, and rock formations such as escarpments and an outcrop (Brownlie 1979, 35-36).

The southernmost segment lies between Ghat and the Niger tripoint and was established in very general terms in the 1919 Exchange of Notes between France and Italy. The Notes discuss the rivers, mountains and villages through which the border runs: “De Rhat à Tumno, la frontière sera déterminée d’après la crête des montagnes qui s’étendent entre ces deux localités en attribuant toutefois à l’Italie les lignes de communications directes entre ces mêmes localités.” (Brownlie 1979, 28) Its alignment is based on the Ghat and Tumno passes and multiple other oases and villages, given that the area was historically important for trans-Saharan trade.

B.2 ALGERIA–MALI

Summary: oueds, watersheds, other water bodies (wells), topography (mountains, valleys), deserts, cities/towns, straight lines

Most important: cities/towns

Details. This border was originally established by French administrative practice in 1905 as the intracolony border between Algeria and French West Africa (of which Mali was a unit). The Niamey Convention of 1909 between Algeria and French West Africa then defined the border using a variety of physical characteristics such as oueds, wells, and mountains: “En quittant l’oued Tin Zaouaten la limite se dirigera en ligne droite sur le cap du Tassili des Ahaggar qui se trouve à 15 kilometres environ au sud du puits d’In Guezzam. . .” (Brownlie 1979, 47) The segment of the border between the Algeria-Mali-Niger tripoint and the Tanezrouft Route follows a variety of physical landmarks (aforementioned) and then follows a straight line until the Algeria-Mali-Mauritania tripoint.

B.3 ALGERIA–MAURITANIA

Summary: deserts, straight lines

Most important: straight lines

Details. This border is a straight line that is essentially a westwards extension of the Algeria-Mali border, first established as the division between Algeria and French West Africa (of which Mauritania was a unit) in 1905 by French administrative arrangement. It was defined in general terms by the Niamey Convention of 1909 between Algeria and French West Africa.

B.4 ALGERIA–MOROCCO

Summary: rivers, mountains, deserts, PCS, non-PCS ethnic groups, cities/towns, infrastructure

Most important: PCS

Details. In the 19th century, the border between Morocco and the Turkish territory of Algiers was “conceptual and approximate rather than linear and exact” (Brownlie 1979, 55) as jurisdiction and political power was exercised over persons and ethnic groups as opposed to physical territory. The Treaty of Lalla Marnia, for example, first established a line in 1845 from the sea to Teniet-el-Sassi (a pass) premised “upon the principle that the borders between Morocco and Turkey should remain as the frontier between Algeria and Morocco.” (Brownlie 1979, 58) The articles of the Treaty of March 18, 1945 trace a path along various bodies of water, mountains and hills, passes, cities and towns, and “tribes” as outlined in the protocol’s preamble. For example, “Toutefois le Haouch lui-même reste à 500 coudées (250 mètres) environ, du côté de l’est, dans les limites Algériennes. De Haouch-Sidi-Aïêd, elle va sur Djerf-el-Baroud, situé sur l’oued Bou-Nâïm. . .” (Brownlie 1979, 61) and “Il est également nécessaire de. . . nommer les tribus qui habitent sur ce territoire. À partir de la mer, le premier territoire et les premières tribus sont ceux des Ouled-Mansour-Rel-Frifa, ceux des Beni-Iznêssen, des Mezaouir. . .” (Brownlie 1979, 62)

However, as the French continually encroached upon Northwestern Africa from 1899 to 1901, the Moroccan empire was compelled to establish a well-defined border as territory it could commit to defending. Once Morocco and Algeria achieved independence in 1956 and 1962, respectively, the border was disputed between the rival French administrative structures. The border was then outlined and amended to greater precision by various treaties and agreements before being conclusively resolved by the Agreement of June 15, 1972 which delineates the border in approximately 24 parts using a variety of physical landmarks such as rivers, valleys, and plateaus including specific coordinates where needed.

B.5 ALGERIA–NIGER

Summary: straight lines

Most important: straight lines

Details. The border was vaguely defined by the Niamey Convention of 1909. It begins at the intersection of Algeria and Mali on the west and travels to the Libyan border at the east. This border is still consistently delineated in recent maps, but no precise course has been outlined and no demarcation has been made. In 1971 the governments of Algeria and Mali physically demarcated the two tripoints with Mali and Libya, though their locations are “still a matter of doubt” (Brownlie 1979, 87).

B.6 ALGERIA–TUNISIA

Summary: other water bodies (wells), topography (mountains, passes), desert, non-PCS ethnic groups, cities/towns, straight lines

Most important: wells

Details. This border was first established in the mid-19th century when parts of current Algeria fell under French administration. It was adjusted and delimited in various conventions and agreements from 1911 until

1970. It is useful to outline this border in two parts.

The northern two-thirds of the border extend from the Mediterranean Sea to Bir Romane (well) using wells, passes, and mountains as reference points. It was established by French administrative practice from 1883 to 1902. This border also assigned four “tribus” to either side of the border while preserving traditional usage rights, mostly of wells. These are the Oulad Sidi Abid el Hamadi, Gherib, Nememcha, and Troud. The text of the 1901 Procès-verbal signed by the French Resident-General and the Governor of Algeria, for example, specified that each group would preserve traditional usage rights over specific zones: “Chaque tribu conservera ses droits d’usage traditionnels. . . à savoir: Les Oulad Sidi Abid el Hamadi, sur les territoires situées a l’ouest de la ligne frontière jusqu’à la limite de Bir bou Guescha. . . Les Gherib sur les terrains. . . Les Nememcha sur les terrains. . . Les Troud sur la région qui s’étend. . .” (Brownlie 1979, 93)

The southern third of the border consists of two straight lines that lead to the Tunisia-Algeria-Libya tripoint. This tripoint was established prior to independence by the 1910 Convention between France and Turkey (Tunisia was a province of the Ottoman Empire).

B.7 ALGERIA–WESTERN SAHARA

Summary: deserts, parallels and meridians, straight lines

Most important: parallels and meridians

Details. This border is a segment of a longer straight line border (8° 40’ W) touching Morocco and Mauritania that was formed along the Sahara. The latter was formed in a partition between Morocco and Mauritania when Spain handed the territory of Spanish Sahara over to them in 1976. The alignment of this Algeria-Western Sahara border is referenced in Article V of the Franco-Spanish Convention of October 3, 1904.

B.8 ANGOLA–CONGO

Summary: rivers, watersheds

Most important: rivers

Details. This border is between Congo and the Cabinda enclave of Angola. The Cabinda enclave was created by the Convention of 1885 between Portugal and the International Association of Congo. The border between Cabinda and French Congo was established in the Franco-Portuguese Conventional of 1886 and supplemented by their Agreement of 1901.

The border for the most part either directly follows the thalweg of the Chiloango river or follows watersheds or ridgelines separating two river basins. The northeastern part starts from the confluence of the Luema and Lubinda Rivers and follows a line that is equidistant to these two rivers.

B.9 ANGOLA–DRC

Summary: rivers, parallels and meridians, straight lines, watersheds

Most important: rivers

Details. Portuguese claims over the area along the mouth of the Congo river were recognized at the Berlin Conference in 1885. The border between the Congo and Portuguese territories was established by the conventions of 1885 and 1891. Demarcation was carried out, approved, and verified by a series of follow-up protocols, conventions, and Procès-verbals.

Angola and the DRC share two borders: the short border between Cabinda coastal enclave and the DRC, and the long border between the rest of Angola and the DRC. This is one of the clearest cases that com-

bine rivers and straight line segments, often following parallels and meridians. The territory of the DRC extends South up to the border with Angola until it reaches the watersheds of multiple Congo tributaries (Kasai, Lulua, the Congo River itself, etc.). The northern part of the Cabinda-DRC border follows the Chiloango river. The western part follows parallels and meridians. The segment excluding the limits of the Cabinda enclave for the most part either directly follows rivers, including the Congo River and its various tributaries, or comprises of straight meridian lines connecting rivers. Occasionally there is a reference to mountains/topography (massif de Pinda; Brownlie 1979, 508), but these are very rare.

B.10 ANGOLA–NAMIBIA

Summary: rivers, meridians, straight lines, other water bodies (waterfalls)

Most important: rivers

Details. Angola-Namibia border was established in general principles by a Portuguese-German Agreement of 1886, and modified and demarcated by a series of follow-up agreements. The border for the most part follows Rivers Kunene and Kubango and connects waterfalls with straight or meridian lines. The weirdly shaped Caprivi Strip, bounded to the north in part by a straight line, was created in 1890 to give Germany access to the Zambezi River.

B.11 ANGOLA–ZAMBIA

Summary: PCS, straight lines, meridians, rivers

Most important: meridians

Details. The Angola-Zambia border stems from the British-Portuguese Treaty of 1891 that divided their spheres of influence and was demarcated and modified in later agreements. The line for the most part is comprised of straight lines and meridians. A segment in the south in principle follows eastern edge of the Kwando river but was replaced in 1964 with a series of straight line along the river due to the unreliability caused by the river's extensive and variable flood zone. The border segment in the north follows rivers.

Ethnic groups were not taken into consideration in the frontier alignment. *Ad hoc* arrangements were made to accommodate the interests of natives living in the frontier area (primarily concerning Angolan and Northern Rhodesian natives living on the Kwando River) in the 1954 Agreement between Britain and Portugal. The Barotse Kingdom was discussed extensively.

B.12 BENIN–BURKINA FASO

Summary: rivers, mountains, non-PCS ethnic groups, cities/towns

Most important: rivers

Details. This border represents the former intracolonial border between Benin and Burkina Faso, respectively named Dahomey and Upper Volta during French colonial rule. A series of decrees from 1909 to 1938 gradually delineated and redelineated this border.

Its alignment primarily follows the Pendjari River from the west, then a drainage divide, then the Mékrou River where the border meets the tripoint with Niger. The decrees also reference mountain ranges and towns in outlining the border.

Additionally, ethnic groups were a factor considered by the French Minister of the Colonies, Jean-Baptiste Morel, in the redrawing of this border in order to remedy the partitioning of the Bariba. In the *rapport* to the President of France in 1913, the Minister notes the advantages of creating intracolonial borders that correspond to the local ethnic geography. The Minister notes that a 1909 decree incorporates Baribas into

Dahomey (now Benin) that had “no ethnic link with the populations of Fada-N’Gourma” [in Upper Volta]. A modification of the border “would ensure, over the populations of the same race, the unity of action that is necessary and, also, would provide a natural limit in this region to both interested colonies” (Brownlie 1979, 206).²⁷

B.13 BENIN–NIGER

Summary: rivers

Most important: rivers

Details. This border represents the former intra-colonial border between Benin (formerly Dahomey) and Togo, both of which were previously French West African colonies. The alignment of this border was established through French decrees from December 1934 and October 1938, solely based on the Mékrou and Niger rivers. However, the precise division of the rivers and islands remain undetermined as “the relevant French instruments [legal documents] are not sufficiently precise.” (Brownlie 1979, 161)

B.14 BENIN–NIGERIA

Summary: rivers, other water bodies, PCS, non-PCS ethnic groups, cities/towns, infrastructure (roads)

Most important: infrastructure (roads)

Details. This border originates from the major Anglo-French Agreements partitioning various territories in Africa in 1889 and 1898. The present border, however, was established in the Anglo-French Agreement of October 19, 1906, as amended by the Protocol of July 20, 1912.

The 1906 Agreement delineates the border in 65 parts, often combining markers of both physical and human geography such as rivers, roads, infrastructure, and towns in order to outline border segments, for example: “11. Thence it follows the thalweg of the River Buru (Bourou), leaving Ilimon (Illemon) in French territory, to a point 200 metres beyond the bridge which spans that river on the road from Ilimon (Ilemon). 12. From this point the frontier runs parallel to and at a distance of 200 metres from the road to a point at which, after passing Ishada (Ichada), Mokofi (Ibokofi), Ibeyan (Ibiyan) and Tabolo, all of which are in British territory, it cuts the River Igunu (Gauna).” (Brownlie 1979, 168)

Brownlie (1979, 165-6) also notes that “The boundary lies in a region of mixed communities of Yoruba and Ewe. Linguistic minorities exist on either side of the line but, given the mixing of groups, any line would have this result.”

B.15 BENIN–TOGO

Summary: rivers, oueds, other water bodies (lagoons), topography (mountains, hills, passes), cities/towns, infrastructure (roads)

Most important: infrastructure (roads)

Details. The alignment of this border is based on the Franco-German declaration of 1912. From the south, it follows the Mono River. It ends where the Oti River crosses the tripoint with Burkina Faso in the north.

²⁷In the original: “Le décret du 12 août 1909, en rattachant au Dahomey certains groupements baribas qu’aucun lien ethnique n’unissait aux populations du cercle de Fada-N’Gourma . . . a laissé dans les limites de ce cercle toute une region occupée par des aborigènes de même race,” and “[il] y aurait intérêt à incorporer également cette région, dite région Porga, au cercle de l’Atacora, dépendant de la colonie du Dahomey, cette mesure offrirait l’avantage d’assurer, sur des populations de même race, l’unité d’action qui est nécessaire et, aussi, de donner dans cette région une limite naturelle aux deux Colonies intéressés.”

This border is mostly equidistant between existing routes that unite towns, with text in the 1897 Convention between French and Germany the rivers, oueds, towns, mountains, and hills it will follow. For example, “De ce point, elle gagnera la Rivière Kara suivant une ligne équidistante des chemins de Bassila à Bafilo par Kirikri et de Penesoulou à Séméré par Aledjo, et ensuite des chemins de Sudu à Séméré et d’Adledjo à Séméré, de manière à passer à égale distance de Daboni et d’Aledjo ainsi que de Sudu et d’Aledjo. ” (Brownlie 1979, 192).

B.16 BOTSWANA–NAMIBIA

Summary: meridians, deserts, straight lines, rivers

Most important: meridians

Details. The Botswana-Namibia border was established by the British-Germany Agreement of 1890 delimiting their spheres of influence in Africa. The line for the most part follows meridian and straight lines. Desert was not explicitly mentioned in the treaty but by inference it mattered. The Caprivi Strip was created in 1890 to give Germany access to the Zambezi River, bordering Botswana in the south. The southern boundary of the Strip comprises straight lines and follows the Chobe River.

The 1890 Agreement provides that the alignment “shall be subject to rectification by agreement between the two Powers, in accordance with local requirements” (Brownlie 1979, 1075). Part of the border from the Orange River northward towards a point near Rietfontein was demarcated between 1898 and 1903, leaving a substantial part of the line undemarcated until today. The southern boundary of the Caprivi Strip was established by an informal British-German arrangement in 1909. It seems plausible that the issue of demarcation is not pressing due to the desert environment, low population density and economic marginality of the border, though no explicit discussion of it is found.

B.17 BOTSWANA–SOUTH AFRICA

Summary: rivers, lakes, other water bodies (pools), mountains

Most important: rivers

Details. Rivers are the main determinant of the Botswana-South Africa border. “[F]or more than 90 per cent of its length the frontier follows rivers. The Convention of 1884 employs various natural features and beacons to establish the non-riverine sectors” (Brownlie 1979, 1096). The Rhodesia-Botswana-South Africa tripoint is located at the confluence of the Rivers Shashi and Limpopo. The eastern border segment from the Ramatlabama Pool to the Rhodesian tripoint is the western frontier of the former Transvaal state (later part of South Africa), which dates back to the Pretoria Convention of 1881 and the London Convention of 1884, which in part inherited the lines defined as early as 1871. In the conventions, rivers, pools, and hill summits determined the beacons connected by short straight lines. The western border segment from the Namibia tripoint to the Ramatlabama pool also comprises of rivers and is influenced by the meridian line that forms the Namibia-Botswana border and Namibia-South Africa border.

B.18 BOTSWANA–ZAMBIA

Summary: rivers, infrastructure (roads)

Most important: rivers

Details. Many small-scale maps show a convergence of four international boundaries (Botswana-Namibia, Namibia-Zambia, Zimbabwe-Zambia, and Botswana-Zimbabwe) at the confluence of the Zambezi and Chobe Rivers near a town named Kazungula. Due to vagueness of the thalwegs of two rivers and the Hunter’s Road, multiple interpretations exist over where the lines intersect and where the quadripoint should

be placed exactly. As a result, whether Botswana borders Zambia or not has been subject to interpretations for a long time. It has now been agreed that the international boundaries contain two tripoints joined by a short line of roughly 150 meters long forming a boundary between Zambia and Botswana, now crossed by the Kazungula Bridge.

B.19 BOTSWANA–ZIMBABWE

Summary: PCS, rivers, watersheds, infrastructure (roads)

Most important: PCS

Details. According to Brownlie (1979, 1082), “the evolution of the boundary was to depend primarily upon the territorial division between the lands of Chief Khama of the Bamangwato (Khama’s Country) and the Kingdom of Lo Bengula (Matabeleland).” Based on a series of proclamations, the frontier in the early 1890s followed the division between Khama’s Country and the Kingdom of Lo Bengula and his tributaries, with the exception of their dispute over the land between the Shashi and Maccloutsie Rivers, which was allocated to Khama’s country in 1895. A Boundary Commissioner was sent to establish the delimitation in 1895, which led to the Southern Rhodesia Order in Council of 1898 that established the principle of the alignment.

The actual alignment of the Botswana-Zimbabwe border for the most part follows rivers and the old Hunter’s Road. Article 4 of the 1898 Order defines the border as “by the South African Republic to a point opposite the mouth of the River Shashi, by the River Shashi to its junction with the Tati and Ramaquaban Rivers, thence by the Ramaquaban River to its source, thenence by the watershed of the Rivers Shashi and Ramaquaban until such watershed strikes the Hunter’s Road (called the Pandamtenka Road), thence by that road to the River Zambezi” (Brownlie 1979, 1084). The Hunter’s Road forms a substantial part of the border. A barbed wire fence was also mentioned. A 1959 boundary commissioner’s report quoted correcting old beacons adjusting to the fence, old tracks and what they learned from local inhabitants. Rich details in the report (Brownlie 1979, 1085-9) indicate that the commissioners knew a lot about local conditions when trying to fix old beacons.

B.20 BURKINA FASO–GHANA

Summary: rivers, non-PCS ethnic groups, cities/towns, infrastructure, parallels and meridians, straight lines

Most important: parallels and meridians

Details. The alignment of this border primarily depends on two 1904 Exchanges of Notes, the 1904 Report of the British and French Commissioners, two 1906 Exchanges of Notes, and redemarcation work from 1968 to 1972. The segments of the border are delimited very thoroughly; in the two 1904 Exchanges of Notes, the border is outlined in 41 segments primarily using rivers and parallels and meridians in addition to roads and villages. The aforementioned exchange also reveals knowledge of local conditions. The French and British governments offer compensation to local rulers as a result of the disruptions caused by the border. “Natives” are temporarily granted the right to emigrate to the other side of the border if dissatisfied with their village’s placement (Brownlie 1979, 285).

B.21 BURKINA FASO–IVORY COAST

Summary: rivers

Most important: rivers

Details. About two thirds of the border follows rivers Leraba, Komoe, and Kelewor. “There is no relevant international agreement and the alignment depends upon French administrative practice in the colonial period” (Brownlie 1979, 375).

B.22 BURKINA FASO–MALI

Summary: rivers, mountains

Most important: rivers

Details. Brownlie (1979, 427) states that “In principle the alignment depends upon [French] administrative practice” and that “No international agreement describes the boundary.” While there are no clear determinants for some parts of the border, the west of the tripoint with Niger roughly follows the Beli river and other “parts of the frontier consist on watercourses” (p. 430). These include semidry watercourses and the Groumbo river, the Sourou river, and the Ngorolaka or Banifing river. Finally, the border contours Mount Tenakourou, the highest point in Burkina Faso.

B.23 BURKINA FASO–NIGER

Summary: rivers, mountains, cities/towns, deserts, infrastructure

Most important: cities/towns

Details. This border represents the former French intracolonial border. The initial border from 1911 to 1919 between Niger and Haut-Sénégal et Niger (Burkina Faso, then known as Upper Volta, was a part of this colony) was the Niger River. After Upper Volta became a separate entity in 1960, the cercle of Say (except for the canton of Gourmantché de Botou) was transferred to Niger (no explanation is given for this in the 1926 Decree). Arrêtés written in 1926 and 1927 reveal detailed knowledge of the territory and mention existing villages (Afassi, Kouro, etc.) as well as rivers (rivière Sirba, Mékrou) and hills (Darouskoy, Baléganguia)

B.24 BURKINA FASO–TOGO

Summary: straight lines, rivers, towns, parallels and meridians

Most important: straight lines

Details. The first delimitation occurred in the Franco-German Convention of 1897, which was no longer applicable except for the eastern section following the 11° north parallel. Most recent delimitation is documented in the Franco-German Declaration of 1912, in which various towns along the border were intensively referenced. “A small segment sits upon the Sansargou river. The remainder consists of straight-line sectors not demarcated by pillars.” (Brownlie 1979, 480) After WWI Togoland was divided into British and French Mandated Territories, but the borders were inherited without change.

B.25 BURUNDI–DRC

Summary: rivers, other water bodies (lakes), mountains, PCS, infrastructure

Most important: PCS

Details. This border is based on the 1910 Convention negotiated between Germany (the Kingdom of Burundi belonged to German East Africa) and Belgium (of which the current Democratic Republic of Congo was a colony). “The Kingdom of Urundi”, Brownlie (1979, 515) explains, “lay on the north-eastern shore of Lake Tanganyika.” The border has two main segments that separate the Kingdom of Urundi from the Congo. The Convention of 1910 specifies the median line of Lake Tanganyika as the border separating Burundi from the DRC. The northern half accomplishes the same goal by using the Rusizi River.

B.26 BURUNDI–RWANDA

Summary: rivers, PCS

Most important: PCS

Details. The Burundi-Rwanda border depends upon the local customary boundary between the Kingdom of Ruanda and the Kingdom of Urundi as the Germans found it and the Belgians documented it (Brownlie 1979, 739), which mostly follows rivers. See Appendix A.3.12 for the influence of the two traditional kingdoms on colonial borders. The border starts from the Tanzania tripoint at the intersection of the *thalwegs* of the Rivers Mwibu and Karega, extends westward along Rivers Karega, Kanyaru, and Luhwa, and ends at the DRC tripoint at the confluence of the Luhwa and Rusizi Rivers (Brownlie 1979, 739-40). A few other minor rivers are also mentioned.

B.27 BURUNDI–TANZANIA

Summary: rivers, mountains, lakes

Most important: rivers

Details. The boundary was established by an Anglo-Belgian Protocol of 1924 (approved in 1926) and for the most part follows rivers and connects hills. It started in the south with the Zaire tripoint on Lake Tanganyika, following the median line of the lake approximately along the 4°27' S meridian line. Major rivers constituting parts of the border include Rivers Ndyakalika, Muragarazi, Lugusi, Kahumo, Ruvubu, Ruvuvu, and Kagaera. Various hills and summits were also referenced in the Protocol. Short straight-lines were used to connect rivers and hills.

B.28 CAMEROON–CENTRAL AFRICAN REPUBLIC

Summary: rivers, topography (valleys), cities/towns, infrastructure, parallels and meridians

Most important: rivers

Details. This border originates from the 1894 Franco-German Convention drawing the border between German Cameroun and the colony of French Congo, and its alignment was altered by the 1908 Franco-German Convention. The border primarily follows rivers and streams, in addition to parallels, valleys, roads, and villages. For example, the 1908 Convention states “Elle va au gué [ford] du ruisseau Mana, sur le chemin Nguia (Ngia)-Bagari, à 16 kilom. Au nord-est de Nguia, ensuite au gué de la Guirma (Gliba) sur le chemin Bingué. (Binge)-Aladji à environ 10 kilom. sud d’Aladji; puis elle descend la Guirma jusqu’à son confluent avec la Kadei et remonte la Kadei jusqu’à sa source.” (Brownlie 1979, 525)

B.29 CAMEROON–CHAD

Summary: rivers, other water bodies, cities/towns, parallels and meridians

Most important: rivers

Details. Germany and France established this boundary at the Franco-German Convention of 1894 to determine their respective spheres of influence in the remaining land of the lake Tchad region between German-held Cameroon and French Congo (of which Chad was originally a part).

The text of the convention very precisely outlines a border adapted to the physical and human geography of the region. Rivers, primarily, and other bodies of water were used to establish the course of the border and establish key tripoints, for example: “... le cours du Logone vers le nord jusqu’à son confluent avec Chari.” (Brownlie 1979, 533) and “The Central African Empire is either on the thalweg of the Mbéré or its median line.” (Brownlie 1979, 533). Additionally, the convention uses parallels and meridians as references, with

statements such as “La frontière entre la Colonie du Congo Français et la Colonie du Cameroun suivra, à partir de l’intersection du parallèle formant la frontière avec la méridien 12° 40’ Paris (15° Greenwich).” (Brownlie 1979, 535) The towns of Koundé (Central African Republic) and Lamé (Chad) also serve to delineate the border (Brownlie 1979, 535-536).

Finally, part seven of the convention appendix states that the border may be redefined to better align with the “natural configuration” of the terrain with specifically defined points as the governments familiarize themselves with the territory in the future—demonstrating the long term intent of the two governments to tailor the border to the geography of the region.

B.30 CAMEROON–CONGO

Summary: rivers, parallels and meridians, straight lines

Most important: rivers

Details. This border originated as the border between German Cameroon and French Congo in 1885, but the Franco-German Convention of 1908 is the basis for the present alignment. The majority of this border from the east follows rivers, notably the Ngoko river, and the westwards remainder follows 2° 10’ 20” N.

B.31 CAMEROON–EQUATORIAL GUINEA

Summary: rivers, parallels and meridians, straight lines

Most important: parallels and meridians

Details. This border originates as the border between German Protectorate of Kamerun and Spanish Guinea, which was outlined in the 1885 Protocol and in the 1894 Convention between France and Germany. The present alignment is based on the 1900 Franco-Spanish Convention confirming the area under Spanish sovereignty. Most of the boundary follows the meridian at 10° of longitude east from Greenwich. Specifically, the border consists of “a line following the said river [Campo] from its embouchure, to the point where it meets the meridian at 10° of longitude east from Greenwich (7° 40’ longitude east from Paris), and, from this point, the parallel of latitude as far as up to its intersection with meridian situated 15° of longitude east of Greenwich” (Brownlie 1979, 545).

B.32 CAMEROON–GABON

Summary: rivers

Most important: rivers

Details. This border is primarily aligned to the rivers of the region that stretch between Equatorial Guinea and the Republic of the Congo. This border originated in the Protocol of December 24, 1885 establishing the German and French spheres of influence that respectively contained the colony of Kamerun (present-day Cameroon) and Congo Français and Dépendances (a grouping that Gabon belonged to). The present border relies primarily on the Franco-German Convention of 1908, with minor revisions initiated in 1911 and restored in 1919.

B.33 CAMEROON–NIGERIA

Summary: rivers, other water bodies, mountains, non-PCS ethnic groups, cities/towns, infrastructure

Most important: rivers

Details. It is useful to outline this border in two parts: the first segment, mainly aligned to regional rivers, originated through Anglo-German agreements from 1885 to 1913. The second segment running from the

Lake Chad tripoint to Mount Kombon was established at the end of World War I when Britain and France partitioned previously German-held Cameroon.

This border was first established and delimited between the British and German Protectorates of Niger Coast (present-day Nigeria) and Kamerun (present-day Cameroon) in a series of note exchanges, treaties, and agreements from 1885 to 1913. The present sectors between the Gamana and Cross rivers and between the Cross River and the Bight of Biafra rely primarily on the Agreements of March 11 and April 12, 1913 which represent the final delimitations agreed upon between Britain and Germany. These sectors are outlined in painstaking detail in 30 parts in the former agreement and 21 parts in the latter, using references to specific natural landmarks such as thalwegs and ridges while noting the exact distances between these markers. Various segments are also delimited in relationship to specific roads while villages are partitioned between Britain and Germany (Brownlie 1979, 558). It accounts for the navigation, travel, and fishing rights of native populations. The March 11 1913 Agreement even contains alternate alignments in the event that certain natural markers such as specific thalwegs and river courses move (Brownlie 1979, 559). It also accounts for and outlines trade regulations between the two governments on the Cross River.

At the end of World War I, Britain and France partitioned the former German colony of Kamerun in the Milner-Simon declaration of 1919 and the 1928 Exchange of Notes. This partition resulted in the present border segment between the Lake Chad tripoint and Mount Kombon. This segment, like the sectors established in 1913, is first outlined in 41 parts in the 1919 Milner-Simon declaration, then meticulously outlined and expanded upon in 138 parts in the 1928 Exchange of Notes using various natural landmarks such as rivers, marshes, and water-holes in addition to multiple villages and roads as reference points.

B.34 CENTRAL AFRICAN REPUBLIC–CHAD

Summary: rivers, cities/towns, infrastructure, straight lines

Most important: rivers

Details. This border is based on the former French intracolonial border between Chad and Oubangui-Chari (present-day Central African Republic) at the time of independence in 1960 . The majority of this border follows rivers, mainly the Lobaye and Ibenga Rivers, though there is no documented definition of detailed segments along river sectors. An example of the border’s description in the United States International Boundary Study No. 83 is “From the tripoint the boundary extends southeastward in a straight line to a point (7 30’ 40” N., 15 32’40” E.) on the road between Baïbokoum (Chad) and Mann (Central African Empire), it then continues eastward in a straight line to the mouth of the Lébé located at the river’s confluence with the Lim.” (Brownlie 1979, 590)

B.35 CENTRAL AFRICAN REPUBLIC–CONGO

Summary: rivers, watersheds

Most important: watersheds

Details. This border is based on the former French intracolonial border between Moyen Congo (French Congo) and Oubangui-Chari (present-day Central African Republic) immediately prior to independence in 1960. “A considerable proportion of the alignment is in principle the drainage divide between the Lobaye and Ibenga Rivers” (Brownlie 1979, 593).

B.36 CENTRAL AFRICAN REPUBLIC–DRC

Summary: rivers, watersheds, parallels and meridians

Most important: rivers

Details. This border is based on the alignment from the 1894 Convention between France and Congo, and originated from the 1885 Convention between France and the International Association of the Congo. The border follows the Ubangui River first from the west and then the Mbomou River until it reaches the tripoint with Sudan, which is defined by the Congo Nile watershed. Specifically, the 1894 Convention states “Le 30e degré de longitude est de Greenwich (27° 40’ Paris), à partir de son intersection avec la crête de partage des eaux des bassins du Congo et du Nil, jusqu’au point où ce méridien rencontre le parallèle 5° 3’, puis ce parallèle jusqu’au Nil.” (Brownlie 1979, 604)

B.37 CENTRAL AFRICAN REPUBLIC–SUDAN

Summary: watersheds, mountains

Most important: watersheds

Details. This border is based on the alignment from the 1924 Anglo-British Protocol, and originated from the 1898 Anglo-French Convention where France and Britain initially established their respective zones of influence east and west of the Niger. “The line depends upon description of topographical features constituting the water divide between the Congo and Nile drainage areas” (Brownlie 1979, 600). Jebel Manda, a mountain, is the most notable topographical feature, besides the drainage areas, that guides the border.

B.38 CHAD–LIBYA

Summary: deserts, cities/towns, PCS, parallels and meridians, straight lines

Most important: parallels and meridians

Details. This border consists of two straight line segments. The first segment between the Niger tripoint and the Tropic of Cancer is simply the political border “forming the southern limit of the Turkish vilayets [provinces] of Tripoli and Barca.” (Brownlie 1979, 121) This segment was expressly recognized in the 1955 Treaty of Friendship and Good Neighbourliness between France and Libya. The second segment from the Tropic of Cancer to the Sudan tripoint was also recognized in the aforementioned treaty.

B.39 CHAD–NIGER

Summary: other water bodies (lake, wells), topography (mountains, dunes), desert, straight lines

Most important: topography (mountains, dunes)

Details. This border represents the former French intracolonial border between French West Africa (which Niger belonged to) and French Equatorial Africa (which Chad belonged to). French administrative measures from 1934 to 1937 provide no specific descriptions of the border but gesture to the extent of Chad’s territory. An English version of a 1931 Memorandum sketches the border segment by segment, using parallels and meridians from the north and physical features such as mountains and dunes. The southern half of the border runs through Lake Chad, Firkachi (a well), and Siltou (a well), then the northern half of the border runs up the Grand Erg de Bilma (dune sea) and the Tibesti Mountains.

B.40 CHAD–NIGERIA

Summary: other water bodies (lakes)

Most important: other water bodies (lakes)

Details. This border originated from the partition of the region between Great Britain, France and Germany and represents the border at the time of independence. It is a straight line joining the Niger tripoint and the Cameroun tripoint, running entirely within Lake Chad. The Niger tripoint was determined by the 1910

Anglo-French Protocol and the Cameroun tripoint was determined during the 1906 Anglo-French Convention and specified in the 1931 Anglo-French Exchange of Notes.

B.41 CHAD–SUDAN

Summary: rivers, oueds, other water bodies (lakes, wells, pools), topography (mountains, valley), deserts, PCS, cities/towns, infrastructure, parallels and meridians

Most important: PCS

Details. This border is based on the division between the former Kingdoms of Wadai and Darfur, as described in Appendix D and as stated in the 1899 Anglo-French Declaration: “From this point it shall be drawn as far as the 15th parallel in such manner as to separate, in principle, the Kingdom of Wadai from what constituted in 1882 the Province of Darfur.” (Brownlie 1979, 622) The precise alignment of this border was established in the 1924 Anglo-French Protocol, which meticulously outlines the border in 102 segments using physical and human characteristics such as lakes and mountains, e.g. “It then follows the bed of that wadi in a north-easterly direction to a point exactly 2 ½ kilometres due south of the southern summit of the most eastern Jebel Gunguri (Goundjouri) [mountain] which is shown on the map height 839.” (Brownlie 1979, 633)

B.42 CONGO–DRC

Summary: rivers, other water bodies (lake), watersheds, topography (mountains, ravine), cities/towns

Most important: rivers

Details. Of the 1,010 miles of this boundary, 500 consist of the Congo River and 290 of the Oubangui River. The remaining 20% is delimited by the Shiloango River, Stanley Pool (presently known as Pool Malebo), mountains, and various villages. For example, the 1903 Franco-Belgian Boundary Commission Procès-verbal describes a border segment as “Here it turns north for a few meters and ends at the crest of the watershed between the Niari-Kouilou and the Congo Rivers. . .” (Brownlie 1979, 665) The first segment of this border was established in the 1885 Convention between France and the International Association of the Congo and the last segment was established in the 1908 Declaration.

B.43 CONGO–GABON

Summary: rivers, cities/towns

Most important: cities/towns

Details. This border represents the division between Moyen Congo (Republic of the Congo today) and Gabon during French administration immediately prior to independence in 1960. According to Brownlie, “The interterritorial boundary changed a great deal during the colonial period but the final change occurred in 1946.” (Brownlie 1979, 641) Recurring references to various “circonscriptions” (districts) in the 1912 Decree suggest the administrators had a clear knowledge of the local political geography. The alignment of this border relies on rivers and streams and the partitioning of local villages, as can be found in the 1912 Decree, e.g. “La circonscription du Como a pour limites: Au Nord, le Cameroun; A l’Ouest, la ligne de partage des eaux entre la Noya à l’est et les petits cours d’eau tributaires de la baie de Mondah à l’ouest, puis une ligne partant de ce point coupant la route N’Toum-Ekododo à mi-chemin des villages Aza et Akoulenam, suivant ensuite la ligne de partage des eaux entre l’Asseagma et l’Agoula. . .” (Brownlie 1979, 643)

B.44 DRC–RWANDA

Summary: rivers, other water bodies (lake), topography (mountains, volcanoes), PCS

Most important: PCS

Details. This border was established by the 1910 German-Belgian Convention to separate the Kingdom of Rwanda, under German control, from the DRC, under Belgian control. The northern third of this border follows four mountains (Hehu and Sabinto) and volcanoes (Karissimbi and Vissoke), the next southwards third follows Lake Kivu, and the southernmost third of this border follows the Ruzizi River. This is an example of a border where geography is used to physically determine the sometimes fuzzy borders of pre-colonial kingdoms.

B.45 DRC–SUDAN

Summary: watersheds, mountains

Most important: watersheds

Details. This border is based on the watershed between the Nile and the Congo and originates from the 1894 and 1906 Belgian-British Agreements. The 1906 Agreement provides the principle for the border as the line of the aforementioned watershed, but does not provide any other description and no other agreement since has elaborated with a written description of the border alignment. However, modern maps show the border falling cleanly south of the Nile River tributaries (e.g. Kisi, Sue) and north of the Congo River tributaries (e.g. Uere, Gurba). Mount Genze and Jabal Ameh, as the highest points on this border, are also used in delimitation.

B.46 DRC–TANZANIA

Summary: other water bodies (lakes)

Most important: other water bodies (lakes)

Details. This border solely represents a median line dividing Lake Tanganyika. No international agreement outlines this border but it is referenced in the 1910 Belgian-German Convention and 1924 Belgian-German Protocol. Its alignment is based on the median line in principle but does not have a precise determination.

B.47 DRC–UGANDA

Summary: rivers, other water bodies (lakes), mountains

Most important: other water bodies (lakes)

Details. This border is delimited by lakes, mountains, and rivers. The southern two thirds of the border follow a succession of geographic features: Mount Sabinio (tripoint with Rwanda), Murungu (stream), Lake Edward, the Rwenzori Range including the Margharita Peak, then the Semliki stream, and then the median line of Lake Albert. The northern third follows the White Nile before 1915 (Brownlie 1979, 693), after which the border moves West because the West Nile region in Uganda was transferred from the Belgian Congo to the Uganda Protectorate in 1914.

B.48 DRC–ZAMBIA

Summary: rivers, other water bodies (lakes), watersheds, hills

Most important: watersheds

Details. This border was established in the 1885 Belgian-British Agreement. The Congo Zambezi watershed delimits the Western half of the border followed in length by the Luapula river. Combined, they comprise well over 50% of the border. Secondly, the boundary uses hills and roads connecting villages (Brownlie 1979, 729-731).

The border can be divided into four segments. Segment I is a straight line from Cape Akalunga in Lake Mweru to Tanzania that was ill-defined in 1894. The 1894 Agreement “rested upon geographical misconceptions and, in any case, was characterized by a general lack of precision. Part of the frontier in the region of Katanga was delimited in greater detail by a mixed commission in 1929 and 1930” (Brownlie 1979, 705). This is an example of Europeans redrawing and refining the delimitation of borders that may have been haphazard in 1884 but not in 1930.

Segment II consists of Lake Mweru. Segment III follows the Luapula River, running from Lake Mweru to the Congo-Zambezi watershed (Brownlie 1979, 707-708). This segment is an interesting example of deficient knowledge of Europeans. Belgians and British said that “[The line] shall follow the thalweg of the Luapula up to its issue from Lake Bangweolo.” Whittermore Boggs observed in 1940 that “The Luapula River, however, does not flow from Lake Bangweolo at all.” Ultimately the river followed the Luapula further south to where it meets the Congo-Zambezi watershed, where a boundary pillar had been erected by the Belgian section of the 1914 Boundary Commission. Finally, Segment IV, the longest, follows the Congo-Zambezi watershed up to the Angola tripoint.

B.49 DJIBOUTI–ETHIOPIA

Summary: PCS, rivers, other water bodies (lakes), mountains/hills

Most important: PCS

Details. The primary basis for this border was the division of territory between the Ethiopian Empire and France (of which Djibouti was a protectorate). This division was first outlined in general terms in the Franco-Ethiopian Convention of 1897, using towns, lakes, and mountains as landmarks.

Further agreements between Ethiopia and France from 1947 to 1954 then delineate the border segment by segment in great detail. The Minutes of the Franco-Ethiopian Boundary Commission, May 6, 1953, for example, contains meticulous notes: “The line crosses the Sankal Wadi [valley] from east to west and cuts across its thalweg at Monument No. 39 approximately 20 meters north of the basin forming the main Sakal water hole (anfractuosity in the rock). Monument No. 40 on the west bank marks the change in direction of the border which merges, to the north, with the cliffline overlooking the left bank of the wadi.” (Brownlie 1979, 759)

B.50 DJIBOUTI–SOMALIA

Summary: other water bodies (wells), hills, cities/towns, straight lines

Most important: other water bodies (wells)

Details. The alignment of this border was established in the 1888 Anglo-French Exchange of Notes. One excerpt of this exchange included Marquis of Salisbury writing to M. Waddington on the path of the border, using various physical characters to delimit this border: “The Protectorate exercised, or to be exercised, by Great Britain and France shall be separated by a straight line starting from a point on the coast opposite to the wells of Hadou and passing through the said wells to Abassouen; from Abassouen the line shall follow the caravan road as far as Bia-Kabouba and from this latter point it shall follow the caravan road from Zeyla to Harrar, passing through Gildessa. It is expressly agreed that the use of well of Hadou shall be common to both parties.” (Brownlie 1979, 769)

B.51 EGYPT–LIBYA

Summary: capes, infrastructure (roads), deserts, meridians, mountains

Most important: meridians

Details. Egypt was a Pashalik (province) of the Turkish Empire in the 19th century before British occupation and colonization. A Firman (royal decree) from 1841 addressed by the Sultan to the Pasha (governor of a Pashalik) of Egypt and an accompanying map showed the precolonial western boundary of Egypt as “extending southeastward and in an irregular line from Khalīj al Kanā’is on the Mediterranean to a point immediately east of the 29th meridian and slightly north of the latitude of Aswan” (Brownlie 1979, 104). The current Egypt-Libya border was established by the Agreement of 1925 between Egypt and Italy, supplemented by a further agreement of 1926, in the background of the Allies’ promise to “compensate Italy”. The border delimitation used various geographic features, including capes and mountains, in the more populated north, but settled on the 25th Greenwich East Meridian in the southern desert area. Ironically, the present delimitation gave Egypt more land westward of the boundary described in the 1841 Firman. The agreement of 1926 also detailed an old truck road and emphasized that “the aforesaid truck road is in Egyptian territory” (Brownlie 1979, 107).

B.52 EGYPT–SUDAN

Summary: meridians, villages, non-PCS ethnic groups, deserts

Most important: meridians

Details. Apart from the Wadi Halfa salient to the north, the boundary between Egypt and Sudan follows the 22nd parallel throughout, as established by the Anglo-Egyptian Agreement of 1899. However, several complications exist. First, in response to local requests, an Egyptian arrêté of March 26, 1899 about two months after the Agreement imprecisely carved out a finger-shaped area, known as the Wadi Halfa salient, along the Nile to the north of the 22nd parallel. The arrêté reads: “[T]he extremity of the north-west frontier of the Soudan should be fixed at a distance of 200 meters north of Birba, at the village of Farass, and to the east of Birba, at the village of Adendane” (Brownlie 1979, 114). Second, to better manage local ethnic groups, an Egyptian arrêté of 1902 placed lands of the Abadba group (south of the 22nd parallel) under Egyptian administration and grazing grounds of the Beja group (north of the parallel) under Sudanese administration. After independence, Sudan attempted to hold elections in the area north of the parallel. In response, Egypt asserted sovereignty to all the territories north of the parallel, including the Wadi Halfa salient, but did not take unilateral actions. The issue remains unresolved.

B.53 EQUATORIAL GUINEA–GABON

Summary: rivers, other water bodies (bay), parallels and meridians, straight lines

Most important: parallels and meridians

Details. Most of the border runs along 1° N and connects the Rio Muni, near the Atlantic Coast, to the tripoint with Gabon, located at 1° N and 11° 20’ E. This alignment depends exclusively on the Franco-Spanish Convention of 1900.

B.54 ETHIOPIA–KENYA

Summary: PCS, rivers, lakes, mountains, non-PCS ethnic groups, wells, infrastructure (roads), meridians

Most important: PCS

Details. In 1891, King Menelik of Ethiopia sent a letter to the Powers of Europe, including Britain, France, Germany, Italy, and Russia to declare the boundaries of Ethiopia, but received no response. The frontiers declared turned out to be a statement of aspiration based upon ancient historical claims that represented a basis for expansion in the years to follow. Italy failed to colonize Ethiopia at the turn of the century and made agreements with Britain and Ethiopia regarding their boundaries. “The Italian plans to absorb much

of Ethiopia failed and, in the East Africa Order in Council, 1902, the northern limit of the [East Africa] Protectorate is described simply as ‘the Abyssinian frontier’” (Brownlie 1979, 775). The first agreement was signed in 1907 in which the line, essentially “the southern limit of Ethiopian penetration of Galla country in the years up to 1902” (Brownlie 1979, 775), in principle followed rivers and connected hill summits. But it provided no details and ended at the intersection of 6° N and 35° E.

The description of the 1907 agreement was replaced by an Exchange of Notes between Great Britain and Ethiopia in 1947 that supplemented further details and legally allocated wells between Ethiopia and Kenya in an attempt to settle the grazing and watering issues at the frontier. In between 1907 and 1947 the frontier was the line maintained *de facto* by the British administration in East Africa and accepted without prejudice by Ethiopia. The 1947 Exchange of Notes partially reflected and legalized the *de facto* administrative control. Boundary commissions were sent to carry out demarcation, which was approved by a Treaty of 1970. A schedule of hundreds of pillars using a variety of natural geographic features accompanied by a series of 30 maps detailed the boundary.

PCS: It is clear that the southern limit of the Abyssinian Empire formed the foundation of the Ethiopia-Kenya border. Britain adopted an alternative line in the treaty of 1907 to avoid the displacement of the Abyssinians and ease the British administrative burden after surveying the southern frontier in 1902-03 and realizing that Abyssinian effective occupation extended far south of the line accepted in principle by the Emperor Menelek in 1898 (Brownlie 1979, 781).

Wells: A British Memorandum of 1909 addressed to the Foreign Office indicated that the British wanted the border to be drawn in a specific way that put certain wells in the British side to guarantee water supply in the dry season. The agreement of 1947 reflected such consideration.

Ethnic groups: Efforts were made to understand local need for watering and grazing. The line was drawn to avoid partitioning local ethnic groups. “After leaving the Dawa River the boundary as defined by the treaty [of 1907] follows the boundary between the Garre and Boran tribes.” (Brownlie 1979, 783) However, the tribal boundary was ill-defined due to the nomadic nature of the Garre, who would move to Gaddaduma and other wells in Boran territory. The existence of the slave “tribe” of Gabras of Somali origin, some of whom are subject to Boran and others to Garre families, further complicated the issue. The British thought of the line of 1907 as the nearest approximation, and also considered modifying the line to accommodate Garre’s claim over the district of Guba Gallgallo. If anything, the partition of Boran as suggested by Murdock was not intentional or random, but a consequence of imposing the European concept of clearly demarcated boundary on ill-defined African tribal boundaries.

B.55 ETHIOPIA–SOMALIA

Summary: PCS, wells, mountains, infrastructure, deserts, straight lines, rivers, non-PCS ethnic groups

Most important: PCS

Details. In 1891 Great Britain and Italy divided East Africa into spheres of influence. A British Protectorate was established on the northern Somali Coast, and Italy ones over a large sector of the Indian Ocean littoral. Italy failed to colonize Ethiopia, necessitating frontier agreements involving the limits of British and Italian Somaliland bordering Ethiopia. The Ethiopian boundary with British Somaliland was established by frontier settlements of 1897 and remained until decolonization. Ethiopian boundary with Italian Somaliland was the subject of a 1908 treaty, the provisions of which were subject to serious disagreements and different interpretations by both parties. Since independence in 1960 Somalia has disputed the 1897 agreement and campaigned for the union of the Somali groups in Ogaden in eastern Ethiopia on the basis of self-determination. The Ogaden dispute has been a serious source of political violence in and between both countries. A point to note is that boundary commissioners were sent to carry out demarcation according to

principles laid down in the 1908 agreement. The outcome was a 108-page long document in 1935 providing a very detailed boundary description. The colonizers knew the lines they drew.

PCS: Ethiopia expanded westward and conquered Harar and other Somali groups in western Somalia, known as Ogaden, in the period 1886-92. Ethiopia-Somalia boundary at the time of 1897 agreements was drawn to reflect the western limit of the Ethiopian Empire. Ogaden was conceded to Ethiopia, leading to the partition of Somali groups. “The Somali Government points out that Harar and the remainder of ‘Western Somalia’ were only occupied by Ethiopia in the period of 1886-92, and remain to be decolonized” (Brownlie 1979, 827). The recognition of Ethiopia’s frontiers in fact led a different group to be partitioned.

Ethnic groups: The agreement of 1908 between Italy and Ethiopia specified that the frontier along the Uebi Scebeli River (Shebelle River) should follow the territorial boundaries between the Rahanuin group (Italian Somaliland) and all the groups to its north (Ethiopia). The frontier on the Uebi Scebeli is the point where the boundary between the Baddi-Addi group (Italian Somaliland) and all the groups above it (Ethiopia) touches the river. Similar arrangements were made along the Juba River. Rahanuin on the left belonged to Italian Somaliland, and the groups of Digodia, Afgab, Djedjedi and all the other to the north belonged to Ethiopia.

Other features: Annex 3 to the 1897 agreement reads: “[F]rontier of the British Protectorate on the Somali Coast the line which, starting from the sea at the point . . . opposite the wells of Hadou, follows the caravan-road, described in that Agreement, through Abbassouen till it reaches the hill of Somadou. From this point on the road the line is traced by the Saw mountains and the hill of Egu to Moga Medir; from Moga Medir it is traced by Eylinta Kaddo to Arran Arrhe, near the intersection of latitude 44° east of Greenwich with longitude 9° north. From this point a straight line is drawn to the intersection of 47° east of Greenwich with 8° north” (Brownlie 1979, 834).

B.56 ETHIOPIA–SUDAN

Summary: rivers, mountains, non-PCS ethnic groups, PCS, infrastructure, cities/towns, watersheds

Most important: PCS

Details. Great Britain and Italy divided their spheres of influence in East Africa in two Protocols of 1891. Confident that the ancient Empire of Abyssinia (Ethiopia) could be colonized soon, they left Ethiopia within the Italian sphere of influence. Eritrea, in which Italy had gradually established possessions in 1865-1889, was also put under Italian sphere of influence. Ethiopia, however, successfully resisted Italian colonization and forced Britain, France, and Italy to recognize Ethiopian sovereignty and territorial limits in a series of agreements between 1898 and 1907 involving Menelek II, the King of the Ethiopian Empire, as a signature party.

It is useful to describe the border in two parts. The first part runs from Res Kasar (the Red Sea Coast) to the town of Abu Gamal, which forms a major part of the now Eritrea-Sudan border. (Note that Brownlie (1979) was published in 1970, before Eritrea gained independence in 1991. So this subsection also includes the now Eritrea-Sudan border.) The segment is established by a combination of mountains, hills, and rivers with short straight lines connecting them. There was an explicit effort to allocate the semi-nomadic ethnic groups on the frontier between Egypt and Eritrea without splitting them across the border (Brownlie 1979, 860).

The rest of the border largely follows the territorial limits of the ancient Empire of Ethiopia, based on several treaties between Ethiopia, Great Britain, and Italy between 1900 and 1903. In the texts of the agreements, a combination of rivers, mountains, parallels/meridians, population centers, ethnic groups, and pre-existing infrastructure were referenced. For example, the Umbrega-El Hafeira road (Brownlie 1979, 869) and the Kassala-Sabderat road (Brownlie 1979, 864) were mentioned. Rivers Akobo, Pibor, and Baro form part of

the border. A British Boundary Commissioner, Major Gwynn, demarcated part of the line in 1903 and 1909 in the absence of Ethiopian representation, leading the latter to contest the Gwynn line. This was solved by an Exchange of Notes in 1972 between Ethiopia and Sudan, which accepted the principle of the treaties but re-demarcated the border on the basis of the Gwynn line, with only minor rectifications.

B.57 GAMBIA–SENEGAL

Summary: rivers, cities/towns, parallels and meridians, straight lines

Most important: rivers

Details. This border is principally formed around the Gambia River. Its alignment is established in the 1981 Procès-verbal; various boundary commissions and other communication record detailed adjustments to the border from 1895 to 1976. These sources reference towns, parallels, and meridians to help delineate the border, and the 1923 Procès-verbal even references precise border markers such as specific cairns of stones.

B.58 GHANA–IVORY COAST

Summary: rivers, other water bodies (lagoons), topography (mountains, hills), non-PCS ethnic groups, cities/towns, infrastructure

Most important: cities/towns

Details. This border was first outlined in arrangements from 1889 to 1898, but primarily established in the 1903 Agreement and the 1905 Exchange of Notes between France and Britain. Adjustments are later made in 1924, 1986, and 1970.

This border is outlined segment by segment in great detail using a variety of physical and geographic elements (such as rivers, mountains, and roads), albeit primarily towns. The 1903 Agreement, for example, outlines the border in 52 separate segments. The 1905 Exchange of Notes does the same in addition to including a list of 70 beacons to act as markers for the border. The border also discusses land usage rights and migration rights of borderland communities: “The villages situated in proximity to the frontier shall retain the right to use the arable and pasture lands, springs, and watering places which they have heretofore used, even in cases in which such arable and pasture lands, springs, and watering places are situated within the territory of the one Power and the village within the territory of the other. Any natives who may not be satisfied with the assignment of their villages to one of the two Powers shall have, for the period of one year from the 1st April, 1905, the right to emigrate to the other side of the frontier.” (Brownlie 1979, 246)

B.59 GHANA–TOGO

Summary: rivers, other water bodies (falls), watersheds, topography (rock outcrops), non-PCS ethnic groups, cities/towns, infrastructure, parallels and meridians, straight lines

Most important: rivers

Details. This border originates as the line dividing German Togoland and the Gold Coast (region now known as Ghana) from 1890. Later adjustments are made through joint Britain-France delimitation and demarcation work from 1927 to 1929. This border is outlined in high detail throughout the years, for example in 41 segments using rivers and local villages in the 1919 Franco-British Declaration and in approximately 167 segments in the 1929 Report of the Commissioners. Colonial documents also discuss tribal boundaries. For example, the 1919 Franco-British Declaration stating “Thence southwards a line following generally this tribal boundary [between the Konkomba and the Bitjem] so as to leave the villages of Natagu, Napari, and Bobtiwe to Great Britain and those of Kujunle and Bisukpabe to France.” (Brownlie 1979, 255)

B.60 GUINEA–GUINEA-BISSAU

Summary: rivers, mountains

Most important: rivers

Details. This border was established by the 1886 Treaty between France and Portugal and two 1904 Exchanges of Notes and two 1906 Exchanges of Notes. The 1886 Treaty relies primarily on rivers such as Senta, Binasse, Oualé Oualé, Corubal and Niamanka for the alignment of this border.

B.61 GUINEA–IVORY COAST

Summary: rivers, mountains

Most important: rivers

Details. This border essentially represents the former intra-colonial border established by French administrative practice between Guinea and the Ivory Coast. Large segments of this border follow the Gbanhala and Feredougouba rivers and the southernmost segment passes through the Nimba Range.

B.62 GUINEA–LIBERIA

Summary: rivers, mountains

Most important: rivers

Details. This border was first delineated in 1892 by France (Guinea was a unit of French West Africa) and Liberia. A more detailed delimitation was outlined in agreements made in 1907 and 1911. The latter agreement led to survey and precise demarcation work by the Franco-Liberian Commission from 1926 to 1929. This Commission relied heavily on rivers and mountains to outline the border, with demarcations such as “A line from the summit of Mount Gabigisi to the source of the Mounie (Mourie) [river] on its lower slopes and the Mounie downstream to its junction with the Niandi (Diana) [river]” (Brownlie 1979, 307).

B.63 GUINEA–MALI

Summary: rivers

Most important: rivers

Details. This border is based on the French West Africa intra-colonial border between established by French administrative practice during the colonial era. Its alignment is based on rivers, streams and remains. Rivers that the border follows include the Balinko, Bafing, and the Sankarani. There are no international agreements that reference the delineation of this border, but the border is referenced (although not described) in the Decree of 1911.

B.64 GUINEA–SENEGAL

Summary: rivers, mountains, non-PCS ethnic groups, cities/towns

Most important: rivers

Details. This border was first established in 1898 and 1899 in French ministerial wire communications, then further defined by the 1915 Decree and 1933 Decree. Rivers and mountains are used to delineate the border segment by segment. Villages are explicitly allocated to either side of the border (Brownlie 1979, 318). The French government also avoids splitting ethnic groups and regions. For example, the Minister of Colonies writes in a 1898 wire to the Governor that the border as proposed will keep four “pays” (territories or administrative units that share cultural similarities) within Guinea: “Vous remarquerez qu’en adoptant la

frontière ici-dessus indiquée, il a été décidé que les pays de Badiari, N'Dama, Labé et Coniagui resteraient placés sous l'administration de la Guinée Française.” (Brownlie 1979, 316)

B.65 GUINEA–SIERRA LEONE

Summary: rivers, watersheds, topography (mountains, hills, escarpments), non-PCS ethnic groups, cities/towns, infrastructure, parallels and meridians

Most important: cities/towns

Details. This border was established in a series of agreements from 1882 to 1913 dividing British and French possessions. The 1895 Agreement delineates the border thoroughly, primarily using villages to situate the alignment until the border reaches a watershed south of the Digipali village, after which the border mainly follows the watershed line and other rivers. The allocation of villages to either side of the border is specified throughout. The 1896 Procès-verbal is similar to the 1895 Agreement in its detailed description of the border and explicit allocation of villages, while also providing a list of 60 roads and paths that the border intersects. The 1913 Agreement also outlines “native” fishing and emigration rights, with text stating “The inhabitants of the two banks have, however, equal rights of fishing in this part” and “During six months, to count from the date of the present Protocol, the natives in the transferred territories shall be permitted to cross the frontier to settle on the other side. . .” (Brownlie 1979, 346)

B.66 GUINEA BISSAU–SENEGAL

Summary: rivers, topography (headlands), parallels and meridians, straight lines

Most important: rivers

Details. This border was established in the 1886 Treaty between Portugal and France dividing their possessions in West Africa. It is primarily drawn to be equidistant between the Casamance River and Cacheu River (known as the Farim River further upstream), and at times also follows meridians and parallels. The 1886 Treaty states, for example, “Au nord, une ligne qui, partant du cap Roxo, se tiendra, autant que possible d’après les indications du terrain, à égale distances des rivières Cazamauce (Casamausa) et San Domingo de Cacheu (São Domingo de Cacheu), jusqu’à l’intersection du méridien 17°30’ de longitude ouest de Paris avec la parallèle 12°40’ de latitude nord. Entre ce point et le 16° de longitude ouest de Paris, la frontière se confondra avec le 12°40’ de latitude nord.” (Brownlie 1979, 352)

B.67 IVORY COAST–LIBERIA

Summary: rivers, mountains, cities/towns

Most important: rivers

Details. This border was established by the Franco-Liberian treaties of 1892, 1907, and 1911. The alignment of this border almost exclusively follows rivers, mainly the Cavally and Nuon rivers, while mountains and villages are also referenced in the treaties to delimit the border. The 1892 Treaty already lays a detailed outline for the border with statements such as “From this point the frontier will run in direct line towards the point of intersection of 11° with the parallel which passes through Tembicounda, it being understood that the town of Bamaquilla and the town of Mahomadou will belong to the Republic of Liberia, the points of Naala and of Mousardou belonging to France.” (Brownlie 1979, 364) The 1911 Treaty then expands on the 1892 Treaty’s level of detail by outlining the border in 49 segments.

B.68 IVORY COAST–MALI

Summary: rivers

Most important: rivers

Details. This border is the former French West Africa intra-colonial boundary established by French administrative practice during the colonial period. It was first established by the Decree of 1899, but this Decree does not provide any description of the border. Maps demonstrate the border as being aligned with various rivers, including the Gbolonzo, Digou, Sorobaga, Kankélaba, Dougo, and Bogoé rivers.

B.69 KENYA–SOMALIA

Summary: rivers, wells, deserts, straight lines

Most important: straight lines

Details. The Juba river demarcated the Anglo-Italian spheres of influence based on their 1891 agreement. In 1925, the British ceded the eastern part of Kenya Colony (Jubaland) to Italy based on a treaty of 1924, in which Italy and Great Britain demarcated the border between Kenya and Italian Somaliland (now Somalia). The northern part follows the Daua River, while the middle and southern parts were straight lines. However, the location of the straight line was not arbitrary. Italy and Great Britain specifically designed the border to make sure that water resources were allocated appropriately. For example, the pool of Dumsa was split in half. Eilla Kalla was allocated to the British, and the straight line was designed in a way to leave the well of El Beru to Italian Somaliland. They also agreed that in case the well of El Beru does not provide enough water for the Italian, the border shall be redrawn to give Italy the well of El Shama. Islets were also mentioned.

The agreement also mentioned that people living in the transferred Jubaland were allowed to choose Italian or British nationality. Somalis separated by the new border were specifically mentioned (Brownlie 1979, 892). Great Britain and Italy apparently were aware that the new border partitioned ethnic groups on the ground, but no evidence suggested that ethnicity was a concern while they drew the border.

The treaty did not mention desert but by inference it obviously mattered. The 18-page-long agreement with four appendices and maps detailing the beacons and geographical co-ordinates clearly indicates that the colonizers knew a lot about local conditions alongside the border. Two likely reasons explain why Europeans drew straight lines: the territory is largely a desert and they had little concern for the local population.

B.70 KENYA–SUDAN

Summary: straight lines, non-PCS ethnic groups, mountains, deserts

Most important: straight lines

Details. Sudan did not border Kenya until the Rudolf Province of Uganda was transferred to Kenya in 1926. The line, as specified in an Order of 1914, started from Lake Rudolf (Turkana), ended at the summit of Jebel Latome, and connected various mountains with straight lines. The texts regarding the straight line connecting Mount Lubur and Jebel Mogila presented a problem: “thence following a straight line, or such a line as would leave to Uganda the customary grazing grounds of the Turkhana tribe” (Brownlie 1979, 917) because the tribal boundary significantly differed from the geometrical boundary. The Red Line was drawn in 1931 and modified in 1938 to represent the northern limit of the Turkana grazing grounds, forming the Ilemi Triangle with the straight line of 1914. Both lines lacked a definitive status and were referred to as either “provisional administrative boundary” or “international border” in different maps. An alternative line that lies even further north than the Red Line, known as the Blue Line, was proposed in 1947 but no international agreement was reached. Kenya maintained *de facto* control of the disputed region. It is hinted that the economic marginality of the land has delayed its formal resolution.

B.71 KENYA–TANZANIA

Summary: rivers, lakes, mountains, straight lines, non-PCS ethnic groups

Most important: straight lines

Details. Although the border mostly comprises straight lines, rivers, lakes, and mountains play a role. The mouth and confluence of rivers, median lines of lakes, mountain summits defined the beacons and pillars, which were connected with straight lines. Population density was the reason for not carefully drawing the border. According to Brownlie (1979, 928): “As in the country to the south of the Uмба there are no villages, the fixing of the frontier points on the path crossing the frontier is not urgent.” In British-Germany agreement of 1890 to divide their spheres of influence in East Africa, ethnic groups were also mentioned: “after which it passes midway between the territories of Taveita and Chagga” (Brownlie 1979, 924).

B.72 KENYA–UGANDA

Summary: PCS, non-PCS ethnic groups, lakes, rivers, mountains, infrastructure (roads)

Most important: non-PCS ethnic groups

Details. Both countries were considered as under British sphere of influence in the Anglo-German Agreement of 1886. Thus the boundary between them was treated as a matter of administrative policy and not seriously considered until the early 20th century. The Uganda Protectorate at its establishment in 1894 comprised the Buganda Kingdom.²⁸ However, the British transferred large portions of territory to the East Africa Protectorate (later Kenya) in 1902 and 1926. The most important result of the transfers was to put the entire Uganda Railway in Kenya.

The new alignment of 1902 was demarcated following boundaries between ethnic groups. According to Brownlie (1979, 942), “[t]he principle on which the demarcation proceeded was primarily that of avoiding tribal division, so that, for example, all the Kavirondo should be within East Africa [Kenya]. However, exceptions were made on administrative grounds. Consequently, islands near Berkeley Bay were allotted to Uganda in spite of the fact that they were inhabited by Kavirondo. Precise adherence to tribal divisions proved impossible in other sectors, including Mount Elgon.” The same is true for the line of 1926, which Brownlie (1979, 942) describes as “a tribal boundary, intended to leave the Turkana and Suk within British East Africa (Kenya).”

The actual demarcation for the most part follows natural geographic features, such as rivers and mountain summits. Existing roads were also considered occasionally.

B.73 LESOTHO–SOUTH AFRICA

Summary: rivers, watersheds, PCS

Most important: PCS

Details. The Southern Sotho country (Lesotho, also known as the Basuto Kingdom, Basutoland, or the Kingdom of Moshesh, who was the last ruler of the Sotho before it was annexed by Great Britain) was roughly bounded by the River Caledon in the north and the Orange River in the south. It extended northward and westward into what was later known as the Orange Free State (part of South Africa today) in the early 19th century but lost those lands due to Zulu incursions and Boer settlement by 1868. The Convention of Aliwal North of 1869 documented the contractions of the Basuto land, which formed the basis of the western sectors of the Lesotho-South Africa border. Great Britain annexed the Kingdom of Moshesh and established the boundary between Basutoland and the Orange Free State. The alignment depends on various British administrative documents, of which the British High Commissioner’s Notice of 1870 was the most important one. As established by the 1870 Notice, “[t]he north-eastern and south-eastern sectors consists entirely of the watershed of the Drakensberg” (Brownlie 1979, 1110). The western and northern segments

²⁸See Appendix A.3.4 for details on the influence of the historical Kingdom of Buganda.

in general correspond to the frontier between the Basuto Kingdom and the Orange Free State in 1868, which for the most part follows the Caledon River.

B.74 LIBERIA—SIERRA LEONE

Summary: rivers, mountains, cities/towns, infrastructure

Most important: rivers

Details. This border is primarily based on Anglo-Liberian agreements of 1885, 1911, 1917, and 1930. From the Atlantic Ocean, half the border follows the Mannah (Mano) River, then most of the remaining half follows the Maia River and Magowi River. The aforementioned agreements, among other legislation, outline the border segments in thorough detail using rivers, mountains, villages, and roads. The 1903 Anglo-Liberian Boundary Commission Procès-verbal, for example, outlines the border in approximately 43 segments, and the 1913-1914 Procès-verbal then lists 165 cairns lining the border.

B.75 LIBYA—NIGER

Summary: other water bodies (wells), topography (mountains, valleys), deserts, cities/towns, PCS, straight lines

Most important: mountains

Details. This border is derived from the historical southern limits of the Ottoman province of Tripoli. It can be described in two segments.

The segment from the Algeria tripoint to Tummo (village and well) was generally outlined in the 1919 Exchange of Notes between Algeria and Libya, where its only description is provided. The existence of the segment between Tummo and the Chad tripoint was confirmed in the 1955 Treaty of Friendship between Algeria and Libya, but the segment itself is not described in any ratified treaty or other agreements. A non-ratified 1938 Agreement between France and Italy, however, outlines the border using mountains, valleys, and rivers, among other physical features.

B.76 LIBYA—SUDAN

Summary: meridians, desert

Most important: meridians

Details. The Agreement of 1934 between Italy, Great Britain and Egypt established the Libya-Sudan border, formed by the 24th and 25th meridians and the 22nd north parallel.

B.77 LIBYA—TUNISIA

Summary: oueds, other water bodies (wells), topography (hills), desert

Most important: hills

Details. This border is based on the Tunisian (Franco)-Turkish Convention of 1910. It is primarily aligned with hills (e.g., Touil Ali Ben Amar) and wells (e.g., Bir Zar and Mechiguig), as well as riverbeds and valleys. The Algeria-Tunisia-Libya tripoint is drawn such that Fort Saint (Borj El Khadra) is part of Tunisia and Ghadamis is part of Libya.

B.78 MALAWI—MOZAMBIQUE

Summary: rivers, lakes, mountains, straight lines, islands

Most important: rivers

Details. Brownlie (1979) spends 97 pages on this border, indicating its complexity. The Malawi-Mozambique border was established in principle by the Anglo-Portuguese Agreement of 1890 and 1891. A considerable number of subsequent demarcations and local adjustment took place afterwards. The entire border is approximately 975 miles long. “It traverses Lake Nyasa for about 205 miles including lines around Likoma Island and Chisumulu Island, which are enclaved parts of Malawi. Southward from Lake Nyasa to the Malosa river, the boundary extends along straight line segments for 195 miles passing through both Lake Chiuta and Lake Chilwa. It follows consecutively the thalwegs of the Malosa, Ruvo, and Shire downstream for 150 miles. The boundary then continues north-westward to the Zambia tripoint utilizing features along the Shire-Zambezi and the Lake Nyasa-Zambezi drainage divides for most of the remainder of the distance” (Brownlie 1979, 1117).

B.79 MALAWI–TANZANIA

Summary: rivers, lakes, watersheds

Most important: lakes

Details. The border segment between the Zambia tripoint and Lake Malawi (Nyasa) “consists almost exclusively of the thalweg of the Songwei and Katendo rivers except for approximately three and a half miles between pillars 1 and 2 which is a straight line sector” (Brownlie 1979, 958). The Zambia tripoint “was fixed as representing the watershed of the Congo Basin” (Brownlie 1979, 958).

From the Songwe River Mouth to the Mozambique tripoint, Malawi and Tanzania dispute over whether the border should be the shoreline as established by the Anglo-German Agreement of 1890 and 1901 or the median line of Lake Malawi according to German *de facto* sovereignty before 1922. Malawi obviously contends for the shoreline while Tanzania argues for the median line. The dispute has not been settled but remains dormant since 1967.

B.80 MALAWI–ZAMBIA

Summary: watersheds

Most important: watersheds

Details. The Malawi-Zambia border was established by a document of the British Foreign Office in 1891 that delimited the western alignment of Nyasaland (later Malawi). The line follows the watershed of the Congo Basin.

B.81 MALI–MAURITANIA

Summary: rivers, other water bodies (wells), desert, cities/towns, parallels and meridians, straight lines

Most important: parallels and meridians

Details. This border represents the former intra-colonial border between Mauritania and Mali (formerly the Republic of Sudan in 1960) in French West Africa. It consists of a series of straight segments developed by administrative practice early on, then detailed in 1944, and finally formalized by the 1963 Kayes Treaty. The border is demarcated by straight lines for the majority of the alignment resting on desert land. Additionally, the border follows the Karakoro River and wells and villages (e.g., Nioro, Boulouli, Aguerakten) in inhabited areas.

B.82 MALI–NIGER

Summary: other water bodies (wadies), topography (mountains, hills), desert, cities/towns, straight lines

Most important: topography (mountains, hills)

Details. This border represents the former intracolonial border established through French administrative acts. A variety of physical and human features are used to delimit the border, including a pond, mountains, hills, villages. For example, the 1939 Niamey-Gao Agreement describes a border segment as “An ideal line leading northwest to the rocky peak situated at the southwest tip of the Andéramboukane pond, then leading south to the rocky peak of Mihan.” (Brownlie 1979, 419) The exact alignment of the border is uncertain due to differences in markings on French maps versus postcolonial maps.

B.83 MALI–SENEGAL

Summary: rivers, cities/towns

Most important: rivers

Details. This border represents the former French intracolonial boundary, established by the 1904 Decree and ministerial cables of 1898 and 1899. The majority of the border follows the Falémé River from the south to the north, with a small segment following the Senegal River. Map evidence shows that the border ceases to follow the Falémé river for much of its northern half such that Madina Foulbé falls on Senegalese territory while Nayé falls on Malian territory. There is no documented description of the border segments, so map sheets are used as the primary reference.

B.84 MAURITANIA–SENEGAL

Summary: rivers, deserts

Most important: rivers

Details. This border represents the former French intracolonial border, tentatively determined in the French Decrees of 1904 and 1913 and revised and consolidated by the French Decree of 1933. Its alignment is based on the right or north bank of the Senegal River from its tripoint with Mali. Then, as the border approaches Saint Louis, it follows the streams (“marigots” in the 1933 Decree) of Kassack and Karakoro.

B.85 MAURITANIA–WESTERN SAHARA

Summary: hills, deserts, parallels and meridians, straight lines

Most important: parallels and meridians

Details. The alignment of this border was established by the Franco-Spanish agreements of 1900 and 1956. From the south, the border begins above the Cap Blanc peninsula (also known as Ras Nouadhibou), then aligns with parallels and meridians, then links the highest points of several hills in straight lines until the intersection with the Tropic of Cancer. For example, the 1956 Agreement states “From the point thus determined on the parallel corresponding to the ‘Chuf’ vertex, the boundary runs in a straight line to Vertex No. 5 of the Spanish triangulation, until it reaches 1st. 21° 20’ N. From that point it follows parallel 21° 20’ until it crosses long. 13° W. The boundary continues in straight lines linking successively the highest points of the following elevations: Galb Azefal, El Gaicha, Lazib, Galb Musa. . .” (Brownlie 1979, 441)

B.86 MOROCCO–WESTERN SAHARA

Summary: oueds, parallels and meridians, deserts

Most important: parallels and meridians

Details. The 1904 Franco-Spanish Convention describes the border as consisting of a meridian 8° 40’ W and parallel 27° 40’ N. Since the 1912 Franco-Spanish Convention, when the Spanish region of Sequiet el Hamra was expanded to include the Northern area of Tarfaya, the border came to consist of the same meridian and Oued Dra.

B.87 MOZAMBIQUE–SOUTH AFRICA

Summary: rivers, mountains, straight lines

Most important: rivers

Details. Although the Mozambique-South African border does not contain any river segment, rivers played a significant role. According to Brownlie (1979, 1252): “The entire alignment is demarcated by rivers or beacons.” Almost every tripoint along the border is either formed by confluences of rivers or the intersection of a straight-line sector with the *thalweg* of a river. When straight lines were used, the end points were where two rivers joined. Summits of mountains were also used jointly with rivers to determine border alignment.

The border consists of two large segments. The first part, the Rhodesian tripoint to the Northern Swaziland tripoint, dates back to a Treaty of 1869 between Portugal and the Transvaal Republic, followed by a series of agreements between Great Britain, the South African Republic, Transvaal, and Portugal. Article XXIII of the Treaty describes the border as: “. . . thence along the summit of the said mountains [Lebombo Mountains] as far as the pass of the river Comatie, where that river runs between the mountains of the Le Bombo; thence to N.N.E. up to the mountain called Pokiones-KKop, which is to the north of the river Oliphant where it runs in those parts; thence to N.N.W. to the nearest point of the ridge of Chicundo where the river Umbovo [Groot-Shingwidzirivier] runs; thence in a straight line as far as the junction of the rivers Pafuri [Luvuvhurivier] and Limpopo.” (Brownlie 1979, 1240)

The second part is from the Southern Swaziland tripoint eastward to the Indian Ocean. An Anglo-Portuguese Treaty of 1891 designated the southern limit of the Portuguese sphere of influence as the Usutu (Maputa) River until its confluence with the Pongolo River, thence a line following the parallel of the confluence eastward to the Indian Ocean coast (Brownlie 1979, 1241).

B.88 MOZAMBIQUE–SWAZILAND

Summary: PCS, rivers, straight lines, mountains

Most important: PCS

Details. The line is first formulated in the Portuguese-South African Republic Treaty of 1869, which simply refers to a line along the summit of the Lebombo Mountains. In the Anglo-Portuguese Treaty of 1891, the Great Usutu River was identified as the southern tripoint. Surveys and demarcation took place in 1888 and 1897, with the final alignment approved by an Exchange of Notes in 1927.

Precolonial state obviously matters since Swaziland is a traditional African kingdom of ethnic Swazis. The Anglo-Portuguese Treaty of 1891 refers to “‘the frontier of Swaziland’ as a determined quantity” (Brownlie 1979, 1255). British policy toward Afrikaner territorial ambitions influenced the status of Swaziland around the turn of the 20th century. The line for the most part connects beacons with straight lines. Geographic features were also extensively referenced in a series of treaties formulating the border.

B.89 MOZAMBIQUE–TANZANIA

Summary: rivers, lakes, meridians

Most important: rivers

Details. According to Brownlie (1979, 969), “[t]he alignment totals 470 miles, and all but a short western sector (32 miles) consists of the Ruvuma (or Rovuma) River”. The short western part from the Ruvuma-Msinje confluence to Lake Nyasa (Malawi) was a parallel in the German-Portuguese agreement of 1886 and the Anglo-Portuguese Treaty of 1891. A joint boundary commission demarcated the sector in 1907 and

made certain adjustments that departed from the meridian line when local conditions required (Brownlie 1979, 971).

B.90 MOZAMBIQUE–ZAMBIA

Summary: mountains, rivers, villages, straight lines

Most important: rivers

Details. The Mozambique-Zambia border was first established by the Anglo-Portuguese Agreement of 1890 and 1891. A joint commission carried out demarcation in 1904, which was approved by an Agreement of 1911. Description of the border extensively references rivers and mountains summits, and villages were also mentioned. The west segment follows the Luangwa River. The Rhodesia tripoint is fixed as the confluence of the Rivers Luangwa and Zambesi.

Although river segments only form 48260 miles of the entire border, rivers have a decisive influence. The line dividing Anglo-Portuguese spheres of influence resulted from British diplomatic effort to obtain Zambezia, a region bounded in the south by the Zambezi River, and the Nyasa region. These two areas put a bound on where the border could roughly lie.

B.91 MOZAMBIQUE–ZIMBABWE

Summary: rivers, mountains, straight lines

Most important: rivers

Details. The Mozambique-Zimbabwe border was established in principle by the British-Portuguese agreements of 1891 and 1893 that divided their spheres of influence. They disputed over an area from the 18°30' S parallel southward on to the confluence of the Rivers Sabi and Lundi and submitted it to arbitration, which led to the Arbitral Award of 1897. Subsequent demarcations and modifications lasted until 1940. The line for the most part follows rivers whenever possible and connects bacons between river segments with short straight lines. Mountains were also referenced. A long straight line links the Rivers Limpopo and Sami in the south.

B.92 NAMIBIA–SOUTH AFRICA

Summary: rivers, meridians, deserts

Most important: rivers

Details. The Namibia-South Africa border was established by the Anglo-German Agreement of 1890 dividing their spheres of influence, which describes the alignment as “a line commencing at the mouth of the Orange River, and ascending the north bank of that river to the point of its intersection by the 20th degree of east longitude” (Brownlie 1979, 1276). The eastern border is the 20° E meridian until its intersection with the 22° S parallel. The Botswana tripoint, established in the Order in Council of 1895, is the intersection of the 20° E meridian and the Nossob River. Desert was not explicitly mentioned but by inference it mattered. The enclave of Walvis Bay on the west coast of Namibia was kept to South Africa for a long time but returned to Namibia in 1994.

B.93 NAMIBIA–ZAMBIA

Summary: rivers, straight lines

Most important: rivers

Details. Article III of the Anglo-German Agreement of 1890 dividing their spheres of influence in Africa specified that Germany should have access to the Zambezi river by a strip of territory from the west narrower

than 20 English miles at any point, now known as the Caprivi Strip. The border originally started from the Katima Mulilo Rapids from the west running along the Zambezi river until its confluence with Linyanti river. The Angola-Zambia border moved westward from the Zambezi river to the Kwando river in 1905, leaving a straight line between the Katima Mulilo rapids located on the Zambezi river “and the village of Andara, on the Okavango, as far as the point where it meets the River Kwando” (Brownlie 1979, 1289) as the western part of Namibia-Zambia border.

In 1930 South Africa, Northern Rhodesia, and Portugal sent a joint boundary commission to survey the straight line segment, resulting in a tripartite agreement of 1931. In 1933, an Exchange of Note between South Africa and Northern Rhodesia recognized that “the *thalweg* of the Zambesi to its junction with the *thalweg* of the Chobe or Linyanti should be regarded as the eastern boundary of the Caprivi Strip” (Brownlie 1979, 1295) and allocated 33 islands in the Zambezi river between the two countries.

B.94 NIGER–NIGERIA

Summary: rivers, other water bodies (lake), deserts, PCS, cities/towns, infrastructure

Most important: PCS

Details. The alignment of this border resulted “from major Anglo-French agreements on partitions of African territories of August 5, 1890,” (Brownlie 1979, 445) specifically the Conventions of 1904 and 1906 and the 1910 Agreement.

The borders of the traditional States of Sokoto, Gwandu, and Borno were important references throughout the Anglo-French negotiations. The Sultanate of Maradi was also referenced, with the border drawn around it at the 1906 Convention in a series of straight lines. The Saharan margins of these States (which were undergoing a period of instability) contained zones of influence and allegiance rather than linear borders, and the lack of natural barriers facilitated the movement and mixing various ethnicities and cultures, making any border inevitably split mobile groups and restrict their freedom of movement (Anene 1970, 233-84).

The border segments are exhaustively delimited and documented using a variety of physical and human features, including rivers, villages, roads, and infrastructure. For example, the 1904 Agreement writes, “Thence it will follow the degree of latitude passing through the *thalweg* of the mouth of the said river [Komadugu Waubé] up to its intersection with the meridian running 35’ east of the centre of the town of Kouka, and will then follow this meridian southwards until it intersects the southern shore of Lake Chad.” (Brownlie 1979, 448) A list of 149 beacons was also outlined to demarcate the border in the 1910 Agreement.

B.95 RWANDA–TANZANIA

Summary: PCS, rivers

Most important: PCS

Details. The border was described in Article 1 of the Belgian and British Mandates of 1922. Britain and Belgium modified the boundary in the agreement of 1924 because the proposed line of 1922 partitioned the Kingdom of Ruanda. For details see Appendix Section [A.3.12](#).

The border follows the *thalweg* of the Kagera River. “The line of the Kagera River was the traditional eastern limit of the Kingdom of Ruanda and had been regarded as such by the administration in German East Africa.” (Brownlie 1979, 983) The Anglo-Belgian Treaty of 1934 fixed the alignment more precisely with a series of straight lines joining adjacent stone pillars because the swamps and meanders along the Kagera River were not stable.

B.96 RWANDA–UGANDA

Summary: PCS, rivers, mountains

Most important: PCS

Details. The border was established by the Anglo-German Agreement of 1910 and the Protocol of 1911, which for the most part follows rivers and connects mountain summits. Straight lines were also used in small segments in the absence of prominent geographic features. The boundary starts from the Zaire tripoint, the highest point of Mount Sabinio, to boundary pillar at the source of the Chizinga River, then “follows the thalweg of the River Chizinga (Kissinga) to its confluence with the River Kachwamba-Kakitumba . . . the thalweg of the River Kachawama-Katitumba to the confluence of the Rivers Kachawamba-Kakitumba and Kagera” (Brownlie 1979, 991). According to Brownlie (1979, 989), “[t]he demarcation of 1911 was to leave a segment of traditional Rwanda within the Kigezi District of Uganda.”

B.97 SOUTH AFRICA–SWAZILAND

Summary: PCS, rivers, lakes, mountains

Most important: PCS

Details. It is useful to describe the South Africa-Swaziland border in two sectors. The sector between the Mozambique tripoint and the N’Yawos Hill was referred to as following “the highest ridge of the Lebombo Mountains” (Brownlie 1979, 1314) before its modern alignment from 1908-9. The sector from the northern terminal on the Lebombo Range west, south and then eastward to rejoin the N’Yawos Hill is defined in the Conventions of 1881 and 1884. Precolonial state obviously mattered since “[t]he alignment originates in cession agreements between the Dutch and the Swazi Ruler of 1846, 1855, and 1866” (Brownlie 1979, 1315). Subsequent demarcations by commissions in 1866, 1875, and 1879-80 also involved Umbandeni the King of Swaziland and his Indunas. Rivers and mountains were extensively referenced in description of the border. The traditional Kingdom of Swaziland, however, was partitioned between South Africa and Swaziland.

B.98 SOUTH AFRICA–ZIMBABWE

Summary: rivers, PCS

Most important: PCS

Details. According to Brownlie (1979, 1299): “The sector consists exclusively of the median line or, perhaps, *thalweg* of the Limpopo river for a distance of 140 miles.” The Limpopo river, according to Brownlie (1979, 1299), “formed the northern limit of Boer settlement and the southern marches of the Matabele Kingdom” in the mid 19th century.

B.99 SUDAN–UGANDA

Summary: non-PCS ethnic groups, mountains, straight lines, rivers, villages

Most important: non-PCS ethnic groups

Details. Great Britain established influence in both Sudan and Uganda. Sudan-Uganda boundary remained undefined for a long time due to economic marginality and underdevelopment of the region. To facilitate administration of local ethnic groups, Sudan proposed to Uganda an exchange of territory in 1911. Sudan proposed a tribal boundary that gave Sudan the remainder of the Bari group to unite with the majority living in Sudan and left the whole of the Turkana group to Uganda (Taha, 1978, 3). In return, Sudan would cede the southern part of the Lado Enclave to Uganda, the line of which follows the northern boundary of the Lugwari group. A joint commission was set up to delimit the boundary in accordance with these proposals in 1913.

The end result was an Order of 1914 and a rectification in favor of Sudan in 1926. The boundary for the most part follows rivers and connects mountains with straight lines. Villages were also mentioned.

According to Brownlie (1979, 1003), “[a] major principle of the boundary-making by a commission in 1913 was the avoidance of a line which would divide a tribe”. However, the commission recognized that it was almost impossible to construct tribal boundaries due to their inter-mixture. “They suggested, therefore, that when the territory on either side of the boundary came to be closely administered, any small modifications which would facilitate the administration could be effected” (Taha, 1978, 4). The commission also did not examine all of the areas in question but ended at Jebel Mogilla. So to the east of the mountain, the boundary was simply fixed as a straight line running to the north of Mount Labur to Lake Rudolf (Turkana), which formed the eastern part of Sudan-Kenya border after Uganda transferred the remaining part of the Rudolf Province in the northeast to Kenya in 1926. During the 1924 Kitgum Conference of Sudan, Uganda and Kenya to solve sleeping sickness problems in the border regions, the Sudan-Uganda boundary was criticized as “most unfortunately non-tribal in its entirety” (Taha, 1978, 8). The Tereteinia-Madial area was ceded to Sudan in 1926 to unite people of the Lango group and facilitate the control of sleeping sickness.

The 1914 Order mentioned that part of the boundary was to follow “the southern boundary of the Kuku tribe” (Brownlie 1979, 1005), which was ill-defined and required further clarification. Sudan and Uganda exchanged correspondence between 1929 and 1936. Although no formal agreement was reached, they agreed on an interpretation of the phrase and some sort of *de facto* local working agreement was followed. The 1914 Order also specified a segment as “such a line as shall exclude the riverain people below Nimule” (Brownlie 1979, 1005). But it was later found out that the riverain people did not exist as the whole area was depopulated by sleeping sickness.

B.100 TANZANIA–UGANDA

Summary: lakes, meridians, rivers

Most important: meridians

Details. The Tanzania-Uganda border was formed on the basis of the Anglo-German division of spheres of influence in 1886 and 1890 with some modification by an Agreement of 1910. The Anglo-German Agreement of 1890 reads: “From the confluence of the Rivers Kachwamba-Katitumba and Kagera the boundary follows the thalweg of the River Kagera as far as the second crossing of the parallel 1° south by the River Kagera between boundary pillars numbered 26 and 27. The boundary then follows the line of boundary pillars already erected along the 1° south as afar as the intersection of this line with the western shore of Lake Victoria” (Brownlie 1979, 1011).

This results in two anomalies in relation to the River Kagera. A small part of Uganda, known as the Kagera Triangle, was left south of the river but north of the parallel near Lake Victoria. A larger area of about 600 square miles north of the river but south of the parallel, known as the Kagera Salient, was left to Tanzania. The Kagera Salient was traditionally a part of Buganda and Ankole (a traditional Bantu kingdom in Uganda), whilst the Kagera Triangle is a part of Uhaya country (a Tanganyika ethnic group). These areas are wrongly attributed in terms of historical and ethnic associations (Brownlie 1979, 1015). Uganda disputed over the Kagera Salient with Tanzania. This has led to Ugandan invasion of the Kagera Salient in 1978 and the initiation of the Uganda-Tanzania War.

B.101 TANZANIA–ZAMBIA

Summary: lakes, rivers, watersheds, mountains, villages

Most important: rivers

Details. Britain and Germany divided their spheres of influence in the Agreement of 1890, which included a delimitation between Lakes Tanganyika and Nyasa (Malawi) that referenced to major rivers, lakes, and meridians with no wealth of details. A joint Boundary Commission surveyed the boundary in 1898, resulting in an Anglo-Germany Agreement of 1901, in which the boundary description referred extensively to natural features, especially rivers and watersheds. Mountains, villages, straight lines connecting boundary pillars were also mentioned. This was followed by a more detailed demarcation with minor local adjustments in 1935 and 1937.

B.102 ZAMBIA–ZIMBABWE

Summary: rivers, lakes, islands, straight lines

Most important: rivers

Details. The Zimbabwe-Zambia border consists entirely of the River Zambezi, except for the sector within Lake Kariba. The latter is a modern man-made lake and reservoir filled between 1958 and 1963 by flooding the Kariba Gorge on the Zambezi River. A 1963 Order in Council provided a precise alignment in the Zambezi River with reference to a number of islands and constructed the boundary through the lake. The border segment within the lake is a series of straight lines approximately following the existing boundary consisting of the old course of the Zambezi River. Notably, Zambia was named after the Zambezi River.

Supplemental Appendix II

In Supplemental Appendix II, we present supporting information for our grid-cell regressions (Appendix C), supporting information for our statistical analysis of ethnic partition and our critique of Murdock data (Appendix D), and additional tables and figures (Appendix E).

C SUPPORTING INFORMATION FOR GRID-CELL REGRESSIONS

C.1 REGRESSION TABLES

Table C.1: Geography and African Borders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Dependent Variable: Country border in cell						
Top 10 river in cell	0.19** (0.07)						0.17* (0.08)
River indicator in cell		0.12** (0.03)					0.09** (0.03)
Navigable river in cell			0.07+ (0.04)				-0.10* (0.05)
Top 10 lake in cell				0.24** (0.07)			0.19** (0.07)
Lake indicator in cell					0.11** (0.04)		0.04 (0.03)
Cell in desert						-0.07** (0.02)	-0.04* (0.02)
Constant	0.14** (0.01)	0.12** (0.01)	0.14** (0.01)	0.14** (0.01)	0.14** (0.01)	0.17** (0.01)	0.14** (0.01)
N	10338	10338	10338	10338	10338	10338	10338
Adjusted R^2	0.16	0.16	0.15	0.15	0.15	0.15	0.17

Notes: All models are OLS. Conley standard errors in parentheses with a distance cutoff of 300 km.

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table C.2: Precolonial States and African Borders

Sample	(1) Full	(2) Full	(3) Full	(4) Full	(5) SSA	(6) SSA	(7) SSA	(8) SSA
Dependent Variable: Country border in cell								
PCS border in cell	0.09* (0.03)				0.11** (0.04)			
PCS border in cell (0.25° buffer)		0.08** (0.03)				0.10** (0.03)		
Cell inside PCS			-0.08** (0.02)				-0.08** (0.03)	
Cell inside PCS (0.25° buffer)				-0.11** (0.02)				-0.12** (0.03)
Top 10 river in cell	0.18* (0.08)	0.18* (0.08)	0.19* (0.08)	0.19* (0.08)	0.19* (0.08)	0.19* (0.08)	0.20* (0.08)	0.20* (0.08)
River indicator in cell	0.09** (0.03)	0.09** (0.03)	0.09** (0.03)	0.09** (0.03)	0.09** (0.03)	0.09** (0.03)	0.10** (0.03)	0.10** (0.03)
Navigable river in cell	-0.11* (0.05)	-0.11* (0.05)	-0.12* (0.05)	-0.12* (0.05)	-0.11* (0.05)	-0.10* (0.05)	-0.12* (0.05)	-0.12* (0.05)
Top 10 lake in cell	0.17* (0.07)	0.17* (0.07)	0.17* (0.07)	0.17* (0.07)	0.19** (0.07)	0.18** (0.07)	0.19** (0.07)	0.19** (0.07)
Lake indicator in cell	0.03 (0.03)	0.02 (0.03)	0.04 (0.03)	0.04 (0.03)	0.02 (0.04)	0.02 (0.04)	0.04 (0.04)	0.03 (0.04)
Cell in desert	-0.01 (0.02)	-0.00 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.05+ (0.03)	-0.05+ (0.03)	-0.06* (0.03)	-0.06* (0.03)
Latitude	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Longitude	-0.00* (0.00)	-0.00** (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00+ (0.00)	-0.00* (0.00)	-0.00 (0.00)	-0.00 (0.00)
Logged group area	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.02 (0.01)	-0.02 (0.01)	-0.02* (0.01)	-0.02* (0.01)
Distance to the coast	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Historical natural resources	-0.03 (0.02)	-0.03 (0.02)	-0.02 (0.02)	-0.03 (0.02)	-0.03 (0.03)	-0.03 (0.03)	-0.02 (0.02)	-0.03 (0.02)
Slave exports	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
Suitability for European settlement	0.00 (0.04)	0.00 (0.04)	0.01 (0.04)	0.01 (0.04)	0.02 (0.04)	0.02 (0.04)	0.03 (0.04)	0.03 (0.04)

Agricultural intensity	-0.00 (0.01)	-0.01 (0.01)	-0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Constant	0.19** (0.06)	0.19** (0.06)	0.21** (0.06)	0.21** (0.06)	0.28** (0.07)	0.28** (0.07)	0.29** (0.07)	0.29** (0.07)
Region FE	YES	YES	YES	YES	YES	YES	YES	YES
N	9699	9699	9699	9699	6988	6988	6988	6988
Adjusted R^2	0.19	0.19	0.19	0.19	0.22	0.22	0.22	0.22

Notes: All models are OLS. Conley standard errors in parentheses with a distance cutoff of 300 km. Controlling for agricultural intensity causes observations to drop. ⁺ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

C.2 DATA SOURCES FOR VARIABLES

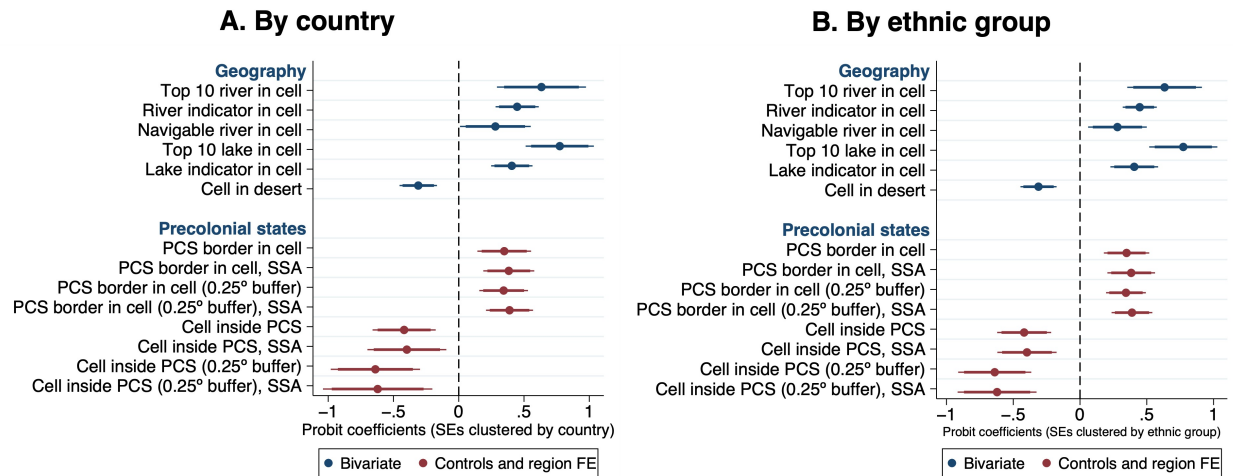
1. **Top 10 River:** Dummy variable that takes on the value one for grid cells/ethnic homelands with any of the 10 longest rivers in Africa and zero otherwise. Top 10 rivers are Nile, Congo, Niger, Zambez, Ubangi-Uele, Kasai, Orange, Limpopo, Senegal and Blue Nile. *Source:* Constructed using the “Rivers and lake centerlines” shapefile available at <https://www.naturalearthdata.com/downloads/10m-physical-vectors/10m-rivers-lake-centerlines>.
2. **Navigable River:** Dummy variable that takes on the value one for grid cells/ethnic homelands with a navigable river and zero otherwise. *Source:* Hammond (1918, p. 44).
3. **River Indicator:** Dummy variable that takes on the value one for grid cells/ethnic homelands with a river and zero otherwise, *Source:* Constructed using the “Rivers and lake centerlines” shapefile available at <https://www.naturalearthdata.com/downloads/10m-physical-vectors/10m-rivers-lake-centerlines>.
4. **Top 10 Lake:** Dummy variable that takes on the value one for grid cells/ethnic homelands with any of the 10 largest lakes in Africa and zero otherwise. Top 10 lakes are Lake Victoria, Tanganyika, Malawi, Chad, Turkana, Albert, Mweru, Tana, Kivu, Edward, Rukwa and Mai-Ndombe. *Source:* Constructed using the “Rivers and lake centerlines” shapefile available at <https://www.naturalearthdata.com/downloads/10m-physical-vectors/10m-rivers-lake-centerlines>.
5. **Lake indicator:** Dummy variable that takes on the value one for grid cells/ethnic homelands with a lake and zero otherwise. *Source:* Constructed using the “Rivers and lake centerlines” shapefile available at <https://www.naturalearthdata.com/downloads/10m-physical-vectors/10m-rivers-lake-centerlines>.
6. **Share of Desert:** The percentage of surface area classified as non-vegetated or sparsely vegetated for each ethnic group. For grid cells, we code an dummy variable indicating whether a cell resides in non-vegetated or sparsely vegetated areas. *Source:* UNESCO Vegetation Map of Africa by White (1983).
7. **Logged Land Area:** Logged surface area of each ethnic homeland in 1000s of km^2 . *Source:* Michalopoulos and Papaioannou (2016). *Original Source:* Global Mapping International, Colorado Springs, Colorado, USA.
8. **Distance to the Coast:** The shortest geodesic distance of the centroid of each grid cell/ethnic homeland from the coast, measured in 1000s of km.
9. **Suitability for European Settlement:** The index takes into account climate, rainfall, elevation and tsetse fly prevalence that influenced prospects for European settlement. For ethnic groups, we use

the average suitability index. For grid cells, we code a dummy variable indicating whether the cell is suitable or not. *Source: Paine (2019)*.

10. **Agricultural Intensity:** 1 – 6 scale index reflecting the intensity of agriculture for each ethnic group. 1 means a “complete absence of agriculture”, 2 for “casual agriculture”, 3 for “extensive or shifting cultivation”, 4 for “horticulture”, 5 for “intensive agriculture on permanent fields”, and 6 for “intensive cultivation where it is largely dependent upon irrigation”. For grid cells, we use the value for the ethnic group containing the cell. If a cell falls into multiple ethnic groups, we calculate the average weighted by group area in cell. *Source: Murdock (1967); variable code v28*.
11. **Jurisdictional Hierarchy:** The number of jurisdictional levels beyond the local community, with 1 representing stateless societies, 2 for petty chiefdom, 3 for larger paramount chiefdom or their equivalent, and 4 or 5 for large states. Organizations not held to be legitimate, e.g., imposed colonial regimes, are excluded. *Source: Murdock (1967); variable code v33*.
12. **Slave Exports:** For ethnic groups, the logged number of slave exports scaled by land area of the ethnic group ($\log(1 + \text{exports}/\text{km}^2)$). For grid cells, the same value of the ethnic group containing the cell. If a cell falls into multiple groups, we use the average weighted by the land area of each group in cell. *Source: Nunn (2008)*.
13. **Historical Natural Resources:** For ethnic groups, the number of historical natural resource sites scaled by group land area. For grid cells, a dummy variable indicating whether a cell contains any historical natural source cite. *Source: Ricart-Huguet (2022)*.
14. **Regions:** For ethnic groups, we use five conventional regions of Africa based on existing country borders. For grid cells, we construct five regions based on latitudes and longitudes. North: cells north of 18° N, roughly everything at or north of the Sahara desert (excludes Sahel); South: cells south of 15° S, roughly everything south of Lake Malawi; West: cells between 18° N and 15° S and west of 14° E, roughly everything West of Lake Chad that is not Northern Africa; East: cells between 18° N and 15° S and east of 14° E, roughly everything East of Lake Tanganyika that is not Northern or Southern Africa; Central: all remaining cells.

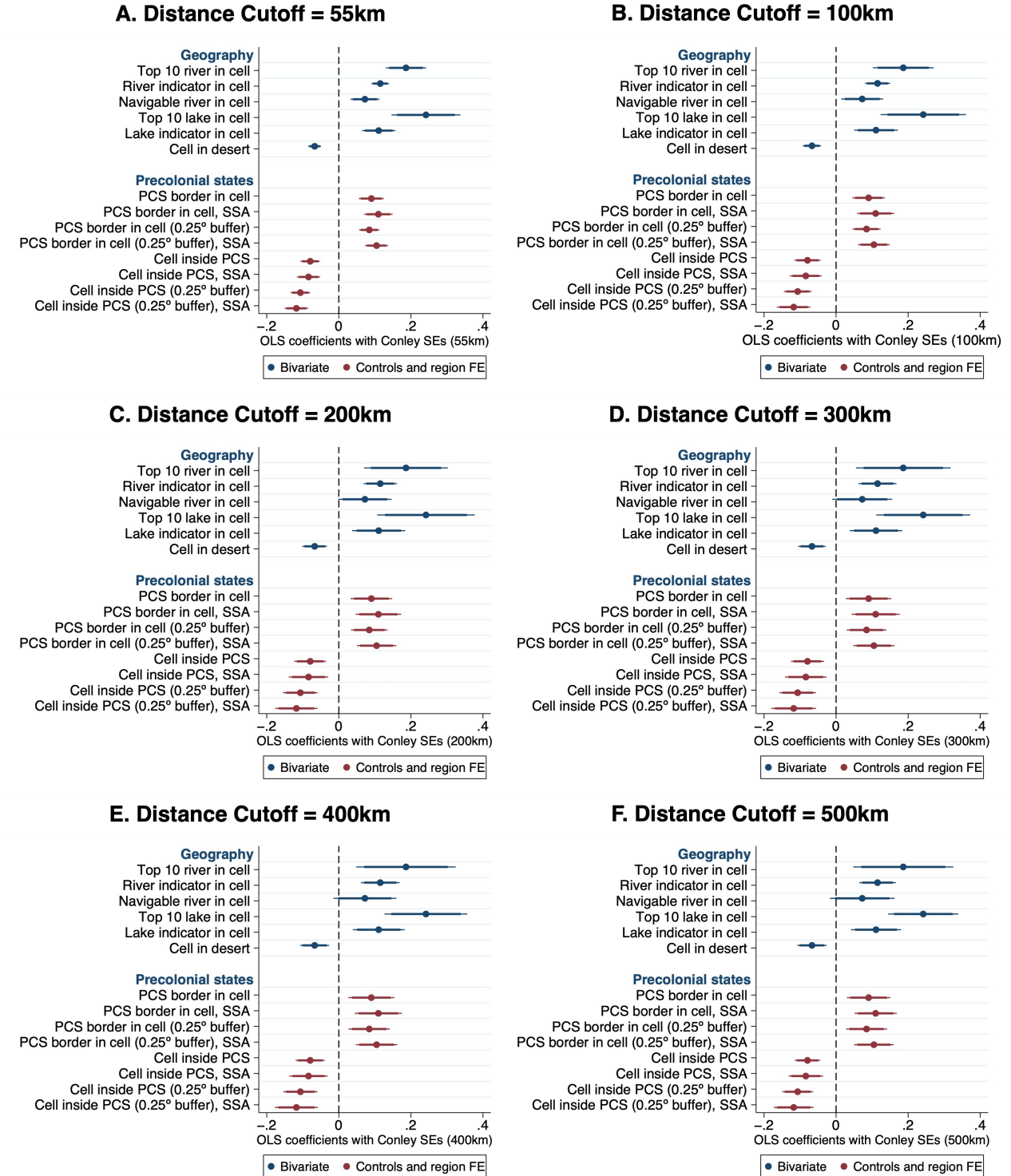
C.3 ROBUSTNESS CHECKS

Figure C.1: Correlates of African Borders with Probit Models



Notes: This figure presents a series of coefficient plots similar to Figure 5 but with probit models with standard errors clustered by country and by ethnic groups.

Figure C.2: Correlates of African Borders with Various Distance Cutoffs



Notes: This figure presents a series of coefficient plots similar to Figure 5 but with varying distance cutoffs.

D SUPPORTING INFORMATION FOR ETHNIC PARTITION REGRESSIONS

The following provides details on our regression analysis using ethnic groups as the unit of analysis. We then critique the use of Murdock data for assessing the relationship between precolonial states and ethnic partition.

D.1 DATA AND RESULTS

Data. We largely follow Michalopoulos and Papaioannou’s (2016) setup for assessing the correlates of ethnic partition. They identify partitioned groups using Murdock’s Ethnolinguistic Map (1959), digitized by Nunn (2008), that describes and geo-locates ethnic groups in Africa at the time of European colonization. There are 825 ethnic homelands after dropping uninhabited areas and small islands. Given inevitable error in the Murdock-drawn “ethnic homeland” boundaries, they code as partitioned any group for which at least 10% of their territory falls into more than one country. For each partitioned group, we also coded whether the border segment that split the group was primarily squiggly or a straight line (following the conceptual distinction in Alesina, Easterly and Matuszeski 2011).

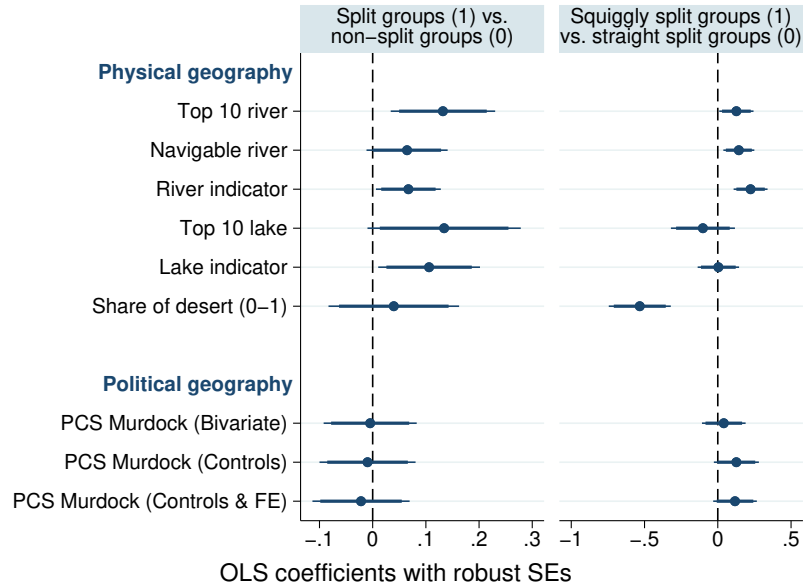
Our measure of precolonial states is based on Murdock’s jurisdictional hierarchy variable, which we refer to as PCS MURDOCK. We count as a precolonial state any group that scores three levels or higher, which correspond with what Murdock labels as “states.” Given our theoretical assessments, a binary variable is easier to interpret than a graded measure, although the correlations are qualitatively identical with Murdock’s original graded jurisdictional hierarchy variable (not reported). We do not anticipate differential rates of partition for polities with less developed hierarchies because the absence of reasonably credible traditional claims to rule a broad territory should prevent European colonizers from identifying focal points.

Rivers and lakes are possibly the most important geographic focal points because they are highly visible and fixed. We measure whether each ethnic homeland contains a TOP 10 RIVER, a NAVIGABLE RIVER, or any river (RIVER INDICATOR, Michalopoulos and Papaioannou’s (2016) measure). Navigable rivers are closely related to economic activities and colonial interests. Many international borders also involve segments of smaller rivers that are locally salient. We also measure whether an ethnic homeland contains a TOP 10 LAKE or any lake (LAKE INDICATOR, Michalopoulos and Papaioannou’s (2016) measure). Different measures allow us to capture rivers and lakes of varied importance and conduct a more comprehensive assessment of their role in border formation. To assess our theoretical expectations about border formation in areas lacking clear focal points, we include SHARE OF DESERT.

Results for physical geography. Figure D.1 presents a series of linear models examining the impact of physical and political geography on ethnic group partition (the results are qualitatively identical with probit models; not reported). The left panel compares ethnic groups split across international borders with non-split groups. The right panel compares groups split by a squiggly border with those partitioned by a straight line. Across the entire sample, 229 of the 825 ethnic groups (28%) are partitioned across multiple countries. In 78% of the 229 split groups, a majority of the border is squiggly.

The top panel presents bivariate OLS estimates for physical geography. The most visible and fixed geographic focal points, rivers and lakes, covary with an elevated likelihood of ethnic group partition, consistent with our theoretical expectations. Ethnic homelands containing a river or a lake are more likely to be partitioned: 39% of groups with a top-10 river in their territory were partitioned compared to 26% among groups lacking this feature, and the figures are almost identical for top-10 lakes. The relationship is consistent among different measures of rivers and lakes. Rivers also affect the *type* of split. The presence of a river increases the likelihood of squiggly split (80% versus 73% otherwise). Lakes, on the other hand, do not

Figure D.1: Correlates of Ethnic Partition



Notes: This figure summarizes a series of OLS estimates with the explanatory variable listed in the rows and the dependent variable in the columns. It presents point estimates and both 95% and 90% confidence intervals calculated with robust standard errors. In the left panel, there are 229 split groups and 596 non-split groups. In the right panel, there are 178 squiggly-split groups and 51 straight-split groups. Physical geography models are bivariate estimates. We present three political geography models: the first is bivariate, the second includes the same set of control variables used in the grid cell analysis, and the third additionally has region fixed effect (FE). The inclusion of agricultural intensity causes 53 observations to drop in the left panel and 6 observations to drop in the right panel.

affect the type of split. This is consistent with qualitative evidence on bilateral borders. Unlike inherently squiggly river borders, some international borders involving lakes follow the squiggly median line between shores (e.g., Lake Tanganyika) while others cut across the lakes with straight lines (e.g., Lake Victoria), leading to a null aggregate effect. Overall, the statistical results suggest that water bodies influenced border formation.

As expected, an ethnic group's percentage of desert area does not affect the likelihood of partition. However, a larger desert area increases the likelihood of ethnic partition via a straight-line border. These results are consistent with the expectation that European powers competed for better-quality land and drew borders more carefully in those areas while dividing territories haphazardly in deserts, where there was a lack of both economic interests and focal points.

Results for precolonial states. The bottom panel of Figure D.1 shows results for PCS MURDOCK. We first present the bivariate result. Since PCS MURDOCK is endogenous, next we control for the same set of geographic and other covariates used in the grid cell analysis. Finally, we control for region fixed effect to compare groups within similar regions of Africa.

In our main analysis with grid cells, we demonstrate, in essence, that precolonial states are less likely to be partitioned. We do not replicate this finding with Murdock ethnic groups. The coefficients for PCS MURDOCK on the left panel is close to 0 and insignificant. Furthermore, the raw magnitudes are small: 27%

of groups with PCS MURDOCK=1 were partitioned compared to 29% with PCS MURDOCK=0. However, *among* split groups, there is stronger evidence that Europeans drew squiggly rather than straight-line borders. The coefficients on the right panel is positive and significant, which suggests that the partition of precolonial states is not a random process.

D.2 SHORTCOMINGS OF THE MURDOCK DATA

In our assessment, measurement error in the Murdock data is too large to render it usable for studying the relationship between precolonial states and partition. This helps to account for why we found strong correlations in the paper using our data, and null correlations when analyzing Murdock data. We offer two criticisms of Murdock: (1) Ethnic groups exhibit a conceptual mismatch with the spatial reach of historical states, and (2) Murdock’s jurisdictional hierarchy variable exhibits considerable measurement error.

To substantiate these points, in Table D.1, we sample every “positive-positive” case from the regressions presented above, that is, every case with PCS MURDOCK=1 and the ethnic group is partitioned according to the criterion in Michalopoulos and Papaioannou (2016). For only two of the 32 cases do we find evidence that members of the ethnic group indeed created centralized political institutions *and* the core area of the historical state was partitioned across international borders. To make this assessment, we first compare the Murdock groups with high jurisdictional hierarchy scores to the list of states from our coding exercise. We conclude that 26 of these ethnic groups did not belong to historical states. Among the groups that belonged to precolonial states, we then assessed that only two of the six corresponding states were partitioned in the sense of core areas of the state were divided across colonial borders (based on the data and historical information we compiled; see Appendix A). Thus, the large number of positive-positive cases that drive the null findings for precolonial states and ethnic partition almost entirely reflect noise.

Table D.1: Partitioned Ethnic Groups with Precolonial States: Murdock

Murdock group	Country	Our assessment	Murdock group	Country	Our assessment
Delim	Western Sahara	Not a state	Regeibat	Mauritania	Not a state
Esa	Somalia	Not a state	Ronga	Mozambique	Not a state
Fon	Benin	Not partitioned (Dahomey)	Ruanda	Rwanda	Not partitioned
Gil	Morocco	Not a state	Rundi	Burundi	Not partitioned
Hamama	Tunisia	Not a state	Runga	Chad	Not a state
Hiechware	Botswana	Not a state	Songhai	Mali	Not a state
Imragen	Western Sahara	Not a state	Sotho	South Africa	Agree
Ishaak	Somalia	Not a state	Subia	Namibia	Not a state
Jerid	Tunisia	Not a state	Swazi	Swaziland	Agree
Kgatla	South Africa	Not a state	Tabwa	Congo DRC	Not a state
Mandara	Nigeria	Not a state	Tama	Sudan	Not a state
Manga	Niger	Not a state	Tienga	Nigeria	Not a state
Masalit	Sudan	Not a state	Tlokwa	South Africa	Not a state
Mashi	Zambia	Not a state	Tripolitanians	Libya	Not a state
Mpezeni	Zambia	Not a state	Tunisians	Tunisia	Not partitioned
Popp	Benin	Not a state	Wakura	Nigeria	Not a state

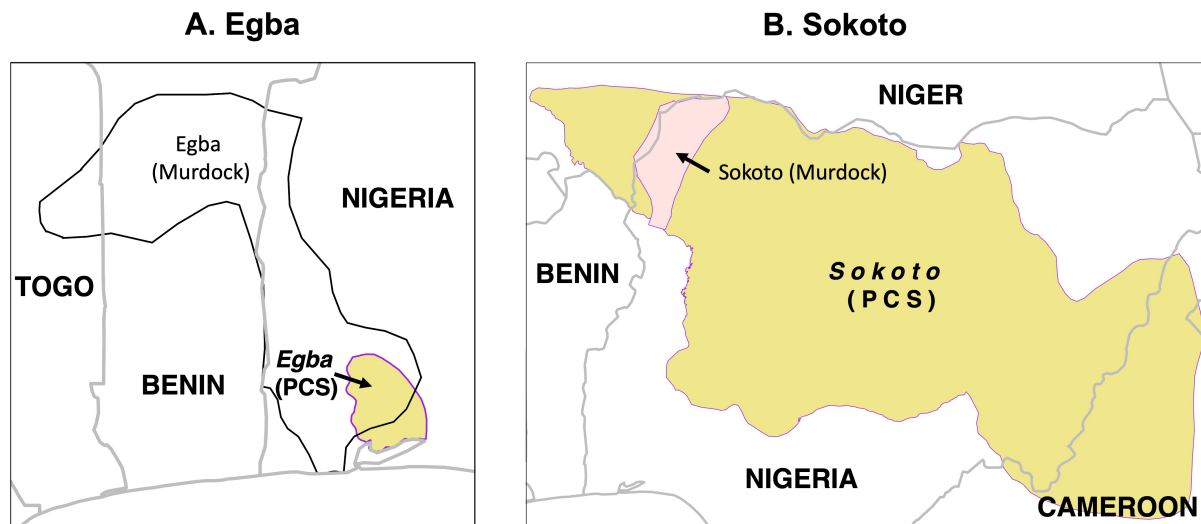
Notes: This table lists every ethnic group for which Murdock codes the ethnic group with a jurisdictional hierarchy score of 3 or above, and Michalopoulos and Papaioannou (2016) code the group as partitioned. The assignment to countries is from Michalopoulos and Papaioannou (2016).

To further highlight the conceptual mismatch between ethnic groups and states, amid more general concerns about measurement error in Murdock’s polygons, we present two examples. In Panel A of Figure D.2, we

present the Murdock polygon for Egba in white and ours in yellow. As we discuss in Appendix A.2.28, we incorporate the historical state governed by the Alake of Egba; as we note, if anything, our polygon is too big. But Murdock instead measures the location of members of ethnic groups, which he suggests is much larger—hence yielding a false positive if the goal is to assess whether the historical state was partitioned. There are two other problems with the Murdock in this case, as well. First, Murdock codes Egba as two levels of political hierarchy above the village level, that is, a paramount chieftaincy rather than a state. However, historical sources argue that Egba was the most powerful state to emerge in Yorubaland following the collapse of the Oyo Empire early in the nineteenth century (see Appendix A.3.7). Second, Murdock’s Egba polygon is undoubtedly too large even given the goal of measuring ethnic groups (see the map in Forde 1951).

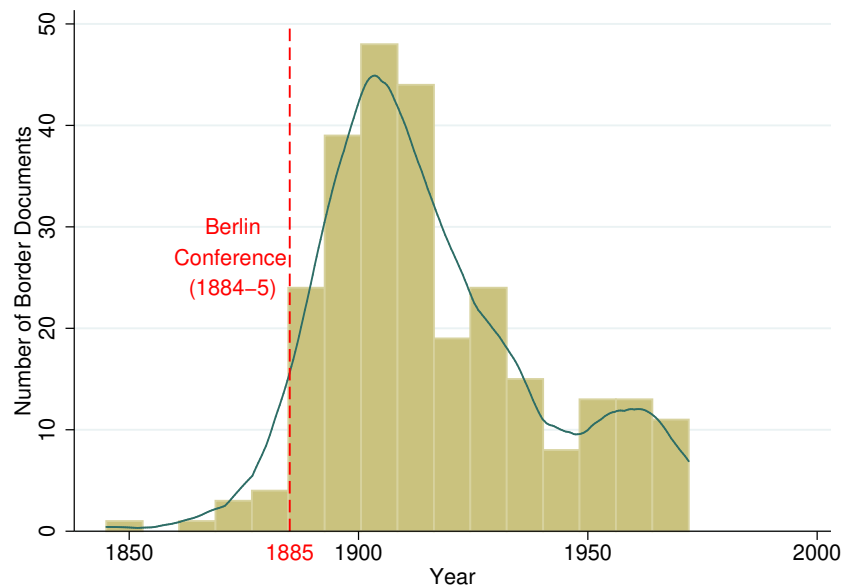
In Panel B, we examine the Sokoto Caliphate. In this case, our polygon is much bigger, and corresponds with the extent of the historical state. This is an odd entry in Murdock. The Sokoto Caliphate was governed by ethnic Fulani, and many of the new emirates displaced historical Hausa states. Sokoto was a state, not an ethnic group, and thus should not appear in his data set at all. Finally, his Sokoto polygon corresponds roughly with the Sokoto emirate only, not the entire empire (and, strangely, Murdock codes Sokoto as exhibiting only one level of hierarchy above the village level). In sum, in both this and the Egba case, even if we correct the jurisdictional hierarchy score, the Murdock polygon is simply too inaccurate to be useful for our purposes.

Figure D.2: Comparing Murdock Polygons



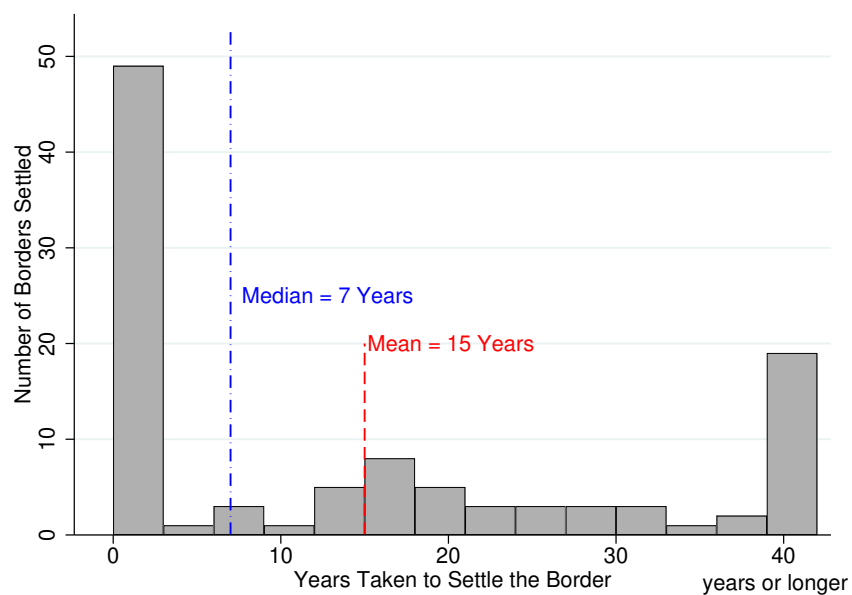
E ADDITIONAL TABLES AND FIGURES

Figure E.1: European Documents Pertaining to African Boundaries



Notes: Documents compiled from Brownlie (1979).

Figure E.2: Years Taken to Settle the Border



Notes: Data from Goemans and Schultz (2017).

Figure E.3: Figure 2 Disaggregated by Colony

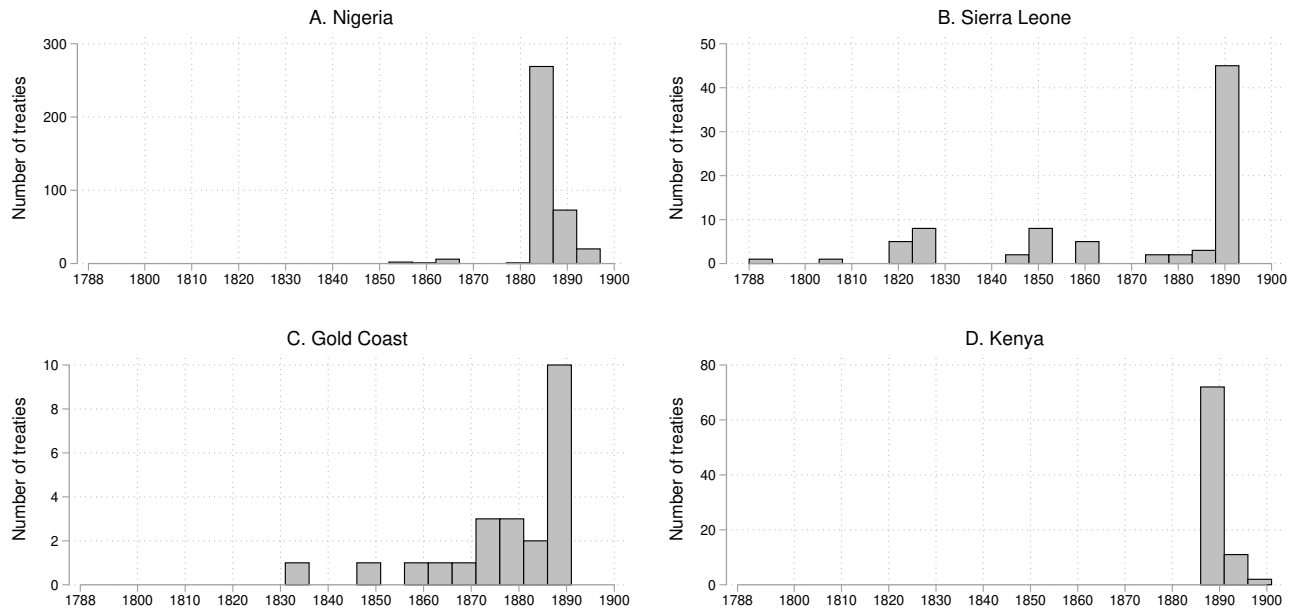
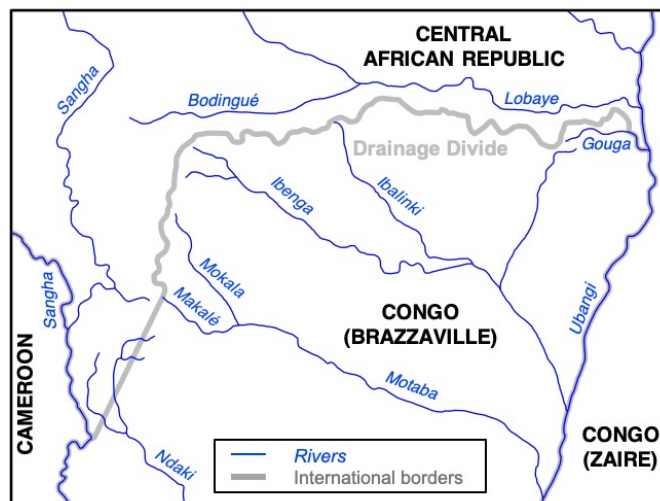


Figure E.4: Non-Obvious Geographic Features: Drainage Divides



Notes: Rivers and international border lines from authors' digitization of Brownlie (1979, 594). The Congo-CAR border starts with the Cameroon tripoint located on the thalweg of the Sangha and extends northeastward in a straight line for about 48 miles. Thence the border follows the watersheds or drainage divides of Sangha-Kenié, Sangha-Ubangi, Ibenga-Bodingué, Ibenga-Lobaye, and Lobaye-Gouga. The rest of the border follows the Gouga until its confluence with the Ubangi.

Table E.1: Determinants of African *inland* bilateral borders

Category	Feature	All determinants		Main determinant	
		Number	Percentage	Number	Percentage
Physical geography	Rivers, oueds	56	80%	26	37%
	Water bodies: lakes, oasis, wells	27	39%	4	6%
	Watershed/drainage divide	12	17%	5	7%
	Topography: mountains, hills, valleys	35	50%	3	4%
	Desert border	17	24%	0	0%
Political geography	Precolonial states (PCS)	20	29%	15	21%
	Non-PCS ethnic groups	9	13%	2	3%
	Cities, towns, high population density	21	30%	3	4%
	Infrastructure: roads and routes	13	19%	0	0%
Straight lines (possibly haphazard)	Parallels and meridians	15	21%	8	11%
	Other straight lines	24	34%	4	6%
Total		249	-	70	100%

Notes: This table is analogous to Table 1 but subsets the analysis to inland borders; n=70. Counterintuitively, 26% of all borders but only 24% of inland borders are in desert areas. This is because as many as 10 bilateral coastal borders are in desert areas (e.g., Algeria-Morocco, Egypt-Libya, Namibia-South Africa).

Table E.2: Determinants of African *coastal* bilateral borders

Category	Feature	All determinants		Main determinant	
		Number	Percentage	Number	Percentage
Physical geography	Rivers, oueds	27	84%	15	47%
	Water bodies: lakes, oasis, wells	14	44%	2	6%
	Watershed/drainage divide	5	16%	0	0%
	Topography: mountains, hills, valleys	19	59%	1	3%
	Desert border	10	31%	0	0%
Political geography	Precolonial states (PCS)	2	6%	1	3%
	Non-PCS ethnic groups	9	28%	0	0%
	Cities, towns, high population density	15	47%	3	9%
	Infrastructure: roads and routes	8	25%	2	6%
Straight lines (possibly haphazard)	Parallels and meridians	14	44%	6	19%
	Other straight lines	13	41%	2	6%
Total		136	-	32	100%

Notes: This table is analogous to Table 1 but subsets the analysis to borders between two coastal colonies (e.g., Benin-Nigeria); n=32.

Table E.3: Determinants of African *inter-imperial* bilateral borders

Category	Feature	All determinants		Main determinant	
		Number	Percentage	Number	Percentage
Physical geography	Rivers, oueds	50	82%	22	36%
	Water bodies: lakes, oasis, wells	30	49%	5	8%
	Watershed/drainage divide	12	20%	3	5%
	Topography: mountains, hills, valleys	37	61%	2	3%
	Desert border	15	25%	0	0%
Political geography	Precolonial states (PCS)	14	23%	9	15%
	Non-PCS ethnic groups	10	16%	0	0%
	Cities, towns, high population density	21	34%	3	5%
	Infrastructure: roads and routes	15	25%	2	3%
Straight lines (possibly haphazard)	Parallels and meridians	24	39%	12	20%
	Other straight lines	25	41%	3	5%
Total		253	-	61	100%

Notes: This table is analogous to Table 1 but subsets the analysis to borders that separate colonies from different empires (e.g., Benin-Nigeria border); n=61.

Table E.4: Determinants of African *intra-imperial* bilateral borders

Category	Feature	All determinants		Main determinant	
		Number	Percentage	Number	Percentage
Physical geography	Rivers, oueds	33	80%	19	46%
	Water bodies: lakes, oasis, wells	11	27%	1	2%
	Watershed/drainage divide	5	12%	2	5%
	Topography: mountains, hills, valleys	17	41%	2	5%
	Desert border	12	29%	0	0%
Political geography	Precolonial states (PCS)	8	20%	7	17%
	Non-PCS ethnic groups	8	20%	2	5%
	Cities, towns, high population density	15	37%	3	7%
	Infrastructure: roads and routes	6	15%	0	0%
Straight lines (possibly haphazard)	Parallels and meridians	5	12%	2	5%
	Other straight lines	12	29%	3	7%
Total		132	-	41	100%

Notes: This table is analogous to Table 1 but subsets the analysis to borders that separate colonies from the same empire (e.g., Senegal-Mali border); n=41.

Table E.5: Names of African States

Country	Colonial name in 1939	Historical state	Water body
Algeria	Algeria	Algiers	
Angola	Angola	Ndongo	
Benin	Dahomey	Dahomey, Benin*	Bight of Benin**
Botswana	Bechuanaland	Tswana	
Burkina Faso	Upper Volta		Volta river
Burundi	Ruanda-Urundi	Burundi	
Cameroon	French Cameroons		Wouri river
Central African Republic	Ubangui-Chari		Ubangui/Chari rivers
Chad	Chad		Lake Chad
Congo Brazzaville	Moyen-Congo		Congo river
Congo Kinshasa	Belgian Congo	Kongo*	Congo river
Egypt	Egypt	Egypt	
Eritrea	Eritrea		Red Sea**
Ethiopia	Ethiopia	Ethiopia	
Gabon	Gabon		Gabon estuary**
Gambia	Gambia		Gambia river
Ghana	Gold Coast	Ghana*	Gold Coast**
Ivory Coast	Ivory Coast		Ivory Coast**
Lesotho	Basutoland	Basutoland	
Malawi	Nyasaland	Maravi*	Lake Nyasa/Malawi
Mali	French Sudan	Mali*	
Morocco	Morocco	Morocco	
Niger	Niger		Niger river
Nigeria	Nigeria		Niger river
Rwanda	Ruanda-Urundi	Rwanda	
Senegal	Senegal		Senegal river
Swaziland	Swaziland	Swaziland	
Tanzania	Tanganyika	Zanzibar	Lake Tanganyika
Tunisia	Tunisia	Tunis	
Uganda	Uganda	Buganda	
Zambia	Northern Rhodesia		Zambezi river**
Zimbabwe	Southern Rhodesia	Great Zimbabwe*	

Notes: The names of colonies and post-independence countries in Africa reflect the importance of precolonial states and rivers/lakes. For each country, we coded whether the name reflects either feature, for example, Uganda was named after the Buganda state and Nigeria after the Niger river. The permissive version of the variable counts any precolonial state and any body of water. The restrictive version requires that the *colonial* name reflected a precolonial state that was *still intact on the eve of colonization*, and that the water body is specifically a *lake or river*. Altogether, we code 66% of countries as meeting the permissive naming criterion, and 51% as meeting the restrictive naming criterion. States not meeting either criteria: Djibouti, Equatorial Guinea, Guinea, Guinea-Bissau, Kenya, Liberia, Libya, Mauritania, Mozambique, Namibia, Sierra Leone, Somalia, South Africa, Sudan, Togo. *Source:* Everett-Heath (2005).

*Does not meet the restrictive version of the historical state variable.

**Does not meet the restrictive version of the water body variable.

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