

MAPPING PLACE

AFRICA BEYOND PAPER



INSTITUTE OF PAPER
SCIENCE AND TECHNOLOGY

IVAN ALLEN COLLEGE
OF LIBERAL ARTS

ROBERT C. WILLIAMS
MUSEUM OF PAPERMAKING

GEORGIA INSTITUTE OF TECHNOLOGY

MAPPING PLACE

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ROBERT C. WILLIAMS
MUSEUM of
PAPERMAKING



GREETING

The Institute of Paper Science and Technology (IPST) is pleased to host *Mapping Place: Africa Beyond Paper*. Our museum, the Robert C. Williams Museum of Papermaking, is the ideal site for an exhibit of this nature. The museum was established at IPST in 1954, and contains thousands of artifacts reflecting the history of paper and hand papermaking. This exhibit combines the tactile element of paper with new mapping innovations showing how maps reflect the time and place in which they are created. While the museum's early focus was on the history of papermaking, forays into the related sciences of papermaking are recent additions to interpretation. This blend of history and science provides a suitable setting in which a topic such as the depiction of Africa in maps over time can be examined and discussed.

Mapping Place: Africa Beyond Paper is a fine example of how partnerships within the Georgia Tech community can lead to exciting new discoveries. The relationships developed between the museum and the Ivan Allen College of Liberal Arts provide new avenues for the

campus to be aware of the resources provided by IPST and the Robert C. Williams Museum of Papermaking. Throughout the exhibition development process, collaboration was key. At critical points along the way, the College of Architecture and the Price Gilbert Library provided their expertise and support to the project. IPST is proud to have been an integral part in the production of what will be a significant exhibit for the Atlanta community.

On behalf of the museum, the Institute of Paper Science and Technology and Georgia Tech, please enjoy your explorations of *Mapping Place: Africa Beyond Paper*.

— Norman Marsolan
Executive Director,
Institute of Paper Science and Technology
Georgia Institute of Technology



WELCOME

I take great pleasure in welcoming you to *Mapping Place: Africa Beyond Paper*. This exhibition is an ambitious collaboration that the Ivan Allen College of Liberal Arts and the Robert C. Williams Museum of Papermaking at the Georgia Institute of Technology. Kenneth Knoespel and Alexandra Mazalek, professors in the School of Literature, Media, and Communication, and Teri Williams, Museum Director, served as leaders for the project, and successfully formed a network of colleagues both on and off campus to create the amazing museum experience that *Mapping Place* has come to be. We are indeed grateful to all.

This exhibition marks the official opening of *Africa Atlanta 2014*. It is a remarkable city-wide cross-sector collaboration that began in the Ivan Allen College but quite quickly grew to include the Consulate of Belgium in Atlanta as a co-organizer with whom we have worked closely to secure a partnership with the Royal Museum of Central Africa (RMCA) in Tervuren, Belgium. The result of this partnership is an anchor exhibition, *Kongo across the Waters*, curated by the RMCA

and the Harn Museum at the University of Florida. We have organized a circle of over 45 partners across Metropolitan Atlanta and beyond — regionally, nationally, internationally. Through this collaboration we present an array of events around *Kongo across the Waters* in four general categories: arts and culture, business and innovation, education, and global affairs. These events acknowledge, celebrate, and raise for critical re-consideration the complex cultural and economic bonds that were formed historically and continue to exist among Africa, Europe, and the Americas.

Mapping Place: Africa Beyond Paper connects deliberately with *Kongo across the Waters*, as it does with all of the *Africa Atlanta 2014* events. It makes visible the geopolitical context in which these events function with meaning and substance and offers audiences the opportunity to locate ourselves materially and conceptually amid this landscape.

Mapping Place also uses our growing technological expertise in presentation, representation, and interactivity as a lever for exploration, for re-thinking and re-calibrating our relationships to our globally cast histories of artistic productivity, including the art of map-making, as well as our relationships to each other. Most particularly, the exhibition helps us to look again at how and why we map, how we use our signs and symbols, and what the stories are that we tell ourselves and others through our precious objects. *Mapping Place* holds great promise, in helping us to re-invent with a set of 21st century tools and sensibilities our ongoing global connections and to engage in perhaps different, more positive, and more productive ways what it means to be human in the presence of others.

Our expectation is that the hands-on experiences that the exhibition offers will help diverse audiences to see ourselves more boldly in cultural context as beings with the agency to express our hearts, minds, and ethical commitments compellingly and in many, many different ways, all capable of speaking both within our cultural boundaries and beyond.

— Jacqueline Jones Royster
Dean, Ivan Allen College of Liberal Arts,
Georgia Institute of Technology

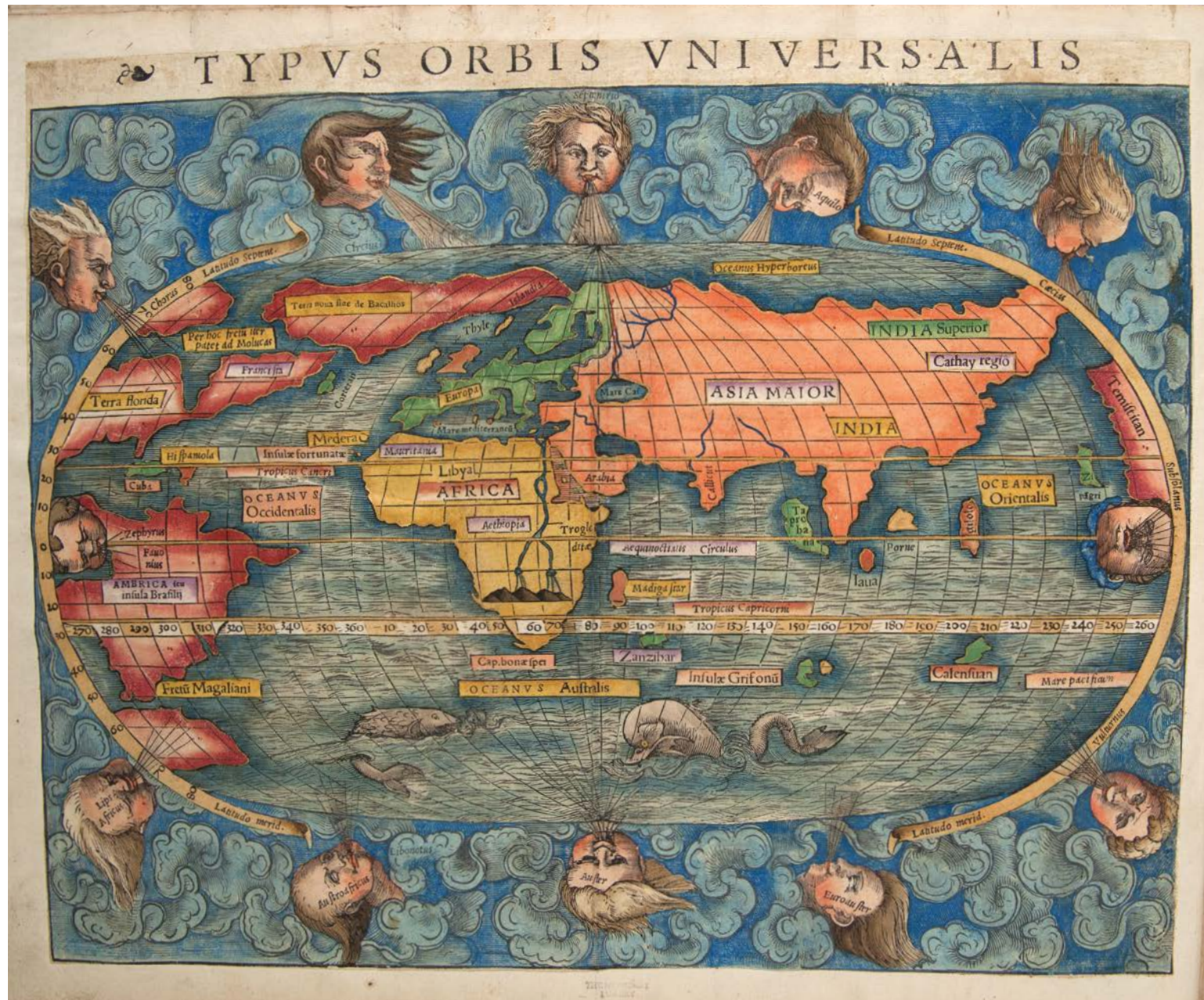


Figure 1: *Typus Orbis Universalis* from Ptolemy's *Geographia* (Sebastian Münster 1540) fol. 2 verso. Courtesy The Newberry Library, Chicago. Call # Baskes G1005, 1540.

MAPPING PLACE: AFRICA BEYOND PAPER

YVES ABRIOUX, KENNETH KNOESPEL, TERI WILLIAMS

Mapping Place: Africa Beyond Paper invites us to explore the relationship between our understanding of geographic space and the stories that often become joined to such space. How are we to think beyond an 'Africa' that often remains a single large continent on which we project stories that guide and influence the way that we think about Africa's future? At a time when many are tempted to turn away from Africa by its portrayal in the media as place of chaos and conflict, it is vital for us to reengage the continent. An article in *Foreign Affairs* challenges serious reappraisal.¹ Images that we bear from the past influence the ways we approach the horizon. So often our ideas of Africa appear through stories of origin, exploration, European colonialism, biodiversity, political transformation, and horrendous brutality. In his book *Of Africa*, Wole Soyinka, the Nigerian writer and 1986 winner of the Nobel Prize for Literature, challenges readers to recognize the constricted ways the West approaches Africa.

*'For many Africa is more a concept than a bounded space, which means, in turn: more 'concepts' than simply one. It is at once part wish fulfillment and part reality, part projection and part historical distillation, part fiction and part memory. It is, of course, generally acknowledged as a warehouse of untapped natural resources. Even as Africa exists as a desire for some, so does it constitute a nightmare from which others pray to be awakened, a piece of history's tapestry whose threads can be unraveled without loss of definition to the rest.'*²

By recognizing at the outset the multiple 'concepts' that shape our approach to Africa, this exhibition invites visitors to ask themselves how they perceive the continent and particularly to think about the relation between their ideas of the space of Africa and the stories that have emerged from understandings of that space. The exhibition also recognizes the precarious place of the museum in approaching Africa. Rather than thinking of the museum as authorial space, *Mapping Place* presents it as a laboratory where visitors may explore the images and objects that they encounter. To this end it serves as a vehicle for looking towards Africa's future. In the words of Soyinka, 'All claims that Africa has been explored are as premature as news of her imminent demise. A truly illuminating exploration of Africa has yet to take place.'³ This exhibition offers a modest step toward an ongoing exploration of Africa.

BACKGROUND

The exhibition was developed in conjunction with Africa Atlanta, a city wide multi-year series of events reinventing the cultural and economic bonds among Africa, Europe, and the Americas, and highlighting Atlanta as a nexus for trans-Atlantic innovation. The exhibition also evolved through projects that seek to ask questions about the 'Future of the Museum.' These first emerged through the study of the architectural development of the High Museum. The projects also engaged the High Museum's extensive enterprise with the Louvre Museum in Paris.⁴ Questions about the role of new media in the museum of the future followed this work and involved the Graduate Program in Digital Media at Georgia Tech.⁵ Work was enhanced by consultation with Constantine Petridis, Curator of Africa Art at the Cleveland Museum of Art, and Carol Thompson, Curator of Africa Art at the High Museum of Art. While the popular success of Louvre-Atlanta celebrated ties between Atlanta and Europe, Africa Atlanta underscores the strategic importance of Atlanta in the ongoing development of Africa. Rather than representing the past cultural heritage of Africa, Africa Atlanta seeks above all to show the vital connections that stand before us today. The small-scale exhibition *Mapping Place* is also intended to prepare for *Kongo Across the Waters*, the major exhibition of Africa Atlanta that will open at the Jimmy Carter Library and Museum in May 2014.

It is not a coincidence that the exhibition is taking place at the Robert C. Williams Museum of Papermaking. European access to Africa relied on paper and an array of inscription technologies used for mapping and gathering data. The museum's rich collections include examples of paper and paper technology from the entire world and attest to the ways in which cultures have used the multiple forms of paper to situate themselves in geographic and cosmological space. The educational resources offered by the museum, located in the Institute of Paper Science and Technology at Georgia Tech, also offer visitors the experience of making paper and reinforce this exhibition's invitation for hands-on experience. Rather than rehearsing expected chronologies, the exhibition invites visitors to ask how maps are used. Instead of asserting the authorial taxonomies often assumed by museums, it emphasizes the importance of individual experience.

The lukasa board featured in the exhibition offers a strong example of the way Luba communities in Central Africa shaped the identity of

their members. The lukasa is a flat, hand-held wooden board created by Luba peoples.⁶ Studded with beads, shells, nails, or other objects in a patterned set of relations the lukasa evokes the geography and clan identity of Luba communities. It is a form of cognitive mapping which allows members of a secretive ‘memory society’, *Mbudye*, to instruct others in ritualistic storytelling, singing histories, and reciting proverbs. [Figures 2 and 3] ‘During Mbudye rituals to induct rulers into office, a lukasa is used to teach sacred lore about culture heroes, clan migrations, and the introduction of sacred rule, and to recite genealogies, king lists, and the episodes in the founding charter. Each lukasa elicits some or all of this information, but the narration varies with the knowledge and oratory skill of the reader.’⁷

The lukasa provided the impetus for the development of the interactive table featured in the exhibition. Preliminary thinking about how a lukasa might serve as a focal point for a project in which maps made by Europeans constituted a core component emerged from the visit of Jacqueline Jones Royster, Dean of the Ivan Allen College, and Teri Williams, the Director of the Robert C. Williams Museum of Papermaking, to the Royal Museum for Central Africa outside Brussels in July 2012. Their conversations with Guido Gryseels, Director of the RMCA and his subsequent visits to Atlanta encouraged all aspects of our work. Further work at the RMCA by Yves Abrioux, University of Paris 8, and Kenneth Knoespel, Director of the Allen Institute at Georgia Tech, in February 2013 shaped the ways the idea of a lukasa

might be used as a metaphor for the development of the digital lukasa described in detail below. Alexandra Mazalek and her PhD student Paul Clifton deserve credit for the design and construction of the interactive table. As work on the project continued, the idea of the lukasa began to take shape as a metaphor for the exhibition.

The tablet certainly evoked an inherent human capacity to relate the arrangement of objects into relationships that carry meaning. However, its very silence within a museum environment also testified to the relative, situated quality of meaning-making. More precisely, the recognition that the functional meaningfulness of lukasa implied — and indeed constrained — the execution of specific interpretative moves could be employed to incite visitors to enquire into the historical

constraints — political and cultural, as much as abstractly cognitive — presupposed and modeled by objects much more familiar to us, such as the maps featured in the exhibition. There doubtless exists a common human propensity to invent or discover relationships between objects and to give voice to the patterns that thus emerge by spinning narratives out of them. Becoming conscious of what remains secret to us in unfamiliar cultures should also help to make us aware of the ways we use objects and spaces to contain our own memories and secrets. The use of the architectural space of a room as a mnemonic vehicle presented in western rhetorical manuals or *ars memoriae* reveals a developed practice that coordinated memory with objects.⁸ Such practice in western culture is reinforced by our own intimate memories of the rooms or



Figure 2: Lukasa Board front view 24.3 cm x 10.6 cm. Object used in the initiation of the Mbudye, a secret society of the Luba people. The bead arrangement tacked to the top surface as well as the carved designs on the back represent clan histories, genealogies, and geographic codes. Origin: Shaba district of Zaire. Georgia Tech gratefully acknowledges the loan of the lukasa from the Royal Museum for Central Africa.



Figure 3: Lukasa Board back view. Georgia Tech gratefully acknowledges the loan of the lukasa from the Royal Museum for Central Africa.

spaces in which we live or have lived in the past. As we view the lukasa, we might think of the ways we encode the spaces in which we live with memories that are known only to ourselves or those closest to us. The cognitive habits associated with mapping provide another way in which spatial orientation reveals space that may be shared at the same time it carries associations that are kept in silence. Maps remind us of the cognitive habits that contribute to the ways we understand ourselves, individually, culturally and indeed ethnically. The connections discovered between maps by visitors to the exhibition brings together ideas of space and narrative.

OBJECTS AND MUSEUMS

We must also be aware that placing objects in a museum involves a complicated process of translation. Although we may think of the ways that objects become categorized within the taxonomies of art history, it is also important to ask how the ‘aesthetic’ evaluation implicit in the selection of particular objects also carries an economic value. The Lukasa presented in this exhibition is far removed from the physical and cultural space from which it came. It challenges us to ask not only how we look at it and use it but how it was used. Frequently, the criteria used to make an aesthetic comment reminds us how utterly removed we are from the multiple settings from which the object came.

Works by the important South African artist William Kentridge (b. 1955) offer orientation to the exhibition by challenging us to ask about the relation between objects and space. They also ask us to encounter the relationship between the aestheticized objects we often see in museums and the multiple spaces that they set in motion. The continuous drawing, redrawing, and overdrawing that appear so frequently in his work challenge the ways that art so often appears separated from the everyday violence and brutality of the European domination of Africa and even more directly the apartheid regime of South Africa that Kentridge himself experienced.

In the graphic work published in *William Kentridge Tapestries* (2008) and shown on the title-wall of the exhibition,⁹ the puppets moving across the atlas ask us to consider the layered process of inscription through which science and technology are shaped, defined, and



Figure 4: William Kentridge, South African (b. 1955). *De peccato original* [2000] (Black paper collage on double text pages, 36 cm x 50 cm). The High Museum of Art. 2013 Gift of Nicole Kekeh's successors, in loving memory of their sister. Georgia Tech gratefully acknowledges the loan of *De peccato originali* from the High Museum of Art, Atlanta.

impressed on Africa. In the graphic work, *De peccato originali* (2000), a shadow procession of figures appears against the backdrop of pages from Bernardo De Rubeis's work *De Peccato Originali, Ejusque Natura, Ac Traduce Et poena: Tractatus Theologicus* (1757).¹⁰ They suggest the evolving frames in a film suddenly stopped for investigation. The interplay between the moving figures and an ecclesiastical treatise on original sin becomes paradoxically, and indeed ironically, a pantomime or shadow play of African movement and enforced change against the seemingly stable, reassuring practice of European moral discourse. While Kentridge's work has come to be recognized as an intimate dismantling of European colonialism in Africa, it shows how all of us seek to negotiate continuous change. Contrary to the tired cliché of an African continent that has failed to engage with the course of history



Figure 5: Title-Page from Ptolemy's *Geographia* (Sebastian Münster 1540) fol. 2 recto. Courtesy The Newberry Library, Chicago. Call # Baskes G1005 1540

and has remained stuck in repetitious pre-historic rituals, research into the Luba culture that produced the Lukasa in the exhibition shows that it is wrong to suppose that ‘while African cultures without writing may have collective memory, they possess no history.’¹¹ If Kentridge eloquently evokes the tribulations of fast-tracked historical ‘progress’, the Lukasa invites us to consider, or indeed imagine, a dynamic of historical time that is all the more forceful in that the very rhythms encoded in the well-worn patterns on its surface will remain unfamiliar to most visitors. Rather than approaching ethnographic objects as categorized pieces for display in isolated museum cases, we have an opportunity to think of them as departure points for asking ourselves how we situate them in our own memories or how we may activate the layered histories of their origin.

EUROPEAN CARTOGRAPHY AND THE REPRESENTATION OF AFRICA

The maps included in the exhibition remind viewers primarily all of the ways in which the geographic image or idea of Africa has been shaped by Western cartography over the past five hundred years.¹³ Rather than being mounted in chronological order, the maps are presented on ‘map walls’ so that each viewer may imagine or construct relationships between them — i.e. start telling stories by way of imagined relationships between the maps. The rearrangement also serves as a reminder of the ways that an individual map may be isolated as an aesthetic object rather than viewed in relationship to other maps. Particularly in regard to Africa, the maps remind us that mapping is a continually evolving practice and that any one map provides only limited access to space. A single maps leads to other maps.

The large continental map of Africa stands as a reminder that we are looking at European maps of Africa that convey a long history of European domination. At the same time as each map reveals details about the perception of Africa it also conceals the space in which Africa’s peoples live. Again and again, it is crucial that we understand that the maps tell us more about Europe that they do about Africa. The simultaneous way that maps both reveal and conceal is present in each of the five maps clusters: 1) Ptolemaic maps; 2) Dutch maps; 3) French maps; 4) British maps; 5) Maps of the Congo.

PTOLEMAIC MAPS OF AFRICA

The hand-colored Ptolemaic maps are among the earliest European maps of Africa. Ptolemy (ca. AD 90–ca. AD 168), a cosmologist and cartographer from late antiquity, provided the first comprehensive cartographic representations of the known world. Although the original maps have not survived, the discovery of his *Geographia* in the Middle Ages, with its inclusion of place names and markings for longitude and latitude, allowed scholars to duplicate his maps. [Figures 6 and 7]

Through his work, we are reminded that geography was hardly absent in Greco-Roman antiquity but was a highly sought-after science. The Ptolemaic renderings of the known world began to be rediscovered in the fifteenth century and provided important examples of the representation of known spaces in the world. The early geometric grid provided by Ptolemy reminds us that he was interested in presenting space on the earth understood as a globe. The four maps of Africa displayed demonstrate how Middle Eastern antiquity divided Africa into parts.

The vivid presentation of the river systems — albeit in many cases imagined — show how concerned early mapmakers were to represent trade connections. Only the fourth map extends beneath the equator to show the mythological ‘Mountains of the Moon’ (*Montes lunae*) and the two lakes that were imagined to be the twin sources of the Nile River. The foundering ship depicted off the northern coast of Africa in Tabula II reminds us of the importance of trade with Africa and of the dangers that accompanied movement across the Mediterranean.

It is quite possible that the ship also became a sign denoting the turbulent waters just off the African coast that continue to this day to be tragically encountered by African immigrants seeking to enter Europe via Italy. The maps displayed are from a 1540 Basel edition of the *Geographia* by Sebastian Münster. Unlike other editions in which maps were folded, this edition presents them ‘Broadside.’¹⁴



Figure 6: Aphricae Tabula II from Ptolemy's *Geographia* (Sebastian Münster 1540) fol. 33 verso. Courtesy The Newberry Library, Chicago. Call # Baskes G1005, 1540.



Figure 7: Tabula Africae IIII from Ptolemy's *Geographia* (Sebastian Münster 1540) fol. 35 verso. Courtesy The Newberry Library, Chicago. Call # Baskes G1005, 1540.

17TH CENTURY EUROPEAN MAPS OF AFRICA

The Dutch maps published in the seventeenth century testify to the growing importance of trade with Africa. The hand-colored map of the African continent featured in the display case comes from the Blaeu *Atlas maior*, which is one of the rarest volumes in the Price Gilbert Library of Georgia Tech.¹⁵ Joan Blaeu (1596–1673), one of the most successful map makers in Holland in the seventeenth century, served as the chief cartographer of the East India Company. The borders of his map constitute a seventeenth-century taxonomy of how Europeans coded space by cross-referencing place and dress.. The townscapes presented across the top border show trading and refueling ports visited by European shipping. The figures of couples presented on the side borders portray the dress of the inhabitants of different regions of Africa as understood from a distinctly European perspective. [Figure 9] Blaeu's map of the continent is exhibited together with an image showing the



other side of the Atlantic — a cartouche from his map of the region of Pernambuco in Brazil. [Figure 8] The image of African slaves in this cartouche illustrates the importance of Africa in the colonization of the New World and provides an example of the social structure generated by commerce of slavery. A European overseer stands on the balcony of the house looking down on the African slaves who are carrying a European woman. On the right side of the painting is a sugar mill in operation. The image is one of the earliest representations of machines in the New World.

The rapid expansion of global commerce and a growing investment in the slave trade led to the production of many maps of Africa. Compared with the early maps of Ptolemy, the maps by Frederik de Wit (1629/30–1706) and Johann Baptist Homann (1664–1724) [Figures 10 and 11] mark a growing interest in the interior of the continent. Each of these remarkable maps from the collection of Raphael E. Bras¹⁶

Figure 8: Joan Blaeu (1596–1673) *Praefecturae Paranambuca pars borealis une cum praefectura de Itamarca*, Vol. XI map 18. The cartouche or hand-colored illustration shows a sugar mill in operation during the time of Dutch control of Pernambuco. A European overseer waits on the balcony for the arrival of figure, possibly a woman, being carried in a sling chair by African slaves. The representation of the sugar mill continues in Vol. XI, map 22. Along the coast, the map depicts the first naval battle between the Dutch and the Spanish fleets on January 12, 1640. The cartouche is a version of a drawing by Frans Post (1612–1680), one of the first artists to paint landscapes of America. Post lived in Brazil from 1637–1644 where he painted numerous landscapes.



Figure 9: Joan Blaeu (1596–1673) *Africae nova description* from *Grooten atlas, oft werelt-beschryving, in welck 't aerdryck, de zee, en hemel, wort vertoont en beschreven*. Vol IX map 24. Amsterdam, 1664. We are pleased to acknowledge the loan of the volume from the Blaeu *Atlas maior* from the Price Gilbert Library, Georgia Institute of Technology.



Figure 10: *Totius Africae Accuratissima Tabula*, Frederick de Wit (Amsterdam 1680) From the cartographic collection of Rafael Bras, Provost, Georgia Institute of Technology.



Figure 11: *Accuratissima Totius Africae in Lucem Producta*, 1702 Nürnberg: Jacob Sandrart; engraved by Johann Baptist Homann, Sr; Frederick de Wit. From the cartographic collection of Rafael Bras, Provost, Georgia Institute of Technology.

demonstrates the expanding interest of individuals in the seventeenth century to possess maps that they could hang on walls in order to demonstrate their knowledge of the expanding world in which they lived.

The large wall map (1695) *L'Afrique, ou tout les points principaux sont placez sur les observations de Messieurs de l'Academie des Siences* [sic], was printed by the French Academy of Sciences under the direction of Nicolas de Fer (1646-1720) and other cartographers. This large map was printed on cloth and hand-colored for the Dauphin, or heir to the French throne. This sumptuous map is striking both for its size and for its detail.

The inset texts that appear throughout the map are hybrid examples of chorography, or the practice of including explanatory narratives in maps. Their hybridity comes from their detail. In effect, they

show that the large map is not only a representation of space but that it simultaneously serves as an encyclopedia. The expansive quality of the map appears above all in the hand-painted vignettes on the borders. [Figures 12 and 13] A regal element to the illustrations, depicting social structure and activity, shows that early European contacts with Africa recognized the existence of states akin to those that were to be found back home. In the 15th century indeed, Portugal had exchanged ambassadors with the Kingdom of the Kongo. It was only with the onset of the slave trade that destroyed the complex political structures of the continent, that Africa became systematically associated with supposedly primitive, purely tribal societies devoid of history. Africa was deliberately removed from history.



Figure 12: Border detail from French wall map, *L'Afrique: ou tous les points principaux...* (Paris 1695) Courtesy The Newberry Library, Chicago. Call # Novacco 8F 10.



Figure 13: Border detail from French wall map, *L'Afrique: ou tous les points principaux...* (Paris 1695) Courtesy The Newberry Library, Chicago. Call # Novacco 8F 10.



Figure 14: French wall map, *L'Afrique, ou tout les points principaux sont placez sur les observations de Messieurs de l'Academie des Siences* [sic], Nicolas de Fer et al. (Paris 1695). Courtesy The Newberry Library, Chicago. Call # Novacco 8F 10.

THE 1885 EUROPEAN GEOPOLITICAL DIVISION OF AFRICA

Examples from Black's Atlas reveal the representation of Africa before and after the European partition of the continent, which happened during the Berlin Conference of 1884–1885. [Figures 15 and 16] The Berlin Conference initiated by the German chancellor Otto von Bismarck brought major European countries together to negotiate over what was perceived by European leaders as hodgepodge of jurisdiction relating to European colonial enterprise. France, Germany, Great Britain,

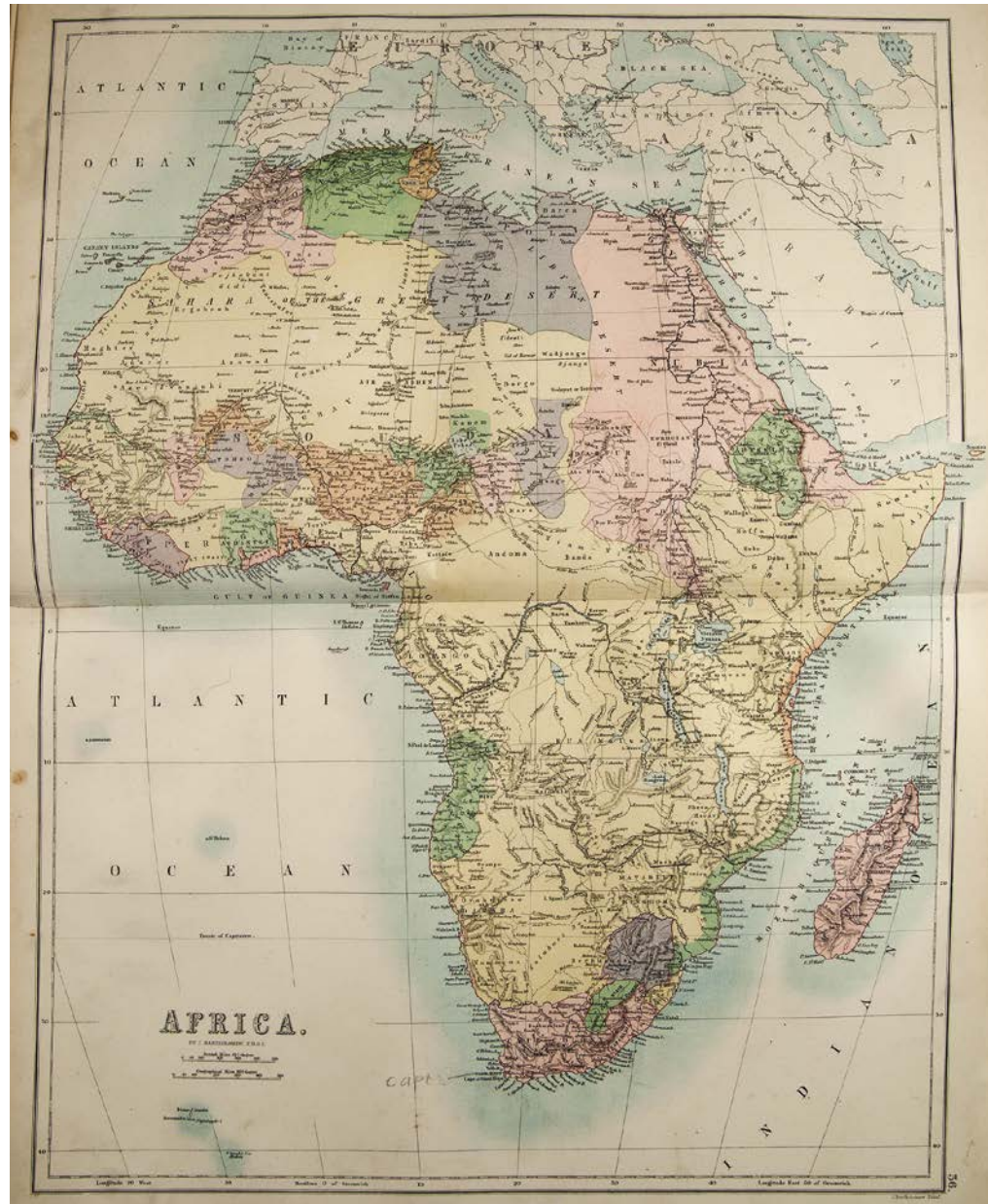


Figure 15: Image of the African continent before the Berlin Conference of 1885 from *Black's General Atlas of the World embracing the latest discoveries, new boundaries...New and rev. ed.* (Edinburgh: A. and C. Black, 1882) fol. 36. Courtesy The Newberry Library, Chicago. Call # Baskes G10-9.

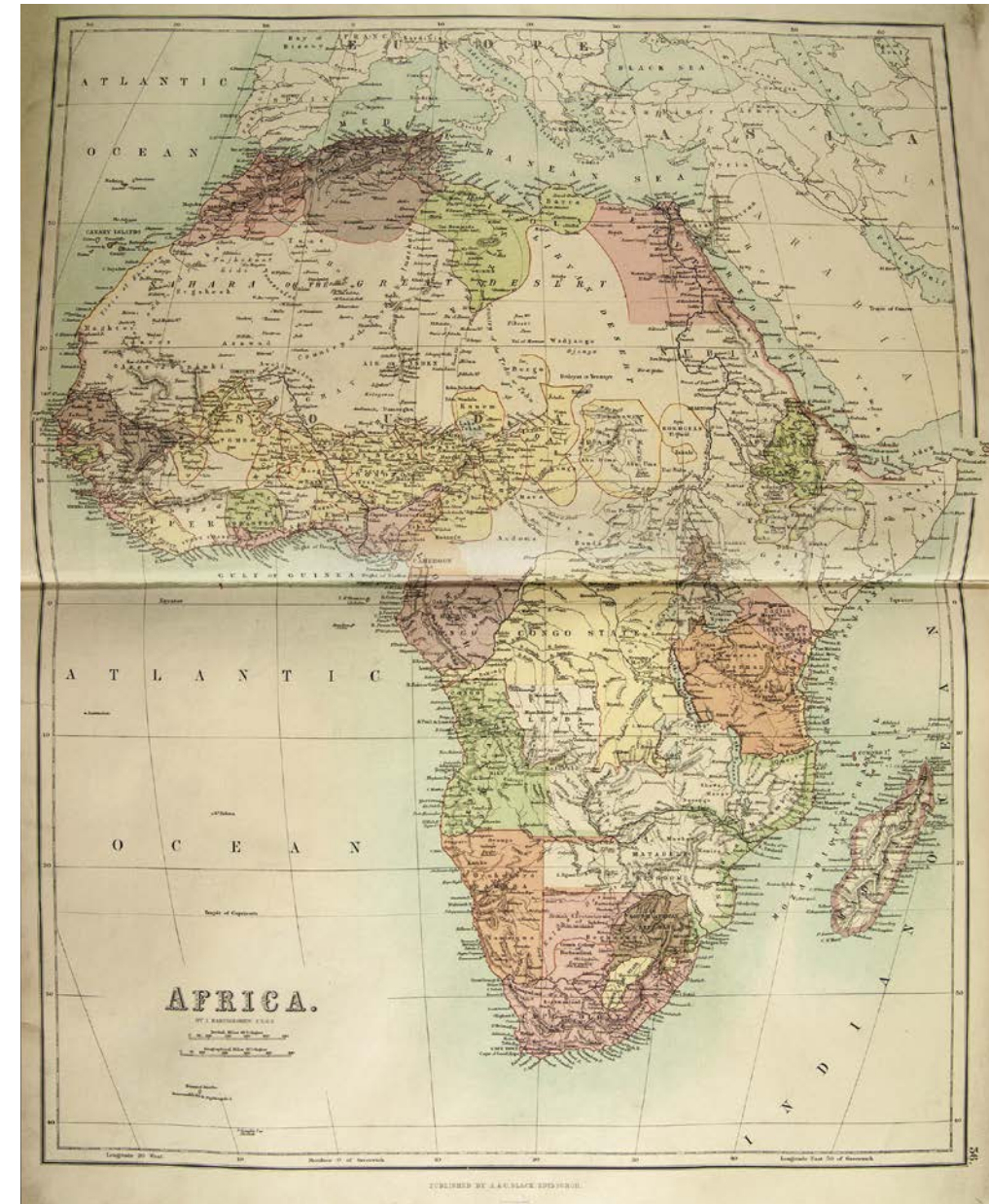


Figure 16: Image of the African continent showing the European division of African territories after the 1885 Berlin Conference. From *Black's General Atlas of the World embracing the latest discoveries, new boundaries, and other changes.* (Edinburgh: A. and C. Black, 1888) fol. 36. Courtesy The Newberry Library, Chicago. Call # Baskes G-10.1.

and Portugal, which controlled most of colonial Africa at the time, were the major players in the conference. A primary objective was to agree that the Congo and Niger River should remain neutral and available for trade with all nations. The conference thus became the scene for European control over resources in the interior of Africa. The divisions printed on the 1888 map are a stark reminder of European colonialism. Their legacy continues to haunt contemporary political divisions throughout the continent.

20TH-CENTURY MAPS OF THE CONGO

The twentieth-century maps of the Congo bear witness to a rapidly expanding colonial infrastructure.¹⁷ The canvas wall map of French Equatorial Africa (1926) by A Meunier, the ‘Géographe au Ministère des Colonies,’ inscribes local detail necessary for territorial administration. The more recent map (1958) displaying airline routes serves political administration, economic development, and tourism [Figure 19]. The map is particularly poignant when we recall that it belongs to the period when Patrice Lumumba was active in the Congolese Liberation Movement and Dag Hammarskjöld, the then Secretary General of the United Nations, was promoting a peaceful solution to the struggle to create an independent Katanga. Lumumba was executed in Elizabethville (now Lubumbashi) on 17 January 1961. Hammarskjöld died in circumstances which remain unclear to this day, in a plane crash near Ndola, Northern Rhodesia (now Zambia) on 18 September 1962.

The map labeled *République du Congo/Carte Economique* (c. 1969) provides an inventory of natural resources available in the Republic of the Congo. [Figure 20] It is a visual presentation of multiple layers of data gathered for the use of a managing authority. The handwritten annotation ‘V-52-D’ shows that it is part of an even larger collection of maps. We come even closer to an experience of the Congo through the maps used by Herbert Weiss during his diplomatic work since the early 1960’s. The Mobil Road Map of the Congo [*Congo Belge/Carte Routière*, 1959] and the Belgian ‘Triptik’ [*Le Congo Belge et le Ruanda-Urundi en Itinéraires*] provide a personal sense of space. The names of Africa ethnic groups added by Herbert Weiss in ballpoint pen in the 1960’s (AZANDE, MANBETU, BAKUMU, WANANTE, BAMBOLE, BANGANTOLU, BABUE, BANAMITUKU) register the ways that maps have always invited interventions that correct or personalize information that may initially appear fixed. [Figure 18] The maps ask us to think of the continent of Africa on the scale of the road maps published to provide easy communication between villages and cities. These maps too are a European legacy of colonial infrastructure.



Figure 17: Afrique équatoriale française, A. Meunier (1926). Map glued on muslin. Georgia Tech is pleased to recognize the loan of the map from the collection of Mr. Herbert Weiss.

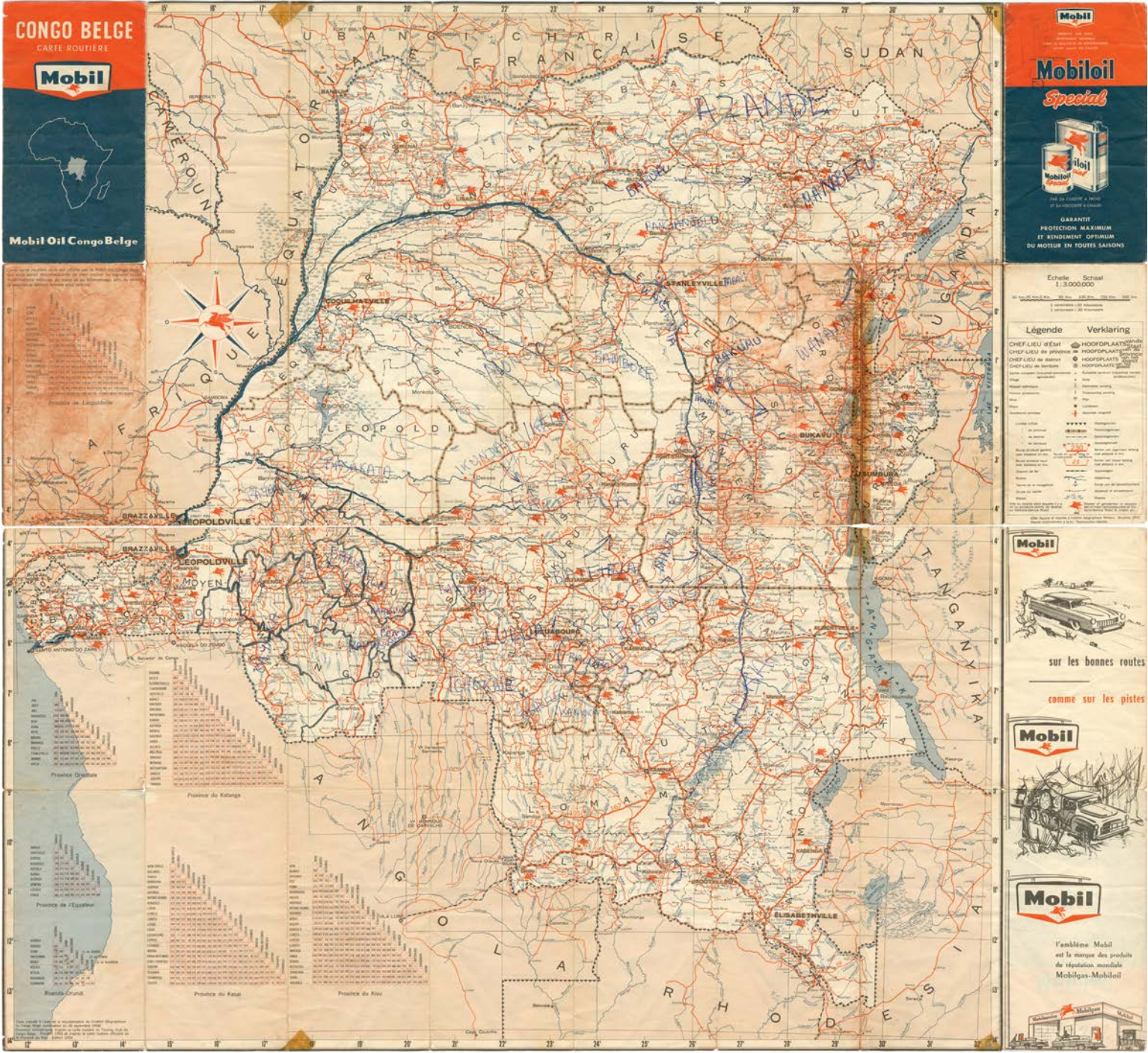


Figure 18: Congo belge. Carte routière Mobil (ca. 1958) with addition of names of Congo peoples in ballpoint pen by Herbert Weiss during his work in the Congo during the late 1950’s and early 1960’s. Georgia Tech is pleased to recognize the loan from the collection of Mr. Herbert Weiss.

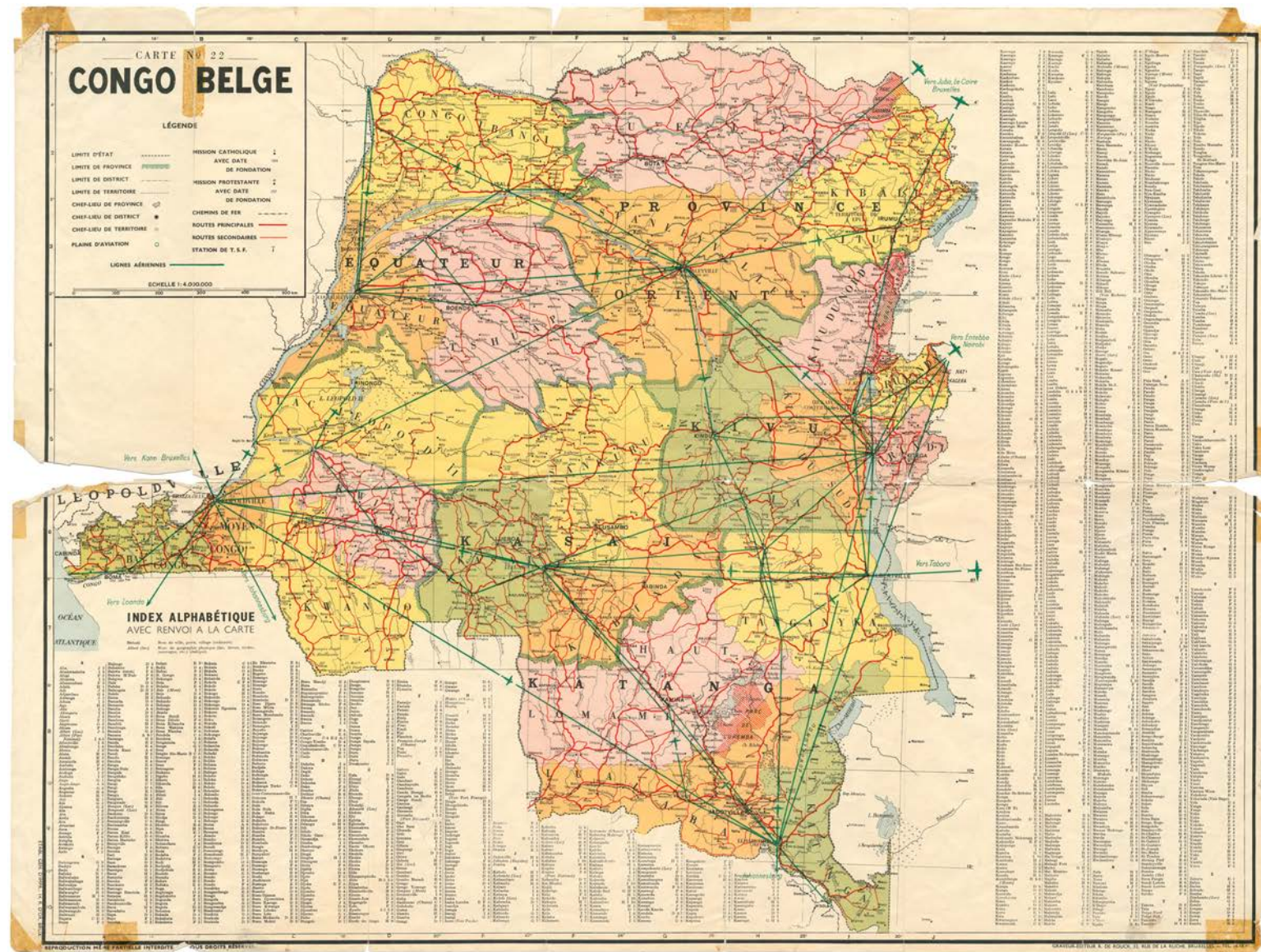


Figure 19: Carte No. 22: Congo belge (Air route map ca. 1958) Georgia Tech is pleased to recognize the loan of the map from the collection of Mr. Herbert Weiss.

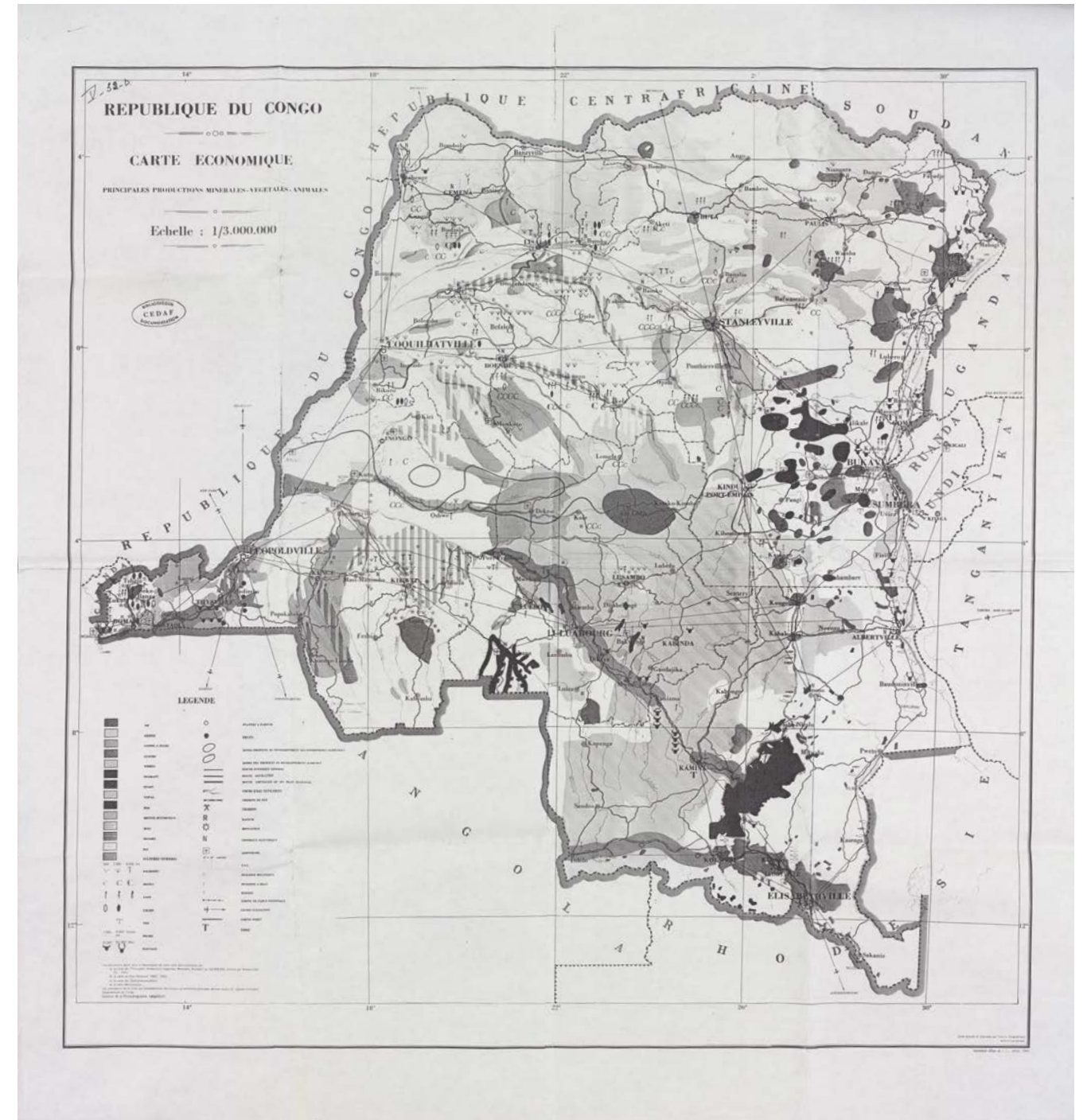


Figure 20: République du Congo. Carte économique: principales productions minérales, végétales, animales (1972)

EXPLORING THE LUKASA BOARD

The digital lukasa table created for the exhibition has its origin in Luba peoples' lukasa board. However, it is important to understand that it in no way claims to simulate an actual lukasa. As suggested above, the memorial function of the lukasa served as a means for the oral transmission of narrative and other forms of traditional wisdom — cosmological, genealogical, political, etc. The digital table emulates the lukasa as it invites visitors to use the table to tell a story by creating a particular configuration of counters in space which is then projected on the wall. [Figure 22] The tokens represent a woman, man, girl, boy, pet, house, and city. Visitors arrange them as a shorthand for a story of their own invention that they may also orally share with others who are near them. The interactive table may thus help users think about ways that memory can be stored in objects whose significance will only be known to a particular user or possessor unless the meaning is shared with others. However, there remains a strong difference between the Luba lukasa and the digital table.

While the representational implications of the beads, shells and sundry lines, forms and incrustations on a lukasa may be organized through motifs that continue to be the subject of research, their meaning will remain unknown to the great majority of viewers. The most thorough anthropological-art historical research of Luba memory systems has been done by Mary Nooter Roberts and Allen Roberts, who have followed a reading of a specific lukasa by Luba court officials in the village of Makwidi. Although each lukasa may be different, their arrangement of objects and carvings shape a memory landscape of lineage involving foundational myth and current clan authority. Just as the configuration of beads is read by the adept, the carvings on the bottom of the lukasa are related to clan identity. The carefully carved back of the lukasa in the exhibition participates in the overall evocation of memory. Furthermore, rather than being an isolated medium for identity, the lukasa participates in a spectrum of identity that includes body-ornamentation and scarification.

The digital lukasa in the exhibition transforms the traditional tablet into a sort of generic family album, which visitors may flesh out in their own way by identifying the counters with various biographical and/or fictional particulars. It is therefore useful to compare the Luba lukasa with an album of family photos. While anyone may be able to identify a photo album as, precisely, a photo album and to date it on the basis of photographic technology or the recognizable individuals and objects represented in its photographs, it is above all a member of the family or 'clan' who will be able to fully identify these contents and retell the stories implicit in the photographs. Luba mnemonics today sometimes incorporate sticklike figures with generic qualities comparable to the digital lukasa's counters. However, this is very much a recent development, doubtless impelled by Western culture. A traditional lukasa contains nothing resembling even the sketchiest of mimetic representations. Its multiple meanings may call up a variety of socio-cultural functions related to the living and the dead, political and genealogical figures, significant sites, 'spiritual' entities, etc. Certainly, these are geolocated to the extent that the structural space of the board may schematically correspond to the local environment and to the cosmology within which this is inscribed. Such semiotic motivation is nevertheless a far cry from the photographic representations that stimulate the spinning of personal or anecdotal stories from a family album.

In *On Photography*, Susan Sontag points out that families construct a portrait-chronicle of themselves through photographs preserved in albums. Adding that "it hardly matters what activities are photographed so long as photographs get taken and are cherished," she comments ironically that photography thus became "a rite of family life" at the very historical moment when the extended family was disappearing and the traditional continuity of family life was under threat. Is there not an uncanny measure of historical coincidence here with the appearance of a sticklike representational content in Luba lukasa? Be that as it may, we might observe that it is only our familiarity with its typically idiosyncratic and unspoken conventions that keeps the powerful, if informal,

ritualistic function of photography from our sight.¹⁸ Do the stories generated by photo albums, which we tend to regard as spontaneous celebrations of our personal histories, not in fact testify to the constrained construction of 'family' in what remains a specific culture, even if it is our own? If this is the case, the silence of a lukasa board may have something to teach us concerning the family photograph album and suchlike cultural artifacts. Can we learn to read the familiar through the unfamiliar, rather than the other way round? It is perhaps easier to accomplish such a move with reference to things such as maps, that exist in the public sphere and have more obvious ideological and historical functions. However, probably unbeknown to most visitors, including those who activate it, the digital lukasa functions as a generator of ethnographical materials, in the shape of the various 'tactile' stories that are spun on its surface and of any other testimonies of their engagement with it that visitors may produce — primarily oral, scriptural and pictorial in nature. The tactile narratives constructed by visitors will be preserved in the shape of the videos generated by the digital board. Should these be considered only as mementos of a personal hands-on experience of the exhibition, to be shared on one's cell-phone or iPad with friends and family, in an updated version of the rituals created around the photo album? Or do they not rather suggest the possibility of a truly productive engagement of visitors with the artifacts in a museum or exhibition, considered as institutions that are capable of functioning as cultural laboratories, in the strong, productive sense of the word?



Figure 21: Installation of the Interactive Table at the Robert C. Williams Museum of Papermaking, January 2014

LABORATORY MUSEUM

Even a modest exhibition carries the question of the future of the museum. We often like to think of the museum as a place of comfort or safety where we will encounter images and objects fixed on walls or placed in museum cases in ways that are engaging and edifying. Since the idea of the museum connotes an idea of the past, we easily make assumptions that whatever we see will fit into chronological taxonomies prepared for by education and research. Do we not think of our very capacity to carry with us a concept of historical periods (Pre-Historic, Primitive, Antiquity (Greece and Rome), Middle Ages, Renaissance, Baroque, Eighteenth Century, Romantic Period, Modern) as the very sign of education? We expect that the museum will respond to the categories that we bring with us. However, the question of what exactly it is that we bring is sharpened in significant ways when we approach cultures from outside our own Euro-American setting. Are we even capable of approaching Africa without forcing it into categories shaped by our own heritage? Can the museum world avoid the risk of artificially imposing restrictive criteria on non-Western and/or non-modern artifacts when, in integrating these into its collections, it applies conventions of documentation and traceability that are foreign to the objects' own socio-cultural identity? The immediate answer is that, as individuals or institutions, we cannot readily escape our experience. A more richly complex answer recognizes that at the beginning of the 21st century we are participating in a transformation of the way we conceive of cultures.¹⁹

The transformations that concern us come from the mesh of networks in which we live. The multiple layers inherent in the natural and human science that earlier centuries clarified cannot be isolated from each other but must be seen as passing through each other continually as intersecting planes. Recent work in cultural anthropology challenges us to recognize that we do not live in a world with a single idea of truth but in settings where there are multiple 'modes of existence.' The museum, and perhaps even more the ethnographic museum, can serve as a laboratory for encountering and negotiating between regimes of truth shaped by different worlds of experience.

Mapping Place invites us into a space where each visitor may negotiate between its images and objects and their own world of experience. Rather than assuming that museums irradiate a silent authority where isolated objects are presented in simple chronological settings, it calls on visitors to approach all the objects as if they were being invited to arrange them on their own memory board — and, in so doing, to consider more particularly what memory implies as a culturally constrained practice and not simply a generic human capacity. In a modest way, the exhibition thus serves to remind us of the ideological frames enacted in the museum.

At a time when an expanding network of world museums is developing mutually beneficial marketing strategies, they are also asking how they may serve as departure points for explorations that extend beyond art history.²⁰ It is especially important that our approach to African objects take place in settings where the authorial presence of western ideas of art history is clearly acknowledged. Museums serve as a means for interaction that extends beyond an allegiance to the versions of western art history so often based on taxonomic chronology.²¹ Digital interventions such as the digital memory table in this exhibition provide a small way of asserting a consideration of sensibility that extends beyond both eighteenth-century aesthetics and the sphere of techno-scientific efficiency. They seek to initiate a move towards the institution of a truly heterotopic museum that brings together the near and the far.²²

As part of the broader series of events that comprise *Africa Atlanta 2014*, the exhibition may be viewed as a step toward *Kongo Across the Waters*, the large exhibition that will be at the Jimmy Carter Library and Museum in Atlanta, May 17-August 15, 2014.²³ By inviting visitors to ask themselves how maps and stories have shaped their approach to Africa, *Mapping Place* serves as a way to ask not simply about Africa's past or conflicted present but even more about its importance in shaping the twenty-first century.



Figure 22: The Interactive Table at the Robert C. Williams Museum of Papermaking



Figure 23: Luba Lukasa Board (detail). Georgia Tech gratefully acknowledges the loan of the lukasa from the Royal Museum for Central Africa.

NOTES

- 1 Shantayanan Devarajan and Wolfgang Fengler, ‘Africa’s Economic Boom: Why the Pessimists and Optimists are Both Right,’ *Foreign Affairs*, Vol. 92:3, 68–81. ‘Despite the global economic crisis, the region’s GDP has grown rapidly, averaging almost five percent a year since 2000, and is expected to rise even faster in the years ahead. Many countries, not just the resource-rich ones, have participated in the boom: indeed, 20 states in sub-Saharan Africa that do not produce oil managed average GDP growth rates of four percent or higher between 1998 and 2008. Meanwhile, the region has begun attracting serious amounts of private capital; at \$50 billion a year, such flows now exceed foreign aid.’ 68
- 2 References are to Wole Soyinka, *Of Africa* (New Haven: Yale Univ. Press, 2012)
- 3 Ibid, 3.
- 4 ‘The Future of the Museum Project’ was initiated through a series of lectures organized by K. Knoespel at the High Museum offered by international scholars and artists in Spring 2007: Barbara Stafford, Jane Prophet, and Yves Abrioux. Lectures were coordinated with project studios in the Graduate Program for Digital Media at Georgia Tech. Professor Yves Abrioux, University of Paris 8, was a visiting professor at Georgia Tech in the fall of 2006; Barbara Stafford was a Distinguished Visiting Faculty member at Georgia Tech between 2009–2012. The ‘Future of the Museum Project’ also included the Georgia Tech participation of Professor Alexandra Mazalek and the SynLab as well as Professor John Peponis (College of Architecture) and Pegah Zamani whose dissertation in the College of Architecture [‘Views across Boundaries and Groupings across Categories: The Morphology of Display in the Galleries of the High Museum of Art 1983–2003,’ (2008)] focused on evolving museum architecture. Work on ‘The Future of the Museum’ has led to presentations in Algeria, France, and Sweden.
- 5 We are pleased to recognize the work of Paul Clifton, SynLab Coordinator, and all the graduate students who have been crucial for the development of the exhibition: Jean Ho Chu, Yuan Yuan Erin Lin, Lauren Schaffer, Kristjen Kjems. We are also pleased to acknowledge the support we have received from Professor Michael Nitsche, Director of the Graduate Program in Digital Media at Georgia Tech.
- 6 Our discussion of the lukasa is indebted to Mary Nooter Roberts & Allen F. Roberts, *Luba* (Milan: 5 Continents Editions, 2007); see too Mary Nooter Roberts and Allen F. Roberts, *Memory: Luba Art and the Making of History* (New York: The Museum for African Art, 1996). We also want to recognize the counsel of Lubangi Muniania, who has been instrumental in developing the educational programs of the Museum for African Arts (now renamed the New Africa Center), New York City.
- 7 Roberts and Roberts, *Memory: Luba Art and the Making of History*, 38.
- 8 As Frances Yates and others have demonstrated, the ‘art of memory’ developed in Europe often developed in ritualistic settings in which privileged information was revealed to initiates through spatial prompts. See Frances Yates, *The Art of Memory* (Chicago: Univ. of Chicago Press, 1966); see too Mary Carruthers, *The Book of Memory* (Cambridge: Cambridge Univ. Press, 1990). Roberts and Roberts underline the analogy between the Luba ‘architecture of memory’ and European memory ‘theaters’ (*Memory: Luba Art and the Making of History*, 38).
- 9 William Kentridge *Tapestries*, ed. Carlos Basualdo with Essays by Gabriele Guercio, Okwui Enwezor, and Ivan Vladislavić (New Haven: Philadelphia Museum of Art in association with Yale Univ. Press, 2008).
- 10 ‘William Kentridge’s *De peccato originali* (*Shadow Procession*), 2000; Chine Collé, torn black canson paper; 9 ¼ x 14 ½ inches; High Museum of Art, Atlanta; Gift of Nicole Kekeh’s successors, in loving memory of their sister, 2013.118.
- 11 The European competition for colonial control is well documented in Margaret MacMillan’s *The War that Ended Peace: The Road to 1914* (New York: Penguin Random House, 2013). ‘The colonial displays at the Exposition hinted too at the extraordinary power that a very small part of the world had amassed in the course of the previous centuries. Europe’s countries dominated much of the earth’s surface whether through their formal empires or by informal control of much of the rest through their economic, financial and technological strength.’ 63–64; ‘But 1900 was not a good year. The British had gone blithely into a war in South Africa the year before against two much smaller Afrikaner republics: the Orange Free State and the Transvaal. The odds — the whole British Empire against two tiny states — should have made the outcome a foregone conclusion, but the British had in fact done very badly in what was called at the time the Boer War.’ 78.
- 12 Roberts and Roberts, *Memory: Luba Art and the Making of History*, 17. When, on an official visit to Dakar (Senegal) in the summer of 2007, the newly elected French president Nicolas Sarkozy once more trotted out the old accusation that ‘African Man’ (sic.) had not sufficiently ‘entered history’, he was roundly condemned for his ignorance.
- 13 Chinese maps from the 14th century have also been identified but are beyond the scope of the exhibition. The earliest known Chinese map that represents Africa was shown in Cape Town, South Africa. The map, produced in silk in 1389 (CE), was from the Da Ming Hun Yi Tu or the Amalgamated Map of the Great Ming Empire. See Alastair Leithead, BBC (12 November, 2002)
- 14 The maps presented are digital reproductions from the Newberry Library. We gratefully acknowledge the Newberry’s permission to include the maps in the exhibition and in this catalog. The copy of the *Geographia* (Vault Baskes G 1005 1540) was a gift to the Newberry from Roger S. Baskes.
- 15 We gratefully acknowledge The Price Gilbert Library and Catherine Murray-Rust, Dean of the Library, for the loan of the Africa Volume from Georgia Tech’s rare Atlas Major. Although the *Blaeu Atlas* was purchased by Dorothy Crosland, Director of the Library in the 1950’s for the Price Gilbert Memorial Library, it was first shown in 1987 in an exhibition, ‘Framing the Foundations,’ organized in conjunction with the celebration of Georgia Tech Centennial.
- 16 It is a pleasure to acknowledge the loan of the De Wit and Homanns maps of Africa from the cartographic collection of Rafael L. Bras, Provost of Georgia Tech.
- 17 We are pleased to acknowledge the generous loan of maps from the personal collection of Herbert Weiss, Washington D.C. Mr. Weiss served as a U.S. State Department officer in the Congo beginning in the late 1950’s. His experience and counsel have enriched this exhibition.
- 18 Susan Sontag, *On Photography* (New York: Farrar, Straus and Giroux, 1977), 8–9.
- 19 See Carol Thompson, ‘Slaves to Sculpture: A Response to Patricia Penn Hilden,’ *The Drama Review* 44:3 (Fall 2000), 37–50.
- 20 For discussion of the evolving museum see: *New Museum Theory and Practice: An Introduction* ed. Janet Marstine (Oxford: Blackwell Publishing, 2006) *Theorizing Digital Cultural Heritage: A Critical Discourse* ed. Fiona Cameron and Sarah Kenderdine (Cambridge: MIT, 2007); *Museum Philosophy for the Twenty-First Century* ed. Hugh H. Genoways (New York: Rowman & Littlefield Publishers, Inc., 2007).
- 21 The digital lukasa table developed from work with Professor Alexandra Mazalek and the SynLab of Georgia Tech’s Graduate Program in Digital Media at Georgia Tech. An earlier project developed with Yves Abrioux at Paris 8 invited participants to ‘curate their own gallery’ by choosing from a selection of digital reproductions of drawings, paintings and other artifacts exhibited in the first Louvre-Atlanta exhibition at the High Museum (2006–2007). Related projects have involved building a digital installation, *En transit* that uses Walter Ruttmann’s *Berlin: die Sinfonie der Großstadt* as a scrim through which to explore the space of cities. (with Sara Hornbacher and Hartmut Koenitz). *En transit*, was exhibited at ,Patterns of Perception/Paris/14–30 November, 2007, in conjunction with the colloquium Architecture and the Technological Unconscious, sponsored jointly by the École Nationale Supérieure d’Architecture de Paris La Villette and the College of Architecture, Georgia Institute of Technology.
- 22 See ‘Un musée à venir: What did we learn from the Louvre-Atlanta Exhibitions?’ delivered at ‘Heritage in the Age of Digital Humanities: How should training practices evolve?’ 21–23 June 2012, French National Archives/Université Paris 8 (forthcoming).
- 23 *Kongo Across the Waters*, ed. Susan Cooksey, Robin Poynor, and Hein Vanhee (Gainesville: University of Florida Press, [Published in collaboration with the Royal Museum for Central Africa] 2013)

TANGIBLE AND EMBODIED MEMORY MAPS: DESIGN OF A LUKASA-INSPIRED INTERACTIVE EXHIBIT

ALEXANDRA MAZALEK & PAUL CLIFTON

As we reflected on the commonalities and differences between the Lukasa and our own experiences with designing tangible narratives on digital tabletop, we realized we would not be able to convey the stories of the Luba peoples in our design, the way some tangible narratives “contain” prerecorded stories that are conveyed through audiovisual media. There appears to be little easily accessible Western documentation of the wealth of stories captured by Lukasa boards and the only textual description of a Lukasa “reading” we were able to find was from *Memory: Luba Art and the Making of History* by Mary Nooter Roberts and Allen F. Roberts. As a result, we began to design around the idea of the Lukasa as a performative mnemonic device. Based on a conversation with Lubangi Muniania, an art educator specializing in the visual and performing arts of Africa who, as a teenager, was initiated into the Luba art and culture, we realized that in order to effectively present this concept in a short amount of time, we needed to focus on a single component of the use of the Lukasa in Luba culture: genealogical records. Genealogy provides a universally accessible framework for storytelling and enables visitors to draw their own conclusions about the assignment of meaning to arbitrary elements of a form.

The piece uses a digital tabletop as large scale version of a Lukasa, on which visitors’ stories are created through a combination of tangible object and multi-touch interaction. As each visitor constructs their story, small animations representing their story’s components begin to play on an adjacent wall. The piece is intended to be experienced in small groups, where visitors complete the interactive session by sharing their stories with one another around the table, accompanied by the playback of the animated scene on the wall. As each group completes their session, their tabletop “Lukasa” is captured as a digital image and stored in an archive of every visitor’s creations. These conceptual maps, which represent the stories shared by visitors, are displayed in a slideshow on screens at the back of the exhibition space. As with the Lukasa, without the original creators to give meaning to these maps by narrating the stories they represent, the recorded images remain little more than abstract symbols to subsequent viewers.



Figure 1: The interactive table is installed in the center of the gallery with animations projected across the corner of two nearby walls.

LUBA MEMORY MAPPING

In developing the design for the interactive component of the Mapping Place exhibition, we investigated the way certain artifacts, particularly from the Luba peoples of Central Africa, capture narratives of the past, serving as conceptual maps that spatially encode elements of place, genealogy, political relations, and more. Representing both shared and personal histories, these artifacts can be seen as performative mnemonic devices: triggers for memory during the act of storytelling.



Figure 2: Visitors construct digital Lukasa boards representing personal stories about family and place around an interactive tabletop display.

The Luba artifacts and practices that exist as conceptual maps — aids for memory and storytelling — are varied: from beaded necklaces and headdresses, to staffs, spears, scepters, and scarification. We focused our design on a specific Luba artifact: the Lukasa, or memory board. The Lukasa is an hourglass-shaped, hand-sized wooden board that is studded with beads and shells and/or carved with ideograms. These physical representations (beads, carvings, etc.) are symbolic, but also open to interpretation. That is, they do not represent the past in a static way; rather, each telling or performance with a Lukasa is unique. Roberts and Roberts call it a “generative reconstruction of the past”

and note: “although the Lukasa is learned, particular meanings are assigned on a significant occasion in a specified locale for a given audience.” Only the creator of a Lukasa, often a court historian, will know the originally intended meaning of its particular selection and spatial configuration of beads or carvings, and through subsequent readings. As the board passes to new hands, it takes on new meanings to fit current circumstances.

TANGIBLE NARRATIVES

The Lukasa and other Luba mnemonic artifacts are especially relevant in light of emerging forms of digital media interaction known as tangible and embodied interfaces, physical interactive objects that couple input and output through the use of embedded sensors. The Synaesthetic Media Lab at Georgia Tech explores new forms of interactive storytelling and expression that we call tangible narratives.

Like the Luba artifacts, tangible narratives employ physical objects and surfaces to represent different story elements, including characters, places, and events. Both Luba artifacts and tangible narratives are not fixed: they employ the power of the abstraction of story elements and their relationships to create dynamic, evolving, and generative stories, which deliver custom experiences for each visitor or group of visitors.

Some tangible narratives are realized as sculptural artifacts or installations, while others make use of digital tabletops as a site for the narrative experience. In the latter case, aspects of the story are visually represented on the surface of a tabletop display or physically embodied with handheld interactive objects whose position and orientation can be detected on the tabletop display surface. For the Lukasa, the tangible and visual representations serve as a kind of conceptual story map. In the tangible narrative system, these representations also serve as controls for the digital story system. By manipulating these representations through multi-touch or tangible object interaction, visitors navigate the story space or trigger the progression of the story, for example through the audiovisual play-out of story components.

Tabletop tangible narrative systems and their associated media content represent only the computationally mediated layer of the storytelling experience. A second, even more open-ended layer of storytelling takes place around the tangible narrative system, as groups of visitors use the digitally mediated story elements to create further stories, shared orally the around the table in a kind of improvised performance.

DESIGN AND DEVELOPMENT

The design of the piece was guided not only by the overarching goals for the exhibition, but also by audience and site related factors. Given the museum setting for the piece, we expected that visitors would typically interact for five minutes or less. Furthermore, we expected the main audience would be primary or middle school children on school field trips. As a result, we realized it would be necessary to convey the Lukasa-inspired story-mapping concept through a short interaction that would be both easy to understand and engaging.

Over the course of several design iterations, we developed an interaction sequence for the construction and sharing of stories that consists of four simple steps, as shown in Figure 3. As visitors approach the digital table, they see beads floating around the surface and a collection of physical objects shaped like shells on the edges. A visitor can pick up a shell and place it on the tabletop display to start building their digital story. This shell becomes the central node of their story, and seven icons appear in a circular “menu” around it, representing possible components of a story about family and place: man, woman, boy, girl, pet, home, and city. The visitors can arrange digital beads around the real world shell by dragging them onto the icons to assign meaning to them. For example, if a visitor wants to tell a story about their mother and aunt, they can drag two beads onto the “woman” icon one after another. They may choose to represent their mother with a red bead and their aunt with a yellow bead in order to distinguish them.

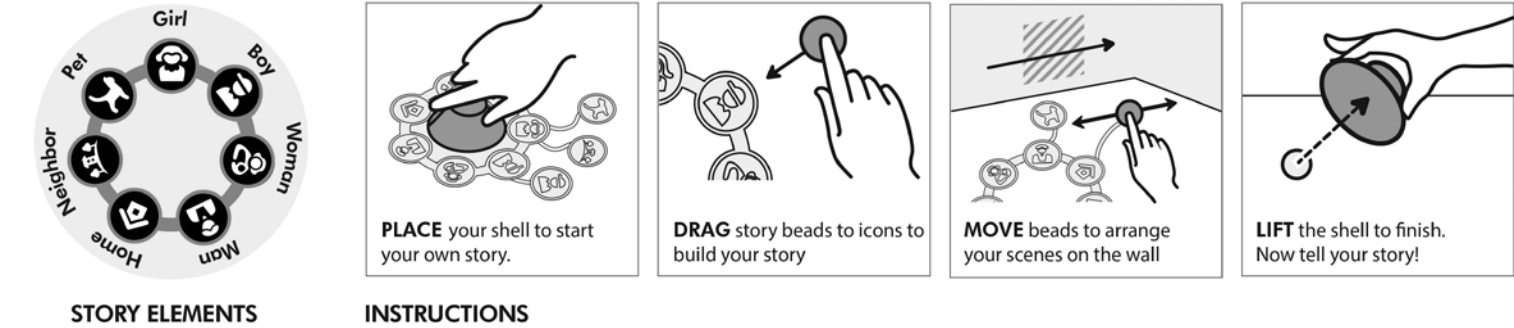


Figure 3: Instructions on the bezel surrounding the table’s display surface help to guide visitors in constructing and sharing their stories

As each bead is assigned meaning, a small corresponding animation begins to play on a wall adjacent to the table. When more beads are added, the animations are layered to create a story scene. The visitor can arrange their scene as desired by moving the assigned beads around the central shell. The story is completed when the visitor removes the tangible shell from the table and the “menu” of icons disappears. Only the final arrangement of assigned beads remains and the visitor can verbally share their story with others around the table.

The visual and physical design of the piece draws on Luba art in general and the Lukasa in particular. Inspired by the cowrie shells in a Lukasa diagram shown in *Memory: Luba Art and the Making of History*,¹ which represent royal and spirit capitals, we decided to center each visitor’s story around a single shell. The tangible shell serves as an interactive object that allows the visitor to create their story; when removed, a graphical representation of the shell remains underneath, surrounded by the beads that have been assigned meaning during the story construction. This cluster of shell and colored beads, remains on the table as a graphic “map” of their story. Multiple visitors can create stories on the table at the same time, each with their own tangible shell, resulting in a larger story map of the group’s shared interactive experience.

TECHNICAL IMPLEMENTATION

The piece was developed on a ReacTIVision-based interactive tabletop, which makes use of computer vision to detect both finger touches and tangible objects that have special visual markers attached to their undersides.²

The table uses the diffused surface illumination (DSI) technique to evenly light the surface with infrared (IR) light by attaching strips of IR LEDs to the edge of a sheet of acrylic impregnated with tiny reflective particles. When touched or when an object is placed on it, the infrared light is reflected towards a set of four modified Playstation™ Eye cameras, which pass their images to a computer vision engine called Community Core Vision (CCV). CCV stitches the images together and interprets them to determine the location of fingers and objects on the surface. These locations are read by an application developed using the Unity3D game engine, which generates the images projected on to the surface and the walls based on the input from CCV and the current state of the application.



Figure 4: A menu of icons appears when a tangible shell is placed on the table and a story can be created by dragging beads onto the icons displayed around the shell (left); the shells were designed in 3D modeling software and fabricated using a 3D printer (right).

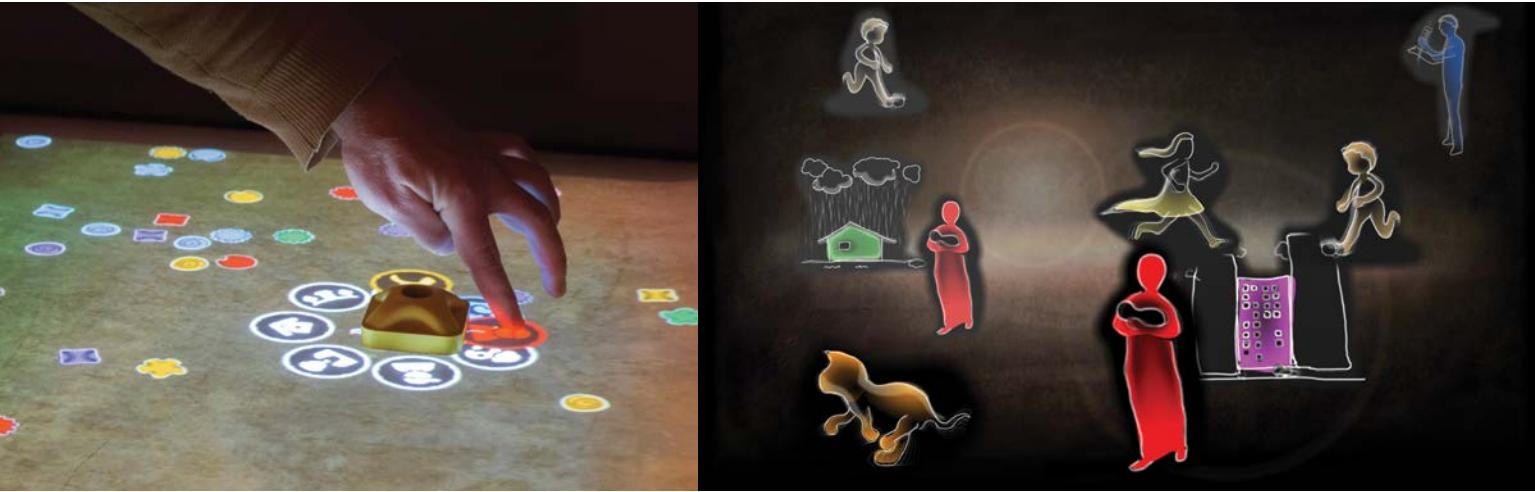


Figure 5: A visitor drags a bead to the icon to create another story element (left); animations projected on the walls perform the elements of the story (right).

The form of the table and the tangible shell objects were designed in SolidWorks, a 3D solid modeling tool. The table was cut at the Advanced Wood Projects Lab at Georgia Tech from plywood using a CNC (computer numerical control) router, and the tangible shell objects were 3D printed on a Dimension SST 768 in the GVU Prototyping Lab, also at Georgia Tech. The objects were then finished by sanding and painting the plastic. The 3D printer reads a solid model file from a program like SolidWorks and builds the form layer by layer from an extruded filament of melted ABS plastic.

Having these tools as well as the students and faculty with the diverse skillsets required to use them, created an opportunity for students at Georgia Tech to construct installations like this one, learn to work with diverse teams, and to imagine, design and create new modes of interaction around systems that consist of many different software, hardware, and physical components.

SUMMARY

The Lukasa-inspired interactive exhibit demonstrates one way in which emerging digital media interaction technologies can be used to revisit long-lived and deeply rooted concepts, such as the way Central African cultures map out their experience of the world in ways that are tangible, embodied, and performative. When experienced alongside the static and two-dimensional maps of Africa created by Westerners, we hope this interactive exhibit can expose Western audiences to a broader understanding of the concept, practices, and functions of mapping place and lived experience.

NOTES

- 1 Roberts, M. N. and Roberts, A. F., Eds. (1996). *Memory: Luba Art and the Making of History*. New York, Museum for African Art.
- 2 Roberts and Roberts, 33.
- 3 Roberts and Roberts, 37.
- 4 Roberts and Roberts, 118.
- 5 Roberts and Roberts, 41.
- 6 Mazalek, A. (2011). Tangible narratives: Emerging interfaces for digital storytelling and machinima. *The machinima reader*. H. Lowood and M. Nitsche, Eds. Cambridge, MA, MIT Press: 91–110.
- 7 See reference for example: Chenzira, A., Chen, Y. and Mazalek, A. (2008). Renati: Recontextualizing narratives for tangible interfaces. *Proceedings of the 14th International Symposium on Electronic Art (ISEA '08)*, ISEA2008 Pte Ltd, 106–108.
- 8 See references for examples: Mazalek, A., Davenport, G. and Ishii, H. (2002). Tangible viewpoints: A physical approach to multimedia stories. *Proceedings of the tenth ACM international conference on Multimedia (MULTIMEDIA '02)*, ACM, New York, NY, USA, 153–160; Mazalek, A. and Davenport, G. (2003). A tangible platform for documenting experiences and sharing multimedia stories. *Proceedings of the 2003 ACM SIGMM workshop on Experiential telepresence (ETP '03)*, ACM, New York, NY, USA, 105–109; Mazalek, A., Winegarden, C., Al-Haddad, T., Robinson, S. J. and Wu, C.-S. (2009). Architales: Physical/digital co-design of an interactive story table. *Proceedings of the 3rd International Conference on Tangible and Embedded Interaction (TEI '09)*, ACM, New York, NY, USA, 241–248; Tanenbaum, J. and Tanenbaum, K. (2011). The reading glove: A non-linear adaptive tangible narrative. *Proceedings of the 4th international conference on Interactive Digital Storytelling (ICIDS'11)*, Springer-Verlag, Berlin, Heidelberg, 346–349.
- 9 Roberts and Roberts, 141.
- 10 Kaltenbrunner, M. and Bencina, R. (2007). Reactivision: A computer-vision framework for table-based tangible interaction. *Proceedings of the 1st international conference on Tangible and Embedded Interaction (TEI '07)*, (Baton Rouge, Louisiana), ACM, New York, NY, 69–74.

EXHIBITION CATALOG



Cat. 1a: Lukasa Board front view
24.3 cm x 10.6 cm object used in the initiation of the Mbudye a secret society of the Luba people. The arrangement of beads tacked to the top surface as well as the carved designs on the back represent clan histories, genealogies, and geographic codes. Origin: Shaba district of the Democratic Republic of the Congo. Georgia Tech gratefully acknowledges the loan of the lukasa from the Royal Museum for Central Africa.



Cat. 1b: Lukasa Board back view.
Georgia Tech gratefully acknowledges the loan of the lukasa from the Royal Museum for Central Africa.



Cat. 2: William Kentridge, South African (b. 1955). *De peccato originali* (Black paper collage on double text pages, 9 ½ x 14 ½ inches). The High Museum of Art. 2013 Gift of Nicole Kekeh's successors, in loving memory of their sister. Georgia Tech gratefully acknowledges the loan of *De peccato originali* from the High Museum of Art, Atlanta.



Cat. 3: Title page from Ptolemy's *Geographia* (Sebastian Münster 1540) fol. 2 recto. Courtesy The Newberry Library, Chicago. Call # Baskes G1005, 1540.



Cat. 4: *Typus Orbis Universalis* from Ptolemy's *Geographia* (Sebastian Münster 1540) fol. 2 verso. Courtesy The Newberry Library, Chicago. Call # Baskes G1005, 1540.



Cat. 5: *Africae Tabula I* from Ptolemy's *Geographia* (Sebastian Münster 1540) fol. 32 verso. Courtesy The Newberry Library, Chicago. Call # Baskes G1005, 1540.



Cat. 6: *Africae Tabula II* from Ptolemy's *Geographia* (Sebastian Münster 1540) fol. 33 verso. Courtesy The Newberry Library, Chicago. Call # Baskes G1005, 1540.



Cat. 7: *Tabula Africae III* from Ptolemy's *Geographia* (Sebastian Münster 1540) fol. 34 verso. Courtesy The Newberry Library, Chicago. Call # Baskes G1005, 1540.



Cat. 8: *Tabula Africae IIII* from Ptolemy's *Geographia* (Sebastian Münster 1540) fol. 35 verso. Courtesy The Newberry Library, Chicago. Call # Baskes G1005, 1540.



Cat. 9: Joan Blaeu (1596–1673) *Praefecturae Paranambuca pars borealis une cum praefectura de Itamarca*, Vol XI map 18. The cartouche or hand-colored illustration shows a sugar mill in operation during the time of Dutch control of Pernambuco. A European overseer waits on the balcony for the arrival of a woman possibly a woman being carried in a sling chair by African slaves. The representation of the sugar mill continues in Vol. XI, map 22. Along the coast the map represents the first naval battle between the Dutch and the Spanish fleets on January 12, 1640.

The cartouche is a version of a drawing by Frans Post (1612–1680) one of the first artists to paint landscapes of America. Post lived in Brazil from 1637–1644 where he painted numerous landscapes. He was a contemporary of Frans Hals who painted his portrait.



Cat. 10: Joan Blaeu (1596–1673) *Africae nova description* from *Grooten atlas, oft werelt-beschryving, in welck 't aerdryck, de zee, en hemel, wort vertoont en beschreven*. Source: *Grooten atlas, oft werelt-beschryving, in welck 't aerdryck, de zee, en hemel, wort vertoont en beschreven*, Vol IX map 24. Amsterdam, 1664. We are pleased to acknowledge the loan of the volumes from the Blaeu, *Atlas major* from the Price Gilbert Library, Georgia Institute of Technology.



Cat. 11: *Accuratissima Totius Africae in Lucem Producta*, 1702 Nürnberg: Jacob Sandrart; engraved by Johann Baptist Homann, Sr; Frederick de Wit. From the cartographic collection of Rafael Bras, Provost, Georgia Institute of Technology.



Cat. 12: *Totius Africae Accuratissima Tabula*, Frederick de Wit (Amsterdam 1680) From the cartographic collection of Rafael Bras, Provost, Georgia Institute of Technology.



Cat. 13: French wall map, *L'Afrique, ou tout les points principaux sont placez sur les observations de Messieurs de l'Academie des Siences* [sic], Nicolas de Fer et al. (Paris 1695). Courtesy The Newberry Library, Chicago. Call # Novacco 8F 10.



Cat. 14: Image of the African continent before the Berlin Conference of 1885 from *Black's General Atlas of the World embracing the latest discoveries, new boundaries...New and rev. ed.* (Edinburgh: A. and C. Black, 1882) fol. 36. Courtesy The Newberry Library, Chicago. Call # Baskes G10-9.



Cat. 15: Image of the African continent showing the European division of African territories after the 1885 Berlin Conference. From *Black's General Atlas of the World embracing the latest discoveries embracing the latest discoveries, new boundaries, and other changes*. (Edinburgh: A. and C. Black, 1888) fol. 36. Courtesy The Newberry Library, Chicago. Call # Baskes G-10.1.



Cat. 16: *Afrique équatoriale française*, A. Meunier (1926). Map glued on muslin. Georgia Tech is pleased to recognize the loan of the map from the collection of Mr. Herbert Weiss.



Cat. 17: *Congo belge. Carte routière Mobil* (ca. 1958) with addition of names of Congo peoples added in ballpoint pen by Herbert Weiss during his work in the Congo during the late 1950's and early 1960's. Georgia Tech is pleased to recognize the loan from the collection of Mr. Herbert Weiss.



Cat. 18: *Carte No. 22: Congo belge* (Air route map ca. 1958). Georgia Tech is pleased to recognize the loan of the map from the collection of Mr. Herbert Weiss.



Cat. 19: *République du Congo. Carte économique: principales productions minérales, végétales, animales* (1972). Georgia Tech is pleased to recognize the loan from the collection of Mr. Herbert Weiss.



Cat. 20: *République démocratique du Congo. Carte routière et administrative*. (Kivu-1972). Georgia Tech is pleased to recognize the loan from the collection of Mr. Herbert Weiss.



Cat. 21: Interactive Table

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FOR THEIR PRESENCE
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