Cartographic Perspectives

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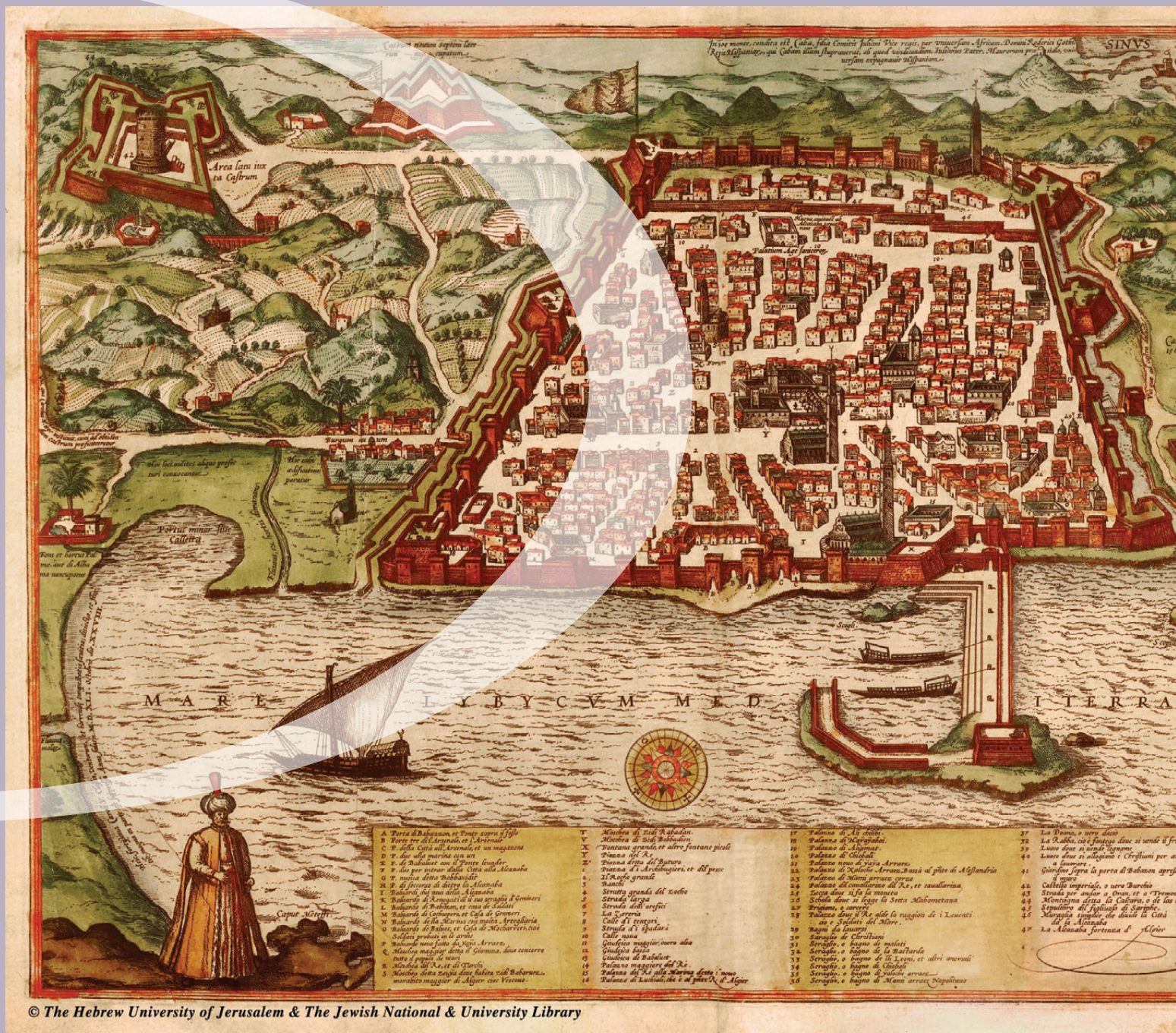

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IN THIS ISSUE

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ABOUT THE COVER: *Plan of Algiers, by Antonio Salamanca, 1541. This map is made available online by Historic Cities, a website created by the Historic Cities Center of the Department of Geography, the Hebrew University of Jerusalem and the Jewish National and University Library. (http://historic-cities.huji.ac.il/algeria/algiers/maps/braun_hogenberg_II_59_b.jpg).*

WORD CLOUDS: *The word clouds featured in this issue were produced using Wordle (http://www.wordle.net/). Complete text from each article was included.*

LETTER FROM THE EDITOR

Open access is good.

I don't know if our good news is the result of systemic change or happenstance since making *Cartographic Perspectives* the first and only open access publication in the world dedicated to cartography. Regardless, our journal has received a "bump" in popularity that puts those of post-convention Romney and Obama to shame. Submittals are up. Visits to our journal's website are up. The flow of articles released on our website is strong and steady. On top of all that, my job of explaining that "open access" means "everything in our journal is immediately and readily available to everyone" is now much simpler than trying to explain our transitional status of a year ago.

This was only possible with NACIS officers and the Board of Directors working both *with* us at *CP* and working *for* you as members. They have managed to devise attractive membership benefits while still supporting our digital publication. Reaching such a consensual balance in a less tightly knit community would seem all but hopeless, but our society—with its exuberant and like-minded members (HINT: "We like maps.")—has pulled it off with aplomb.

Returning to our good tidings, I'm happy to announce that Mark Monmonier, Distinguished Professor of Geography at Syracuse University and literary ambassador of cartography to the world, has agreed to join our Editorial Board. Mark told me that he has "always been impressed with *CP*'s eclectic contents, from clever technical notes you can use to thoughtful discussions of solutions to design challenges, and from critiques of important products and programs to its amazingly effective incorporation of color and longstanding appreciation of interactive, dynamic mapping." Regarding our new format, he states "I'm especially intrigued by *CP*'s recasting itself as the pioneering fully open-access cartographic journal."

Mark also commented on challenges he sees facing our journal. The first is recruiting high-quality content. This is something that's been on our radar for a long time, and one that we hope open access will address in part. His next challenge is the development of a long-term archival preservation plan. Now there is a future challenge worthy of consideration. Who could possibly be put in charge of ensuring that our content on mapping is still around in 100 years? The federal government? A new kind of map collector? I'd put my money on an organization of exuberant and like-minded members who sincerely like the product (HINT: "We like maps.") to be archived!

Although we look ahead to the future of *CP* with much anticipation, I would also like to take the opportunity to thank all of the people from my first year as Editor who worked so diligently to make *CP* successful. Assistant Editor Rob Roth's efforts in helping to set up the Open Journal System (OJS) and with numerous other editorial tasks were invaluable, and Assistant Editor Laura McCormick's outstanding eye for layout and skill in copyediting help make *CP* such an attractive and readable journal. Special thanks, also, to all of my Section Editors, on whom I rely for recruiting and providing content: Terri Robar (Collections), Alex Tait (Practical Cartographer's Corner), Andy Woodruff (On the Horizon), Lisa Sutton and Mark Denil (Reviews), and Daniel Huffman (Visual Fields). Finally, thanks to the following individuals who agreed to review manuscripts and returned the highest-quality reviews in the timeliest manner possible:

Marc Armstrong
Sarah Battersby
Matthew Beaty
Francis Boscoe
Cindy Brewer
Nat Case
Karen Cook
Robert Cromley
Matt Dooley
Matthew Edney
Amy Griffin
Dennis Haskell
Fritz Kessler
Jon Kimerling
John Krygier
Michael Leitner
Mark Monmonier
Ian Muehlenhaus
Tom Patterson
Michael Peterson
Keith Rice
Anthony Robinson
Terry Slocum
daan Strebe
Roger Wheate
Denis Wood

As a result of their tireless efforts, the average decision on peer-reviewed papers in 2011 took just under eight weeks, and we hope to shorten this turnaround a bit this year with efficiencies built into our Open Journal System (OJS).

As for the present issue, it should have much appeal for those who appreciate "eclectic contents." Our two peer-reviewed articles are examples of intriguing work in two disparate branches of the discipline. Adele Haft, after introducing Australian poet Kenneth Slessor and his five-poem sequence *The Atlas* in *CP* 70, analyzes cartographic elements of the first of these poems, "The King of Cuckooz" in this issue. The second article in this issue is a much different type of cartographic analysis, as Michael Finn and other researchers at the US Geological Survey look into methods to better handle map projections of small-scale raster datasets.

Our Collections piece explores the map collection at Cornell University. If this contribution by Boris Michev sounds familiar, it may be because this article led our charge by being the first posted to our fully open access website months ago! It's a pleasure to now incorporate Boris' contribution into our current issue.

The Practical Cartographer's Corner includes a number of techniques devised by students of Michael Peterson, who kindly includes a brief introduction to these efforts. Our Reviews section includes six book reviews that the frequent visitor to our *CP* website will note have been cropping up over the last few months.

This issue's Marginalia focuses on the Student competitions held annually at NACIS' conference. It includes reports on the winners of the Student Poster Competition and the Dynamic Map Competition with its two prizes, one for best narrative and another for best interactive map. I hope a glimpse at last year's winners will help to inspire participants to this year's event. A final inspiration is supplied in the Visual Fields section by Karla Sanders, who discusses her inspired *Perceptions of Athens* map illustration, which took the 2nd Place Honorable Mention at last year's Student Poster Competition.

—Patrick Kennelly

Who's "The King of Cuckooz"? Maps and Mapping in Kenneth Slessor's Poetic Sequence *The Atlas*

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ABSTRACT

"The King of Cuckooz" by the acclaimed Australian poet Kenneth Slessor opens the five-poem sequence *The Atlas* as well as *Cuckooz Contrey* (1932), the collection in which it debuted. Like each of *The Atlas* poems, "The King of Cuckooz" begins with a quote from a prominent seventeenth-century map-maker; in this case, Robert Norton (d. 1635)—the English engineer, gunner, writer, and surveyor. Slessor not only alludes to Norton's 1620 plan of Algiers throughout the poem, but imagines his narrator assuming Norton's (highly fictionalized) persona. This article, part of the first full-scale examination of Slessor's ambitious but poorly understood sequence, begins by considering what critics have said about "The King of Cuckooz," traces its development in Slessor's poetry notebook, and details the complex relationships between his poem, Norton's map, and a particularly lyrical description of that map in an ephemeral catalogue of atlases and maps. Slessor modeled his King of Cuckooz on Barbarossa/Kheir-ed-din (ca. 1478–1546), Algiers' most charismatic corsair and pasha. But what Norton meant by "The King of Cuckooz Contrey" eluded Slessor. By focusing on Norton's participation in the British expedition against Algiers (1620–1621), tracking down memoirs of foreign officials and former captives in Ottoman Algiers, scouring old maps for "Cuckooz," and cobbling together the astonishing exploits of the Berber Kingdom of Koukou/

Cucco through Norton's day and beyond—my paper will make the "unknown" known in its strangely poetic reality.

KEYWORDS: Kenneth Slessor (1901–1971); *Cuckooz Contrey* (1932); *The Atlas* sequence (ca. 1930); "The King of Cuckooz"; poetry—twentieth-century; poetry—Australian; poetry and maps; cartography—seventeenth-century; Robert Norton (d. 1635); Barbarossa/Kheir-ed-din (ca. 1478–1546); Berbers; Kingdom of Koukou/Cucco

WHO'S "THE KING OF CUCKOOZ"? MAPS AND MAPPING IN KENNETH SLESSOR'S POETIC SEQUENCE *THE ATLAS*, PART ONE

Despite my title's claim to be "Part One," this is not the first article in *Cartographic Perspectives* to focus on *The Atlas* (ca. 1930). In *CP* 70, my "Introduction to Maps and Mapping in Kenneth Slessor's Poetic Sequence *The Atlas*" presented the background for what is gradually becoming the first extended analysis, in several parts, of that five-poem sequence by the acclaimed Australian poet Kenneth Slessor (1901–1971: Haft 2011). Beginning with a brief biography of Slessor as poet, journalist, and man about Sydney, it surveyed his third solo collection, *Cuckooz Contrey* (1932), before turning to *The Atlas*, which both opened and debuted in that collection. Examining the notebook in which he drafted all five poems (NLA MS 3020/19/1[1]) revealed the enormous effort that Slessor—then at the height of his artistry and productivity—lavished on *The Atlas* and on mastering the period in which it is set. Not only does the sequence encompass nearly half of the 282 pages in that "National Treasure" (Elizabeth Caplice, e-mail to author: May 28, 2010), but, as the notebook makes clear, Slessor considered naming his entire collection *The Atlas* (September 13, -s242[2]) before choosing the catchy title *Cuckooz Contrey*. My review of his corpus, furthermore, showed that the sequence uniquely combines interests and strategies apparent in Slessor's earlier and later poems, including his abiding fascination with cartography of exotic places and bygone eras, as well as his emphasis on the arts and the use of illustrations to heighten his poetry's allure. Next came the maps that were created to illustrate his poetry—especially *Strange Lands*, made by Slessor's famously controversial friend and mentor, Norman Lindsay (1879–1969: Smith 1986), and reproduced as "Cuckooz Contrey" for the frontispiece of *Cuckooz Contrey*. Slessor's poetic allusions to maps, in turn, led to the great Australian mariner Captain Francis Joseph Bayldon (1872–1948: Phillips 1979) and to Bayldon's magnificent nautical library, in which the poet may have found the inspiration for *The Atlas*. Finally, I managed to track down *Old Maps of the World* (Francis Edwards 1929), the rare and hitherto elusive catalogue to which Slessor refers in his notes on *The Atlas*. What that article and the remaining parts of my study attempt to prove is that the relationship between that ephemeral catalogue and *The Atlas* is far more profound and far-reaching than anyone might have anticipated.

The article now unfolding before you focuses on three related documents: "The King of Cuckooz," the first poem of Slessor's sequence *The Atlas* and his collection *Cuckooz Contrey*; Robert Norton's 1620 *Platt of Argier*, whose title

Slessor used to begin his poem; and the 1929 Francis Edwards catalogue *Old Maps of the World*, which advertised and described Norton's manuscript map. Through a close reading of a variety of textual and cartographic documents—each of them replete with narratives of power, wealth, and desire—"Who's 'The King of Cuckooz'" will weave together some rather curious strands of literature, cartography, geography, and history, and in the process offer new discoveries about the poet's use of cartographic sources in constructing "The King of Cuckooz."

POWER, WEALTH, AND DESIRE: SLESSOR'S "THE KING OF CUCKOOZ"

We begin with the delights of "The King of Cuckooz":[3]

> *The Atlas*, I: "The King of Cuckooz" (ca. 1930)
>
> *"The Platt of Argier and the Pts. adoining within the view thereof made by Robert Norton the Muster Mr. of his Ma't's Fleet ther Ao Di 1620 & by his owne carfull & dilligent observations then not without danger."*[4]
>
> The King of Cuckooz Contrey
> Hangs peaked above Argier
> With Janzaries and Marabutts
> To bid a sailor fear
>
> With lantern-eyed astrologers
> Who walk upon the walls
> And ram with stars their basilisks
> Instead of cannon-balls.
>
> And in that floating castle
> (I tell you it is so)
> Five thousand naked Concubines
> With dulcimers do go.
>
> Each rosy nose anoints a tile,
> Bang, bang! the fort salutes,
> When He, the King of Cuckooz Land,
> Comes forth in satin boots,
>
> Each rosy darling flies before
> When he desires his tent,
> Or, like a tempest driving flowers,
> Inspects a battlement.
>
> And this I spied by moonlight
> Behind a royal bamboo
> That Monarch in a curricle
> Which ninety virgins drew;

That Monarch drinking nectar
(Lord God, my tale attest!)
Milked from a snow-white elephant
As white as *your* white breast!

And this is no vain fable
As other knaves may lie
Have I not got that Fowl aboard
Which no man may deny?

The King's own hunting-falcon
I limed across the side
When by the Bayes of Africa
King James's Fleet did ride.

What crest is there emblazoned,
Whose mark is this, I beg,
Stamped on the silver manacle
Around that dainty leg?

Let this be news to you, my dear,
How Man should be revered;
Though I'm no King of Cuckooz Land,
Behold as fierce a beard!

I have as huge an appetite,
As deep a kiss, my girl,
And *somewhere*, for the hand that seeks,
Perhaps a Sultan's pearl!

Like a nursery rhyme, "The King of Cuckooz" sparkles with curious words, arresting images, and bouncy rhythms. In each stanza, longer first and third lines alternate with shorter, end-rhymed lines. Adding to the poem's exuberance is Slessor's tongue-in-cheek narrator, who claims to have sailed "by the Bayes of Africa/ [with] King James's Fleet." He barrages his beloved with an arsenal of expressions ranging from affectionate ("my dear," "my girl") and intimate ("*your* white breast," "as deep a kiss") to titillating ("five thousand naked Concubines") and unfamiliar ("Cuckooz," "Janzaries," "Marabutts," "lantern-eyed," "basilisks"). More delicious is his self-mocking tone. Slessor's seducer attempts to impress his beloved not with his valor or wealth, not even with his "first-hand" account of an exotic country, but rather with amusing travesties of these. His wealth is "*somewhere*…perhaps." It's his beard that is "fierce," and he performs his only deeds—acting the voyeur and ensnaring with birdlime the "King's own hunting-falcon"—while safely on deck. He repeatedly undermines his account by emphasizing its implausibility and lack of corroboration ("I tell you it is so." "Lord God, my tale attest!" "And this is no vain fable…/ Which no man may deny?"). In fact, the entire poem undermines the gravity of its epigraph. The 1620 *Platt of Argier* is a *military* "plan" or "map" of Algiers (*OED*, 2nd ed., 1989, 11:992, s.v. "plat" sb3 II.2), one that Robert Norton (d. 1635: Tooley et al. 1999–2004, 3:337) claims to have made "by his owne carfull & dilligent

observations then *not without danger*" (emphasis mine). If Slessor meant for his narrator to be that map-maker, he used Norton's double negative "not without danger" to develop a wry poetic voice that casts doubt not only on the narrator's participation against Algiers, but also on his description of that foreign place and time.

Slessor's "response" to Norton's map (or, at least, to its title) also raises the specter of cartographic doubt that permeates this study and the entire project of textual re-presentation of mapped knowledge (Wood and Fels 1992, 4–27; Harley and Laxton 2001, 36, 110–112, 159). As we shall see, biographers don't always agree that *Norton* witnessed what he mapped, and Norton's uncertain role in King James's expedition appears to have inspired Slessor's creation of the unreliable narrator in "The King of Cuckooz." Yet perhaps our most surprising encounter with the voyeur who remains safely on board will be when we discover the poet eagerly leafing through a *catalogue* of old maps.

"The King of Cuckooz" may have its roots in the naval songs and ballads collected by Captain Francis Bayldon, maternal uncle of Slessor's first wife, Noela, and frequent host to the young couple. The poem's rhythm, rhyme, and address to the beloved echo the seventh stanza of "The Sailor's Farewell," for instance, which Slessor could have found in Bayldon's copy of *Naval Songs, and Other Songs and Ballads of Sea Life*—a charming pocket-size book with gilt edges and ornaments: "So all you pretty English girls,/ Now see what we go through,/ And see what hardship we endure,/ For the sake of loving you" (Rinder 1899, 265). Because "The Sailor's Farewell" also opens with a sailor recounting his journey to a dangerous North African locale (Egypt), it acts—like Slessor's poem—as another mode of mapping, but one in which the knowledge of maritime space is enshrined in song. "The King of Cuckooz" certainly harkens back to Slessor's earlier poetry (Green [1961] 1985, 944–946). Most apparent are his exotic settings in bygone eras. Early China dominated many of his uncollected poems ("Civilization," "Songs from the Chinese," "Youth") as well as *Thief of the Moon* (Slessor and Lindsay 1924: "Amazement," "Marco Polo," "Old Chinese Poem," "Taoist," "An Old Harp"). Later, Tartar kings invaded his second collection, *Earth-Visitors* (Slessor and Lindsay 1926: "Music" [VI], "Earth-Visitors"). The "rosy darling[s]" and "ninety virgins" with whom the king disports in "The King of Cuckooz" recall a comment made by Slessor's writer/friend Hal Porter: "no women-sized women appear in his poetry, but 'girls' abound. Like mice the size of pussy-willow buds they appear and disappear in the same twink" (1975, 98; see Caesar 1995, 13). In its eroticism, "The King of Cuckooz" is reminiscent of Slessor's "Adventure Bay," which Norman Lindsay illustrated with three lusty mermaids in *Vision: A Literary Quarterly* (Johnson, Lindsay, and Slessor, November 1923, 6; Slessor, Haskell, and Dutton 1994, 10). And "A Surrender" conceives of sex as a military skirmish enlivened by cannons and artillery (Judith Wright, in Thomson 1968, 12). In it, Slessor portrayed a lover storming his beloved's "Venusbergs, thy breasts,/ By wars of love and moonlight batteries" in the hope that she, "sweet enemy of love,/ Shalt find a conquest in capitulation!" (1923: Slessor and Lindsay 1924; Slessor, Haskell, and Dutton 1994, 4–5, 333).

If the narrator of "The King of Cuckooz" only hopes for the sexual favors alluded to in the last two poems, Adrian Caesar's observation that both "Adventure Bay" and "A Surrender" "rework Renaissance tropes of conquest and

exploration to figure sexual 'possession'" nevertheless holds true for "The King of Cuckooz" as well: "Women, like towns or countries, are there to be explored, conquered, possessed by the brave and adventurous male" (1995, 29). Our poem, which begins with a man's fascination for the "contrey" of his enemy, quickly transforms—however drolly—into a model for "how Man should be revered." The ambiguity of "the silver manacle/ Around that dainty leg" only strengthens Caesar's point. For although "that dainty leg" could refer to the King's falcon (Slessor, Haskell, and Dutton 1994, 359), it alludes as well to the narrator's girlfriend—"bird" being British slang for "young woman" or "sweetheart" since at least the nineteenth century (Patridge, Dalzell, and Victor 2006, 1:160, s.v. "bird"). Both the "crest" and "mark" "stamped" upon the manacle denote the sexual possession of the beloved's body. The fact that the epigraph of "The King of Cuckooz" comes from a 1620 map reminds us of Robert Norton's contemporary, John Donne (1572–1631), the great metaphysical poet whom Slessor imitated elsewhere (Green [1961] 1985, 2:947–948). Donne repeatedly referenced maps of his era. In "To His Mistress Going to Bed," for instance, Donne imagined his hand upon his mistress as a "seal" (Donne and Smith 1971, 125, lines 25–32), a metaphor for "claiming an unknown territory upon a map by stamping it with the seal of the claimant" (Zanger 1982, 779).

"The King of Cuckooz" was the perfect opening for Slessor's new collection. Its title and first line, "The King of Cuckooz Contrey," ties the poem to *Cuckooz Contrey* and to the collection's epigraph: "The unknown hilly country to the south of the Bay is coloured green, and marked 'Part of the King of Cuckooz Contrey.'" Accompanied by Norman Lindsay's map-like frontispiece "Cuckooz Contrey," the poem alludes to Slessor's previous fantasies and promises more. Lindsay himself regarded "The King of Cuckooz" as one of his friend's "delectable fantasies" (Lindsay, quoted in Stewart 1977, 174). Other readers drawn to his earlier work, or to the more topical verses he was publishing in *Smith's Weekly*, enjoy the poem's "pleasure-giving" raciness and lightness (Burns 1975, 24; see Green [1961] 1985, 946), or its "unfaltering *élan*" (Stewart 1969, 158–158; rpt. 1977, 73–74). In that sense, "The King of Cuckooz" contrasts starkly with the final poem of the sequence, "The Seafight," which ends with the haunting lines: "But we can always find a minute/ For the festivities of Death/ Who sail upon this dangerous planet" (Slessor, Haskell, and Dutton 1994, 76). The contrast not only demonstrates Slessor's range as Australia's first modernist poet and pioneer of its modern national poetic identity, but also presents *The Atlas* as a bridge between the often forced gaiety of his "early" period (1919–1926: Slessor and Lindsay 1924; Slessor and Lindsay 1926; see Slessor 1944, Part I) and the more mature time and sea obsessed reflections of his "middle" period (1927–1932: Slessor 1932; see Slessor 1944, Part II). But when *The Atlas* lost its role to "Captain Dobbin" as the opening poem of his middle period in both *One Hundred Poems* (Slessor 1944, 49–61) and *Poems* (Slessor 1957, 42–53), the displaced "King of Cuckooz" became—at least for one influential critic—"the rather flimsy, Norman Lindsayish first poem in the series called 'The Atlas'" (Dutton 1991, 135).

"The King of Cuckooz" was the perfect opening for Slessor's new collection. Its title and first line, "The King of Cuckooz Contrey," ties the poem to Cuckooz Contrey and to the collection's epigraph: "The unknown hilly country to the south of the Bay is coloured green, and marked 'Part of the King of Cuckooz Contrey.'"

Douglas Stewart, on the other hand, remembered and valued "The King of Cuckooz" as the opening poem of *Cuckooz Contrey*. For his upcoming *Modern Australian Verse* (1964, 3–9), he requested permission to reprint at least "the first two [poems] in the sequence" in case he couldn't accommodate the first four

(Douglas Stewart, letter to Kenneth Slessor, 17 February 1963: NLA MS 3020 1/5/353).[5] Herbert Jaffa regarded "The King of Cuckooz" as autobiographical and focused on "the uninhibited and unmixed humor of 'The King of Cuckooz', [which though] rare in Slessor's poetry… [was] much less rare in the man himself" (1971, 82). Singling out the narrator's professed "appetite," Jaffa recalled Slessor's fondness for good food and wine (Jaffa 1971, 81–82), and referred readers to Jack Lindsay's reminiscences of his friend in *The Roaring Twenties* (Lindsay 1960). Slessor's personality helped him create for *Cuckooz Contrey* other bigger-than-life characters "who indulge in what physical life offers and are secure in their passions" (Jaffa 1971, 128). These include not only the King of Cuckooz but also William Hickey ("The Nabob") and John Benbow ("Metempsychosis"), whom fans of *Treasure Island* (1883) will recognize as the name behind the "Admiral Benbow" inn (Slessor, Haskell, and Dutton 1994, 384).

CREATING "THE KING OF CUCKOOZ": A TALE OF TWO CATALOGUES

Like Robert Louis Stevenson, Slessor "kn[ew] where romance lurks for the discerning to apprehend" (Review of *Cuckooz Contrey* 1932; NLA MS 3020/8/20):

> One of its chief haunts is maps, especially old maps in which lacunae are filled by fanciful illustrations and entries indicating allurements and terrors.

Slessor found Norton's map of Algiers almost immediately while perusing the 1929 Francis Edwards catalogue, *Old Maps of the World*, otherwise known as *Ancient Geography; a Catalogue of Atlases & Maps of All Parts of the World from XV Century to Present Day* (Francis Edwards 1929). On the fifth page of the 130-page *Atlas* draft in his poetry notebook (March 2, NLA MS 3020/19/1/62), Slessor put *XX* beside the phrase he was quoting—"'The King of Cuckooz Contrey'"—and, under it, *XXX* beside "'The place wher the King of Englands Fleet did ride' by Robert Norton, Muster Mr. of his Ma^{ts} Fleet" [*sic*]. In the right margin, just above these quotes, another *XXX* highlights "Plan of Argier (Algiers)." The quantity of *X*'s is arresting. Prior to this page, eight phrases had earned a single *X* but only one merited *XXX*—a parenthesized "note" reading "vanished empires, lost kingdoms, forgotten lands & provinces, crumbled boundaries" (February 18, -s61). These *XXX*-quotes are related: two pages later, Slessor listed "'The King of Cuckooz Contrey'" among his "Lost Countries" (March 6, -s65). Meanwhile, at the top of "Atlas 6," the phrase "Algiers map" is accompanied by the following list: "'the King's House,' 'the Arsenal,' 'the Janzaries House,' 'Marabutts House,' 'Emperors Castle,' 'drawn in red, green & yellow'" (March 4, -s63). In these exotic names Slessor had discovered his entrée into what was to become "The King of Cuckooz": "The King of Cuckooz Contrey/… Argier,/ With Janzaries & Marabutts/ To bid the…" (March 16, -s75).[6]

After he'd finished "The King of Cuckooz," Slessor wrote the following note at the top of the page that opens "Post-roads," the sequence's second poem (April 5, -s90: emphasis mine):

> (1) The King of Cuckooz
>
> Note
>
> —Robert Norton *probably took* part in the English expedition to Algiers sent against the Barbary pirates in October 1620. On his manuscript map, the unknown hilly country to the south of the Bay is coloured green and marked "Part of the King of Cuckooz Contrey."
>
> ~~The facts quoted are from "Old Maps of the World" published by Francis Edwards Ltd.~~

While editing or crossing out as much as he kept, Slessor named for the first time his source for "The King of Cuckooz" (and, as it turns out, for *The Atlas* as a whole). Later, at the end of *Cuckooz Contrey*, he acknowledged the Francis Edwards catalogue in his "Author's Note" on the sequence itself (Slessor 1932, 75). Then, after excising the acknowledgment, Slessor reused his manuscript "Note" to compose his "Author's Note" for "The King of Cuckooz." Only in parentheses did he add "'Argier,' of course, is pronounced with the g soft, as in 'Algiers'" (ibid ; Slessor, Haskell, and Dutton 1994, 359).[7]

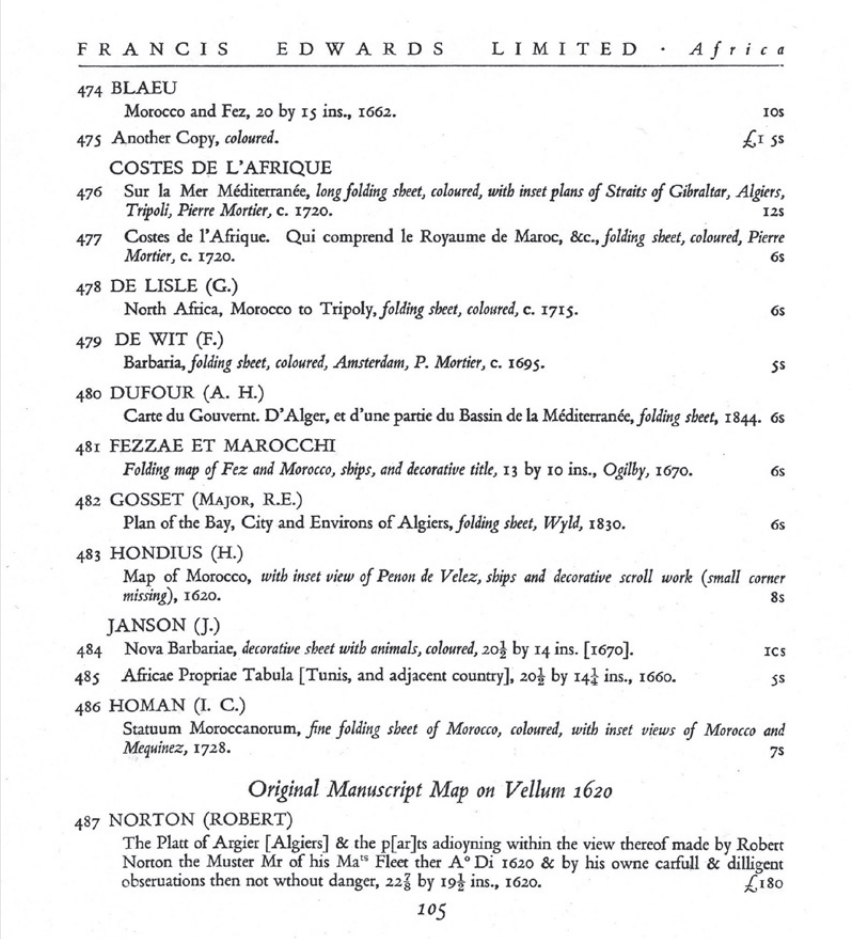
While editing or crossing out as much as he kept, Slessor named for the first time his source for "The King of Cuckooz" (and, as it turns out, for The Atlas *as a whole).*

Slessor's quotations are lifted from item 487 of *Old Maps of the World* (Figures 1 and 2), to which the poet's header "Old Maps" on "March 16" probably refers (-s75). The Francis Edwards entry warrants both annotation and quotation in full not only because of the catalogue's rarity, but also because Slessor took so much from it. In the annotated entry below, underlines indicate the phrases that Slessor copied into his notebook. Italics highlight that part of the item's title used by Slessor as his epigraph for "The King of Cuckooz." The sentence in CAPITAL LETTERS became his epigraph for *Cuckooz Contrey*, and the section in red will be explained shortly (see below, page 17) (Francis Edwards 1929, 105–106):

> Original Manuscript Map on Vellum 1620
>
> 487 NORTON (ROBERT)
>
> *The Platt of Argier* [Algiers] *and the p*[ar]*ts adoiyning within the view thereof made by Robert Norton the Muster Mr of his Ma*[ts] *Fleet ther A*[o] *Di 1620 & by his owne carfull & dilligent obseruations then not without danger*," 22 7/8 by 19 1/2 ins., 1620. £180 [p. 105]
>
> A drawing of a full-rigged ship marks "The place wher the King of Englands Fleet did ride." THE UNKNOWN HILLY COUNTRY TO THE SOUTH OF THE BAY IS COLOURED GREEN AND MARKED "PART OF THE KING OF CUCKOOZ CONTREY." The town itself is shown with the divisions of the various streets, the King's House, the Arsenal, the Janzaries House, the various

fortifications, position of the guns, &c. Outside the walls the "Townes Castle," "Emperors Castle" and the "Marabutts' House" are shown, also the water supply of the Town. The whole is beautifully drawn and coloured, the title being enclosed in a fine cartouche of red, green, and yellow.

An English fleet was sent against the Barbary pirates in October 1620, and an attack was made on Algiers in May 1621, but without much success, and the rovers captured above 30 English ships in the same year. It does not seem to be recorded, however, that Norton had a share in this expedition. In 1624 he received the grant of a gunner's room in the Tower, and in 1627 he was granted the post of engineer of the Tower of London for life. He wrote the *Gunner's Dialogue*. [p. 106]



FRANCIS EDWARDS LIMITED · *Africa*

474 BLAEU
Morocco and Fez, 20 by 15 ins., 1662. 10s

475 Another Copy, *coloured*. £1 5s

COSTES DE L'AFRIQUE

476 Sur la Mer Méditerranée, *long folding sheet, coloured, with inset plans of Straits of Gibraltar, Algiers, Tripoli, Pierre Mortier*, c. 1720. 12s

477 Costes de l'Afrique. Qui comprend le Royaume de Maroc, &c., *folding sheet, coloured, Pierre Mortier*, c. 1720. 6s

478 DE LISLE (G.)
North Africa, Morocco to Tripoly, *folding sheet, coloured*, c. 1715. 6s

479 DE WIT (F.)
Barbaria, *folding sheet, coloured, Amsterdam, P. Mortier*, c. 1695. 5s

480 DUFOUR (A. H.)
Carte du Gouvernt. D'Alger, et d'une partie du Bassin de la Méditerranée, *folding sheet*, 1844. 6s

481 FEZZAE ET MAROCCHI
Folding map of Fez and Morocco, ships, and decorative title, 13 by 10 ins., *Ogilby*, 1670. 6s

482 GOSSET (Major, R.E.)
Plan of the Bay, City and Environs of Algiers, *folding sheet, Wyld*, 1830. 6s

483 HONDIUS (H.)
Map of Morocco, *with inset view of Penon de Velez, ships and decorative scroll work (small corner missing)*, 1620. 8s

JANSON (J.)

484 Nova Barbariae, *decorative sheet with animals, coloured*, 20½ by 14 ins. [1670]. 10s

485 Africae Propriae Tabula [Tunis, and adjacent country], 20½ by 14¼ ins., 1660. 5s

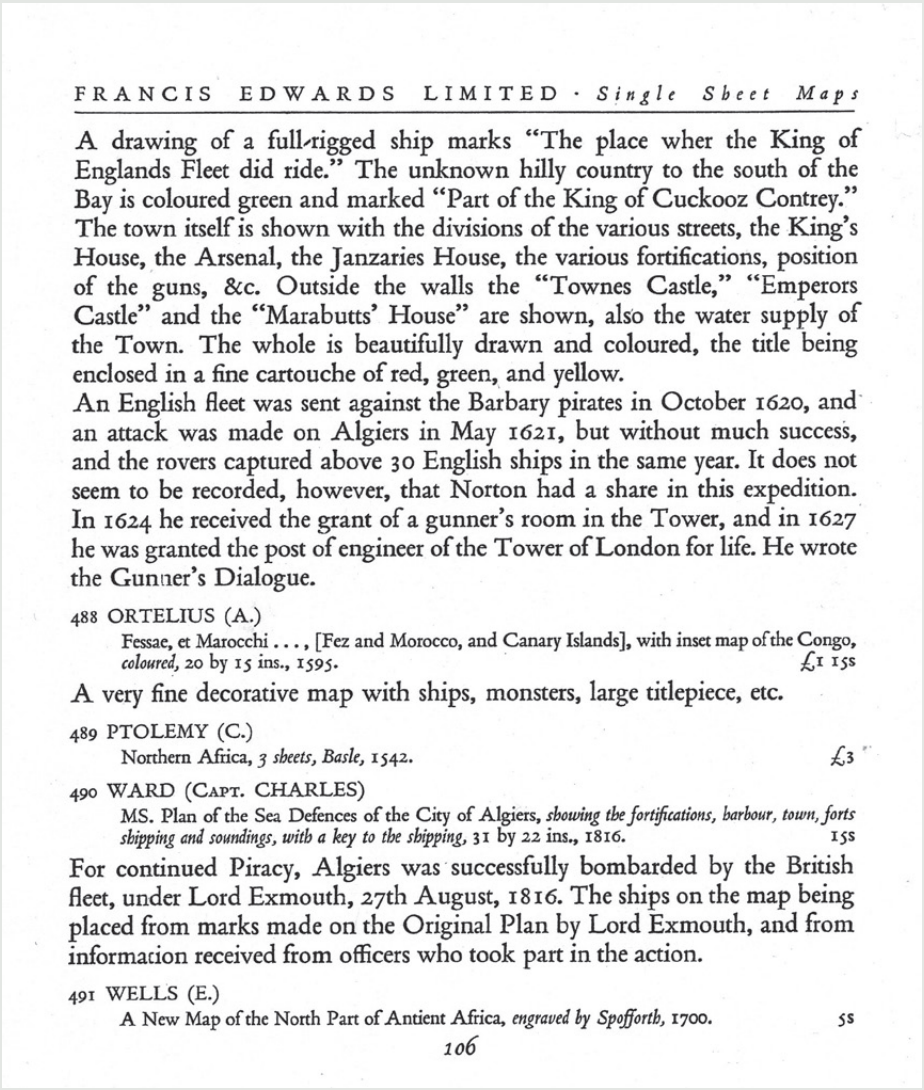
486 HOMAN (I. C.)
Statuum Moroccanorum, *fine folding sheet of Morocco, coloured, with inset views of Morocco and Mequinez*, 1728. 7s

Original Manuscript Map on Vellum 1620

487 NORTON (ROBERT)
The Platt of Argier [Algiers] & the p[ar]ts adioyning within the view thereof made by Robert Norton the Muster Mr of his Ma[ts] Fleet ther A° Di 1620 & by his owne carfull & dilligent obseruations then not wthout danger, 22⅞ by 19½ ins., 1620. £180

105

Figure 1. Item 487, p. 105, of the 1929 Francis Edwards catalogue Old Maps of the World, or Ancient Geography; a Catalogue of Atlases & Maps of All Parts of the World from XV Century to Present Day *(London: F. Edwards Ltd.). This is the first page of item 487: Robert Norton's 1620 Platt of Argier [Algiers] and the p[ar]ts adoiyning within the view thereof made by Robert Norton the Muster Mr of his Mats Fleet ther Ao Di 1620 & by his owne carfull & dilligent obseruations then not without danger." The third of four catalogues in the short-lived "new series" produced in 1929, Old Maps of the World and its companion booklets were larger and far better illustrated than the more than 500 Francis Edwards catalogues preceding it. Courtesy of Francis Edwards Ltd.*



FRANCIS EDWARDS LIMITED · *Single Sheet Maps*

A drawing of a full-rigged ship marks "The place wher the King of Englands Fleet did ride." The unknown hilly country to the south of the Bay is coloured green and marked "Part of the King of Cuckooz Contrey." The town itself is shown with the divisions of the various streets, the King's House, the Arsenal, the Janzaries House, the various fortifications, position of the guns, &c. Outside the walls the "Townes Castle," "Emperors Castle" and the "Marabutts' House" are shown, also the water supply of the Town. The whole is beautifully drawn and coloured, the title being enclosed in a fine cartouche of red, green, and yellow.

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488 ORTELIUS (A.)
Fessae, et Marocchi . . . , [Fez and Morocco, and Canary Islands], with inset map of the Congo, *coloured*, 20 by 15 ins., 1595. £1 15s

A very fine decorative map with ships, monsters, large titlepiece, etc.

489 PTOLEMY (C.)
Northern Africa, *3 sheets, Basle*, 1542. £3

490 WARD (CAPT. CHARLES)
MS. Plan of the Sea Defences of the City of Algiers, *showing the fortifications, harbour, town, forts shipping and soundings, with a key to the shipping*, 31 by 22 ins., 1816. 15s

For continued Piracy, Algiers was successfully bombarded by the British fleet, under Lord Exmouth, 27th August, 1816. The ships on the map being placed from marks made on the Original Plan by Lord Exmouth, and from information received from officers who took part in the action.

491 WELLS (E.)
A New Map of the North Part of Antient Africa, *engraved by Spofforth*, 1700. 5s

106

Figure 2. Item 487, p. 106, of the 1929 Francis Edwards catalogue Old Maps of the World, or Ancient Geography; a Catalogue *(London: F. Edwards Ltd.). This is the second and last page of item 487: Robert Norton's 1620 Platt of Argier [Algiers]. Note the length and detail of the Norton entry compared with other items on pp. 105–106. Courtesy of Francis Edwards Ltd.*

The point is not to criticize Slessor: poets create original works by borrowing from others, and comparisons help us understand the creative process. The annotations simply emphasize what attracted Slessor to this particular item in an ephemeral map catalogue. Certainly the length of item 487 stands out. Dividing the catalogue's 852 entries by 133 pages yields 6.4 entries per page. Yet Robert Norton's map takes up two-thirds of a page, the space of four entries. Several other items are equally long, but most of them describe an entire atlas, not a single map, and they are little more than lists of countries/regions mapped on separate pages within their atlas. Another detail caught Slessor's eye as well. *The Platt of Argier* is one of only four manuscript maps offered in *Old Maps of the World* (items 313, 515, 556). The centered, italicized heading "Original Manuscript Map on Vellum 1620" draws as much attention as its price. Though

£180 may seem like a bargain today, only two maps and six atlases were selling for more.

But something else sparked his creativity. For over a decade, my assumption has been that the catalogue led Slessor to Norton's map. Familiarity with maps, whether individual or generic, is revealed in the work of several poets whom Slessor admired (Dutton 1991; Hawke 1998–99). Shakespeare immediately comes to mind (Turner 2007, 419–420 and n.58), not only because he, like the map-obsessed Donne (416–417 and nn.31–33), was Norton's contemporary, but because "Shakespeare's passion for siege warfare" may be linked "with his remarkable interest in sexually besieged women" (Woodbridge 1991, 338). Slessor favored other poetic models of bygone and partially fictitious cartography closer to his own time. Thomas Hardy, famous for his novels set in "South Wessex" and for the maps with which he illustrated his semi-fictitious county, composed "The Place on the Map" (1914: see Haft 2001, 34–35); Robert Frost wrote "A Brook in the City" about a rivulet whose existence is acknowledged only on "ancient maps" (1921); and Marianne Moore penned "Sea Unicorns and Land Unicorns," a paean to the unicorn and Olaus Magnus's magnificent "marine map" of 1539, the *Carta Marina* (1924: see Haft 2003). But the longer I've compared Slessor's poem and notebook with Norton's actual map, the more convinced I've become that *"The King of Cuckooz" is a poetic response—not to the map itself*—but to a particularly lyrical description of it. And that description does not come not from a famous poem or work of literature, but from a pre-eminently practical and expendable catalogue, no trace of which exists today in any of Australia's public libraries or archives.

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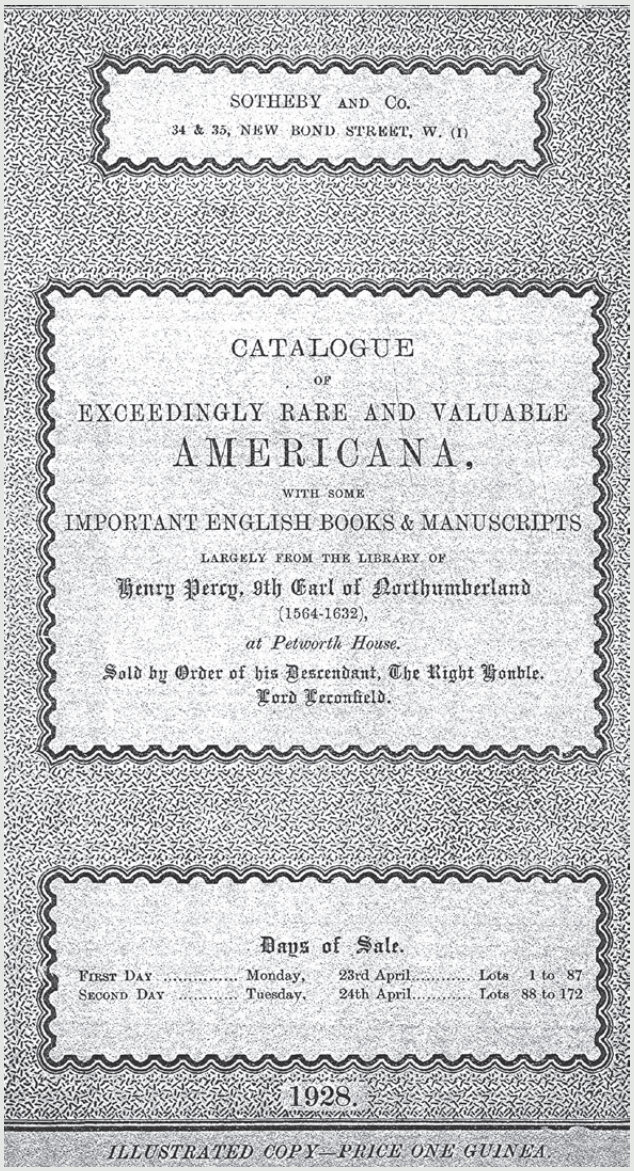
Slessor's strategy was thoroughly modernist. In 1917, T.S. Eliot had remarked: "One of the ways by which contemporary verse has tried to escape the rhetorical, the abstract, the moralizing, to recover (for that is its purpose) the accents of direct speech, is to concentrate its attention on trivial or accidental or commonplace objects" (quoted in Thomson 1968, 13). Australian poet/essayist A.D. Hope believed Slessor had achieved just that: "Slessor's great triumph was to take the unpromising material he found to hand, to accept the romantic farrago and create a genuine poetic world" (ibid., 130).

Old Maps of the World is not just any catalogue, however. Just compare its description of the *Platt of Argier* with the one in the Sotheby & Company catalogue dated April 23–24, 1928 (see Migrations 1928, 63). Titled *Catalogue of Exceedingly Rare and Valuable Americana* (Figure 3), the Sotheby & Company booklet deals with "important English books and manuscripts largely from the library of Henry Percy, 9th Earl of Northumberland (1564–1632), at Petworth House" (Sotheby & Co. 1928). Because Percy "owned maps,…, globes and Saxton's *Atlas*, and he [had] bought two copies of Ortelius's 'Theater of the worlde' for £1 in 1610" (Steer, Eden, and Bendall 1997, 1:29), it is not surprising that among the items auctioned by Sotheby's of London on April 23rd were two precious works by Norton. Item 110 may have been a first edition of his *The Gunners Dialogue, with the Art of Great Artillery*, described as "apparently unrecorded and the only copy known" (Sotheby & Co. 1928, 46–47). Item 81 reads: "MAP. ALGIERS. THE PLATT OF ARGIER & the p[art]s adoiyning within the View thereof MADE BY ROBERT NORTON…" (ibid., 36). Though only one-third of a page long, item 81 is

almost identical to item 487 in the Francis Edwards catalogue (Figure 4). The few details that distinguish the Sotheby & Co. entry are the words "see lot 110," after "The Gunner's Dialogue"; a reference to an article on Norton in the


SOTHEBY AND CO.
34 & 35, NEW BOND STREET, W. (1)

CATALOGUE
OF
EXCEEDINGLY RARE AND VALUABLE
AMERICANA,
WITH SOME
IMPORTANT ENGLISH BOOKS & MANUSCRIPTS
LARGELY FROM THE LIBRARY OF
Henry Percy, 9th Earl of Northumberland
(1564-1632),
at Petworth House.
Sold by Order of his Descendant, The Right Honble.
Lord Leconfield.

Days of Sale.

First Day	Monday,	23rd April.....	Lots 1 to 87
Second Day	Tuesday,	24th April.....	Lots 88 to 172

1928.

ILLUSTRATED COPY—PRICE ONE GUINEA.

Figure 3. Cover of the 1928 Sotheby & Co. Catalogue of Exceedingly Rare and Valuable Americana: With Some Important English Books & Manuscripts, Largely from the Library of Henry Percy, 9th Earl of Northumberland *(London: Printed by J. Davy and Sons). This beautifully illustrated 81-page catalogue measures 25.4 by 17.8 by 1 cm (10 x 7 x 3/8 inches). Among the treasures auctioned off in London by Sotheby & Co. on April 23, 1928 were two important works by Robert Norton (d. 1635): a possible first edition of* The Gunners Dialogue, with the Art of Great Artillery *(1628: item 110, pp. 46–47), and his manuscript map of Algiers (1620: item 81). Courtesy of Sotheby's.*

Dictionary of National Biography; the absence of a price for the map (or any other item); and the phrase "original coloured map drawn on vellum," which the Francis Edwards catalogue transformed into "Original Manuscript Map on Vellum 1620." The two catalogues' nearly identical wording and proximity in time allow us to make the following inferences:

(1) Francis Edwards Ltd. purchased Norton's manuscript map at the Sotheby & Co. auction on April 23, 1928.

(2) Francis Edwards Ltd. then issued its own catalogue, which, though undated, came out in 1929. Its entry on Norton reproduced, word-for-word, almost everything the Sotheby & Co. catalogue said about the map.

(3) *Old Maps of the World* didn't just lift material from its source catalogue, however. It also added a price and, far more crucially, a detailed description of what the map actually shows. *As the red section in my reproduction of entry 487 indicates, this new detail accounts for a third of the Francis Edwards entry* (see pages 12–13, above).

81 MAP. ALGIERS. THE PLATT OF ARGIER & the p[ar]ts adioyning within the View thereof MADE BY ROBERT NORTON the Muster Mr of his Mats Fleet ther A° Di 1620 & by his owne carfull & dilligent obseruations then not wthout danger, ORIGINAL COLOURED MAP DRAWN ON VELLUM 22⅞ *in. by* 19½ *in.* 1620

*** A drawing of a full-rigged ship marks "The place wher the King off Englands Fleet did ride." The unknown hilly country to the South of the Bay is coloured green and marked "Part of the King of Cuckooz Contrey."

An English fleet was sent against the Barbary pirates in October, 1620, and an attack was made on Algiers in May, 1621, but without much success, and the rovers captured above 30 English ships in the same year.

It does not seem to be recorded that Norton had a share in this expedition (*see* Art. NORTON in D.N.B.). In 1624 he received the grant of a gunner's room in the Tower, and in 1627 he was granted the post of engineer of the Tower of London for life. He wrote "The Gunner's Dialogue" (see lot 110).

Figure 4. Item 81, p. 36, in the 1928 Sotheby & Co. Catalogue of Exceedingly Rare and Valuable Americana: With Some Important English Books & Manuscripts, Largely from the Library of Henry Percy, 9th Earl of Northumberland *(London: Printed by J. Davy and Sons). Although there is no evidence that Slessor ever saw the Sotheby catalogue, its item 81 was copied extensively into the 1929 Francis Edwards catalogue (item 487). But the 1929 catalogue also added pizzazz, turning the dull opening of the Sotheby & Co. item "Map. Argiers. The Platt of Argier…" into the eye-catching "Original Manuscript Map on Vellum 1620." Courtesy of Sotheby's.*

Ultimately, it wasn't the length or historical detail of the Francis Edwards entry that appealed to Slessor. It was its poetic evocation of precisely the concrete images and exotic words that so intrigued him: "The King's House," "the Arsenal," "the Janzaries House," "Marabutts House," "Emperors Castle," "drawn in red, green & yellow" (Francis Edwards 1929, 106). These phrases,

assiduously copied by Slessor into his notebook (March 4, -s63), are the very ones that *Old Maps of the World* introduced into its description of Norton's map. And they, along with others on that catalogue page (Francis Edwards 1929, 106), inspired him to begin "The King of Cuckooz":

> The King of Cuckooz Contrey
> Hangs peaked above Argier
> With Janzaries and Marabutts
> To bid a sailor fear…

"THE KING OF CUCKOOZ" MEETS THE *PLATT OF ARGIER*

But why discount Norton's map as the visual inspiration for "The King of Cuckooz"? To answer this question, we need to compare the plan with Slessor's poem.

Norton's 1620 Platt of Argier has been housed in the National Maritime Museum in London since November 1970 (Gillian Hutchinson, e-mail to author, September 23, 2009). Recently the museum reprinted the map in *Treasures of the National Maritime Museum* (NMM, Clifton, and Rigby 2004, "Pirates and Privateering," 148–149) and digitized it for online viewing.

Prior to these efforts, however, locating a reproduction of Norton's manuscript map would have proved very difficult. Neither the 1928 Sotheby & Co. catalogue nor its 1929 Francis Edwards counterpart depict the plan. Furthermore, the Sotheby & Co. catalogue suggests that *during Norton's lifetime*, his *Platt of Argier* came into the possession of Henry Percy. Three centuries later, Percy's library—including Norton's map of Algiers and a rare copy of *The Gunner's Dialogue*—was auctioned to Francis Edwards. For the next forty years, from 1928 to 1970, there is little record of the *Platt of Argier* until the National Maritime Museum purchased it from an Amsterdam dealer of maps and fine books (Gillian Hutchinson, e-mail to author, September 23, 2009). Of all the Francis Edwards catalogues published during that period, only *Old Atlases and Books on Astronomy and Cartography* depicts the map (Francis Edwards 1936, item 1) and it appeared several years after Slessor composed "The King of Cuckooz." Could he have sent away for a photograph? A note beside another manuscript map in *Old Maps of the World* states that "a photograph can be supplied to an intending purchaser on application" (Francis Edwards 1929, 108–109, item 515). But no evidence of such a photograph exists in Slessor's meticulously preserved papers. Which means that, beginning in 1928, a window opened in which to view and purchase Norton's vellum manuscript, a window that allowed Slessor—through a particularly succinct and evocative catalogue description—to learn enough about the map's appearance to create "The King of Cuckooz." He probably never saw the map, not even in facsimile, while writing *The Atlas*—and perhaps never in his lifetime.

"The King of Cuckooz" thus "stands for" the map, in the same way a map can be said to stand for a territory. The very meticulousness with which Slessor took notes on the catalogue's report of the Algiers plan makes him a poetic

Figure 5. Robert Norton, The Platt of Argier & the pts. adoiyning within the View therof Made by Robert Norton the Muster Mr of his Mats Fleet ther Ao Di 1620 & by his owne carfull & dilligent obseruations then not without danger, *1620. This colored manuscript map on vellum measures 58 by 49 cm (22 7/8 by 19 1/2 inches), is oriented west, and has a scale of around 1:40,000. (Repro ID: K1034 © National Maritime Museum, Greenwich, London). The 1929 Francis Edwards catalogue offered it for £180 (p. 105). To reveal hidden details, zoom into the online version at the National Maritime Museum, http://collections.rmg.co.uk/collections/objects/546569.html (May 28, 2012). © National Maritime Museum, Greenwich, London.*

cartographer selecting and manipulating data for his own map, or "controlled fiction" (Muehrcke and Muehrcke 1978, 103; see Wood and Fels 1992, 78, 88; Harley and Laxton 2001, 52, 162–163, 106–107, 251). Ultimately about the power and delights of the imagination, the poem remains thoroughly grounded within the medium of language, however, even in those instances where the poet looks to other sources of inspiration, such as maps.

The *Platt of Argier* would not have disappointed him, however (Figure 5). While accurately depicting what Norton's contemporaries reported of the town (see Yver [1913–1927] 1987a, 1:258–261; Spencer 1976, 29–30), it resembles "The King of Cuckooz" in combining threat and romance. With the delicacy of a landscape painting, Norton's map pictures a bay full of waves surrounded by a green, mountainous countryside. Within the bay, a single large ship represents the expedition that James I of England sent against Algiers in 1620–1621. The ship floats upon the words "The place wher the King of Englands Fleet did ride," which Slessor turned into "When by the Bayes of Africa/ King James's Fleet did ride" (lines 35–36). Several rocky islets and "The Mould" ("mole"/"breakwater") shelter smaller vessels. West of the harbor is the red triangle of Algiers, an imposing and picturesque town that rises to its heavily fortified "peak," the citadel known as the "Cassabaw" ("Casbah"), complete with arsenals and barracks. The Francis Edwards catalogue describes the map's depiction of the buildings, ramparts, and guns inside Algiers; and just outside, its monuments, water supply, and free-standing fortifications or "castles." Surrounding the town are thick walls, punctuated by gates and bastions, and topped by an impressive array of cannons. Along the eastern walls, near the rocky outcrop that parallels the mole, "The Ianizaries House" identifies the largest of the barracks where up to 600 Ottoman soldiers known as janissaries were housed and fed (Spencer 1976, 32; Wolf 1979, 60). Outside the northeastern wall stands "The Marabutts House." This traditional circular building capped with a blue roof and crescent moon most likely entombs a revered holy man, known in North Africa as a "marabout." Such "patron saints" were believed to protect Algiers from disaster (McDougall 2006, 146; Spencer 1976, 77); corsair captains, when sailing past the shrine of a favorite marabout, would dip their flag and utter a prayer before departing in search of booty and slaves (Wolf 1979, 143). The map's yellow neat line, while missing on the right side, encloses the rest of the scene, which is oriented west, as we can tell from the cardinal directions written inside each line. At bottom-left, an elaborate cartouche in green, red, and yellow frames the map's title, copied faithfully into *Old Maps of the World* as well as Slessor's epigraph for "The King of Cuckooz." Beside the cartouche there seems to be a narrow peninsula, though it is actually the African coast stretching east from Algiers towards "Cape de Montafooz" (lower right corner). Just inland, the pale green area bears the tantalizing words "Part of the King of Cuckooz Contrey."

For Slessor, the name "Cuckooz Contrey" couldn't have been more romantic. Today, an internet search for "Cuckooz" uncovers only Slessor's book and the explicit lyrics of "One Flew over the Cuckooz Nezt," a 2001 album by B.G. Evil. The name also evokes the migrating cuckoo birds that breed in northern Algeria (Wilkin [1900] 1970, 97; Hollom 1988, 129), or Cloudcuckoo Land, the comic utopia of the Greek playwright Aristophanes (*The Birds*, 414 BCE). On the other hand, the resemblance between "Cuckooz" and "cuckoo" made

Slessor's biographer Geoffrey Dutton speculate that the poet, distressed by his wife's infidelity, called his collection Cuckooz Contrey because "'cuckoo' is so close to 'cuckold,' 'contrey' to the 'country matters' of Shakespeare" (1991, 136). To Slessor, whose poetry notebook lists Cuckooz Contrey among "Lost Countries" (March 6, -s65), the attraction was precisely that it was "unknown." Despite his enthusiasm for "master[ing] the period" whenever he composed "an historical poem, or a poem touching history in any way" (Thomson 1968, 39), the mystery of the name freed him to create his own "take" on the mysterious King of Cuckooz. That Slessor "got it wrong" is not surprising given how little is known, even today, about Norton's delicately colored military map. Or about his role in the 1620–1621 English expedition against the Barbary pirates of Algiers. Or about the complex feuds between and among European powers and the heterogeneous populations of the Algerian coast during the three centuries of Ottoman occupation.

BARBAROSSA AND "THE KING OF CUCKOOZ"

Slessor modeled the King of Cuckooz most obviously upon the first Ottoman pasha of Algiers. Kheir-ed-din—better known as "Barbarossa" or "Red beard"—is one of the most charismatic leaders in history.[8] Born in the Levant (Wolf 1979, 6) or Mytilene (Abun-Nasr 1987, 148), Barbarossa became leader of Algiers after the death in battle of the "original" Barbarossa, his elder brother, Aroudj, whom the people of Algiers had invited into their city (1516: Wolf 1979, 8) to help rid them of their Spanish overlords.

The trouble had originated when Ferdinand and Isabella began expelling those who refused to convert to Christianity or apostatized from it, and Spanish Muslims embarked on more than a century-long flight to Algiers and other parts of coastal North Africa (ibid., 175). These so-called "Moriscos" then convinced the Muslim population to join them in raiding the coasts of Spain and its territories. In retaliation, Ferdinand established fortified positions called "presidios" along the coast of the Maghrib—the area extending from Tripoli to Morocco—in order to chasten the most powerful of the North African "pirate" states (ibid., 1, 67; Spencer 1976, 16). The jihadist raiders of Algiers found themselves frustrated economically and militarily as soon as the Spaniards built a presidio, packed with cannons (1510), on the largest of the harbor islands for which Algiers was named (Arabic, *El Jezair,* "the islands": Reclus and Keane 1886, 268; see Morgan [1731] 1970, 214–215; Spencer 1976, 4). Barbarossa recognized that he lacked both the weapons and men to repel the Spaniards, and that he was outnumbered by the tribesmen of the interior. He therefore took a step that altered the history of Algiers and the central Maghrib for the next three hundred years: he wed Algiers to the Ottoman Empire, thus creating the Regency of Algiers.

In 1519, Barbarossa became pasha of Algiers and received reinforcements from the Sultan: 4,000 Anatolian recruits, cannons and other munitions, and 2,000 janissaries—members of the Sultan's elite and fiercely loyal militia, originally composed of those taken as "boy tax" from the Balkan Christian communities conquered by the Ottomans (Wolf 1979, 7, 10, 57–58). Ten years

later, Barbarossa freed Algiers from two decades of Spanish occupation by destroying the presidio (1529). To prevent another from being built, he began construction of the massive mole that still extends from the town to the island on which 200 Spanish soldiers had been garrisoned (Yver [1913–1927] 1987a, 1:258). Promoted in the mid-1530s to High Admiral of the Ottoman Empire, Barbarossa left Algiers as "the western base of the Ottoman empire" (Wolf 1979, 30). He spent his last decade terrorizing the Mediterranean and winning so much booty that he became a legend in his own time. A 1537 raid on the Greek islands (so we are told) won him 1,000 girls, 15,000 boys, and 400,000 pieces of gold (Lewis [1929] 1969, 79). Another account dismisses the "malicious French report" that in 1546, while in his sixties, Barbarossa "'died exhausted by the manifold vices of the harem'" (Bradford 1968, 203). Edward Currey, whose *Sea Wolves of the Mediterranean* is in the Bayldon Nautical Collection along with Charles Lewis's Famous *Old-World Sea Fighters*, begrudgingly praises this enemy of Christendom (Currey 1928, 45):

> In this man [Kheir-ed-din] the genius of the statesman lay hidden beneath the outward semblance of the bold and ruthless pirate…. With a brain of ice and a heart of fire, he looked out, serene and calm, upon the turbulent times in which he lived, a monstrous egotist desiring nothing but his own advancement, all his faculties bent upon securing more wealth and yet more power.

Slessor adapted stories of Barbarossa, subsequent pashas, and wannabes to make his hedonistic King of Cuckooz into the stereotypical "lusty Turk" with wives and concubines galore. After all, "earlier Eurocentric historians and sensationalist writers on piracy give us an impression of Algiers as a kind of ravening horde in a state of perpetual arousal" (Wilson 2003, 29; see Wolf 1979, 61; Marcus [1966] 1967, 200-219, "The Lustful Turk"). Portraits of Barbarossa show him with "as fierce a beard" as the King of Cuckooz, whose beard Slessor's narrator compares with his own (see Bradford 1968, opposite 112; Wolf 1979, 124). If Geoffrey Dutton once complained that "the galleons and pirates of Captain Bayldon's books were also Lindsay's stock-in-trade" (1991, 144), Lindsay's illustration on the frontispiece of *Cuckooz Contrey* shows three views of a heavily bearded monarch, attired in a plumed turban and caftan, and surrounded by galleons and armed adventurers (Figure 6). In every view, his King of Cuckooz resembles an Ottoman pasha, like Barbarossa, being conveyed in outrageous style and accompanied by naked beauties. Slessor himself emphasized the wealth of the town, whose fame and fortune depended almost entirely upon privateering in the sixteenth century and outright piracy in the seventeenth (Wolf 1979, 54, 113). Captives, whether kept for slaves and or sold for ransom, were the basis of Algiers' economy. And though unusual, female captives did marry the corsairs who put "the silver manacle around [their] dainty leg." A young Italian noblewoman, for example, is said to have wed the much older Barbarossa (ibid., 166). Besides "silver," the poem's "satin boots," "royal bamboo," and "Sultan's pearl" echo the exotic products that flooded into the town following raids on coasts and merchant vessels. Fra Diego de Haëdo, the Spanish author and Benedictine monk imprisoned in Algiers from 1578 to 1581 (ibid., 341), described the "Gold, Silver, Pearls, Amber, Spices, Drugs, Silks, Cloths, Velvets, &c.,… whereby [this Den of Thieves] have rendered…this City the most opulent…[in] the World: insomuch that the Turks call it, and not

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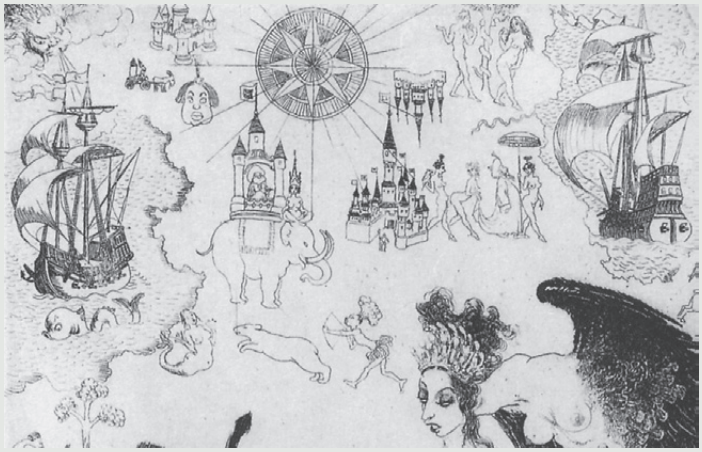

Figure 6. Two views of the King of Cuckooz on Norman Lindsay's frontispiece, the only illustration in Kenneth Slessor's Cuckooz Contrey *and a visual counterpart to the The Atlas's recreation of the world portrayed on seventeenth-century maps (Sydney: Frank C. Johnson, 1932). This detail (upper-left) shows the king as he rides on an elephant (Slessor's "snow-white elephant"), and is conducted from his "floating castle" by naked beauties holding a parasol and a large bird ("the King's own hunting-falcon"). The third view, with the king carried on a litter by four "naked Concubines," appears near the right margin below the hovering Harpy. Standing like the rest of Lindsay's figures on an old chart, the heavily bearded monarch attired in a plumed turban and caftan not only stands resembles Barbarossa/ Kheir-ed-din, Algiers' most charismatic corsair and pasha. © Lin Bloomfield, Odana Editions, Bungendore, NSW, Australia.*

without abundance of reason, their India, their Mexico, their Peru" (quoted in Morgan [1731] 1970, 593–594). Although Slessor ornamented his poems and home with such luxuries, "The King of Cuckoo" doesn't dwell on the finery befitting its king. Nevertheless, Slessor would have enjoyed what Dey Sidi Hassan (1790–1798) reportedly wore during an interview with the American consul to Algiers (quoted in Spencer 1976, 65):

> "His feet [were] shod with buskins bound upon his legs with diamond buttons in loops of pearl; round his waist was a broad sash glittering with jewels, to which was suspended a broad scimitar, its sheath of the finest velvet…"

Just as his predecessors had done with Barbarossa, Slessor created his King of Cuckooz by wedding the "lusty Turk" to the romance of the pirate (see Heers 2003, 232–236) (Figure 7).

Without its defenses, Algiers never could have remained affluent for three centuries. Over and over "The King of Cuckooz" refers to Algiers' "walls," "fort[s]," and "battlement[s]," its "basilisks" and "cannon-balls," its "Janzaries and Marabutts/ [that] bid a sailor fear." Barbarossa, through his union with the Ottoman Empire, put together in Algiers the tripartite system that

Figure 7. Plan of Algiers, by Antonio Salamanca, 1541 (or after one of the engravings derived from it). Plate 59, volume II in Civitates Orbis Terrarum, *edited by Georg Braun, Franz Hogenberg, and Simon Novellanus [van den Neuvel] (Cologne: Gottfried von Kempen, 1575). Like most Braun and Hogenberg maps, this one features a "native" in local attire. The regal man in the Ottoman turban and caftan stands, in the lower left, precisely the same place where Norton wrote "Part of the King of Cuckooz Contrey" on his plan. On this map attributed to Antonio Salamanca (c.1500–1562: Skelton 1965, volume 1, xlii and pt.2, plate 59; Tooley 1999–2004, 4:94), the words behind the Ottoman gentleman say nothing about Cuckooz, but lament the disastrous defeat of Charles V in 1541, the year the original map is believed to have been created (Tooley 1939, 22 [96]; Braun, Hogenberg, and Skelton 1965, 1:xlii). Instead of Norton's single European ship, the small, easily maneuverable vessels of the Algerian pirates appear in the harbor. Otherwise, Norton's plan covers the same area and employs the same orientation and colors as the larger (30 x 43.5 cm) hand-colored copperplate shown here. This map is made available online by Historic Cities, a website created by the Historic Cities Center of the Department of Geography, the Hebrew University of Jerusalem and the Jewish National and University Library. <http://historic-cities.huji.ac.il/algeria/algiers/maps/braun_hogenberg_II_59_b.jpg> (August 3, 2011). Courtesy of the Hebrew University of Jerusalem & the Jewish National and University Library.*

maintained perhaps the most enduring "foreign army of occupation" (Wolf 1979, xi). That system included the pasha, who owed his power to the Sultan in Constantinople; the corsairs, who, like Barbarossa, sailed the seas for prizes; and the janissaries, the foreign infantrymen whom Barbarossa introduced and helped to organize into a corps of mercenaries that policed the city, protected it from its neighbors, and expanded its power throughout the central Maghrib. Slessor's "ram with stars their basilisks" imagines cannons shooting the very stars that, spangled across a green background, decorated the corsairs' flag of Algiers (ibid., 114). Even his charming "like a tempest driving flowers" alludes to the savage

northeasters that repeatedly humbled invaders. One devastated the Spanish armada escorted by Charles V, the Holy Roman Emperor (1541), for whom such tempests were called "Charles's gale" as recently as the early twentieth century (Lane-Poole [1901] 1970, 119). Slessor's comparison of his King to a tempest also has precedent: "Often it has been remarked," says one historian, "that the very Elements, the Tempests themselves, have seemed to fight for the no less tempestuous Algerines" (Morgan [1731] 1970, 301). To many Europeans, "'well-guarded Algiers'" appeared "invincible" and "totally secure under the protection of a mightier God than theirs" (Spencer 1976, 23, 29, 26, respectively). Ultimately, Ottoman Algiers would survive twelve major attacks before falling to the French in 1830 (Reclus and Keane 1886, 268; Wolf 1979, 333)—more than two centuries after Norton made his military map, and exactly a century before Slessor wrote "The King of Cuckooz."

ROBERT NORTON AND KING JAMES'S FLEET: ALGIERS, 1620–1621

James I, King of England from 1603 to 1625, mounted one of those failed attacks in 1620.

Attacks by Algiers on English shipping had began in earnest during the 1580s as a result of the decline of the Ottoman navy after Lepanto (1571) and the Sultan's belated decision (1587) to curtail the ever more independent and powerful Algerian regency. England, though hostile to Spain and technically at peace with the Sultan (1585–1604: Wolf 1979, 178, 184–185; Lane-Poole [1901] 1970, 162), nevertheless found herself increasingly at the mercy of "this den of thieves," to use Haëdo's scathing term for Algiers (quoted in Morgan [1731] 1970, 593–594). The corsairs reduced the power of their pasha even further and gave only lip service to the Sultan in far-away Constantinople (ibid., 575ff.; Wolf 1979, 187–198). To compound the problem, after James I signed a peace treaty with Philip III of Spain in 1604, Englishmen-turned-pirates brought to Algiers their light sailing ships as well as the skills necessary to slip through Gibraltar and navigate the Atlantic Ocean (Morgan [1731] 1970, 627–637; Braudel and Reynolds 1976, 884–886; Spencer 1976, 124–125). Many of these men's "careers read like improbable romances" (Waters 1978, 2:253). In *True Travels, Adventures, and Observations* (1630), for instance, Captain John Smith reported that John Ward (1553–1623), "'a poore English sailer,… lived like a Bashaw ["pasha"] in Barbary'" (quoted in Waters 1978, 2:253; Lloyd 1981, 48–53; Wilson 2003, 55, 67–68)—*a life-style to which Slessor's narrator patently aspires*. Between 1609 and 1619, the number of renegades who voluntarily adopted Islam in Algiers included "'300 English'" (Jean-Baptiste Gramaye 1620, quoted in Spencer 1976, 127). And during the first seven of those years, the pirates of Algiers captured as many as "466 British vessels" on the high seas (Clowes et al. 1897, 2:22, and Waters 1978, 2:253: cf. Wolf 1979, 184). So intolerable had matters become that in 1616 the English ambassador to Spain, Sir Francis Cottingham, is said to have written from Madrid (quoted in Morgan [1731] 1970, 629):

> "The Strength and Boldness of the Barbary Pirates is now grown to that Height, both in the Ocean and Mediterranean Seas, as I have never

> known any thing to have wrought a greater Sadness and Distraction in this Court."

There was certainly reason for Slessor's King of Cuckooz to be so nonchalant.

The result was that the normally war-adverse King of England bowed to pressure and sent against Algiers the Vice-Admiral of England, Sir Robert Mansell (1570/71–1652: Thrush 2004, 36:537). Mansell left England at the head of a fleet comprising 18 ships, 2600 men, and 500 cannons (Lane-Poole [1901] 1970, 272).[9] But whereas Admiral Sir William Monson had expressed reluctance in 1617 to launch such an expedition and warned the government to prepare in secret for *multiple campaigns involving as many allies as possible* (Playfair [1884] 1972, 38, emphasis mine; see Monson [1703] 1902, 252–256; Morgan [1731] 1970, 632–639):

> James, however, [was] determined to carry out the expedition himself; it was the only warlike undertaking of his reign, and *the fleet which he sent against Algiers was the first English naval force that ever entered the Mediterranean, at least since the Crusades* (Playfair [1884] 1972, 38: emphasis mine).

Both the *Platt of Argier* and Slessor's narrator hint at the pride and confidence that marked the expedition in 1620, even if Norton has represented "the place wher the King of Englands Fleet did ride" with only a single, over-size ship. Yet, despite its promise and numbers, the "first war between England and the Algerian Regency" proved comically futile (Wolf 1979, 188). The Spanish sent no reinforcements and Mansell didn't assist a Spanish squadron when it finally arrived and fired upon the town (December 1620). The English fleet then retired to Spain, but misunderstandings prevented Mansell from obtaining Dutch or Spanish aid for his return to Algiers. Of the many hundreds of English captives detained in the corsair capital, Mansell freed only forty. He captured not a single pirate ship during the winter; and in May/June 1621, he sank only one enemy vessel, took another, ran a third ashore, and rendered two others "unserviceable" while attempting to fire-bomb the entire fleet (Mansell 1621, in *Cabala* 1663, 324). Worse still, when Mansell departed for England, the regency captured nearly thirty-five English ships under sail (NMM, Clifton, and Rigby 2004, 149). Not only did suspicions of bribery surround the expedition (Clowes *et al.* 1897, 2:18), but Mansell has gone down as "one of the most inept admirals in history" (Lloyd 1981, 67) and "one of the most corrupt officials in a most corrupt epoch" (Callender 1924, 81). He left Algiers poised to dominate the entire Mediterranean (Braudel and Reynolds 1976, 886) with the town's 125,000 individuals holding "'Scots, English, [and] Irish'" among its more than 20,000 Christians captives (Playfair [1884] 1972, 885; see Yver [1913–1927] 1987a, 1:260–261; Spencer 1976, 31, 127; Wolf 1979, 97, 150). The corsairs, at the peak of their power, roamed so far afield that they were attacking ships in British waters.[10] Nevertheless, because Algiers proved a useful, if inconstant ally in damaging England's enemies *and* trade rivals, the town survived far longer than her size might warrant (Reclus and Keane 1886, 268–269). As Louis XIV famously quipped: "'If there were no Algiers I would myself make one'" (Playfair [1884] 1972, 159).

Despite its promise and numbers, the "first war between England and the Algerian Regency" proved comically futile.

"Not without danger" suggests Norton's good fortune at escaping death or capture. Although Algiers ransomed most captives, Norton's skills would have made him too valuable for release (see Wolf 1979, 161). Slessor's poem certainly hints at the dangers posed to both sides "When by the Bayes of Africa/ King James's Fleet did ride." But whether Norton actually sailed with Mansell has proved a fascinating puzzle. In the "Author's Note" to "The King of Cuckooz," Slessor states that Norton "probably took part" (Slessor 1932, 75; Slessor, Haskell, and Dutton 1994, 358). The Francis Edwards catalogue from which Slessor took his information hedges its bet by saying, "it does not seem to be recorded that Norton had a share in this expedition" (Francis Edwards 1929, 106). And the Sotheby & Co. catalogue, the apparent source of the Francis Edwards quotation, cites the *Dictionary of National Biography* as the basis for *its* skepticism (Sotheby & Co. 1928, 36). That prestigious, multi-volume dictionary emphasizes Norton's highly technical publications in mathematics (1604–1623) and his books on artillery: *Of the Art of Great Artillery* (Norton 1624), *The Gunners Dialogue, With the Art of Great Artillery* (Norton 1628b), and *The Gunner* (Norton 1628a). As an engineer and gunner, Norton received promotion to the Tower during the years he was composing his artillery manuals. There he was given a "gunner's room" (1624) and "the post of engineer of the Tower of London for life" (1627)—details from the dictionary (Porter 1921; Glozier 2004) that appear word-for-word in both catalogues. The dictionary is silent, however, not only about Norton's possible role in the English expedition but also about his career as a surveyor. Elsewhere we discover that for two decades beginning in 1611, Norton was surveying estates in Sussex and Yorkshire as well as in Northumberland (Plackett 2000, 193–194; see Steer, Eden, and Bendall 1997, 2:381, N129). During the 1620s Norton surveyed several manors belonging to Henry Percy, whom Norton, as a member of the royal service, may have met when the 9th Earl of Northumberland was imprisoned in the Tower (1605–1621: Batho 1959, 72; Steer, Eden, and Bendall 1997, 1:29; Plackett 2000, 193 and n.10). One of the estates visited by Norton was Petworth House (Plackett 2000, 193 n.10), Percy's principal residence (Batho 1957, 435). The library at Petworth House housed several of Norton's surveys (Steer, Eden, and Bendall 1997, 2:381) in addition to his *Platt of Argier* and a rare copy of *The Gunners Dialogue.* Norton had originally dedicated that book to the Duke of Buckingham (Norton 1628b: Glozier 2004, 41:185), the very gentleman who, as Lord High Admiral, had sent Mansell to suppress the pirate base at Algiers (Thrush 2004, 36:539).

Norton's mapping skills, his military service as officer and ballistics expert, his reference on the Platt of Argier *to "Cuckooz Contrey," and his title "Muster Master of his Majesty's Fleet"*—all of these facts point to his having taken part in Mansell's expedition against the pirates of Algiers.

Norton's mapping skills, his military service as officer and ballistics expert, his reference on the Platt of Argier to "Cuckooz Contrey," and his title "Muster Master of his Majesty's Fleet" (a military term for the person "who takes an account of troops, and of their equipment" [*Webster's Revised Unabridged Dictionary*, 1913, s.v. "muster master"])—*all of these facts point to his having taken part in Mansell's expedition*. That's exactly how the National Maritime Museum promotes its map (Waters 1978, 2:446; NMM, Clifton, and Rigby 2004, 49). And even earlier, a 1934 Francis Edwards catalogue asserted that Norton not only sailed to Algiers in 1620, but "*it is very likely* that [his] valuable plan of the town's defences, or a copy, was utilized by the expedition that attacked Algiers, unsuccessfully, in the following year" (p. 13, item 48: emphasis mine).[11]

So what *did* Slessor know about Norton, or the *Platt of Argier*? Nothing more, in all likelihood, than what he found in item 487 of the Francis Edwards catalogue. Several reasons can be cited for such doubt. Just before its entries, *Old Maps of the World* offers brief insights into each of the cartographers named in the epigraphs of *The Atlas* poems—each, that is, except for Norton (Francis Edwards 1929, 6–7). Not one of the books in Bayldon's collection mentions him, let alone depicts his map. Furthermore, Slessor's epigraphs for both "The King of Cuckooz" and *Cuckooz Contrey* came directly from the catalogue (5 April, -s90). The same is true of his spellings for the exotic names in his first stanza: "King of Cuckooz Contrey," "Argier," "Marabutts," and "Janzaries"—the last of which is spelled more accurately on the map as "Ianizaries" (Norton 1620).

So what did Slessor know about Norton, or the Platt of Argier? Nothing more, in all likelihood, than what he found in item 487 of the Francis Edwards catalogue.

But what if "The King of Cuckooz" echoes some detail *on the map* that is not described *in the catalogue*? One word alone suggests that the poet might have seen Norton's map: the "basilisks" that Slessor's astrologers "ram with stars… / instead of cannon-balls." A mythical serpent whose very glance/breath proved fatal, the word "basilisk" had by Norton's time morphed (like the names of other poisonous snakes) into a type of cannon; more specifically, a big brass cannon capable of shooting 200-pound balls. Although not mentioned in *Old Maps of the World*, the word appears prominently on Norton's map. "2 Basilisks" is written under two over-sized cannons on the coastal battery running north from Barbarossa's massive breakwater, "The Mould," toward "The Marabutts House." Yet any hopes that "basilisk" may raise are dashed when we discover how many alternatives for "cannon" crop up in Slessor's draft of "The King of Cuckooz." Always a stickler for the "right word," Slessor filled his notebooks with lists of synonyms in order to find the one that "sounded right" and had "the right associations" (Dutton 1991, 147; see also NLA MS 3020 2/1/—). Nowhere is this more obvious than in his "March 22" entry: "And ram their basilisks with stars"; "And ram with stars their basilisks/cannonades/parrot-guns"; "And ram their firelocks full of stars" (-s79). In fact, any source on seventeenth-century cannons could supply "basilisk"—just as Norton's *Gunners Dialogue* (Norton 1628b, 2–3) might have informed Slessor that "falcons" and "fowlers" were small cannons, a detail that turns "The King's own hunting-falcon" into a double entendre.

Finally, since no living thing animates Norton's map, Slessor's "snow-white elephant" may come from four famous lines by Jonathan Swift (*On Poetry, a Rhapsody*, 1733, 1.169–182), whose "combination of the satiric and fantastic in voyages of explorations" pervades *The Atlas* (Inglis Moore, in Thomson 1968, 168). Once again, it is *Old Maps of the World* that highlights these verses (Francis Edwards 1929, "Preface," 4):

> The collection of old maps has in the last few years assumed a position of considerable importance. There is a mystery and romance about old maps that their modern counterparts can never hope to rival. In the eighteenth century it was fashionable to condemn geographers who
>
> …"in Afric maps
> With savage pictures fill their gaps,
> And o'er unhabitable downs
> Place elephants for want of Towns." … SWIFT.

To-day that is the essence of their charm…

Slessor could hardly have failed to read these words that open the catalogue (ibid., "Preface"). *The Atlas*—his poetic "collection of old maps"—shows that he agreed.

CUCKOOZ CONTREY REVEALED

Despite the charms of Robert Norton's map, no evidence exists that Slessor ever laid eyes on it. Nor is there any evidence that he discovered what "Cuckooz Contrey" meant, except as one of his "Lost Countries" (6 March, -s65). Bayldon's library, however marvelous in terms of British naval history, offered the poet no clues for uncovering the identity of "Cuckooz." Other maps and sources contemporary to Norton, however, demonstrate what his *Platt of Argier* only hints at—that *"Cuckooz Contrey" was an influential Berber kingdom and neighbor of Algiers in the century leading up to Mansell's expedition of 1620–1621*.

Although comprising a range of peoples, the Berbers are the ancient inhabitants of North Africa. From their name comes "Barbaria," which Slessor found in *Old Maps of the World* among the titles of seventeenth-century maps of Africa (Francis Edwards 1929, 104–105: entries 473, 479, 484). He transformed Barbaria into another of his "lost lands": "And this is a projection of the world,/ … With pictures of lost lands and vanished towns." "Where's the Kingdom of Barbaria/ Where's Francisca?" (May 31, -s136). "Barbaria," of course, is just another name for the "Barbary Coast," now commonly known as the Maghrib (Wolf 1979, 1). Since "Berber" and "Barbary" derive from the Latin *barbari* "barbarian" (i.e., someone who did not speak Latin or Greek) or, more recently, from an Arabic word meaning "to speak rapidly and confusedly," these names did not originate with the people themselves, but may have been given to them by the Arabs who overran the Maghrib from the mid-seventh century on (*OED*, 2nd ed., 1989, 1:946, s.v. "Barbary"; Abun-Nasr 1987, 2, 7). When the Ottomans began competing with Spain for Algiers (Braudel and Reynolds 1976, 884; Abun-Nasr 1987, 167), the town was a small Berber and Morisco port whose surrounding countryside contained an assortment of Berber tribes, especially in the coastal mountains of what is now northeastern Algeria.

East of Algiers lived the Kabyles (Ilahiane 2006, 72), "one of the largest groups of Berbers" (Mattar 2004, 458) and "the major Berber group in Algeria" (Olson 1996, 91). "Kabyles" is Arabic for "tribes" or "clans," and the name endures in "Lesser Kabylia" and "Great(er) Kabylia," two plains in the Maritime Atlas traditionally inhabited by these Berbers. Greater Kabylia lies between the sea, from which it is separated by a coastal mountain range and the Sebau/Sebaou River on the north, and the Isser (west) and Sahel-Summan/Soumman rivers (south and east) (Rodríguez Joulia 1953, 17, 19). Greater Kabylia boasts one of the tallest ranges in that part of the Atlas, namely the Djurdjura/Jurjura mountains, with peaks reaching 2,308 meters (7,572 feet: Abun-Nasr 1987, 6). On the northern slope of the Djurdjura lay a summit fortress five miles northeast of present-day Michelet along Route N71 (Google Maps, s.v. "Koukou, Tizi Ouzou, Algérie"; Julien 1970, 274; cf. Pelet 1838). The name of

the fortress was "Koukou" (Shaw [1738] 1972, 86–87, 101; Playfair [1884] 1972, 147; Reclus and Keane 1886, 261; Wolf 1979, 148; Ilahiane 2006, 72). Though in ruins by the first third of the eighteenth century (Morgan [1731] 1970, 69), Koukou was once capital of the Kingdom of Koukou/Cucco (ibid.), a nearly impenetrable region roughly coterminous with Greater Kabylia (*Viquipèdia* 2010, s.v. "Kuko").

For two centuries, the Kingdom of Koukou was ruled by the head of an "ancient and noble family" named "al Cadhi" (or "el Cadi/Kadi"). In Arabic the surname means "civil judge" (Morgan [1731] 1970, 327), although the family's origins and the significance of the name are debated (Rodríguez Joulia 1953, 23–24). Each ruler was known as the "Sultan" or "Sheikh of Koukou" (Shaw [1738] 1972, 168; Wolf 1979, 148), for "those Highland-princes assume[d] that Majestic Title" (Morgan [1731] 1970, 407). His followers were the "Koukou" or "Koukous" (Wolf 1979, 14), whom Thomas Shaw, the Consular Chaplain at Algiers in the early eighteenth century (Playfair [1884] 1972, 14), called "the richest and most numerous Kabyles of This Province" (Shaw [1738] 1972, 101). *These "Koukous" are none other than the "Coukooz" of Norton's map and Slessor's*

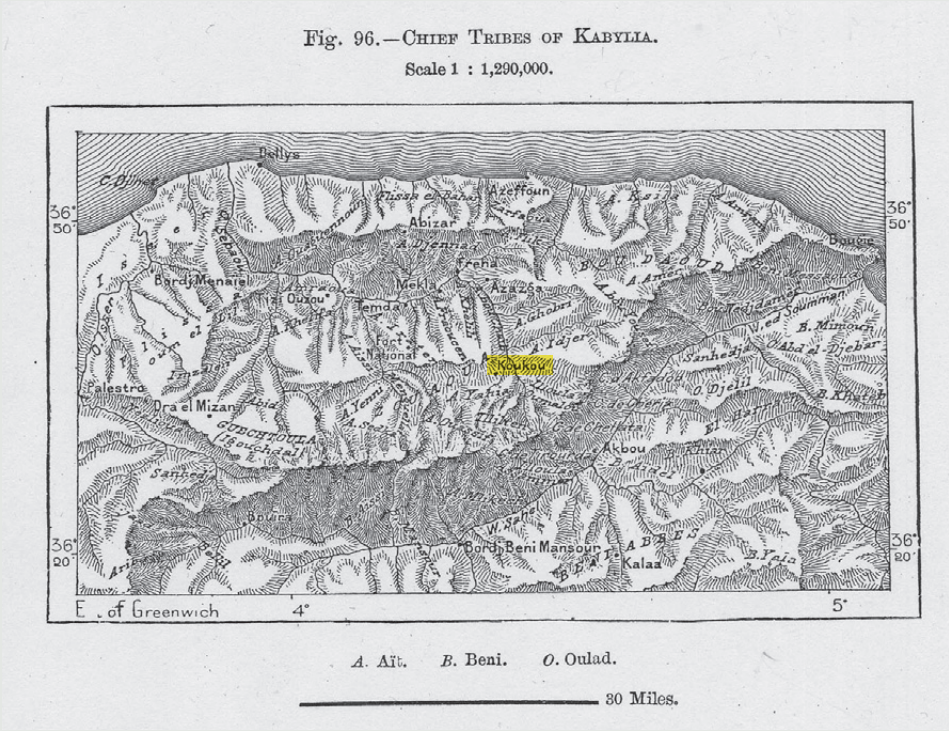

Figure 8. Chief Tribes of Kabylia, 1886 (1:1,290,000). Figure 96, page 258, in Elisée Reclus and Augustus Henry Keane, editors, The Earth and Its Inhabitants, *Vol.11*, North-West Africa *(New York: D. Appleton and Company, 1886). Koukou lies in the center of the map, beside the final "a" in the tribal name "Zouaoua" and above the dark hachures representing the Djurdjura mountains. Bounding Greater Kabylia are the coastal mountain range and the Sebaou River on the north, the Isser River on the west, and Sahel-Soumman Rivers to the south and east.*

poem. In the spirit of our map-maker and poet, and because poor records and the rulers' adoption of their predecessors' names made charting their family tree nearly impossible even by the mid-sixteenth century (see Rodríguez Joulia 1953, 28), I will refer to each ruler simply as "The King of Koukou."

Little is straightforward about these tribesmen. The Kabyles of the Djurdjura highlands have called themselves "Imazighen" or "Amzigh"/"Amasigh," meaning "Freemen" (Reclus and Keane 1886, 254; Kagda and Latif 2009, 61). Earlier sources from the sixteenth century to the twentieth refer to them as "Azuaga" or "Igawawen" or by the clearly related forms of "Zwouwa"—"Zwowah," "Zwawa," "Zouaves," and "Zouaoua" as well as "Zouara," "Soara," and "Soava."[12] The Zwouwa/Zouaves forms may reflect the name assumed by the Kabyles after abandoning their capital-fortress, Koukou (Morgan [1731] 1970, 69–70, 262; Brett and Fentress 1996, 164–165; Google Maps, s.v. "Koukou, Tizi Ouzou, Algérie") (Figure 8). As for "Koukou," it too has several spellings:

"Kouko" (Leo and Pory 1896, 1:281 n.83; Brett and Fentress 1996, 168)

"Kou-kou" (Shaw [1738] 1972, 101)

"Kuko" (Reclus and Keane 1886, 255; Rodríguez Joulia 1953, 19; Pitcher 1972, 107–108; Isichei 1997, 273; Ilahiane 2006, 72)

"Kuku" (Reclus and Keane 1886, 255, 261; Google Maps, s.v. "Kuku, Algeria")

"Cuco" (Marmol, in Leo and Pory, 1896, 1:281 n.83; Rodríguez Joulia 1953, 19)

"Couco" (undated Spanish map in Rodríguez Joulia 1953, 32–33; Rossi 1691; Rousset de Missy 1742)

"Cucco" (Morgan [1731] 1970, 69; 1736 map in Lane-Poole [1901] 1970, 17)

"Couque" (L'Isle 1730a and 1730b; Bowen 1752b)

"Couquo" (Bowen 1752a)

"Chuco" (Konetzke 1955, 419)

"Cauco" (Moll 1711-1717)

The identity of Koukou/Cucco shows how lost the meaning of this "Lost countr[y]" was to Slessor, and how much his fascination with maps has to do with the enshrining of lost histories in cryptic form.

Adding to the confusion of different spellings, languages, and periods is the fact that Europeans didn't recognize the difference between the Berbers and the Arabs of North Africa. A decade after Mansell's expedition, Père Pierre

Figure 9. The Kingdom of "Couquo," by Emanuel Bowen, 1752. Detail from Bowen's A New & Accurate Map of the Western Parts of Barbary: Containing Fez, Morocco, Algiers, Tunis & Biledulgerid. Drawn from the Best Authorities & Regulated by Astron. Observations. *Plate 47 in* A Complete Atlas, or Distinct View of the Known World: Exhibited in Sixty-Eight Maps: ... by Emanuel Bowen *(London: Printed for William Innys and Joseph Richardson, Richard Ware, J. and P. Knapton ... Jo. and Ja. Rivington, and John Ward, 1752). This detail of "Western Barbary" shows the proximity of the "Km. of Couquo" (Koukou) to the "Km. of Labez" (Banu Abbas), and of both Barbary kingdoms to Algiers and Spain. Algiers, three hours away by car today (N 36°02'26", E 2°57'41": Google Maps, s.v. "Koukou, Tizi Ouzou, Algérie"), was a three-day march northwest of Couquo, the fortress shown above "Km." in "Km. of Couquo." Courtesy of the National Library of Australia, MAP Ra 36 Plate 47.*

Dan was one of the first to do so when he visited Algiers to redeem captives (Wolf 1979, 109, 341). Father Dan realized that while Arabs and Berbers were both Muslim, their "customs, language, and features were strikingly different" (Wolf 1979, 109). As Kabyles descended from the ancient Sanhaja Berbers (Reclus and Keane 1886, 254; Ilahiane 2006, 71, 109–110), the Koukou came from a Caucasoid stock originally unrelated to the Semitic Arabs. Furthermore, while many Arabs inhabited coastal towns like Algiers and nomadic Arabs and Berbers lived out of tents in the hinterlands and desert borders, the Koukou and their Kabyle neighbors were farmers who cultivated figs and olives in the mountains and resided in "widely separated villages…with houses made from mud or stone" (Ilahiane 2006, 109; see 73). Their language is yet another distinction not addressed in the *Platt of Argier* or Slessor's poem. Although both Berber and Arabic are members of the Afro-Asiatic family, Berber belongs to the Hamitic branch, while Arabic belongs to the Semitic. By the late nineteenth century, Arabic still comprised only one-third of the Berber dialect spoken by

the Kabyles of the Djurdjura and eastern ranges (Reclus and Keane 1886, 255; cf. Ilahiane 2006, 129).[13] If there *is* one thing straightforward about the Kabyles, it is summarized best by Joseph Morgan, the English historian and vice-consul at Algiers in the early eighteenth century (Brett and Fentress 1996, 164–165): "The Kabeyls [*sic*]…value themselves excessively upon their Antiquity, Purity of Blood, and Invincibility.… I never yet met with an Arab pretending to count the Kabeyl among the Nations subdued by his Progenitors" (Morgan [1731] 1970, 70–71).

When the Barbarossas came to Algiers, two Kabyle confederations important to our study inhabited the eastern ranges (Rodríguez Joulia 1953, 19). Occupying Greater Kabylia with territory stretching down to the small port of Azzefun (Ilahiane 2006, 72) was the Kingdom of Koukou, lying "within sight of Algiers" and three days to the east (Morgan [1731] 1970, 68, 326; Rodríguez Joulia 1953, 27). South and east of the Koukou, across the Sahel-Summan/Soumman river valley in Lesser Kabylia (Rodríguez Joulia 1953, 19; Brett and Fentress 1996, 168), were the Banu Abbas or Beni-Abbes, whom some European sources still refer to as "Labes" (Yver [1913–1927] 1987c, 3:281) or "Labbes" (Rodríguez Joulia 1953, 19; Pitcher 1972, 107).[14]

Like their fellow Kabyles, the Koukou "always had a deserved reputation for fierce independence, of inclination to rebellion, of resistance to any imposition of control over their lives. They usually sided with the upcoming conqueror against the entrenched tyrant, whether either was Berber or not, for greater local control and independence" (Mattar 2004, 460). Nowhere is this clearer than in their long-standing hostility towards their neighbors, the Banu Abbas (Figure 9), both of whose sultans "possessed their own armies and fortresses, and ruled over their feuding peoples with a mixture of patronage, diplomacy, and force" (Brett and Fentress 1996, 158). Mutual animosity conditioned how these rival Kabyle kingdoms dealt with Spain and the Ottoman Empire—the two superpowers locked in a long and bitter struggle for supremacy over the western Mediterranean (Ilahiane 2006, 72). As Morgan reports ([1731] 1970, 69–70):

> The Kingdom of Cucco, from a Fortress of that Name, naturally exceeding strong, and now in Ruins, [was] once the Capital and Regal Seat of the Princes of that State, which has made no contemptible Figure. And had it not been for their cruel, and almost incessant Wars with their Eastern and contiguous Neighbors, Beni-Abbas, a powerful Nation, in all respects very much resembling themselves, which have somewhat eclipsed their former Grandeur, their Prince might still have been reckoned among the most formidable Potentates of Africa; and as it is, they have more than once baffled the united strength of Beni-Abbas and the Turks of Algiers; nor are they yet in any wise subject to either, tho' intirely encompassed by them, and other less considerable, tho' no less inveterate Enemies.

Alternately rivals and allies of Ottoman Algiers (Rodríguez Joulia 1953, 24), the Kingdom of Koukou went from power in the sixteenth century to decline in the seventeenth, paralleling to some extent the fortunes of the Spanish empire in North Africa.

Spanish writers provide much of what is known about the Koukou. Two stand out: Luis del Marmol-Carvajal (Marmol), who traveled the Maghrib for a

decade after participating with Charles V against Tunis and being enslaved in Morocco; and Fra Diego de Haëdo, the Benedictine monk imprisoned in Algiers while Cervantes was trying to secure his own release (1575–1580: Morgan [1731] 1970, 565; Wolf 1979, 341–342; Heers 2003, 154, 204). Another name in this story is Joseph Morgan. Because his *Complete History of Algiers* (1731) drew so heavily on the works of both Haëdo and Marmol (Brett and Fentress 1996, 165), and because his account of seventeenth-century Algiers and its neighbors also incorporated English and French sources (Wolf 1979, 341–342), Morgan plays a large role in what follows. So does Carlos Rodríguez Joulia Saint-Cyr, author of *Felipe III y el Rey de Cuco* (1953). Long after the Zwouwa confederacy had absorbed the Kingdom of Koukou, that Spanish historian discovered startling evidence among the unpublished documents in Spain's Archivo General de Simancas that the King of Koukou, *less than two decades prior to Norton's* Platt of Argier*, was corresponding in secret with Philip III of Spain.*

But I'm getting ahead of myself. Our sources, though often vague and contradictory, suggest that the Koukou originally collided with the Barbarossas while the brothers were making their way west toward Algiers (Morgan [1731] 1970, 232; Pitcher 1972, 108), and that the Banu Abbas supplied the Barbarossas with aid and reinforcements (Yver [1913–1927] 1987b, 1:471; Julien 1970, 278; Spencer 1976, 19). Once in Algiers, ostensibly to rid the town of its Spanish occupation, Aroudj quickly put his own men in charge. He then assassinated the sheikh who had invited him to Algiers in the first place (Yver [1913–1927] 1987b, 1:471; Spencer 1976, 20; Brett and Fentress 1996, 157), for that sheikh called in the Spaniards as soon as he recognized Aroudj as a threat to his own power (Abun-Nasr 1987, 149). The murder made the brothers mortal enemies of the Koukou: the sheikh of Algiers was not only related to their own king (Morgan [1731] 1970, 410), but had conspired with him to seek the help of the Barbarossas against the Spaniards (Rodríguez Joulia 1953, 25–26). In 1519/1520, two years after Aroudj's death, Kheir-ed-din Barbarossa defeated the Koukou in Kabylia, exiled their king, and occupied two cities further east. On his return, however, he ran into the Berber Sheikh of Tunis, who had once welcomed the Barbarossas to the Maghrib, but, troubled by their aggressive expansion, now allied with the King of Koukou and restored him to his kingdom (Rodríguez Joulia 1953, 26; Wolf 1979, 14). Defeated in Kabylia and driven back to Algiers (Pitcher 1972, 108), Barbarossa and his men were soon forced to abandon their capital as well (Abun-Nasr 1987, 150). Yet, because the King of Koukou and his allies chose to loot the town rather than govern it, they controlled Algiers only briefly (Brett and Fentress 1996, 158). In 1525, bolstered by new Ottoman recruits and the Banu Abbas, Barbarossa retook Algiers and bribed the Koukou to send him the head of their king (Haëdo, in Rodríguez Joulia 1953, 26 and n.13; Wolf 1979, 14–15). For the next four years, the king's brother fought against the Ottomans. Finally, in 1529 Barbarossa destroyed the Spanish presidio (Wolf 1979, 14–16) and allowed the king's brother to become "chief of Grand Kabylia," though not without imposing tribute on him (Abun-Nasr 1987, 151; Morgan [1731] 1970, 263–264; cf. Spencer 1976, 25).

The Koukou did not submit to Algiers for long. After Barbarossa took the city of Tunis, Charles V retaliated by seizing it for himself (1535: Wolf 1979, 17–21). It took him six more years to attack Algiers, and he did so only after trying to bribe Barbarossa, now High Admiral of the Ottoman Empire, into

changing sides (ibid., 26; Abun-Nasr 1987, 154). When Charles V arrived in October 1541, he brought an armada of over 450 vessels and 36,000 men (Wolf 1979, 27). After the tempest destroyed as much as a third of his fleet (Morgan [1731] 1970, 303–305; Abun-Nasr 1987, 155), however, Charles helped his men regroup on the other side of Cap(e) Matifou (Norton's "Cape de Montafooz"), four miles east of Algiers, and then continue on to more hospitable ports (Wolf 1979, 28). One was Azzefun, the only port harbor belonging to the Koukou (Reclus and Keane 1886, 267; Rodríguez Joulia 1953, 19). Morgan relates that the King of Koukou was heading down the mountains to join the Spaniards when he heard of their tragedy and retreat to Bougie (Bujeya/Bejaia) farther to the east. In that larger, more sheltered harbor the Spaniards received desperately needed food and provisions from the Tunisians, according to a French source, or from the Koukou, according to Haëdo and other Spanish chroniclers (Morgan [1731] 1970, 306–307, 326–327; Rodríguez Joulia 1953, 27). Surprising as his assistance might seem, the King of Koukou had good reason to aid Charles V: the Ottomans, though fellow Muslims, used their janissary armies to rule over the North African countryside, whereas Spain seemed content to control the coast with their presidios (Wolf 1979, 67).

Surprising as his assistance might seem, the King of Koukou/Cuckooz had good reason to aid Charles V: the Ottomans, though fellow Muslims, used their janissary armies to rule over the North African countryside, whereas Spain seemed content to control the coast with their presidios.

Perhaps the most dangerous threat to Algiers from the Koukou and their allies came nearly six decades later, when Philip III (1598–1621) attempted to finish what his grandfather Charles V had envisaged: the annihilation of Ottoman Algiers.[15] In 1601 Spain sent seventy galleys and ten thousand men to bombard the town. Weather and fear of risks resulted in another failure (Braudel and Reynolds 1976, 1234; see Morgan [1731] 1970, 627, 638; Rodríguez Joulia 1953, 35–40; Allen 2000, 264 and n.26; Feros 2000, 202). Spain tried again in 1603 with a smaller fleet, but more disastrous results (Morgan [1731] 1970, 638; Rodríguez Joulia 1953, 51–55). And yet again the following year, when a few men carrying gunpowder on boats to the Koukou heroically blew themselves up along with four-hundred Ottoman captors (Rodríguez Joulia 1953, 66–70). By this time, secret negotiations had been going on between Spain and the King of Koukou since at least 1602 (ibid., 35, 41; cf. Boyer 1970). In 1603, the King of Koukou began to take on Algiers himself (Isichei 1997, 273; Boyer 1970, 37). His correspondence with Spanish officials reveals that he offered them use of Azeffun and nearby Tamagut so that Philip III could deliver instructions for a combined attack on the corsair capital; and so that Spanish vessels could unload 50,000 ducats, munitions, gunpowder and various other gifts (Rodríguez Joulia 1953, 51, 71; see 17). Although that expedition ended dismally, the King of Koukou not only repulsed the Ottomans from the mountains, but soundly defeated Algiers' ally—the king of the Banu Abbas (1603: ibid., 56). Spain subsequently prepared to strike Algiers in 1607. But when an expedition materialized the following year, it attacked Moroccan Larache, and lost (Allen 2000, 215, 222, 300). In 1608, after years of disappointment and neglect, the Koukou abruptly made peace with Algiers (Bono 1955, 251; Konetzke 1955, 419). Yet the King of Koukou continued to correspond with the Spanish king until at least 1610 (Boyer 1970, 38–39). And no wonder, since the treaty with Algiers forced the Koukou into a state of vassalage, ruining their reputation and forcing them to send enormous amounts of money and animals to the pasha (Rodríguez Joulia 1953, 77).

And so the stage was set for "King James's Fleet." For if Spain could no longer mount an effective assault on Algiers, it certainly encouraged its new

ally, Britain, to do so. The pressure that the Spanish ambassador Count Diego Gondomar put on James I resulted in the failed expedition of 1620–1621 (Morgan [1731] 1970, 641–648). Before Mansell sailed, however, Admiral Sir William Monson, who regarded the entire matter as Spain's problem, suggested that the British would find the tribesmen as fierce as the regency itself in repelling an attack (Monson [1703] 1902, 2:255):

> Now, that Part of Barbary, where Algiers is seated, is a spacious and fertile Country, and abounds in Inhabitants; and tho' the King of it be a Mahometan, as well as the Algerines, yet they live in perpetual Hatred and War; but so, that if either of them is attacked by Christians, they will presently join as Partners in Mischief; and we shall no sooner land, but be welcomed by 60, or 80000 of those ungodly People.

According to Morgan, the "King" to whom Monson refers is none other than "the Sheikh of Cucco; and these ungodly People are the Zwouwa his Subjects" ([1731] 1970, 640). Which meant that Mansell's expedition could face two traditional enemies—the regency of Algiers and the "King of Cuckooz"—allied, in common cause, against the British and their allies.

Between Monson's report and the launching of the expedition, however, disaster struck the Koukou. In 1618, the ever restive King of Koukou was assassinated by his brother (Boyer 1970, 37). Eventually, his son succeeded him (1633: Rodríguez Joulia 1953, 78) and the family continued to thrive nearby, at least into the mid-twentieth century (ibid.). But the Kingdom of Koukou never regained the power it had wielded when attempting to wrest Algiers from the Barbarossas and the Ottomans in the first half of the sixteenth century, or when intriguing with Spain in the opening decade of the seventeenth (Boyer 1970, 40). Sometime after 1640, the people abandoned Koukou and their sultans devolved into second-rate tribal leaders even as the Zwouwa/Zouaves—descended from the Koukou—became the dominant confederacy in the eighteenth century (Rodríguez Joulia 1953, 78–79). Nevertheless, as Slessor's poem illustrates, the title "King of Koukou" lived on long after it had any meaning (Boyer 1970, 40).

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Norton's plan shows "the King of Englands Fleet" [*sic*] riding between Algiers *and* Cuckooz Contrey, though the former sports an aggressive red; the latter, a gentle green. So, what are we to make of that image? When Norton wrote on his map "Part of the King of Cuckooz Contrey" in 1620, did he regard the King of Cuckooz as a *threat or as a potential ally*? That too remains a mystery. In 1618–1619, Philip III apparently studied plans by a Frenchman named Antonio Oliver to destroy the pirates in Algiers, but nothing came of it (Rodríguez Joulia 1953, 76). A French source suggests that the new King of Koukou restored ties with Spain and rebelled against Algiers, again unsuccessfully, sometime before 1625 (Ernest Mercier 1891, in Rodríguez Joulia 1953, 78). But if such an alliance existed in 1620–1621, we hear nothing about it—or the Koukou—in Monson's final report on the expedition, even though it was *he* who had warned James I four years earlier about "those ungodly people." Mansell had under his command "at least two men who had been on intimate terms" with the Algerian pirates (Tinniswood 2010, 110). Moreover, James Frizzell, "an English agent who [had] worked in Algiers since at least 1613" and may even have served as interpreter for Mansell (ibid., 114), would have known *something*, presumably, about the

state of the Koukou. Yet Mansell does not mention any group but "the Turks" in his report to the Duke of Buckingham on June 9, 1621 (*Cabala* 1663, 324).

That the Koukou remain so elusive on Norton's map cannot help but invite further speculation. Perhaps there were inherent problems with mapping, or even writing about, the changing alliances in a land full of "Partners in Mischief," whose political and social histories were as complex as their topography. Perhaps Norton expected that those who commissioned his plan would obtain their knowledge of the Koukou from other, possibly oral, sources. Given the sensitivity of any military intelligence map and the dangers of such a map falling into the wrong hands (Harley and Laxton 2001, 88–89, 165), he may have deliberately eschewed any further description (graphic or otherwise) of the Koukou. Nor does it help that the expedition came to naught, and that Norton's *Platt of Argier* disappeared into a private library for three hundred years. In the end, all that can be said is that the traditionally unstable power realities on the ground are rendered as delicately by Norton as the terrible firepower of Algiers.

FULL CIRCLE

By the 1630s the Koukou were again up to their old tricks. In 1638 they defeated a janissary force sent from Algiers (Wolf 1979, 210). More provocatively, the King of Koukou threw in his lot with a renegade corsair named Piccinio, known as Ali Bitchnin/Biçnin after his conversion to Islam. Having carried on for years as if he were ruler of Algiers (Spencer 1976, 77), Ali Bitchnin married a Koukou princess to strengthen his authority against the pasha, and later fled to his father-in-law's stronghold in Kabylia when tensions in Algiers became too great. Before what seemed to be Bitchnin's victorious return…and his subsequent poisoning (ca. 1645: Wikipédia 2011, s.v. "Ali Bitchin" [*sic*]), presumably at the command of the Sultan in Constantinople (Wolf 1979, 148):

> [Bitchnin] owned two palaces in the city, a villa in the suburbs, several thousand slaves, jewels, plate, and great wealth in merchandise. He built a sumptuous public bath and a great mosque in Algiers as a gift to the city. He had his own bodyguard of footmen as well as cavalry, recruited mostly from the Koukou tribesmen whose sultan became his father-in-law.

With this story of power, wealth and desire, we return full circle to "The King of Cuckooz." Though Slessor's "Cuckooz Contrey" is a fantasy in almost every way, behind the name stands a once powerful family of self-proclaimed sultans who—because they could not decisively defeat the Ottomans or their own mountain rivals—risk passing into oblivion along with their kingdom.

Except for tantalizing clues on an old map, and one poet's tongue-in-cheek response.[16]

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And by Him Published, in His Stratiaticos, and Pantometria, Concerning Great Ordinance, and His Theorems Thereupon. Together, Vvith Certaine Expositions, and Answers Thereunto Adioyned: Written by Robert Norton Gunner. and by Him Dedicated, to the Worshipfull Iohn Reinolds Esquire, Master Gunner of England. London: Printed by Edw. Allde, for Iohn Tap, and are to bee sold at his shop, at the corner of Saint Magnus Church.

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NOTES

1. "NLA" refers to the National Library of Australia, which holds the Papers of Kenneth Adolf Slessor (1901–1971) under the designation MS 3020. An earlier version of this paper was presented at the annual meeting of the Association of American Geographers (AAG) in Washington, D.C. (April 14, 2010).

2. For brevity, subsequent references to items in the poetry notebook that contains Slessor's drafts of *The Atlas*—MS 3020/19/1—will be abbreviated "-s#". For example, "-s242" represents both "NLA MS 3020/19/1/242" (for the paper version) and **http://nla.gov.au/nla.ms-ms3020-19-1-s242-v** (for the online scan). As explained in my Introduction, Slessor drafted *The Atlas* (ca. 1930) in a 1927 desk calendar: neither 1927 nor the date accompanying each entry has anything to do with the actual year, month, or day in which the poet created the various parts of his sequence. Nevertheless, I've included the notebook's "month" and "day" ("September 13") along with its "page" number (e.g., -s242) to aid identification.

3. "The King of Cuckooz" is reprinted from the Haskell and Dutton edition *Kenneth Slessor: Collected Poems* (Slessor, Haskell, and Dutton 1994, 70-71), whose version differs from the original one in *Cuckooz Contrey* (Slessor 1932, 11-12) only in minor details: e.g., "obseruations" (ibid., 11), vs. "observations" (Slessor, Haskell, and Dutton 1994, 70). Like Haskell and Dutton, I quote the poem in its entirety. Rather than annotating some of Slessor's consciously baroque vocabulary in notes on the poem (ibid., 359), however, I explain the poet's word/phrase choices as they become relevant to my article's larger arguments.

4. As we shall see (below, p. 13 and Figures 1 and 5), Haskell and Dutton read "pts." as "points" (Slessor, Haskell, and Dutton 1994, 358), in contrast to "parts," which is the transliteration of the Norton map title offered by the Francis Edwards catalogue (Francis Edwards 1929, 105), and by the National Maritime Museum website. Other discrepancies are equally minor: e.g., Slessor's "adioning" and "Ma't's" for the map's "adoiyning" and "Mats."

5. Because he regarded *The Atlas* as "one of [Slessor's] earlier, more 'romantic'" works (Douglas Stewart, letter to Kenneth Slessor, 17 February 1963: NLA MS 3020 1/5/353), however, Stewart's published comments on its opening poem reflect some ambivalence toward *The Atlas* generally (1969, 158–158; rpt. 1977, 73–74):

> [*The Atlas*] is alive with Slessor's own delight in what he has found, moving with utter inconsequence and unfaltering *élan* from the fifty rosy darlings of the King of Cuckooz's harem… But sometimes you can find things with plenty of consequence in an inconsequential poem. Girls as tempest-driven flowers are things of consequence.

Of more "consequence," presumably, were the other Slessor poems that Stewart published alongside the truncated *Atlas* sequence in his anthology: "Country Towns," "Five Visions of Captain Cook," "Five Bells," and "Beach Burial"—all of them directly relating to Australia and Australians. That *The Atlas* essentially ignores Australia will be addressed in my forthcoming Epilogue.

6. Except that he couldn't settle upon the title. "A Mappe" appears above the opening words of his poem (March 6, -s65). Then two titles compete—"An old Atlas" (March 16, -s75; March 18, -s76) and "The King of Cuckooz Contrey" (March 18, -s76; perhaps -s65)—before the abbreviated "The King of Cuckooz" finally makes its appearance (April 3, -s88). After finishing the first stanza (March 16–20, -s75 to -s77), Slessor turned to the second (ibid.; March 22, -s79) and the third (March 20, -s77); followed, in order, by the fifth with its simile "like a tempest driving flowers" (March 21, -s78; March 24, -s80) and the sixth (ibid.); the fourth and the eleventh (March 22, -s79; March 26, -s81); the seventh (March 24, -s80); and, finally, the twelfth (March 26, -s81). Unfortunately, Slessor's notebook contains no draft of stanzas eight to ten, or any complete version of the poem. Three details, however, suggest that he had a clear vision of his poem and finished "The King of Cuckooz" quickly. Only three lines prove to be dead-ends in terms of the published version (March 16, -s75; March 20, -s77). Furthermore, each time Slessor listed poems for the sequence, he began with "The King of Cuckooz," then put a check beside its title (March 18, -s76; April 3, -s88); meanwhile, the other poems shifted position within *The Atlas*, remained unchecked, or disappeared entirely. Finally, "The King of Cuckooz" is the first poem for which Slessor created a note.

7. According to Stanley Lane-Poole, "Europeans spelt the name—Arger, Argel, Argeir, Algel, &c, down to the French Alger and our Algiers ([1901] 1970, 13, n.1).

8. Spellings of Berber and Arab names, as well as descriptions of sixteenth- and seventeenth-century sources, come from Wolf 1979, unless otherwise noted. Historical dates, if not from Wolf or the cited source, come from the *Columbia Encyclopedia* (5th edition, 1993).

9. Unless otherwise noted, both of my paragraphs on the Mansell expedition derive from Morgan [1731] 1970, 644-646; Playfair [1884] 1972, 44; Clowes *et al*. 1897, 2:50-54; Wolf 1979, 186-188; and Thrush 2004, 36:537, who provides the spelling "Mansell."

10. Geoffrey Callender, whose book *The Naval Side of British History* was owned by Captain Bayldon, offers a particularly striking account of the period following the 1628 assassination of the Duke of Buckingham (1924, 85–86):

> The years that followed Buckingham's death are among the saddest in our maritime history. Not an English river nor an English

> harbour was safe from insult… The Algerine pirates were especially daring. They raided the English harbours, in five years carried off 266 ships, and in every case of capture sold the ship's company into lifelong servitude. The honour of England suffered the last indignity when in 1631 the royal fleet fled before a squadron of alien privateers.

The rest of the seventeenth century saw the British repeatedly sending fleets against Algiers, redeeming captives, exacting promises that English vessels would no longer be searched or molested, and then returning within a decade as the round of piracy and intimidation began anew (Playfair [1884] 1972, 44–162; Clowes *et al.* 1897, 2:212ff.; Lane-Poole [1901] 1970, 267–273).

11. Serving in Mansell's botched expedition would have given the "versatile Robert Norton" incentive to share his specialized knowledge of cannons and other artillery (Waters 1978, 2:446, 471). No sooner had Charles I ascended the British throne in 1625, than "every sailor was now ordered to learn to handle firearms and every master to become a competent gunner" (ibid.). Recommended reading included Norton's recently published *Of the Art of Great Artillery* (Norton 1624), "wherein I persuade myself"—the author boasts in his dedication—"that the most necessary particulars belonging to the Gunners Art, are more acutely shewed, then in any other Treatise in any language yet extant" [*sic*] (Norton 1628b). When Norton's *The Gunner* appeared a few years later, Captain John Smith added this poetic tribute (Norton 1628a, opposite "Contents"):

> Perfection, if't hath ever been attayned,
> In *Gunners* Art, this Author hath it gayned.

12. For "Azuaga," see Morgan (1731] 1970, 70, after sixteenth-century writers like Leo Africanus and Marmol; and for "Igawawen," see Reclus 1886, 255. Regarding "Zwouwa" and its related forms, see Morgan [1731] 1970, 69-70, and Brett and Fentress 1996, 164-165. "Zwowah" is found in Shaw [1738] 1972, 101, and Brett and Fentress 1996, 168; "Zwawa," in Brett and Fentress 1996, 159-160, 168, and Ilahiane 2006, 72; "Zouaves," in Reclus 1886, 255, and Brett and Fentress 1996, 159-160; "Zouaoua," in Ilahiane 2006, 72; and "Zouara," "Soara," and "Soava," in Leo and Pory 1896, 1:281 n.83.

13. Though Berber is regularly spoken by only a small minority (Abun-Nasr 1987, 3), the twenty-first century has found the Kabyles at "the center of Berber activism and unrest" against Arabization (Ilahiane 2006, 128–129); in 2002, they helped bring about the recognition of Berber Tamazight as an official language alongside Arabic in Algeria (Kagda and Latif 2009, 97).

14. "Banu Abbas" is the preferred spelling in Brett and Fentress 1996, 168, and Ilahiane 2006, 72. "Beni-Abbes" appears in Morgan [1731] 1970, 70, and elsewhere. For "Beni Abbas," see the 1736 map in Lane-Poole [1901] 1970, 17, and Yver [1913–1927] 1987c, 3:281. Earlier citations for "Labes" can be seen on Rossi 1691, plate 112. For "Labbes," see Rodríguez Joulia 1953,

17; and for "Labez," Rodríguez Joulia 1953, map between 32-33. Another variant is "Abès" (Wolf 1979, 68). In addition to the Koukou and the Banu Abbas, a third group of Kabyles, known as the Banu 'Abd al-Jabbar (Ilahiane 2006, 72) or Beni Jubar (Rodríguez Joulia 1953, 19), held the coast east of Bougie (Bujeya/Bejaia).

15. In the intervening years, the Koukou were granted free trade with Algiers either because their King, after the incident with Charles V, surrendered large quantities of money and livestock, presented his teenage son as a hostage, and offered to pay tribute (1542: Rodríguez Joulia 1953, 27–28), or because the Koukou helped Algiers against the rebelling Banu Abbas a decade later. Whatever the cause, Morgan opines that the tribute received by the Algerian Regency in no way compensated for the long-term damage done by the trade agreement, which enabled the Koukou not only to acquire guns and ammunition, but to become expert marksmen ([1731] 1970, 307, 327–328, 415–418). Furthermore, Barbarossa's only son, Hassan-ben-Kheir-ed-Din (otherwise known as "Hassan Pasha/Basha"), cemented the alliance by marrying the daughter of the King of Koukou (1559: Yver [1913–1927] 1987c, 3:281; Morgan [1731] 1970, 414–416). After Hassan Pasha died (1570), the King's daughter and her son, the last of the Barbarossas, continued to live in Algiers "in great Honour and Reputation" (Morgan [1731] 1970, 475). Nevertheless, toward the end of the sixteenth century, power struggles with Algiers meant that the Koukou never really enjoyed the power they had obtained (Rodríguez Joulia 1953, 29). Increasingly, they resented paying tribute and chafed at restrictions imposed by the janissaries stationed in their region (Wolf 1979, 68–69). For more, see Morgan [1731] 1970, 407–423, 492, 522, 600; Julien 1970, 295; Wolf 1979, 66–67, 77; Brett and Fentress 1996, 160; Heers 2003, 18, 120, 170.

16. Stay tuned for Part II of my study. "Post-roads," the second poem of Slessor's suite *The Atlas*, imagines the ghost of John Ogilby (1600–1676) surveying "the unmapped savanna of dumb shades" just as he'd undertaken to measure the roads of England and Wales prior to mapping them in his brilliantly illustrated *Britannia* (1675).

A Program for Handling Map Projections of Small-Scale Geospatial Raster Data

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ABSTRACT

Scientists routinely accomplish small-scale geospatial modeling using raster datasets of global extent. Such use often requires the projection of global raster datasets onto a map or the reprojection from a given map projection associated with a dataset. The distortion characteristics of these projection transformations can have significant effects on modeling results. Distortions associated with the reprojection of global data are generally greater than distortions associated with reprojections of larger-scale, localized areas. The accuracy of areas in projected raster datasets of global extent is dependent on spatial resolution. To address these problems of projection and the associated resampling that accompanies it, methods for framing the transformation space, direct point-to-point transformations rather than gridded transformation spaces, a solution to the wrap-around problem, and an approach to alternative resampling methods are presented. The implementations of these methods are provided in an open-source software package called MapImage (or *mapIMG*, for short), which is designed to function on a variety of computer architectures.

Note: Any use of trade, firm, or product names in this article is for descriptive purposes only, and does not imply endorsement by the US government.

INTRODUCTION

"Each method of map making has something peculiar to itself. When the earth is delineated on a sphere, it has a shape like its own, nor is there any need of altering at all. Yet it is not easy to provide space large enough (on a globe) for all of the details that are to be inscribed thereon; nor can one fix one's eye at the same time on the whole sphere, but one or the other must be moved, that is, the eye or the sphere, if one wishes to see other places."

– Claudius Ptolemy (90–168 A.D.)

Raster datasets with global or near-global coverage are now commonly available, in part due to advances in remote sensing technologies and computer storage and processing. These large datasets allow researchers from across the world to conduct small-scale geospatial modeling projects with easily comparable results. In addition, research on vast areas, such as across a continent, can be accomplished more quickly and efficiently when access to a global dataset is available. An inherent issue with these datasets is that the original projection may not be the most desirable to a researcher, and therefore reprojection becomes necessary; often times it is beneficial to combine multiple global data sets in different projections to a common projection base (Ilifee and Lott 2008).

While existing reprojection software works well at the local scale, some implementations produce unexpected and erroneous results when working with raster datasets with global coverage (Usery et al. 2003a; Wonders 2011). Usery and Seong (2001) investigated the effects of global map projections on the accuracy of calculated areas in raster datasets and showed them to be dependent on both spatial resolution and latitude, and, further, they found that no single projection was best for all uses. This paper reviews the processing procedures for such small-scale data, particularly as they relate to geometric issues. These issues include distortions that are often present in large area transformations, and the associated resampling issues. The paper also provides documentation for an open-source software, *mapIMG*, that can successfully reproject such large datasets.

Several issues that affect overall product quality need to be considered when reprojecting raster map data. Very generally, the more coarse the spatial resolution, the more prominent the problems can be, especially with regard to how various map projections contribute differently to problems based on their derivation (properties). All of the following factors can affect the reprojected data, and are therefore covered in this paper: coordinate framing of the resulting output space; selection of a forward or inverse mapping model; selection of a gridded (and interpolated) or point-by-point method of querying the mapping model; and choice of resampling method.

All map projections have distortions. At a more local level (across a few kilometers), transformations between two map projections tend towards the linear, but as one moves towards the continental or global scale, these transformations are highly non-linear; thus, the distortions resulting from reprojection of global raster data are much more of a concern than are local

area distortions (Steinwand et al. 1995). As a result, reprojecting global raster datasets—such as the continuous ASTER Global DEM (NASA 2011) or categorical global vegetation (Matthews 1983)—can produce accuracy errors in the reprojected data as a function of both scale and map transformation. In addition, the reprojection process can exceed the limits of traditional algorithms, causing software designed for large-scale, local area data to perform incorrectly (triggering an error condition) when used with datasets of global extent. Algorithms used for reprojecting global datasets need to be written specifically for this task.

In this paper, we discuss coordinate framing issues, show an algorithm used for the reprojection process and approaches to using it, examine the resampling process, and, finally, present the implementation of *mapIMG* to better handle these issues that are unique to raster datasets and that are not present when projecting point data. (For example, a cell is a projection of four corners and a resampling function must accompany it to populate the new cell value.) This program was used as the basis for other research that demonstrated distinctions between the new software and other software packages that a user might instead employ to reproject a small-scale raster dataset (Usery et al. 2003a and 2003b). In particular, Usery and others (2003a) showed that some software packages can introduce errors when projecting raster datasets, such as failing to use exact projection equations, and issues when handling data near the poles[1]. More recent work (Wonders 2011) shows that many of these problems still persist in some software packages. Comparisons between these software packages and *mapIMG* illustrated that the ability of *mapIMG* to check transformations in the forward direction, after the inverse transformations, reduces projection errors. Therefore, the benefits of *mapIMG* have already been tested in previous work. The goals of this paper are to expand upon the issues related to raster dataset reprojection and provide documentation highlighting how *mapIMG*'s implementation can more efficiently process small-scale dataset reprojections.

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1. MAP PROJECTION COORDINATE TRANSFORMATION PACKAGES

Map projection science is primarily concerned with the basic mathematics behind the theories and methods for mapping (Yang et al. 2000). Map projections provide an understanding of the mathematical relations of the spatial element on a map. This understanding can yield significant insight into informational properties within a given region (Bugayevskiy and Snyder 1995). The recent development and advancement of GIS and remote sensing platforms for managing and controlling digital data has brought about an explosion in the quantity of geospatial data. With this explosion has come an increasing utilization of spatial data, which are often in a map projection that is different from the one in which the data will ultimately be required (Ilifee and Lott 2008). Because of the above advances and problems, there is an increased need for automated projection transformations.

[1] These test datasets are available at http://cegis.usgs.gov/projection/acc_proj_data.html

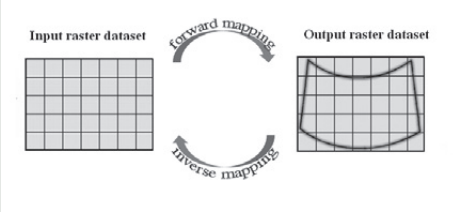

Figure 1. Workflow process for a typical automated raster projection transformation. The line, sample (row, column) coordinates from an input raster dataset are converted to projection coordinates in the projection system defined for the input raster dataset Likewise, the resulting output raster dataset dimensions are determined in both line, sample coordinates and in projection coordinates defined by the output projection system. These line, sample to projection coordinate mappings are typically simple first-order transformations. The reprojection process then takes place by either mapping from the output projection coordinates to the input projection coordinates (inverse mapping) or from the input projection coordinates to the output projection coordinates (forward mapping) by using the point-by-point map projection transformation package.

Software subroutine packages that perform map projection transformations usually operate on a point-by-point basis. The typical workflow process for such programs is outlined in Figure 1. The next few sections address projection transformation processes and problems for raster-specific automated projection transformations.

II. PROJECTION TRANSFORMATION PROCESS: COORDINATE FRAMING

The frame of a raster dataset defines the extent of the raster dataset in the projection space and also the alignment of projection space with the raster dataset coordinate system. Equations 1 through 4 define this relationship for projection grids that are aligned with line, sample (row, column) grids without rotation:

$$X = ULprojX + ((sample - 1) * pixelSizeX) \quad (1)$$

$$Y = ULprojY - ((line - 1) * pixelSizeY) \quad (2)$$

or, alternatively:

$$Sample = ((X - ULprojX) / PixelSizeX) + 1 \quad (3)$$

$$Line = ((ULprojY - Y) / pixelSizeY) + 1 \quad (4)$$

where, ULprojX is the upper-left X projection coordinate that corresponds to the upper-left-most sample in the raster dataset and ULprojY is the Upper Left Y projection coordinate that corresponds to the upper left-most line in the raster dataset. As a raster dataset coordinate pair, it is equal to (1,1). This is sometimes called "1-relative coordinates" because of this

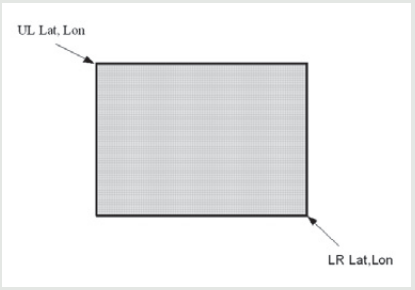

Figure 2. User defined output raster dataset extent as the upper-left (UL) and lower-right (LR) geographic coordinates.

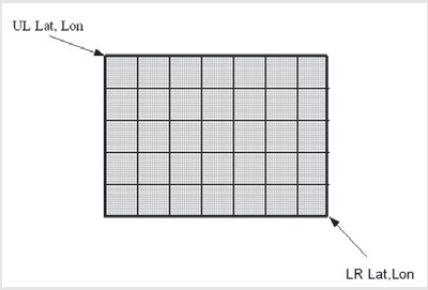

Figure 3. Conceptualized frame in geographic space of the input raster dataset, with grid lines added for clarification.

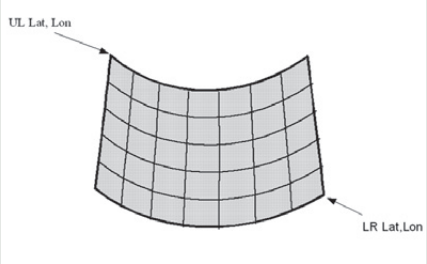

Figure 4. This space is converted to the output projection frame. Corners and sides of the frame are converted (piecewise) and projection coordinate minimums and maximums are recorded.

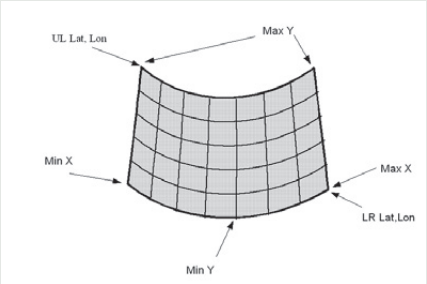

Figure 5. Locations of the minimum/maximum projection coordinates are noted. Maximums are recorded.

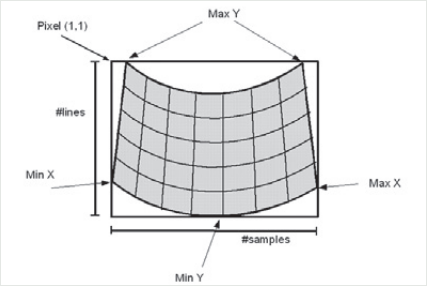

Figure 6. The minimum and maximum extents form the MinBox—this is the extent of the output raster dataset frame. The number of lines and samples are determined by dividing these dimensions by the pixel size.

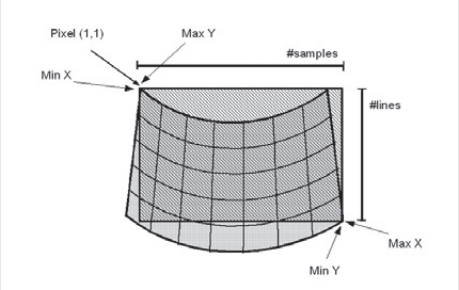

Figure 7. If the minBox algorithm is not applied, and only the UL and LR geographic coordinates are used to determine projection min/max, clipping of the frame can occur.

relationship to the UL (upper-left coordinate) = (1,1). (Note that different packages will define this somewhat differently; some are 0-relative, some define it at 0.5, 0.5, etc.)

This first-order transformation translates and scales coordinates and also defines the relationship between the raster (line, sample) grid and the dataset's projection grid. There is usually no rotation between the two coordinate systems. If there were a rotation, the above equations would need to be expanded to handle that condition. A common practice is to reference the upper-left raster dataset pixel to the projection coordinate system by specifying the projection coordinate of the center (or, just as commonly, the upper-left corner) of that pixel in the raster dataset.

DETERMINATION OF THE OUTPUT FRAME

The first step in changing the projection of a raster dataset to a new projection is to determine the geographic extent of the output space. We refer to this as the "output frame" and it is specified in the units of the output projection. The projection coordinates of the output raster dataset correspond in a linear fashion to the raster dataset coordinates of the output raster dataset, as given in the transformation equations (1)–(4). Two common methods used to determine the output raster dataset frame are the "geographic minBox" and the "direct specification of output projection extent."

THE GEOGRAPHIC MINBOX

The geographic minBox is defined as the area of a box formed by the upper-left and lower-right geographic coordinates covering the user's area of interest (Figures 2 and 3) in the input raster dataset. The output raster dataset frame corresponds to the geographic minBox. The geographic minBox can be viewed as a rectangle drawn on a map in a Plate Carrée or Equirectangular projection, which completely covers the user's area of interest (AOI) up to, and including, the entire map in the input raster dataset. This rectangular area is projected onto the output projection coordinate system (Figure 4). This is usually implemented with an incremental stepping through the coordinates, with the step size sufficiently small, keeping track of the minimum and maximum projection coordinates along the way (Figures 4 and 5). This minBox operation defines the minimum and maximum projection coordinates of the output raster dataset frame (Figure 6). If only the corners of the geographic area of interest are used, then they become the minimum and maximum projection coordinates of the output raster dataset frame, although this may result in a clipping of the AOI (Figure 7).

DIRECT SPECIFICATION OF OUTPUT PROJECTION EXTENT

In this method, the user directly specifies the minimum and maximum projection coordinates of the output space. A modification of this method is to specify the upper left corner (or some other point of reference) of the raster dataset in projection coordinates and the number of lines and samples. In contrast to the geographic minBox, the direct specification of output projection extent does not rely on an algorithm to determine projection coordinate extents.

III. PROJECTION TRANSFORMATION PROCESS: FORWARD AND INVERSE MAPPING

After the output frame is determined, the pixels in the output raster dataset need to be populated with the appropriate values from the input raster dataset as determined by the projection transformation model. This transformation model is implemented using either a forward mapping approach or an inverse mapping approach—or a combination of both. Once the locations are determined, the process of resampling—that is, pixel interpolation, is applied to determine a final data value for the given pixel.

Forward transformation models would typically step along the input raster dataset pixels, converting each line, sample coordinate pair to projection coordinates in the input projection space, and—using the map projection transformation software on a point by point basis—map to output space projection coordinates and then finally to output raster dataset line, sample coordinates. An inverse model does the opposite: it steps along the output space line, sample grid that is being created, converts each raster dataset coordinate to a projection coordinate in the output space, uses the map projection transformation software to find the corresponding input projection coordinate, and converts it to the input space line, sample coordinate. The location of the point (projection coordinates (X, Y) in the input raster projection system) within a pixel used in the map projection transformation step is determined during the raster dataset framing process defined earlier; this defines how the projection grid aligns with the raster dataset (line, sample) grid, whether it be center-referenced, corner-referenced, or tied to some other reference point.

Because these map projection transformations are often not linear over the entire raster dataset space, results of the above transformations will not result in integer pixel locations—they will usually lie in between pixel postings. Therefore, some method of resampling is necessary to determine a pixel value in the output raster dataset. Oftentimes the nearest value is assigned (the nearest-neighbor method), but other methods are typically used for remote sensing datasets that rely on the signal characteristics of the cells and recognize contributions to the signal from neighboring pixels. Examples of these methods of resampling are bilinear interpolation (2x2 neighborhood) and cubic convolution (4x4 neighborhood). These neighborhood based interpolation resampling methods are typically not used with categorical data.

APPROACHES AND DETAILS ABOUT THE INVERSE MAPPING PROCESS

The inverse mapping algorithm for performing a projection conversion on a raster dataset works as follows:

For each line in the output raster dataset:

For each pixel in this output raster dataset line:

- Determine the output projection coordinate for this pixel using equations (1) and (2).
- Convert the coordinate to the input projection using a projection transformation package.
- Determine the input raster dataset coordinate using equations (3) and (4).
- Convert to the nearest pixel by adding 0.5 to the line and to the sample coordinate and then truncate and read the raster dataset value(s) at this input raster dataset coordinate.

The simple algorithm steps outlined above describe a point-by-point, nearest neighbor approach. This point-by-point process can be time-consuming when the number of pixels to process is large. The approach of several existing algorithms use grids, which can save a considerable amount of processing time. The gridded approach processes blocks of the raster dataset when the transformation between the two spaces is defined in an incremental linear fashion in two dimensions. Some local-area projection changes can be modeled in this fashion because at their large scale the geographic coordinates approximate a straight line with grid blocks. On the other hand, most projection transformations of data with global extent cannot be described in this incremental linear fashion because their smaller scale causes their geographic coordinates to be curvilinear.

The algorithm for *mapIMG* uses the point-by-point method. While some processing efficiencies can be gained by utilizing some incremental linear approximations where they are valid, we chose to implement an algorithm in the more rigorous point-by-point method.

At times, a potential problem remains after the completion of populating all values through the inverse mapping/resampling process. This problem is often referred to as the wrap-around problem; handling it is discussed next.

IV. PROJECTION TRANSFORMATION POTENTIAL PROBLEM: THE WRAP-AROUND PROBLEM

A problem referred to as "wrap-around" is not uncommon when projecting raster data on a global scale (Figure 8). The figure shows the result of projecting global land cover data from geographic coordinates to a Hammer IV projection, which is an equal-area projection with curved parallels, without concern for the appropriate geometry associated with projecting raster data of global extent. (This reprojection shown in Figure 8 could have been one of many different projections.) Note the replicated areas of Alaska and Siberian Russia on both sides of the map.

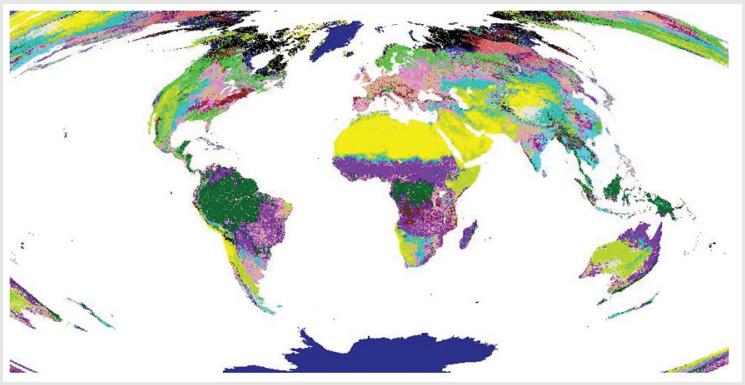

Figure 8. The wrap-around problem. Note the inapt geometry associated with projecting raster data of global extent.

The wrap-around problem shown in Figure 8 is an artifact arising from the use of inverse mapping. While inverse mapping has the computational advantage of only computing those pixels needed for the output raster dataset, it does pose problems when attempting to map a location that is located in the output raster dataset fill areas—that is, areas in which the projection transformation into the input space is not truly defined. In Figure 8, the Hammer IV projection results in an oval-shaped map of the globe. When we attempt to inverse map a point (pixel) in an area of fill (for example pixel (1,1)), the transformation between the line, sample space to the Hammer IV projection grid is well defined (it is a linear grid). However, when that resulting projection coordinate is placed in the map projection transformation software, one of two things could happen: it may cause an error condition, or it might be mapped to an incorrect location with valid data and without error conditions (often due to the periodic nature of trigonometric functions used in map projection transformations). This final condition is what is referred to as "wrap-around" and results in the effect seen in Figure 8. A simple but computationally expensive solution to this problem in the general case is to perform the inverse projection transformation and then perform the forward transformation on the result back into the output space to see if the output space coordinates match. If they do not, the condition is flagged as "wrap-around" and the output pixel is given a fill value (see Figure 9).

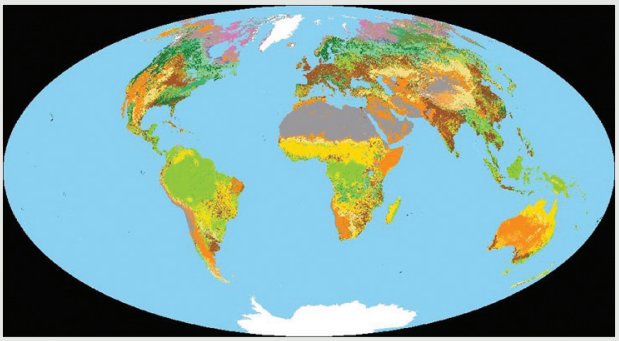

Figure 9. Projection of global land cover data to the Hammer IV projection. Note "wrap-around" problem fixed using fill value (from Steinwand 2003).

V. PROJECTION TRANSFORMATION POTENTIAL ISSUE: RESAMPLING

Kimerling (2002) outlined the spatial and mathematical nature of data loss and duplication during raster reprojection and resampling for three equal-area world map projections, showing explicitly the extent of loss and duplication at five-minute intervals using the ETOPO5 dataset (a continuous dataset). The choice of resampling methods deserves special attention when working with raster data of global or continental extent. Issues of concern are (a) the greater geometric distortions that are often present in large area map projection changes, such as a square cell being transformed to a parallelogram or a pixel to an entire raster dataset line (the pole in Mollweide converted to Equirectangular); and (b) the resampling that has to occur with signal-based continuous vs. categorical data. The errors from resampling in areas of large geometric distortion or scale change caused by a change in projection for categorical data (but not continuous/signal data) have been addressed by Steinwand (2003) and are reviewed below.

In general, projection transformation software packages are designed to work with points. Despite their point-specific approach, automated map projection software programs are used on both vector and raster data. Normally, a master routine provides the data in point form and keeps track of these point locations in pixels or vectors. In other words, they treat the raster data as just a grid of points and not as cells. In converse, software packages written specifically for raster datasets preserve (or should preserve) area (cell) relationships; more specifically, the (preserved) relationship is in the manner in which the transformation model uses the projection software, and then how the resampling over a cell is performed.

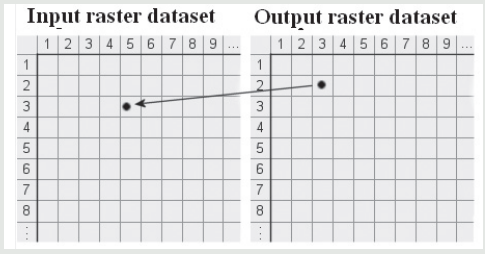

Figure 10. Nearest-neighbor mapping of one pixel in raster dataset (line, sample) space. Because the input and output are in different projection spaces, the corresponding raster dataset (line, sample) spaces will not be identical. This inverse mapping looks to the value in the input raster dataset (that the arrow points to) and uses that value to populate the pixel in the output raster dataset (from Steinwand 2003).

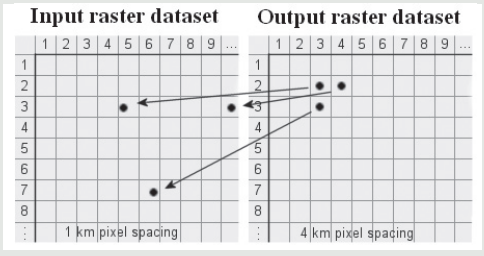

Figure 11. Nearest neighbor mapping of adjacent pixels when output resolution is reduced (from Steinwand 2003).

The nearest-neighbor resampling algorithm is used to determine an output pixel value by rounding to the nearest integer pixel location in the input raster dataset (Figure 10). This is because the resulting input raster dataset coordinates from the reprojection process are usually not at exact pixel center locations but are somewhere within that pixel. That pixel's value is assigned to the output raster dataset at the coordinate under study. Although this method is computationally efficient, it can result in a raster dataset that is not completely representative of the original data due to this within-pixel location that is not the center.

Occasionally, the next pixel in the output raster dataset, again mapped with the same algorithm, falls more than one pixel away in the input array (Figure 11). This can occur when the spatial resolution of the

output raster dataset is reduced, or as a result of the projection change transformation. The output raster dataset is then said to be under-sampled in that area.

Under these conditions (for example, when mapping a 1 km pixel to a desired 4 km pixel output), the output raster dataset does not include all data in the input raster dataset. More importantly, the nearest-neighbor resampling algorithm does not necessarily select a pixel that is representative of the area being resampled, but instead chooses the nearest one. This can result in areas of a raster dataset not being representative of the input raster dataset area, if, for example, a minority class happened to be the nearest pixel. For example, Figure 11 shows 1 km pixels that are spaced 4 km apart in the output raster dataset, instead of a pixel that truly represents the area of the 4 km pixel. Further, Figure 11 shows that the output pixel values (2,3) and (2,4) contain values from only the pixel values of (3, 5) and (3, 10) without capturing in any way the value between (3, 6) and (3, 9) horizontally.

Steinwand (2003) presented a new resampling algorithm for categorical data that addresses issues discussed in this section (Section V). The algorithm maps pixels as polygons rather than as points. As shown in Figure 12, the corners a, b, c, and d of the output pixel at sample 3, line 2, map to input locations A, B, C, and D. From this figure, one sees that 33 pixels, some of which are partial, comprise the data that could be considered for the output pixel. Once the input array pixels that are a part of the output raster dataset pixel footprint are determined, simple statistical methods or common resampling techniques can be applied to determine the output array pixel value that is to be assigned to the output array. For example, statistical methods such as the maximum occurring pixel, the minimum, and the mode, can be utilized for categorical data (Figure 13). Methods of resampling that are more complex—for example, that favor certain classes or that combine classes into composite classes—can also be used, at the cost of runtime performance.

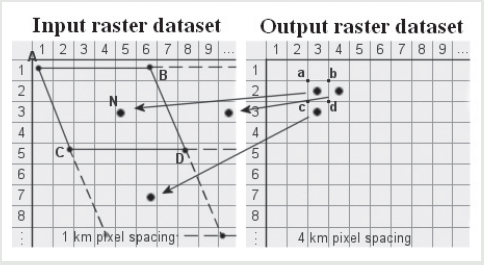

Figure 12. Mapping the input pixel's footprint—the concept behind the new algorithm. N is the center (or nearest-neighbor) point of the pixel being populated (from Steinwand 2003).

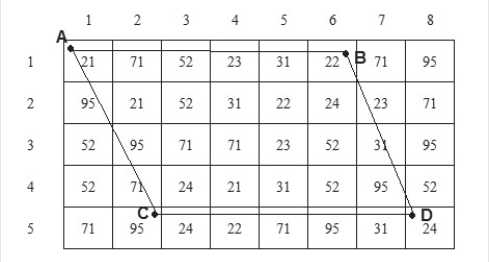

Figure 13. Input raster dataset from Figure 12 with pixel values. Using these categorical values, the value of N from Figure 12 can be 31 (median), 21 (minimum), 95 (maximum), or 33 (mode).

VI. MAPIMAGE (MAPIMG): AN IMPLEMENTATION

The *mapIMG* program has been successfully used to investigate problems with raster dataset reprojection, particularly with global data (Usery et al. 2003a and 2003b). The program is able to handle raster datasets with varying spatial resolution and projections. This section describes the implementation of the software package covering the resampling option, the wrap-around problem, data manipulation, schematic and flow charts that show the relationship between the code and the user interface, the multiplatform capabilities, the major classes (programming constructs) used, and the two major functions of the program.

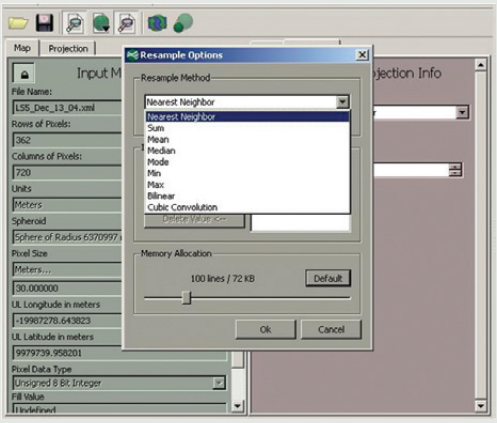

Figure 14. User options for resampling

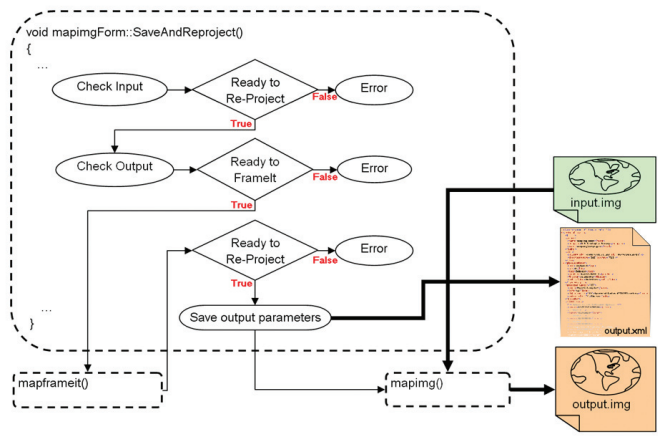

Figure 15. Schematic of mapIMG *program*

The user can select the sampling method they prefer (Figure 14). In addition, the program implements the inverse mapping process described previously and addresses the wrap-around issue. Figure 9 demonstrates a typical output product from the program (in this case, projection of global land cover data to the Hammer IV projection). When compared with Figure 8, it is noted that the wrap-around problem has been resolved by the *mapIMG* software. As a stand-alone program, *mapIMG* is available for various operating systems including MS Windows, UNIX (many variants), and Linux. It has a dialog box as a user interface and a menu bar and toolbar that appears upon execution of the program described in the User's Guide for this program (Finn and Mattli 2012).

The *mapIMG* program utilizes multiple computer input/output (I/O) techniques for manipulating data files. The program uses generic binary raster dataset, which are files with a value for each cell, sorted in a row major order without any header information. All raster dataset files must be accompanied by a metadata-type file describing the information about the raster dataset file contents (like the information contained in a header) for both the input and the output. Earlier versions of the *mapIMG* program use an ASCII file known as the .info files for this purpose. The current version of the program uses an .xml file for the same purpose. The .xml file is an easily read format that can assist in the importation of the generic binary file into other GIS packages.

Schematic and flow charts are shown in Figures 15 and 16, respectively. Figure 15 displays the relationship between the code for the interface, the two primary functions, and the input and output. Figure 16 details the logical flow of the process.

The *mapIMG* program is "multiplatform" and, thus, a researcher can port it to virtually any operating system. Users can download pre-compiled versions for Windows, Linux with K Desktop Environment 4, and UNIX for x86 and Sparc (Solaris 8 and 9) from the US Geological Survey (USGS) website (http://cegis.usgs.gov/projection/acc_proj_data.html). The source code is also available at the same site. A user can download and compile it for their own computing environment if they have the following three components: Nokia Qt (2012) installed the Tagged

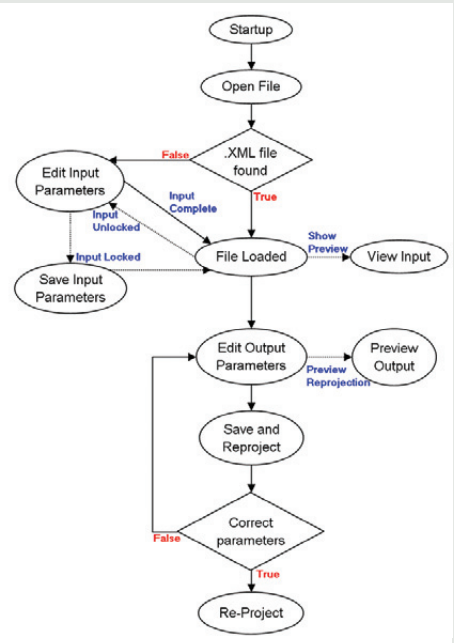

Figure 16. Diagram of reprojection flow

Image File Format (TIFF) library, and a C++ compiler. The TIFF library is used to convert incoming TIFF files to generic binary images (IMGs) which are then processed internal to the program.

Beyond the classes created in forming the GUI, which are transparent to the user, four major classes are used: RasterInfo, ResampleInfo, IMGINFO, and ImgIO<>. (Again, these classes are programming constructs, and not to be confused with classes of map projections.) These files are created by the code and do not have to be supplied by the user. RasterInfo is an encapsulation of all uses of the metadata. It stores the parameters as private attributes and it is used for passing the data among functions. When passed a filename it will automatically look for a corresponding .xml file. If none is found, it will look for the older .info file and replace it with an .xml file (Figure 15). (The .info file was used in an earlier version of the program. It functioned as a parameter file for input and output.) By checking for both the .xml file and the .info file, backward compatibility can be maintained. ResampleInfo stores all the parameters associated with the resampling method options. IMGINFO is a "struct" that holds a copy of the parameters needed in the GCTP function. The *mapIMG* program begins by copying information from the RasterInfo into the IMGINFO. While this may seem redundant, it actually helps to improve performance because it is faster to reference directly a public attribute than to use a get function. Finally, ImgIO<> is a templated class that encapsulates file I/O to the generic binary file as well as calls the GCTP function. It stores the input file in memory by lines using a "least recently used" cache. The larger the cache, the less often it will have to access the hard drive and request a read. This has helped to speed up greatly the operation of many reprojections of global raster datasets (Przybylski, 1990).

There are two major functions executed within the *mapIMG* program that work with GCTP: mapframeit() and mapimg(). The mapframeit () function is used to calculate the row and column dimensions as well as the coordinates of the upper left corner in a given projection. It begins by setting the minimum and maximum coordinates for each of the axes (pxmin, pxmax, pymin, and pymax) to be equal to their negative expected geographic coordinates of the selected map projection (pxmin = 180; pxmax = -180; pymin = 90; pymax = -90). It then loops through every latitude and longitude point with a grid resolution of 0.36 degrees of arc, or 500 rows by 1000 columns, and compares these points with the current minimum and maximum values of the output projection coordinates to determine if a point's values are outside those values—i.e., less than minimum or greater than maximum. If a value is outside, then it saves its value over the current one (Figures 6 and 7). Thus, at the completion of the algorithm, the output raster dataset space is defined.

After mapframeit() completes, the mapimg() function loops through every row and column (line and sample) in the output raster dataset and loads it with the appropriate values from the input raster dataset. If GCTP returns an error for a current point or detects the wrap-around condition then a "fill value" is placed there, otherwise, based on the resampling scheme, GCTP determines the input pixel that maps to the current output pixel and mapimg() loads the value from the input raster dataset. The mapimg() uses an additional code to check

the transformation in the forward direction after the inverse transformation to look for the wrap-around problem. This problem is evaluated by transforming a point to the old projection and then transforming that point back again. If the final point is different from the initial point then it is considered a wrap-around point. For time optimization, a row buffer is used in mapimg() to reduce I/O time by only writing to the output when an entire row has been populated.

CONCLUSIONS

Projection of global raster data can introduce significant errors unless proper reprojection techniques are utilized. The methods discussed in this paper minimize these errors by, first, framing the raster dataset, as defined by the extent of the raster dataset in the projection space. This extent is specified in the units of the output raster dataset map projection system, and is accomplished using a geographic minBox (the area contained in a box formed by the upper-left and lower right geographic coordinates covering the user's area of interest) and the specification of the output extent (the minimum and maximum projection coordinates of the output space). Second, the inverse mapping algorithm is applied by stepping through the output raster dataset space pixel-by-pixel, calculating the corresponding coordinates in the input raster dataset as it executes. By utilizing categorical resampling with modal categories, better results can be achieved than nearest-neighbor methods (based on desired outputs/visualization) when large changes in scale occur.

Although the benefits to *mapIMG* have been documented, there are potential limitations to the program. For example, in the cases of more complicated topology than those outlined previously, edge effects that affect the resampling operation process may be present. In addition, the geographic minBox may also encounter problems with unusual or complicated topology or arbitrary spherical rotations. Future studies include a more detailed analysis on comparing spherical versus ellipsoidal projections, evaluating the accuracy of multiple forward and inverse projections, and issues associated with aliasing due to resampling.

Because some software packages can introduce artifacts (the "wrap-around problem") when projecting raster datasets, *mapIMG* checks transformations in the forward direction after the inverse transformations to eliminate these reprojection artifacts. This is one of the primary benefits of *mapIMG* ; this paper expands upon issues related to raster dataset reprojection and provides documentation to highlight how *mapIMG*'s implementation can more efficiently process small-scale dataset reprojections. We presented the implementation of *mapIMG* to better handle issues that are unique to these raster datasets. The *mapIMG* program uses methods to provide solutions to the problems for raster data reprojection on a variety of computer architectures, including the often-overlooked problems of wrap-around and coordinate framing, especially for small-scale data. The program is freely available in both source code and executable forms.

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No Geography Department? No Problem: The Map Collection at Cornell University Library and the Humanities

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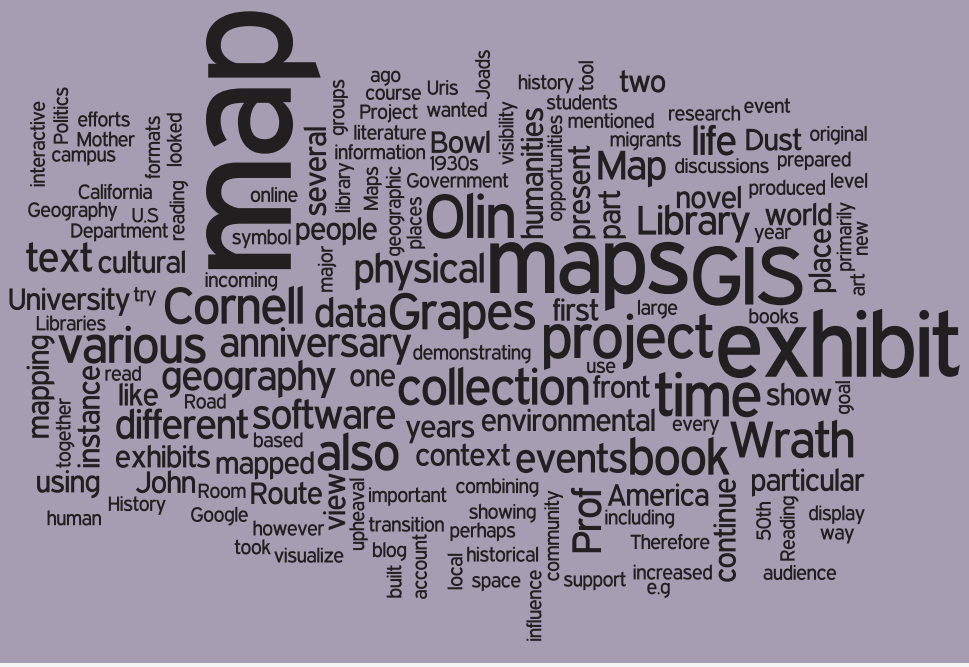

INTRODUCTION

When I was giving a Map Collection tour to the parents of first-year students last year, someone observed, "So, you have more than 350,000 maps, atlases, journals, and books, and no Geography Department?! Who then uses the collection?" The quick, and quite true, answer would be, people are "doing geography" all over the Cornell University campus—researching historical and present boundaries, examining linguistic groupings, imagining how a particular place looked 100 years ago, etc.

All this makes the physical collection relevant but, with the absence of a "normal" primary audience, we try to provide support to a broader audience primarily in the humanities. In this context, the new exhibits we mount every six months in the lobby in front of the Maps Room serve two purposes: (1) increasing the visibility of the Map Collection, including advertising the opportunities that maps and mapping software present; and (2) engaging in the cultural discourse at the University, local, national, or even world level. For instance, several years ago Cornell launched its New Student Reading Project, as part of which incoming freshmen read and engage in year-long discussions of a particular book. This

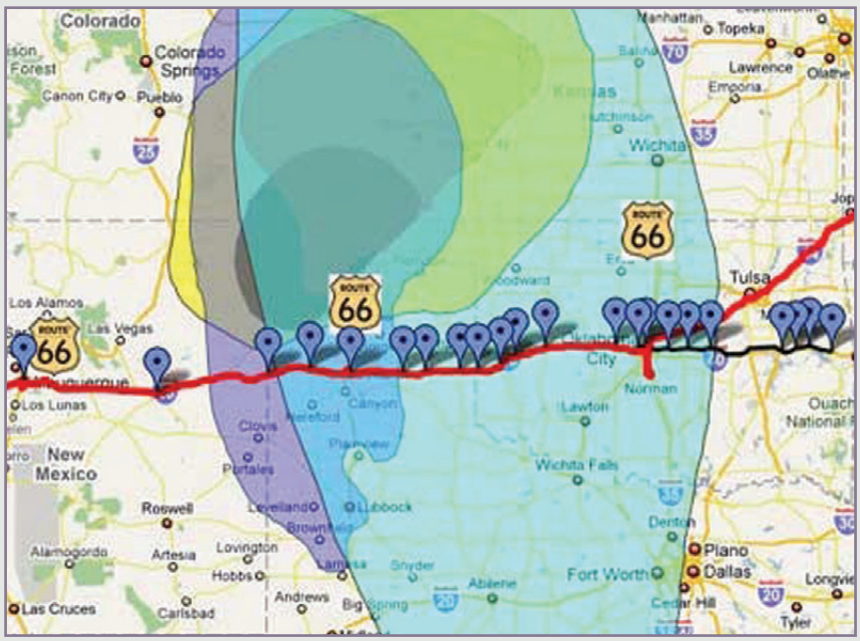

Figure 1. A screen shot of the interactive online Grapes of Wrath *map. The colored layer shapes show the different levels of wind erosion resulting from the Dust Bowl.*

creates a sense of community and academic integration. Several times, where the content allowed us, we prepared a map exhibit in support of the project; for example, in 2009, we mapped John Steinbeck's *The Grapes of Wrath*. The exhibit completed our involvement in the project and the celebration of the 70th anniversary of the publication of the novel.

THE GRAPES OF WRATH

When we learned that the incoming freshman class Reading Project was *The Grapes of Wrath*, we asked ourselves, why not map it? After all, the book is an extraordinary account of a major upheaval and transition in the way of life of large groups of people in America, caused by both environmental and social factors. We can read it from multiple perspectives—as literature, as a sociological or political study, or as an economic report on the poverty of the 1930s. We can also listen to the music it contains, or view the art that it inspired. And we can look at its geography, since there is a natural link between literature and geography. Geography has a big influence in shaping any society. Literature, like all art, is ultimately a reflection and illustration of the landscape that produced it. Virtually every story has a setting that can be expressed in geographical terms. Therefore, as part of the discussions within the Reading Project, in July 2009 we published an interactive online map (Figure 1) that drew some excited reviews from visitors on our blog page, like the one by Aimee Noel, Dayton, OH, on August 7, 2009: "This will be an extremely helpful site to use in my classroom. Thank you for the time and attention to detail that you are investing into this project."

Encouraged by the positive response, we decided to continue our efforts and prepare a map exhibit aimed at helping to visualize the events and places in this extraordinarily rich account of a major transition and upheaval in the way of life for large groups of people in America, and showing the influence of physical, geographic space on human behavior and cultural development—at the same time demonstrating the possibilities that GIS affords us.

GIS as a tool faces significant obstacles at the outset. The basic problem is that GIS was not developed for the humanities; it emerged as a tool of the environmental sciences and was quickly accepted in the corporate world. Its uptake in the academy is much slower. On the other hand, the ability of GIS to integrate data from different formats by virtue of their shared geography (Bodenhamer et al. 2010, viii-ix) has attracted the interest of historians, archaeologists, linguists, and many other humanists. GIS can be applied in answering a variety of historical and cultural questions; e.g., did the Dust Bowl of the 1930s result from over-farming the land, or was it primarily the consequence of long term environmental changes; how did the internal migration of the 1930s–1940s change the demographics of the Great Plains; why were the migrant camps in California concentrated where they were; and so on.

We considered two methods of realizing our goal: (1) the above-mentioned interactive Internet map, and (2) a physical exhibit combining both maps prepared by using the mapping software ArcGIS and an explanatory text. We believed that, by using graphics together with text, we would enhance students' understanding. The expectation was based on the results of various studies showing that when users view a map prior to reading a related text, they are able to more accurately recall more information from both the map and the text (Verdi and Kulhavy 2002, 43).

THE GRAPES OF WRATH: *GOOGLE MAPS*

Of course, ours was not the first attempt to map a literary work. For instance, Jerome Burg, founder of the Google Lit Trips Project, has mapped the locations in *The Grapes of Wrath* and provides some additional information in the placemark balloons.

For our project, we did a similar thing—we mapped the Joads' journey and geocoded all the places mentioned in the book together with an excerpt from the novel that mentions the particular place. We did not stop here, however. As we all know, Steinbeck immortalized Route 66, the Mother Road, as a symbol of the quest for better life. Therefore, we felt that Route 66 must exist on our map. And, of course, we wanted to show the driving force of the events happening in the novel—the ecological disaster known as The Dust Bowl. It seems that we ultimately succeeded—in addition to the comments in the blog, an anonymous viewer posted the following comment in the body of the map: "You … saved my life and my grade…"

THE GRAPES OF WRATH: *EXHIBIT*

With the permanent exhibit in the display case in front of the Map Room in Olin Library, we had a slightly different goal. We wanted to show the real physical/geographic context and environment. We did map the Joads' itinerary on Historic Route 66 (or "The Mother Road"), along which the migrants travelled to California; however, we put the emphasis on the Dust Bowl extent, the migrants' destinations, and the efforts of the federal administration to accommodate them. The maps in the exhibit came in different formats. Most of the materials shown were illustrations in books. We also showed, with their permission, a map from the National Agricultural Library special collections. The rest of the maps were original creations using GIS software based on data harvested in various sources (Figures 2, 3, 4, and 5).

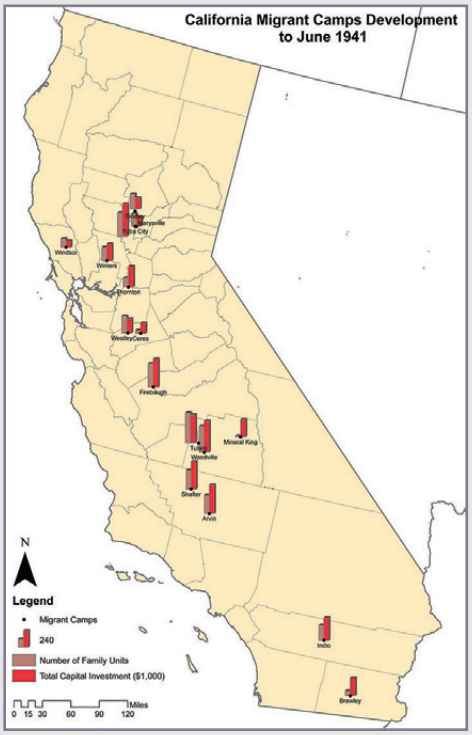

Figure 2. Development of California migrant camps to 1941.

Figure 3. Map of John Steinbeck's travels in California during the fall of 1937 in preparation for The Grapes of Wrath.

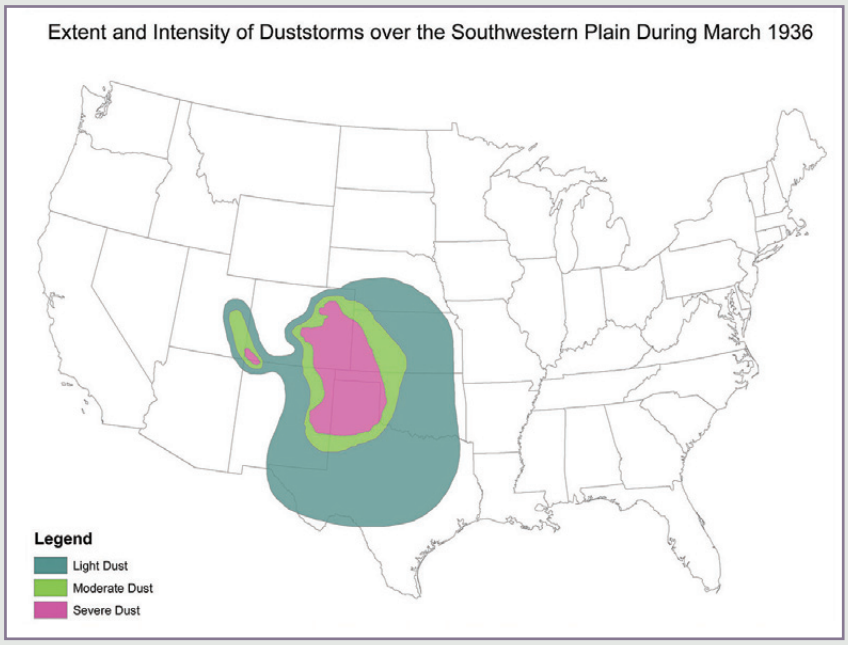

Figure 4. Extent and intensity of the dust storms over the Southwestern plains in 1936

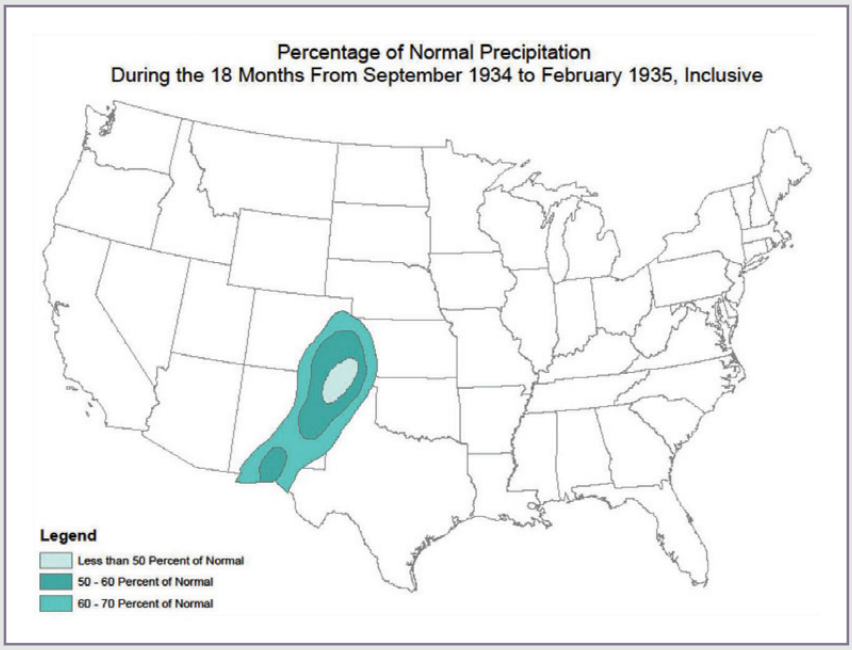

Figure 5. Percentage of normal precipitation between September 1934 and February 1935. The light, at best, rainfall and the careless cultivation and overgrazing depleted the subsoil moisture and greatly contributed to the dust storms of the 1930s.

THE 50TH ANNIVERSARY OF OLIN LIBRARY

2011 marked the 50th anniversary of the largest library on the Cornell University's Ithaca, New York, campus. The John M. Olin Library was built in 1961. It was the first library in the country to be purposely built as a research facility. Various events celebrated the anniversary, including an exhibition on display in Olin and Uris Libraries and also online. It traced Olin's history through photographs, drawings and artifacts, and examined how Olin had kept pace with evolving research needs.

This time, we took a different approach in preparing the map exhibit. We tried to show what the world looked like in 1961 by placing this concrete local event in a global geopolitical context, at the same time demonstrating the opportunities the various mapping software presents to visualize our experiences.

Arguably the most important event of the year was the inauguration of President John F. Kennedy (Figure 6). The inaugural address was the fourth-shortest in US history and one of the most crucial. It took place at the front steps of the US Capitol building and addressed the most critical issues of the time. 1961 also saw the emergence of perhaps the world's greatest symbol of division in the Berlin Wall. On April 12, a human being reached outer space for the first time. Despite the stated intentions, the arms race continued, leading to several serious nuclear accidents (Figure 7). Within the US, challenges to racial segregation gathered strength as the civil rights movement picked up speed. All of these events became part of the exhibit.

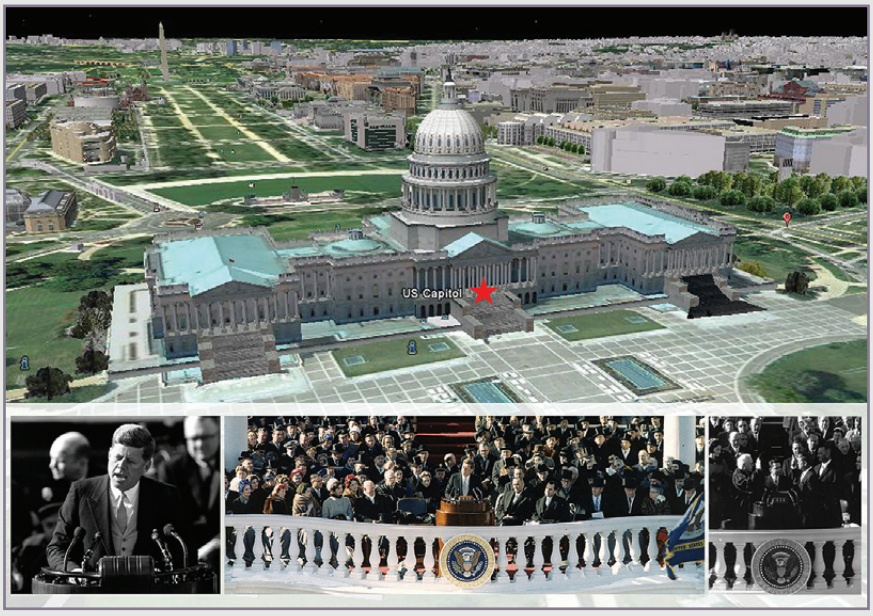

Figure 6. A poster of President John F. Kennedy's inauguration. The red star within the Google Earth image of the US Capitol indicates the location of the ceremony.

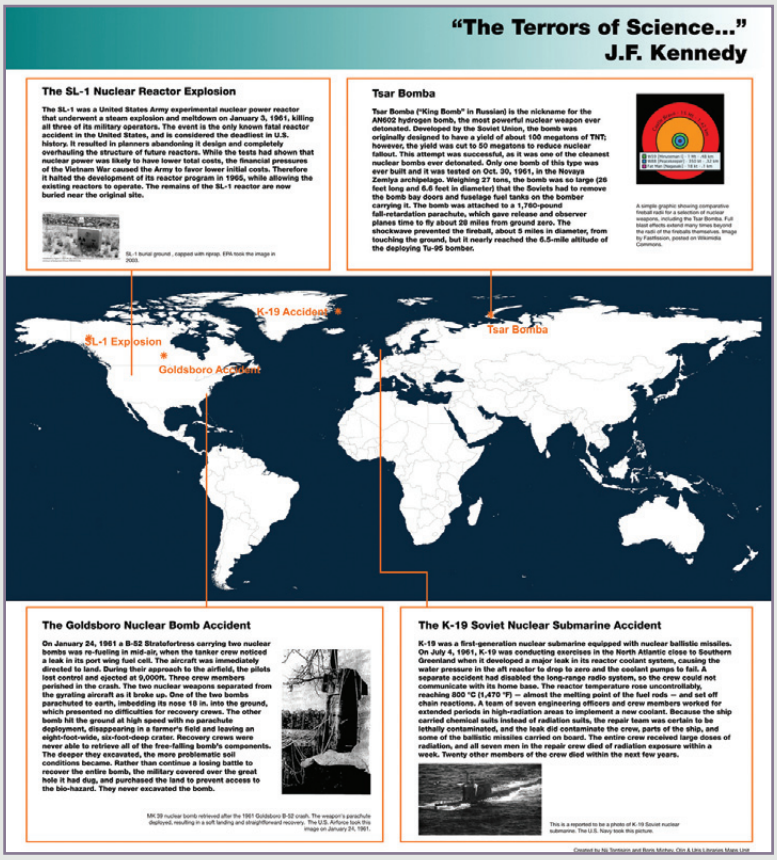

Figure 7. A poster of several nuclear disasters of 1961, including the detonation by the USSR of the AN-602 hydrogen bomb, the most powerful nuclear weapon in history.

Our plans for map exhibits continue into the future. 2012 marks the 500th anniversary of the death of Amerigo Vespucci and, in March, a new exhibit will appear, "America or Columbia: 500 Years of Controversy," which will try to present the opposing points of view and perhaps take a side itself.

CONCLUSION

The regular exhibits presented by the Map Unit of Olin & Uris Libraries are an important contributing factor to the increased visibility of the unit, the collection we curate, and the various projects we either participate in or have been commissioned to perform. Our collaboration with various departments at Cornell University have sharply increased over the past several years. For instance, Nij Tontisirin, student-assistant and the unit's GIS specialist, created the original maps for the 2011 book *Islam: A Short Guide to the Faith*, by Prof. Shawkat Toorawa, Near Eastern Studies. She provided the maps and GIS analysis for Prof. Jon Parmenter's (History) 2010 book *The Edge of the Woods: Iroquia, 1534-1701*, as well as the maps for Prof. Sandra Greene's (History) 2011 book

West African Narratives of Slavery: Texts from Late Nineteenth- and Early Twentieth-Century Ghana. We also produced the maps for the Matthew Robar's 2010 senior honors thesis, "All Politics Is Local: Even the Politics of War in the Government Department." Currently, we are working with Prof. Thomas Pepinsky, Government, on his long-term project combining data from the 1930 Dutch census of Indonesia (Volkstelling 1930) with contemporary data on governance at the district level.

Thus, we hope to continue to increase the use and relevance of our map collection for both the humanities and the entire Cornell community.

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Cloud Mapping: Google Fusion Tables

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INTRODUCTION

The cloud is presenting new possibilities for mapping. Fusion Tables is a Google service for storing, sharing, and visualizing data; it accepts data in a variety of formats, including Excel and CSV. The ability to import KML files makes mapping possible. Fusion Tables is still a beta product. Up to 250 MB per user can be stored at no cost.

The following three articles all deal with mapping applications utilizing Fusion Tables. The article by Koespell looks at how spatial and attribute data from the US Census Bureau can be uploaded and mapped. Pereda relates how maps can be styled within Google Fusion Tables. Trowbridge examines the layering of data on maps.

These three contributions come from a graduate course entitled "Cartographic Methods," taught by Michael Peterson at the University of Nebraska at Omaha. The course dealt with various ways of using cloud resources to make maps. The next issue of *Cartographic Perspectives* will include three more articles on cloud mapping.

—Michael Peterson

MAPPING CENSUS DATA IN THE CLOUD
Kelly S. Koepsell

INTRODUCTION

Displaying and analyzing data from the US Census Bureau and other agencies can be difficult without commercial geospatial software. Cloud-based tools provide free solutions for the mapping of this data. The method outlined here guides users in building a table of data and mapping the data through services provided in the cloud.

DATA CONVERSION

Digital maps and attribute data can be found through the US Census Bureau website. Basemaps are provided in the form of ESRI shapefiles. Attributes are provided in tabular form.

In the example used here, a shapefile will be converted to a Keyhole Markup Language (KML) file. Many free conversion services are available, including Shape2KML, Geoserver, and Shape2Earth. The conversion can be done online with some services, while others require that the software be installed on the user's desktop. All of these services adequately convert shapefiles to KML.

Once the shapefile has been converted into a KML file, it can be uploaded to a cloud application to display the map. Again, the user has several choices. Google Fusion Tables is used in the steps outline here because it provides an "all-in-one" approach to database table storage, geographic information display, and data display with various mapping options. Many other cloud-based mapping services are also available (e.g., GeoCommons, ESRI, and Geoserver).

When the KML file is uploaded into Google Fusion Tables, it is split into its components, that are then placed into different columns in the table (see Figure 1). The three columns will usually be titled "description," "name," and "geometry." The description column contains the HTML code for the map display format and the shapefile attribute table information. The name column contains the name of the map as declared in the shapefile. The geometry column holds the KML code of latitude and longitude points for drawing the map.

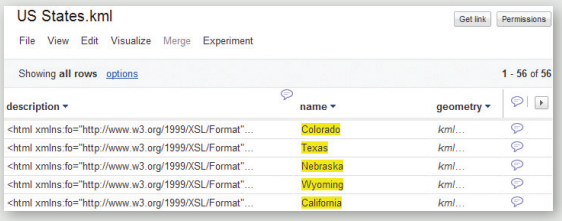


Figure 1. The imported KML file is displayed in a Google Fusion Table. The three column headings are the main subsections of the KML file. The description column contains the HTML code for map display format and the attribute table data. The name column contains the map's name from the shapefile. The geometry column holds the KML code for the points that comprise the map from the shapefile. Notice the number of entries is 56, for the 56 polygons that correspond to the 56 states and territories.

SHAPEFILE DOWNLOAD AND CONVERSION

Shapefiles from the US Census Bureau website can be found under "TIGER" (Topologically Integrated Geographic Encoding and Referencing). Files are available for download in zipped form.

Some shapefile-to-KML converters require as input the zipped file and others do not. Experimentation may be needed to find the solution that works best. Some options produce a KMZ file, a zipped version of the KML. In this case, unzipping to KML is required before the file can be imported into a Google Fusion Table.

Access to Google Fusion Tables requires a Google account. In Google Documents, select "Create" and then select "Table." A dialog box will appear with file import options. Select the KML file and import. When import is complete, the KML file will be displayed as a table.

After the shapefile is uploaded, the demographic data needs to be acquired and uploaded to a second Google Fusion Table.

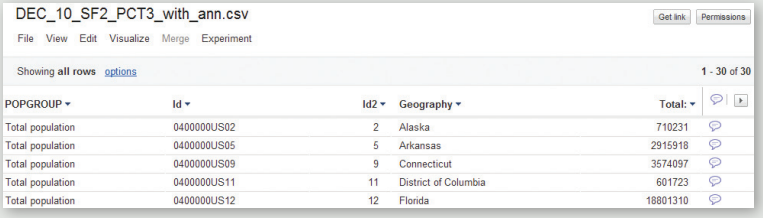
DEMOGRAPHIC DATA DOWNLOAD AND MANIPULATION

Demographic data can be downloaded from the US Census Bureau by subject, type, year, and geography. Many different data file types are available, including PDF, Microsoft Excel, Rich Text Format, and Comma Delimited Format. A comma-delimited format is selected here to enable uploading to the Fusion Table, but the Excel option could also have been used (a size limit of 1 MB is imposed upon .xls files; 100 MB for .csv files). The data file is downloaded as a zipped file.

After the file is unzipped, minor manipulations of the demographic data file are required in order to prepare the file for uploading into a Google Fusion Table. These modifications can be done in Excel.

In the file provided by the US Census Bureau, the column headings occupy three or four rows at the top of each column. In order to upload the spreadsheet to a Google Fusion Table the column headings must be in one row. This change is easily done in Excel with the Concatenate function, which combines all text in select cells into one cell. Select the cell where the single heading row should be and type "=concatenate" into the function bar. Then, enter the column/row reference for each of the three or four cells containing the header information desired, separated by a comma. After concatenation, a single heading row cell will now contain a string of text from the input cells. Since the header is now in a single row, it can be uploaded into Google Fusion Tables.

After the modified demographic data file has been uploaded, select "Create" and then select "Table." A dialog box will appear with upload options. Select the data file and import into Google Documents. When import is complete the data file will be displayed as a table (Figure 2).


DEC_10_SF2_PCT3_with_ann.csv

Get link | Permissions

File View Edit Visualize Merge Experiment

Showing **all rows** options 1 - 30 of 30

POPGROUP	Id	Id2	Geography	Total:
Total population	0400000US02	2	Alaska	710231
Total population	0400000US05	5	Arkansas	2915918
Total population	0400000US09	9	Connecticut	3574097
Total population	0400000US11	11	District of Columbia	601723
Total population	0400000US12	12	Florida	18801310

Figure 2. The uploaded demographic data file in Google Fusion Tables. Note the number of entries is equal to 30.

Note how the table organizes the demographic data. The first four columns contain geographic data relating to the data collection area. The area's name will be found under the "Geography" column. This column will be used to merge the demographic data with the geographic data previously uploaded as a KML file. (Recall that in the uploaded KML file, the column "name" was the column that contained the map labels.)

MERGING THE TABLES AND DISPLAYING THE DATA

To merge the geographic (KML) data with the demographic data, open the KML Fusion Table and select "Merge" from the menu (Figure 3).

In the dialog box, select the column ("name") to be associated with the geographic area column from the demographic table. On the right, select the file to merge and select the column to be associated ("Geography"). The choice to save the merged tables as a new table is made automatically; simply provide a new file name in the space provided. Select "Merge tables," and the new table will be displayed when the merge operation is complete.

There are two parameters in the merge operation that require explanation. The merging operation performed by Google Fusion Tables is "computed dynamically," meaning the data in the merged table will be updated if the data in the original tables is changed. The note in the dialog box also states if the data in the merged table is changed, the data in the original tables will be changed as well. This is a very useful function if the user is aware that this is happening. The user could merge tables, believing the original tables and the merged table are separate and distinct entities. However, changing one table will affect the data in the other table, as stated in the merge dialog box. Without understanding this, the user might inadvertently change data in both tables.

The other merge parameter the user needs to be aware of is the merging order. The merge dialog box states that the tables will be merged "using the rows from the first table." In the examples below, the KML table (of US States) is selected first and the demographic table is merged to the KML table. The resulting table contains all the states listed in the original KML table with their associated demographic data, but some states do not have demographic data because they were not present in the original demographic table (Figure 4).

Conversely, when the demographic table is selected first and the KML table is merged to it, only the states in the KML table that have population data in the demographic table are merged into the final table. This is because the demographic table does not have data for all states listed in the KML table (Figure 5).

From the Google Fusion Tables menu, select "Visualize" and then "Map" to display the merged tables in a Google Map (Figure 6). This map may now be styled and altered as desired using "Configure styles." The specific attribute that is mapped can also be changed. To share the data or the map, click on the "Share" button in the top right hand corner of the page. This modifies the permissions settings of the table to allow access for specified users.

To distribute this table as a map, three options are provided. In the map menu bar, the first option, "Export to KML," creates and downloads a KML file for use in Google Earth or Google Maps. The next option, "Get KML network link," generates a website link that, when opened in a browser, will download a KML for use in Google Earth or Google Maps. The final option, "Get embeddable link," generates an HTML inline frame code for use on a website. The inline frame link specifies frame height and width, and the map URL. By modifying this code prior to use, the website author can adjust the size of the map displayed, and the map center, as the map center latitude and longitude coordinates are specified in the URL. The "Get link" button at the top right corner of the page enables sharing via e-mail or instant messaging. Finally, using the Google Maps API, the Google Fusion Table can be embedded into a webpage using the Google Fusion Table "Numeric ID." This can be found in the Google Fusion Table interface by clicking "File," then "About." The dialog box that appears contains all the properties of the table.

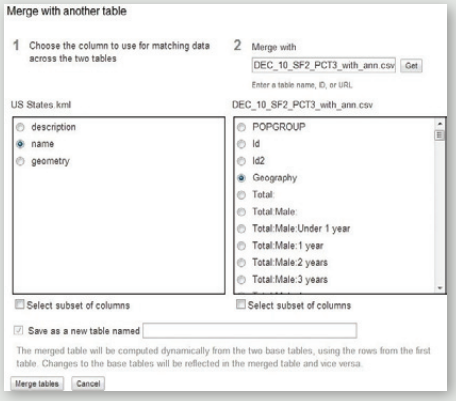


Figure 3. The "Merge Fusion Tables" dialog box. Notice that the "Save as a new table" checkbox is automatically filled in. The dialog box also provides guidance on how the tables will be merged, which is explained in the text of this article.

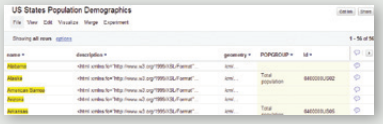


Figure 4. Merged results of selected KML file with demographic data file merged to it. Notice that all states, territories and districts in the US are represented by the number of rows of data in the table (56). In this figure, Alabama, American Samoa, and Arizona did not have corresponding entries in the demographic data table. Those maps are still in the table due to the order of the merge (KML first).

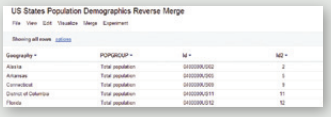


Figure 5. Results of the table merge when the demographic table is selected first. Notice the number of table rows is reduced to 30. This represents the number of rows in the demographic data file.

SUMMARY

The use of cloud computing tables and visualization tools, such as Google Fusion Tables, is an easy and effective way to store, integrate, and display census data. The free maps and data can be manipulated and customized in the cloud environment with a few simple operations. The ability to combine the geographic and demographic data via the merge operation provides the ability to place a very large amount of data into a single geo-referenced source. Google's distribution methods for the mapped data table enhances this powerful array by creating a flexible, accessible source for maps and data.

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Figure 6. Map of the merged Google Fusion Tables when the demographic table is selected first. Notice that only the states with demographic factors are displayed.

CONFIGURE STYLES IN GOOGLE FUSION TABLES

Gabriel Pereda

INTRODUCTION

Google Fusion Tables is a web service provided by Google for data management in the cloud. The service was originally designed for organizations that struggle with making their data available internally and externally, and for communities of users that need to collaborate on data management across multiple enterprises. Fusion Tables also provides a simple data integration platform where users can join tables that may belong to different users. To collaborate, users can share the data with a select set of collaborators, or make it public and thus available to everyone. Fusion Tables is helpful for geocoding data, as street addresses in a Fusion Table are automatically converted into latitude and longitude coordinates. The map option under visualization is used to map the results. However, one must have a Google account to make use of all the web services.

CONFIGURE STYLES OPTIONS

Configure styles" is used within Fusion Tables to control the display of the map. Figure 1 shows the default layout of the different tabs under visualize. "Configure styles" allows the user to manipulate the display of points, lines, and polygons on the map.

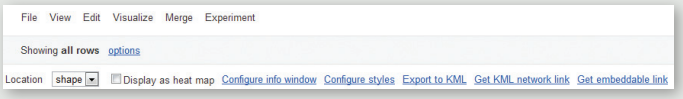


Figure 1. The options available after clicking on the Visualize tab.order of the merge (KML first).

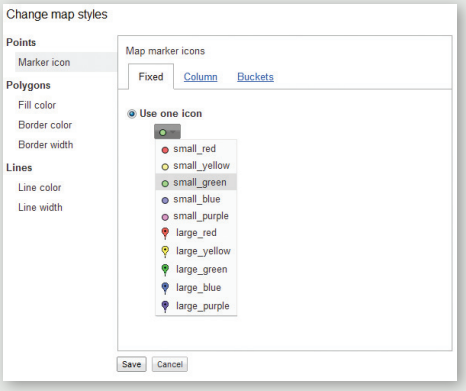


Figure 2. The available colors for icon markers within "Configure Styles."

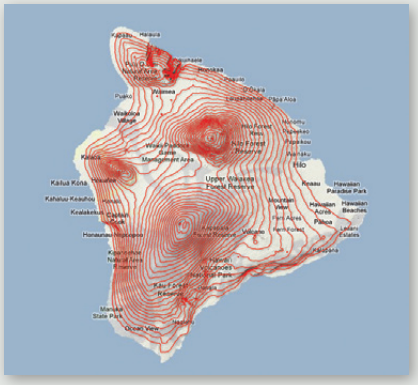
POINTS

Points on a map are identified as markers. The default marker is the standard upside down tear drop, although Fusion Tables offers approximately 200 additional markers. Figure 2 shows how the user can change the color of the icon under the fixed tab. The fixed tab means that the user wishes to set all of the points to be equal value. The column tab is used to provide a specification for each row's display in one of the table's data columns. This option provides the most specific control over the appearance of features on the map. The Buckets tab is used to classify the data. If the user wishes to represent multiple classes of data, he or she can change the color of each class to represent the data more accurately.

Figure 3. A point map with specified markers and color.

LINES

Lines on a map are another way to represent data. Similar to polygons, lines can be styled with the "Fixed," "Column,"



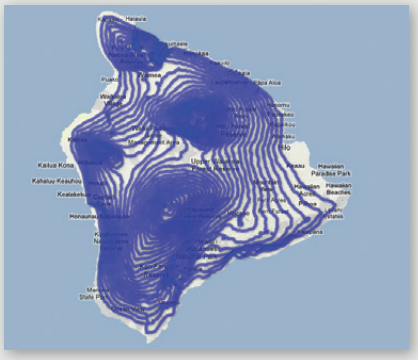


Figure 4. Map of contour lines on the Big Island in Hawaii showing the different colors and line width options that are available in "Configure styles."

"Bucket," and "Gradient" functions. Line width can be manipulated as well with "Fixed," "Columns," and "Bucket." As shown in Figure 4, the user can assign a specific color and width to each line if needed. Figure 5 shows the classification of the contour lines using the "Buckets" option.

POLYGONS

Fusion Tables can also handle polygons. Similar to points, a polygon can be modified with the "Fixed," "Column," and "Buckets" functions. "Buckets" control the shading of the polygons. In Figure 6, "Buckets" is used to specify a range of values to assign to each color. Style is assigned to each row based on the value in a numeric data column.

Polygons introduce the use of a fourth representation function, "Gradient." "Gradient" is an unclassed form of data representation that does not classify the data into categories but defines a continuous range of colors. The user can change the color of the overall gradient as well as the opacity of the fill color. In certain scenarios, where more than one column of data is being represented, the user needs to choose which column of data to represent. An example is shown in Figure 7.

WEB DISPLAY

Once the user has finished configuring the styles, the map can be displayed within a webpage. The JavaScript code example shown on Figure 10 will display the map; the user needs to change the numeric ID in the code shown on line 27. By clicking on the File tab, the user can see the "About" button, that gives the user the Number ID for the map. The center of the map will also need to be changed depending on which part of the world is being mapped.

Figure 5. Contour lines are given a certain value and divided into classes with the "Buckets" function. Ranges are distinguished by color value.

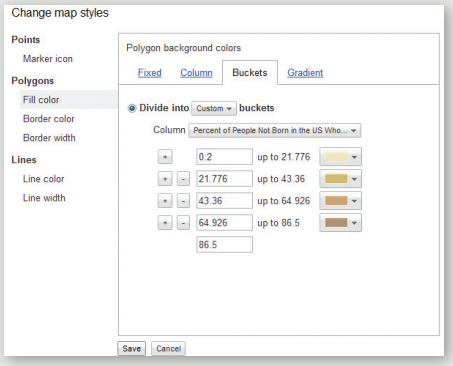


Figure 6. Buckets can be changed according the desired color and classification range.

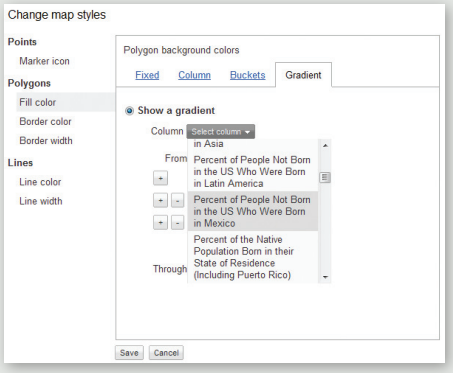


Figure 7. The user can select which column of data they wish to manipulate.

LIMITATIONS

Google Fusion Tables have a number of limitations. A few to note are: a storage limit of 250 MB per user account, 1 MB upload limit per Excel spreadsheet, no legend, no choice in the map projection, and limited icon styles and colors. The size difference between icons can be important due to the fact that larger icons can block smaller icons behind them which can lead to data misinterpretation, as shown in Figure 11. Incorrect geocoding is a frequent problem that can also alter a map.

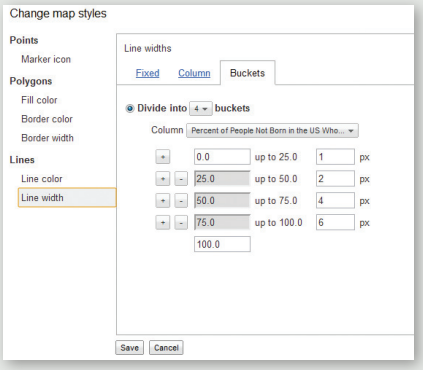


Figure 8. Lines can be represented with the "Fixed," "Columns," and "Buckets" functions.

SUMMARY

More and more maps are being made and displayed on the Internet through services in the cloud. Google Fusion Tables are just one of the many web services available that offer quick styling features and require no software installation. Fusion Tables allows the user to present their data in an appropriate manner and display interactive maps on a website. Although there are limitations to what the user can do with the application, Google Fusion Tables is a quick and easy way to display geospatial data on the web.

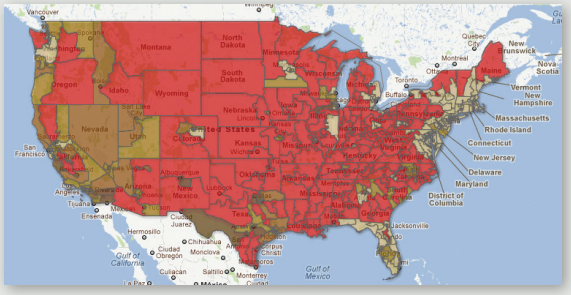


Figure 9. A map defined in Fusion Tables showing the percent of population born in Mexico for each Congressional district.

```
<html>
<head>
<meta name="viewport" content="initial-scale=1.0, user-scalable=no" />
<style type="text/css">
  html { height: 100% }
  body { height: 100%; margin: 0px; padding: 0px }
  #map_canvas { height: 100% }
</style>

<script type="text/javascript"
    src="http://maps.google.com/maps/api/js?sensor=false">
</script>

<script type="text/javascript">

function initialize() {

  var Omaha = new google.maps.LatLng(41.259,-95.995);

  map = new google.maps.Map(document.getElementById('map_canvas'), {
    center: Omaha,
    zoom: 11,
    mapTypeId: 'terrain'
  });

  // View this table in a webpage:  http://tables.googlelabs.com/DataSource?dsrcid=2879200
  layer = new google.maps.FusionTablesLayer(2879200);
  layer.setMap(map);
}
```

Figure 10. HTML/JavaScript code to display the Fusion Table Map.

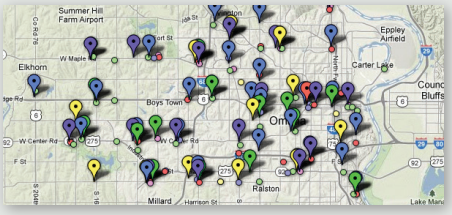


Figure 11. The use of different icon types and colors can lead to misinterpretation of the data.

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LAYERING MULTIPLE KML FILES IN GOOGLE MAPS WITH FUSION TABLES

Spencer Trowbridge

INTRODUCTION

Maps on the web are often displayed as a series of user-selectable layers. Map users seem to prefer a multi-layered map to a single map that displays all of the information simultaneously. Toggling between layers allows the user to go back and forth easily to compare the information depicted in each layer. Google Fusion Tables can be used to display information in this manner.

Google Fusion Tables are a way of storing, sharing, and visualizing data tables imported by users. The data is viewable in a spreadsheet format, and can be queried, edited, or exported in formats like CSV and KML. Google Fusion Tables is still described as experimental, and does have some limitations, including the size of files to be uploaded, upload formats, and options for map display.

Google Fusion Tables accepts map files in the KML format. Keyhole Markup Language (KML) is based on the XML standard and is designed for the display of geospatial information in Google Maps and Google Earth. Much of the code can be generated within Google Earth. Options include the addition of placemarks, lines, or polygons. Right-clicking on the newly-created layer allows the copying of the KML that can be then edited with any text editor.

Up to five Fusion Tables can be displayed on one Google map as layers. In this demonstration, stream channel changes will be depicted. This technique of using layers within Google Maps can enhance the presentation of change.

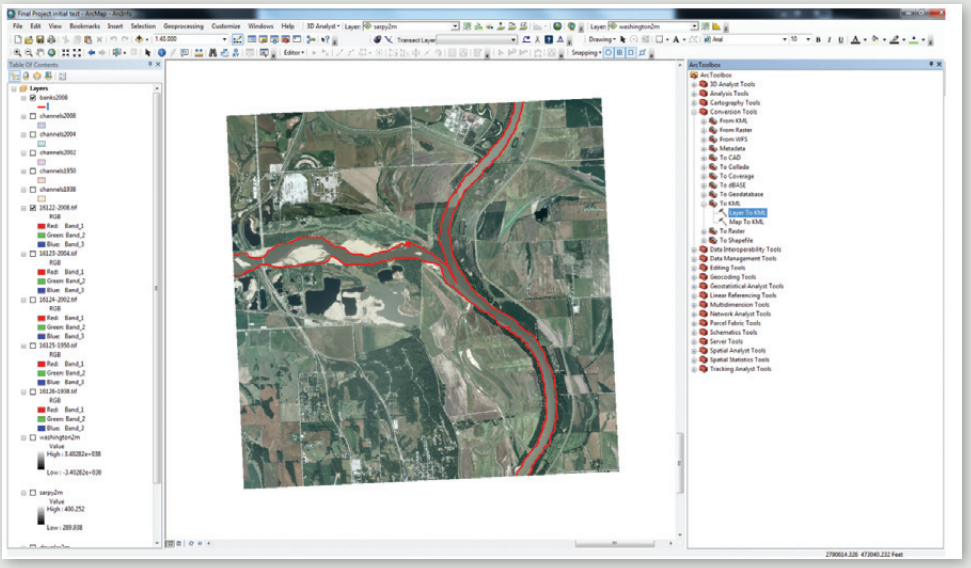

Figure 1. A digitized stream channel layer ready for export to KML from ArcMap.

CREATING RIVER CHANNEL LAYERS

Historic georeferenced aerial photographs were obtained as .tif files from http://www.historicaerials.com/aerials.php?op=home. These files were imported to ArcMap 10.0 (Figure 1). While one can overlay images in Google Earth and extract the KML code, ArcMap was chosen to allow the tracing of stream locations. Using ArcMap editing tools, the outer margins of the stream

channels were traced from separate years for the Platte and Missouri Rivers near Plattsmouth, Nebraska, and were digitized as lines on separate layers.

The conversion tool "To KML" in the ArcToolbox menu was selected to export each map layer. When the tool was opened, a selection window allowed the selection of the appropriate layer and destination or "Output" location.

ArcMap exports the file as a KMZ and not a KML. This is shown in Figure 2. A conversion from KMZ to KML is needed for importing into Google Fusion Tables. The file was opened with Google Earth and viewed for accuracy. Any styling that was done in ArcMap is not included in the KMZ file. The styling

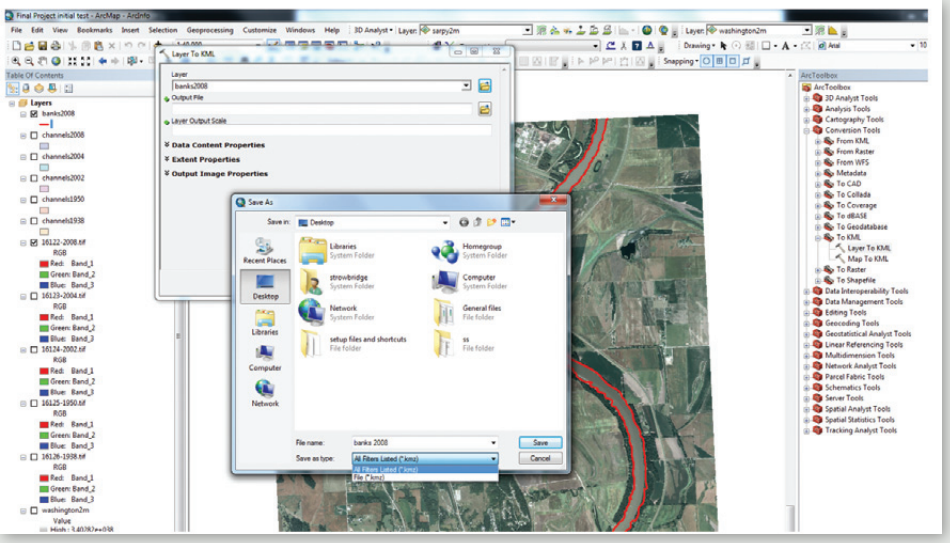

Figure 2. ArcMap exports to .kmz rather than to .kml format. A simple conversion is needed.

of the map, including colors and line thicknesses is done in Fusion Tables. Once the map displayed in Google Earth, that layer was highlighted within "Temporary Places" in the left "Places" pane. By selecting "Save" under "File", a "Save Place As..." option is presented. The "Save as type" drop-down menu allowed the file to be saved as a KML. This KML file was uploaded to Fusion Tables.

A Google account is required to import files and use Fusion Tables. Several file types can be imported into a Fusion Table. These include spreadsheets, delimited text files (.csv, .tsv, or .txt), as well as KML files.

The following steps are performed to import a file to a Fusion Table. These steps are also illustrated in Figure 3. From the Google Docs Fusion Tables screen, the blue "See my tables" button was selected. Once in the Google Docs page, the red "Create" button was selected followed by "Table (beta)" from the drop down menu. "Browse" was then clicked and the appropriate KML file previously created was selected. After the filename was shown in the window, "next" was selected. From the "Import new table" window, "Next" was selected followed by "Finish." The Fusion Table data was then displayed in a spreadsheet format. By selecting "File" from the Google Docs menu followed by "About", the Numeric ID of the Fusion Table is available for reference.

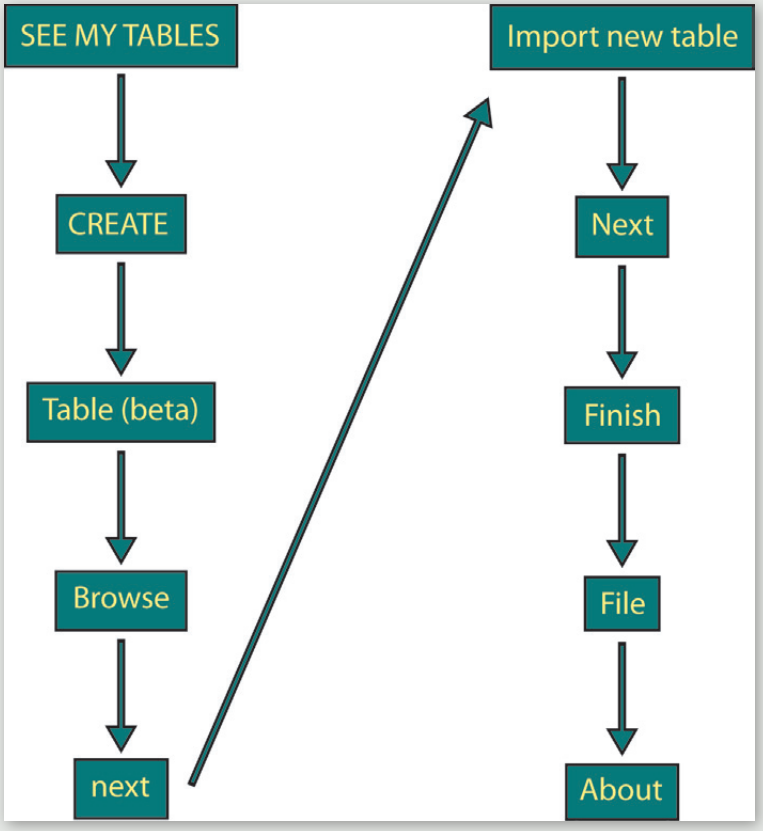

Figure 3. Steps needed within Google Docs to import a file and create a Google Fusion Table.

To display the map while in Google Docs, "Visualize," then "Map" was selected from the drop-down menu. The default color red was changed after clicking "Configure styles." The line opacity was changed to 100%. The hexadecimal color codes of the lines were written down for future use in making a legend. This process was repeated to add four more Fusion Tables to the Google Docs list.

Up to five Fusion Tables can be displayed on a Google Map. This can be beneficial for showing intersections of different data sets or change detection, especially when toggle option is added. This can help to avoid confusion by selecting which layers are visible. When all five layers are visible, they are difficult to visually separate, as the top layers overlap others and conceal information. The options to toggle layers allow the user to adjust their view of the data.

Displaying layers on a Google map does require some basic knowledge of HTML and JavaScript programming. The following JavaScript code sets variables using the Fusion Table numeric ID numbers. All of the code for this tutorial was obtained from http://www.geocodezip.com/insight-projects_com_pedc_A.html available through the Google Maps example page at **http://www.geocodezip.com/**.

```
<script type="text/javascript">

var tableid1 = 3469113 //1938
var tableid2 = 3468740 //1950
var tableid3 = 3468934 //2002
var tableid4 = 3469115 //2004
var tableid5 = 3468860 //2008

var layer1 = new google.maps.FusionTablesLayer(tableid1);
var layer2 = new google.maps.FusionTablesLayer(tableid2);
var layer3 = new google.maps.FusionTablesLayer(tableid3);
var layer4 = new google.maps.FusionTablesLayer(tableid4);
var layer5 = new google.maps.FusionTablesLayer(tableid5);
```

The following code sets the map center, zoom level, and basemap type:

```
function initialize() {
     var mylatlng = new google.maps.LatLng(41.048, -95.885);
//Lat-Long for center of map
     var myOptions = {
            zoom: 13,
            center: mylatlng,
            panControl: false,
            zoomControl: true,
            scaleControl: true,
            mapTypeId: google.maps.MapTypeId.SATELLITE     };
```

This code toggles Fusion Table layers on or off using if/then statements. Only one layer, 1938, is demonstrated in this code:

```
function changeLayer(tableidselections) {

     if (tableidselections == 3469113){
             if (document.getElementById("1938").checked ==
true) {
               if(layer1.getMap() == null) { layer1.
setMap(map); }
             }
             if (document.getElementById("1938").checked ==
false) {
                    layer1.setMap(null);  /*layersetoff*/
             }
     }
```

Checkboxes for displaying the layers changes the color of the text for each layer. The same hexadecimal code used in the Fusion Table to signify each stream channel was used here for the text of the map. The position of the map for on-screen display is also defined here.

```
<h4><p align="center" style="color:#657383">Click on the
checkboxes to display those layers</h4>
<!-- Form to turn layers on/off -->
<table width=90% align="center">
<tr align="center"><td>
<form>
<tr align="center"><td>
<!-- Map --><br>
<div id="map_canvas" ></div>
</td></tr>
<p style="position: absolute; left: 30%; top: 175;
color:#ff00ff"><input type="checkbox" value="3469113"
id="1938" onclick="changeLayer(this.value);">1938
<p style="position: absolute; left: 40%; top: 175;
color:#0000ff"><input type="checkbox" value="3468740"
id="1950" onclick="changeLayer(this.value);">1950
```

```
<p style="position: absolute; left: 50%; top: 175;
color:#00ff80"><input type="checkbox" value="3468934"
id="2002" onclick="changeLayer(this.value);">2002
<p style="position: absolute; left: 60%; top: 175;
color:#ffff00"><input type="checkbox" value="3469115"
id="2004" onclick="changeLayer(this.value);">2004
<p style="position: absolute; left: 70%; top: 175;
color:#ff0000"><input type="checkbox" value="3468860"
id="2008" onclick="changeLayer(this.value);">2008
</form>
</td></tr>
</table>
```

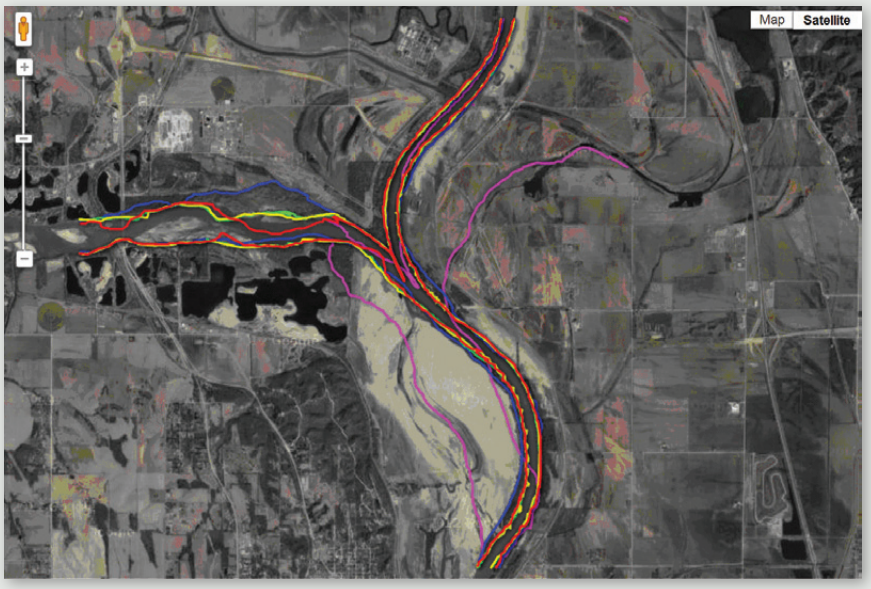

Figure 4. The display of all five years of stream channel locations can be confusing.

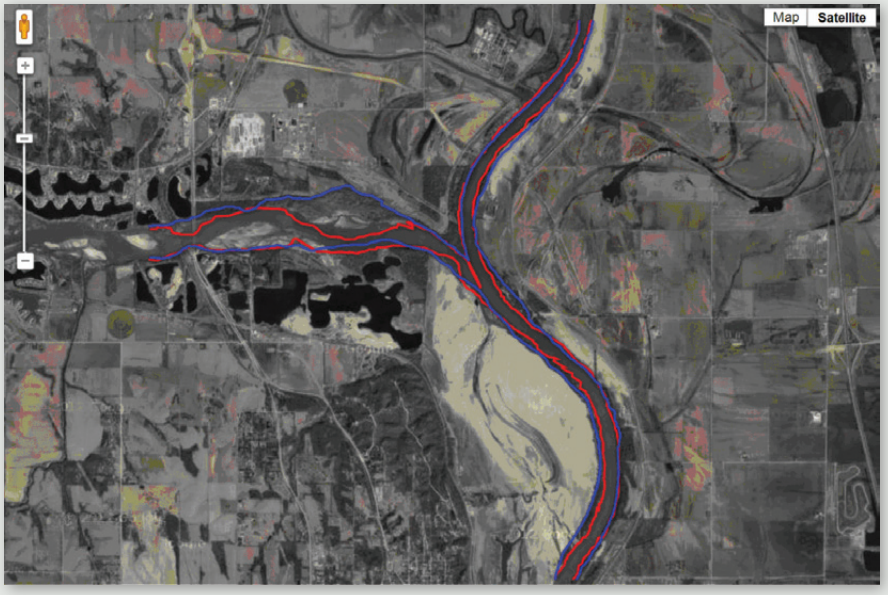

Figure 5. The display of only 1950 and 2008 stream channel locations. The 2012 stream location is visible in the underlying orthophoto.

Displaying five layers at once can be confusing, as demonstrated in Figure 4. Comparison of the stream channels is easier after toggling some layers off. The basemap in this image is from 2012, a year after a historic flood occurred along the Missouri River. The tan area at the lower center of the image is a large sandbar that is devoid of vegetation as a result of the flooding.

SUMMARY

Many types of data can be placed into a Fusion Table. Lists of addresses can be imported and mapped. Associated attribute data will be displayed in a popup bubble on the map if the marker is clicked. Census TIGER/Line shapefiles can be downloaded and imported into Fusion Tables. Once the shapefile is in Google Docs, it can be merged with other tables.

The display of data in Google Maps as layers that can be toggled can be beneficial for detecting and demonstrating change. The procedure for creating Google Fusion Tables is straightforward, as has been shown in this demonstration. One only needs a free account with Google, some basic computing skills, and some creativity. The finished map and HTML code for this demonstration can be found at **http://maps.unomaha.edu/GoogleMapGallery/LineLayers/**.

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On the Horizon

Using OpenStreetMap Data with Open-Source GIS

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www.spatialanalysis.ca

INTRODUCTION

For many, free and open-source data and software represents accessibility to otherwise inaccessible geospatial workflows in terms of cost and availability. Commercial data used in geographic information systems (GIS) is available through a relatively small number of merchants or vendors, which produce highly accurate, precise, and detailed information. This is produced, however, at a cost that many small and large businesses, private consultants, and startups cannot afford. Open-source data, such as the volunteer geographic information on OpenStreetMap (OSM), represents a community effort to build one of the best web maps, and subsequently the best GIS database, available for free to the public. OpenStreetMap is a web-based map to which any registered user can submit data. These updates, over time, populate the now extensive web map that is the OpenStreetMap. At the same time, the data that lives on the OpenStreetMap can be downloaded and used inside of a GIS for geospatial analysis, cartographic rendering, and other geo-related tasks.

There are various workflows for extracting and consuming the data that is made available by the OpenStreetMap project. One of these methods is outlined in this tutorial. This tutorial will take Mac OSX users through a typical setup of a local PostgreSQL database, downloading and parsing raw OpenStreetMap data, and querying the database to extract data for use in QGIS, an open-source GIS package. Upon completing this tutorial, users will have hit the ground running, with the ability to run spatial queries—such as locating all the coffee shops within 500 metres of a subway station—or building cartographically pleasing reference map books with data that is of interest to the map reader.

THIS TUTORIAL WILL COVER THE FOLLOWING:

- Access and browse an OSM data repositories
- Download a subset (often called an "extract") of the planet.osm data package
- Install PostgreSQL (object-relational database system)
- Install PostGIS for use with PostgreSQL (spatial database extension for PostgreSQL)
- Install and utilize osm2pgsql (converts OSM data for use in the PostgreSQL database)
- Install QGIS and its dependencies (GIS package)
- Query and add data in QGIS from PostGIS/PostgreSQL

ALSO, THIS TUTORIAL MAKES THE FOLLOWING ASSUMPTIONS:

- Currently running Mac OS X 10.6 or later (tutorial verified using both 10.6.7 and 10.7)
- Access to administrative privileges so that we can perform installations
- Plenty of storage space (extracts from OSM range from a few MB to many GBs)
- Willingness to try something new!

LASTLY, THIS TUTORIAL WILL FOLLOW THE FOLLOWING FORMAT:

The tutorial will follow a guided, step-by-step instruction that will assume the role of a new user installing and processing all data from scratch. The included links and information above are for background to the project that we are about to begin. Please follow all the instructions (don't skip any steps if you don't know what you are doing) and download all the required data when prompted to.

We will be using Terminal in this guide but it is not expected, nor is it required, that any readers of this tutorial have any Terminal.app background or knowledge. Terminal allows users to interact with the computer through a command-line interface. If you have not seen or used the Terminal before, you may have come across some instance of command-line interfaces (perhaps on

Windows machines, à la Command Prompt). I will do my best to explain what we are doing during the phase of the tutorial which utilizes the Terminal.app.

If you would like more information about any of the items mentioned above, please feel free to visit the respective website/wiki as listed below (but remember to come back!):

OpenStreetMap **http://www.openstreetmap.org/**
Planet.osm **http://wiki.openstreetmap.org/wiki/Planet.osm**
PostgreSQL **http://en.wikipedia.org/wiki/PostgreSQL**
PostGIS **http://en.wikipedia.org/wiki/PostGIS**
Osm2pgsql **http://wiki.openstreetmap.org/wiki/Osm2pgsql**
QGIS **http://www.qgis.org/wiki/Welcome_to_the_QGIS_Wiki**

OPENSTREETMAP & THE REPOSITORIES

OpenStreetMap (OSM) is a collection of free geographic data that can be viewed within a browser (**http://www.openstreetmap.org/**). We can also access, download, and utilize the underlying OSM project data from various repositories. What makes this so attractive is the fact that it's a community driven project, which means that anyone can contribute to it. It is also free to use and distribute under the CC-BY-SA license (as long as we attribute OSM and the license itself). The standard package that OSM distributes is called the "planet.osm." It is a standard XML-formatted .osm file of global data which, at the time of writing (Aug 22, 2011), is over 220 GB (17 GB compressed). The planet.osm is updated weekly (every Thursday) and includes the latest revisions of nodes, ways and polygons (points, lines, and polygons). I strongly encourage you NOT to download the entire planet.osm and work with it, due to its size and the required computing power needed to work with such a database. We will be exploring an extract of the planet.osm—specifically the province of Ontario, Canada—which comes in a much smaller/cpu-friendly size (2 GB uncompressed/350 MB compressed).

http://wiki.openstreetmap.org/wiki/Planet.osm provides a list of mirrors from which the planet.osm file and its extracts can be downloaded. We will specifically be using the CloudMade directory located on **http://downloads.cloudmade.com/**

PREFACE

This tutorial will reflect what I am doing on my computer. This is done in an effort to address commonly made mistakes. Tailor the tutorial to suit your own needs or follow my instructions to a tee.

Let us make sure that we stay somewhat organized during this tutorial.

- Create a new folder on the desktop called "osm_tutorial"
- Create two subfolders within "osm_tutorial" called "downloads" and "data"

We will download all of our installation files to the "downloads" directory and we will download the OSM data to the "data" directory.

ACCESS, BROWSE, & DOWNLOAD OSM DATA

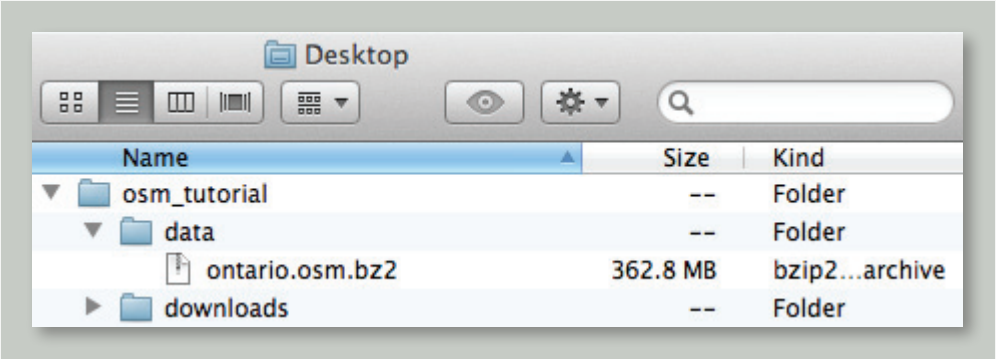
Let's download an extract of the planet.osm file (remember that the planet.osm file is too large to handle on its own). We will use the CloudMade repository which updates their planet.osm and "extract."osm (such that "extract" is the name of a location/place) weekly.

Go to **http://downloads.cloudmade.com/**

The repository is organized in a hierarchal structure (Region > SubRegion > Country > Province or State). Note that CloudMade does not have the entire planet.osm parsed into smaller extracts, such that only the most popular or demanded areas have been extracted for us to use. Some repositories will extract different regions than others. There are also some repositories that extract smaller scale areas (Cities, Towns, etc).

Here we will use the Ontario extract, which is located in Americas > Northern America > Canada > Ontario. Feel free to use any of the other extracts. However, I recommend that you choose an extract from the lowest level in the hierarchy (e.g., provinces or cities), and stay away from the larger extracts such as regions or countries.

- Follow the folder structure "Americas > Northern America > Canada > Ontario" to find the ontario.osm.bz2 extract.
- Right click > Save Link As on the "ontario.osm.bz2" link.
- Save the file to your "/Desktop/osm_tutorial/data" folder.



Do not extract this file. A benefit of using the tools mentioned in this tutorial, is the ability to work with fully compressed OSM data. Why is the file named "ontario.osm.bz2"? BZIP2 (bz2) is an open-source compression tool that OSMutilizes to produce small production packages (eg. a 17 GB "planet.osm.bz2" v. 220 GB uncompressed "planet.osm").

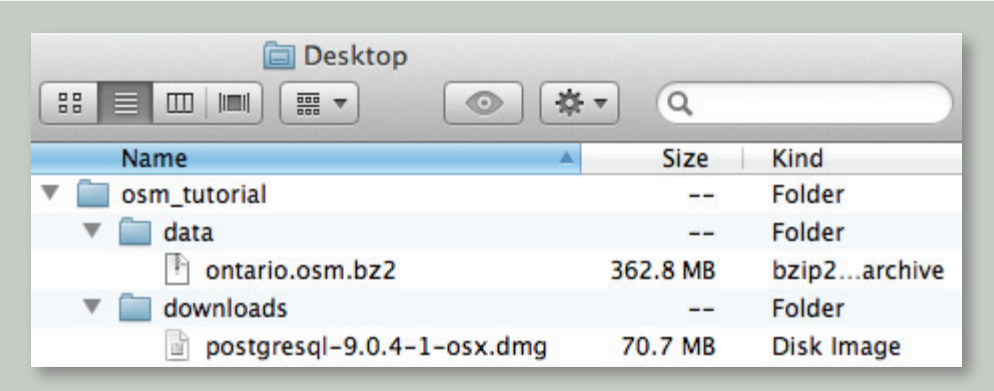
DOWNLOAD AND INSTALL POSTGRESQL

The next step is to download our database client, PostgreSQL. PostgreSQL is an enterprise-level database that is able to scale efficiently upon the demands of a single user or multiple users. By enabling spatial data storage with the PostGIS extension, PostgreSQL can store a wide variety of geometric objects, such as point, line polygons, multipoint, multiline, multipolygon, and geometric collections. Spatial databases empower the user by providing spatial functions, such as calculating the number of features within a specified radius of a point, or identifying the distance between two objects on the surface of the earth. PostGIS can also handle the reprojection of data as it is retrieved from the database, such that data can be stored in one common projection, but retrieved in a user-specified coordinate system.

The ESRI shapefile datatype is a common format for GIS data storage; however, with the amount of data provided by OpenStreetMap, it is unlikely that the shapefile specification can be used effectively. For example, the linestrings (polylines in ESRI-speak) table in our OpenStreetMap database contains all of the roads, paths, footways, creeks, rivers and so on. To effectively work with this data in an ESRI shapefile datatype, the features would require separation based on thematic content (roadways, pedestrian-ways, natural). However, while the data is in our PostgreSQL database, we can easily create three separate queries on our data to extract the same thematic content. This saves both space and time, as our data can be precisely extracted from one source database, based on the tagging system used in OpenStreetMap (**http://wiki.openstreetmap.org/wiki/Map_Features**), as opposed to producing three separate feature classes in the ESRI shapefile format. Lastly, it is important to note that queries on our database do not make changes to the data itself, and therefore can be easily modified if the user if the query results are not as expected.

There are many iterations of PostgreSQL and it can get quite confusing for the beginner user. Luckily, Dave Page at Enterprise DB maintains an easy-to-use, all-in-one installer that is available for Mac OS X (and other platforms as well).

- Go to **http://www.enterprisedb.com/products-services-training/pgdownload#osx**
- Select "Installer version Version 9.1.4" (latest at the time of writing) for Mac OS X.
- Save the file to your "/Desktop/osm_tutorial/downloads" folder.



We will now try to install PostgreSQL. If this is your first attempt at installing PostgreSQL, you will be prompted with regard to your computer's "Shared Memory" configuration. Not to worry: PostgreSQL handles the changes that are necessary, and yes, it is safe to allow PostgreSQL make these changes. I've included a snippet from the PostgreSQL "readme."

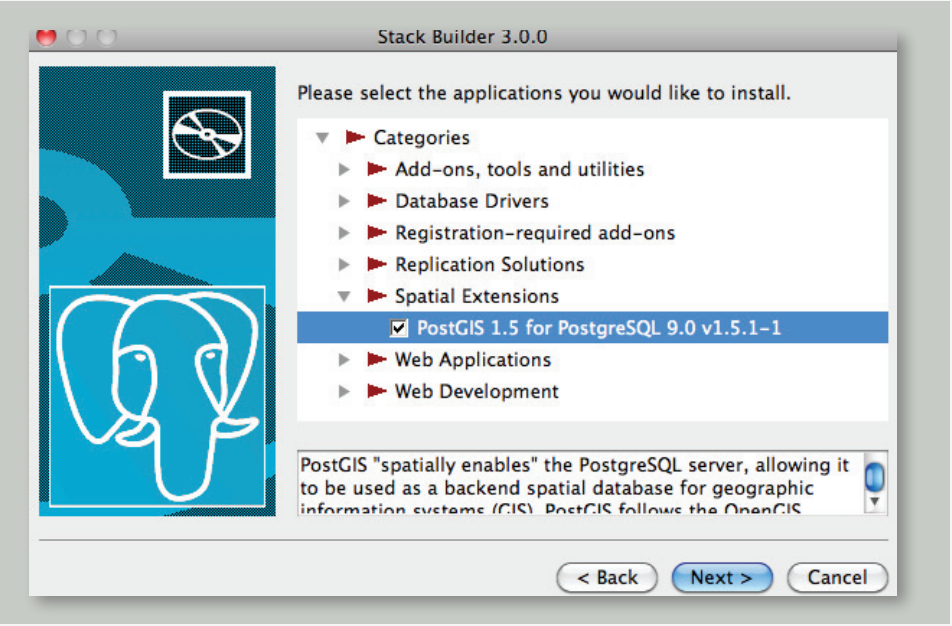
SHARED MEMORY

PostgreSQL uses shared memory extensively for caching and inter-process communication. Unfortunately, the default configuration of Mac OS X does not allow suitable amounts of shared memory to be created to run the database server.

- Mount the PostgreSQL disk image by double-clicking on "postgresql-9.0.4–1-osx.dmg"
- Launch the installer and allow it to make the necessary changes.
- You will need to restart your computer.
- After restarting, re-mount the PostgreSQL disk image by double-clicking on "postgresql-9.0.4–1-osx.dmg" (if it is not already mounted on the desktop).
- The installer will now pass the shared memory check and load the setup wizard.
- Proceed through the setup wizard, accepting all default configuration settings. Remember to assign a unique password for your PostgreSQL database when prompted.
- Make special note of port number "5432" that PostgreSQL has been assigned to. We will need to call upon this number later on in this tutorial.

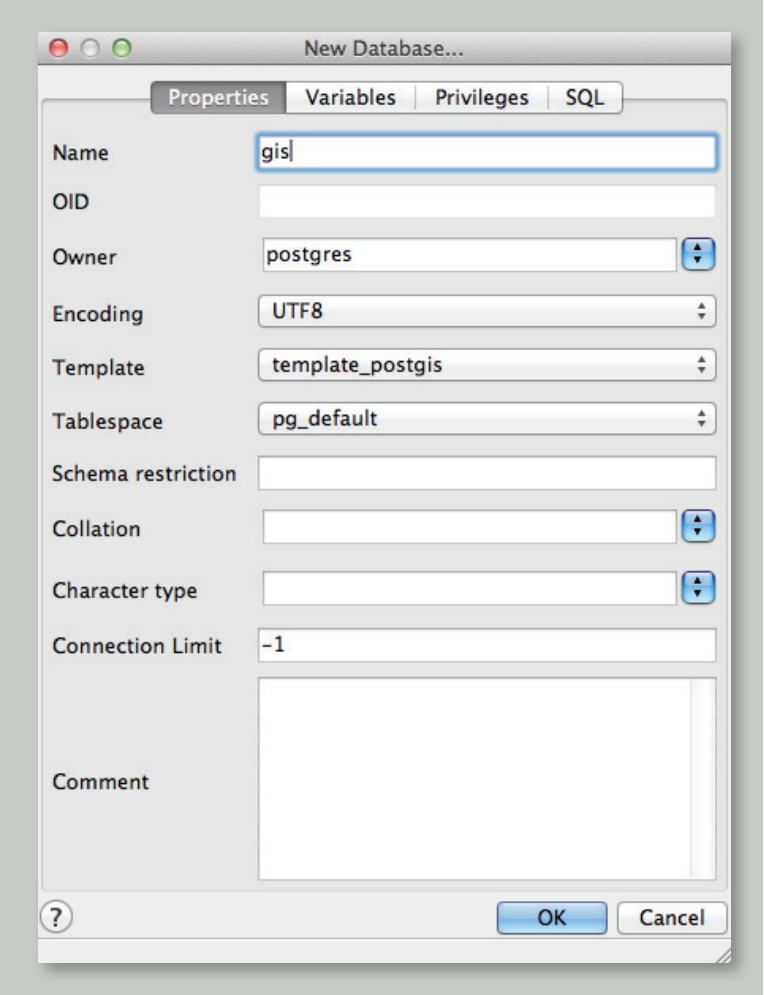
The installer will take a minute or so to complete, and will then ask if you would like to "Launch Stack Builder at exit?" This is required; we will need to install the PostGIS extension because PostgreSQL cannot handle our OSM data on its own. PostGIS will act as our database's forerunner, handling the spatial information in the OSM data for our PostgreSQL database.

- Make sure the checkbox to launch stack builder on exit is ticked.
- When stack builder launches, it will ask you to select your PostgreSQL installation from the drop-down style menu.
- Select "Spatial Extensions > PostGIS" (as seen to right)
- Proceed through the rest of the installation, accepting all default configuration options.
- When prompted to, input your unique password for the PostgreSQL database. By default, the port number (5432)



and username (postgres) are correct

- Once the installation is completed, launch "pgAdmin III" from the "Applications" folder.
- Double-clicking on "PostgreSQL 9.0 (localhost:5432)" will start the database (located under "Object browser > Servers" in the left pane).
- Right click > New Database… in the central pane (making sure not to select the "postgres" or "template_postgis" items).
- Fill out the "New Database…" form with the settings as shown below.
- That's it; we can exit the application.

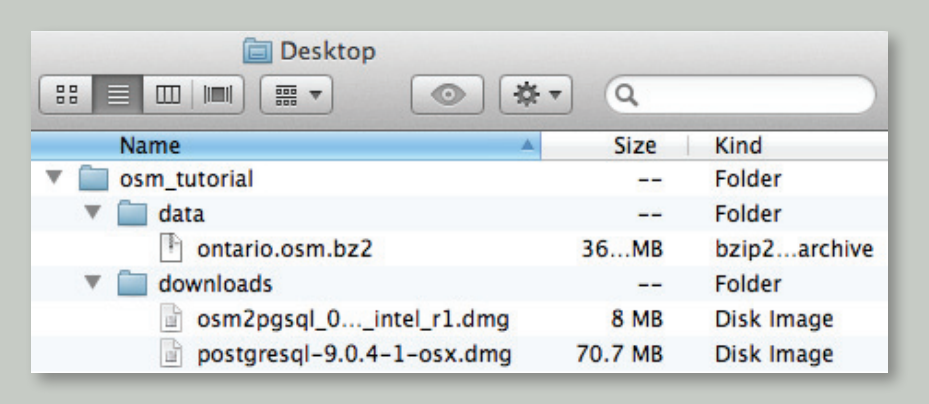


DOWNLOAD AND INSTALL OSM2PGSQL

Our next step is to download and install osm2pgsql, which will expedite the "ontario.osm.bz2" file into our PostgreSQL database.

- Go to **http://dbsgeo.com/downloads/#osm2pgsql**
- Select and download "osm2pgsql 0.70.5 — Snow Leopard / OS 10.6 (Intel x86_64)" to your "/Desktop/osm_tutorial/downloads" folder.

- Mount the osm2pgsql diskimage by double-clicking "osm2pgsql_0.70.5_snow_intel_r1.dmg."
- You must install GEOS and PROJ frameworks before installing the osm2pgsql tool. Do this now. Proceed through the installations, accepting all default configurations.
- Once GEOS and PROJ are installed, we can move on to osm2pgsql. Accept all default configurations when installing osm2pgsql.



USING OSM2PGSQL AND THE TERMINAL.APP

We will use osm2pgsql to parse our OSM data into the PostgreSQL database. Here is where we will encounter the use of the Terminal.app. As I mentioned earlier, I will try to explain what exactly we are telling Terminal to do.

• Launch Terminal. You can use the spotlight (magnify glass in the top right-hand corner) to search for it.

The first line of code—if you haven't opened terminal recently—should say something similar to this (replace my computer name and username with your own). Terminal is letting us know what {whose} computer we are on (michael-markietas-mac), and where are we performing the tasks (a directory; in this case, michael markieta's home directory)

- `Last login: Mon Aug 22 19:38:44 on console`
- `Michael-Markietas-MacBook-Pro:~ michaelmarkieta$`

We need to change the working directory from our user directory (michaelmarkieta) to the desktop. We use the "cd" command, which intuitively means "change directory." We also pass in the location to which we would like to change our directory. In this case, we will change directory to the "desktop." Type the following into Terminal (or copy and paste):

- `cd desktop`

If done correctly, Terminal will switch the current working directory to the desktop and the repeating line of code should read something like this:

- `michael-markietas-mac:~desktop$>`

Now that we know how to change working directories, let's navigate to our ontario.osm.bz2 file, which is located in "desktop/osm_tutorial/data." To move more than one folder when changing directories, we must insert our path between quotation marks and separate folders with forward slashes (/). Type the following into Terminal (or copy and paste):

- `cd "osm_tutorial/data"`

Terminal should now be working from within the "data" folder, which is located inside the "osm_tutorial" folder, which is also located inside {on} the "desktop", which is also part of michael markieta's user folder. The full path would look something like "/Users/Michael Markieta/Desktop/osm_tutorial/data."

- `michael-markietas-mac:~data$>`

Now to perform some osm2pgl magic. The tool offers many configurable parameters. These can be seen by typing the following into Terminal:

- `osm2pgsql --help`

We will concern ourselves with a few of these parameters, but it's useful to look over what is included with a tool when you install something new. We will be using –U, username, –d, database name to guide osm2pgsql in parsing the ontario.osm.bz2 file into our PostgreSQL database. The code will need to look like this:

- `osm2pgsql -d gis -U postgres -P 5432 ontario.osm.bz2`

LET'S PICK THIS APART ONE CHUNK AT A TIME.

- `osm2pgsql` — in words, we are telling Terminal.app to start the osm2pgsql script
- `-d gis` — in words, we are configuring the script to use the database called "gis"
- `-U postgres` — in words, we are configuring the script to access the database with username "postgres"
- `-P 5432` — in words, we are configuring the script to access the database on port 5432
- `ontario.osm.bz2` — in words, this is the file we would like our script to parse into our database

We will need to let it run for a few minutes. If everything went smoothly, you should have received the following confirmation in Terminal:

- `Completed planet_osm_point`
- `Completed planet_osm_roads`
- `Completed planet_osm_polygon`
- `Completed planet_osm_line`

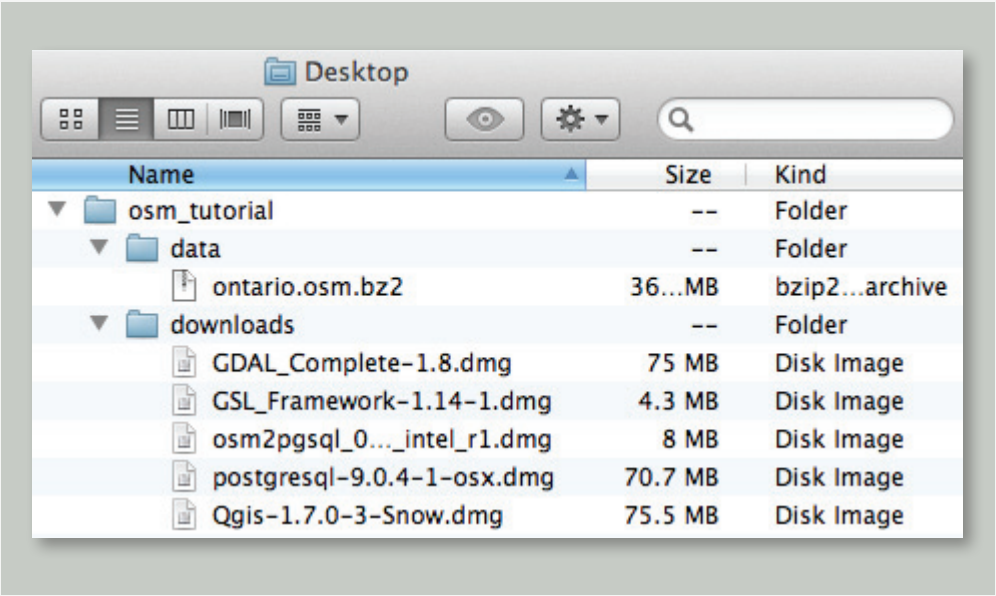
QGIS

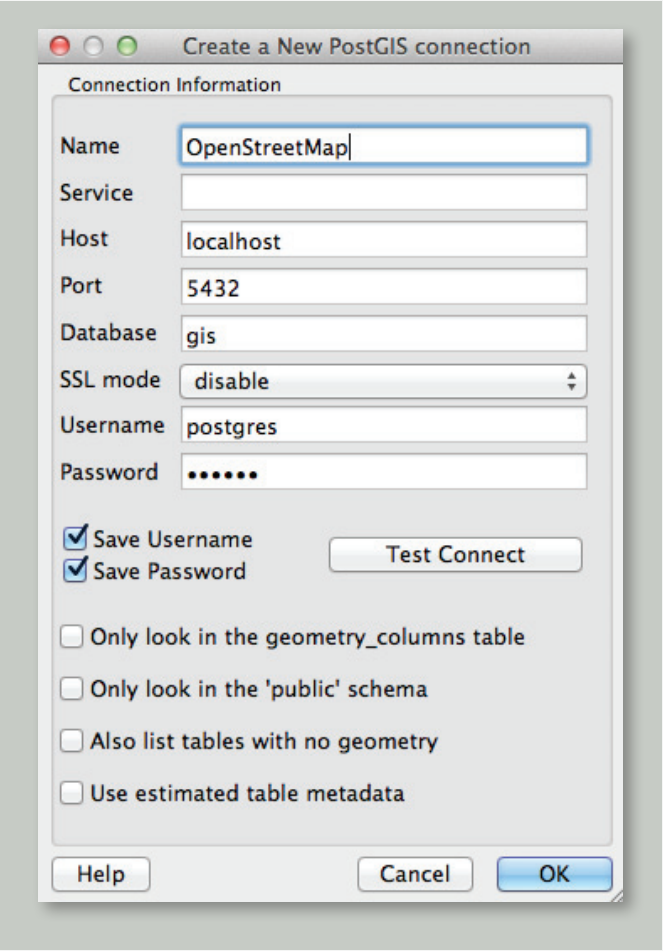
QGIS is an open-source GIS software licensed under the GNU public license. This tutorial makes use of QGIS to query, extract, and visualize the OpenStreetMap data that currently lives inside of our PostgreSQL database. QGIS provides a vast array of functionality which makes it a competitor of commercial solutions. Also, due to its open-source roots, users will find direct compatibility with many other open-source projects such as the PostgreSQL database. QGIS also provides powerful Python scripting capabilities, making it a viable option for automating spatial workflows. Lastly, the QGIS community has a large and growing plugin repository where users can find useful tools or scripts that enhance the usability and efficiency of QGIS.

INSTALLING QGIS AND ITS DEPENDENCIES

The QGIS dependencies and the QGIS installer are located on the KyngChaos Wiki.

- navigate to http://www.kyngchaos.com/software/qgis
- download the "GDAL Complete 1.8 framework package" to your "/Desktop/osm_tutorial/downloads" folder
- download the appropriate "GSL framework" to your "/Desktop/osm_tutorial/downloads" folder
- download the appropriate "QGIS 1.7.x.x" build to your "/Desktop/osm_tutorial/downloads" folder
- proceed through the installations of GDAL and GSL before QGIS. Make sure to accept all the default configurations/options.
- QGIS installation is also straightforward. Install this after GDAL and GSL.

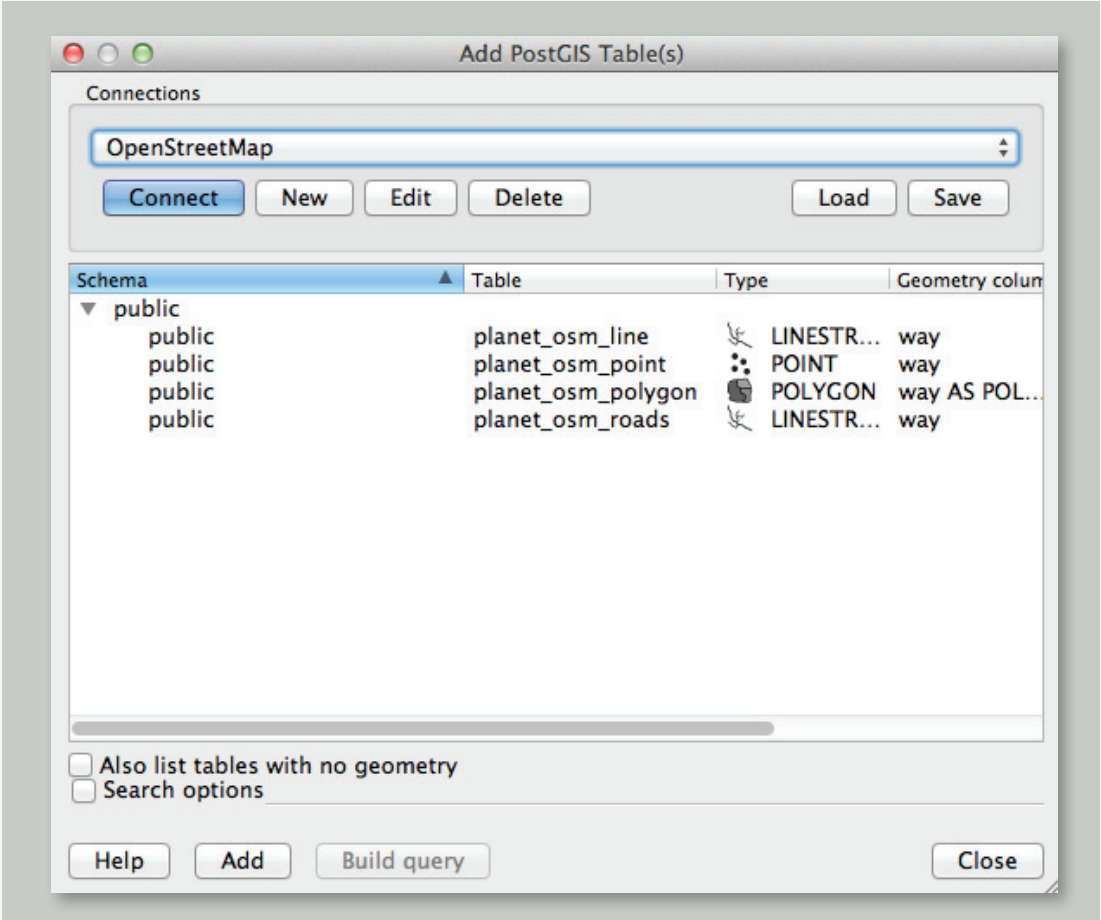




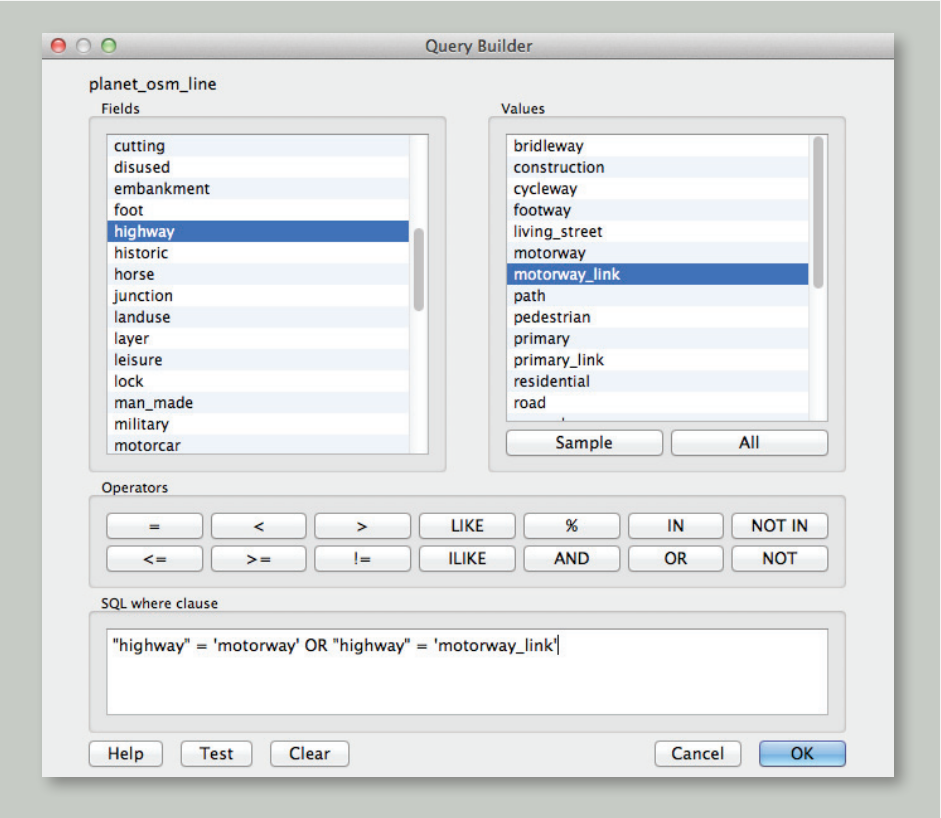
QUERYING POSTGIS INSIDE QGIS

Let's launch QGIS for the first time and query our PostgreSQL/PostGIS database and load some OpenStreetMap data.

- Launch QGIS from the applications folder
- "File > Save project as" and save the project before we get started and forget to! Name it something relevant and place it in the "/Desktop/osm_tutorial/data" folder
- The toolbar at the top of the application window holds the tools that allow us to add new data to our map.
- By hovering over the icons we can locate the "Add PostGIS Layer" tool. Select this tool to open the Add PostGIS Tables dialogue.
- Select "new" to add our PostGIS database.
- Configure your new PostGIS layer as so (remember that the PostGIS layer uses your PostgreSQL configured username and password):



If this works, you will be able to connect to your OpenStreetMap PostGIS layer and you will get the following screen:



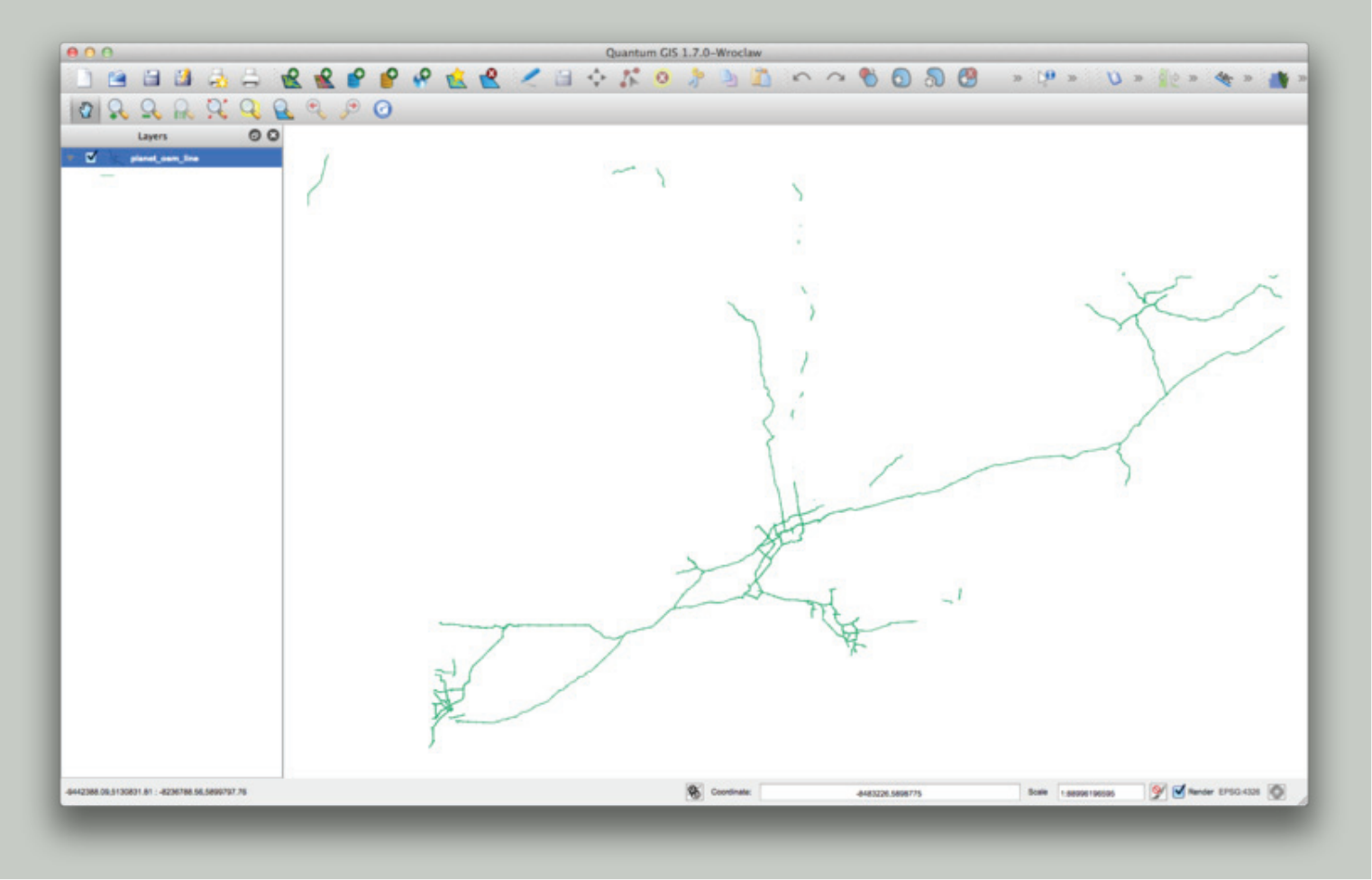
I will show you how to add some data using the query builder. All that you will need to do is get a grasp of the query builder syntax and the OSM tables so you can build your own custom queries and add OSM data to your projects at your heart's content.

- Select the first row, "public|planet_osm_line|LINESTRING|way."
- Select "Build Query."
- Using the interactive query builder, replicate the following query syntax:

Tip select "all" in the "Values" column to see all the available headings.

- Choose "OK."
- Select "Add."

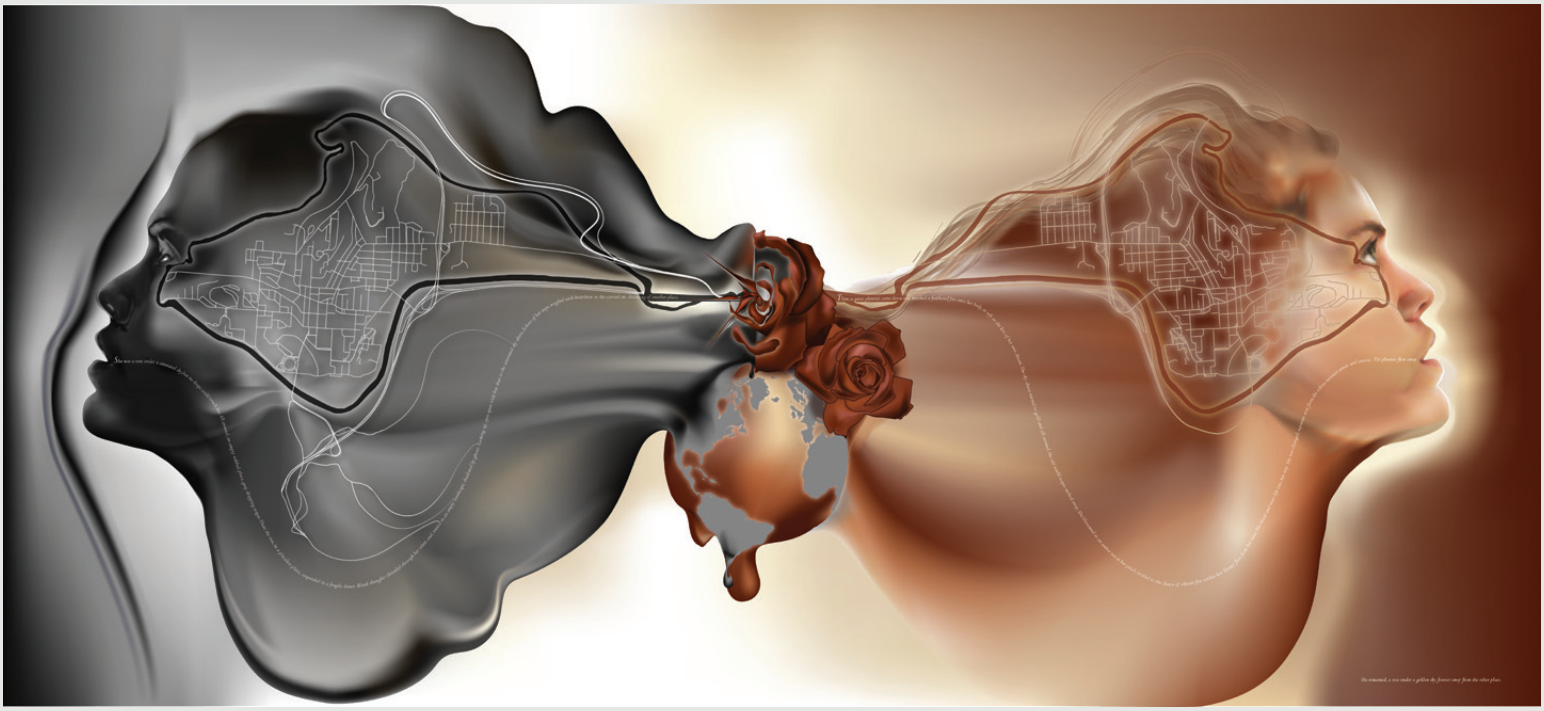
The data will be queried from your PostgreSQL/PostGIS database and added to your map. If you have followed the tutorial using the Ontario extract you should have something that looks similar to the following image:



That is it! You are now ready to start using OSM data in your GIS. Note that you can export to shapefile in QGIS so that you can take the data and move it across computers and open it up in other GIS applications. Remember to save often in case QGIS crashes!

"Perceptions of Athens"

Karla Sanders: design.krs@gmail.com



We all see things differently as a result of our genetic and psychological structuring, as well as environmental influences and outside forces. Psychology plays a role in cartographic representations of places, as each viewer sees a map through a unique personal lens and reads the cartographer's design differently. A cartographer can mold two completely different perceptions of the same place by choosing how to represent the place through color associations, typography, differences in the hierarchies of visual elements, and other design decisions. Design triggers psychological responses in people, thus influencing the way we absorb knowledge. Our knowledge about places and ideas shapes worldviews and determines how we interact with our daily lives. In this way, design in communication is highly significant.

I began to reflect on how I could translate my interest in the psychology of visual communication and design into a map. The outcome borrows themes from surrealism, which explores psychology through dreamlike imagery, to form a narrative about place using a blend of art and traditional cartographic elements.

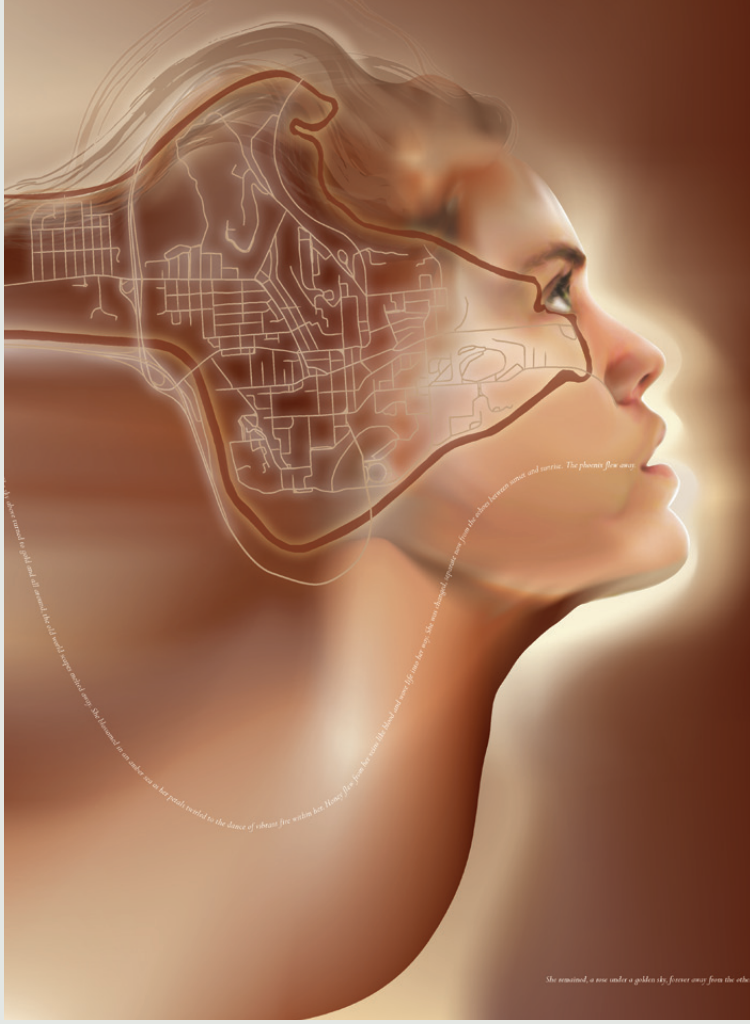


Figure 1. Detail.

The written narrative in the map illustration is about transformation in place. Design techniques depict how the character's perceptions of the same place, Athens, Ohio, changed based on the psychological transformation occurring within the character of the narrative. The left side visually reveals the character's isolation by using cool hues, and an almost eerie representation of the character draws on emotions about cool metal, smoke, and ghosts to instill a haunted impression of Athens. White streets stand out starkly to impress upon the viewer a feeling of emptiness, while the fading of the head into the center provides a sensation of melting to reflect the story being told.

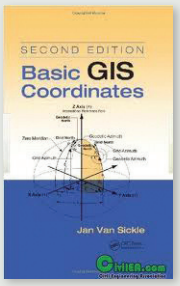
Symbolism, used in surrealism, embodies the transformation of the character's psychology. The "great phoenix," may be viewed as an event that changes the psychology of the character, thus changing the representation of the place experienced by the character. Old perceptions of Athens literally melt away as the character's worldview of the place transforms. A melting Earth symbolizes this change of worldview and burst of roses reflects the character's positive growth. The inclusion of a north arrow changing into a rose represents a change in mental orientation. Warm hues and a more realistic representation of the character help to represent a vibrant conception of Athens, which now features glowing streets and luminous tones.

This map illustration may be seen as an example of map art, which I am exploring as a way to tell stories about places and the way people interact with places. My interest in the psychology of visual communication began while I was a graduate student at Ohio University, where I am currently studying environmental and visual communication. This work is the first exploration of the journey, but also a statement about the relationship between art and cartography and using imagery as storytelling.

Sources: This map illustration was made using Athens City GIS and Natural Earth data. I used a vertical near side perspective projection for the globe, and left out a scale bar, as scale here is irrelevant. I wish to thank my former professor Dr. Margaret Pearce for mentoring me as an undergraduate student and introducing me to the art side of cartography. I also thank my current Ohio University professors and the GIS staff at the Voinovich School of Leadership and Public Affairs for their patience and support with my mapping endeavors.

Visual Fields focuses on the appreciation of cartographic aesthetics and design, featuring examples of inspirational, beautiful, and intriguing work. Suggestions of works that will help enhance the appreciation and understanding of the cartographic arts are welcomed, and should be directed to the section editor, Daniel Huffman: daniel.p.huffman@gmail.com.

BASIC GIS COORDINATES, 2ND EDITION



By Jan Van Sickle.

CRC Press (Taylor and Francis Group): Boca Raton, Florida.
200 Pages, black and white line illustrations, hardcover. $89.95.
Also available as an e-book, $89.95.

Review by: Mark Denil

Overview

Basic GIS Coordinates is a general reference book about coordinate systems. It focuses exclusively on how the various parts and components of a coordinate system fit together to define locations. The range of examples given is not exhaustive; in fact, quite the opposite. Examples are pared down to a few basic cases comprehensively examined. The book contains mathematical formulas, but the formulas are there to illustrate particular relationships, not to dazzle or befuddle. For instance, algebraic terms used are defined in each formula so the user is not expected to recall that "small alpha/subscript G" (ℓG) is the geodetic azimuth. There is some history, too, but only enough to explain why legacy solutions might be encountered. The line illustrations are simple and clear, and for the most part well designed and executed (Figure 1).

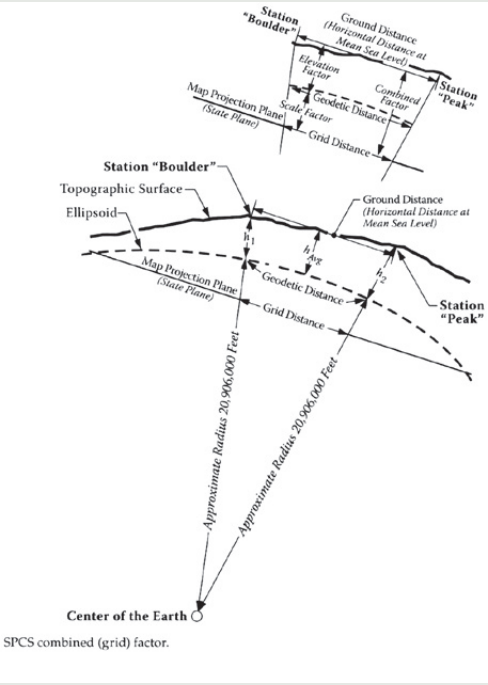


Figure 1. The line illustrations are simple and clear.

On first glance, the book is quite unprepossessing. Neat and compact, with thick hardboard covers and a tight binding, it is clearly a solidly made volume. What is not clear at first glance is that it is worth reading. The title probably contributes to this impression: it even sounds boring. *Basic GIS Coordinates* sat on my "books for review" shelf for some time; it seemed no one wanted to read and review it. Finally, I picked it up myself and cracked it open, and am quite pleased I did.

Jan Van Sickle begins *Basic GIS Coordinates* by simply stating: "Coordinates are slippery devils" (p. 1), and he then systematically proceeds to show where and how the devilment can slip into the picture. Starting from a place on the earth, the author demonstrates that there are variety of ways of describing that place, and how there can be such a plethora of descriptions. He explains that every such description is ultimately based on certain assumptions, assumptions about things that might be sometimes thought of as fixed. The notion of "down," for instance, could refer to a couple of different, incompatible, concepts, and the relationship between these conceptualizations has an effect on a place's locational definition.

Coordinate systems, as Van Sickle points out, are ideals chosen and applied for convenience and utility. Over time, needs and capabilities change, and older approximations, compromises, and conventions no longer provide the same advantages they may once have held. In fact, outmoded or inappropriate coordinate systems may themselves become sources of uncertainty and inexactitude.

Structure

The text of *Basic GIS Coordinates* is divided into five chapters, each with several sections, and many of these with multiple sub-sections. The earlier chapters—"Foundation of a Coordinate System," "Building a Coordinate System," and "Heights"—lay the foundation of understanding by isolating the factors involved and examining the interrelationships amongst them.

The examination begins with "Uncertainty," the title of the first subsection, and proceeds to the idealized certainty afforded by a datum. This leads into Cartesian coordinates (all very safe and well known stuff so far), before kicking the props out from under all this familiarity by showing the ramifications of applying all this idealism in the real world. Just what, for example, is meant by *Latitude*? Is that *Geocentric* Latitude? *Geodetic* Latitude? *Astronomic* Latitude? Does it make any *difference*? Well, *that depends*..., but depends on *what*?

The second chapter begins: "The actual surface of the Earth is not very cooperative." (p. 39), and the next sixty-one pages (the chapters "Building a Coordinate System" and "Heights") show that this is a bit of an understatement. Legacy Geodetic Surveying, Ellipsoids, Geodetic Datums, and Coordinate Transformation are all covered. What is more, they are made readable; maybe not as readable as Laurence Sterne's *Tristram Shandy*, but certainly with a clearer narrative line.

The later chapters: "Two Coordinate Systems" and "Rectangular System," apply the conceptual chapters to three (actually, four) particular coordinate systems. US examples predominate, with discussions of State Plane (with its two main projection types) and the US Public Land Survey System taking up the lion's share of the page count, and UTM getting a look in as the second of the "Two Coordinate Systems."

Because the State Plane discussion includes examination of both the Lambert Conic and Transverse Mercator based zones types, it is generally applicable to systems other than State Plane. As well, it offers an opportunity to compare the Transverse Mercator as used in State Plane with the version used in UTM.

Without a doubt, there are a lot of people who operate daily in a State Plane Coordinate System (SPCS) coordinate environment, and *Basic GIS Coordinates* provides a good comprehensive look at it. One may argue that systems such as State Plane are not true coordinate systems, but, nonetheless, they are used to describe locations on the planet and are based on the application of specific projected frameworks. One may also note that this specific system (SPCS) is only used for a very small portion of the globe, but, again, the basic problems to be encountered when using such a system will be similar wherever one is applied. My first GIS job was processing survey fabric data under the Canadian Dominion Land Survey (DLS), which is similar, albeit (I always thought) admirably more regular in plan and execution. On reflection, though, that impression of regularity may be mistaken, arising because I have never seen it described to this level of detail (and I note that Van Sickle never uses the term "road allowance," which is one of the particularly charming features of the DLS).

The five chapter-ending "Exercises" and "Explanations and Answers" sections should be mentioned. I usually ignore these parts of a book; put it down to pure unadulterated laziness on my part. In *Basic GIS Coordinates*, however, these exercises are well worth working through. The explanations are short, sharp summations of the main text relevant to the exercise question, and placed, as they are, immediately after the question pages, there is no disincentive to 'bother' with the exercises.

Criticism

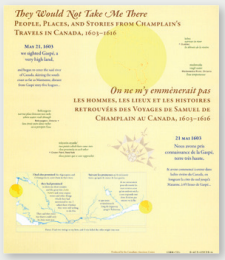
One could argue that the domestic US focus of *Basic GIS Coordinates* is more limiting than it may appear to someone who has worked only in the US. Similarly, the author's focus on surveying concerns and conformality is obvious. Azimuthal projections get only the briefest of mentions, and non-conformal projections even less space. Still, the aim is clearly not to be encyclopedic, but to focus on the components of coordinate systems, and this aim is achieved.

Summary

This is really an excellent little book. It brings together a whole skein of threads that might be hard to round up otherwise. I perhaps flatter myself in thinking that I already have a pretty good grasp of at least the basics of most of the issues raised in *Basic GIS Coordinates*. I know I have, over the years, been able to solve a good many seemingly sticky coordinate problems, and have given some sound and well-reasoned advice on projection choices and other issues. In part, this has been because I both understand the general frame of the issue and know where I can find the relevant specific information when it is needed. *Basic GIS Coordinates* is very much the kind of basic reference that is useful in this: its explanations are short and succinct, its illustrations are clear, and it is unencumbered with extraneous anecdotal and mathematical detail. In general, in these days of computer computation, one seldom (or never) has to work these calculations out, but it pays to know what is going on. This book contains the sort of stuff I need to know to allow me to understand specific situations as they arise. I am glad I have it on my shelf.

On the other hand, *Basic GIS Coordinates* is published by CRC Press, and CRC Press does not publish inexpensive books. At a slim 200 pages, and with a list price only a nickel shy of ninety dollars, one must think long and hard before shelling out scarce pennies for such a publication. I know I would have to think very long indeed. I would have no qualms, however, pressing my librarian to lay in a copy for circulation.

THEY WOULD NOT TAKE ME THERE: PEOPLE, PLACES AND STORIES FROM CHAMPLAIN'S TRAVELS IN CANADA, 1603–1616



By Michael James Hermann & Margaret Wickens Pearce.

Translation by Raymond Pelletier.
The University of Maine Canadian–American Center, Orono, Maine, USA.
ISBN 978-0615-23159-4. $14.99.

Review by: Daniel Huffman, University of Wisconsin–Madison

In *They Would Not Take Me There*, Margaret Pearce and Mike Hermann set out to tell the story of Samuel de Champlain's journeys in New France in the early seventeenth century. At first glance, their work appears deceptively simple. Champlain's route is drawn on a very plain base map of the St. Lawrence River and the eastern edge of the Great Lakes. Spilling into the otherwise empty expanse of land south of the river are five panels, each consisting of a series of relatively simple inset maps which carry us through episodes from Champlain's journals (Figure 1). There are no clever multivariate symbols. There are no trendy design embellishments. There is little more than land, water, and text. It would be a mistake, however, to assume it is cartographically unremarkable simply because of its plain appearance.

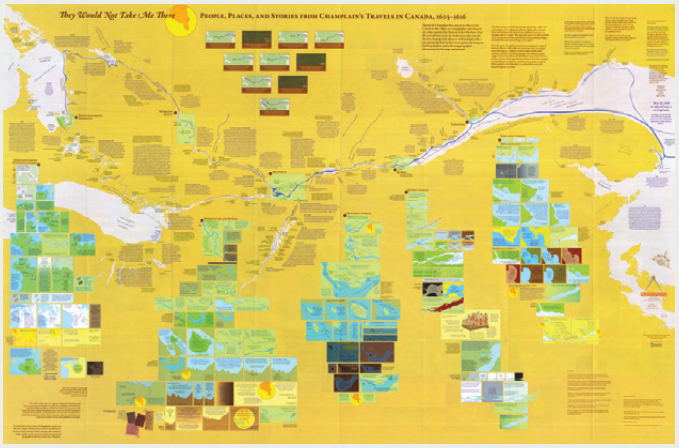


Figure 1. Map Overview.

Within that simple framework the authors have created a work that is as deep and engaging as it is unassuming in appearance. This is not merely a catalogue of the path of Champlain's travels overlaid onto some local hydrography and annotated with a few quotations from his writings. Here, Champlain's words are the star. The text is supported and enhanced by the spatial representation, not the other way around. In reading *They Would Not Take Me There*, we are reading Champlain's journals, arranged not linearly, but instead embedded in their spatial context. When Champlain says that he "never saw any torrent of water pour over with such force as this", we see his words define the location of the very

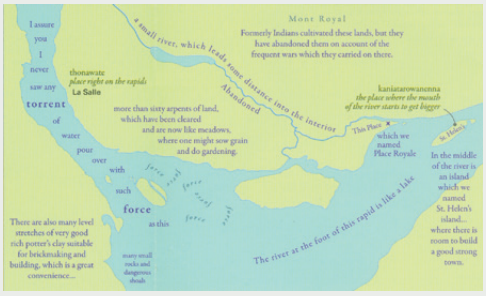


Figure 2. Torrents inset.

torrent he's describing (Figure 2). The authors seek to give Champlain a voice, and this they do quite well. We can hear him narrate his experiences as we look on, and his words point to the geographies that he lived just as clearly as would his finger if he were present.

Champlain's is not the only voice on the map; the imagined voices of the native peoples of his New France are heard as well, set in a separate color of type. They compete for the chance to interpret events, while observing and commenting on his actions. Their toponyms sit beside his. The map's authors, too, get in on the act, using their own notes to fill in details and describe events from an outsider's perspective. This is not a sterile map of the physical landscape; it is populated and alive. It is a work of very human cartography.

In the inset map sequences we find specific episodes from Champlain's travels. As the authors move through each small map in the series, they carefully shift location, scale, and color palette to influence the reader's understanding of the story being told. The darkness of death, the red of blood, the loneliness of a small island amidst the water—all of these play quietly upon our feelings, reinforcing the tone of Champlain's words. The map engages us at an emotional level; something critical for effective storytelling (Figure 3).

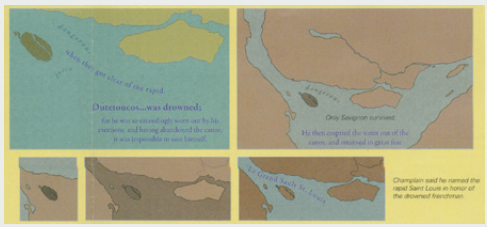


Figure 3. Drowning insets.

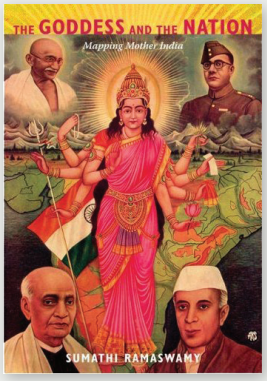
Engaging though its narrative is, the map does a poor job visually advertising its wealth. The creative use of voices will interest readers, but only if the lack of an immediate aesthetic appeal does not keep them from coming close enough to look. The cold white hydrography on the base map is empty and uninviting, and there are vast stretches of flat, uniform tan land. It seems like the only purpose of either is to show that it is not the other: the tan polygons are simply there to mark not-water, and the white layer looks like it only indicates places where there is no land. Neither has its own positive identity, and this can serve as a barrier to engaging with the narrative so carefully crafted in the typography. The actors' words mean more when we can look at the map and see them talking about a landscape, not canoeing atop a polygon. The uniform emptiness could be a useful device to illustrate the great stretches of New France which were unknown to Europeans at the time, but there is no visual contrast drawn between the places Champlain knew of or experienced, and the places he did not. His

words fit on the St. Lawrence about as well as they fit in Michigan. As a final note on the overall aesthetics, the thin, semi-matte coated stock on which the map is printed feels at odds with the subject matter. Its lack of weight and its plastic feel does not mesh with the historical drama which unfolds on its surface.

While the panels of inset maps are more attractively done, they are poorly integrated with the base map. Their richer color palette makes the main map look dull in comparison, and contributes to a sense that they belong on another page altogether. They are meant to show events taking place at a small location marked on the base map, but they necessarily move far away from that location as the story unfolds, making it difficult to maintain a sense of context and thus weakening their connection to those spaces.

These weaknesses are not fatal; while they can introduce static into the transmission of Champlain's voice, enough comes through to make for a rewarding experience. *They Would Not Take Me There* is a valuable contribution and a worthy addition to anyone's library. It is a map for human beings, about human beings, in a way that too few are, and gives voice to those living in the geography represented. The reader is drawn emotionally into the story through its creative typography and the thoughtful use of color and scale in the inset maps. *They Would Not Take Me There* is worthy of imitation and will hopefully serve as a source of inspiration to others.

THE GODDESS AND THE NATION: MAPPING MOTHER INDIA



By Sumathi Ramaswamy.

Duke University Press,
2010. 379pp.
152 figures and illustrations, 100 in color. $27.95. Paperback.
ISBN 978-0-8223-4610-4.

Review by: Jonathan Lewis, Benedictine University

Sumathi Ramaswamy's book traces the initial appearance and subsequent evolution of "Bharat Mata" (India Mother), a new deity that emerged in conjunction with India's struggle for nationhood. Significantly, the figure of Bharat Mata was regularly depicted along with a map of the Indian subcontinent, thus (in philosopher Edward Casey's terms) both *standing for* and *standing in for* the nation waiting to be created. The author accounts for the importance of these representations of Mother India by reviewing theories of representation in conjunction with historical events and key personages in Indian history, in order to provide frames for the images and contexts for their interpretation. The book's chapters each begin with an explanation of how its particular topic contributes to an overall understanding of the image's importance and impact, followed by detailed descriptions of several prominent examples, generally presented in chronological sequence. The chapters also follow a historical sequence, moving from the image's earliest appearance through periods of growing use and into the present period, when Bharat Mata's recognizability has made her a popular feature on contemporary political posters.

Rawaswamy traces Bharat Mata's origins to Bengal in 1904, where a female figure identified as "Mother Bengal" first appeared on posters. Although clearly a deity (she had four arms and an aura), she bore a strong resemblance to an average Bengali woman and was intended as a symbol of that area. Over the next few decades, as Bharat Mata gained in popularity, artists added new features to her depiction: the tri-colored flag of the independence movement, lions, and most importantly, a visual image of the territory she represented. Mother India's success as an icon of national independence was not assured from the outset, however, and many decisions had to be made about her appearance. Although the territory depicted in images of Bharat Mata varied, with some posters suggesting greater territorial claims than others, obtaining consensus on the map of India and its boundaries appears to have been less problematic than settling on the female deity's character and characteristics. For example, although bearing a very strong resemblance to Hindu deities, Bharat Mata had to be a unifying figure, so many posters depicting her took pains to include messages and slogans in the languages of India's religious minorities (p. 21). India was also deeply divided by its caste system, complicating what would be appropriate for Bharat Mata's attire and jewelry. Would portrayals of her as rich make her less attractive to the enormous number of India's poor? Would portraying her as poor adequately convey the exploitative character of British occupation? Should she be young or old? If she was young, just how attractive and desirable could she appear and still maintain her dignity? Also, if she was "Mother" India, should she be depicted as having children? If so, how many, and who might be their father? If not portrayed as a mother, could she still appear to be a maternal figure? If she did represent the struggle for independence, should she perhaps be more aggressive than maternal and be depicted with instruments of battle? As artists grappled with these issues, their chosen solutions often dictated how they incorporated the mapped image of the Indian subcontinent into their designs. Virtually all portrayals of Bharat Mata, for example, include the island of Sri Lanka in some fashion: in many, it takes the form of a flower, in others a vase, and in still others it is simply a

spot of land where Mother India is standing or is about to step. Similarly, during a period before independence was granted and when many outsiders saw the region simply as "Hindoostan," the cartographed image of India accompanying Bharat Mata usually embraced northern borders that included areas (Pakistan, Nepal, and Bangladesh) whose residents did not wish to be part of India and sought national independence in their own right.

Ramaswamy pays close attention to the relationship between what are to her the defining parts of the Bharat Mata image: the female deity and the landmass of India she represents. Sometimes, the landmass serves as a frame to the goddess's image, while other times her form is deftly grafted into the landmass and emerges from it. Other images simply show India mapped onto a globe with Bharat Mata standing upon it. Ultimately, the combination becomes so widespread and familiar that the map is either removed to the distant background or dispensed with altogether and Bharat Mata stands in for landmass. She becomes both the sense of a unified nation state chosen by spiritual forces and the physical landmass where that nation is located. Ramaswamy sees this evolution as initially benefiting from the science of cartography, which corroborated the existence of a distinctly Indian region, but lacking a sense of India as more than simply a place. It needed to convey the sense of just what India was as an idea. "India was more than 'a mere bit of earth,' more than 'the dust of some map-made land,' and more than the lines and contours on a map of the influential colonial sciences" (p. 53). For nationalists, it was progressive to have a readily identified homeland, but difficult to persuade Indians to revere, much less sacrifice or even die for, a map. This led to the foregrounding and further refinement and embellishment of Bharat Mata herself. Over time, this meant making her "ethnically indeterminate and not readily associable with women of any particular region" (p. 57) and light-skinned. More important were the props with which she appeared, including weapons (archaic, such as a spear or sword rather than something more contemporary, such as a revolver), a spinning wheel (a powerful symbol linking the goddess to Gandhi, whose campaign to get Indians to produce their own cloth and thus move them away from importing finished products from Britain expressed values of the home and nation), a flag, and often a lion. Because many versions of Bharat Mata portrayed her as a Hindu goddess, she was sometimes depicted with many pairs of arms, allowing her to brandish a variety of symbolic objects. By the time Indians moved more assuredly toward independence, Bharat Mata had evolved into an unmistakably Hindu form, complicating "attempts to secure a plural and religious diverse body politic" (p. 71).

It is not until the middle of her book that Ramaswamy moves her discussion away from Bharat Mata toward the more general use of female figures as referents to nations, most notably Britannia, emblem of India's colonial ruler. She then moves to review the various Hindu deities available to the "barefoot cartographers" (Ramaswamy's term for artists who appropriated images of India generated by the "command cartography" of its occupier and used them to subvert that occupier's attempts at control by incorporating the images into nationalist propaganda) as models for Mother India. Identifying several possibilities, she lingers on the most violent: Kali, said to have emerged from the goddess Durga's scowling brow and associated with unbridled fury. Kali apparently struck fear into the hearts of some British occupiers, who saw her potential for rallying opponents to British control, particularly through secret societies. Inspired by fear, British authorities proceeded to find any number of farfetched corroborations of their anxieties, further fueling those same anxieties and bringing Kali's possibilities more clearly to the attention of Indian nationalists. Both Durga and Kali posed challenges to those nationalists, however, as "their more ferocious proclivities were a potential embarrassment in a social climate increasingly governed by norms of bourgeois respectability …Their autonomy was glaringly at odds with the normative expectation that females were to be always under the control of their male kin" (p. 112). Ramaswamy argues that Bharat Mata emerged as a safe compromise: a respectable symbol of bourgeois motherhood merged with the independence and capacity for assertive behavior of Hindu legend.

Other chapters illustrate how the concept of India as a mother appeared in other artifacts of popular culture, including the important hymn *Vande Mataram* ("I Worship the Mother"), an enormous relief map of the Indian subcontinent (Bharat Mata Mandir, or "Mother India Temple," in Benaras, Uttar Pradesh, built in 1936), novels, and cinema. These materials document how widespread and deep the metaphor was, and how important popular culture was in communicating the idea of India (both as a concept and as an identifiable physical location) to India's masses.

Closing chapters contrast the appearance of male politicians alongside the now highly recognizable Bharat Mata image with depictions featuring female activists. While both benefit from their association with Mother India, images of men do so in a distinct way. Depending on the individual and the movement, images of Bharat Mata might show her blessing or receiving men leading nationalist movements into her presence, thus appearing to bless both them and their objectives, or alternatively witnessing and grieving over their violent demise. Unlike most previous images of the mother/goddess, these later images often include considerable bloodshed, typically in the form of a martyr's severed head being offered to Bharat Mata as a sacrifice to the cause she represented. Because it was to be sons and not daughters who shed blood for the nation, women in posters featuring Bharat Mata were rarely involved in action more dramatic than

leading groups of people in a march and for decades did not appear as martyrs. Indira Ghandi's arrival on the political scene changed this. Being female and highly recognizable made it possible simply to substitute her image for that of Bharat Mata and display her figure within India's outline. Her death led to the only instances of a woman appearing as a martyr, with one grim depiction featuring the outline of India as a ghostly spirit carrying Indira's bleeding body.

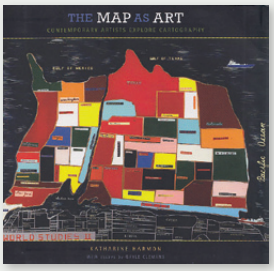
In her closing summary, Ramaswamy notes that while British surveys generated an image of India's territory that appeared widely in classrooms and official printed literature, Indians came to see that image differently than did the British because they inhabited the land differently. Captured visually, India became available for inspection and interpretation. Stripped of iconography associated with dispassionate mapping (e.g., lines of latitude and longitude), "the logo-map penetrated deep into the popular imagination, to form a powerful emblem for the anti-colonial nationalisms being born" (p. 290). Yet to be fully effective as an instrument of nationalism, "The map form had to be supplemented by something else in order to do the deadly work of patriotism—and one of the enduring ways of supplementing it takes recourse, again and again, to the anthropomorphic form of the glorious plenteous mother/goddess" (p. 292). While this particular goddess figure was not part of an ancient pantheon, neither was it truly inter-religious: Ramaswamy acknowledges the distinctly Hindu character of Mother India, as well as her safely upper middle class appearance.

Ramaswamy has assembled a thoroughly researched collection of images sharing a common theme linked directly to the importance of cartography in accomplishing something beyond its usual functions. While in some ways India's appearance alongside a mother/goddess is another way of getting from here to there (that is, from colony to independent nation), looking at popular images of cartography goes beyond conventional thinking about maps and their purposes. For a citizen to understand that he/she is an occupant of a particular territory extending beyond their horizon of sight, they must first grasp the idea of a map and then recognize it as a portion of territory they inhabit: "You see this? It's how land is depicted. And this, this is your land." Ramaswamy's barefoot cartographers shrewdly employed motifs recognizable to the bulk of India's citizenry to move nationalism forward, and to realize the idea of an independent country having a particular form. In doing so, her account pulls together material generated throughout a long period of time and from a variety of sources such as novels, films, and poems. Ramaswamy takes pains to clarify the cultural significance of references occasionally found in images of Bharat Mata, explaining linkages maybe not obvious to someone less well-versed in the complexities of Indian culture. The book has a confident, self-assured tone fortified by the very large number of illustrations buttressing its central points. If there is one area where the book lapses, it is not one that is overlooked altogether and is in fact touched on in several spots: the dominance of the Hindu form Bharat Mata takes, and her clear link to a particular religious tradition. Despite apparent efforts by various political leaders to portray their nationalist objective as benefiting all Indians regardless of their religion, Bharat Mata links independence closely with the Hindu faith. The abundance of cartographed images in which she appears has the effect of qualifying the territory being depicted: "... this is *your* land" becomes "... this is *Hindu* land." Were there comparable images, or images serving similar ends even if they varied in terms of composition, among Islamic Indians?, among Jains?, Christians? The lack of any section substantially covering that aspect of the topic suggests that Mother India is a concept whose meaning is limited largely to its Hindu citizens even though her appearance and contribution to rallying support for independence has affected other groups. This is particularly important in light of interminable border conflicts with Pakistan and the ongoing struggle over Kashmir, and the question if anyone is currently employing this type of rallying image in these situations remains unaddressed. *The Goddess and the Nation* represents the best kind of popular cultural analysis, one that utilizes everyday yet unconventional evidence to provide insight into serious questions concerning how political ideals become meaningful to masses of people and how individuals who may be illiterate are nonetheless still able to read artifacts of visual culture. The book's back cover identifies fields the publisher expects might be especially receptive to the arguments it contains: South Asia Studies, Visual Culture, History. To that list might be added Religious Studies, as readers familiar with the concept of American civil religion will find here intriguing parallels as well as significant contrasts with earlier work on that subject.

With respect to cartography, *The Goddess and the Nation* connects well with other books such as Matthew Edney's *Mapping and Empire*. Indeed, Edney's observations about the effects of cartographic expeditions mesh easily with Ramaswamy's views on India as an emerging independent country. Simply substitute *nation* for *empire* in this passage from *Mapping and Empire*: "maps came to define the empire itself, to give it territorial integrity and its basic existence. The empire exists because it can be mapped" (Edney, p. 2). As Edney notes about the British, "They mapped the India that they perceived and that they governed. To the extent that many aspects of India's societies and cultures remained beyond British experience and to the extent that Indians resisted and negotiated with the British, India could never be entirely

and perfectly known" (p. 2). *The Goddess and the Nation* both corroborates that observation and helps resolve the shortcomings it describes by providing a view of India from an Indian perspective.

THE MAP AS ART: CONTEMPORARY ARTISTS EXPLORE CARTOGRAPHY



By Katherine Harmon with Gayle Clemens.

Princeton Architectural Press, 2009.
256 pages, 360 color illustrations.
$45.00. Hardbound.
ISBN 978-1-56898-762-0.

Review by: Jonathan F. Lewis and William Scarlato, Benedictine University

The Map as Art is a collection of photographs documenting a variety of artistic creations having maps or cartography as their theme. The works of 160 artists are included, utilizing a variety of media: paint, photography, sculpture, pen and ink, etc. Following the introduction, the book is divided into seven sections, most containing relatively brief coverage of several artists and almost all concluding with a more extended treatment of one particular artist.

In her introduction, Katherine Harmon points out that while there has long been art in cartography, less frequently has there been cartography in art. But "since the 1960s there has been an exponential increase in artists working with maps" (p. 9), a claim documented in part by a timeline identifying major 20th century figures who have produced notable works directly incorporating maps or otherwise inspired by cartography: Salvador Dali, Joan Miro, Marcel Duchamp, Jasper Johns, and Robert Smithson, to name just a few. She offers brief descriptions of some of these individuals' work, and provides quotations supporting her observations about the manner in which maps encouraged these artists to consider new ways of capturing landscape, space, and atmosphere. These opening passages set up her criteria for selecting examples of contemporary artists engaged in extending these explorations, undertaking new approaches, subverting traditional cartography, and taking risks in an effort to effectively depict inner space; of what she terms *psychogeography*. That term is left unexplained but appears inspired by Baudrillard's contention that in the contemporary world, unlike previous periods, maps precede territories. According to Harmon, if maps, as traditionally understood, provide visual guides to understanding where things are, then these new works similarly (or more self-consciously) reverse the relationship by making "a mark on a bigger map, calling out, I AM HERE" (p. 16).

The first section, entitled "Conflict and Sorrow: Maps of Opposition and Displacement," contains works by eleven different artists, culminating with extended description of Joyce Kozloff's work in a subsection entitled "A Geography of History and Strife." Kozloff's use of maps centers on their connections with conquest and combat. Her nine-foot globe, *Targets*, for example, places the viewer inside a sphere whose surfaces contain "aerial views of twenty-four countries that have been bombed by US warplanes since 1945" (p. 35) while her series *Boys' Art* documents links between masculinity and the siege of territory. The book's second section, "Global Reckoning: Maps That Take a Stand," presents the work of sixteen artists before introducing Landon Mackenzie in a short essay called "The Politics of Land." A Canadian painter, Mackenzie drew inspiration from the manner in which very early maps conveyed a sense of remote territories to inform contemporary depictions of ancient territorial quests. Her series *Houbart's Hope,* for example, refers to ship's pilot Josiah Houbart, who was for a while thought to have discovered an entrance to the long-sought Northwest Passage. Briefly generating considerable enthusiasm, the feature "disappeared from maps in the eighteenth century" (p. 71).

The next section, "Animal, Vegetable, Mineral: Maps of Natural Origins," displays works by twenty-six artists, and then describes the work of Ingrid Calame in a portrayal called "Constellations of Residue." Calame's work moves the scale of mapping to the normally unthinkable 1:1, as she literally traces the various residues of human existence onto paper, primarily those left by the feet of men and women engaged in activities both ordinary (for example, the wear and tear of foot traffic on sidewalks) and exalted (such as found patterns on the aisles of churches and the floors of observatories). The book's fourth section, "Personal Terrain: Maps of Intimate Places," offers works from twenty-eight artists, but no culminating artist's work is featured.

"You Are Here, Somewhere: Maps of Global Positioning" incorporates thirty artists and their work into its pages before moving to "Maps of Presence and Absence," an essay describing works produced by Guillermo Kuitca. Where Ingrid Calame lifts patterns of human movement in space from existing surfaces and places them onto traditional surfaces like paper and canvas, Guillermo Kuitca, in some of his works, takes maps and transposes them onto the surfaces of everyday objects, embedding them in unexpected objects. Illustrations in this essay include two examples, both involving maps painted on the surface of mattresses. Section six, "Inner Visions: Maps of Invented Places," is composed of works by seventeen artists, with the book's concluding section, "Dimension/Deletion: Maps

That Play with Cartographic Conventions," presenting twenty-five artists. The section wraps up with an extended treatment of Maya Lin's work in a subsection called "Where Opposites Meet." Lin, perhaps the best known, to general readers, of all the book's artists, here is shown to have great interest in replicating recognizable landscape forms, such as hills, in her work. She also expands on cartographic techniques both new (a wireframe surface bearing a strong resemblance to a digital elevation model) and established (stacked sheets of plywood carved and offset to resemble contour elevations). As Clemens notes: "Her installations are complex fabrications, but they are also stripped-down, powerful forms created out of simple materials" (p. 253).

One clear strength of this collection lies in the large number of individuals and works assembled. Together, it provides a resource for readers curious about the ways in which maps have inspired and been incorporated into artworks, many of which do not appear particularly map-like on first consideration. Given the number of art exhibits in recent years featuring cartography as a theme (several of which are listed toward the back of the book) as well as the volume and variety of ongoing work, *The Map as Art* cannot be considered so much a comprehensive collection as a thorough representation.

Another of the book's successes resides in Gayle Clemens' essays, which generally provide greater depth and clarification of the activities and work of the selected artists than appear in the necessarily brief, fragmented descriptions accompanying most of the works. Art of this sort needs text, as it is intrinsically silent and benefits from the provision of information that shapes its context. Here, the shorter treatments are sometimes scant, which can make it difficult to grasp the work or connect the samples with the descriptions provided. While most of the descriptions are adequate, some seem somewhat obtuse or abstract and so remote or un-revealing. Heidi Whitman's *Brain Terrain* paintings, for example, are described as "churning" mental maps responding to "turbulent" events in the world, but the images presented are calm in both their composition and color. It may very well be that in this case, the stimulus to undertake the painting ultimately yields a result that, in becoming art, loses connection with the initial impulse behind it. In becoming removed from her original motive to make sense of shifting dream themes and images associated with a dynamic world, then, Whitman produces a work that achieves a higher accomplishment in terms of its artistic value. But the brief narrative doesn't so much exonerate such speculation as to mandate it. Another problem is that while some of the works contain text, many of the illustrations are so small as to make the words unreadable. Richard Long's maps of personal excursions, for example, are very difficult to make out, as is the writing found in Landon Mackenzie's paintings, and those done by Dan Mills.

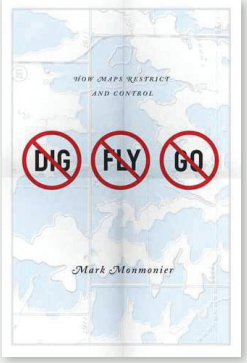
The selected works themselves vary in significance from the playful (Coriette Schoenaerts' maps made from pieces of clothing scattered on her floor, for example) to more interesting and arguably worthwhile explorations having a clear motif, theme, or device showing that the artist has struck upon something that could reward further pursuit. Melissa Gould's ghostly floor plans of Titanic and Holocaust memorials, for example, are especially evocative of spaces haunted by individuals whose lives are memorialized within the glowing boundaries she lays down. Similarly, Ingrid Calame's constellations of human activity transcend their sources, making the places she chose to map less inspirational in themselves than pretexts for something more substantial.

Other effective pieces are site-specific, such as Yukinori Yanangi's installations at Alcatraz, which gain much of their strength from their setting, and probably can only be completely experienced on location. This is also true of Alban Biaussat's *The Green(er) Side of the Line*, which extended a broad green cloth along contested sections of Israel's border.

The variety of things presented is both interesting and impressive, with color providing something of a common ground. That is, while the works' reasons for having been created are different, the use of color to represent the variety of ideas produces a common idea about color—and the works become decorative and delightful to the eye.

The Map as Art is essentially an anthology of what can be done with maps, of what can be gleaned from an artist's imagination with a map serving as a prod or motive to create. Harmon has produced a compendium of broad scale containing important active artists and their works. Often colorful and even exciting, these works are always innovative and few can be appreciated with a quick glance. It won't take anyone long to read this book, but it will take them time to completely see it.

NO DIG, NO FLY, NO GO: HOW MAPS RESTRICT AND CONTROL



By Mark Monmonier.

242 pages, 63 halftones, 19 line drawings
Cloth $65, paper $18.
University of Chicago Press, 2010.

Review by: Mark Denil

No Dig, No Fly, No Go is map history. There is a long history of histories, going back to Herodotus and Thucydides (both from the 5th century BCE), and there are many types of histories. There are academic histories (Gibbon and

Hegel, from the 18th and 19th centuries, come to mind, as do Harley and Woodward from the 20th) and then there are popular histories. Amongst popular histories, there are, again, two main types. The difference can be characterized by comparing the outputs of two well-known Canadian authors of popular histories: Pierre Berton and Farley Mowat.

Berton, author of *The National Dream* (1970) and *The Arctic Grail* (1988) among dozens of others, was responsible for introducing thousands of general readers to the richness and sweep of Canadian history. Mowat, on the other hand, is a past master storyteller who, as he admitted in a 1968 Canadian Broadcasting Corporation Radio interview, never let the facts get in the way of the truth. He is author of works like *Westviking*: *The Ancient Norse in Greenland and North America* (1965) and *The Farfarers: Before the Norse* (1998), a type of popular history very different from Berton's.

Mark Monmonier sits firmly at the Berton end of that scale. Monmonier has, since 1982, published over a score of books about maps and cartography, and the overwhelming majority of that output has been targeted primarily at a general audience. Books like *How to Lie with Maps* (1996 2nd ed.), and *Air Apparent: How Meteorologists Learned to Map, Predict, and Dramatize Weather* (1999) have provided readable and understandable access to what would, for the great majority of the books' readers, have been an arcane and obscure field of study.

Popular history is far from easy to write, and despite some private sneering by some academic authors who might otherwise envy Monmonier's audience, most recognize his success at it. Certainly, not every book in his bibliography has been of identical value or interest (to put it diplomatically), and he certainly seems to be a tireless factory of cartographic knowledge, but when he is on his game there is no one who delivers as succinct and easily understood an overview of a complex topic.

No Dig, No Fly, No Go "...explores the momentum and impact of prohibitive cartography across a range of scales and phenomena" (p. 4). Monmonier's definition of "prohibitive cartography" is perhaps most completely spelled out in his own preview summation of the book's contents (pp. 4–5):

> Chapter 2 [...] focuses on property boundaries and real estate law, [and] looks at land survey systems and land registration practices, while chapter 3, which deals with national sovereignty, limns the marking and adjustment of international borders, the questionable effectiveness of walls and security fences, and the rhetorical role of boundary maps in asserting spurious claims and fictional sovereignty. Chapter 4 turns to colonial ambitions and geopolitics and appraises the boundaries imposed by imperial powers on Africa, the Balkans, and the Middle East. Chapter 5 looks at offshore and maritime boundaries, while chapter 6 examines the implications in the United States of state, county, municipal, special-district, and tribal boundaries. Law and litigation frame chapters 7 and 8, which treat gerrymandering and redlining, often condemned as subtle (or not so subtle) forms of apartheid. Legal restrictions also figure prominently in chapter 9, which examines zoning and environmental protection, and in chapter 10, which explores the use of maps to regulate behavior deemed offensive or socially harmful. Chapter 11 examines the map's role in protecting air travelers, underground infrastructure, and ethnic minorities like the Kurds in northern Iraq, and chapter 12 looks at satellite tracking, the latest and perhaps most ominous manifestation of prohibitive cartography.

The individual chapters are brief and brisk: situations are described, examples presented and explained, and segues are identified that flow into the next situation and example. Nowhere does it bog down in minutia, and if some particular passage fails to interest a particular reader, s/he need only follow along for a short jaunt before the narrative turns a corner and offers a new prospect. Clearly, *No Dig, No Fly, No Go* is sketched quickly, but not in such broad strokes as to obscure the places nuance would lurk. For issues breezed over that a reader might care to know better, there are leads to information and to sources, with six pages of "Further Reading" (segregated by chapter) and 387 end notes (an average of just over 35 per substantive chapter). The use of end notes, which banishes the references to a few pages in the back, is symptomatic of the popular format: one seldom wants to break the flow of the narration to fumble about finding the note and ultimately one may just ignore the notes altogether. The practice of using end notes is, while common in popular works, just a bit shady. As Al Franken remarks: "If you are using "footnotes" to lie, make them endnotes" (Franken 2003, p.12). Still, the notes are there when one wants them.

Sometimes, however, the "popular" label might seem to be pasted on to excuse some rather curious grammatical practices. On page 145, at the end of Chapter 9, the author mentions "a Georgia wetlands delineator named, ah, Todd Ball...". What is this "ah"? Was Monmonier dictating this passage? Using the web URLs in the end notes one finds the man's name reported as Michael Todd Ball. Is there some implication of a question as to Mr. Ball's proper name? Even so, why imply it by enshrining a verbal pause? One is reminded of another author notorious for dramatic … pauses.

In at least one instance, *No Dig, No Fly, No Go* allows Monmonier to go back over some previously trodden ground. Chapter 7: "Contorted Boundaries, Wasted Votes" begins, in fact, with the remark of a reviewer (Berke 2001) of *Bushmanders and Bullwinkles* (2001) that

the older book offers "no clear point of view" (p.104), and the author proceeds forthwith to correct that perceived failing. The ensuing synopsis of the earlier, much lengthier, discussion is brief, sharp, and well-focused, and offers some clear and concise recommendations on electoral redistricting. Here is an instance of a barb hitting home, and the author responding with a small gem of a presentation unencumbered by excessive inclusiveness. It is short and sweet, and hands the audience the conclusion on a platter; a platter sitting on a lean and well-constructed argument.

In some cases, however, the arguments presented are open to some challenge. In Chapter 4: "Absentee Landlords," the author several times suggests that it was the use of polar projections that determined the "sector" form of Antarctic land claims. On reflection, one wonders if this might be rather putting the cart before the horse. There is plenty of precedent for "sector" colonial claims on unexplored coasts: "from here to there and as far inland as it can go," so to speak. In North America, this practice explains the phenomenon of the Western Reserve of Connecticut, in what is now Ohio, and it was the general practice in other contemporary British North American land grants. Obviously, on a coast as devoid of major landmarks as is Antarctica, a stretch between declared longitudes is an obvious means to unambiguously delineate claims; the fact that these lines converge inland is more of a happenstance than a planned outcome.

Beside the author's (relatively innocuous) predilection for anecdotes from his own neighborhood in Upstate New York, there is a clear preponderance of US-based examples throughout *No Dig, No Fly, No Go*. Certainly, this will make the book more accessible to a predominantly American audience (who tend to ignore most of the world anyway), but it sometimes bypasses useful illustrations of interesting facets of the topic under discussion. In Chapter 6: "Divide and Govern," the relative rareness of municipal amalgamation in the Northeastern and Midwestern US leaves that issue completely unexplored. Just over the border in Canada, however, the 1990s saw a wave of massive (forced) municipal amalgamations: from Ontario to Nova Scotia broad tracts of territory, with sometimes widely scattered cities and settlements, were forced into so-called Regional Municipalities. These Municipalities can be huge: Halifax Regional Municipality in Nova Scotia is over 5,000 square kilometers (over 2,000 square miles); about the size of the province of Prince Edward Island! Such entities offer a counter illustration that could only further Monmonier's arguments about "sense of place" and other issues. Except, of course, it is not in the US... .

All in all, *No Dig, No Fly, No Go: How Maps Restrict and Control* is a good general introduction to the various issues that fall under that broad rubric of "maps that restrict and control." It is not exhaustive, it is not complete, and at 242 pages including the index, it does not pretend to be. It is the sort of book from which one might excerpt a passage or chapter in educating a supervisor or in making a pitch. The fact that you can "Draw a boundary on a map, stick a label on it, and people [will] think it's real" (p.129) may seem obvious to us, but there are a lot of people who have never even considered what that implies. This slim book may help them over it.

Beyond that, there is clearly a place for general, popular treatments of complex subjects. A good overview is always a valuable thing in itself: it is healthy to occasionally take the synoptic view, and to consider how well a general account covers the bases.

Monmonier's *No Dig, No Fly, No Go* is brisk and succinct, it speaks from a position, albeit a non-confrontational one (rare enough these days), and it expounds important cartographic issues in an undeniably popular manner without unduly embarrassing or infuriating a knowledgeable audience. One cannot ask more of any such publication.

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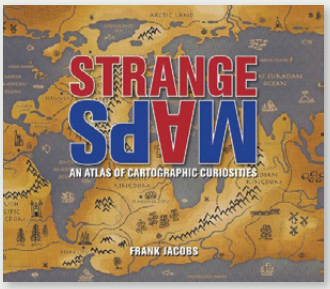
STRANGE MAPS: AN ATLAS OF CARTOGRAPHIC CURIOSITIES



By Frank Jacobs.

2009 Studio (Penguin Group); New York, New York.
244 pages, 138 maps.
$30.00 US, softcover.
ISBN: 9780142005255.

Review by: Eva Dodsworth, Geospatial Data Services Librarian, University of Waterloo

Strange Maps: An Atlas of Cartographic Curiosities is the print version of a selection of maps collected by Frank Jacobs and posted on his *Strange Maps* blog (**http://bigthink.com/blogs/strange-maps**). The blog has approximately 500 maps with corresponding descriptions and comments, of which 138 have been selected and published in the atlas.

Unlike traditional geographic and thematic atlases, *Strange Maps* is comprised of unordinary, remarkable, and eccentric maps that span several centuries, continents, and themes. Accompanying every map is a carefully written description of not only the map itself, but a thorough discussion of the map's purpose, the atlas author's interpretation of it, and his remarks on any historical, political, literary and/or geographical influences and contributions that the map may have had in its creation. It is clear that the author has researched many aspects of the maps, providing between one to two pages of insightful descriptions for each of the "cartographic curiosities."

The author describes his anthology of maps as an *anti*-atlas, where the maps are clearly not to be used for navigational purposes. It quickly becomes obvious that this atlas is a collection of rare maps that fall under their own category of "light-hearted and strange"; it is filled with cartographic misconceptions, fictitious creations, artistic renditions, humorous works, propaganda, and bias.

The atlas is divided into 18 thematic sections: Cartographic Misconceptions, Literary Creations, Artography, Zoomorphic Maps, (Political) Parody, Maps as Propaganda, Obscure Proposals, Ephemeral States, Strange Borders, Exclaves and Enclaves, A Matter of Perspective, Iconic Manhattan, Linguistic Cartography, Based on the Underground, Fantastic Maps, Cartographs and other Data Maps, Maps from Outer Space, and Whatchamacallit. There are between four and 11 maps for each category, almost all available in color. Essentially every second page features a map, with its description available either on the same or the opposite page, depending on the map size. Examples of some of the types of maps found in this atlas include:

Literary Creations: Many literary works include maps of fictitious places and settings. Frank Jacobs included a few of these maps; for instance, Thomas More's fictional island of Utopia, situated in the Americas, and The Land of Oz from L. Frank Baum's *The Wonderful Wizard of Oz.*

Frank Jacobs' descriptions of the literary maps include a summary of the story, description of the details seen on the maps, and a discussion of why the cartographer/artist may have drawn things the way he did.

Artography: Looking at maps from an artistic point of view, and not a cartographic one, the author included a selection of maps that are both visually appealing and graphical in nature. One example is "Drawn from Memory: United Shapes of America," by the artist Kim Dingle. This is a compilation of maps of the US drawn by children. Every map is different, and when compiled together, the canvas looks like a herd of abstract cows. Another unique one is "Now this is World Music: Harmonious World Beat," a map of the world's continents created solely with notes, ties, bars and staffs of that continent's traditional sheet music. This map can actually be played.

Ephemeral States: Frank Jacobs was able to locate maps of countries that existed at some point in time, but are no longer present. One particular map shows Carpatho-Ukraine which existed for only 24 hours before being seized by Hungary. The day earlier it had been part of Czechoslovakia.

Iconic Manhattan: A selection of maps of New York clearly show it as the center of the universe. One interesting work is a wordmap, using poetry to create the neighborhoods of Manhattan. The actual text corresponds to the localities it describes, including in all over 100 places on Manhattan Island.

There are of course many other maps displayed in the atlas, including coincidental geographic boundaries created with food or clouds, upside-down maps, plans for states that never left the drawing board, cartograms, maps of outer space, and much more. Since many of these maps have been created to tell a story, Frank Jacobs' interpretation of the maps, based on researched facts and supplemented by trivia and at times humor, helps the reader discover the cartographic and thematic value in an otherwise questionable composition.

The atlas is comprised mainly of European, American, and world-level geographic areas. It appears as though the maps selected for the atlas were not picked to represent any specific region of the world, but rather chosen for their interesting and unique themes. That being said, however, there are dozens of American maps included, making it the country with the largest representation in the atlas.

The map designs and styles vary quite a bit from one map to another, with some composed of simple sketches and scribbles, and others being carefully illustrated with icons, images, and photographs. Some maps were printed as large as the atlas pages, about 12 inches in height and width, whereas others were smaller than 4.5 inches.

The size of some of the maps is perhaps one area of weakness in this atlas. Because it is an atlas (even if it is an anti-atlas), one might expect the maps should be given more coverage than the text describing it. There are several maps that look like thumbnails compared to the amount of writing that surrounds them. Perhaps the selection criterion for the atlas should have included map size. The placement of the maps on the pages could have been better thought out as well. Several maps were printed right into the binding edge at the center of the page spread, making them difficult to read, appreciate and comprehend.

Although this atlas really isn't about cartography, but rather the underlying themes of the maps, many purchasers of this atlas will in fact be cartographers, map collectors, artists, and the like. Readers interested in learning more about these maps that are not published in any other atlas may, therefore, be a bit disappointed to discover that the author has left out a few valuable details in the maps' descriptions. How large are the maps in reality? What are their dimensions? Are they really the size of thumbnails, or are some of them the scope of murals? Physical map details add an important element to map appreciation, and, for this atlas, transfer something illusory into a physical reality. These maps actually exist.

Along the lines of the maps' existence, another essential detail that is missing in the map descriptions, quite ironically, is the maps' location. With few exceptions, the author does not reveal where the maps have been published, and where they may be found. With so many extraordinary maps, such as those painted on canvas, one may well question where the originals are, and whether prints have been made. Is the collection of "strange" maps also a collection of "rare" maps? Are the maps available as single-sheet paper prints, or only in electronic format? Were they self-published by unknown cartographers who have the only copy on their computer drive? Are they available in books of poetry, such as the Manhattan word map? Are they valuable, famous, out of print? Answers to these questions would help bring the maps to life.

One of the risks of creating a publication from material that is freely available online is that readers may opt for the freely accessible online version. As mentioned earlier, the contents of the atlas are also available on Frank Jacobs' blog, and in fact he has hundreds of additional maps comparably "strange." The blog, however, serves the beneficial purpose of giving a taste of the type of maps that can be expected in this unique atlas. In today's digital age, very little isn't available online, and if it wasn't for the creation of the blog and the contributions from the blog's followers, this atlas certainly wouldn't contain the carefully selected maps that it does.

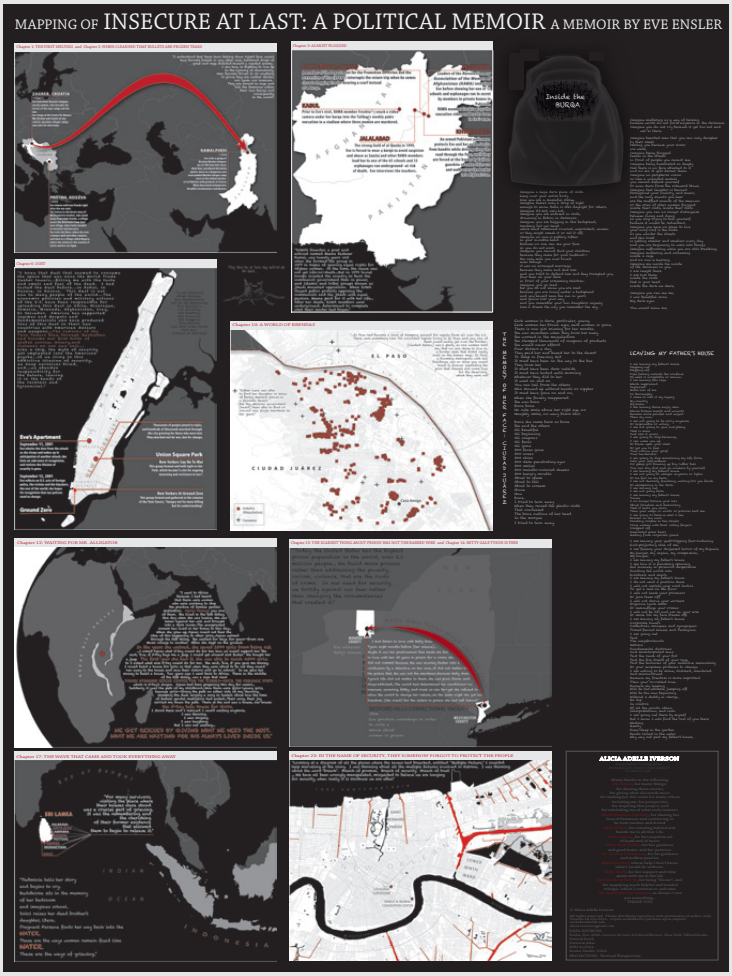
Frank Jacobs' atlas of cartographic curiosities is one of the more unique atlases available. With topics that span a broad theme base, the atlas is certainly much more than a cartographic compilation. The themes selected for the atlas blend geography and society, creating a collection of cartographic works that have been merged with history, art, music, politics, literature, science fiction, and much else besides. What readers will discover is that the atlas demonstrates society's love for maps and geography and the realization that a map really can be created by anybody, and about anything, as long as it tells a story. *Strange Maps*, simply put, is a compilation of stories.

NACIS Student Poster Competition

Daniel Huffman | daniel.p.huffman@gmail.com

One of the largest editions of the Map Gallery in recent memory greeted attendees to the 2011 NACIS Annual Meeting in Madison, Wisconsin. Forty-four separate entries packed the display room, offering everything from expertly-crafted reference maps to displays showing off the latest research and techniques. Visitors had plenty of beautiful and intriguing works to ponder, and kept the gallery busy throughout the duration of the conference.

Twenty-two of the entrants to the Map Gallery were also competitors in the Student Poster Competition, leaving attendees with the tough task of selecting only one winner. Despite a somewhat more involved balloting process, a sizable percentage of attendees took the time to evaluate the posters and cast a vote. When all were tallied, Alicia Iverson of Humboldt State University came away with the grand prize: $500 and the acclaim of her peers in the cartographic world. Her award-winning work, *Mapping of Insecure at Last: A Political Memoir*, traces out the spaces and journeys in portions of Eve Ensler's book. Done up in dark tones with light type and subject features, it is a very visually striking narrative work.



Also lauded by attendees was the second-place map, *Perceptions of Athens*, by Karla Sanders, a student at Ohio University. A surreal blend of cartography and dream imagery, it pushes at the outer bounds of cartography. It can be seen in this issue's edition of Visual Fields.

The poster session for NACIS 2012 in Portland, Oregon is now beginning to take shape, and it promises to be every bit as large and diverse as that in Madison, if not more so. Students and professionals are encouraged to submit their work for display, and map gallery and poster competition entries will be accepted up through September 14th, 2012. For more information, or to register, visit **www.nacis.org**.

NACIS Student Dynamic Map Competition

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The NACIS Student Dynamic Map Competition provides an opportunity for students to demonstrate their skills in dynamic map design. The 2011 competition was another success thanks to a strong community of dedicated cartography instructors, several high-quality map entries, and a distinguished panel of judges.

Two prizes were awarded in the categories of best **narrative map** and best **interactive map**. The narrative category includes maps that are designed to communicate a story, cause, or message. The interactive category includes maps that provide tools for navigation, location-based services, or exploratory geovisualization.

The winner for best narrative map is Zachary Bodenner, from the University of Wisconsin–River Falls, for his map titled *The Rising Sun, Japanese Imperial Action: 1868-1941*. This map tells the story of Japanese imperialism through a series of captions and map animations depicting seven periods of invasion. The design is elegant in its simplicity, with smoothly fading transitions and traditional Japanese music playing softly in the background.

2011 winner for best narrative map

The winner for best interactive map is Erik Samsoe, from the University of Montana, for his map titled *University Campus Map*. His work, powered by Google Maps, allows students to locate and highlight points of interest, such as parking, eateries, works of art, and places to print, among others. A custom interface provides the ability to map efficient routes between buildings and other important places on campus.

2011 winner for best interactive map

A special thanks goes out to our panel of judges: Michael Peterson (University of Nebraska at Omaha), Hans van der Maarel (Red Geographics), and Alethea Steingisser (University of Oregon InfoGraphics Lab). Their expertise and hard work proved invaluable for a successful 2011 competition.

This year's competition offers a $500 prize for best **narrative** map and a $500 prize for best **interactive** map. Any student enrolled in a degree or certificate program may enter. Instructors, please encourage your students to submit a map today!

For complete rules and submission guidelines, visit **www.nacis.org**.

Cartographic Perspectives (*CP*) publishes original articles demonstrating creative and rigorous research in cartography and geographic visualization under open-source licensing. Papers undergo double-blind peer review; those accepted for publication must meet the highest standards of scholarship, address important research problems and issues, and appeal to a diverse audience.

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OPINION/RESPONSE PIECES: *CP* welcomes topical responses to previously-published articles. The length of such pieces may vary; however, we suggest 2,000 words or less as an informal guide.

ILLUSTRATIONS: Maps, graphs, and photos should convey ideas efficiently and tastefully. Graphics should be legible, clean, and clearly referenced by call-outs in the text. Sound principles of design should be employed in the construction of graphic materials, and the results should be visually interesting and attractive.

All graphics must be in digital form, either digitally generated or scanned. Preferred formats are .tif, .ai, .eps, .jpg, or press-ready .pdf.

Maximum width is 17.5 cm (7.0 inches). Common intermediate sizes are 11.25 cm (4.5 inches) and 6.25 cm (2.5 inches). The editor reserves the right to make minor size adjustments.

- Art should be created or scaled to the size intended for print, or larger, and will later be modified as needed for online display.
- Color images should be submitted in CMYK mode. The preferred resolution is 300 ppi at printed size.
- Files should be free of color functions, including Postscript color management, transfer curves, halftone screen assignments, and black generation functions. Files should not include references to ICC profiles or be in a color space other than CMYK or grayscale.
- Digital art files should be cropped to remove non-printing borders (such as unnecessary white space around an image).
- Image orientation should be the same as intended for print.
- For vector files, fonts should be embedded or converted to outlines.
- Type sizes below 6 point should be avoided.
- Captions should not be part of the graphics and will be added by the assistant editor. Please supply captions within the text of the article.

For questions on specific guidelines for graphics, please contact Laura McCormick, *CP* Assistant Editor, (**laura@xnrproductions.com**).

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PEER-REVIEWED ARTICLES

TITLE PAGE: The title serves as the author's invitation to a diverse audience. It should be chosen wisely. The title section should include the full name(s) of the author(s) and academic or other professional affiliation(s).

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in *The Chicago Manual of Style,* 16th ed. (http://www.chicagomanualofstyle.org). When a direct quote, include the page number. Examples: (Doe 2001) and (Doe 2001, 38).

Books: Invert first named author's name (last name, first initial, and middle initial). Middle initials should be given wherever known.

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Name of author(s). Year. *Title in Italics*. City of Publication: Publisher Name.

MacEachren, A. M. 1995. *How Maps Work.* New York: Guilford Press.

A. H. Robinson, J. L. Morrison, P. C. Muehrcke, A. J. Kimerling, and S. C. Guptill. 1995. *Elements of Cartography, 6th Edition.* New York: John Wiley & Sons.

Articles in Periodicals: Author's or authors' names as in *Books,* above. Year. "Title of Article." *Title of Periodical,* volume number, page numbers [follow punctuation and spacing shown in the following example].

Peterson, M. 2008. "Choropleth Google Maps." *Cartographic Perspectives* 60:80–83.

Articles in edited volumes: Author's or authors' names as in *Books,* above. Year. "Title of Article. *Title of Edited Volume in Italics,* edited by [Editor's or Editors' names, not inverted], page numbers. City of Publication: Publisher's Name.

Bassett, T. J. 1998. "Indigenous Mapmaking in Intertropical Africa." *The History of Cartography. Vol. 2, Book 3: Cartography in the Traditional African, American, Arctic, Australian, and Pacific Societies*, edited by David Woodward and G. Malcolm Lewis, [page #]. Chicago and London: University of Chicago Press.

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Cartography Associates. 2009. "David Rumsey Donates 150,000 Maps to Stanford University." David Rumsey Map Collection. Accessed January 3, 2011. http://www.davidrumsey.com/blog/2009/8/29/david-rumsey-donates-150-000-maps-to-stanford.

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