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## Investigating a Cartographic Niche: Drawing Maps for Historians

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INVESTIGATING A CARTOGRAPHIC NICHE:  
DRAWING MAPS FOR HISTORIANS

A thesis presented  
by  
KATE BLACKMER

Submitted to the Graduate School of the  
University of Massachusetts in partial fulfillment  
of the requirements for the degree of

MASTER OF SCIENCE

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Geography

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DRAWING MAPS FOR HISTORIANS

A thesis presented  
by  
KATE BLACKMER

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## DEDICATION

For those in my life who have valued academic achievement more than myself, but who have never questioned my ability to succeed at that level—no matter how enthusiastically and for how many decades I may have struggled against it.

## ABSTRACT

### INVESTIGATING A CARTOGRAPHIC NICHE: DRAWING MAPS FOR HISTORIANS

MAY 2015

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Drawing maps for historians involves a number of distinct challenges. The historical cartographer must grapple not only with geological changes over time, but geographical ones, from human-cultural to physical, and from political to spatial. Original manuscripts must be read with close attention toward extracting geographical data, map sources must be vetted, and design challenges must be resolved. Furthermore, many of the antiquarian sources that are used to create current-day maps of historical times have unique scales, projections, and senses of place—all of which present complications that need to be overcome when creating historically based maps for publication. This thesis describes some of the quagmires that the historical cartographer encounters on a regular basis, and details methods for avoiding them. Using maps drawn by the author as source materials, techniques for creating historically cognizant, technically accurate, and elegant maps are examined and described as parts of the process of illustrating historians' manuscripts. Ultimately, the goal of the historical cartographer is to create maps that provide readers with an easily graspable graphic methodology for understanding the arguments presented in the text. When this is done well, the maps

support the legitimacy of the historian's research and offer a clarity of vision that might otherwise be difficult with words alone.

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**CHAPTER 1**  
**CARTOGRAPHIC CAPABILITY:**  
**ON DRAWING HISTORICAL MAPS**

*How historically cognizant, technically accurate,  
and elegant maps can illuminate a historian's manuscript.*

Well-drawn maps are perfect examples of the convergence of science and art in that they can illustrate an extremely complicated dataset in elegant and succinct ways. When maps such as these are included in publications, they provide readers with an easily graspable graphic methodology for understanding the information being discussed. Effective maps lend legitimacy to research and offer a clarity that might be otherwise difficult with words alone. In comparison, poorly conceived or inadequately drawn maps often prove detrimental to the perceived authority of the author, as they can be misleading, confusing, or difficult to parse. Any document that includes such unfortunate maps is affected negatively by those images, in one way or another, every time. Mapping technologies have changed dramatically during the past few millennia, allowing maps to be drawn more easily and more accurately, but a basic cartographic sensibility, rooted in geographic truth, and enhanced by artistic notion, has remained markedly steadfast throughout time: If a map is to be useful, it must be easily decipherable. This project explores the relationship between texts written by historians and the maps that are drawn to specifically accompany those texts.

The goals of effective mapping are straightforward: consistency, clarity of presentation, accurate display of the information, and elegance or beauty. A first-rate

cartographer relies on a set of intellectual skills and geographic training as well as a collection of physical tools to assist in both the initial conceptualization of a map as well as the process of bringing it to fruition. Additionally, cartographers who draw maps for others must have the ability to quickly learn a new subject matter and grasp concepts with ease, be able to manage long-term projects, and find communicating with authors, editors, and book designers an easy task. They must also have the necessary computer and software skills, a keen sense of spatial awareness, and a good grasp of typographic style. Ultimately, if these skills and tools are not in place, the maps will suffer, and that will directly affect the success of the publication; however, when these skills and tools are combined, along with a dose of patience and a modicum of compassion, the best maps are created, illuminating the text of the author.

I have chosen to apply the title *historical cartographer* within this thesis to explain and encompass all that it is that a cartographer does when drawing maps for historians. My goal in writing this thesis is to offer those who have an interest in creating maps for historians and historically based texts an opportunity to observe some of the themes I have encountered throughout two decades of my own research and development as a historical cartographer. These cartographic fundamentals hold true for any number of fields—anthropology, archaeology, sociology, biology, et cetera—but in this paper I am focusing the discussion on creating maps specifically for historians, as these have been some of the most complicated and arduous maps that I have drawn, and they make up a substantial component of my cartographic work to date.

Human beings have been creating and reading maps for millennia. It might even be suggested that the advent of mapmaking for a given group could be as accurate an

indicator of civilization as any other (organized settlement, written language, establishment of laws). Maps have been drawn in the dirt and sand, portrayed with leaves and sticks, painted on animal hides and cave walls, chiseled into stone, etched onto metal, printed atop various forms of paper and in books, and most recently, displayed on computer screens. Raisz (1962) states that the “ability to make maps is an innate ability of mankind” (p. 3), and Hall (1992) suggests that “one could view the history of cartography, from the crudest clay tablet to yesterday’s survey of galaxies, as the story of civilization shedding a succession of untenable centrisms” (p. 21), and I agree with both of these postulations; maps are a major component of our history. Regardless of language, culture, or class, maps have been created and used for any number of purposes, from communicating directions and boundaries, to counting populations, illustrating land use, establishing taxation, and beyond. In each case however, maps were often utilized instead of text or spoken language precisely because of their ability to quickly and accurately communicate multiple layers of complex data with a single image; a concept that is often tied to the notion of graphicacy (Davenport, 2005; Wilmot, 1999). Some maps have helped to discover new worlds, save lives, and win political battles, while others have instigated local disputes, national debates, and global wars. In summary though, one might state it as concisely as Demko, Agel, and Boe (1992): “Maps are simplifications or models of reality. They are the tools for discovering where things are and—in modern geography—how they move over space and through time” (p. 79).

When maps entered the academic sphere, they found a natural place within the discipline of geography, and although most disciplines use maps in one way or another (and some rely very heavily on them), geography is where they found their most natural

and necessary home, and where they prospered for more than a century. Academic cartographers were a natural extension of this growth and as such they were trained as specialized geographers, with intrinsic understandings of geographic concepts and evidence. Increasingly, maps became integral tools for all types of geographers in that they could most effectively show layer upon layer of data in ways that text alone could not. To this day, many geographers rely on maps daily—using any number and variety of mixed methods (Elwood, 2010)—the tools may have changed dramatically over the years, but the need for maps and mapping has never been stronger.

Historically, the realm of the mapmaker has been very fluid. Mapmakers other than geographers have often been artists, scientists, and historians by their own rightful titles. Cartography is one of those special fields where data and design merge, where truth and beauty find a natural union. In the past, cartographers have most certainly been artists, but their skills also had to encompass a vast knowledge of geographical space and location, as well as math, perspective drawing, and science. These men and women have had to use tools across disciplines and through difficult circumstances, regardless of era or nationality. But what of today? Where does the cartographer fit? Geographer? Artist? Scientist? Who draws the maps for our current-day books and journals, and what do they call themselves? This paper will suggest that anyone can draw a map, whether they have been trained to do so or not, and that in fact more people are drawing maps and working with geographical datasets than ever before, regardless of what they are calling themselves: cartographer, mapmaker, artist, graphic designer, scientist, et cetera. It is important to keep in mind that through history, it is not just cartographers who have drawn spectacular maps; in fact, many of the most significant cartographic advances over

the past few hundred years have been made by non-geographers, by non-academics, by non-cartographers (Crampton, 2009; Wood, 2003). Classic examples of this include John Snow's 1854 map of a cholera epidemic in London (which helped establish new methodological practices for what became the field of epidemiology), and Charles Minard's 1869 graphic depicting the disastrous Russian campaign of 1812 (which illustrates no less than six interrelated sets of data). Maps such as these have been used to prove points, illustrate complicated concepts, and transfer knowledge in succinct ways—using cartographic and scientific methods that cleverly moved the unconceivable to the comprehensible (Friendly, Valero-Mora, & Ulargui, 2010; Hallisey, 2005).

At the most fundamental level, maps help us transcribe data into readable formats. Whether that data is geographical in nature such as establishing river courses and town locations, or more obscure such as plotting deaths in a certain area at a given time, or movements of people over space, maps help us parse data into a more easily understood configuration. Maps allow us to see a problem or a solution in ways that would not have been so implicit otherwise, that might have remained concealed. Physicians, geologists, farmers, and any number of other citizens have been using maps for centuries, to document how disease outbreaks spread, to prove how rock formations establish continental drift, and to record how river shifts have changed land rights. These people were not cartographers by trade or training, but they drew maps as the most effective way to describe or investigate a particular dataset. This practice of map-as-documentation is alive and well in many academic disciplines, especially so within history departments. Outside of the realm of geography—where maps are most clearly rooted—it is probably historians who work with maps more than any other academic discipline. Maps are often

some of the most revealing documents that remain from a given time or event. These old maps can provide a richness of data that text alone does not allow. Furthermore, maps help to impart the story a historian is telling. Translating these new versions of old stories into clarifying cartographic renderings is the job of the historical cartographer. And it is the collaboration between the cartographer and the historian that is of the greatest interest to this paper.

Creating maps for clients is always a balancing act between quickly learning enough about the subject matter at hand to be able to draw a useful map, and having the research skills and patience to be able to handle working with that client for an extended period of time. Being able to bridge the gap between understanding the “truth” of the written words and creating a map that elucidates those words while remaining true to geographic sensibilities and principles is a unique skill set, one that is required of a successful historical cartographer. This paper will investigate some of the unique factors that are involved when working with historians and detail some of the elements that need to be considered when doing this type of work.

Technology has changed dramatically in these past 20 years (as it had in the 20 years before that) and those changes have directly affected how maps are drawn, edited, and produced—and by whom (Crampton & Krygier, 2006). What will be presented in this thesis are discussions directed towards creating elegant maps for authors and their publications, and as such the question of technology must also be interleaved. The cartographer often works in close partnership with the author, working towards the success of the publication together through comprehensive and meticulous collaboration,

and the products of this work are directly influenced by the tools that are used in both developing the maps and in the relationship between author and cartographer.

Maps surround us like never before, and with each technological advance they are becoming yet more significant to how we understand our lives. We now use them—knowingly or not, and willingly or not—for everything from GPS navigation in our cars to geotagging photographs that are posted on social networking sites, and from managing emergency responses to planning a beachside soirée. Maps are everywhere now, and they are increasingly woven into the fabric of our everyday lives in ever more exciting and enticing ways (Elwood, 2009). Google Maps and Google Earth brought the world of GIS to the desktop-based consumer in ways that would have been virtually unimaginable 20 years ago, allowing the entry-level user to see Earth from above or design a road trip. Smartphones have taken maps and geography to a whole new level by establishing them as the standard upon which just about everything is based; from Foursquare to Facebook, the backbone is all about understanding placement on a map and in Cartesian space, all of which must be geographically sound. It is an especially exciting time for mapping and maps. However, while the greater world has gone map-happy, geographic academia over the last quarter-century has frequently dismissed maps and mapping, especially in the realm of GIS (Leszczynski, 2009). And while I argue that historical cartography is in many ways becoming increasingly popular, it is being explored more recently not by cartographers or human geographers per se, but progressively by artists, designers, and by the generally curious of all sorts. This thesis will investigate some of these trends and directions.

Although no writing that I have been able to find discusses my specific subject matter at any great length, there is a rich history of cartographic writing that can be investigated and applied in regard to the historical cartographer, both within academia and in the professional world. There are many magazines dedicated to cartography, and a number of professional organizations that cartographers join as a matter of course. Some fascinating experiments are currently occurring in the realm of what might be labeled *historical cartography*; from experiments with creating historically cognizant maps to biographies that focus on maps and map histories, people across all disciplines and in the public sphere are seemingly becoming more interested in and involved with maps and mapmaking.

Additionally, the public has gone map-crazy over the past few years, and a number of books have been published in a vein that could easily be called map-based autobiography. Especially of interest in regard to this thesis are Jennings' *Maphead: Charting the Wide, Weird World of Geography Wonks* (2011), and Parker's *Map Addict: A Tale of Obsession, Fudge and the Ordnance Survey* (2010). Again, neither of these men is a trained cartographer, but they have created memoirs that speak to the general increase in map awareness in our society, and specifically toward cartographic understandings. Two other especially interesting novels that include maps are Hodgson's *The Tattooed Map* (1995), and Larsen's entitled *The Selected Works of T. S. Spivet* (2010). Both of these books make integral use of maps throughout the storyline, interleaved between the text and the graphics, and neither of these books could exist without the map component as they are built directly into the framework and telling of the story.

Rosenberg and Grafton's *Cartographies of Time: A History of the Timeline* (2010) provides a view of cartography through uses of timelines and data graphics. And Tufte's set of fascinating books about maps and mapping (some would say statistics but this cartographer suggests that the two are in many ways synonymous) are worth an especially deep exploration: *Envisioning Information* (1990), *Visual Explanations: Images and Quantities, Evidence and Narrative* (1997), and *The Visual Display of Quantitative Information* (2001). Each of these books is an example of how graphic design and data visualization can be combined to create elegant and informative maps.

Art maps and mapping experiments will also be included within the discussions in this paper. Especially of interest here are Harmon's *You Are Here: Personal Geographies and Other Maps of the Imagination* (2010), and Turchi's *Maps of the Imagination: The Writer as Cartographer* (2004). Furthermore, there are other map-project books that have recently been written that detail for readers how to make antique-looking maps, how to design cartouches, and how to create narrative maps; see Berry's *Personal Geographies: Explorations in Mixed-Media Mapmaking* (2011). Each of these map-as-art themed books detail some of the fascinating work that is being done in this realm. Although many of these maps are not true to traditional geographic thinking—projection, scale, or medium—they are no less interesting in regard to cartographic explorations. Art maps have been used as political tools, emotional manipulators, and as outright propaganda; all interesting subjects that shine light on aspects of the historical cartographer's craft.

Finally, I will use my own experiences with creating historically based maps over the past 20 years as specific examples toward understanding the role of the historical cartographer and her place within the professional sphere. There is a list of maps at the

end of this document (contained in the appendix) which details 108 maps across 43 publications, all of which I have drawn specifically for historians or historically based interests. Each of these maps or map-sets provides yet more data points that can be used as examples of the historical cartographer's work. A number of poignant maps will be used for illustrative models throughout the paper.

Furthermore, today's educational landscape includes not just brick-and-mortar institutions with physical classrooms, libraries, and students, but an ever-increasing and ever-expanding digital presence with far-flung individuals who can share passions, interests, and experiments. With the recent shift to digital media, many non-academics have entered the fray of education, albeit not necessarily academia. Subject-matter experts now have websites, blogs, and social networking presences that allow them to wax poetical (or wane scientific) on any number of subjects. One of the most fascinating subsets of this world is the set of mapping blogs and websites that have surfaced—not only those dedicated to featuring excellent cartographic work past and present, but those dedicated to documenting cartographic travesties. In this arena, multitudinous examples of wretched cartography are posted and much maligned by any number of readers who can openly add their own comments and discuss at great length the reasons why a particular map failed miserably. Most of these individuals are not cartographers themselves, but people who feel an affection for maps; the dialogues are often intellectual and educational, and very often humorous. These examples of poor cartography are further illustrations of why a solid grasp of cartographic principles is especially important when drawing maps for publication.

## CHAPTER 2

### INITIATIONS: MANUSCRIPTS, DATASETS, AND FACTS

*On client contact, understanding press specifications, requesting manuscripts, data compilation, and map conceptualization.*

In Turchi's 2004 book, *Maps of the Imagination: The Writer as Cartographer*, writing is discussed as an exercise that has distinct yet intermingled phases: exploration and presentation (p. 12). He suggests that the writer explores and examines the facts and ideas that will eventually make up a piece of writing, and then at some point, the writer must turn all of that into a final product that can be read. Most of us have had to struggle with the writing process and can see this as a very typical pathway toward sharing concepts and ideas. The process for the historical cartographer is really no different—she is responsible for taking the facts and ideas presented in a manuscript and applying them to a final product that is also readable, it's simply a more *graphical* or *pictorial* product. Turchi goes on to discuss artistic vision and how the writer (or cartographer in this case) has to choose the layers to include, and equally important, choose what to exclude—and consider what the white spaces in between can mean. In a way, both the writer and the cartographer have to balance the more mundane tasks such as word-count and spelling—or placing geographic locations and establishing sound spatial thinking—with the creative individuality that makes a piece of writing or a map specialized and unique.

#### **Client Contact and Press Specifications**

The initial contact with a new cartography client can come from any number of places: referral from a previous client, a direct request from a press, a cartography credit

on a map or in an acknowledgement, or via the historical cartographer's professional presence on the Internet (usually a website, but increasingly, social media sites such as LinkedIn, Facebook, and Twitter are yielding business). Regardless of the way contact is made, the general first steps are the same: agree on a price and timeframe for the work. Keep in mind, however, that pricing can vary wildly from job to job, and timeframes often shift dramatically during the course of a project. Also, once the project has begun, it may become clear that more maps are required to complete the project, or sometimes fewer—leave room for those eventualities.

One aspect of the project to consider at the very outset is the *size* of the map and the requirements of the press (details that also help determine the price of a map). Early knowledge regarding the allowable size of the image will save many headaches later. Most of my own cartographic work has been published in printed academic book form, so the maps typically fall in the realm of approximately  $4\frac{1}{2} \times 6$  inches. While it was once quite difficult to discern, these days most presses have specific requirements for authors posted on their websites—and these include the specifications for artwork—so it is now relatively easy to secure the required information. Some of the guidelines also include font options or requirements, line-width recommendations or demands, and information about color options (or if color is allowed at all). For example, knowing that a press will not print graphics with hairline-width lines is a critical detail to know when designing a map. Having to go back and redraw maps based simply on press specifications is time-consuming and can be very expensive, so knowing as many of these requirements as possible in advance is invaluable.

However, keep in mind that if the author has not yet secured a publisher, the map may need to be redrawn to meet the requirements of a future-determined press. Most authors approach me with a manuscript that has already been accepted by a press, however, now and again I do run into situations where there is no contract in place. In these cases, it is important to remember that the maps may never be published, or if they are it may be years in the future, so be sure to keep current drafts at the ready.

Unfortunately, all of this was true in one particular case of mine, where a set of four maps had been painstakingly drawn in 2008–2009 but then sat dormant for three years as the author secured a publisher and rewrote parts of his manuscript.<sup>1</sup> Once he had done this, the maps needed to be redrawn to meet the publisher's standards (in this case, hairline widths were specifically forbidden and the sizing of the maps needed to be altered). Changing line widths may not seem like a tremendous task, but if the narrowest width must move up a fraction of a size, so must every other line width above that to maintain the design integrity of the map. In the case of these particular maps, other changes also needed to be made, so I made all the changes at once, which saved some time, but even so, it was an arduous task. Monmonier (1993) explains this concisely:

Constraints on the thickness of line symbols restrict the flexibility and use of some retinal variables. Thin and medium-weight lines, for instance, do not support a range of graytone values or hues as effectively as comparatively thick lines, and very thin lines sometimes disappear during printing (p. 68).

One other thing to keep in mind when first interacting with a new client: some clients are outwardly annoyed that they have been asked by their press to include a map or maps with the manuscript. As it turns out, some historians are not in fact map-people and do not see the value of the cartographic addition. I have occasionally encountered

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<sup>1</sup> Robert E. Jones (2013). *Bread Upon the Waters: The St. Petersburg Grain Trade and the Russian Economy, 1703–1811*. Pittsburgh: University of Pittsburgh Press.

hostility regarding the requirement for maps and who was expected to pay for them. In all honesty though, in my experience, once the maps were completed, even the most initially hostile clients have been pleased with the result and can clearly see the benefit of having maps included in their book.

### **Manuscript and Data Request**

The first step when setting out to draw a map for a client is to collect the dataset that will be presented. This dataset often includes physical landforms, political boundaries, historical data, and names of towns, rivers, streets, et cetera. Where these facts and figures come from and how they are arranged can vary dramatically, and how they are handed from historian to cartographer can fluctuate as well—from a simple bulleted list of towns to quite detailed illustrations that basically just need to be fact-checked and redrawn. In my years of working with historians, I have received everything from wall-size maps that have been marked up, to photocopies, scans, sketches, and even a video. Regardless of what the source materials are, they will need to be carefully vetted and arranged so that a final cartographic product can be created.

When I was first drawing maps for clients, I simply asked for a list of details to be included on their map. However, as I drew more and more maps, and as I read an increasing number of the books that my maps were being published in, I saw a recurring theme: some of the place names mentioned in the book were not included on the maps. As a reader, I have to say that this is one of the most aggravating things that I see in books that include maps—what indeed is the point of including the map if the mountain ranges mentioned repeatedly in the text are not labeled on the map, or if cities are missing or spelled differently between text and map. This is a familiar complaint I hear from

readers when told that I draw maps for historians; they relate to me how frustrating it is to read a historical book (especially military history it seems) and not have the maps be illuminating—and so often to be downright frustrating.

Thus, given that the historical cartographer's goal is to illustrate and illuminate the historian's text, I believe that reading the author's manuscript is the absolutely best way to capture the mappable data from the text. Even if only in early draft form, reading an author's manuscript will help shape the data that gets included on the map. Some clients might not wish to share an incomplete manuscript—especially if the topic is sensitive or if it is still in very rough form—but most are more than happy to forward a copy of their work for perusal (even if it does include an amusing note debasing the writing and sharing how even their own wife would find the subject too dull to bother with). Reading these early drafts is time-consuming and can often be exasperating, but the facts gained from the exercise will make the maps a much better fit with the eventual published product. Additionally, helping the author to further clarify the dataset is paramount; very often, authors assume their readers' knowledge is much more vast than it is. I have personally read manuscripts on topics ranging from missionaries in Hawaii to race relations in Alabama, and from Early American history to current day New England town politics. I have read essays, articles, papers, and any number of outlines; each came with a set of data that I often knew little to nothing about at the onset—the historical cartographer must be a quick study in each of these cases—and each was ultimately expanded, clarified, and illuminated in dialog with the author.

Additionally, authors are often disagreeing with extant published research on the subject being discussed, and thus it is critical to be familiar with any maps that may have

been drawn for that earlier work and how they may have lacked a level of clarity or truth, or how they might have been evaluated negatively by peers. This is very important towards not reproducing embarrassing or plagiaristic errors (common mistakes in historical cartography). Geographical data and facts must be confirmed, and an author's misunderstandings about geography often need to be corrected. All of this and more happen in the first stage of creating a map for a client, often before a single line is drawn or a single city placed in Cartesian space (or otherwise).

Keep in mind that the author presumably knows more about the given subject and the history of its academic investigations than the cartographer might ever understand—so I ask the author to provide a list of articles or books that cover the topic and I do some basic web investigations on the subject as well. Furthermore, the author may be contesting the validity of the research of another author. Knowing this is very important in that the maps used in those earlier publications may have included errors, and it is of paramount importance that those errors not be replicated. For example, one author I worked with was horrified that the maps in the book he was refuting had included the Quabbin Reservoir. The book was discussing western Massachusetts in the early 1700s and construction of the Quabbin wasn't begun until the 1930s. One of his adamant—and fully understandable—requests was that the Quabbin must absolutely be left off of *his* maps (and it was).<sup>2</sup>

In addition, I also request of the historian a copy of any and all maps that he has run across in his research and that happen to still be available, both good and bad. I ask him to answer the following questions as best as he can by drawing on photocopies or

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<sup>2</sup> Evan Haefeli and Kevin Sweeney (2003). *Captors and Captives: The 1704 French and Indian Raid on Deerfield*. Amherst: University of Massachusetts Press.

marking up electronic versions of those maps: (1) What do you like or dislike about each map and what do you wish had been different or what is incorrect about that map? (2) What should and shouldn't be included on *your* map? (3) Indicate the symbols you like or dislike on the maps and show me where you want things placed as best as you can. The more information that you can collect from the author at this point the better—it makes drawing early drafts of maps more constructive for all. Granted, many project schedules do not allow for the time to read the manuscript or for the author to spend the time and effort thinking about mapping, but in an ideal case, all of this can be done.

### **Dataset Creation and Map Visualization**

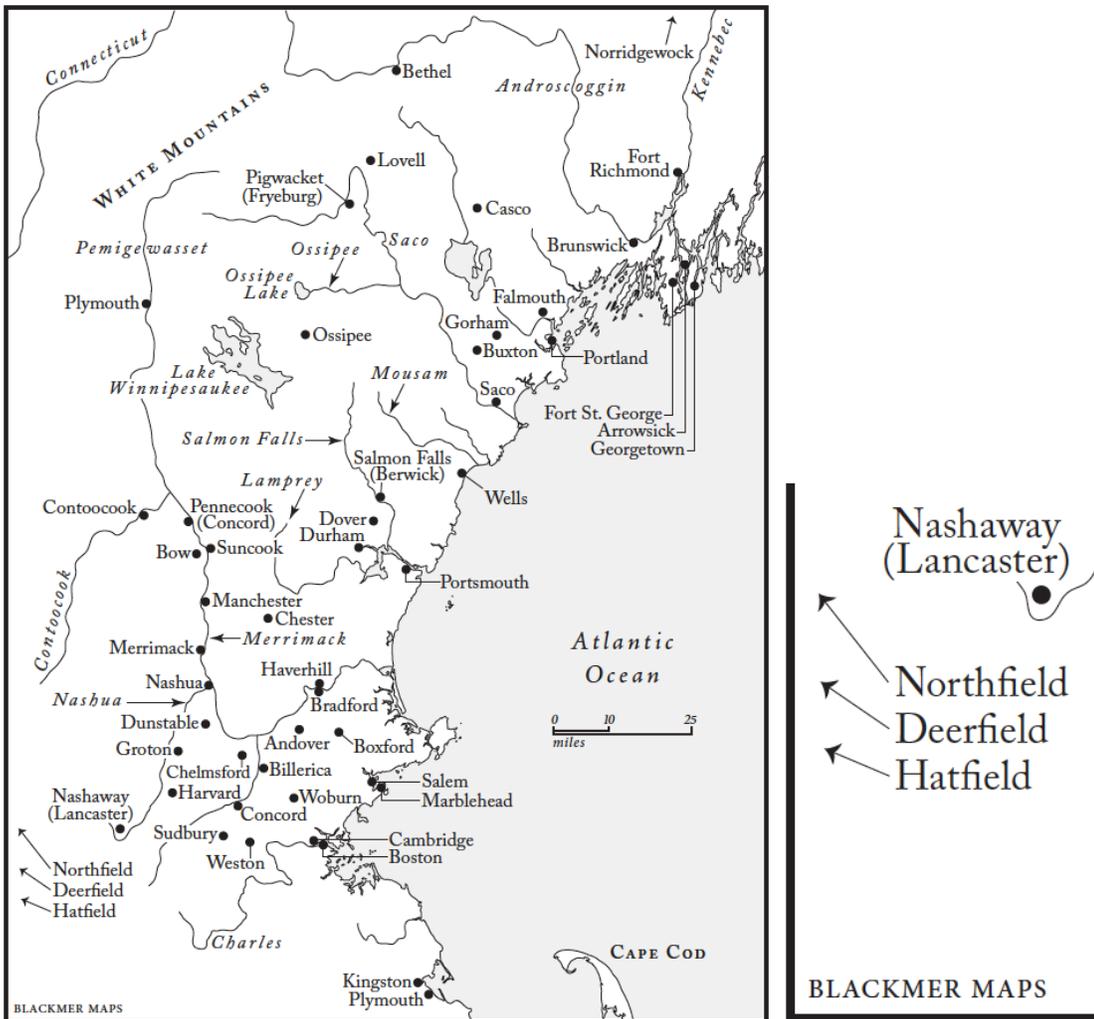
Generally though, one of the first steps when setting out to draw a map for a client is to establish a deadline for the work to be completed. If the author has in fact supplied a manuscript, remember that the time it takes to read the manuscript and collate the data should be added to the time estimate. Most authors that I have worked with have many months during which the maps can be drawn as they are often just beginning the copyediting phase of the project. However, now and again I have encountered cases where maps are needed in an expedited timeframe, usually because the maps that had been promised by another mapmaker never materialized or were not acceptable. In these cases, the opportunity for manuscript inspection is limited and even unlikely. I have completed a set of maps from beginning to end in a week, but it's an exhausting exercise and the maps don't always get the vetting, editing, and inspection that they should have.

The most effective way to keep the various geographical elements straight is to manage them while reading through the manuscript. By keeping a list of every geographical element organized by theme—mountains, rivers, lakes, cities, states,

countries, battles, roads, empires, et cetera—when discrepancies arise regarding the spelling of a place name, do not assume that one is correct and the other an error; often they are both correct but from different sources, cultures, or timeframes. Make pairs of these for the client and ask which he wants used on the map, or if he wants both included using one method or another (in parentheses, within a key, using a virgule/slash, et cetera). Organizing the geographical elements in this way at the outset will help in establishing the scope and breadth of the map as you read.

I find that putting tick-marks to the right of the term each time it comes up will help prioritize the data when it comes time to place it. If for example a town is only mentioned once within a manuscript, and the map would have to be scaled differently to include said town—usually to the detriment of the level of detail that can be shown on the main area of the map—the cartographer might choose to simply include an arrow indicating the location of the town instead of compromising other more important towns on the map because of a scaling consideration. I used this technique recently on both lower-left and upper-right of a map of New England (see map 1). The towns Northfield, Deerfield, Hatfield, and Norridgewock were each mentioned only once in the text, and although they weren't of particular significance to the story being told, they were close enough to the other locations and important enough to the region at the time that I wanted to include them. Because of this, I chose to use arrows to indicate their general location. Had it been necessary to also include the specific locations of those towns on the map, you can imagine that the scale of the map would have needed to be adjusted accordingly, losing some of the important details. The goal is to present a map that seems natural to

the reader, and that includes the necessary details but is easy to read and move around in visually—one that is not too crowded nor too sparse.



**Map 1 and detail: Indicating off-map locations.<sup>3</sup>**

It can also be useful to start with a map of the region that can be drawn and scribbled upon while you are reading through the manuscript. I call these scratch-maps, and often create them by simply printing out a map of the general area in question and marking it up as I read.

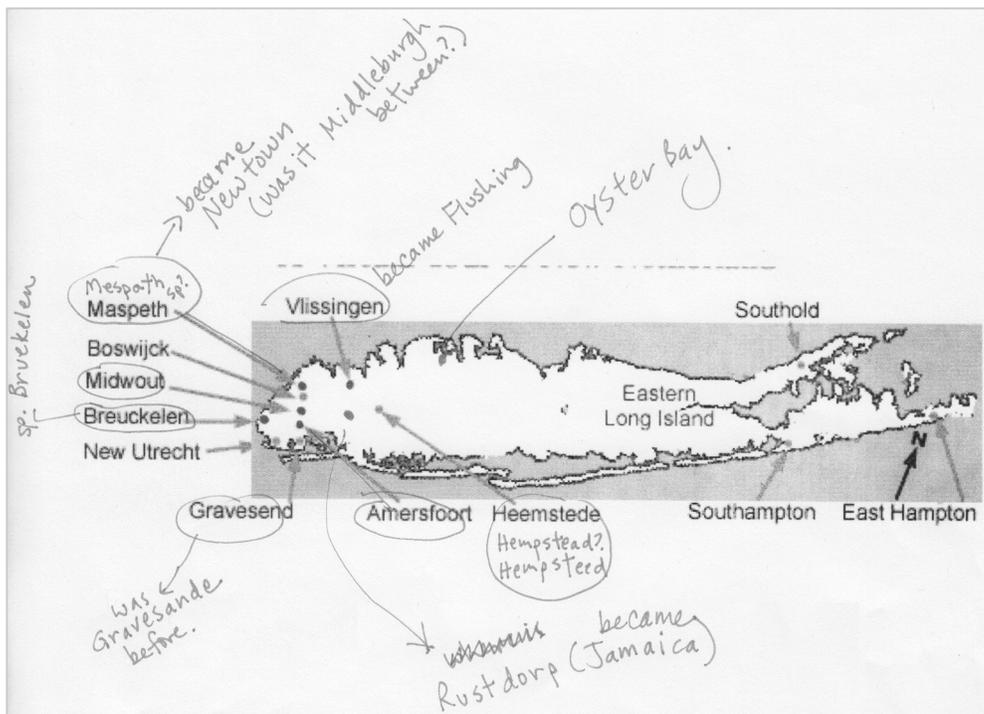
<sup>3</sup> Robert Cray (in press). *Lovewell's Fight: War, Death, and Memory in Borderland New England*. Amherst: University of Massachusetts Press.

Producing a rough-draft map is useful in forcing the author to think about the map's hierarchy of concepts and in judging and responding to the limitations of the format. It may lead to identifying a need for an additional map to accommodate either more information than a single map can easily handle or a different treatment in another part of the manuscript (Monmonier, 1993, p. 117).

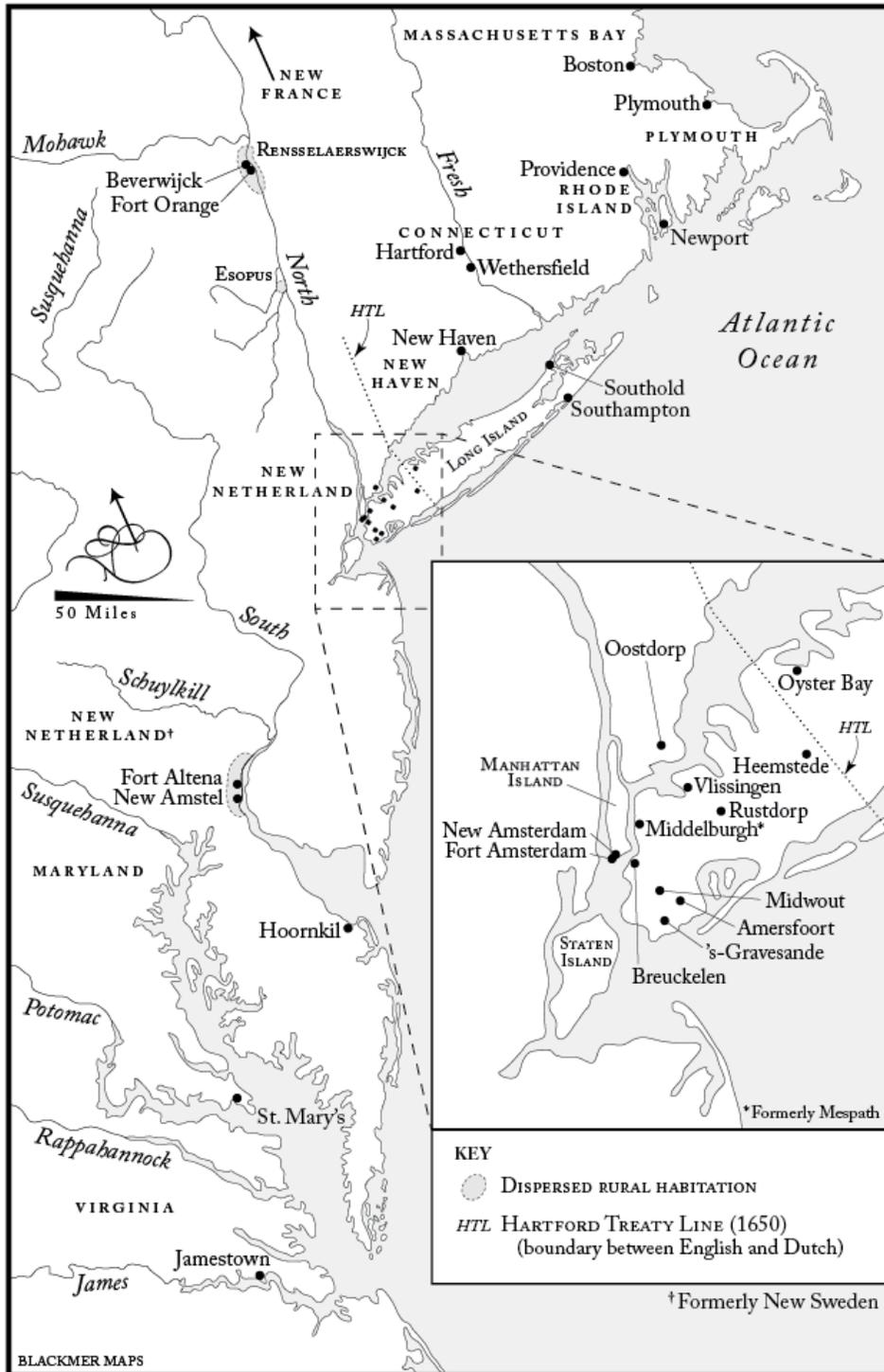
Placing the larger elements on this map will allow a vision to appear regarding how many maps may be needed for the project (if multiple maps are even possible), where a key or inset might go, and where the extents of the boundaries might be.

a simple map of commonplace features can be both essential and elegant, and even the simple map can be done poorly and fail. Its design reflects a variety of decisions—scale, projection, how large an area to show, which features to include, whether to use an inset (Monmonier, 1993, p. 77).

The following two images (map 2 and map 3) portray an original scratch-map of Long Island that I used while working out the naming conventions that were discussed in the text, and after that, a detail of one of the final maps in the book with the named locations placed within an all-important inset.



**Map 2: Original scratch-map of Long Island.**



Map 3: Final map with Long Island inset.<sup>4</sup>

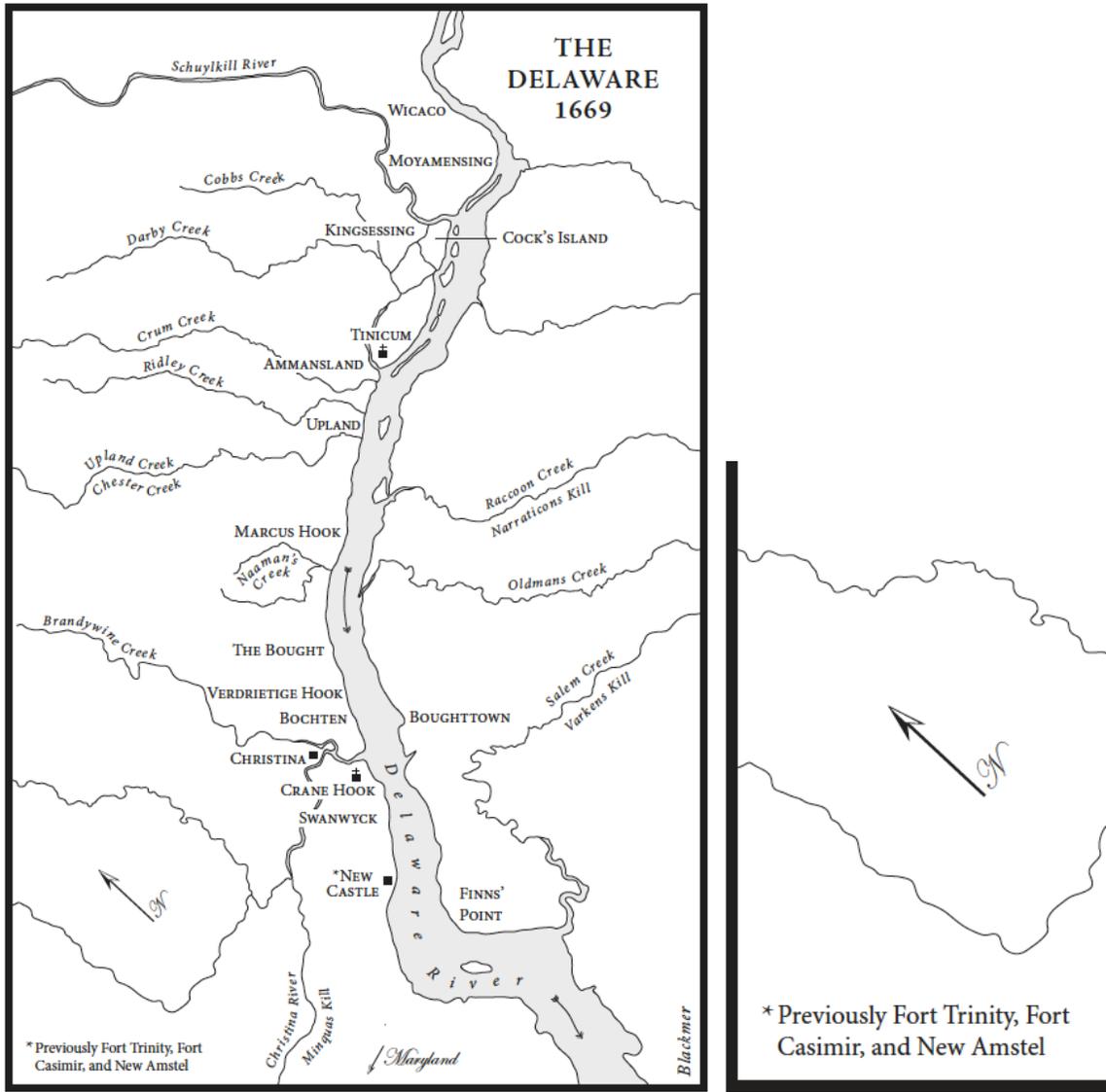
<sup>4</sup> Evan Haefeli (2012). *New Netherland and the Dutch Origins of American Religious Liberty*. Philadelphia: University of Pennsylvania Press.

What this exercise shows is that although many of the towns in this area changed their names even during the progression of the text (and again as time went on), as this particular map was entitled “New Netherland, circa 1657,” the correct names for that specific time needed to be used here, while some of the other names and spellings were used on the companion maps (depending on the title of the map).

Drawing lines on the scratch-map to determine these extents will also help in determining an orientation for the map—not all maps use a north-as-up orientation, and sometimes switching this orientation can be beneficial to the overall design and scale of the map (see further discussion of north arrows in Chapter 4). Monmonier (1993) elegantly summarizes this concern/solution for locator maps, but it can be applied to insets as well as whole maps more generally:

Locator maps can be particularly useful if the map author decides to gain space by abandoning the traditional north-at-the-top orientation. The alternative can be advantageous for a study area with a pronounced northwest–southeast or northeast–southwest elongation, although an unfamiliar orientation might puzzle or mildly annoy a few readers. A north arrow can both signal and describe the map’s atypical orientation, and a north-oriented locator inset showing the area covered by the larger-scale main map might make the unfamiliar orientation both understandable and acceptable (p. 29).

I have also included an example (map 4) of how switching the orientation of a map can allow for the best use of space while losing nothing—as long as an indication of direction is included to orient geographically cognizant readers. In this case, reorienting the map ultimately allowed for the font size of the text to be larger which is always critical when designing maps with 7- or 8-point text sizes, and it better highlighted the Delaware River and its flow, which was an integral component of this particular story. (Note that this map also includes an asterisk with associated details regarding three of the previous names for the New Castle location, as discussed later in this chapter.)



**Map 4 and detail: Setting an untraditional orientation.<sup>5</sup>**

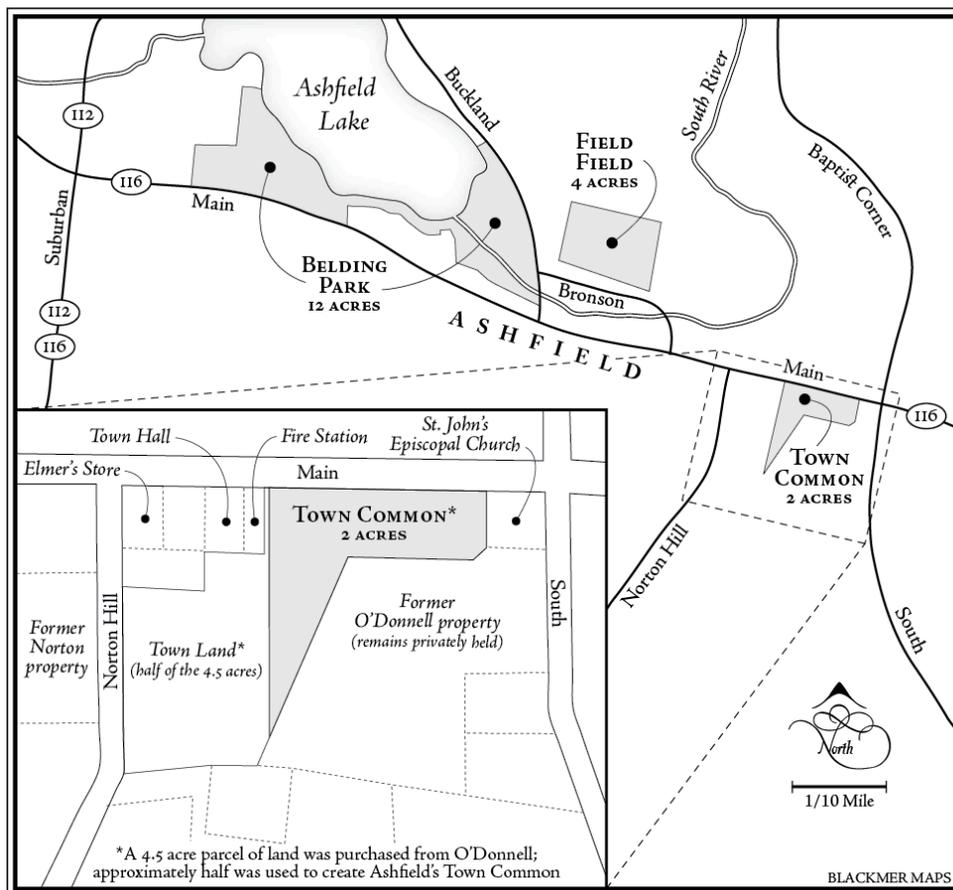
North is by no means required to be “up” on a map. And while it is true that our current-day maps are typically set in north-oriented space, this is a relatively new convention. Turchi (2004) summarizes this very well:

There is no “up” or “down” in space; the term “orientation” comes from the practice of locating the East, which for Europeans was the direction of the Orient, at the top of maps. The East earned its priority thanks to the Earth’s rotation (the sun appears to arrive from the East) and because it was believed to be the

<sup>5</sup> Evan Haefeli (2006). “The Revolt of the Long Swede: Transatlantic Hopes and Fears on the Delaware, 1669.” *The Pennsylvania Magazine of History and Biography*.

direction of Eden, or Paradise. With the discovery of magnetic north and the invention of the compass, most maps swung around ninety degrees. Yet many Islamic maps were oriented to the south, as was Fra Mauro's world map, and today Australians happily promote a map not only oriented to the south, giving the Southern Hemisphere the superior position, but locating their continent in the center (p. 99).

Another way that switching orientation can help when designing maps is when placing an inset. In the example shown by map 5, there was no easy way to keep the lines of the inset in vertical/horizontal orientation and also have everything else on the map fit elegantly. So I added a spin to the call-out so that the whole map fit well within the allotted space.



**Map 5: Twisting orientation when placing insets.<sup>6</sup>**

<sup>6</sup> Robinson, Donald L. (2011). *Town Meeting: Practicing Democracy in Rural New England*. Amherst: University of Massachusetts Press.

The best way to identify some of these options and choices is to work with extant maps of the area in question as the dataset is collected. Draw directly on photocopies of maps of the area and scribble potential boundaries so that you can see what the alternatives might be as the map finds its footing. All of this can be done as the Long Island scratch-map illustrated earlier in this chapter.

Also, within a given book it may have to be explained that the name of a city or river changed over time (often this is mentioned in a footnote or endnote where it is commonly missed), or that there are alternate spellings of a place; but if that detail is not also included on the map, it can get very confusing for the reader.

We organize information on maps in order to see our knowledge in a new way. As a result, maps suggest explanations; and while explanations reassure us, they also inspire us to ask more questions, consider other possibilities (Turchi, 2004, p. 11).

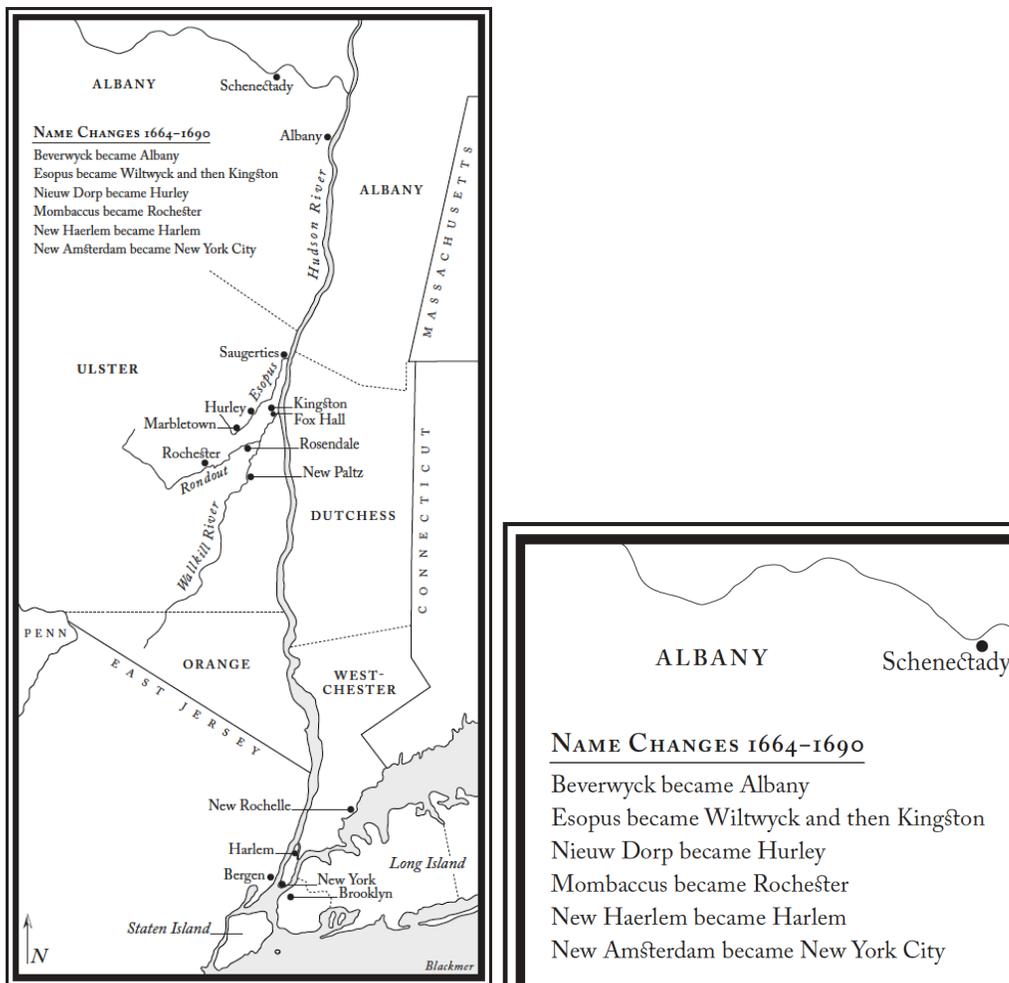
As one example of how to solve the problem of multiple names for one place, I have included map 6 which shows the six town and city names on this one small map that had name changes which were important to understanding the story that was being relayed by the article.

In fact, by including these names directly on the map, important details about the places that weren't specifically mentioned in the text were captured and communicated to the reader, ultimately leading to a deeper understanding of place, geography, history, and context. Monmonier (1993) mentions this exact problem and one easy solution in his writing:

Maps addressing an earlier period might benefit from use of the older name, especially if the text quotes records or literature of the time. But the current name should be noted somewhere, either in the text or on the map, in brackets (p. 113).

And I would go further to note a discussion of place names as Harley (2001) did in his essay "New England Cartography and the Native Americans." He presents a discussion

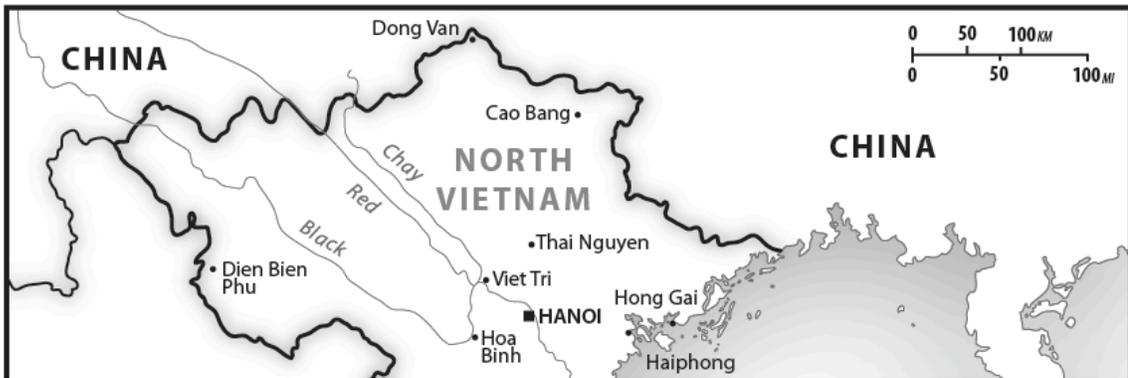
about how by renaming a place, one effectively owns or possesses it. And in contrast, when the old place name is replaced, it is in effect dispossessing the original people of their place, whether Native or simply the most recently conquered (pp. 178–179). Because of this, including alternate place names on the map assists the illustration in detailing additional layers of history, politics, and understanding (see map 6). However, this should only be done on the map if it supports the historical text being illuminated—if the additional data doesn't enhance the text in some way, don't include it.



**Map 6 and detail: Capturing name changes.**<sup>7</sup>

<sup>7</sup> Evan Haefeli (2007). "A Scandalous Minister in a Divided Community: Ulster County in Leisler's Rebellion, 1689–1691." *New York History*.

There is yet another problem for the historical cartographer to consider when placing text on a map: the problem of translation and transliteration. I recently drew a map of Vietnam and needed to label the rivers along the northern extent of the country (map 7 shows a detail of this map). This may seem like a simple task, but really, every label on a map holds enormous power, so they must be carefully considered. Most maps that I consulted during my research that didn't use the name *Red* used the terms *Hong He*, *Honghe*, or *Song Hong* for what is labeled *Red* on the map below. Each of these is a legitimate translation or transliteration of various names for the river—but of course, the river also has different names on either side of the international border between Vietnam and China. Furthermore, most of those conventions are devoid of the all-important diacritics (accents) that tonal languages employ. In Vietnamese this river is more accurately named *Sông Hồng* (and like many important rivers, it is also called other more colloquial or traditional names). What's more, the Chinese looks like this: 紅河 (traditional) and 红河 (simplified), and like this when in pinyin: *Sóng Hé*. So the concern of which label to use and if additional labels should be included in a key were all considerations.



**Map 7: Translation and transliteration across international borders.<sup>8</sup>**

In the end, I chose to simply label the river *Red*, but it was a choice that included some debate and consideration. *Black* also got its more western name while *Chay* remained a transliteration and not a translation. I could have included one or more of the alternate names and/or spellings in a key or in parentheses, but it wouldn't have assisted in the telling of this particular story, so I didn't.

In cases such as these, the cartographer must both honor the text of the author and create a map that assists the reader. One has to draw the proverbial line somewhere—and an international boundary is as good a line as any—while ensuring that there isn't so much information that it starts to become confusing and ceases being edifying. So, both place names and transliterations have their challenges, but they are critical considerations for the historical cartographer. History is a fickle mistress, and one that must be carefully disrobed, layer by layer; and each subsequent layer includes emotions, political considerations, and various layers of power struggle and ownership (Aitken & Craine, 2009). Elwood (2006) details three distinct and yet interwoven types of politics that should be considered when working with data: spatial politics, institutional politics, and

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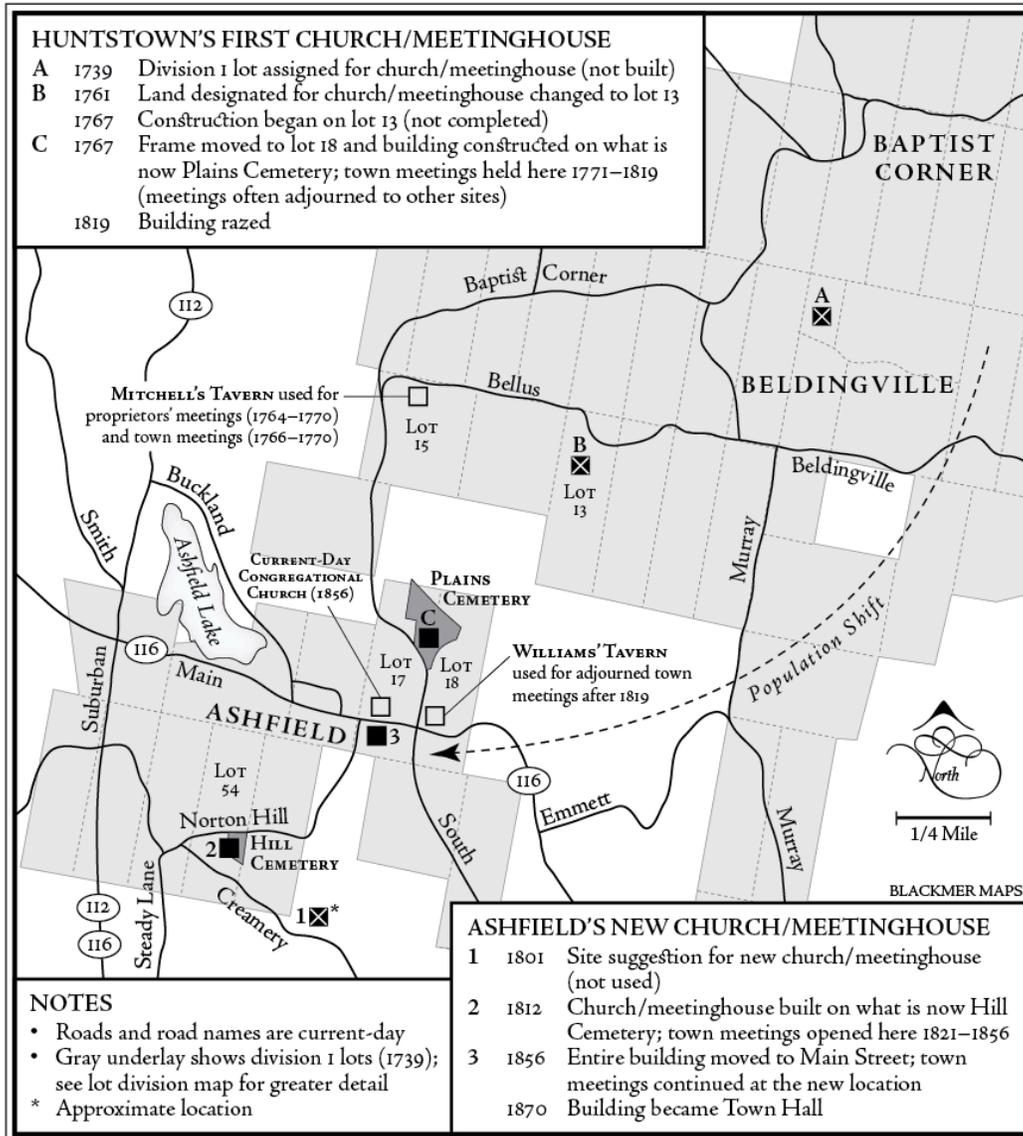
<sup>8</sup> Boston Publishing Company (in press). *The American Experience in Vietnam: Reflections on an Era*. Zenith Press.

knowledge politics (pp. 324–328). Lin (2013) further discusses concerns surrounding spatial knowledge and power, subject–object dualism, and abuse of collected data (in both participatory and resistive circumstances). Thus, there will certainly be important choices to make in regard to how much and what types of detail can be reasonably included on a map, but if the detail helps elucidate the story, can be included without overwhelming the map, and the inclusion doesn't negatively influence the hypothesis of the author's text (and the author is amenable to the idea) by all means add the additional details.

For the historical cartographer, the essential task is to illustrate what an author has written, however, a critical mind should be employed when reading manuscripts, as the geographic “facts” that are assumed by the author or that have been collected from historical documents are sometimes erroneous. Ironically, this is especially true when data is collected from old maps. Very often, the maps published of an area were created in far-away places by mapmakers who may never have even been to the place being illustrated, and these include some often bizarre oversights. Also, plans for towns were also set on paper in one far-off place (England for example), and implemented with varying success by people in the actual location. The original plan may well be altered in dramatic or seemingly insignificant ways to account for geographic features such as rock ledges, seasonal springs, extreme topography, et cetera, but the changes may never have made it back to the printed maps. Topography often caused problems, as safe harbors and coastlines were much more important to these early explorers, and easier to draw, than topography (much of which was invisible due to vegetation). Thus, faith in an old town plan of any area should be regarded with skepticism. While an official map created in

England or Spain may show arrow-straight roads, they were likely less than straight in actual development within the newly-colonized Americas. And it isn't just that roads altered from their "official" course, there were transliterations, spelling errors, and renamings as well.

In the case of a map I drew a few years ago (see map 8), painstaking research was completed by the author, a local expert, and myself in regard to the location(s) of the church/meetinghouse in one small town. Politics, personalities, misinterpretations, and finances all contributed to the many, many locations that this meetinghouse saw between 1739 and 1870. What needed to be shown on the map was that there were essentially two separate sets of data, one regarding the *First* meetinghouse and one regarding the *New* meetinghouse. The datasets overlapped slightly and there were many data points to incorporate (including if the building was actually constructed on a plot of land or not). I created two separate keys and used A–B–C in one key and 1–2–3 in the second key so that the two separate yet overlapping datasets could be clearly viewed.



**Map 8: Showing multiple locations.**<sup>9</sup>

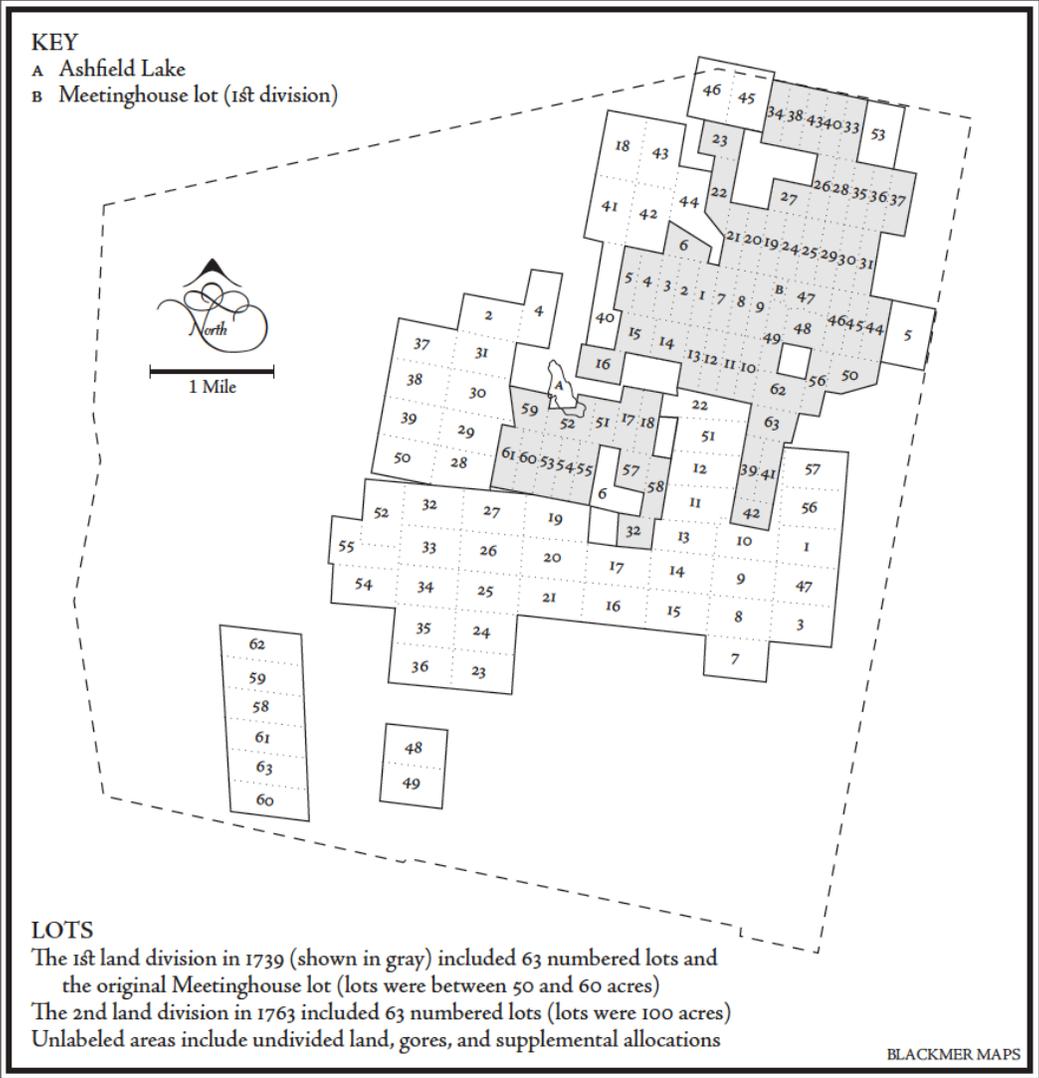
It wasn't that any one of the locations was right or wrong, it was that each of the locations was correct in some way, and that by piecing the story together, the map told a tale that would have been much more difficult with words alone.

When an article, book, or dissertation concerns interaction among places, words with maps can be far more powerful as a vehicle for scholarly exposition than the same words without maps. Scholarly writing always has and always will depend

<sup>9</sup> Robinson, Donald L. (2011). *Town Meeting: Practicing Democracy in Rural New England*. Amherst: University of Massachusetts Press.

largely on words. To be useful, maps must complement our sentences and paragraphs, not compete with them (Monmonier 1993, p. 7).

One final discussion for this chapter is related to the source materials that I received to create map 8, and how the historical cartographer must be flexible and willing to work with just about any sort of data, regardless of medium.



**Map 9: Reducing large data to small spaces.<sup>10</sup>**

<sup>10</sup> Robinson, Donald L. (2011). *Town Meeting: Practicing Democracy in Rural New England*. Amherst: University of Massachusetts Press.

This map was a subsequent map in the published book; while an earlier map in the series (map 9) may look like a seemingly simple one to create, but certainly wasn't. It took three of us working on the details for quite some time to manage the creation of the final product.

The original materials I received to create this lot map included a wall-size (5 × 5 foot) printout and a stack of 11 × 22 inch color photocopies of the area. I then also did some of my own research online that resulted in additional early lot maps of the town. Reducing the larger maps to smaller, more manageable sizes that I could get into my computer took some canoodling, but I managed it. Then the problems started to arise; once the various maps were layered, more and more inconsistencies within the data arose. The author and I worked out as much as we could, and then he brought in a local expert who helped us create probably the most accurate early map of the town ever published. Ultimately, the data shown on this map (and the one previous which leveraged this one) had to be compressed dramatically from the original sources, but the resulting map had to remain functional, readable, and useable. The greatest challenge here was how to make it legible at such a dramatically different scale.

In summary, the more facts and data you can collect when first starting to create a map—regardless of the medium or the scale of said medium—the better. Authors are often surprised when you tell them that a town moved—in some cases seasonally (especially true of early American maps showing Native American villages) and in some cases permanently to the other side of a river or significantly upstream for one reason or another; or that the town was never where it was thought to be because of errors in original cartographic data collection or translation, local politics, or presumed ownership

and use (Monmonier, 1995, pp. 105–147). Sometimes the town’s two or more locations should be included and/or their various names illustrated, and other times this isn’t relevant to the historical text—or doesn’t help illuminate it in some way—so they should be left off. All of this is information that comes from effective historical map research—the topic of the following chapter.

**CHAPTER 3**  
**RECTIFICATIONS: HISTORICAL MAP RESEARCH**  
**AND SOURCE VALIDATIONS**

*On watercourses, human ingenuity, and land reclamation—how  
researching old maps will change how a historical map is drawn today.*

Once the manuscript has been read and the dataset to be included is seemingly complete,<sup>11</sup> the next stage is to begin the process of researching historical maps from the era or timeframe being discussed in the text. This important stage is one of the main divergences between what a traditional cartographer might do—which is typically to draw the world as we know it at the moment or how we wish it to be in the future—and what the historical cartographer might do—which is to draw a specific slice of the world as it was in 1648 or 1812 or 1967 (Friendly, Valero-Mora, & Ulargui, 2010). This requirement to shift back in time and draw a landscape based on maps that were often more artistic than scientific, and more sanguine than factual, is one of the skills that the historical cartographer must employ. But it is these old maps that will provide the knowledge required to create the best possible map using today’s sensibilities and technologies. Keep in mind that each of these maps will provide a useful layer of facts and information, even if what they initially show is how disparate they are from one another, with cities sometimes being placed in different or alternate locations, the flow of a river moving from one side of a mountain to another, and whole bays of water disappearing.

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<sup>11</sup> I say *seemingly* because as any historical cartographer (or possibly any cartographer) will recognize, layer upon layer of optional or alternative data will occur and appear throughout the life of the project.

## Regarding Copyright and Intellectual Property

It only seems natural that at the outset of a chapter describing reviewing and collecting map sources, that the question of copyright and intellectual property be discussed. So let's start with this straightforward and yet possibly quarrelsome statement: "Like most intellectual discourse, after all, scholarly maps are at least partly derivative" (Monmonier, 1993, p. 121). This is the realm in which the historical cartographer lives, breathes, and explores.

Needless to say, although it may be illegal to screen-capture a Google Map, Yahoo!, or MapQuest image and then use that image as your own—even if you do add a layer of unique data to it—it's somewhat more complicated than that. The fact is, it's the *image* that is copyrighted, not necessarily the underlying data that the image is based on that is protected. The geographical data is—and again, I'll use the word *seemingly*—fixed: mountains are here, roads are there, this is what the coastline looks like, et cetera. There are a set of "factual" data that road maps have in common or that nautical charts share. If you can look at seven maps from seven different companies and see that they all display the same layers of roads, rails, and realms, or shoals, bays, and buoys—is that data protected? Or is it common knowledge?

In short, a map's originality and creativity are in its generalization and symbolic portrayal of geographic features and its selection of details. The law protects the fixed graphic expression of these features, not the information on which their representation is based (Monmonier, 1993, p. 139).

Furthermore, many of the maps the historical cartographer uses as sources when drawing illustrations located in the United States, were created by the federal government using tax dollars, so that data is in effect, public. Monmonier (1993) once again presents a compelling argument:

Researchers are often uncertain about exactly what a map copyright safeguards. After all, what creative, original material is there to protect when the copyrighted map from which we want to borrow was itself compiled from previous maps in the public domain? Because most American maps originate with information to which we as citizens are already entitled, the map challenges the legal notion of intellectual property (p. 139).

Also, many of the older or antiquarian maps are long since out of copyright. This doesn't mean that you can or should necessarily *copy* them without credit, but you can certainly use their data and sensibilities.

As you can tell from the quotations above, Monmonier's *Mapping it Out: Expository Cartography for the Humanities and Social Sciences*, published in 1993, is an interesting and informative source of thoughtfulness on the subject. Much of what he wrote about then remains true today, and those essays would hold up in today's world. However, in the twenty years that have passed since publication, one major thing has changed that affected every aspect of how people research maps: the Internet. In today's world of mobility, accessibility, and the cloud, maps are researched and vetted and found and evaluated in completely different ways than they were twenty years ago. The stationary card catalogs that were used two decades ago are all but useless in today's world of instant access and availability. Many educational institutions, public libraries, private companies, individual collectors, as well as state and federal governments have taken their collections online and many have made them openly available to the public. Furthermore, the worlds of instant computer mapping on our smartphones and GPS tagging on everything from photographs to bicycles, has changed how we think about maps—they are more ubiquitous than ever.

In fact, for the cartographer this poses an interesting challenge. I cannot tell you how many times I have been asked questions along the lines of, "Now that we have

Google Maps and Google Earth, does that mean your industry is dead?” Far from it. In fact, I’d guess that more maps are being created today than at any previous point in history. Not just ones that conveniently get us from place to place, but ones that plot open restaurants in a specified radius like Yelp will, ones that show us where our most recent jog took us ... just about anything. And using publicly accessible data, you can plug virtually any dataset into Google Maps and a resulting map will appear.

### **Vetting Map Sources and Uncovering Inconsistencies**

All that said, there are a great number of resources that are currently available to the historical cartographer, from online databases of map collections to more traditional library and government resources. The databases that I use most commonly are: Old Maps Online ([oldmapsonline.org](http://oldmapsonline.org)), the David Rumsey Map Collection ([davidrumsey.com](http://davidrumsey.com)), and the Library of Congress Map Collection ([loc.gov/maps](http://loc.gov/maps)).

The Library of Congress has had maps in its collection since its founding under President John Adams; in fact, the library’s very first shipment of books, purchased in London in 1801, included three maps and an atlas. ... Today the collection holds more than five and a half million maps and more than eighty thousand atlases (Jennings, 2011, p. 59).

Each of these online resources will often provide a fantastic starting place, and then any number of wormholes down which one can slide. Also, a basic web search will often result in additional interesting hits, many of which will offer supplemental sources and maps that can be collected via traditional libraries and social networks. Researching period maps is a fascinating pastime, but a word of warning: when saving these maps to your own collections, carefully tag them so that you know where they came from and how to get back there if you need a different perspective or you want to see what other

maps were in that set. I have spent countless hours trying to rediscover where an old map came from—not always to fruition.

Historical map research often leads to unforeseen datasets being unearthed, and errors being uncovered; also, if the author is not particularly map-oriented, showing him a particularly poignant historical map may lead him to see details about his own documentation and arguments that might otherwise have been overlooked. Another consideration is that the names of places change over time—the historical cartographer must ensure to keep a running tally of these various names (toponyms) and dates when creating the dataset so that they can be added to the map (or at least considered for inclusion). Jennings has a fascinating discussion about toponyms in his book *Maphead: Charting the Wide, Weird World of Geography Wonks* (2011). Some names change with ownership or because a conquering culture renames extant things as discussed previously, but others change for more social purposes or simply out of embarrassment.

It's hard for Americans to understand the patriotism that can get bound up in place-names. We're a young country. ... But elsewhere in the world, toponymy *is* national identity. The imported Western atlases I saw on Korean shelves as a kid always had the words "Sea of Japan" blacked out on the Asian maps and the traditional Korean name, "East Sea," hand-lettered below. Greece got so angry about the new name of the newly independent Republic of Macedonia (historically, Macedonia was a region of northern Greece) that it blackballed Macedonia's entrance into NATO in 2008 (Jennings, 2011, p. 72).

Old atlases are treasure troves of data, and although the information is often outdated and sometimes erroneous, they are excellent representations of the worldview at that time. Old maps (and new) are full of errors and omissions, but there is much convoluted history fraught with controversy that these maps can demonstrate. As such, each of the map reference materials must be carefully analyzed and examined for

accuracy before being added to the collaborative total so that the new map being created does not bring any errors further forward.

We chart our cities, so we chart ourselves. To chart the external world is to reveal ourselves—our priorities, our interests, our desires, our fears, our biases. We believe we're mapping our knowledge, but in fact we're mapping what we want—and what we want others—to believe. In this way, every map is a reflection of the individual or group that creates it. By “reading” a map, by studying it, we share, however temporarily, those beliefs (Turchi, 2004, p. 146).

Rail lines that never got laid appear on old maps as either hopeful or eventual facts that never saw completion; fictitious towns were included on old maps to prove plagiarism if that same town appeared on the maps of a rival company; street names were changed at the whim of the cartographer or typesetter; and printing errors abound that place borders in the wrong places and suggest topography that doesn't actually exist.

Many of the place names that we take for granted are in fact quite recent labels. For example, when recently drawing a map of the War Between the States 1861–1865 (also known as the American Civil War), I kept seeing the area that we know today as Oklahoma labeled a whole variety of names on maps new and old. These options included: *Oklahoma* (which was certainly incorrect as the map was based on 1860 borders and Oklahoma didn't receive its statehood name until 1907); *Oklahoma Territory* (which it was called from 1890 until 1907, so still outside of the correct era); and then three others *Indian Territory*, *Indian Territories*, and *Indian Country* (all of which might have been accurate but none absolutely—at least without an explanation). In the end, I had to choose one to label that area, and the most accurate was *Indian Territory*. To distinguish it from being the name of a proper state—which it wasn't yet—I also italicized the name. Map 10 showcases a detail of this map.



**Map 10: The challenge of labeling *Indian Territory*.**<sup>12</sup>

Furthermore, another problem that I encountered when drawing this particular map was the question of if Indian Territory should be shown as being part of the South (Confederacy) or the North (Union). Most of the maps I reviewed showed it as part of the North, but then two of the old maps clearly showed it as part of the South, so I had to raise the question and resolve it. I did some research and discovered that it absolutely, unquestionably belonged in the realm of the South. With just about every map I've drawn, problems like these have arisen that needed careful research, consideration, and resolution. But as Turchi (2004) suggests of writers, and I suggest applies equally as well to cartographers:

As writers, no matter whether our tendency is toward expansion or compression, we must gauge what to leave blank, and why. We need to be sure to choose our

<sup>12</sup> Boston Publishing Company (in press). *The Medal of Honor: A History of Service Above and Beyond*. Zenith Press.

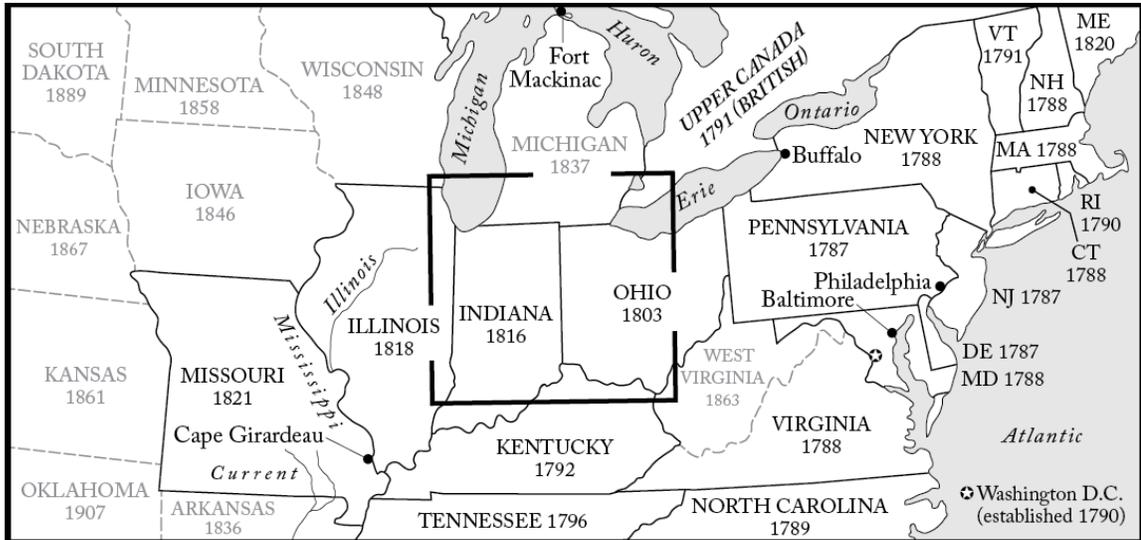
blanks, rather than simply omit part of the fictional world that seem too large or complicated or bothersome to include (p. 44).

And so, even though adding another layer of information to a map may well be interesting or curious or fascinating, sometimes one must choose to leave the layer off for the sake of clarity or consistency, or simply to avoid confusion. Leaving the emptiness may be the best resolution, but hopefully it can be done in a way that does not show a lack of data so much as a clarity of data. One other point about the map above—I included the islands southeast of Florida while many other maps depicting this war leave them off. It is an easy exclusion to make, but one that misspeaks generally of the era and the connection between America at that time and those islands.

And one other thing to note on map 10: West Virginia. The state of West Virginia has caused me some consternation over the years in that it only came into existence in 1863 when it split from Virginia-proper halfway through the Civil War. Virginia officially became a state in 1788, so any maps of the area drawn between 1788 and 1863 need to be sure to either leave Virginia and West Virginia as one state labeled *Virginia*, or indicate somehow that they split in 1863. In the case of the map above, which was illustrating the War Between the States, this was a natural and important event to include as it was a critical aspect of the war itself and thus one that needed to be highlighted in some useful and clarifying way—and without being overwhelming or inelegant. As such, my solution was to add the date of statehood in parentheses beneath the name of the state.

I had to solve this problem again on another map that was based during the war of 1812—again, in that period after Virginia became a state and before West Virginia did. In the case of that particular map (see map 11 which is a detail from the map), the statehood dates between 1787 and 1821 were very important to the topic of the article, so I also

added them to the map, but in fact, the story of West Virginia is irrelevant to this particular discussion. The quandary here was that if the dates of the other states after 1821 were included (as they needed to be), so would the date of creation of West Virginia. I solved the problem with a dashed line separating West Virginia and Virginia, and using grey text as I did with the other states.

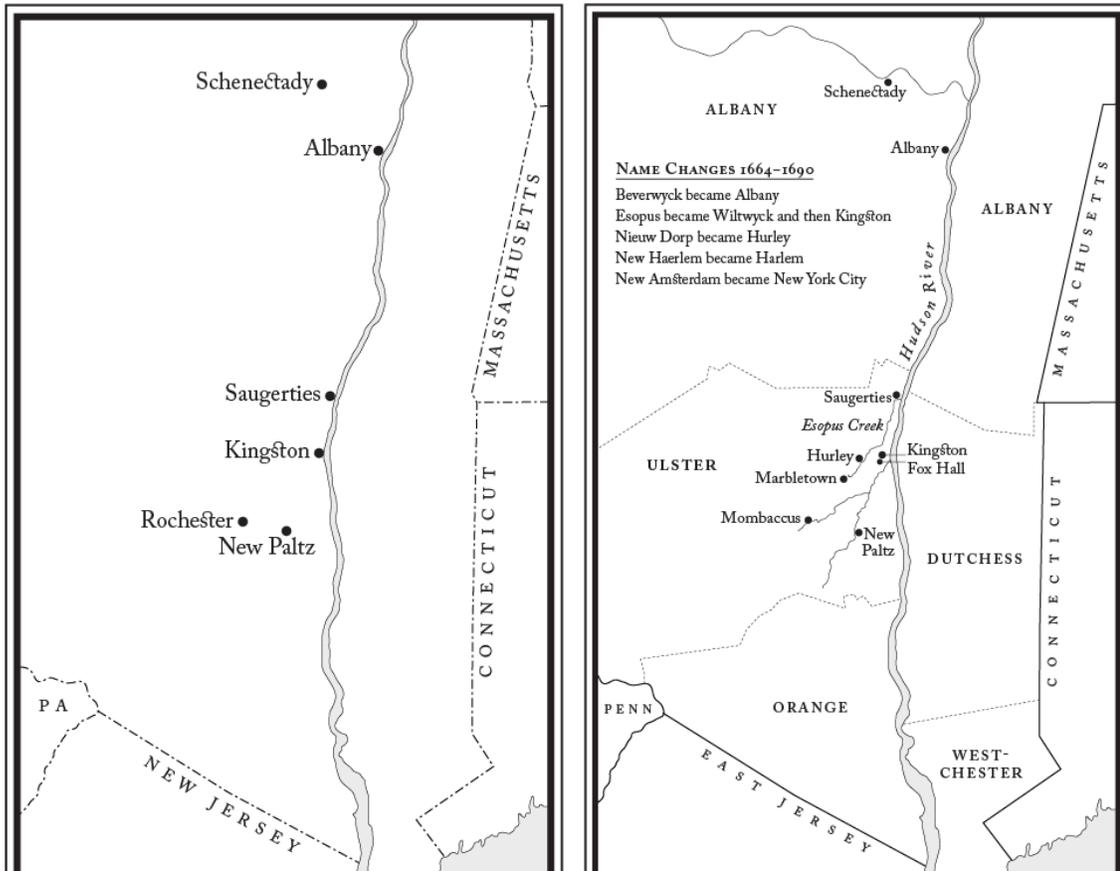


**Map 11: Indicating West Virginia's statehood date.**<sup>13</sup>

Political borders also shift in other interesting ways and for any number of reasons. In this day and age, we all understand that the extents of sovereign nations are in constant flux, but this is also true of states even within our own country. I'm not talking about maps from the Louisiana Purchase era or original statehood maps that showed how the states one by one gained statehood and drew their western borders—or indeed the whole carving out of West Virginia from Virginia as discussed above—but more minute changes such as the small southwestern corner of Massachusetts that was ceded to New York in the late 1850s, approximately 75 years after these two states joined the union and

<sup>13</sup> Karim Tiro (forthcoming). Note that this map is an inset of a larger map and that it is still in the draft stage—it may or may not look exactly like this when published.

established their borders. The story of the town of Boston Commons is an interesting one, but for the historical cartographer, it is a critical piece of information to know when drawing a historical map of that area. I found out about the change when I was sketching an early draft of a map for an article based on an event that took place between 1689 and 1691. I forwarded the map to the client for an early review and he mentioned two important considerations that you can see changed between the early draft on the left and a much later draft on the right (see map 12, details a and b). First, the corner of Massachusetts was changed to reflect the earlier border of the state when it came to a sharp point, and second, the Vermont border was removed.



**Map 12: Using era-appropriate political borders.<sup>14</sup>**

Clearly, many other changes also occurred as the map progressed through the process of being drawn and vetted, but those two details were critical in presenting a final map that was true to its era and not an apparent mistake.

Another important consideration when reviewing old maps for data is that it is not simply the human-based lexicon and political borders that change over time, but the physical features of the landscape are also transfigured; the courses of rivers are changed dramatically, and the creation of dams and reservoirs can considerably reshape the landscape—by either human hand or by nature. In the previous chapter, the creation of the Quabbin Reservoir was discussed as an example of how the physical landscape has

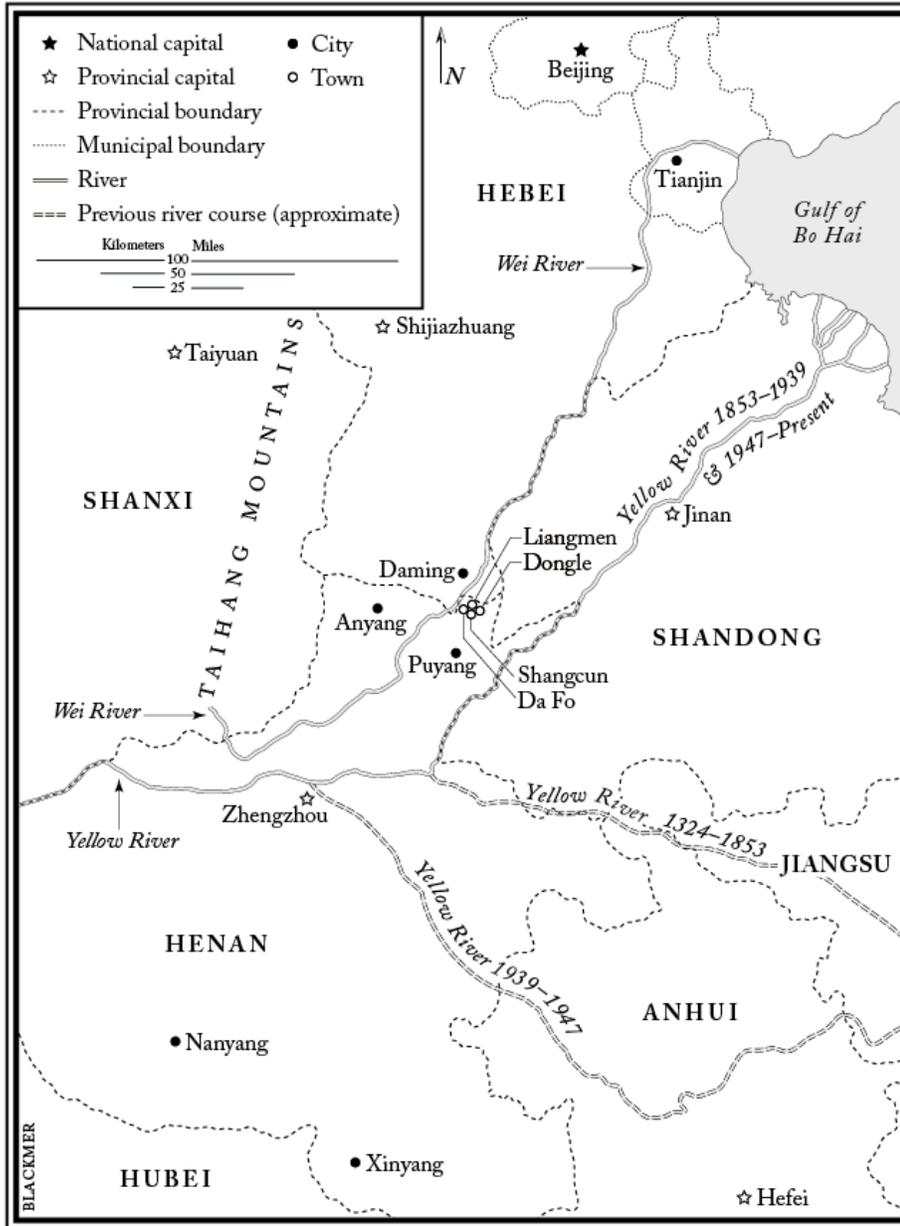
<sup>14</sup> Evan Haefeli (2007). “A Scandalous Minister in a Divided Community: Ulster County in Leisler’s Rebellion, 1689–1691.” *New York History*.

been altered dramatically by human intervention, and there are many other examples of major reroutings and dammings of rivers over time; all of which need to be carefully considered when drawing maps for historians. For example, when drawing a map of New York state in the 1750s, make sure not to include the course of the Erie Canal, however, in maps after about 1820, at least part of the canal *should* be included. Granted, it's also important to note that the route of the canal today differs from what it was in the 1800s, so don't use a current-day base map to plot that feature circa 1850 as it will be incorrect.

Sometimes, the rerouting of a river is something that happens naturally—and in some cases more than once and in more than one path—and often with catastrophic results. In the case of the Yellow River in China, it has changed course with cataclysmic consequences on four separate occasions since the 1300s.<sup>15</sup> I had to do an enormous amount of research on these recent shifts to create map 13, and still, there were many questions and sources that remained suspect as a river doesn't always stay on one course for even a few days or months, it twists and turns and gets dammed, and as it flows along the path of least resistance.

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<sup>15</sup> More than ten million deaths resulted directly from the floods that occurred due to these four reroutings alone, and the Yellow River has been changing course and wreaking havoc for millennia.



**Map 13: Mapping fluctuating watercourses.**<sup>16</sup>

So clearly, when doing historical cartography, it is important to review maps of the timeframe that is being illustrated so that grievous errors are not made on the map.

Unfortunately, many historians are not cognizant of many of these geographical changes

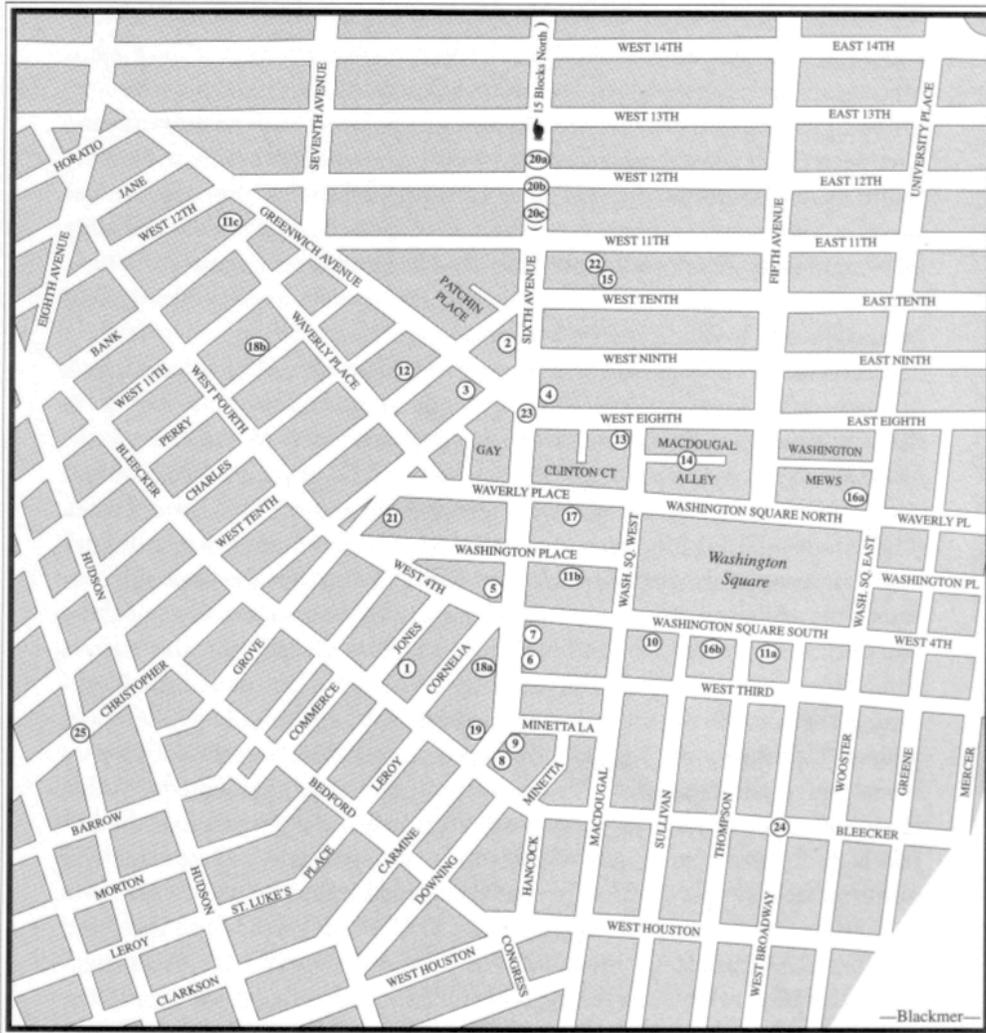
<sup>16</sup> Ralph A. Thaxton, Jr. (2008). *Catastrophe and Contention in Rural China: Mao's Great Leap Forward Famine and the Origins of Righteous Resistance in Da Fo Village*. Cambridge, UK: Cambridge University Press.

in regard to their own work. They may well be focused on an aspect of their subject matter (birthing practices or the grain trade) that doesn't necessarily have an expressly geographical component, but if a map is to be included that places the research area in space and time, factors such as the course of one of the most important rivers in Asia will be important. Relying on the expertise of the author to correct the map's inaccuracies or miscalculations is a mistake—and this is one of many reasons to have extensive review cycles with outside eyes and/or experts, which will be discussed later, and why it is critical to review so many different map sources.

There are also other human-created changes that are important to consider. Reviewing an early map of the Boston area for example, will reveal that a great amount of the land that we consider current-day Boston was in fact quite recently simply swamp, marsh, bay, and river. It was back-filled over time to create solid ground. But this original geography must be used when drawing a map of early Boston. And the best way to see these changes is to spend time reviewing maps of the area within the timeframe that is being discussed. Historical atlases such as Wilkie and Tager's *Historical Atlas of Massachusetts* (1991) are a rich source of old maps. There will always be discrepancies, and as the cartographer, you will have to make executive decisions about what to include and exclude, but having a reasonably accurate base map that is appropriate to the timeframe will at least get you started in the right direction.

One historian hired me to create a set of maps that showed the street grid of New York City in the 1898–1918 timeframe, and historical maps were proving inaccurate and problematic as there were so many major discrepancies. I had to choose a base map to use and ended up employing an old fire department map from that time, figuring that the

map would at least have the streets drawn accurately—which was my greatest concern—and I could add the rest of the data from other maps.



**Map 14: Establishing an appropriate base map.<sup>17</sup>**

One other aspect of map 14 that should be noted, is that not all keys end up being on the maps themselves, sometimes a key is on a separate page or under the map in the text of the book itself. Keys will be discussed in the following chapter, but this map is an

<sup>17</sup> Gerald W. McFarland (2001). *Inside Greenwich Village: A New York City Neighborhood, 1898–1918*. Amherst: University of Massachusetts Press.

interesting example of a map that can't stand on its own without the associated key in that the numbers don't have a readable reference.

Another example of how landscape has been changed dramatically by human hands—and why it is important to use a base map from the timeframe being illustrated—is the case of the Dutch and their astonishing reclamation of land from the sea. I was asked to draw a map of the Dutch Republic in 1648 and used a current-day printout as a base for my scratch-map, figuring that it wasn't probably so different at that scale—what a mistake that was. As it turns out, what the Netherlands looks like today is only vaguely reminiscent of what the same region looked like only 400 years ago. Map 15 includes two details (a & b) from versions of the map. I have laid out these two maps as a set so that my reader can best see the erroneous details included on an early draft of the map of the Dutch Republic circa 1648 on the top, and the more era-accurate version below that.

While you may initially note that the Zeeland region on the top map includes far fewer islands than the same region below, also look in the center of the maps to see that there is an enormous man-made/reclaimed island north of Naarden in the more modern-day rendering. As it turns out, that particular 500 square miles of land wasn't there in 1648, and neither were its approximately 400,000 inhabitants.



Map 15 (a & b): Land reclamation on a magnificent scale.<sup>18</sup>

<sup>18</sup> Evan Haefeli (2012). *New Netherland and the Dutch Origins of American Religious Liberty*. Philadelphia: University of Pennsylvania Press.

The fact is, landmasses and their geographical features have been changing since before Pangaea existed,<sup>19</sup> and they will continue to do so both with human intervention and by natural course. The historical cartographer must be aware of these changes in both small and large ways, and at many different scales, from megadams in China to artificial islands in Dubai. In the introduction to her book *Infinite City: A San Francisco Atlas* (2010), Solnit explains that maps are “in essence and intent, an arbitrary selection of information,” and that one person’s experience in and with a place will be so dramatically different than another, also discusses the large scale of time and mapping:

About fourteen thousand years ago, during the height of the last ice age, San Francisco was not what it is now, a seven-mile square tip of a peninsula. It was part of a landmass that extended about ten miles farther west in that age of low oceans here and glaciers elsewhere ... Climate change will gradually render all atlases with coastlines out of date and create a sequence of new cartographies—of the Northwest Passage, the now feasible route that was impracticable for most of nautical history; of the glaciers, the polar ice, Greenland; of beaches, low islands, and coral reefs (Solnit, 2010, p. 3).

So again, it’s especially important that the historical cartographer consider era, epoch, and scales of both time and distance when setting out to draw a map.

### **Stacking Maps and Projection Problems**

My method while researching source maps is to screenshot everything that I think might be useful. I add the link to where I collected it to the metadata of the resulting PNG file so that I can find the map again later, or to provide source credit when appropriate. I put all of the image files into folders and subfolders so that I can more easily sort through them at the next stage. Once the map research has been completed, the historical maps can then be loaded up into a software program and morphed onto a base map that has

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<sup>19</sup> The supercontinent of Pangaea formed around 300,000,000 years ago and eventually drifted apart into the continents that we are familiar with today.

been chosen for the particular project. Additional inaccuracies are often illuminated at this point, provoking another round of fact checking and accuracy validations.

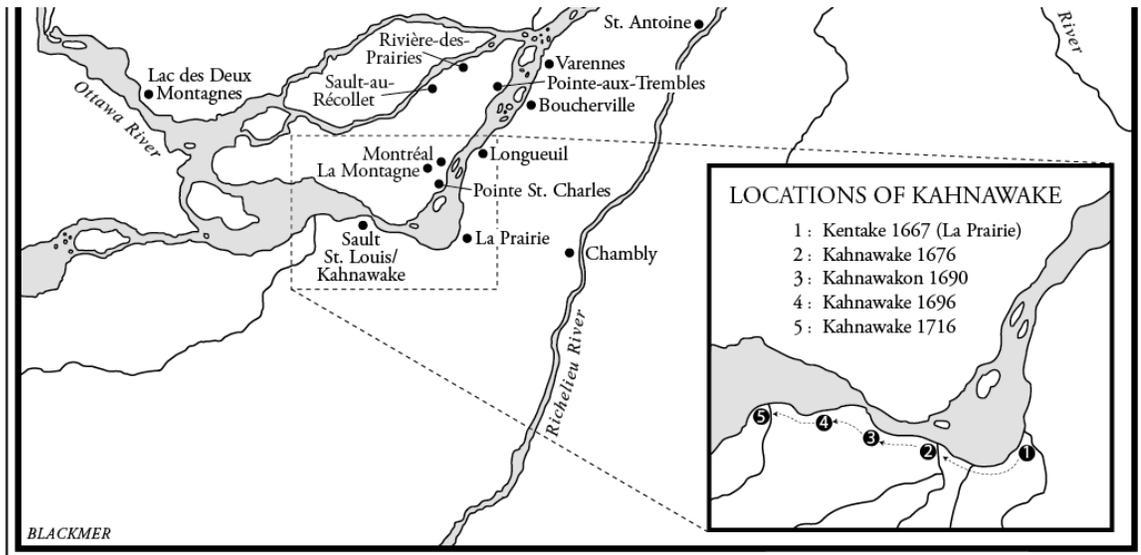
Every place is if not infinite then practically inexhaustible, and no quantity of maps will allow the distance to be completely traversed. Any single map can depict only an arbitrary selection of the facts on its two-dimensional surface (and today's computer-driven Geographic Information Systems [GIS] cartography, with its ability to layer information, is only an elegantly maneuverable electronic equivalent of the transparent pages that were, in the age of paper, more common in anatomy books (Solnit, 2010, p. 2).

As Solnit (2010) suggests, there are boundless layers of data and information that can be uncovered and layered onto a map. The historical cartographer needs to carefully select the layers that are most appropriate in the telling of the story and to best illuminate the text of the author.

My own methodology for managing the source data layers is to add each useful map to a separate layer in my drawing program of choice, Adobe Illustrator. I label each layer with an appropriate name so that I know what data is contained on the layer, and can then easily turn the layers on and off as needed (for example: rivers, river text, town locations, town text). I then morph each source map to a base map that has been chosen for the project. This is where *scale* and *projection* as well as *artistic notion* come into play and become problems that will need to be resolved. Especially so of very old maps which although beautiful and fascinating, are often, scientifically speaking, totally and epically bogus. After the maps are stacked and morphed, additional misconceptions are often illuminated. Sometimes one map is so dramatically out of sorts that using it in a stack is impossible, and the data will have to be evoked manually.

One aspect of old maps to consider is that towns move, so if one or more of the maps that is being used as a source places a town or village in a different location than another, a number of ideas should be considered. First, as is true today, one old map often

copied another to collect the data sources, and if the first map was incorrect about a geographical placement, all of the resulting *copies* will also be incorrect. Second, towns literally moved. In the case of the inset map of Kahnawake (map 16), five separate locations were detailed between 1667 and 1716.



**Map 16: Settlements relocate both seasonally and permanently.<sup>20</sup>**

Much like the meetinghouse map discussed in Chapter 2, none of the locations in map 16 is necessarily incorrect, and yet maybe not altogether correct either—all depending on the year that the map is depicting.

Thus, collecting old maps, vetting their data, comparing their features, and establishing relevant data layers all assist the historical cartographer in creating the best possible illustration for the historian’s text. The goal is to create a map or set of maps that is historically cognizant, easy to parse, elegant to view, and most importantly, is effective in evoking for the reader a sense of time and place. What is being created is a unique version of a set of data, and it should allow the reader to envision a greater story. In fact,

<sup>20</sup> Evan Haefeli and Kevin Sweeney (2006). *Captive Histories: English, French, and Native Narratives of the 1704 Deerfield Raid*. Amherst: University of Massachusetts Press.

when a map can tell a story on its own, it has been particularly effective. As Haefeli and Sweeney wrote of my maps in their book, *Captors and Captives: The 1704 French and Indian Raid on Deerfield* (2003):

An important component of the book's illustrations are the maps produced by Kate Blackmer. They are in fact more than illustrations. They elegantly tell their own stories of colonists' aspirations, Native dispossession, and imperial warfare that complement the stories in the text (p. xiv).

**CHAPTER 4**  
**MELDING AND MOLDING: UPDATING TRADITIONAL**  
**CARTOGRAPHIC TECHNIQUES**

*On creating aesthetically pleasing and functional maps—sizing,  
typography, line-widths, gradients, scales, insets, and keys.*

When the dataset has been refined and the map sources stacked, the actual map creation can finally begin. Decisions will need to be made about the orientation of the map and how best to fit the illustration in the allowable space, which fonts to use, how graphic elements will be deployed, and if an inset or key will be required. Each of the decisions that are made during these early stages of drawing a map will determine the look and feel of the resulting image. All of the choices can of course be reconsidered and changed throughout the design, development, and editing stages, but each change will take time and effort, and need to be carefully proofed.

Confusion and clutter are failures of design, not attributes of information. And so the point is to find design strategies that reveal detail and complexity—rather than to fault the data for an excess of complication. Or, worse, to fault viewers for a lack of understanding. Among the most powerful devices for reducing noise and enriching the content of displays is the technique of layering and separation, visually stratifying various aspects of the data (Tufte, 1990, p. 53).

Essentially, drawing a map is about laying geographical features on a page and labeling them with subsets of data that include everything from the absolute basic of items such as the *name* of the place, to elevation, transportation routes, structures, movements of people or commodity, wind patterns, ocean currents ... the list of possible data layers is endless and how they can be placed and intermingled is infinite. It is the historical cartographer's

responsibility to make sure that the dataset being presented is clear, concise, elegant, and illustrative of the text being elucidated.

Mapmakers have been doing exactly this type of work since before there was even written language, and it would be foolish to believe that what we are doing today is really all that different. Certainly the methods we currently use bring us speed in regard to adjustment, editing, duplication, and distribution, but really, the maps that were created 3,000 years ago are not so different than those of today. If a map's purpose is to present data in a way that is best visualized graphically, then we have simply enhanced or improved the tools, not created a new method of communication. As Turchi (2004) explains,

The earliest extant alphabetic texts, the earliest extant geographical maps, and the earliest extant map of the human brain date back to the same general period: around 3,000 B.C. While no one can say for certain when the first writing and mapping occurred, the reasons for recording who we are, where we are, what is, and what might be haven't changed much over time (p. 11).

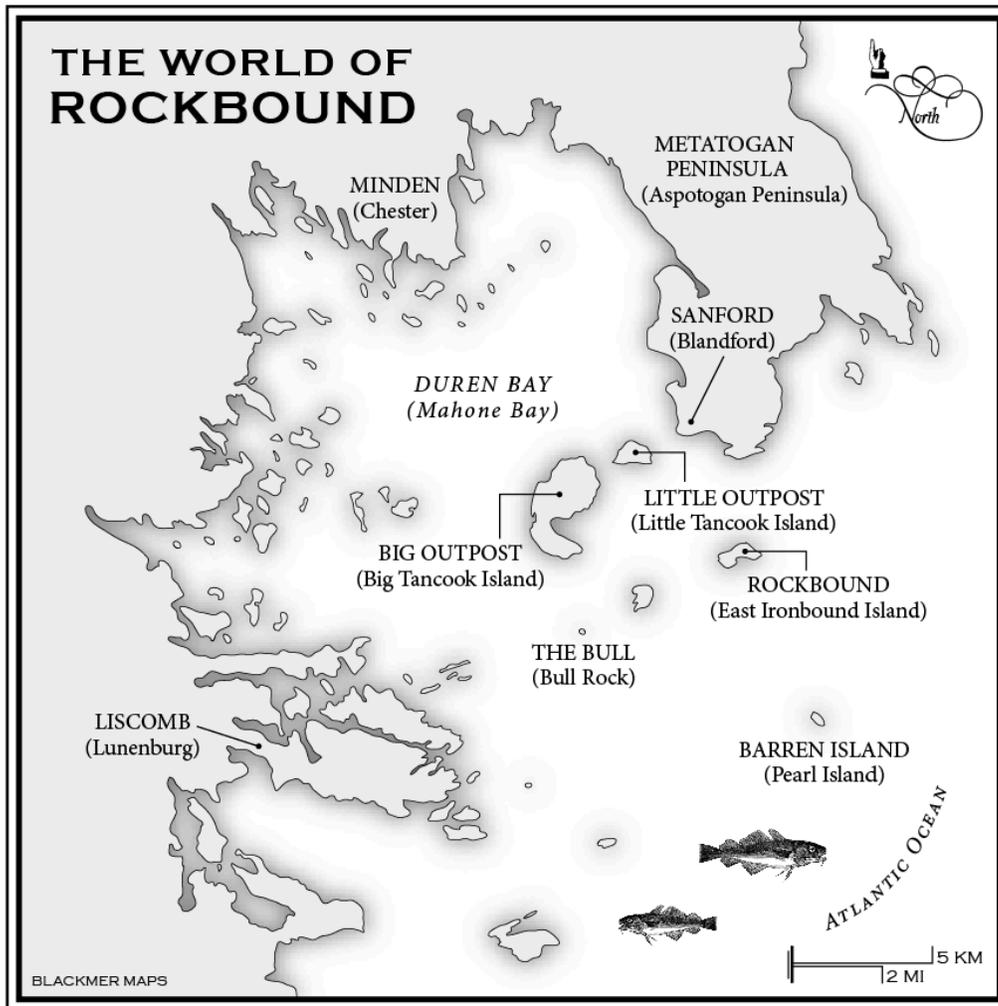
The most powerful of these improved tools is the software that is now used to create maps. In the same way that GIS software allows a technician to turn on and off layers of data, a drawing program such as Adobe Illustrator—my own software of choice for drawing maps—allows for this same type of layering technique. This ability permits the cartographer to see the map as stackable layers so that global adjustments can be easily made to line widths, labels, font sizes, and symbols, and so that each layer of data can be independently *visually stratified* as Tufte mentions above. This allows for deeper clarity during creation and a greater lucidity and/or elocution with the final presentation.

## Sizing Maps for Publication

Earlier in this text I mentioned that when possible, establishing the technical specifications of the press is critically important before starting to draw a map. As well as understanding the press' requirements regarding aesthetic and mechanical processes—which will allow the cartographer to create the most effective map—the most important single piece of information that can be collected is that of *size*. Knowing the size that the final document be printed will determine the amount of detail that can be included and how choices should be made regarding fonts (serif or sans-serif), line-widths (hairline versus 1-point minimums), and gradients (full grayscale versus black-only). If the map needs to fit within a  $4\frac{1}{2} \times 6$  inch margin (typical for academic books and journals), or if it will be printed on a  $9 \times 12$  inch page will change everything about how a map is created and the layers of detail that are included.

To envision information—and what bright and splendid visions can result—is to work at the intersection of image, word, number, art. The instruments are those of writing and typography, of managing large data sets and statistical analysis, of line and layout and color. And the standards of quality are those derived from visual principles that tell us how to put the right mark in the right place (Tufte, 1990, p. 9).

I once painstakingly drew a map for a publication (see map 17) which I believed would be printed at about  $5 \times 5$  inches, and when I saw the final product, I was horrified, as it had been printed at  $10 \times 10$  inches. All of the careful decisions I had made about the map from the size of the fonts I used to how I created the shading were absolutely lost at the larger scale. (See additional discussion on sizing in Chapter 5.)



**Map 17: Design maps with publication size in mind.<sup>21</sup>**

What’s more, I had made some meticulous decisions about how much detail to include when drawing the coastline of map 17 so that it would be easy to read on the newsprint it was to be printed on. However, when printed at the much larger size, the generalizations that had been made when drawing the coastline—and especially the islands—looked downright childish, if not negligent. Unfortunately, during my decades of drawing maps for publication, the opposite has also been true; I have also had maps printed so small that

<sup>21</sup> Created for Ken Schwartz (2009). This historically based fantasy map was published as part of a director’s guide to the play “Rockbound,” produced by Two Planks and a Passion Theatre Company in Canning, Nova Scotia.

the text is virtually unreadable (I will discuss one of these in the upcoming chapter on press politics).

When the cartographer knows the margins of the allowable size of the map, she will be able to best design an elegant and illuminating image, and the map will sit on the page in a natural way and match the feel of the book. When, however, the final size is unknown (which is true when the author does not yet have a publisher), maps may end up having to sit on a page in an awkward way—reduced or expanded to fit within allowable margins. In these cases, the best practice is to draw maps with more detail rather than less so that generalizations and smoothing can occur if necessary, instead of having to having to undertake a complete redraw of the map to include the additional clearer detail.

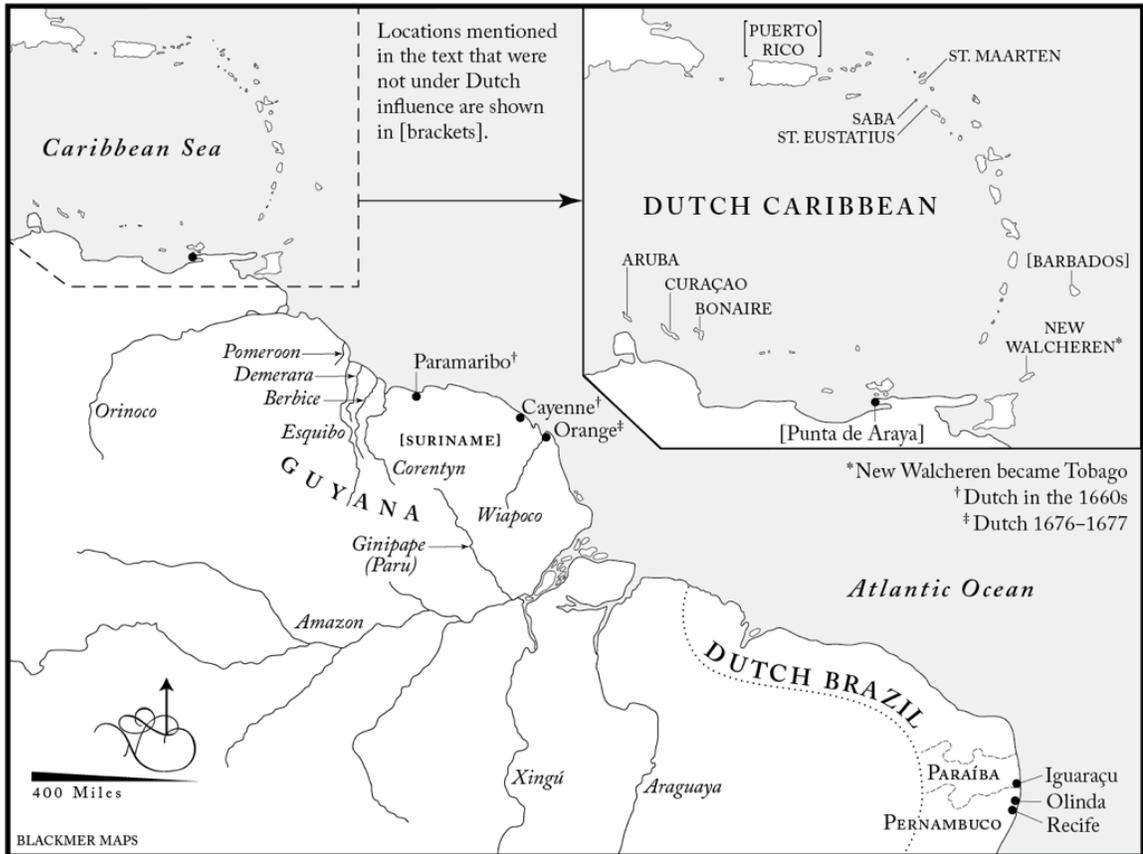
On the other hand, there are books that have been designed *around* the maps that they contain. Unsurprisingly, these typically tend to be atlases. A number of fascinating atlases have been published in the past few years by non-academic artists/writers that suggest a distinct leaning towards historical cartography. Three atlases that I feel are of specific interest are Solnit's *Infinite City: A San Francisco Atlas* (2010), Schalansky's *Atlas of Remote Islands: Fifty Islands I Have Not Visited and Never Will* (2010), and Solnit and Snedeker's more recent joint project *Unfathomable City: A New Orleans Atlas* (2013). Each of these works not only includes spectacular cartography, they are also gloriously designed books with senses of style, elegance, and sophistication. Interestingly enough, neither of these authors is a professional cartographer, and yet each has produced a document that will certainly stand the test of time. Furthermore, the Solnit atlases are a unique form-factor at  $7 \times 12$  inches, and most of the maps are two-page spreads, a tricky technique to perform with success.

There are many other excellent historical atlases that exist which feel as if they were designed especially around the maps, and not just the text. Especially so Wilkie and Tager's *Historical Atlas of Massachusetts* (1991) which was for its time a groundbreaking volume, and it remains an important example of what I am calling historical cartography. Furthermore, this book was also one of the first that leapt into the realm of using computer-generated images alongside older maps, an innovative tack in 1991. And the clear overlays that could be placed to see additional layers on the maps in the book are an example of how the variety and number of layers possible on a map are endless.

### **Insets, Keys, and Setting Orientation**

Very often, an inset map can be used to assist the cartographer in quickly sharing a sense of scale, and a general or overall location of the subject area to the reader. As long as the scales on the main map and insets don't conflict, this can be a very effective tool. The easiest way to ensure that the scale is easily understood is to highlight the area to be expanded or reduced, and to use a call-out with lines or arrows reaching out to the new map, or by shading the associated area on two separate maps so that it is clear that it is the same area that is being shown on both the main map and the inset.

When designing insets, it is important to maintain consistency between the fonts and symbols on the main map and those within the insets so that the reader feels clarity and not inconsistency. Also important is that the outline of the call-out and the shape of the area defining the call-out are the same, not just in regard to aspect ratio, but also in regard to the shape itself.



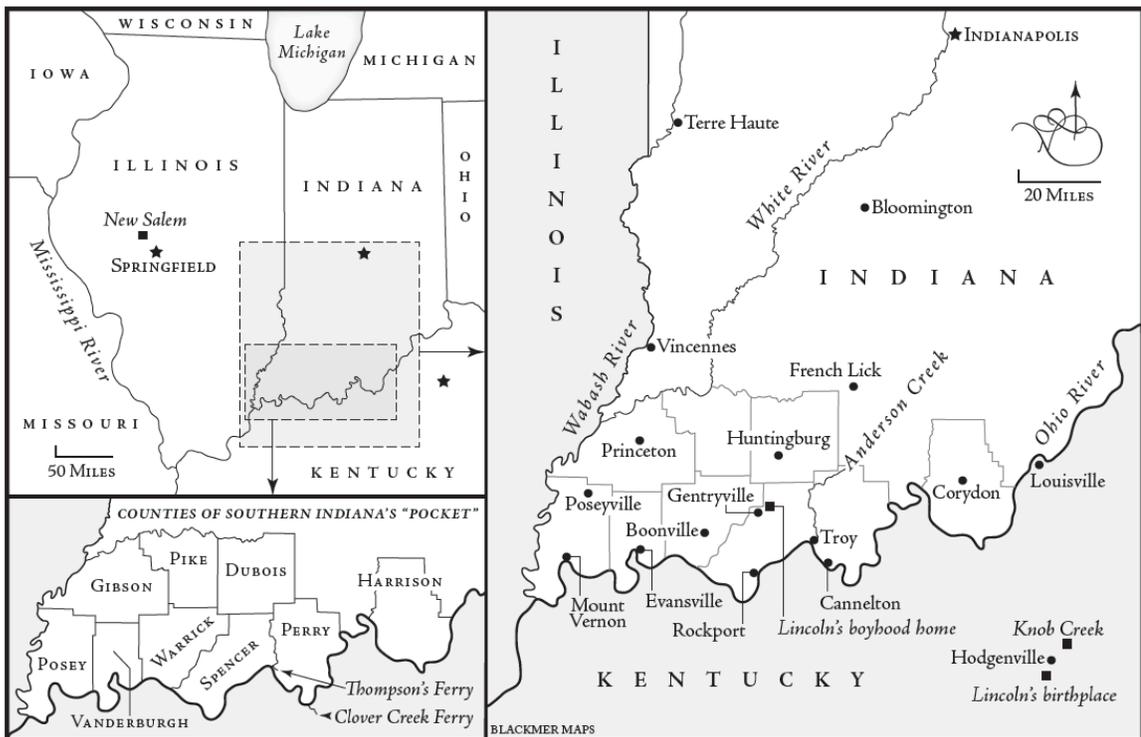
**Map 18: Insets require consistency.**<sup>22</sup>

Map 18 shows how placing the towns of Cayenne and Orange on the Suriname coast was going to conflict with the bottom-left corner of the inset box. The solution I employed was to make a 45° cut in the box itself. This was also reflected in the dashed call-out shape so that there was not a visual discrepancy. Also note that the scale shown on the main map provides enough of a sense of scale for the reader such that a second scale is not required within the inset.

The next example (map 19) needed to show three different layers of data on one image, have it fit in a small area, and still have the text be readable, I used a method that called out two separate insets from within a single base map. Why this worked was

<sup>22</sup> Evan Haefeli (2012). *New Netherland and the Dutch Origins of American Religious Liberty*. Philadelphia: University of Pennsylvania Press.

because the two call-out shapes are each filled with a slightly different gradient screen. Transparency wouldn't have worked in this case as the layers would have conflicted, so the larger box was filled with a 5% gradient and the small box with 10%. It supplied just enough visual variability to share the idea that there were two separate and distinct call-outs, but without having to number or label them. The solid arrows that touch the edge of each dashed box also assist in clarifying this function. The solid arrows that touch the edge of each dashed box also assist in clarifying this function.



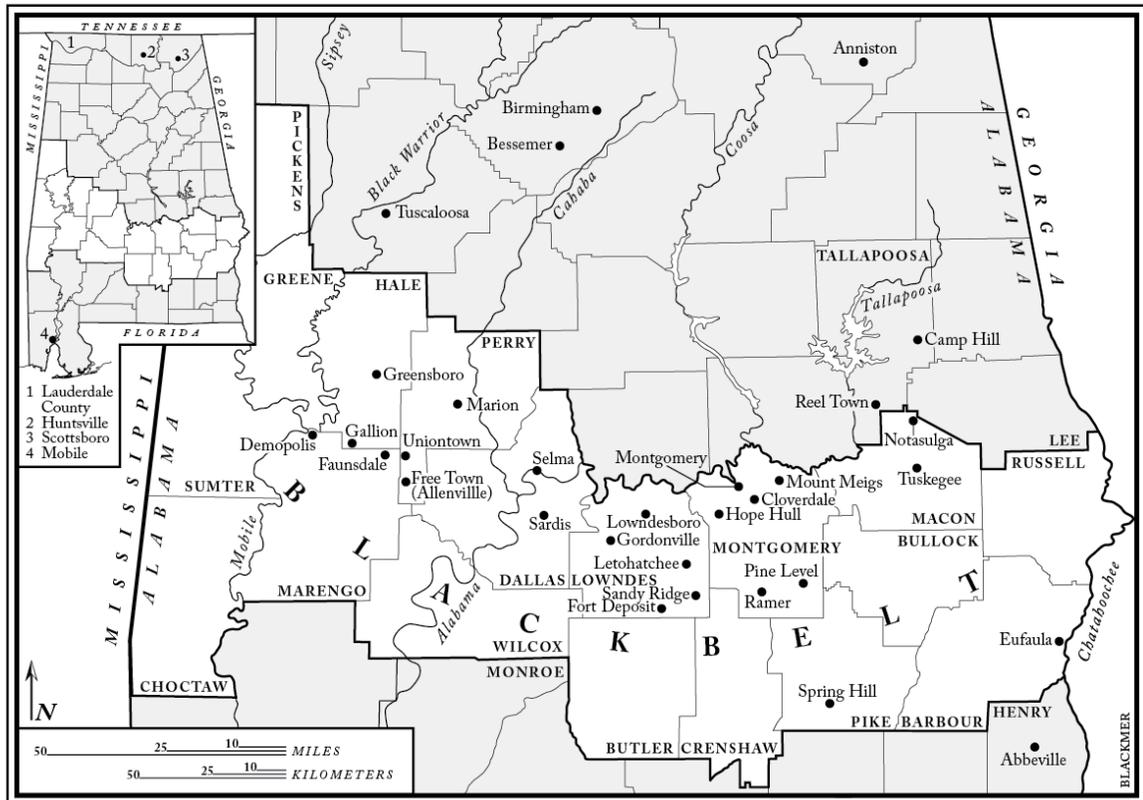
**Map 19: Deploying multiple inset maps.**<sup>23</sup>

In the following example (map 20), the difficulty was in finding a way to include three important locations at the very northern edge of the state of Alabama and one at the southern edge while still being able to display the required detail of the Black Belt<sup>24</sup>—

<sup>23</sup> Keith A. Erikson (2012). *Everybody's History: Indiana's Lincoln Inquiry and the Quest to Reclaim a President's Past*. Amherst: University of Massachusetts Press.

<sup>24</sup> The term "Black Belt" was originally associated with the color of the soil in that region, but it currently refers to the number of African Americans that live in those counties and not the underlying geological structure—an initial confusion both author and cartographer were guilty of. Although it isn't unrelated in

including county, town, river, and state names—in the more central area of the state. It may seem like the solution presented below is an obvious resolution to the problem, but it took quite a lot of finagling to arrive at the resulting image. Much moving and shifting of images, and experimentation with scales and valuation must sometimes be performed to arrive at an elegant solution.



**Map 20: Insets allow additional locations to be placed.<sup>25</sup>**

And essentially, that is the goal of the historical cartographer: to find the most elegant and illustrative way to portray quite a lot of often disparate information on one usually quite small map, and typically using only gradients of black. All in the hopes of

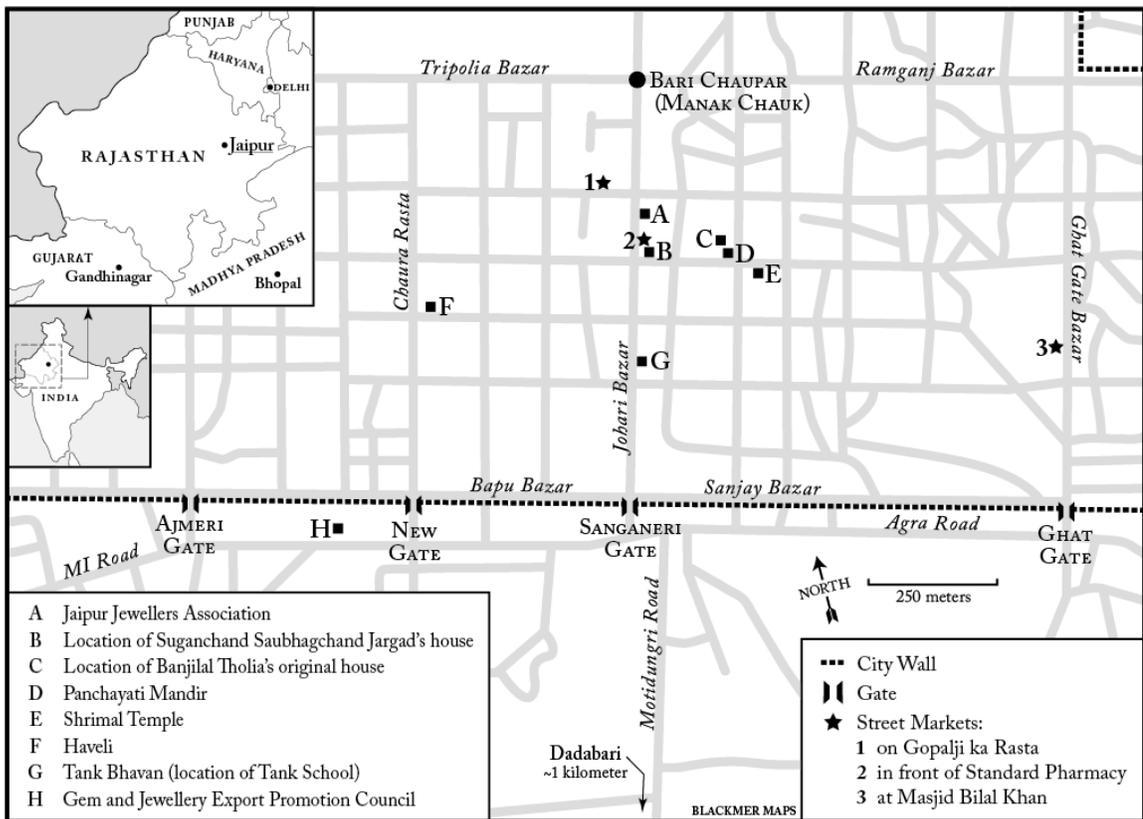
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that the dark soil provided an ideal environment for growing cotton, and so there were plantations and then slaves to work the fields, but still, the first draft of the map drawn for this project did display not county-based social structures, but geological-based bands of soil. One of my map copyeditors—who knows quite a lot about both geography and anthropology—discovered this discrepancy.

<sup>25</sup> Pamela E. Brooks (2008). *Boycotts, Buses, and Passes: Black Women's Resistance in the U.S. South and South Africa*. Amherst: University of Massachusetts Press.

achieving the goal of illustrating the story being told by the historian in the associated text.

When drawing a map of a more *foreign* land, where the audience may not understand the location of the place if not set with a region, country, or even continent, it can be useful to include multiple location maps. In the example below (map 21), both an inset showing the placement of a state within a country and then the city within the state helped to communicate the exact placement of the city within the country as a whole.



**Map 21: Using multiple insets to establish location.**<sup>26</sup>

One other subject of interest that should sit within this section about insets and keys, is making the decision regarding whether to include an arrow to indicate orientation

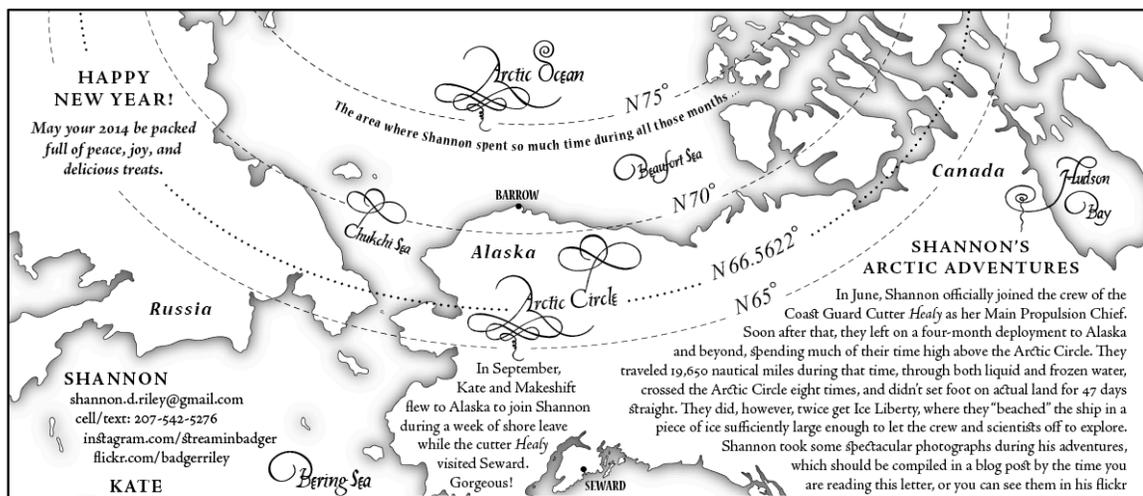
<sup>26</sup> Alan Babb (2013). *Emerald City: The Birth and Evolution of an Indian Gemstone Industry*. New York: SUNY Press.

on a map—usually an arrow indicating *north* on western maps (also see discussion of orientation in Chapter 2). Looking once again at the map above, consider the practicality of having turned the orientation of the map by a few degrees so that the grid pattern of the city could be used more effectively to show location and distance. Furthermore, this shift allowed the text to sit more naturally atop the grid and not be affected by the underlying busyness of the streets.

Although many do feel that an arrow is of critical importance, on some maps, including one would be downright careless. As an example of this, in the map below (map 22)—which incidentally also includes three insets at three different scales—the inclusion of a north arrow would be erroneous. Whenever a map stretches across more than about a thousand miles at latitudes closer to the equator, and much less as you move closer to the poles, the question of where north really *is* becomes academic. This has to do with a number of factors including the chosen projection (azimuthal equidistant, conic, sinusoidal, cylindrical, et cetera), and how close the map sits to a pole or point of origin on the base map. All maps are essentially *wrong* in that the need to project a curved object onto something flat causes distortions, but this is especially true the closer you get to a pole.



A further example of this can be illustrated if one uses Google Earth to zoom in from a planet-scale image down to a local neighborhood; at some point, the curved perception will be replaced by the equirectangular projection that Google uses. This was chosen at least in part because it is a very straightforward base to project imagery into, but it does mean that the problems inherent in the Mercator and other cylindrical projections are in play, especially at the poles where area is stretched dramatically to fit within the rectangle associated with that landmass. One additional, quite extreme example of where a north arrow would cause more harm than good appears in the following cropped image (map 23). In this case, the area being shown is so close to the North Pole that an arrow on the left and an arrow on the right would almost have to point directly at one another.



**Map 23: Eliminating north-arrow placement entirely.**<sup>28</sup>

So, knowing the *size* of the map at the outset, and if any insets or keys will be needed will clearly assist with ending up with a final printed product that best fits within the margins allowed on a page. If this detail is known, place a box of that size on a layer by itself and call it *Border*. Lock that layer and then select all of the other map source

<sup>28</sup> New Year's Note by Kate Blackmer (January 2014).

layers and spin, turn, and scale them as a set to best fit the area to be shown on the map. As discussed previously, north doesn't need to be "up," and changing the orientation of the map to best fit within the bordered box will create the best map. Also, at this point, if it is known that an inset or key is required, try to envision where it might be placed within the boundary of the greater map, and try to leave room for that feature.

## **Typography**

Given the same set of data, the resulting work of any number of cartographers, artists, and experts will conclude with vastly differing images. One major difference between these illustrations and maps would be the fonts chosen to represent the text. Fonts and text sizing are critical components of any map project, and a strong knowledge of typography will lend great elegance, clarity, and illumination and to the resulting image. Robinson was writing about the importance of lettering in 1952, and although he was not the first to do so, what he wrote six decades ago still holds remarkably true today:

The technique of lettering on maps covers a wide range. Perhaps the first question of choice facing the cartographer is that of the form of the typeface. There are an infinite number of possibilities from freehand lettering to the innumerable styles available from printers and typographers. They vary in legibility, appropriateness, texture, and even in the general character or mood they represent. Next the cartographer must decide on sizes for, after all, the best typeface is of little concern if it cannot be read. The relative sizes are of great significance in a map in terms of comparative emphasis and legibility (Robinson, 1952, p. 29).

The difference in truth between what Robinson outlined in 1952 and the truth today is only that there are literally hundreds of thousands of additional fonts available to the cartographer with the click of a button. Granted, most of these fonts are barely worth the click, but others can provide an incredible resource. If you aren't interested in creating

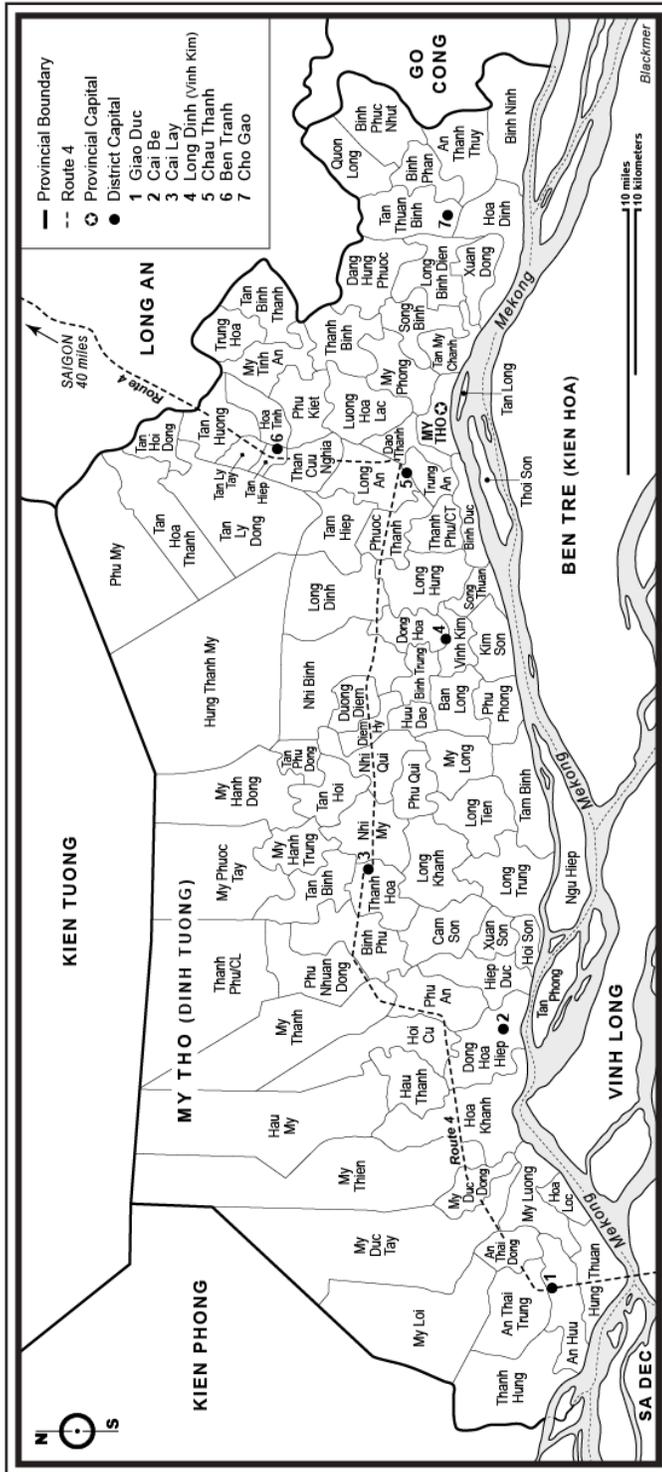
your own symbols for a map, suitable representations can doubtless be discovered on the Internet with not much effort. But keep Raisz's axiom from 1948 in mind if choosing to create cartographic symbols from scratch: "A good symbol is one which can be recognized without a legend" (p. 97).

Map authors need to be aware of the visual variations of type ... In addition to coding qualitative and quantitative differences among geographic features, appropriate typographic variation can promote legibility, expedite the search for features and places, and contribute to the map's aesthetic appearance. Labels identifying places and features also serve as cartographic symbols that supplement or reinforce the visual variables of the map's point, line, and area symbols (Monmonier, 1993, p. 117).

In regard to type, there are two general categories to consider, serif fonts and sans-serif fonts—the difference being if the glyphs (letters or characters) have stylistic curly bits or not. Generally speaking, sans-serif fonts look more modern, and as such aren't typically chosen to be used on historical maps, however, the most important aspect of a map is that the data on it is readable, and sans-serif fonts are often easier to read when occupying small spaces.

sans serif type might provide greater legibility and more reliable reproduction when numerous very small uppercase street-name labels must be squeezed into tight spaces (Monmonier, 1993, p. 109).

I employed Arial Narrow as the font shown on map 24, the My Tho area within the Republic of South Vietnam during the Vietnam War.



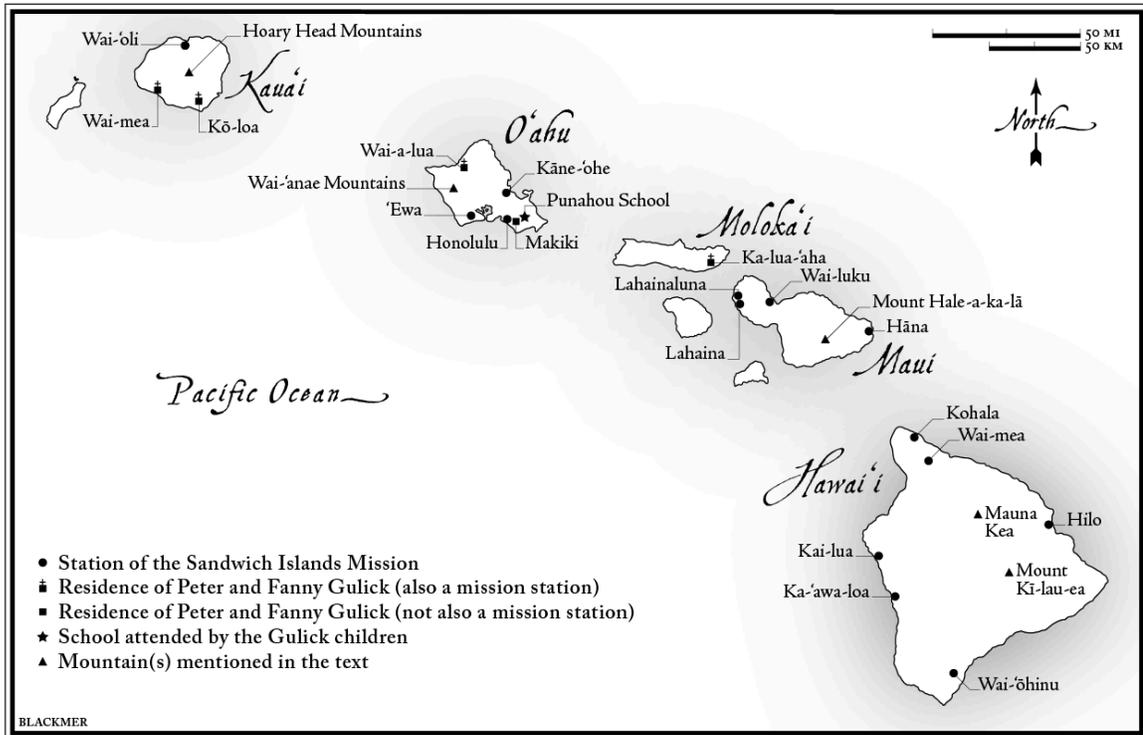
Map 24: Sans-serif as a solution for small spaces.<sup>29</sup>

<sup>29</sup> David Hunt (2008). *Vietnam's Southern Revolution: From Peasant Insurrection to Total War*. Amherst: University of Massachusetts Press.

Also of note in regard to the typography on this map is that all of the diacritics (accents) have been left off—as was also true in the text of the book (and the map reflected the style of the book). In western text, My Tho is actually written Mỹ Tho with a tilde (˜) over the *y*. As an example of how complicated this map might have been if diacritics were used, the current names of the district capitals are as follows (some remain the same while some are different, but the comparison holds regardless): Gò Công Đông, Gò Công Tây, Chợ Gạo, Châu Thành, Tân Phước, Cai Lậy, Cái Bè, and Tân Phú Đông.

And yet one more mention of note in regard to font choice: the Times New Roman font that this thesis is displayed in is a very robust font that actually allows for diacritics to be added to the words above, while most fonts found on a western computer only include the most basic accents found in French and Spanish. When choosing a font for a map, or really for any purpose, make sure that if accents are to be included, that the font will allow for all of them. The alternative is to create the characters yourself and add them to the font, or to alter the characters as needed using a drawing program.

An additional example of how a font needed to be chosen to include diacritics was in the following map of Hawai‘i (map 25). Both *‘okinas* (a letter in the Hawaiian language that represents a glottal stop; written as a left single quotation mark: ‘) and *macrons* (a bar above a letter: ā, ī, and ō used here) were required. This was a map that was based historically in the 1797–1883 timeframe, and focused on the lives of two educated American missionaries, so I wanted the fonts to have somewhat of a textual flourish to match the handwriting of the time. I chose Adobe Jensen Pro for the place names and Aquiline for the names of the islands.



**Map 25: Choosing a font that includes diacritics.**<sup>30</sup>

The choice of Adobe Jensen Pro for the location text was a careful one; again, I wanted to evoke a sense of that same flourish that existed in handwriting of the day, and that font’s slightly angled hyphens did this. Maps should make sense both visually and historically, and font choice is one of the methods the historical cartographer can use to conjure this.

Choosing a font for a map is a personal adventure, and when considering the options—especially when the use of accents is necessary—looking at the diacritics available in a given font can be enlightening:

Neither typographers nor their tools should labor under the sad misapprehension that no one will ever mention crêpes flambées or aïoli, no one will have a name like Antonín Dvořák, Søren Kierkegaard, Stéphane Mallarmé or Chloë Jones, and no one will live in Óbidos or Århus, in Kroměříž or Øster Vrå, Průhonice or Nagykovács, Dalasýsla, Kırkağaç or Köln (Bringhurst, 2001, p. 90).

<sup>30</sup> Clifford Putney (2010). *Missionaries in Hawai‘i: The Lives of Peter and Fanny Gulick, 1797–1883*. Amherst: University of Massachusetts Press.

Generally speaking though, choosing one or more typefaces for a map is an important step in designing an illustration that is clear and easily readable. The more fonts you use on a single map, the more careful you need to be, so choose wisely. Also, not all fonts have a complete set of italic, bold, and small-caps glyphs, so again, choose wisely as most fonts don't work particularly well together:

Using what there is to best advantage almost always means using less than what is available. Baskerville, Helvetica, Palatino, and Times Roman, for example—which are four of the most widely available typefaces—are four faces with nothing to offer one another except public disagreement. None makes a good companion face for any of the others, because each of them is rooted in a different concept of what constitutes a letterform. If the available palette is limited to these faces, the first thing to do is to choose *one* for the task at hand and ignore the other three (Bringhurst, 2001, pp. 96–98).

Furthermore, good professional fonts are distinctly different from the more amateurish efforts that exist for immediate download from the Internet in that they include everything that you need for a map. Some fonts include glyph sets that go on and on while others are limited to as few as thirty characters. Be aware also that not all fonts have glyph sets that are uniquely designed—some borrow glyphs from other fonts that don't necessarily match in feel or sensibility.

A normal font of type now includes about two dozen mutant forms of the few ancient signs of punctuation (period, comma, colon, quotation marks, brackets, parentheses, dashes, and so on). It also includes about a dozen diacritics (acute and grave accents, the circumflex, tilde, ogonek, umlaut, and others), and some legal logograms (@ # \$ % & etc) and a few arithmetical symbols. ... On some fonts, these alphabetic characters are beautifully designed; on others they are not designed at all. Often they are simply borrowed from another font, which may have been drawn in a different weight and style (Bringhurst, 2001, p. 76).

Don't make the mistake of trying to squeeze out of a font what isn't there; true italic and machine-created italic are really quite different beasts, with variances in leading and kerning. Carefully designed fonts are intended to work best at the kerning that they are designed for; by squishing letters together by either narrowing their width or by reducing

the whitespace around them, readability is often compromised. Also to consider when choosing a font is to look at the font's ascenders and descenders and if they will negatively affect the look of the text on the map. Negative leading can sometimes be used where required or where it works, but again, if it compromises the font, the clarity or elegance of the map is not benefitting.

And a few other hints: Make sure to use tab-stops when creating keys and not spaces so that the text lines up correctly to a hard-line edge. It is important also to comprehend the difference between hyphens (-), en dashes (–), and em dashes (—), and understand where to use each. Should ligatures be employed on a map or not, and if so, make sure that they are turned off when adding kerning to a word as the ligature treats what would have been two separate glyphs as a single character. There are hundreds of other typographic considerations, but generally speaking, don't let the map overwhelm the text, allow it to harmonize.

**CHAPTER 5**  
**ESSENTIAL EXAMINATIONS: DRAFT CONTROL,  
VERSIONING, AND REVIEW**

*How assessment, evaluation, and examination of a map can lead to  
clarity, lucidity, and a more effective transfer of knowledge.*

Once the map has been drawn and vetted by the cartographer, it is ready to be sent to the client for review. The review process might take only a few drafts and be completed in a few days, or it might take twenty drafts and still be an in-process project many years later. Each project has its own pace as each author, editor, and press provide input and do battle over aspects of the project that the cartographer is not involved with. The key is to be ready and capable of making requested changes at any point during the writing, editing, design, and publication processes. During the editing phase, there are a number of important communication paths that must remain open; with the author, peer reviewers, and the proofreader involved with the publication. If any one of these parties is not involved at this stage, there may be concerns that arise later in the process that will need to be addressed. Furthermore, tracking all requested changes and archiving documentation on the decisions that influenced those changes is essential, as a record of the changes protects all involved and provides a reminder for rusty minds—as such, documentation is key.

**Review and Editing Cycles**

When I began drawing maps professionally two decades ago, it was on a drafting table with a T-square and triangle, with technical pens on vellum or tracing paper, with

text being carefully lettered by hand, and with each dot indicating a coastline being stippled by hand. Each painstaking draft took countless additional hours as the entire base map would often need to be redrawn with each iteration. And back then, the editing process was an arduous task that often involved yet additional complete redraws of maps. Thankfully, in today's much more technologically advanced world, edits are completed with simple keystrokes and copy/paste computer commands within software programs. The advent and dissemination of drawing programs that run on consumer-grade laptops made these changes possible, and honestly, this historical cartographer couldn't be happier.

Aside from the basic functionalities of being able to move or alter text on a page, change font style, increase or decrease an entire layer of rivers by percentages of a point or pica, and adjust shading or gradients of land or water features—and to be able to do so very quickly—the most important change has been the simple fact that the file can be *copied*. Each day, when I sit down with a map that is in progress, I copy the file and give it a new name (I use the current date as both a versioning tool and as an easy reference). Having complete freedom to experiment with a map that is being created allows for a deeper investigation of the subject. Furthermore, the layering tools currently available allow the cartographer to see discrepancies in the data, the details, and with the map itself, and to change the graphic elements accordingly. She knows that whatever changes are made can be easily reversed an hour, day, or even year later.

When I was first drawing maps for historians, I would send a photocopy of the draft to my client via the postal system, and he would mark up the draft and return it to me. This process took quite a long time and was often ineffectual, but it is what was

possible at the time. Today, the equivalent handoff includes simply the *Create PDF* command from within my drawing program and attaching the immediately available draft to an email. Not a minute later, the draft is in my client's email queue. The same edits that once might have taken weeks or months of envelopes back and forth in the mail to accomplish, can now be completed in only hours or days. More recently, even the file format that I use to supply digital drafts has changed; it was once JPG files that were universally viewable, but now PDF is the file format of choice. What's more, even the most technologically challenged of my clients have email access and can easily open and/or print a PDF file. Plus, for those clients with a deeper knowledge of the editing functions within PDFs, they can mark them up digitally.

One might ask why so many versions of the map need to be created and why so many reviews have to be completed. Cartographers can benefit from editors and copyeditors in that same way that writers do. Not only is the skill set slightly different, the external reviewer has no emotional or political investment on the map, and as such can be critical without sentiment. If the map isn't clear or causes some confusion, it is the map that needs to be changed, not the reader. Sometimes it is the text itself that is confusing and needs to be changed, but more often it's the map that can be changed to help clarify the text. As Turchi (2004) suggests, "A map may be beautiful, but if it doesn't tell us what we want to know, or clearly illustrate what it means to tell us, it's merely a decoration" (p. 22). Thus, the more times a map is reviewed and by numbers of different people, the better the final product will be. The editing process allows confusions to be surfaced, data to be focused, and clarity to ultimately be achieved.

Aside from the expert review of the author, additional peer review can make all the difference between a great, thorough map and an unfortunate map full of inconsistencies and/or errors. I personally use three different proofreaders on each of my maps—and each one of them finds details that the others haven't necessarily seen. One might notice that the name of a place has a descender (the J in NJ falls below the baseline) while none of the other letters do; another might notice that a city is too close or far away from a river because of his knowledge of the region; and yet another might note that the north arrow on one map is a slightly different size or shape than on the other maps in a set, or that an embellishment on a scale is missing from one map while all the others include it. Each of my reviewers is an expert in multiple fields and as such, considers and evaluates different aspects of the map than the others. Much like the eventual readers will.

And aside from all of that, a great comparative proofreader review at the text level is also a benefit. It isn't always possible for the map to be in the hands of the proofreader when she does her pass of the book, but it sure is helpful if it can be—so that discrepancies between text and map can be surfaced and resolved. On one of the projects that I worked, it was a sharp-eyed proofreader who discovered that the map used the spelling *Bosphorus* while the text used the equally correct and yet different spelling without the *h*: *Bosporus* (see map 26). I changed the spelling on the map to match the spelling used in the text and immediately sent her a new version of the map to use during the remainder of her review.



Map 26: Maintaining spelling consistency between text and map.<sup>31</sup>

Another change that was made to this particular map is that the press and author had decided to remove most of the diacritics in the text once quite deep into the editing process, so they needed to be removed on the map as well—to make sure that they matched. Monmonier (1993) summarizes this nicely:

<sup>31</sup> Barbara Reeves-Ellington (2013). *Domestic Frontiers: Gender, Reform, and American Interventions in the Ottoman Balkans and the Near East, 1831–1908*. Amherst: University of Massachusetts Press.

Although the spelling of all labels on the map should be checked carefully, place names warrant particular care. If a name has more than one spelling, the spelling on the map must match the spelling in the text. Transliterating place names from other alphabets can be particularly troublesome, especially when a foreign government decrees a change (for example, China's replacement of "Peking" with "Beijing") (p. 113).

In the case of the map above, and the timeframe in which it was set, there were so many different options for the spellings of the various locations that the author ended up writing an explanation in the book of why and how the spelling choices were made in the text (and by extension, on the map).

In many cases, the historical cartographer is hired to create not one map, but two or three or seven maps for a single publication. It is especially important that consistency is maintained across the entire set of maps so that they do not create confusion within or between themselves. If the reader cannot move easily from one map to the next, improvements need to be made across the entire set. It is the reviewers who often see small peculiarities between the maps in a set that the cartographer has overlooked in all the fiddling and adjusting that happens when working across separate yet inter-reliant maps.

### **Project Files and Always-On Availability**

In this age of mobility and easy technological upgrades, it is important for the historical cartographer to keep careful tabs on unfinished or unpublished work. It is never known when a client may reappear after months or years of silence to request a new draft of a map, or announce that the press is finally ready for the map(s) to be handed off (usually with immediate need). Or indeed, a client may ask for an update to be made to a map drawn long ago. To keep all of my own active (and reasonably recent but seemingly

dormant) cartographic projects at the ready, I use Dropbox, a robust cloud-based technology. Dropbox allows me to store all of these projects in the cloud and to automatically sync the files across my various computers and devices so that they are available no matter where I am or on which platform.<sup>32</sup> As mentioned previously, some projects are completed in just weeks or months, but for one reason or another, others may languish for years as research is completed, text is polished, and manuscripts are edited. Also, clients often request edits to their previously published maps for use in an additional book or journal article on the subject, and having the older map available immediately makes it possible to achieve this in a reasonable timeframe, and on a reasonable budget.

Also, it is important to keep not just the map files available but also all of the source data and the fonts that are used in those files, so that no matter which computer you may be using in the future, the fonts can be installed and the maps opened without resulting in broken data links or missing fonts. Note also that the fonts will eventually need to be supplied to the press anyway, so this can be considered proactive work simply done in advance. Storing such vast amounts of data used to be technically complicated, problematic in regard to accessibility, and very expensive, but data storage these days is simply a matter of clicking a button and requesting additional space on a mirrored server. This is all achieved immediately and for pennies on the dollar compared to what used to

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<sup>32</sup> As an example of how things work in this digital and mobile age, my own files are synced to an iMac, two laptops, an iPad, an iPod Touch, an iPhone, and the cloud (where I can access them from a browser just about anywhere in the world). And if I add a new device, the files will automatically sync to that machine as well. Far different from even five years ago, much less twenty.

be true, and with the benefit of user-friendly management tools that allow for versioning and recovery at a moment's notice.<sup>33</sup>

I have detailed below a few examples of why keeping files at the ready is prudent. I am including these particular examples as each of them either remains a current concern or the need for the files occurred within the past month:

*Example 1:* I handed off a completed set of maps to a press this past April (while I was living in Washington) and closed out the project.<sup>34</sup> In June (while I was living in Maine), I received a number of requests from the client to change information in the keys of two of the maps. These were simple enough changes to make, and presumably resulted from the editing or copyediting phases of the book that they are to be published in, but I couldn't have made the changes in the matter of an hour that it took me if I hadn't still had all of the files readily available. What's more, Dropbox had already synced the files from my main work machine to all the others, which allowed for the easy editing and handoff of the updated maps on a subsequent machine.

*Example 2:* I completed a map for a client in August 2013 and it was successfully handed off to the press long in advance of the publication date.<sup>35</sup> Just last month, in May 2014, I received a request from the author to make a change to one of the keys. Again, it was easy enough to make the change, but I couldn't have done so if the original map files weren't immediately available.

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<sup>33</sup> As a matter of record, I currently receive access to 1 terabyte of mirrored data for \$120 per year.

<sup>34</sup> David Shapira for Boston Publishing Company (in press).

<sup>35</sup> Gerald McFarland (in press).

*Example 3:* I drew a trail map back in 2004—literally a decade ago.<sup>36</sup> Earlier this month, I received a request to adjust one of the trails on the map and make a few other updates and changes. Thankfully, knowing that I was going to be traveling for four months, I had recently uploaded all of my older project files into Dropbox. This is an example of a project that I wouldn't normally have had accessible to me before (most likely just in storage on a backup CD or DVD) but the cloud allowed me the freedom to make this organizational change. Because I had done this, my entire catalog of digital cartography projects is available—now it's just the older, paper-and-ink-based projects that remain in file folders in storage). And although I had fortuitously done the work of moving the older project folders to Dropbox, unfortunately, in the case of this map, two of the fonts used in the old files were no longer on any of my current computers. Thankfully, I was able to find the fonts via an Internet search and install them, but this is an example of why packaging the fonts for each project is an important step to take.<sup>37</sup>

*Example 4:* There is a folder in my Dropbox that includes a set of maps and graphics that have been in the works since 2012.<sup>38</sup> The files were handed off in late 2012 but then a request for a new image was made in 2013, and that was also handed off more than a year ago now. However, as far as I know, the book is still being edited or may be in press. There may yet be another round of requests or maybe the book has lost traction at the press, but regardless, the folder will remain synched across all of my devices so that I can get to the files if the need arises. (Update: In the two days since I wrote this

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<sup>36</sup> Friends of Brushy Hills: trail map.

<sup>37</sup> About five years ago I started to prepare a folder of fonts within each of the individual project folders so that this exact problem no longer arises; now, no matter how old the files are, I will have easy access to install the fonts on a new machine.

<sup>38</sup> Susan Pedersen (in press).

particular example, the author has in fact contacted me to say that the press is ready for handoff of the maps and graphics.)

*Example 5:* I have done numerous iterations of a set of maps for a client, which seemingly remains in flux.<sup>39</sup> I originally drew the maps in 2008 and then redrew them to the press' (updated) specifications in 2009, but then nothing. In this case, there was some disagreement between the press and the author regarding transliteration, and that may have disrupted the process, but last I heard (in 2012) the press might have been moving forward with publication. Until I hear otherwise, all versions of the maps and their source files and fonts will remain accessible.

*Example 6:* In 2007 I completed a redraw of a large set of maps for a client but have heard nothing since then regarding the publication of the book that was in the works at that time.<sup>40</sup> After seven years, this may well seem like a lost cause, but I have learned in my years of working with clients to never assume that maps won't be requested at any moment in time. Yet again, this is an example of how Dropbox allows for the flexibility to store and access files with absolutely no hassle.

### **Cartographer as Contractor**

One final dilemma for the historical cartographer to consider is that essentially, she is a contracted artist, someone who will create a map for the author based on the information in the text. However, problems arise when the cartographer has a vested interest in presenting the information in one way while the author has his own feelings and opinions about the matter. Opinions as to style of font(s), the data chosen to be

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<sup>39</sup> Joan Afferica (in press?).

<sup>40</sup> Kevin Sweeney (in press?).

included, and even the data in the key or within an inset can cause disagreements. The cartographer must be patient and carefully explain map-related concepts and ideas to the author, and she must listen carefully to the author and apply requests in the best possible way—even if the request seems absurd or foolish. Artist or not, and opinions aside, the cartographer is a contractor, one hired to create a map.

A simple resolution to addressing a deep political or emotional concern is to simply remove the cartographer's name from the map. I recently did just that on a map that I redrew for a client. After a decade, the client wanted an old map redrawn, and I did so, adding the new changes but also updating the map to be more elegant and refined. Review after review, they kept saying it was nice but that they wanted the older style returned. In the end, they received a “new” map but it was one that I would no longer be proud to be associated with, so I removed my name from the image. It was a protest on my part, but one that was silent and thankfully went unnoticed. The client received a map that they desired and I was able to do it without a negative association to my name or reputation.

One further question that often comes up is in regard to ownership of the maps that the historical cartographer creates. Although each cartographer may choose to copyright the maps (or not)—and depending on the type of publication she may well want to do that—I for the most part do not. My feeling is that the author contracts my services as a cartographer to create a product, and that he owns the resultant product of that contract. This makes it easier for the author to reprint the map in future publications, use the map openly in lectures, presentations, and in class handouts, and photocopy it to his heart's desire. I do add my name to a corner of the map, but more as an artist

signature than anything else, and if I particularly like the map, I do ask permission to use the image on my website. As it turns out, most authors and presses are quite happy to have me advertise the map, the book, and its associated publication information.<sup>41</sup>

### **Press Requests and Demands**

Working closely with the press that is publishing the map will make the process of getting the map accepted a much easier task. Usually involved are the editor, the copyeditor, the graphic designer, and the production or project manager. As discussed earlier, the sooner the technical specifications are established, the better off the project will be, as the directives can be followed without worry. However, the political propensity of a press plays a role in how maps look and what they can say; I have had to redraw maps that included the India–Pakistan border for a press in India, and been asked to purposely place a town inaccurately to protect the identity of research subjects. And the book designer may or may not care to design around map and image placement; sometimes burying the maps in awkward places or printing them at unfortunate sizes or with odd orientation. Some of these intricacies are manageable, and some are only visible once the book has been published.

### **Packaging Maps for Delivery**

It was once—in the not so distant past—that the final paper versions of maps had to be mailed out to the author, and even with expensive certified mail methods, breath was held until the maps were confirmed to be safely in the hands of the author. He would then package the manuscript and all the supporting documents (photographs, graphs,

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<sup>41</sup> These maps can be viewed at: [blackmermaps.com/portfolio](http://blackmermaps.com/portfolio)

charts, and maps) together and mail those out to the press—and I know that breath was held once more until confirmation of receipt was assured. Nowadays, however, the final delivery of maps happens digitally, in only minutes, over the Internet. And as the final files are often quite large (too large to be emailed), the file usually gets uploaded directly from the cartographer to the art director or project manager at the press. Dropbox and other server and cloud technologies have entirely changed the landscape regarding the transfer of documents large and small, from one person to another, and from cartographer to press. Yet again, technology has allowed a complete transformation within the industry—one for the distinct better.

Most presses prefer (or require) that documents being supplied are in digital form—no more original maps on vellum via the post. The transfer of map files these days is a simple task. In my particular case, I usually pack everything required into one folder (map files in the required formats, a text document detailing the fonts used and the working title of the map, and a folder including the fonts), compress the folder, and either upload it to a drive or server at the press, or I supply them with a link via an email to where the file exists in my Dropbox. It's a simple and straightforward transaction. If a series of handoffs is necessary, I create a shared Dropbox folder where we can all upload and download the files as needed.

Most presses these days prefer to receive final map files as grayscale TIFF documents or as EPS files. I prefer 1200 dpi resolution for best printing, and presses are usually quite enthusiastic to receive large files as they print beautifully. Some presses ask for PDFs and occasionally I still get a request for a JPG, but those are quite rare these days. Some presses request the original Adobe Illustrator (AI) file—and this is where the

packaged fonts become critical—so that they can export the type of file they need directly from the program. If the press does request an AI file, make sure that every layer is locked so that the map remains intact and stacked correctly. The AI technician will know how to unlock the layers if necessary, but in the meantime errors won't happen with a layer or object being mistakenly selected and unknowingly moved, scaled, edited, or deleted. Also, it is important for the layers to remain stacked in the order that they are, as rivers might otherwise flow atop text or gradients might cover important text blocks. My final AI files typically consist of between five and twenty-five layers of map data, and each layer, although independent, is mutually dependent on every other layer. Locking the layers will assist in avoiding unfortunate blunders.

Every once in a while however, I do run into a press that has a bizarre or outdated set of requirements. Last year I encountered one press that required a compact disc containing the map be mailed directly to the publisher. I hadn't received a request like this in years—in fact, I had to visit my storage unit to find actual compact discs (not a DVD mind you, it had to be a compact disc). This wasn't really an enormous task, but it was an odd request in today's instant-everything world. What was downright bizarre was the hostility of the map instructions from the press that stated that no materials (specifically PDF files) could be created on a Macintosh computer. Well, that's just silly—and antiquated. It is true that let's say a decade ago, a PDF file produced from a Windows machine versus a Macintosh machine might be unreadable by the other, but that hasn't been true in years and years.

## Map Handling and Placement

One thing to remember when drawing maps for publication, especially in longer books, is that the maps might not end up where you might think they should appear. Sometimes, if there is only one map included in the book, it is placed at the beginning of the document, before the chapters begin. This can be ideal in some cases and yet in others, especially if the map is not specifically mentioned in the text, the map might not ever be seen. When there is a *set* of maps involved, they are usually interspersed throughout the book with the map for chapter two naturally placed close to the beginning of chapter two, et cetera. Most of the books I have done sets of maps for had this sensible format, which both assists the reader in locating the relevant map while also assisting in the best telling of the story. When the map is located in close proximity to the text being read, it is more likely to be viewed, which helps on all fronts. Unfortunately, I have also seen cases where the entire set of maps is thoughtlessly placed together at the beginning of the book. This type of placement downright discourages the reader from accessing the maps.

Equally important in getting the reader to look at the map is a convenient page layout with exhibits positioned near the associated text. After all, the eyes move faster than the fingers, and readers dislike having to hunt for inconveniently placed illustrations. Ideally, the map should appear above or below its text reference or on the facing page. But the map author usually has little control over the placement of illustration, which the book designer or layout artists positions to promote visual balance (Monmonier, 1993, p. 95).

Worse than that, sometimes the book designer—again, for whatever unknown reason but I’m guessing so that the reader doesn’t need to turn the book ninety degrees—decides to place a map vertically that was carefully designed to sit horizontally on the page (therefore using the very most of the available page real estate). Unfortunately, a

map that was designed to be read when printed at six-inches across often becomes literally *unreadable* when printed at 4-inches across. (Also see discussion of sizing in Chapter 4.) Imagine a map of the United States, which is naturally more expanded in the west–east direction than the north–south direction that is carefully designed to be read sideways on a page, getting printed such that the book wouldn’t need to be turned. The nine-point type would become six-point type, which doesn’t print well and would certainly be unreadable. Sadly, I have also drawn maps that have encountered this type of experience.

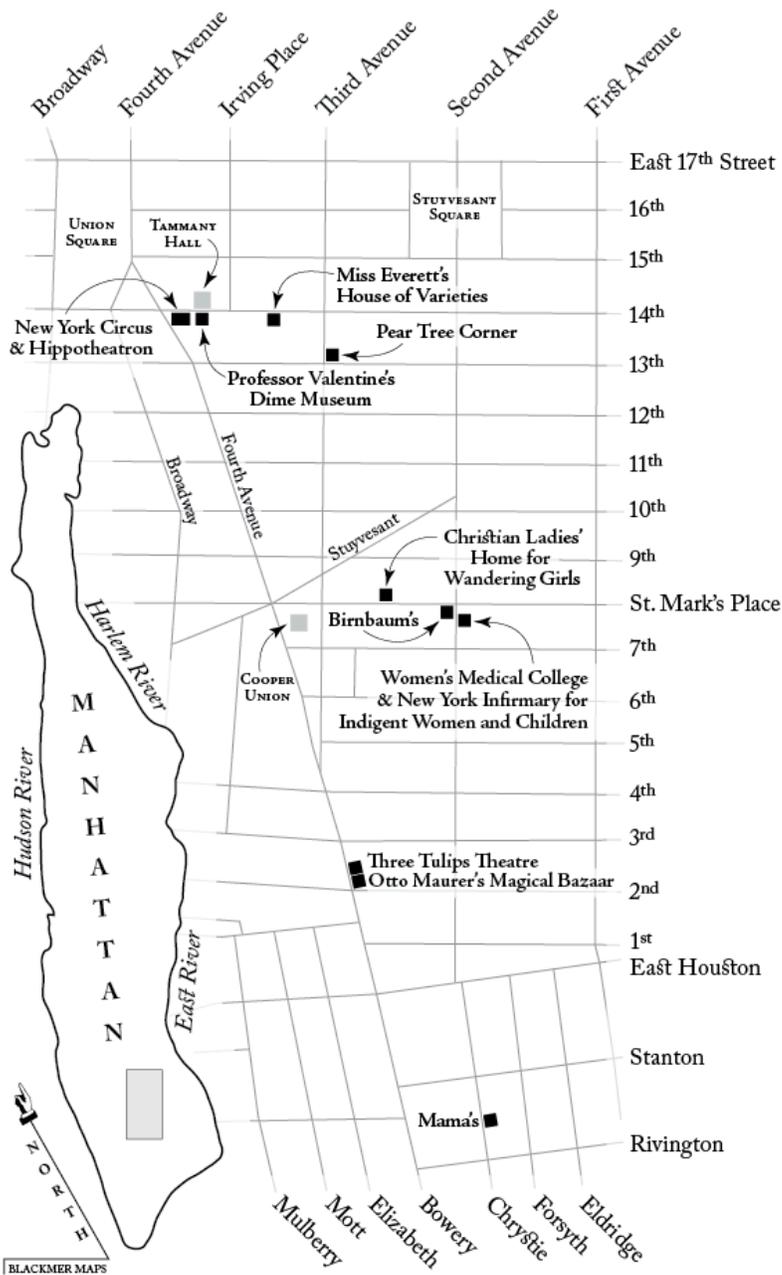
Labels should always be easy to read. Legibility requires that uppercase type not be smaller than 6 points and that lowercase type not be smaller than 7 or 8 points, depending on the x-height and compression of the typeface ... Authors must be aware that an editor or publisher could make some labels illegible by shrinking the map to fit a small page or a narrow column (Monmonier, 1993, p.108).

The politics of some presses are more strict/severe than others. Twice I have been asked to change the placement of the India–Pakistan border by an author based on what the press would consider an acceptable boundary. My response as a cartographer was to simply move the line as requested. My own political feelings on the matter in this particular case were irrelevant. I have also been asked to move the location of a town on a map and label it with the pseudonym that the author used in the book. His justification for this was to protect the identities of the people he had used in his research. This seemed like a somewhat grey area of validity to me, but in the end, I decided that the author was the one commissioning the map and I would draw what he wanted, even if it was inaccurate. I determined that as the expert on that particular subject matter, and the politics involved, that he knew better than I what was at stake for the participants.

## On Rejection

Occasionally, for one reason or another, a press rejects the map. Well, I've really only ever had this occur once, so I have very little experience with this sort of event, but still, when it happened to me it was an unpleasant surprise. What happened in this case was that the author wanted a map included with her novel and she contracted me to create the image. We steadfastly worked on the map together (see map 27) and created a lovely example of historical cartography for her book, which was set in the tenements of lower Manhattan in the year 1871. I used a number of historical maps as source materials for this recreation including a fire insurance atlas. Monmonier and Schnell (1988) discuss real estate and fire insurance atlases as helpful sources for cartographic information (pp. 323–326).

When we were done and she handed the map off to the press, they told her that they had their own cartographer and that the map would not be used. But in fact, very sadly, the book was published without a map of any sort. If you ever read the book, you will see how incredibly useful it would have been to have a reference map—just like illuminating a historian's text with the use of a map, this historical novel would have been equally elucidated with a map pairing.



Map 27: Plotting locations mentioned in a historical novel.<sup>42</sup>

<sup>42</sup> This map was never published, but it described the locations in: Ami McKay (2012). *The Virgin Cure: A Novel*. New York: HarperCollins.

**CHAPTER 6**  
**PRODUCING HISTORICAL MAPS FOR**  
**NON-TRADITIONAL CARTOGRAPHIC PROJECTS**

*Charts, art maps, and personal histories—there is  
an abundance of work for the historical cartographer.*

As discussed previously, one of the proficiency sets that any good cartographer requires is a trifecta of understanding that combines graphic design, layout, and typography. If the cartographer has this aptitude, there is additional work available. Books that include maps often also incorporate tables, graphs, and charts—and instead of hiring a separate graphic designer or artist to create those images, the cartographer herself can be contracted to do that work. Furthermore, keeping the theme or design of the various graphic components tied together also helps the reader feel that the book is more coherent. Often these are text-only imaginings, but sometimes old maps need to be redrawn to match a newer style map that has been included, or a new way of looking at old data needs to be imagined.

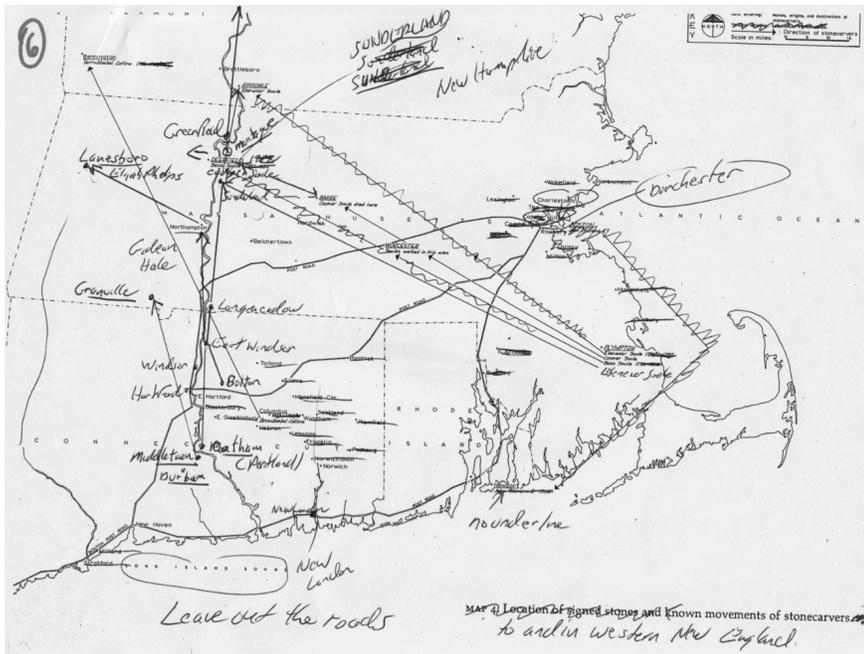
Parallel with the more traditional mapping work that the historical cartographer typically does, is another set of projects that fit naturally within this same skill set: creating historically *inspired* maps. These are cartographic experiments that may not necessarily ring the bells of truth or fact—and may even offer a data set that is complete fantasy—but these too can be beautiful and useful maps that need to support an existing text. Fantasy books such as those that include maps of the realms of Tolkien’s Middle-earth, or LeGuin’s Earthsea would probably not have stood the test of time with the

absolute popularity that they currently have without the addition of the accompanying maps that provided readers with a concrete way to visualize the world being explored.

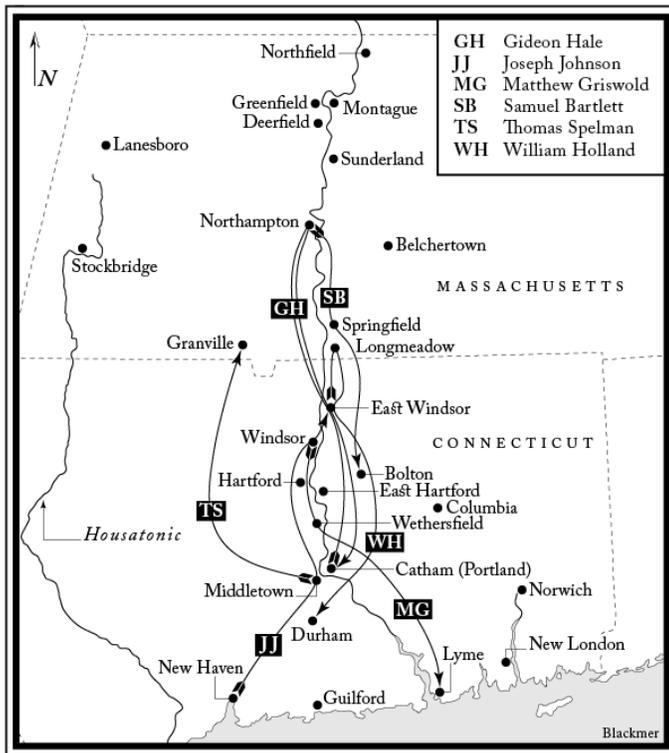
### **Redrawing Old Maps, Tables, and Charts**

When a historian is an expert in a given subject, he likely publishes articles and books on various aspects of the topic throughout his career. As new information comes to light about a subject or additional investigations are undertaken, he may well want one of his older, already-published maps redrawn to match the recent text more succinctly, or simply to bring the map up to the more current design and technology standards of today. I have worked with a number of authors to bring their earlier work forward, and as is often true of maps created from scratch, during the development of the updated maps yet additional information arises out of the process. Also, many authors who have published multiple essays on a subject or within a field get asked at some point to collate those essays into a book, and if there are extant maps, a need arises to have the maps redrawn as a set so that stylistically speaking, the publication holds together more elegantly.

As an example of this type of work, I have included both an original scratch-map that an author sent me (number six in a series of seven that were redrawn for a book of essays), marking up his earlier work to match the new text (map 28), and below that, the redrawn map that I created for him from that data (map 29). This was one of those cases where the process of redrawing an old map illuminated aspects of the subject that weren't clear before, and as a result, the text was ultimately improved.



Map 28: Original scratch-map from author.<sup>43</sup>



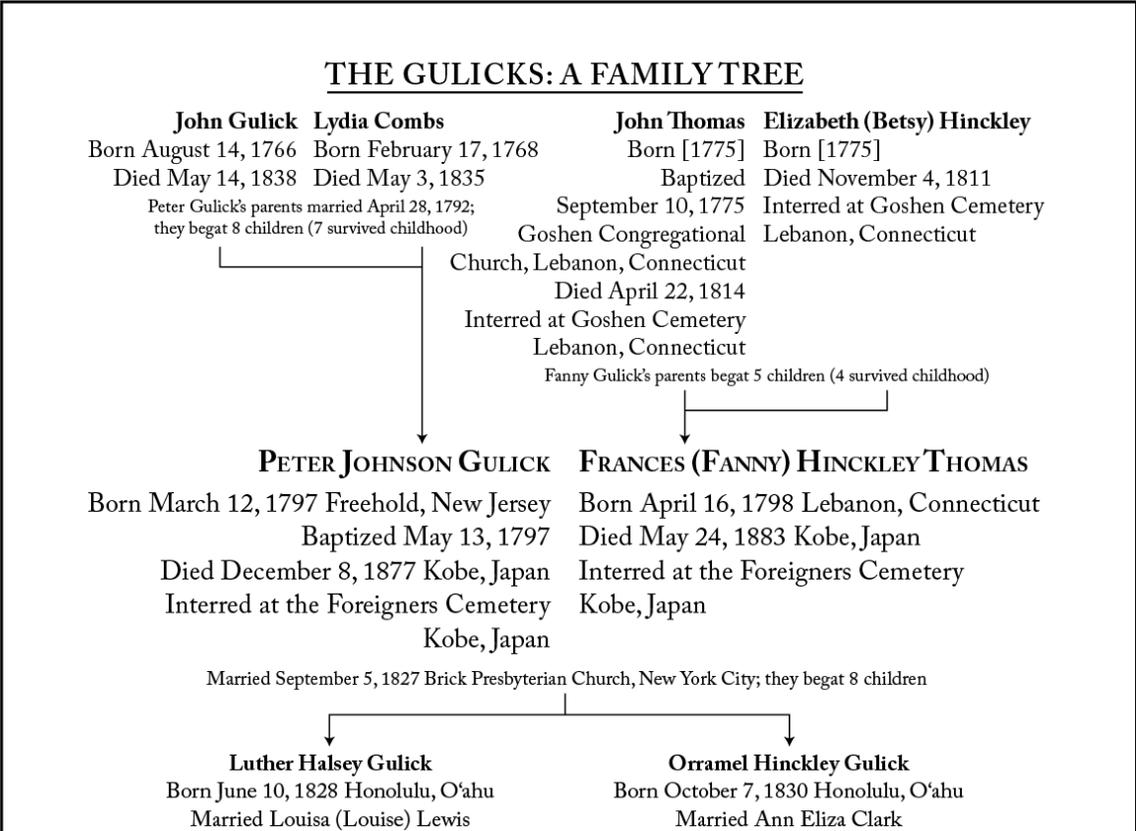
Map 29: Redraw of old map to match new text.<sup>44</sup>

<sup>43</sup> Kevin Sweeney (original author scratch-map from 2006).

On a number of occasions, I have also been asked to draw charts and tables for publications that were to include my maps. Although rarely a part of the original scope of the cartography project, once the author sees the elegance and clarity of the maps, the desire to have the other graphics in the document match that same *feel* apparently sets in. Although in many ways unconnected to mapping and cartographic sensibilities, creating an elegant and coherent chart or graph is certainly a design challenge not so unlike that present in mapping (Friendly, 2001, 2005, 2008). It's clearly a somewhat different skill set, but one that any typographically inspired graphic designer or cartographer could undertake and gain expertise in. I have included two examples of this type of work. The first example (map 30) is a detail of family tree where one of the same fonts as used on the Hawaii map discussed earlier in this paper was employed such that the chart better matched the look and feel of the map in the book.

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<sup>44</sup> Kevin Sweeney (redrawn map from 2007; forthcoming?).



**Map 30: Designing charts.**<sup>45</sup>

The second example (map 31) is a small section of a much larger table that I redrew for a client after it was realized that the table that had originally been submitted by the author couldn't possibly fit within the margins of the academic book that it was to be published in (the original table spanned two pieces of 8½ × 11 paper and the entire dataset needed to fit within the 4½ × 6 margins of a single page in the book). It took many drafts and some of the information was carefully redacted by the author, but in the end, it was a grand success. Working with numbers is a complicated and intricate dance—ample crosschecking and proofreading must be completed to avoid mistakes. If a statistician or

<sup>45</sup> Clifford Putney (2010). *Missionaries in Hawai'i: The Lives of Peter and Fanny Gulick, 1797–1883*. Amherst: University of Massachusetts Press.

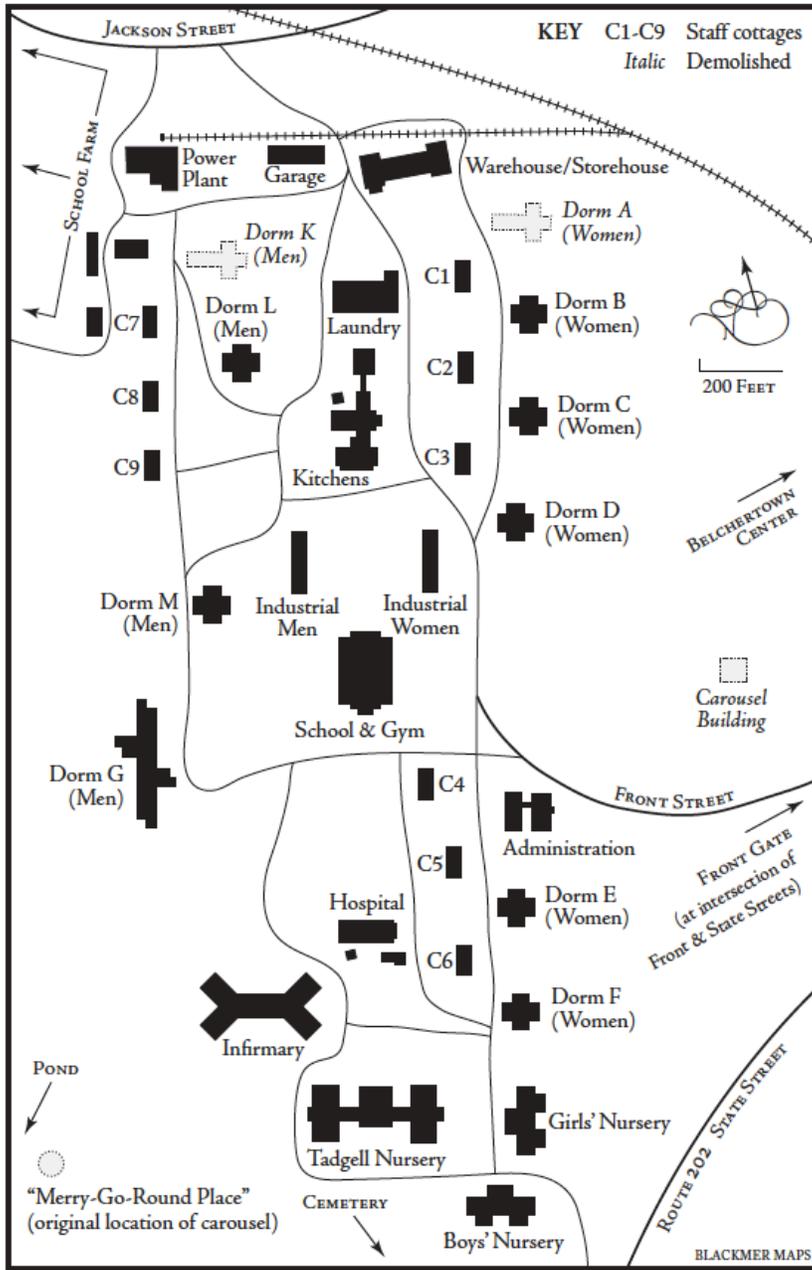
math specialist is willing to proofread the resulting image, all the better—unexpected and absolutely necessary edits will doubtless arise.

<b>Mandated Territories: Size and Population</b> (as counted and classified by the mandatory powers)				
<i>Territory</i>	<i>Size (km<sup>2</sup>)</i>	<i>1921 Population</i>	<i>1938 Population</i>	
<b>“A” MANDATES</b>	<b>Palestine Mandate</b> <i>Palestine only</i>	27,009	589,177 Moslems 83,790 Jews 71,464 Christians 7,617 Others (1922)	997,000 Arabs 411,000 Jews 27,000 Others
	<i>Transjordan only</i>	90,000	200,000 (1924 estimate)	300,214
	<b>Syria and Lebanon</b> <i>Syria only</i>	202,500	1,509,000 Settled 250,000 Bedouins	2,715,107
	<i>Lebanon only</i>		570,000	850,000
	<b>Iraq</b>	438,000	2,850,000 (1927) <sup>1</sup>	<i>Independent</i>

**Map 31: Creating tables.**<sup>46</sup>

There are also other types of redraws and recreations that are often needed for a publication that includes maps. The example below (map 32) is one that I created for a book that investigated an old school. A plot or location map that placed the buildings on the property was integral to the reader’s understanding of the text. Although clearly more map-like than the chart and graphic examples above, this type of plot or location map is an example of its own sort of historical cartography. Similar tools were used to create this map as were used to create the other more traditional historical maps in this book, and the same sort of research and inspection occurred with regard to both source materials and base maps.

<sup>46</sup> Susan Pedersen (in press).



Map 32: Recreating plot maps.<sup>47</sup>

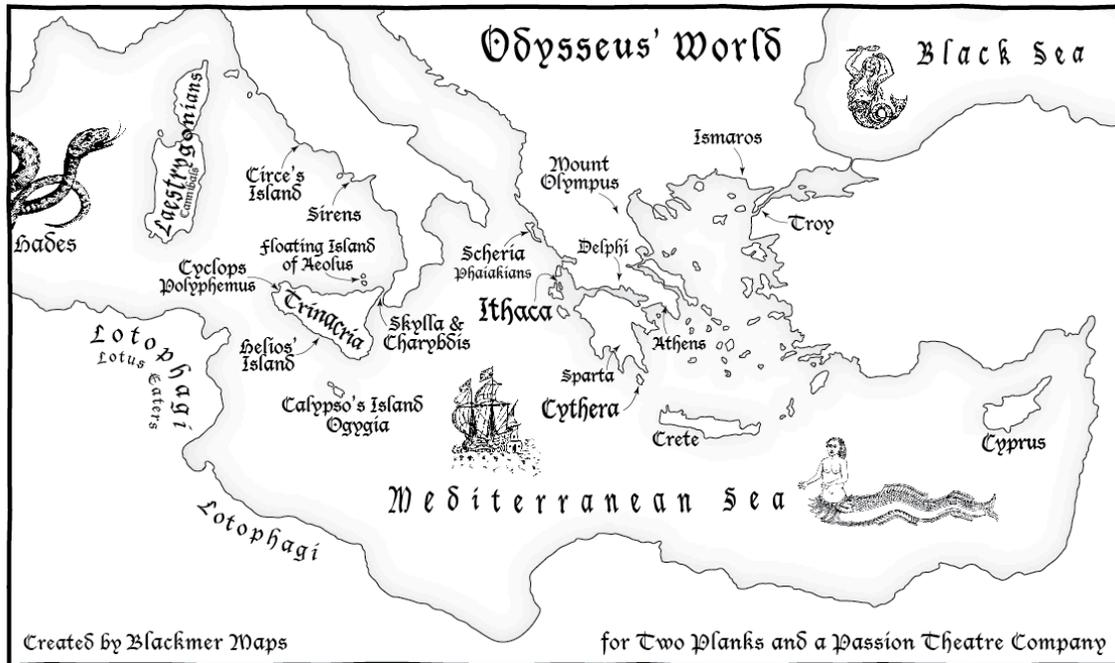
When redrawing a chart, table, graphic, or any other type of image to match the maps in a publication, use the same methods of editing and vetting as you would when considering a complete set of maps, and always be sure to supply your reviewers with the

<sup>47</sup> Robert N. Hornick (2012). *The Girls and Boys of Belchertown: A Social History of the Belchertown State School for the Feeble-Minded*. Amherst: University of Massachusetts Press.

entire collection of images at once so that the best possible chance of finding inconsistencies and oddities between them exists. From serial commas to tab-stops, and from small-caps to capitalizations, each diminutive edit will assist in assuring that the entire set is convincing, credible, and authoritative—thus achieving the ultimate goal of illuminating the text of the author.

### **Historically Inspired Art Maps**

Not all historical cartography is about a specific battle or event that needs to be illustrated with a map. I have also created quite a number of maps for non-historians, historians-turned-fiction authors, playwrights, and novelists that are simply *based* on old maps, or *inspired* by old maps. Much like the map for the historical novel discussed in the previous chapter, some of them never make it to press, or the type of press is less traditional in some way, but they are historical maps—or at least they have the sensibilities of being based on historical maps in one way or another.



**Map 33: Illustrating classical literature.**<sup>48</sup>

The examples immediately above (map 33) and below (map 34)—as well as map 17 on page 59—were commissioned specially to be included in the programs that were distributed at the performances of the plays that these maps illustrated. Again, as is true with the other more traditional types of cartography that this paper outlines, fantasy mapping of historical literature requires research, vetting, and editing. However, what this type of map does allow is a more spirited interpretation of what “fact” is. Plus, one can add sea creatures and dragons without worry of distain.

<sup>48</sup> Ken Schwartz (2007). This historically based fantasy map was published as part of a director’s guide to the play “The Odyssey,” produced by Two Planks and a Passion Theatre Company in Canning, Nova Scotia.

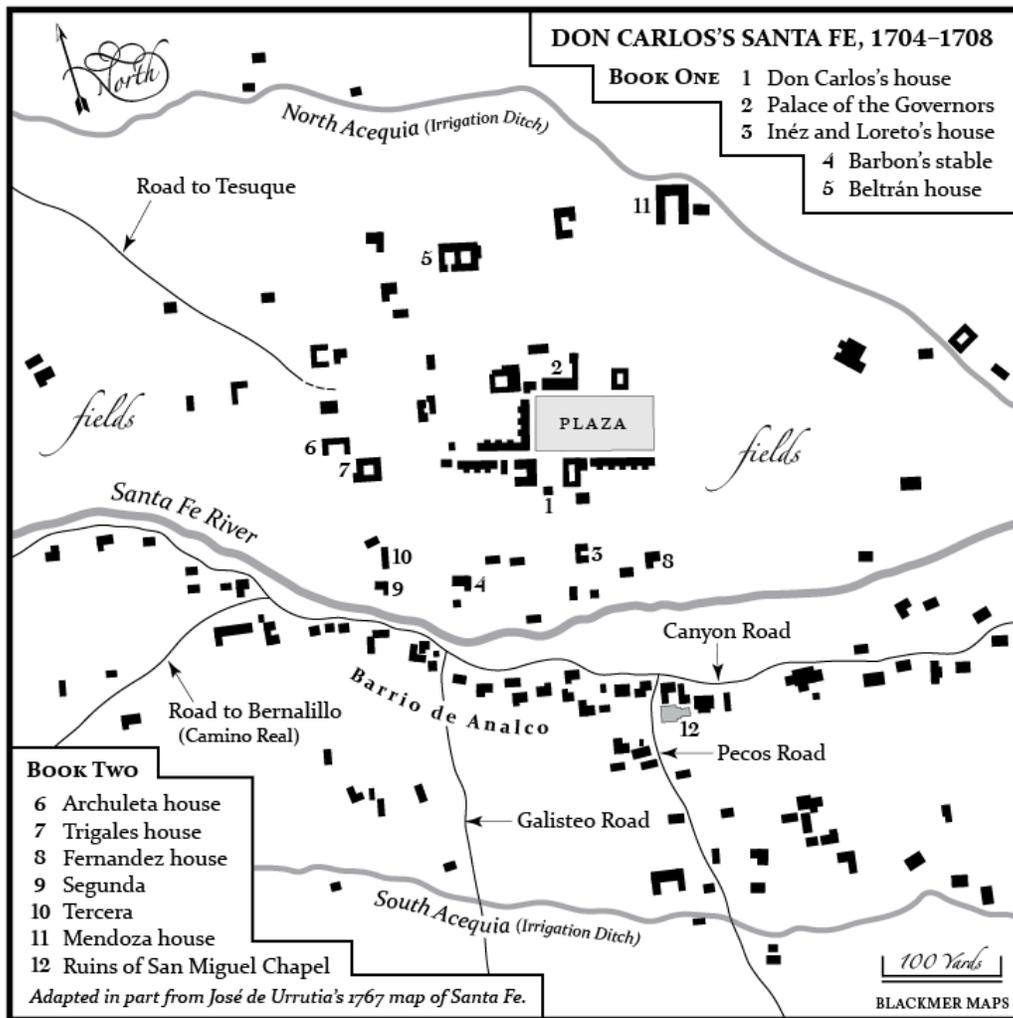


**Map 34: Mapping fantastical myths.**<sup>49</sup>

Another sort of fantasy mapping is that done for historical novels that are set in a specific time and place—the Manhattan map in the previous chapter (map 27) is an example of this sort of mapping. The following map (map 35) is another example of this type, which needed to be placed in Santa Fe in the early 1700s. Only one original map of the area at the time seems to exist, so much of the data was pulled from that old map, but some of the rest was collected from both current-day maps as well as other historic maps from the 1800s and 1900s. As the original 1767 map was drawn sixty years *after* the

<sup>49</sup> Ken Schwartz (2011). This historically based fantasy map was published as part of a director’s guide to the play “Beowulf,” produced by Two Planks and a Passion Theatre Company in Canning, Nova Scotia.

timeframe of the novel, the author got to make decisions about which of the buildings to remove. So, the resulting map that was published in his book is accurate in many ways, and yet fictional at the same time.



Map 35: Historically accurate fantasy maps.<sup>50</sup>

One other thing to note about this particular map is that we gave source credit to José de Urrutia, the Spanish explorer who created the original 1767 map of Santa Fe. Although we did alter our version of the map in some significant ways to better match the text of

<sup>50</sup> Gerald W. McFarland (2014). *What the Owl Saw: Second in the Buenaventura Series*. Santa Fe: Sunstone Press.

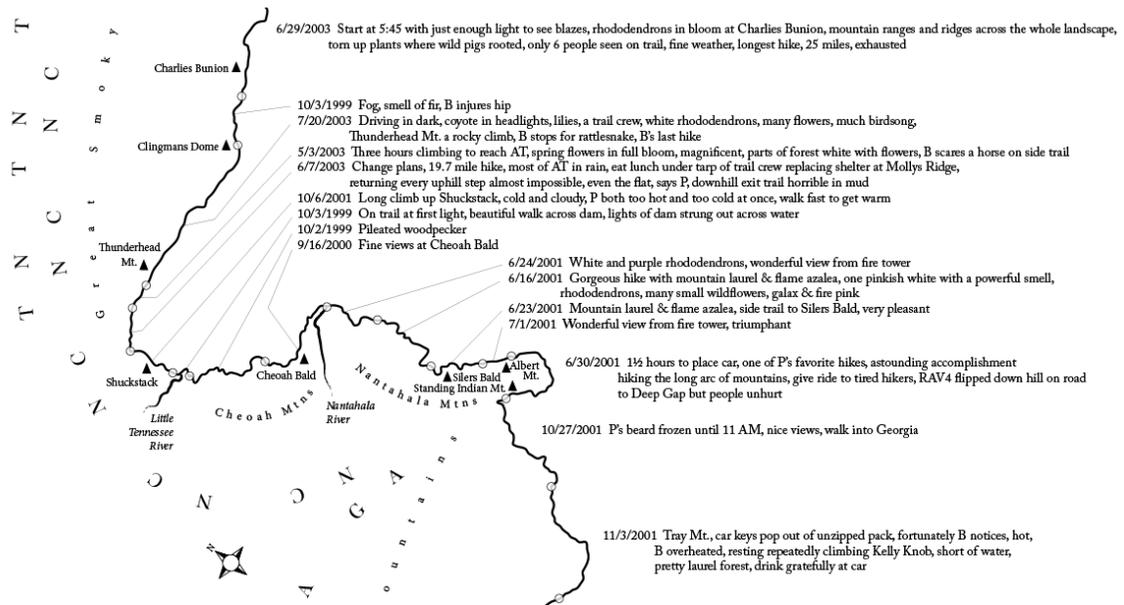
the novel, and to bring it more up to date in regard to geographical accuracy, both the author and myself felt that the credit for the underlying data should be attributed.

### **Private Histories and Personal Projects**

There is yet another avenue that the historical cartographer can explore: mapping data for individuals and for groups via more personal projects. In this age of easy one-off and on-demand printing, personal and professional blogs, digital display devices, and tools that make collaborative work across continents possible, the opportunities to map are endless. One example of mapping a more personal dataset is the following map (map 36). Below are two screenshots of an enormous map that measures 14 inches by 14 *feet!* It used to be that a map this size and with such small type could only be displayed as a scroll or folded into leaflets. Nowadays, however, this exceptionally long but narrow map has found a natural home as a PDF displayed on a tablet. Although not readable at the following screenshot sizes, the two images will provide an illustration of the problem.



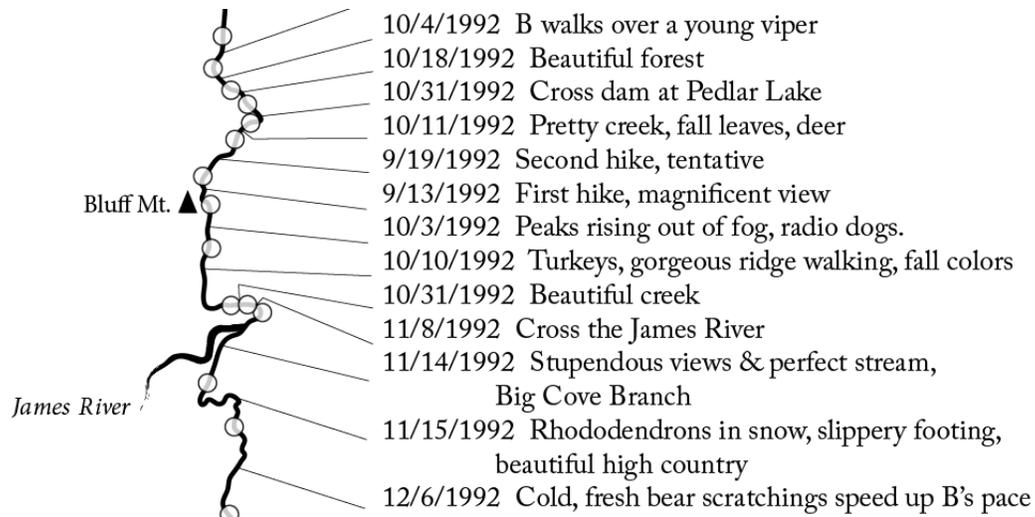
The screenshot on the left of map 36 shows how the tablet form factor allows the entire map to be seen in miniature, and yet with a double-tap, the map (see the right side of map 36) can be easily scrolled through to view the top layers of information: states, north arrows, and mountain ranges. With another double-tap, as shown by map 37, the image snaps to a more easily readable width and the user can start to see the minutia of the documentation included in the smaller type: mountains, rivers, and dates. At this level, the circles and lines that indicate some sort or variety of specific data are also revealed.



**Map 37: Capturing personal histories.**<sup>51</sup>

From there, simple pinch/zoom gestures on the tablet screen make the type as large as the reader wishes (see map 38). At this level, the very smallest layer of data is exposed for what it is: eleven years of day-hikes along the Appalachian Trail.

<sup>51</sup> Appalachian Trail Map created for Hugh and Elizabeth Blackmer.



**Map 38: Diving for the details.**

What becomes clear at this level—and what was utterly unknowable in that first screenshot—is that the tiny text is in fact a collection of moments and memories lifted from the trail journals of two hikers, and concentrated into one short descriptive sentence. These two spent eleven years day-hiking the Appalachian Trail and managed to complete every foot of it during their adventures. The hikes are thus forever illuminated for this pair of explorers both as individual units and as a whole. No other method or form factor that currently exists could possibly allow for this type of personal, geographic, and cartographic amalgamation, nor so succinctly illustrate such a feat.

**CHAPTER 7**  
**DIRECTIONS AND BEARINGS**  
**FOR THE HISTORICAL CARTOGRAPHER**

*By means of a summary from aboard a Coast Guard cutter ...*

Historical maps belong in a multitude of places, from novels to professional papers, and from museum displays to illustrating scientific research. Even now, as I write these words from aboard my husband's polar icebreaker, the U.S. Coast Guard Cutter *Healy*, transiting the Inner Passage from Juneau to Seattle, I can envision how a series of historical maps of this particular area would provide the reader with a very interesting narrative regarding various aspects of the environment, political boundaries, peoples, and marine life that have existed here over the years/decades/centuries/eons. Historical maps such as these could illustrate the various routes that have been called the "Inner Passage" over the years, they could show the historical migration paths of whales, birds, and fish, the locations of traditional fishing grounds, and even the basics such as names that have been used for these islands over the years. In fact, just about any set of collected historical data can be mapped. Tides—records of highs and lows. Shipwrecks—salvaged and abandoned. Explosions—successful and blundered. Burial sites—Native and otherwise. Each of these maps would provide an aspect or explanation of historical fact to help enlighten the viewer as he travels these waters and sees the thousands of islands that make up this territory. These maps could stand alone, or this "set" of geographically specific images could be combined into a single, *themed* atlas—much like the atlases that Solnit has been creating in the past few years. Solnit's atlases of San Francisco (2010)

and New Orleans (with Snedeker in 2013) explore and plot all sorts of data ranging from blues clubs to butterfly habitats, and from shipwrecks to religious centers. Combining these diverse and yet regional maps in a single atlas allows the reader a deeper look at minute data, and yet he steps back with a more concrete knowledge that all data is somehow connected. Maps—and especially so thematic historical maps—provide this understanding more clearly than any other method.

Furthermore, Solnit's atlases are examples of how modern-day artists and cartographers are imagining, reconsidering, and reenvisioning data of all sorts, both factual and fantasy, and with fascinating results. Also though, these atlases represent a perfect blend of current-day digital data and more historical cartographic methods. There is an absolutely elegant melding of digital data (let's say GIS data) and more traditional cartographic data going on here—and the ability of this melding to occur increases more so with each passing month as additional historical data is catalogued in digital archives. From charts to tables to journal entries, and from public databases to GIS libraries, historical data can be harvested from just about anywhere. What's more, digital data will inform and assist cartographers in the future in ways that we can just barely begin to imagine (Sheppard, 1995). From glaciers to shipwrecks, and from coffee growing regions to where tea is consumed, all that data can be mapped—allowing us to see pieces of a larger, more globally connected puzzle. And here's the beauty: each historical cartographer will map this data in different ways, such that each graphic display can be equally legitimate, and yet lead to different paths of further investigation. All proportionately valid and scientific, while each is presented in a unique graphical way.

Regardless of its heredity or lineage, historical data can be used in two essential ways: as a record of what has been, and as a subset of what may yet be. Mapping historical data allows for new understandings, deeper investigations, and somehow manages to unearth yet more fascinating connections between events, places, and peoples both in the past and for the future. Maps are graphic representations of data—of subsets of truth. Historical maps allow their readers to construct an understanding of an event or a series of interrelated events in ways that tables and charts could never adequately display. And while anyone can draw a map, it's the map that does more than simply portray data that is the most significant success, historically speaking. It is the map that lends curiosity or supplies understanding that achieves the greatest accomplishment. Each cartographer will create a different map using the same data, as the options for presenting data and data sets is unlimited, but one will certainly be more accessible or useful than another. Providing a successful graphic display of information, be it geographical or not, is a skill. Being able to add the geographical layer is where a true delicacy of tact is required.

Although a military vessel, the *Healy* was designed primarily as a scientific platform, and as such, everywhere it goes, it is collecting data of all sorts. Even here, in the “wilds” of Pacific Canada, among the islands of the Pacific Northwest, there is history being made and there is data being collected. Or rather, there are many unique and separate histories being made and layers of data being gathered, from atmospheric weather to water temperature, from sea currents to directionality, and from humidity to location. It is the unique and exciting job of the historical cartographer to see and illustrate these often mundane and sometimes dramatic and fascinating versions of history—slices of history—creating scientific images that detail our singular and

collective pasts. Anything and everything from types of seaweed and weather oddities, to rescues, record-setting marine catches, collisions, last sightings—just about anything can be turned into a historical map that has value or interest, shares fascinating concepts, and can ultimately help others visualize data in new and interesting ways. There is no end to the options that can be considered as subjects for a historical map.

In fact, as I sit here on the fo’c’s’le writing these original penned words, I hear the *ping-ping-ping* of the sonar that is currently mapping the bottom of the channel as we motor along. But five, twenty-five, or fifty years from now, this exact data may be used to create historical maps that explore silt patterns, land mass shifts, or tidal currents; or that explains the ocean’s salinity changes or even a mysterious sickness. Digital data offers unlimited possibilities. The other day, as we transited up to, along, and away from a glacier, the audible pinging never ceased. Apparently, that particular glacier has receded so much in recent years that there is now newly accessible seafloor that could finally be mapped for the first time. Parallel with collecting this brand new data, is the fact that this subset of data has also now been added to the existing historical archive—all of which can collectively be used to create historical maps in the future; anything from the track of the glacier’s collapse to the path of the newly illuminated shoreline. We won’t know what happens with this data until later, as historical data can come from everywhere and anywhere, and mapping different layers of it can illuminate texts, tomes, and papers. Historical data has helped explain outbreaks of disease, has determined international borders, and has resolved land disputes. Mapping data allows for a clarity that might escape without this type of graphic visualization, weather in the Arctic, the Pacific Northwest, or elsewhere.

Another *Healy*-related discussion from the cutter's most recent spring and summer in and around the Arctic also has to do with maps and historical mapping. In recent years, the polar icecaps have been receding rather dramatically, and many countries, companies, and individuals have been interested in transiting through and even establishing a year-round route through the Northwest Passage. This year, one man set out in a boat from British Columbia with the plan to sail through the Northwest Passage and across the Atlantic to Turkey. However, he got stuck in the ice forty miles north of Barrow, Alaska and the *Healy* was diverted from a scientific mission to rescue him. *Healy* broke a path twelve miles long to get him back out of the ice and safely into port in Barrow where he was planning to recoup before setting out again. This is a story of both trial and tribulation, of hope and passion, and of determination and discovery. Granted, the tiny thirty-six foot sailboat had nothing on the Coast Guard's 420 feet of icebreaking diesel-electric power, but thankfully, *Healy* was divertible and the man's life was saved. But in then researching early explorations of the Arctic and looking at maps of previous attempts at transiting the Northwest Passage over the past few hundred years, and reading about some of the disastrous outcomes, it occurred to me that a comprehensive historical map of early efforts to transit this region could be created. And that understanding these historical endeavors via a mapped display would allow us to better see the changes in the Arctic in more interesting and helpful ways.

The deeper point though in regard to mapping, is that this particular voyage would have been unimaginable even five years ago, but now it's an inevitability. Establishing this route, determining various international rights and responsibilities, and mapping it is something that will absolutely need to happen in the next decade if not sooner. It's a

world of digital mapping that has never been undertaken. The historical basis for some of the data is there, but the scientific technology has never been before. Melding the “known” historical data with that of the newly collected and catalogued data is an exciting undertaking—one that this particular historical cartographer has a deep interest in. *Healy* can go where most ships cannot—capable of transiting through ice almost five feet thick at 3 knots, and eight feet thick when backing and ramming, and can use her four engines to reverse out of just about any situation, while most other vessels cannot. This means that *Healy* will be able to map the seafloor in some of these areas for the first time ever, and that this data will be available to cartographers. It’s an exciting time for Arctic exploration and mapping, both digital and historical. Imagine being able to map Sir John Franklin’s tragic 1845 route atop this newly collected data, or plot Commander Robert McClure’s ill-fated journey five years later in search of Franklin’s ships. There is no end to the interesting historical maps that could be developed using a melding of the old data and the new.

On a slightly different but interrelated concluding topic, one of the books I am reading right now—again, while aboard *Healy* this week—is Stolzenburg’s *Rat Island: Predators in Paradise and the World’s Greatest Wildlife Rescue* (2011), which discusses the introduction of the rat to various global ecosystems (especially islands) and the eventual resulting ongoing eradication of the animals from those islands. It’s a fascinating book, but it lacks the desperately required maps that I feel should have accompanied the text. These maps would assist the reader to negotiate the places being discussed, from New Zealand to Alaska and beyond. Like many fiction and non-fiction accounts of history, this book would be so much more complete and easily absorbable if

maps had been included. Not simply maps of the areas being discussed, but maps that show connections between the places, and how the rats got from one place to another, and in what timeframes or eras. Furthermore, I bet that if maps had been drawn for this book during the writing phase, that the author—who has done a fantastic job of textually explaining the historical connections between mainlands and islands—would have discovered yet additional interrelationships between the various locations. Historical maps such as these would allow readers of all sorts and types an avenue to visualize data in new and interesting ways. History is never stagnant. New histories are constantly being uncovered like a latticework of interconnected spiderwebs that span the globe, never complete and ever expanding. Each history separate and yet interwoven. Maps help illuminate those connections and intricacies better than any other method, and maps allow writers the opportunity to see data in alternate ways—providing hypotheses that might otherwise be lost. This, too, is the realm of the historical cartographer.

And finally—by means of an explanation—twenty years ago, this cartography-themed thesis would certainly have found a natural home in what was then a Geology & Geography department. Today, however, although it may seem somewhat out of place in a current-day Geosciences department, I argue that it still fits no better anywhere else—at least not until Data Illustration exists as an academic field (and note that Data Mining now does, or at least KDD<sup>52</sup> does, so it may simply be a matter of time). Geosciences remains the academic field that probably still relies most strongly on maps and mapping

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<sup>52</sup> KDD stands for “knowledge discovery in databases” which deals with mining all sorts of data from various types of digital databases and plotting or displaying it. Typically, this is viewed as a subspecialty of the computer sciences world, but it, too, is expanding into other disciplines as databases and data become more and more globally prevalent as sources, both academic and otherwise.

data, and in the same way that GIS somehow fits within the Geosciences, so too can more traditional forms of cartography and even data design and illustration. Clearly, historical mapping is more than simply art, it is more than historical knowledge, it is more than just data mapping, it is a true convergence of science and art—a melding of geographical principles and sensibilities with a deep regard for scientific method and a rootedness in artistic ability. And while mapping can be done successfully by someone in any field, it is the *Geo* in Geosciences that places it squarely within this department. Most appropriately. Most thoroughly. Most clearly. Absolutely.

Historical mapping is a niche. It has never wholly fit within a single discipline or academic department. It isn't simply art. It isn't just history. In fact, it may be the most truly cross-disciplinary field of all time. And it is more than simply a matter of effectively displaying data, especially when the resulting map or map set accompanies an extant historical text. Whether this is done using GIS data, old maps, or raw text, it is the job of the cartographer to extract the information and present it in illustrative and elegant ways. The goal of the historical cartographer is not simply to illustrate texts but to *illuminate* the words of a historian. It's a specialized niche, one where problems regarding data displays are solved, multiple truths are unveiled, deeper understandings are developed, and clarity is realized.

The benchmarks for cartographic excellence are varied, but those that establish cartographic failures are clear. If a map is difficult to read, unpleasant to look at, or simply does not contain the dataset that is discussed in the accompanying text, it is an abject failure. However, some of the best-drawn maps look simple, suggesting that they were easy to create—but in fact, many of those maps were arduously complicated to get

to appear as such. Working with a historian or any author is an intricate dance, a back-and-forth of information, data, and edits—one has to have the *patience* to stick with it so that the best possible maps result, and the *fortitude* to wait out the publication process. But if one does have these abilities, paired with an interest in old maps, a sense of design, an understanding of typography, a deep working knowledge of geography and geographic principles, and the desire to read and illustrate historians' texts, a career as a historical cartographer might be of interest.

One might well ask if work exists for the historical cartographer. The answer though, is that there is quite a lot. From new historical texts and redraws of older maps to bring them up to date, and from historical literature to fantasy maps and personal histories, work abounds. Between maps, charts, and tables, personal and professional projects, and any number of other avenues, historical cartography is alive and well. Generally speaking, my own client-base continues to publish and thus, they are often in the market for cartographic services. Some have progressed from student to professor during the past twenty years, others have retired from professorships and are now writing historical novels, while yet others continue to write plays, poems, and graphic novels. But what they all seem to have in common is that they require maps for one project or another. I believe that by being easy to reach and easy to work with, they'll keep returning and I'll keep drawing their maps.

I hope that what I've shown in this paper is that while the skill set of the historical cartographer must be varied and vast, anyone with an interest in maps, the ability to visualize data, and the graphic design skills sufficient to create technical and yet elegant maps can enter the fray. Until the 20th century, mapping wasn't a professional field; there

were certainly people—scientists, farmers, and politicians alike—who drew maps and charts and tables for a variety of purposes, but they did so because they were curious about seeing the data in a graphical way. With the advent of the personal computer and the Internet, any number of us can now plot data in new and interesting ways. As such, the realm of historical cartography seems absolutely agape for anyone who wants to dabble or establish herself. Maps allow us to visualize information in interesting and illuminating ways—being able to read a text, conceptualize the data, and create a map that shares or relays that data is a skill for sure, and it's one that's in good demand.

## APPENDIX

### MAP SOURCES AND CREDITS

The following is a list of 108 maps across 43 publications that I have drawn specifically for historians and historically based texts over the past 20 years—a subset of my work—some of which have been used as sample graphics within the thesis. I include this documentation to show that I have a substantial body of professional work and experience with drawing historical maps.

Afferica, Joan (forthcoming?).

- Cossack Uprising of Bogdan Khmelnytsky
- Commonwealth of Poland-Lithuania on eve of Khmelnytsky's Cossack Uprising

Babb, Lawrence A. (1996). *Absent Lord: Ascetics and Kings in a Jain Ritual Culture*. Berkeley: University of California Press.

- Gujarat and Rajasthan with selected locations

Babb, Lawrence A. (2004). *Alchemies of Violence: Myths of Identity and the Life of Trade in Western India*. New Delhi: Sage Publications.

- Map of Rajasthan with India insert

Babb, Lawrence A. (2013). *Emerald City: The Birth and Evolution of an Indian Gemstone Industry*. New York: SUNY Press.

- Jaipur: Johari Bazar and Environs

Bargen, Doris (in press). Honolulu: University of Hawaii Press.

- The Heian Capital and its Environs
- Residences in the Northeastern part of the Heian Capital

Boston Publishing Company (2014). *The American Experience in Vietnam: Reflections on an Era*. Zenith Press.

- North and South Vietnam, circa 1967
- Corps tactical zones and administrative divisions of South Vietnam, circa 1967
- Tet Offensive, 1968
- Ho Chi Minh Trail

- Boston Publishing Company (2014). *The Medal of Honor: A History of Service Above and Beyond*. Zenith Press.
- The War Between the States 1861–1865
  - North and South Vietnam with Ho Chi Minh Trail, circa 1967
  - Kham Duc base and airfield, May 12, 1968
  - Mogadishu, October 3–4, 1993
  - Ganjgal Valley, Eastern Afghanistan, September 8, 2009
- Brooks, Pamela E. (2008). *Boycotts, Buses, and Passes: Black Women's Resistance in the U.S. South and South Africa*. Amherst: University of Massachusetts Press.
- Alabama (with neighboring southern states)
  - Montgomery, Alabama
  - South Africa (with provincial divisions)
  - Greater Johannesburg (with Alexandra and Soweto)
- Cray, Robert (2014). *Lovewell's Fight: War, Death, and Memory in Borderland New England*. Amherst: University of Massachusetts Press.
- Map of New England showing locations mentioned in the text
- Erekson, Keith A. (2012). *Everybody's History: Indiana's Lincoln Inquiry and the Quest to Reclaim a President's Past*. Amherst: University of Massachusetts Press.
- Indiana's "Pocket" counties
- Glick, Leonard B. (1999). *Abraham's Heirs: Jews and Christians in Medieval Europe*. Syracuse: Syracuse University Press.
- Carolingian Empire, ca. 825
  - Holy Roman Empire and France, ca. 1150
- Haefeli, Evan (2006). "The Revolt of the Long Swede: Transatlantic Hopes and Fears on the Delaware, 1669." *The Pennsylvania Magazine of History and Biography*, CXXX(2).
- The Delaware 1669
- Haefeli, Evan (2007). "A Scandalous Minister in a Divided Community: Ulster County in Leisler's Rebellion, 1689–1691." *New York History*, 88(4).
- Ulster County, New York, and selected locations, 1690
- Haefeli, Evan (2012). *New Netherland and the Dutch Origins of American Religious Liberty*. Philadelphia: University of Pennsylvania Press.
- Dutch Republic, c. 1648
  - Dutch World, c. 1650
  - Dutch Caribbean, c. 1650
  - New Netherland, c. 1657
  - New Netherland, c. 1664
  - New York, 1672

- Haefeli, Evan & Kevin Sweeney (1994). "Wattanummon's World: Personal and Tribal Identity in the Algonquian Diaspora, c. 1660–1712." *Papers of the 25th Algonquian Conference*.
- Map of the northeast
- Haefeli, Evan & Kevin Sweeney (1995). "Revisiting the Redeemed Captive: New perspectives on the 1704 attack on Deerfield." *The William and Mary Quarterly: A Magazine of Early American History and Culture*, LII(1).
- Map of the northeast, showing rivers, villages, and east–west route
  - Map of the northeast, showing tribal homelands and movements circa 1675–1704
- Haefeli, Evan & Kevin Sweeney (2003). *Captors and Captives: The 1704 French and Indian Raid on Deerfield*. Amherst: University of Massachusetts Press.
- Map of the northeast, circa 1660–1725
  - Early town plan of Deerfield, circa 1700
  - Boucherville, 1673
  - Map of the northeast showing tribal homelands, Native villages, and movements, circa 1675–1704
  - The Deerfield Stockade during the assault, February 29, 1704
  - Routes of the captives, 1704
  - Offensive operations during the War of the Spanish Succession, 1702-1713
  - The greater Montréal region, early 1700s
- Haefeli, Evan & Kevin Sweeney (2006). *Captive Histories: English, French, and Native Narratives of the 1704 Deerfield Raid*. Amherst: University of Massachusetts Press.
- The Northeast, circa 1660–1725
  - Routes of Quentin Stockwell, 1677, and Daniel Belding, 1696
  - Routes of the 1704 Deerfield captives
  - The greater Montréal region, early 1700s
  - Escape route of Thomas Baker, Martin Kellogg Jr., John Nims, and Joseph Petty, 1705
- Hornick, Robert N. (2012). *The Girls and Boys of Belchertown: A Social History of the Belchertown State School for the Feeble-Minded*. Amherst: University of Massachusetts Press.
- Massachusetts with two insets highlighting the town of Belchertown and the Belchertown State School
  - Campus plan of the Belchertown State School
- Hunt, David (2008). *Vietnam's Southern Revolution: From Peasant Insurrection to Total War*. Amherst: University of Massachusetts Press.

- My province
- Region 2 and the Mekong Delta

Jones, Robert. E. (1996). "Opening a Window on the South: Russia and the Black Sea 1695–1792." In M. Di Salvo & L. Hughes (Eds.), *A Window on Russia: Papers from the V International Conference of the Study Group on Eighteenth-Century Russia*. Rome: La Fenice Edizioni.

- The Black Sea Region of Russia

Jones, Robert. E. (2013). *Bread Upon the Waters: The St. Petersburg Grain Trade and the Russian Economy, 1703–1811*. Pittsburgh: University of Pittsburgh Press.

- Provinces of European Russia in the late eighteenth century
- Vegetation zones and provinces of European Russia in the late eighteenth century
- Natural waterways in northwestern Russia
- Commercial plan of St. Petersburg in the 1770s

Lin, Jan (1995). "Ethnic Places, Postmodernism, and Urban Change in Houston." *The Sociological Quarterly*, 36(4).

- Ethnic neighborhoods and major landmarks in Houston
- Ethnic sites and downtown landmarks of Houston in detail

Lin, Jan (1998). *Reconstructing Chinatown: Ethnic Enclave, Global Change*. Minneapolis: University of Minnesota Press.

- Geographic sources of Chinese emigration
- Chinatown and Lower Manhattan
- Core and satellite Chinatowns in New York City

Lin, Jan (2010). *The Power of Urban Ethnic Places: Cultural Heritage and Community Life*. New York: Routledge.

- Ethnic neighborhoods and major landmarks of Houston
- Ethnic sites and downtown landmarks of Houston
- Major heritage sites of Miami

McFarland, Gerald W. (2001). *Inside Greenwich Village: A New York City Neighborhood, 1898–1918*. Amherst: University of Massachusetts Press.

- Greater Greenwich Village, 1900
- Important Village sites, chapters 1–2
- Important Village sites, chapters 3–4
- Important Village sites, chapter 5
- The Seventh Village, 1912–1918

McFarland, Gerald W. (2014). *What the Owl Saw: Second in the Buenaventura Series*. Santa Fe: Sunstone Press.

- Don Carlos's Santa Fe, 1704–1708

- McKay, Amy. This historical map was originally produced for McKay's book entitled *The Virgin Cure: A Novel*, but was never published.
- East Village, Manhattan
- Miller, Marla (2006). *The Needle's Eye: Women and Work in the Age of Revolution*. Amherst: University of Massachusetts Press.
- Map of the Connecticut River Valley
- Pedersen, Susan (in press). *The Guardians: The League of Nations and the Crisis of Empire*. Oxford University Press.
- Exploration and control in Mandated New Guinea in the early 1930s
  - League of Nations: Mandated Pacific Territories, c. 1931
  - League of Nations: Mandated African Territories, c. 1922
  - League of Nations: Mandated Middle East Territories, c. 1932
  - Construction of the road network of Ruanda/Urundi, 1925, 1931, and 1936.
- Perl-Rosenthal, Nathan & Evan Haefeli (Spring 2012). "Transnational Connections: Special Issue Introduction." *Early American Studies: An Interdisciplinary Journal*, 10(2).
- The Dutch Empire, ca. 1640–1674
  - The Dutch Caribbean, ca. 1780
- Putney, Clifford (2010). *Missionaries in Hawai'i: The Lives of Peter and Fanny Gulick, 1797–1883*. Amherst: University of Massachusetts Press.
- The Hawaiian islands
- Reeves-Ellington, Barbara (2013). *Domestic Frontiers: Gender, Reform, and American Interventions in the Ottoman Balkans and the Near East, 1831–1908*. Amherst: University of Massachusetts Press.
- Map of the Ottoman Balkans 1831–1908, showing major towns, American mission stations, and other locations mentioned in the text
- Robinson, Donald (2011). *Town Meeting: Practicing Democracy in Rural New England*. Amherst: University of Massachusetts Press.
- Ashfield and western Massachusetts
  - Lot divisions in early Huntstown (Ashfield)
  - Locations of proprietors' meetings and town meetings
  - Water district and sewage treatment plant
  - Locations of Sanderson Academy
  - Ashfield's town common and other public spaces

- Salisbury, Neil (1996). "The Indians' Old World: Native Americans and the Coming of Europeans." *The William and Mary Quarterly: A Magazine of Early American History and Culture*, LIII(3).
- Selected Native American centers in North America, ca. 1250
  - Selected Native American centers in North America, ca. 1645
- Sawada, Mitziko (1996). *Tokyo Life, New York Dreams: Urban Japanese Visions of America, 1890–1924*. Berkeley: University of California Press.
- The fifteen wards of Tokyo in 1894
- Schwartz, Ken (2007). This historically based fantasy map was published as part of a director's guide to the play "The Odyssey," produced by Two Planks and a Passion Theatre Company in Canning, Nova Scotia.
- Odysseus' World
- Schwartz, Ken (2009). This historically based fantasy map was published as part of a director's guide to the play "Rockbound," produced by Two Planks and a Passion Theatre Company in Canning, Nova Scotia.
- The World of Rockbound
- Schwartz, Ken (2011). This historically based fantasy map was published as part of a director's guide to the play "Beowulf," produced by Two Planks and a Passion Theatre Company in Canning, Nova Scotia.
- Beowulf's World
- Sweeney, Kevin (forthcoming?).
- Towns along the Connecticut River in Massachusetts and Connecticut
  - Early town plan of Springfield, 1640
  - Early town plan of Deerfield, circa 1700
  - Western Massachusetts and central and western Connecticut, showing towns mentioned in the text
  - Gravestone material variation
  - Known movements of gravestone cutters before 1770
  - Known movements of gravestone cutters after 1770
  - Locations of known seventeenth- and eighteenth-century town houses
  - Location of town meetings in selected Massachusetts towns, ca. 1860
- Thaxton, Ralph A., Jr. (2008). *Catastrophe and Contention in Rural China: Mao's Great Leap Forward Famine and the Origins of Righteous Resistance in Da Fo Village*. Cambridge: Cambridge University Press.
- Provinces of China, neighboring countries, and area of study
  - Hebei–Shandong–Henan border area, showing location of Da Fo village

Tiro, Karim M. (2011). *People of the Standing Stone: The Oneida Nation from the Revolution Through the Era of Removal*. Amherst: University of Massachusetts Press.

- Oneida Territory in the later 18th century
- Oneida land and land cessions

Tiro, Karim M. (forthcoming).

- The view from Piqua Agency

## BIBLIOGRAPHY

- Aitken, S. C. & Craine, J. (2009). "Into the Image and Beyond: Affective Visual Geographies and GIScience." In M. Cope & S. Elwood (Eds.), *Qualitative GIS: A Mixed Methods Approach* (pp. 139–156). London: SAGE Publications Ltd.
- Berry, J. K. (2011). *Personal Geographies: Explorations in Mixed-Media Mapmaking*. Cincinnati: North Light Books.
- Bringhurst, R. (2001). *The Elements of Typographic Style, Version 2.4*. Point Roberts, WA: Hartley & Marks.
- Crampton, J. W. (2009). "Cartography: Performative, Participatory, Political." *Progress in Human Geography*, 33(6), pp. 840–848.
- Crampton, J. W. & Krygier, J. (2006). "An Introduction to Critical Cartography." *ACME: An International E-Journal for Critical Geographies*, 4(1), pp. 11–33.
- Davenport, M. (2005). "Intercultural Graphicacy: Art Educational Strategies for the Post-colonial Era." *Intercultural Communication Studies*, 14(3), pp. 40–48.
- Demko, G. J., Agel, J. & Boe, E. (1992). *Why in the World: Adventures in Geography*. New York: Anchor Books.
- Elwood, S. (2006). "Beyond Cooptation or Resistance: Urban Spatial Politics, Community Organizations, and GIS-Based Spatial Narratives." *Annals of the Association of American Geographers*, 96(2), pp. 323–341.
- Elwood, S. (2009). "Thinking Outside the Box: Engaging Critical Geographic Information Systems Theory, Practice and Politics in Human Geography." *Geography Compass* 3, pp.1–16.
- Elwood, S. (2010). "Mixed Methods: Thinking, Doing, and Asking in Multiple Ways." In D. DeLyser, S. Herbert, S. Aitken, M. Crang, & L. McDowell (Eds.), *The SAGE Handbook of Qualitative Geography* (pp. 94–115). London: SAGE Publications Ltd.
- Friendly, M. (2001). "A Brief History of the Mosaic Display." *Journal of Computational and Graphical Statistics*, 11(1), pp. 89–107.
- Friendly, M. (2005). "Milestones in the History of Data Visualization: A Case Study in Statistical Historiography." In C. Weihs & W. A. Gaul (Eds.), *Classification: The Ubiquitous Challenge*. New York: Springer
- Friendly, M. (2008). "The Golden Age of Statistical Graphics." *Statistical Science*, 23(4), pp. 502–535.

- Friendly, M., Valero-Mora, P., & Ulargui, J. I. (2010). "The First (Known) Statistical Graph: Michael Florent van Langren and the 'Secret' of Longitude." *The American Statistician*, 64(2), pp. 174–184.
- Haefeli, E. & Sweeney, K. (2003). *Captors and Captives: The 1704 French and Indian Raid on Deerfield*. Amherst: University of Massachusetts Press.
- Hall, S. S. (1992). *Mapping the Next Millennium: How Computer-Driven Cartography is Revolutionizing the Face of Science*. New York: Vintage.
- Hallisey, E. J. (2005). "Cartographic Visualization: An Assessment and Epistemological Review." *The Professional Geographer* 57(3), pp. 350–364.
- Harley, J. B. (2001). *The New Nature of Maps: Essays in the History of Cartography*. Baltimore: Johns Hopkins University Press.
- Harmon, K. (2003). *You Are Here: Personal Geographies and Other Maps of the Imagination*. New York: Princeton Architectural Press.
- Hodgson, B. (1995). *The Tattooed Map*. San Francisco: Chronicle Books.
- Jennings, K. (2011). *Maphead: Charting the Wide, Weird World of Geography Wonks*. New York: Scribner.
- Larsen, R. (2010). *The Selected Works of T. S. Spivet*. New York: Penguin Books.
- Leszczynski, A. (2009). "Poststructuralism and GIS: Is there a 'disconnect?'" *Environment and Planning D: Society and Space*, 27, pp. 581–602.
- Lin, W. (2013). "When Web 2.0 Meets Public Participation GIS (PPGIS): VGI and Spaces of Participatory Mapping in China." In D. Sui, S. Elwood, and M. Goodchild (Eds.), *Crowdsourcing Geographic Knowledge: Volunteered Geographic Information (VGI) in Theory and Practice*. New York: Springer.
- Monmonier, M., & Schnell, G. A. (1988). *Map Appreciation*. Upper Saddle River, NJ: Prentice Hall.
- Monmonier, M. (1993). *Mapping it Out: Expository Cartography for the Humanities and Social Sciences*. Chicago: University of Chicago Press.
- Monmonier, M. (1995). *Drawing the Line: Tales of Maps and Cartocontroversy*. New York: Henry Holt and Company.
- Parker, M. (2010). *Map Addict: A Tale of Obsession, Fudge & the Ordnance Survey*. HarperCollins; Reprint edition.

- Raisz, E. (1948). *General Cartography*. New York: McGraw-Hill.
- Raisz, E. (1962). *Principles of Cartography*. New York: McGraw-Hill.
- Robinson, A. H. (1952/2010). *The Look of Maps: An Examination of Cartographic Design*. Madison, Wisconsin: University of Wisconsin Press. Reprinted in 2010 by ESRI Press in Redlands, California.
- Rosenberg, D. & Grafton, A. (2010). *Cartographies of Time: A History of the Timeline*. New York: Princeton Architectural Press.
- Schalansky, J. (2010). *Atlas of Remote Islands: Fifty Islands I Have Not Visited and Never Will*. London: Particular Books.
- Sheppard, E. (1995). "GIS and Society: Towards a Research Agenda." *Cartography and Geographic Information Systems*, Vol. 22, No. 1, pp. 5–16.
- Solnit, R. (2010). *Infinite City: A San Francisco Atlas*. Berkeley: University of California Press.
- Solnit, R. & Snedeker, R. (2013). *Unfathomable City: A New Orleans Atlas*. Berkeley: University of California Press.
- Stolzenburg, W. (2011). *Rat Island: Predators in Paradise and the World's Greatest Wildlife Rescue*. New York: Bloomsbury.
- Tufte, E. R. (1990). *Envisioning Information*. Cheshire, CT: Graphics Press.
- Tufte, E. R. (1997). *Visual Explanations: Images and Quantities, Evidence and Narrative*. Cheshire, CT: Graphics Press.
- Tufte, E. R. (2001). *The Visual Display of Quantitative Information*. Cheshire, CT: Graphics Press.
- Turchi, P. (2004). *Maps of the Imagination: The Writer as Cartographer*. San Antonio, Texas: Trinity University Press.
- Wilkie, R. W., & Blackmer, K. (Second Edition: 1997). *Map Skills Workbook*. Minneapolis/St. Paul: West Publishing Company. (This workbook was designed to accompany *Geography: People and Places in a Changing World* by P. W. English.)
- Wilkie, R. W., & Tager, J. (1991). *Historical Atlas of Massachusetts*. Amherst: University of Massachusetts Press.

- Wilmot, P. D. (1999). "Graphicacy as a Form of Communication." *South African Geographical Journal*, 81(2), pp. 91–95.
- Wood, D. (2003). "Cartography is Dead (Thank God!)." *Cartographic Perspectives*, 45, pp. 4–7.