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Mapping Folklore

The earliest folklorists were keenly aware of the power that visual representations have as analytical tools. Julius and Kaarle Krohn's methodology for the study of folklore variants, originally predicated on the study of oral narrative, but later adapted for most forms of folkloric expression, required the use of geographical representations—maps—as a means for understanding not only the distribution of variant forms, but also for tracing the development and spread of those forms. The method, often referred to as the "Historic-Geographic Method," ultimately proved untenable, focused as it was on the discovery of urformen (original forms) and a fairly simplistic—or at least unrealistic—model of stasis, change, transmission and distribution. 1 Nevertheless, this "Finnish" method recognized the profound impact on thinking that the map can have as a means for understanding places related to memory, recollection and performance.

The method was codified by Antti Aarne in Leitfaden der vergleichenden Märchenforschung (Manual for Comparative Folktale Research) (1913; Chesnutt 1993, 236) and later presented in Die folkloristische arbeitsmethode (Folklore Methodology) (Krohn 1926) as a how-to guide for implementing the method in the study of a folk expression and its variants. Alternately labeled "the comparative method," the "cartographic method," the "historic-geographic method,"

and the "Finnish method," the adaptation of this method as the defining approach in folkloristics resulted in a large series of studies, many published in FF Communications (FFC). In its early years, FFC became a de facto factory for the dissemination of these results. Apart from Aarne's numerous monographs on various folktale types, the most impressive of these comparative studies in the first quarter of the twentieth century include Walter Anderson's Kaiser und Abt (Emperor and Abbot), considered among the most important application of the method to the study of jocular tales (1923); Waldemar Liungman's study of the princess in the earthmound (1925), one of the more thorough applications of the method; and Reidar Christiansen's study of the two travelers (1916). The method also led to the development of many of the standard reference works for the comparative study of tales, including the tale type index, the motif index and the catalog of the migratory legends (Uther 2004; Thompson 1955-1958; Christiansen 1958). In more recent years, scholars such as Christine Goldberg have attempted to rehabilitate the method (1993; 1997). It is interesting to note that the number of actual maps included in these studies is small, in part because of the difficulty and costs associated with producing hand-drawn maps, but also because of the limited amount of data, and the limited types of maps largely point distribution maps—that the method required. Nevertheless, there are several important concepts from the historic geographic method that still are applicable in our attempts to understand traditional expression and the processes by which traditions are created, circulate and change. Without too much trouble, these concepts can be incorporated into a more considered and a more wide ranging appreciation of the roles that history and geography play in conditioning traditional expression. This wider understanding, in turn, can inform decisions regarding what to map, and how to analyze the resulting maps.

Although the original historic geographic method focused entirely on texts, and made scant mention of the collectors, the tradition participants, and the local social and economic forces that shaped the collections, a new historic geographic method needs to consider each of these as part of the folkloric process. Indeed, it is incumbent on contemporary folklorists to extend the appreciation of historical and environmental forces that influence the development of tradition to include factors that are not considered in the original method. The visual representation of interconnectedness of each of these relationships through maps as well as through what Franco Moretti labels graphs and trees provides a more accurate representation of the complex relationships that result in a folklore recording than the simple maps of the earlier Finnish method (Moretti 2005).

In central Europe and the Nordic countries, a cartographic approach to folklore and folklife studies emphasizing regional variation and local social contexts began to find adherents as early as the the 1920s (Sanderson 1971, 90). The idea of mapping folklore was already conceived in 1857 by Wilhelm Riehl, but it was not until the early decades of the twentieth century that it gained intellectual traction among folklorists (Wiegelmann and Cotter 1968, 188). Instead, mapping was largely claimed by dialectologists and, with the Krohns, researchers engaged in the study of the historical development of expressive culture.

In Scandinavia, Sigurd Erixson's work with the *Nordiska Museet* and his close collaboration with Åke Campbell led to the production of the *Atlas över svensk folkkultur: materiell och social kultur* (Atlas of Swedish Folk Culture: Material and Social Culture, 1957). This comprehensive ethnographic atlas describing the distribution of a broad range of distinct

cultural expressive forms documented across Sweden was inspired by similar projects in Germany, Austria, the Netherlands, Poland and other central European countries in the decades leading up to the Second World War. With these atlases as models, the Swedish atlas emphasized aspects of material culture and folk life rather than narrative traditions. Erixon, along with colleagues from Germany and Holland, was also deeply involved in early discussions about the production of an ambitious pan-European ethnological atlas, a project that has yet to reach fruition (Sarmela 2009, 17).

The German atlas was the most ambitious of the early atlases of folk culture. The effort was initiated by a young folklorist, Lutz Mackensen who, in the late nineteen twenties and early nineteen thirties, was a faculty member at the University of Greifswald. Although hired to teach German and Nordic philology, he soon became a key figure in establishing folklore at the university. He founded the folklore archive for Pomerania and, in his capacity of director of the archive, began the process of compiling material for what he envisioned would be a comprehensive Atlas für Volkskunde (Atlas of Folklore), describing the folk culture of Germany. He also initiated important contacts with colleagues in Sweden, and this collaboration doubtlessly influenced the development of the atlas of Swedish folk culture. Mackensen's project was interrupted by the war, with his co-editor Erich Röhr falling in battle in 1943, and his collaborator on the Pomeranian atlas, Karl Kaiser, falling in battle on the western front in 1940 (Boberg 1953, 65). Eventually Mackensen's early work led to the publication of a greatly abbreviated edition of the Atlas der Deutschen Volkskunde (Atlas of German Folklore) (Harmjanz and Röhr, 1937-1939). After the war, the atlas project evolved into a massive undertaking based on largely questionnaire-based data collection. Starting in the 1950s, volumes of this new

atlas, now edited by Matthias Zender, began appearing under the title *Atlas der Deutschen Volkskunde (II)* (1958-1982). This work on the cartographic representation of variation and distribution of folklore and folklife was echoed not only in the work of European scholars in the ensuing decades, but also in the work of American folklorists, such as Henry Glassie (1971).

Apart from Sweden, Finland was the only other Nordic country significantly involved in the folk atlas enterprise. Neither Denmark nor Norway ever produced comprehensive atlas of folk culture, a fact attributable to the greater emphasis in those countries on folk narrative culture. Work on a Finnish folk cultural atlas began already in the late 1930s but, as with many of these major national undertakings, it was interrupted by the war. In 1945, Ragna Ahlbäck published Kultur-geografiska kartor över Svenskfinland (Cultural Geographic Maps of Swedish Finland), a project that focused specifically on the Swedish-speaking minority in western Finland (Sarmela 2009, 16). In the mid 1970s, Martti Sarmela took charge of the broader and more comprehensive Finnish Folklore Atlas (2009). This atlas was preceded in the mid 1970s by an atlas of Finnish material culture (Vuorela 1976). Whereas earlier atlases of folk culture were largely dependent on hand-drawn maps, and made little use of Geographic Information Systems (GIS) or statistical approaches to data representation, Sarmela's work has taken advantage of the technological advances of the past three decades. The Finnish Folklore Atlas, with its ninety-nine excellent maps stands as a natural bridge to the dynamic mapping of expressive folk culture. In this approach, multiple phenomena—historical maps, land use maps, satellite imagery, field collecting routes, biographical data of informants, and the distribution of folk expressive culture—can all be projected into a single mapping

environment allowing for sophisticated analysis and visualization of the data.

Since the mid 1990s, several technological developments have made it possible to reincorporate mapping and geography in the study of folklore: inexpensive computers have become increasingly powerful both in terms of computation and visual display; mapping software has become far more user friendly than it once was; and large scale digitization projects have made resources available for use across the internet. Consequently, connecting maps—the production of which had been largely a mechanical operation limited to highly trained cartographers—with large databases of historical data has become possible. This ability to connect large amounts of "attribute data" (e.g. stories or songs) to geo-referenced historical maps holds the promise of making the geographic visualization of historically collected data a potentially productive component of any folklore research.

The computational approach to the geographic visualization of historical data and the relationships encoded in that data is generally labeled historical Geographic Information Systems or historical GIS (Gregory and Ell 2007, 15). Historical GIS as a methodology for the study of historical data in the context of geography goes far beyond the cartographic representation of historical data. Anne Knowles emphasizes that "GIS allows familiar evidence to be re-examined... so that long-standing interpretations can be challenged" (Gregory and Ell 2007, 16). One of the main avenues for challenging earlier assumptions is through the visualization of the geographic relationships that exist in most historical collections of documents or cultural expressions. Several examples of historical GIS successfully challenging established ideas include Geoff Cunfer's study of the causes of the Dust Bowl and Knowles's exploration of "view sheds" at Gettysburg (Knowles et. al. 2008). In both cases,

researchers were able to couple historical accounts to historical maps, and use the tools of GIS to discover patterns and subsequently provide convincing arguments based on those patterns that have led to broad reassessments of historical events.

One of the main challenges of historical GIS is reconciling on the one hand imperfect databases that are replete with missing values and information that cannot be easily quantified with, on the other hand, an approach that is fundamentally based on the mathematics of graphs. Earth scientists, climatologists, geologists, demographers, urban planners and so on have used GIS for many years. Their databases tend to be very large, focus on easily quantifiable values, and incorporate measurements from remote sensing. Folklorists, historians and cultural geographers, on the other hand, tend to deal with data that is hard to quantify, is sparse, and often imprecise. Early claims about the role GIS would play in revolutionizing the study of cultural geography were met with equally hard pushback (Gregory and Ell 2007, 14).

The important criticism of GIS as "the very worst sort of positivism" stems in part from the overtly quantitative nature of GIS (Taylor 1990, 211; cited in Gregory and Ell 2007, 14). Complex historical data is reduced to points on a map, and various statistical applications are then applied to these points, providing seemingly very accurate visualizations of fundamentally fuzzy data. This criticism of the positivist tendency in GIS could also be applied to the earliest historic-geographic method in folklore. Although this early approach to mapping folklore did not make use of computers and statistics, it proposed that mapping variants of folk expression would make clear the geographic and, by extrapolation, historic origins of that expression. In essence, the early historic-geographic folklorists reduced their variant data to simple point data, and then proposed an essentially

positivist and reductionist view of similarity and folklore transmission. A contemporary application of mapping to folklore could easily fall prey to the positivist fallacy that the representations are an irrefutable "result" and not simply the starting point for further analysis. Recognizing the incomplete nature of the underlying data as well as the biases that exist within the data, such as Grundtvig's instructions to collectors or Tang Kristensen's own bias toward older people from central Jutland, are important steps toward recognizing the limitations of this approach.

Gregory and Ell offer an important refutation of the criticism of historical GIS as essentially positivist (2007). They note that the "quantitative nature of spatial data does not mean that spatial analysis is necessarily positivist. In many ways, it can be the reverse, as rather than trying to produce aggregate summaries of an entire study area, it allows us to explore how different parts of the map behave differently. Therefore, rather than searching for similarities, much of spatial analysis is concerned with how different places behave differently" (Gregory and Ell 2007, 161). This emphasis on how different parts of the map behave differently both across space and across time is a key goal of the GIS component of this study. Taylor, who launched the critique of GIS as a positivist enterprise, eventually conceded that GIS offers geographers the ability to "portray the world in a complexity and detail that their predecessors could hardly [have] imagined" (Taylor and Johnston 1995, 63; cited in Gregory and Ell 2007, 14). The role that historical GIS should play in the study of folklore will likely be a subject of continuing debate, while the abandonment of mapping in folklore precipitated by the failure of the underlying theoretical basis of the "Historical Geographic method" should be revisited. Hopefully, the maps and the analysis of those maps available

here will help the process of rehabilitating the role that maps and their analysis can play in folklore studies.

Historical GIS (and its application in folklore) is not limited solely to the display of historical data on historically accurate maps. An important goal of historical GIS is to temporal dimension couple to the geographic representations of data. Unfortunately, combining temporal data with geographic data is not as easy as it might seem since plotting change over time can quickly become quite complex (Gregory and Ell 2007, 61-62). In this exploration of Tang Kristensen's folklore collection, a "snapshot" approach is used: rather than trying to present the flow of time as fluid, time is presented in slices. So, for example, fieldtrip routes cover only a fixed time frame, encompassing the start and end of any trip. Since fieldtrips can be displayed simultaneously, they allow one to visualize a certain "fiction" that compresses time. Other map layers that could be added, such as census data, would similarly present a "snapshot" view of time, freezing the population counts and the parish boundaries at a distinct moment; aggregating these across ten year intervals would present a similarly fictitious view of time as a geographic projection.

GIS allows one to treat the mapped data as a graph. Because the mathematics of graphs is well described, this approach allows one to calculate meaningful relationships between the nodes and edges that comprise the graph. Most GIS software allow one at the very least to calculate relationships between points on the map. These calculations can provide a basis for later analysis. As long as one exercises caution and does not fall prey to the positivist fallacy that these representations are anything more than a useful model on which to build analysis, these tools can be quite powerful. Oppenshaw, one of the leading proponents of the benefits of GIS, acknowledges that this approach "would not offer

complete scientific understanding but would instead only offer insights into patterns and associations found within the data" (Gregory and Ell 2007, 14; cf. Oppenshaw 1991). The use of mapping in this project aligns with these goals—the maps and mapping tools are intended to assist in pattern discovery and provide a rich visual representation of the underlying relationships between Tang Kristensen, his informants, their repertoires and the physical environment in which they lived and worked. At the same time, one has to be cautious that one does not get seduced by the maps. Gregory and Ell raise a yellow flag, noting that maps "have the ability to present deceptively simple patterns, either deliberately or through poor cartography, and they are often attractive products that appear to be meaningful, but tell us very little" (2007, 89). The study of folklore is not the study of maps but maps can be useful in developing a more sophisticated understanding of the relationships between parts of the folkloric equation.

Despite the shortcomings that are inherent in GIS in general and historical GIS in particular, the application of historical GIS to folklore study has certain clear advantages over disregarding altogether geographic representations of the data and relationships in the data. Maps that represent both the endeavors of collectors and the political dimensions of their endeavors—dimensions that are often reflected in the landscape—help one understand the scope of the collecting and allow one to interrogate the ideology of that collecting. Exploring the scope of these collecting trips as they change over time may reflect changes in the underlying philosophy of collection—where do people at the time of collection perceive folklore to be most readily available? Similarly, the changes in the scope of these collecting trips may reflect changes not only in communication and transportation infrastructure but also in land use. Accordingly, connecting

maps of fieldtrip routes to maps that show shifting patterns of land use, demographic change, and infrastructure development afford more sophisticated views of folklore collection.

In this study, map layers are included that show all the collecting trips that Tang Kristensen took on which he visited any of the five main informants—Bitte Jens Kristensen, Jens Peter Petersen, (Ane) Margrete Jensdatter, Kirsten Marie Pedersen and Peder Johansen. The routes are close approximations of the routes traveled and not exact paths, as they are based on his travel descriptions in letters home and in Minder og Oplevelser, and the evidence about the order in which he visited informants as reflected in his field diaries. The actual roads that he chose to travel, or the portion of the routes that he traveled by rail as opposed to by carriage, have been guessed. In some cases, it has been possible to trace the route exactly, either because there is only one path between one location and another, or because he explicitly describes how he traveled; as the train system was developed, routes have been drawn for long distances that follow the tracks. In other cases, the routes have been "snapped" to the most likely path. Nevertheless, these routes are "fuzzy" and bring to the fore the need for caution discussed above.

This same type of "fuzziness" exists in many of the other map layers as well—while people are placed in the landscape with some precision, that precision is limited by the existing information. The historic base map layers are themselves an act of interpretation and approximation; simply projecting them into a mapping environment requires acknowledging the distortions inherent in projecting an area that exists on a sphere (the earth) onto a two dimensional representation.² Similarly, errors in this information can be introduced by faulty memory on the part of informants, faulty recording on Tang Kristensen's part, faulty record-keeping on the part of

census takers and church administrators, and faulty description on the part of local administrators and surveyors. As long as one approaches the material with the same caution that one brings to any historical source, the maps provide a reasonably good illustration of the relationships in the underlying data.

Plotting where people lived, where they worked, where they studied, where they went to church, where they were born and where they were buried is a surprisingly informative endeavor. Early folklore collectors and scholars paid scant attention to the people who actually created and perpetuated the folklore that otherwise so captivated their scholarly attention. Early on, Tang Kristensen became interested enough in his informants to note their names and where they lived. As his collecting expanded, he used these annotations to plan future visits—he was always eager to revisit prolific storytellers—and to further his own developing ideas of the distribution of folklore throughout Jutland. Eventually, he began augmenting his folkloric collections with ethnographic descriptions of everyday life throughout Jutland and this inevitably led to collecting short biographies from hundreds of his informants. By coupling Tang Kristensen's information with information from the national census and church book records, it is possible to develop a fairly in-depth biographical sketch of each of his storytellers. This sketch includes place of birth, place of death, and various residences at the ten-year intervals of the census. Accordingly, one can plot for these informants a map that reveals their physical mobility and, by correlating this with cadastral survey information—that includes taxation records for plots of land—as well as the occasional probate record, a general picture emerges of their economic status and its trajectory over the course of their life. Similarly, one can trace people's mobility in the context of shifting land use patterns and in the context of changes in the

general economy from one that was purely agricultural to one that was increasingly industrial.

In the realm of folklore, one of the main things that maps can show us is the connection between things—between people, between people and places, between people and stories, and between stories and places. The study of folklore is, at least implicitly, closely related to the study of social networks. Although there is not much explicit network information in Tang Kristensen's collection materials, there is a substantial amount of implicit material. Certainly, his descriptions of how he discovered storytellers—usually with the help of local teachers and ministers—describe one such network. Other networks—such as those defined by family relationships or occupational relationships—can also be inferred through the data. Maps help illustrate not only how people are connected but also how the physical environment influences those connections. Maps that show where informants lived and how they moved during the course of their lives are an important component of these social networks. Plotting these networks—the points showing where people lived, and the edges showing connections to other people—onto historical maps that were made at the time of the collection can help uncover phenomena related to the physical environment that may go unnoticed in more standard social network visualizations. These phenomena can include changes in land use practices; social or political institutions such as schools, associations and churches; transportation and communications infrastructure; and changes in class affiliations. For example, standard social network visualization might not reveal that a network stretches along the eastern coast of Jutland, closely following the railway lines. Similarly, a non geo-referenced social network map might not reveal that members of a network are

separated by great distance, or that a network is concentrated in a single parish.

Plotting the location where each folk expression was collected is a straightforward undertaking and this map necessarily intersects both the route maps and the informant maps described above. It is also the main type of map that one finds in the "Historical-Geographic" method. Ultimately, this type of map is of limited interest, unless it is combined with a series of other maps (or "map layers"). Fortunately, current mapping environments allow one to easily combine map layers to produce composite pictures of underlying data. As this information is stored in a database—a "geodatabase" in the parlance of geographic information systems (GIS) one can limit the information displayed in each layer by structured queries. Whereas the early historic-geographic studies could only display one set of information at a time the locations where a particular song that included a specific motif were collected for instance—a GIS environment allows for far greater complexity. For example, one can quickly refine the previous map to display locations limited by the gender of the informant and limited to a series of collecting trips.

Another productive series of maps are related to the folk expressions themselves. If the other types of maps described above are related to issues of collecting and tradition groups—the "external" life of tradition, this other series of maps is related to the "internal" life of tradition. The most important of these maps is one that plots story points: places mentioned in stories. Frequently, stories mention more than one place—in Tang Kristensen's collection, some stories include six or seven place names. Because of this complexity, constructing even a simple map of places mentioned in a story can be an arduous task. This becomes even more difficult given the ambiguity of place names in nineteenth

century Denmark. Place names can also be personal names, spellings of place names change, places disappear and, since many of the places mentioned in stories are based on local knowledge, many do not appear in any standard place name lists (gazetteers). Consequently, automatic discovery and tagging of place names lacks the precision necessary to create accurate maps. Despite these difficulties, these maps offer a window into the conception of "place" as expressed by the storytellers.

Using detailed maps from the area that were made at the same time the story was told allows one to provide a visual representation of landscape features, both natural and manmade, that are reconfigured through the performance of those stories (Gunnell 2008). This approach allows for several important visualizations of the story. On the level of an individual story, one can easily access the places mentioned in the story, allowing one to see the place in relationship to landscape features—swamps or rivers for example—as well as the proximity of places to one another. If the Devil is challenged to a race, for example, it is interesting to see the "race course." For a person well steeped in local knowledge, a map may be extraneous, but for later audiences it provides a much richer basis for understanding the story. One can similarly situate the "action" of the story in geographic relation to the storyteller—did the story take place in the immediate region, or did it take place at some distance? This "narrative distance" can inform a subsequent analysis of the story.

Story points can also be aggregated across an individual's repertoire, or across other categories such as genre, motifs, informant gender, informant age, date of collection, or any other category—or combination of categories—available in the underlying database. Aggregating across an individual's repertoire allows one to see all the places mentioned in the

person's repertoire, providing a visual representation of the storyteller's "narrative reach." Similarly, one can get a sense of whether the individual tends to situate action close to home, or at a distance. If one selects only for stories with negative resolutions, and then contrasts that with stories with positive resolutions, one can quickly get a sense of the difference—if any—in how "close" the informant chooses to situate these stories to where he or she lives. It is not difficult to calculate a mean distance from the places mentioned in an individual's repertoire (or a subset of those stories) to where the individual lives. This selection can be made even narrower by using limiting factors such as motifs (ghosts, witches, murder, and so on). Other types of aggregation and comparison of stories based on places mentioned are limited solely by the data available. One could, for example, look at a series of repertoires—perhaps those of individuals connected to each other in an explicit or implicit social network—and map the locations mentioned in their stories, again conditioned by aspects of the stories themselves.

Each of these map layers—those describing the field collecting trips, those describing the informants, and those describing the stories—can be projected on top of different base maps. This project makes use of a historical map series from the *Videnskabelige Selskab* (Danish Academy of Sciences) as the base map; these historical maps are available at two levels of resolution, and thereby provide a reasonable historical approximation of the relationship between towns, villages, farms and churches. Although they were drawn after the major land reforms of the late eighteenth and early nineteenth centuries, they still predate Tang Kristensen's major collecting efforts by nearly fifty years. Switching between these base maps can in itself be an interesting exercise in understanding the significant shifts in spatial

organization and land use in Denmark since the mid nineteenth century.

Bringing all these maps together into one viewing environment and allowing one to plot one's own path of discovery through this interconnected thicket, is a big step toward achieving an ethnographically "thick" representation of folklore (Geertz 1973). The maps are not an end unto themselves. They provide a basis for asking additional questions that otherwise would be impossible to answer. As Gregory and Ell note, maps are "good at illustrating a story, but poor at telling it" (2007, 90). They further caution that there is a risk with GIS, "where slick graphics, clever technology and exciting presentation are emphasized at the expense of high-quality scholarship that attempts to describe and explain the geography of the research topic" (Gregory and Ell 2007, 105). Even though the accompanying maps are unavoidably exciting, the hope is that these maps augment the analysis of repertoires presented here, and offer a starting point for additional analysis of this material.

Ultimately, this "thick" approach to exploring folklore collections offers a more meaningful visualization of the geographic relationships that exist in any folklore collection. These relationships include that of the collector to an area of collection; the collector with his or her informants (and vice versa); the collector and the collected folklore; the informants and their folkloric repertoires; the informants and each other; the informants and the environment in which they live; the environment and the performed instantiations of the folklore; and the possible thematic or linguistic affinities between expressions in a single repertoire or across many repertoires. All of these relationships are interdependent. The approach described here, a new "Historic-Geographic" method, recognizes the historically situated component of the underlying relationships in a folklore corpus, and also

acknowledges the close relationship between place and folklore.

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Notes

¹ The method has also been referred to as the "Cartographic Method," recognizing the importance of drawing maps depicting the distribution of variants for this approach. Von Sydow, who was one of the most prominent critics of the method, explores some of the flaws in the underlying premises of the theory in his articles "Om traditionsspridning" ["On the spread of tradition"] (1932; translated and reprinted 1948b).

² Just because the data is distorted does not mean that it is without use—for example Mercator projections greatly distort our view of the earth, but are used frequently to understand geographic relationships or to find driving directions.

³ Unlike the vector data that forms the basis for the folklore specific layers, these base layers are georeferenced raster data. An excellent discussion of the differences between vector data and raster data can be found in Gregory and Ell (2007, 23-30).

⁴ The cadastral survey maps from the 1880s would be the ideal map set for this study, since they provide the most detail. Their resolution is so fine that at times the detail can obscure the big picture. These maps are not included here because of Danish copyright law; ideally, the cadastral survey maps could be accessed from the *Kort og Matrikelstyrelsens* own servers in Denmark. A project known as digdag (http://didag.dk) promises to make these maps available as a web service to

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academic projects. Future updates to the Danish Folklore Nexus may be able to take advantage of this service.

⁵ Other base layer maps, such as a general outline of Denmark with and without contemporary infrastructure overlays, and satellite imagery (or a hybrid map) can be used as the base layer in the accompanying browser as well. These layers are accessed through ESRI (Earth Sciences Research Institute) servers or directly from the accompanying DVD.