# Chapter 5: Datafied Landscapes and Located Maps

## Maps and Photographs

The difference between the up-in-the-air photograph and the map is not as great as the difference between the map and the down-to-the-ground landscape. Indeed, aerial photography and map making have much more in common. Both genres of image depict the world without visibly having either a particular subject’s view angle or even a general human view angle. Given the similarity between aerial photographs and maps, some authors, such as Anthony Vidler, claim that both image genres have their foundation in the representation of the human view from above.[[1]](#footnote-1) Aerial photography, because it is free from the constraints of human existence on the surface of the Earth and perspective systems which are relative to this way of being, provides a big picture which functions topographically while appearing cartographical. And Christine Buci-Glucksmann also defined such an ‘Icaro-cartographic’ view by asking: ‘Does the cartographic eye of the earth already reveal to us a truth that the Icarian eye of a technologically programmed world would conceal from us?’[[2]](#footnote-2) An ‘Apollonian perspective is implicit in Ptolemaic cartography’s positioning of the observer at sufficient distance to see the spherical Earth’, wrote Denis Cosgrove.[[3]](#footnote-3) The media evolution of an image genre in which aerial photography and map making are combined was so rapid and intense that Fred Moffit named it an era of ‘aero-photographic mapping’.[[4]](#footnote-4)  In this chapter, however, I will show how the small differences between aerial photographs and maps changed with their dataification.

Yet, at the very beginning of the implementation of aerial photography, map making and photography were still being treated as distinct practices. For instance, the map and photograph were used not only to represent space bellow, but also for mutual testing how space was being represented. During the First World War, the aerial view or bird’s eye view was still a novel experience. Only a very few soldiers, being also aviators, ever actually went into the wild blue yonder and climbed high into the sun. And most of these soldiers were not yet accustomed to the view. They required additional support for their own eyes, in terms of some proof for the correlation between the location on the map and the location which they saw while they were flying. For this reason, so as to double check the reality of their own perception, some pilots sketched maps on the palms of their hands. Soon after WWI, aerial photography began to be combined with map making independent of human verification that the map and the photograph in fact reference the same information.[[5]](#footnote-5) The principle motivation for combining these image genres, at least in the armed forces, was not only to control the space represented, but also to correct this data through the reciprocal testing of each form’s accuracy. And across the 20th century, with the acceleration in their use by the military, these two image types have become increasingly merged.[[6]](#footnote-6)

After a time of acclimatization to an aerial view which combined ways of seeing from both photograph and map, further similarity between two image genres become clear. When comparing aerial photography to ordinary photography, the photographer has fewer choices for how they do the recording, such as less possible view angles, and even more objects on which to focus. By reducing the range and variety of subjective aesthetic choices in how the photographer can represent the landscape, aerial photography shifts from an aesthetic framework to a practical and utilitarian purpose.

Even so, there are differences between aerial photographs and maps. When comparing aerial photographs to map making, for example, there are no scales in aerial photography which provide a ratio between the distance in the image and the distance on the ground. This makes spatial distortions in the image less clear at a first glance because they have no metric parameter. And such distortions produce ‘noise’ in our interpretation of our own habitat. At least, this was a problem until the image genre became digitized, and aerial photographs could incorporate the kind of measurement systems that have long been included with maps. While in the early 20th century aerial photographs may have looked like maps but did not function like maps, since the 1950s with the digital turn, the possibility of full integration between aerial photography and map making became possible.

## Datafication of Geography

The first experiments with imaging techniques which would lead to digital map making were already being undertaken after WWII. Yet it took many years for these techniques to become fully functional. And the mid-20th century wave of simultaneous digitization and datafication had a strong influence on our image of the world, regarding both photographs as well as maps, profoundly changing these image genres and, ultimately, even connecting them.

The first pre-digital experiment with mapping was undertaken in the project *The Streets of London* (1944) by the British company Nextbase. The *Glasgow Online Digital Atlas* soon followed. The first digital map was in ASCII format, with its code representing English characters as numbers, with each letter. Assigned a number from 0 to 127 in a reductive schema.[[7]](#footnote-7) However, it took many years for interactive maps to be developed. In 1978 the *Aspen Movie Map* project by MIT introduced the streets of the city of Aspen to the audience using photographs. With CD technology, the *Digital Chart of the World* (DCW), a comprehensive digital map of the Earth based on the United States Defense Mapping Agency’s (DMA) operational navigation chart, was developed. Still, the first years of implementation of digital maps were dedicated to the digitization of analogue media through a process of scanning, as in the *World Factbook* by the Central Intelligence Agency (CIA). Desktop and web publishing led to further developments for the map. Although only with Web 2.0, which emphasized user-generated content, ease of use, a participatory culture, and interoperability for end users, did digital cartography begin to develop. And today there are plenty of new techniques for mapping, from as augmented vision to tele-cartography.[[8]](#footnote-8) Beyond such techniques, there are cartographic games, like the *Magellan* board and video games. The digitization of maps, along with satellite photography, has also been integrated into projects such as Google Earth, Google Maps, and Google Street View, which are accessible through mobile devices .[[9]](#footnote-9) These projects, launched since 2001, 2005, and 2007, respectively, support users as they explore the Earth with comparatively realistic images which combine maps and photographs.

## GiS

Another key invention for contemporary digital geography is the Geographic Information System (GIS), a computer system designed to capture, store, analyze, and present data related to spatial or geographic data about positions of various entities or objects on the Earth’s surface. Utilizing systems like GIS in their analyses, the field of Geographic Information Science (GiScience or GiS) was established on the methodological and theoretical grounds of psychogeographic strategies for exploring urban environments. Historically, the field emerged from the Situationist International (SI) organization of social revolutionaries, prominent in Europe from 1957 to 1972, and made up of avant-garde artists as well as intellectual and political theorists. Already in the mid-20th century, in their work, aerial photography and maps were being fused together, as for example by Guy-Ernest Debord in his *Introduction to a Critique of Urban Geography* (1955) which, as Anthony Vidler notes, preserved the fundamental roles of both maps and photographs in the combined works, as with his collaged map of Paris (1956).[[10]](#footnote-10) William Bunge in *Fitzgerald: Geography of a Revolution* (1971); as well as the Experiments in Art and Technology (E.A.T.) Datascape (1966-1970), an exploratory tool for humanities scholars in social history for exploring the intersection between art and non-art contexts followed.[[11]](#footnote-11) And by the 1990s, GIS technology had evolved into a practical software.[[12]](#footnote-12) Beyond applied GiScience, art-based researchers have also developed a number of experimental methods, such as the tactical cartography of the Paris-based conceptual art group Bureau D’études, or Mapping Contemporary Capitalism (MoC) by the editors of *Mute Magazine*, among others.[[13]](#footnote-13) The psychogeographies of the mid-20th century included ‘attempts to record and represent the grain and patina of place through juxtapositions and interpretations of the historical and the contemporary, the political and poetic, the discursive and sensual’[[14]](#footnote-14)

In the GiScience of today, in addition to quantitative projects, there are also qualitative projects. These projects are used to present a critical geography in which new methods are applied to mapping services which might, for example, provide a better life quality. There are also feminist and queer geographic information systems.[[15]](#footnote-15) The FOAM Map, for example, allows the exploration of various community-verified registries of crowdsourced places.[[16]](#footnote-16) The ‘network image’, as Virilio them, today has a capacity to convey various rich information.[[17]](#footnote-17) To describe such maps, which are made not only from spatial but other kinds of information, the term ‘deep map’ is commonly used.[[18]](#footnote-18) The pioneering *Spatial History Project* at the Center for Spatial and Textual Analysis (CESTA) at Stanford University, for example, supports the development of such deep maps. In one of their projects, researchers use GIS technology to create a layered history of Rome, updating the cartographic masterpiece of ancient Roman topography, the *Forma Urbis Romae*, published in 1901 by archaeologist Rodolfo Lanciani. While the 13th century *Tabula Peutingeriana*, described previously, showed how many post-Roman cultures imagined the Roman Empire at one point in time, the 21st century *Forma Urbis Romae* shows how the city of Rome changed over time from the retrospective vantage point of today.[[19]](#footnote-19) The outcome of such works from Stanford’s *Spatial History Project* have not only informed the fields of visual studies and visual history, but improved how space is being visualized, leading to new kinds of interaction.[[20]](#footnote-20) Other such projects which implement a critical geography include artistic projects like GPS Art by Michael Wallace, who drives around on his bike as it is tracked with GPS in order to outline various figures on a map, or the *Tangible Disaster Information System* developed by the Tangible Media Group at MIT, a collaborative tool. For planning disaster measures based on simulations using GIS.[[21]](#footnote-21) And there are those which are based on crowd sourcing and social networks. Such artistic experiments show that control is not the only possible outcome for digital mapping, but that new tools can also be developed for the betterment of society.

## Space and GIS

GIS has introduced large change in the way we orientate by using maps, so for example the navigation feature for Google Maps employs the reader of the map no longer has to navigate wander on the map, in the search of the place. Maps have long been thought of as objective, in large part because they are made in a Cartesian space and with location descriptors. But an element of subjectivity was still involved, because such maps were used by viewers who were engaged in ‘reading’ them, and who located themselves in relation to both the map and the world. Today, however, place is represented not by a coordinate system but rather the system’s coordinates, which automatically position the viewer in relation to the data.[[22]](#footnote-22) This re-introduction of the specific into the genre of the map is not only because Google Maps and other mapping systems turn our spaces of imagination into a concrete, unique, and physically precise place.

As a consequence of the Geographic Information System, at least according to Alberto Toscano and Jeff Kinkle, local placement has become privileged over general picture in the post-digital era.[[23]](#footnote-23) When using such geoprocessing, such as with the free-to-use and easily accessible proprietary web application Google Maps, the user becomes caught up in a passive logic within a system that self-organizes around them while allowing only a portion of the Earth to be visible. We use devices to locate ourselves in maps and photographs which are taken not from a human perspective down on Earth but from an eye-in-the-sky perspective up in the air. In so doing, however, they deprive us from the process of placing ourselves in the larger geographic area, which we would need in order to understand the geographic specification, as we are being placed by the system, not our own action of the navigation.

While conveying a great deal of information, becoming total, all information are situated and particular around placement of the user loosing insight into a total image. Geo-positioning triangulation, aerial photography, and images of outer space have all lead to a cartography which is far from the ground, producing total images, while simultaneously tracking the user.[[24]](#footnote-24) Contemporary geographic imaging and representing technologies, contrary to drawings on palms of pilots, may pinpoint our location in a map, by the use of the global navigation satellite system (GNSS), global positioning system (GPS), and geographic information systems (GIS) which together provide geolocation and time information to a receiver anywhere on or near the Earth.

Figure 21: GPS information in photography (screenshot)

Figure 22: Hyperimage with place tags (screenshot)

## Tagging Landscapes

With each new technological means for geographic abstraction, the ways in which we represent space and place changes substantially, as new roles are assigned to the landscape and its parts which serve not to depict but to classify. New modes of visual representation, when applied in map and landscape making, have changed how we understand our habitat as well. These days, landscapes are highly coded with linguistic and symbolic information. Geographic information systems, designed to capture, store, manipulate, analyze, manage, and present spatial and geographic data, also allow users to create interactive queries to analyze spatial information, edit data in maps, and present the results of these operations, adding non-geographical data to place.[[25]](#footnote-25)

Since of now, turning them into complex image-text collages. Name-tags are attached to photographs, making them complex collages. Such place names or toponyms, according Matthew Johnson, ‘continue to be an invaluable source of information, particularly in the topographical information they provide,’ as it is possible to reconstruct ideas, narratives, purposes and values a society that made a certain map, out of the toponymic names on the map.[[26]](#footnote-26) Mapping over a photograph is often even accompanied by crowdsourced data tagging, with crowd tagging and over-tagging. Using the navigation feature in the Google Maps application, a user of the map now moves through a dynamic system of explanation, rather than simply wandering the streets of a city or the hills of a wood in search of a place. These practices of naming and renaming are interesting because they indicate the specific meanings which become attached to the places on a map.[[27]](#footnote-27) Crowd-sourced name-places are also available as GIS tools on platforms.[[28]](#footnote-28) A number of users can crowd-name the same location producing a cacophony. So, for the artwork *The City Formerly Known as Cambridge* (2008), the artist Catherine d’Ignazio (known as kanarinka) held a series of thirteen events in which she invited members of the public to rename the public spaces in the city of Cambridge, Massachusetts, collecting over 300 new names for crowd-sourced maps.[[29]](#footnote-29)

## Neither Maps nor Photographs

The post-digital age has lead to more interactive maps, bringing with it different kinds of interactivity and user-orientation, such as the browseability of fixed maps (while at the same it is possible for users to navigate aerial or street-view photographs as well). In the post-digital era, thus, map and landscape are merged as data are introduced into another map. Moreover, different types of maps are merged with the landscape, which carry not only information on place and space, but also spatially organized information, as geo-positioning and geolocation which effectively maps the user.[[30]](#footnote-30) By merging landscapes and maps, precise places with spaces, and direct visions with visualizations, all previously strictly divided spatial descriptions are merged, and in a way – confused. Qualities of two previously separate genres fuse, and in a way mutually contaminate.

Fusing together this enormous amount of data, some of which are also maps, the medium as photography loses its vagueness, by which something that necessary exists is not the place we necessary recognize. Being precise and deictic, photographs are obliged to represent and lose the artistic vagueness characteristic for the medium. Among such data, geo-mapped photographs play a large deal, as they are simultaneously while used for mapping the road, used for targeting and evading the privacy. Today, most photographically based images are automatically encoded with location data. Maps situate photography in place which can be tracked and found. Today most of the cameras automatically precise the place via GPS, while GIS mapping can be introduced to mobile phones, already traced by satellites. Once set on the network such images directly produce data that can be used in order to engage many actions, even the complicated ones of satellite tracing.[[31]](#footnote-31) Such new total images connect the devices to the internet, even acquiring an Internet Protocol (IP) address, and with direct implementation of GPS and GIS technologies, superimpose traceability of to ordinary human visual control.

Along with GPS features, both photographs and maps are incorporated into new location and tracking devices. With GIS technology maps are not general anymore, but user-orientated and situated, while with GIS and GPS data in photographs, we are precisely placed in space. Visualization of maps destroyed the original vision of evidence in photograph. At the same time maps started mapping users, not the territory. Simultaneously, with implementation of new location technologies maps become localized, losing their stabile general purpose, as being organized around dynamic directions, itineraries, or routes, which refer to only a section of the map. It is the map that mocks the viewer showing something that can never be seen. To the other hand, introducing location technologies into images produces a new sense of the targeting. What changes in particular with maps, is - their visuality and it is two parallel tendencies that mark the development: the de-visualization of maps, as tools of visualization by their change into systems that self-organizes around the act of use, rather than being visually constantly present and absorption of photographs into yet one of the layers of maps. A map is not only sequenced and de-visualized in its peculiar abstract sense. While map becomes a hypermap, containing many strata of information as layers, landscape produces a place into a hyper-place, merging various visual information.

Still, by merging with maps, photographs which were standing for particular yet usually not necessarily known places to the audience become very precise, geo-mapped places. Now, with the merge between photograph and map, these hybrid forms teeter between realism and abstraction. They are again, as Peutinger’s map, neither-map-nor-landscape, and thus also; neither real-nor abstract. Yet, the problem of mixture is not in its vagueness, but for forms that cannot be easily defined.

Strict division between map and landscape, which has existed for over two thousand years, has all but vanished under these new geographies. Yet, despite the introduction of aerial photography and digital maps, bringing once split reality closer, especially by dataification, the divide between the map and landscape persist. With Google Earth Engine, for example, the divide between the map and landscape is still profound and applied to different projects, Google Maps and Google Earth, respectively.[[32]](#footnote-32) While allows the viewer to sliding aside the orthogonal view for about five degrees, which maintains maintaining fixed shadows, allowing travel through streets, and 360-degree view, Google Maps combines flattened abstract street organization with Google Earth satellite image, as well as photographs uploaded by the user community. While these image genres have been partially integrated with new techniques for visually representing the world we live in, this has changed the way we use maps and landscapes as well.[[33]](#footnote-33) To have a view that is cartographic and realistic the user must change layers or switch the platform in toto.

## Double Coding

Bringing formally together far and close, map and landscape, space and place, contemporary technologies are diminishing clarity of binaries, often organizing human systems of thought. Thus, simultaneously as diminishing differences in the geographical binary, the new amalgamation leads to the same effect in visual and socio-political ones. A double coding occurs in new genres of images which are neither maps nor landscapes but a kind of coded text. This double coding may be analyzed using nine parameters set forth by Katherine Hayles for describing the differences between printed and coded texts.[[34]](#footnote-34) First, coded texts are dynamic images. Second, they include both analogue and digital coding. And thus coded texts simultaneously include coded as well as natural languages. Consequently, third, they are not fixed, but mutable and transformable. Thus, fourth, they are generated through the fragmentation and recombination. Fifth, coded texts operate in three dimensions. And therefore, sixth, they are spaces to navigate. Seventh, they are written and are read in distributed cognitive environments and can be read only by cyborgs. Eight, ‘with digital texts, the fragmentation is deeper, more pervasive, and more extreme than with the alphanumeric character of print’.[[35]](#footnote-35) And, in such a way, ninth, this information can be easier to manipulate. This shift between the printed and coded texts can also be applied to visual material, for instance, to the landscape and a map, but also to all of their potential layers of digitalization, such as analogue or digital maps as well as analogue or digital photographic landscapes.

Digital maps, which are more complex than analogue printed maps because they contain more information, in so far as the information which they contain is interactive and transforms according to the needs of the user, are also doubly coded: once by the computer and once by the user. Because of this double coding, and the consequent transformability of the map, the map can be manipulated. And the interpretation of digital maps becomes particularly tricky when photographic materials are employed in their production, given the epistemic power of such photographs. Although analogue photographs are not originally coded in the same way that digital photographs are, neither consists of the same kinds of discreet elements that both the language alphabet and cartographic symbols do, Hayles calls iconographic as bearing ‘morphological resemblance to its referent’, once fragmented, can be employed as a material in various manipulations too.[[36]](#footnote-36) Likewise maps, in contrast to analogue photography, digital photography is discreet, consisting of equal basic elements, which are then computable. The pixel is the simplest metrical element. Because of this, large constellations of pixel structures may be more easily traced by photogrammetric software merging images. The merging of complex data does not just merge photographs and maps, but at certain stages in the process fuses them, using these as building material for a precise three-dimensional reality. Ultimately, of course, such digital photographs may still be printed on paper, as has been done with analogue photographs for nearly two centuries now. But having been reworked and distorted, even these photographs fail to provide a direct and undisturbed relation to the reality.

Manipulations Hayles mentions for texts also are applicable to photographs, as for example in photomontage. Photo montaged images are traceable in the analogue world, but less visible in the digital one. The initial coding of the photography has been set by aerial images, which tended to simulate a mapping view. Moreover, once merged with maps, photographs are not only as digital, but also as maps, becoming more complex systems. Such a double coding happens in all the cases where photographs are merged with maps, as in hypermaps, photomaps, orthophotos, and mapped photographs, I will analyze in the next chapter.

Post-digital aerial and satellite photography is not exclusively a photographic medium. Here, the photograph is but one layer of many. Or it is merely a visual style for the image. Whether part of the hypermap, orthomap, or photomap, the photograph is given a secondary role and value. It has lost its representative function. It has become a coded system. Even so, however, in comparison the visualizations of large datasets, photography fails to be authentically ‘deep’ in terms of an amount of information carried by it (if deep is to be taken as the authentic criteria of this age, as in deep space). Or, its ‘depth’ may consist of a mere resolution enlargement (such is the one in high resolution photography). These images display an enormous amount of information, as well as offering both close and distant views and far breaking the barrier of the human vision. Besides, they are breaking the boundary of the human photography as offering the near and far, which was previously dividing the tele and macro photography.[[37]](#footnote-37)

1. Anthony Vidler, ‘Terres Inconnues: Cartographies of a landscape to be invented’, *October* 115 (Winter 2006): 13-30. [↑](#footnote-ref-1)
2. Buci-Glucksmann, ‘Icarus Today’, 60. [↑](#footnote-ref-2)
3. Cosgrove, ‘Contested Global Visions’, 271. [↑](#footnote-ref-3)
4. Fred H. Moffit, ‘A Method of Aerophotographic Mapping’, *Geographical Review* 10 (November 1920): 326-338. [↑](#footnote-ref-4)
5. There can be different types of maps of the same battlefield in war, produced by different armies; field sketch, blank topographic map, trench maps, intelligence map, practical artillery positioning map, strategic map, each being used by different military order. [↑](#footnote-ref-5)
6. Siegfried Kracauer, ‘Photography’, *Critical Inquiry (*Spring 1993): 433. [↑](#footnote-ref-6)
7. See: Cartwright, Peterson, and Gartner, *Multimedia Cartography*. [↑](#footnote-ref-7)
8. See: Cartwright, Peterson, and Gartner, *Multimedia Cartography*. [↑](#footnote-ref-8)
9. Denis Cosgrove, *Geography and Vision: Seeing, Imagining and Representing the World*, London: I. B. Tauris, 2008;Cosgrove, *Apollo’s Eye*;W.J.T. Mitchell, *Landscape and Power*, Chicago: University of Chicago Press, 2002. [↑](#footnote-ref-9)
10. See: Anthony Vidler, ‘Terres Inconnues’, *October* 115.1 (2006): 13-30. [↑](#footnote-ref-10)
11. This included artworks by Andy Warhol, Nam June Paik, Robert Breer, Merce Cunningham, John Cage, Robert Rauschenberg, and Robert Whitman, among others. [↑](#footnote-ref-11)
12. For example such software is: ESRI’s ArcGIS, CARTO, mapbok. [↑](#footnote-ref-12)
13. For an overview, see: Michael F. Goodchild, ‘Twenty years of progress: GIScience in 2010’, *Journal of Spatial Information Science* 1 (2010): 10.5311/JOSIS.2010.1.2 [↑](#footnote-ref-13)
14. Mike Pearson and Michael Shanks, *Theatre/Archaeology*, London: Routledge, 2001, 64-65. [↑](#footnote-ref-14)
15. See: Matthew H. Wilson, *New Lines: Critical GIS and the Trouble of the Map,* Minneapolis: University of Minnesota Press,2017. [↑](#footnote-ref-15)
16. ‘Foam Map’, https://www.foam.space/map. [↑](#footnote-ref-16)
17. ‘Technical images arise in an attempt to consolidate particular around us and in our consciousness’, writes Flusser in *Into the universe of technical images,* 16. Adding that the role of such images is to grasp the ungraspable, visualize the invisible, among others. ‘People no longer group themselves according to problems, but around technical images’, he wrote. Flusser *Into the Universe of Technical Images*, 5. [↑](#footnote-ref-17)
18. Trevor Harris gives a number of criteria for deep maps, they should be; ‘1. Large to contain all data, 2. Should be slow, 3. Sumptuous, or multilayered, 4. Multimedia, 5. Should contain graphic, time-based and database media/systems, 6. Require engagement of insiders and outsiders, 7. Bring together amateur and professional, artist and scientist 8. Are possible by digital, 9. Will not seek authority and objectivity as ordinary cartography, but will be negotiated, 10. Will be unstable’. David J Bodenhamer, John Corrigan and Trevor M Harris, *Deep Maps and Spatial Narratives*, Bloomington and Indianapolis: Indiana University Press, 2015. [↑](#footnote-ref-18)
19. ‘Spatial History Project’, http://web.stanford.edu/group/spatialhistory/cgi-bin/site/project.php?id=1063. [↑](#footnote-ref-19)
20. This type of spatialization is often used in analysis of novels, especially adventurous. Susan Piedmont-Palladino, ‘Intelligent Cities’, in *National Building Museum*, 2011, 36-41. [↑](#footnote-ref-20)
21. ‘Disaster Simulation’, https://tangible.media.mit.edu/project/disaster-simulation/. [↑](#footnote-ref-21)
22. McKenzie Wark, *Molecular Red: Theory for the Anthropocene*, London: Verso, 2015. [↑](#footnote-ref-22)
23. Toscano and Kinkle, *Cartographies of the Absolute*. [↑](#footnote-ref-23)
24. Antoni Moore and Igor Drecki, *Geospatial Visualisation,* Berlin,Springer, 2011. [↑](#footnote-ref-24)
25. K.C. Clarke, ‘Advances in Geographic Information Systems’, *Computers, Environment and Urban Systems* Vol. 10 (1986): 175–184; V. Maliene, V. Grigonis, V. Palevičius, and S. Griffiths, ‘Geographic information system: Old principles with new capabilities’ *Urban Design International*. 16.1 (2011): 1-6; Goodchild, ‘Twenty years of progress: GIScience in 2010’. [↑](#footnote-ref-25)
26. Matthew Johnson, *Ideas of Landscape,* Oxford:Blackwell Publishing, 2007, 142. [↑](#footnote-ref-26)
27. Growing with contemporary age, see ‘Geonames’, https://www.geonames.org/. Geonames contains nearly nine million toponyms. Besides historical and geographical analysis, also a comparative linguistic analysis is possible. [↑](#footnote-ref-27)
28. ‘Openstreet Map:’, https://www.openstreetmap.org/. [↑](#footnote-ref-28)
29. Kanarinka, ‘The City Formerly Known as Cambridge’, http://www.kanarinka.com/project/the-city-formerly-known-as-cambridge/kanarinka. ‘The City Formerly Known as Cambridge is a useless map by the Institute for Infinitely Small Things. Michael, *GeoHumanities*. [↑](#footnote-ref-29)
30. SusanSontag, *On Photography,* London: Penguin Books, 1978. [↑](#footnote-ref-30)
31. Also Yahoo Maps, OpenStreetMap, Bing Live Map. [↑](#footnote-ref-31)
32. ‘Google Earth Engine’, https://earthengine.google.com. [↑](#footnote-ref-32)
33. When GIS become integrative, thus linking to sources such as Wikipedia. [↑](#footnote-ref-33)
34. Katherine Hayles, ‘Print Is Flat, Code Is Deep: The Importance of Media-specific Analysis’, *The Poetics Today* 25.1 (2004): 67-90. [↑](#footnote-ref-34)
35. Hayles, *Print is Flat,* 77. [↑](#footnote-ref-35)
36. Hayles, *Print is flat.*  [↑](#footnote-ref-36)
37. As the resolution of images constantly changes, the image with the highest resolution is a breakable border. At this point, in early 2019, the highest resolution recorded is the image of Mont Blanc, recorded in 365 giga pixels. [↑](#footnote-ref-37)