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Can We Talk About Cartography Without Borders?

Common knowledge regards the internationally recognized geopolitical borders between nation-states as clearly marking the separation lines by which we define the legal status of physical spaces based on the binary logic of inclusion or exclusion. In various places around the globe, however, the unstable reality of the terrain, a reality of which temporality is becoming an inseparable element, has stimulated a search for new solutions to mark borders. The method for marking the border located in the peaks of the Alps, between northern Italy, Austria, and Switzerland, provides an example of a response to this problem. Its demarcation enables representation of the changing topography of the area caused by global warming. As a result of the warming trend, the glaciers at the mountain peaks are melting and the watershed line is moving. In order to represent this reality on the ground, an instrument has been installed that receives input from sensors scattered over the area using GPS networks that enable a redrafting of the border in real time.

The perception of instability, the view of the border as existing in constant flux lies at the basis of the new definition of "border." The recognition of border instability and the use of new types of mapping methodologies have lately received juridical attention because of the legal need to define the sovereign borders of states. New definitions of the concept of border, as in the example of northern Italy, are an expression of new perceptions of mapping. This shift is a result of new technological developments in mapping and new theoretical thinking about space.

Maps are a medium of two separate but closely related spheres of knowledge: science and art. Maps denote geopolitical units, with either measured precision or as the embodiment of an esthetic perception. This act of denotation projects two messages: One focuses on an objectified description of a geopolitical unit and the second, on the utopian concept of man's place in the world.[1] Cognizance of various design aspects is vital to an understanding of mapping; these include visual design, the highlighting or suppressing of information, relations between the various components, the medium of access, and production practices and distribution methods.

The theoretical discourse that has developed in recent decades as a result of new scientific theories and technological developments has rejected the dichotomous divisions characteristic of Western thinking that marked boundaries between what was considered natural or artificial, between reality and its representation, and between subject and object. Whereas a clear borderline formerly separated the map from the

1 David Woodward, "Introduction," in *Art and Cartography*, 1–9.

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subject, contemporary developments in cartography have changed the essence of these relations. The use of mapping technologies by means of satellite systems and GIS and GPS systems, sensor technologies (as, for example, touch sensors, light, heat, movement, and sound) enable visibility of phenomena that cannot be seen optically, applications of cooperative mapping, and interfacing cartographic information with databases and platforms of dynamic mapping. These developments redefine concepts of mapping and, in many cases, reduce or eliminate the relevance of marking borders in their framework. They are based on a new, non-representative association between the map and space that views mapping as a constitutive act, affecting the space that it is mapping and, in certain cases, encompassing the potential for its change.

The Internet has multiplied the quantity of information presently available to us at an unimaginable rate. Organizing this information into something meaningful by mapping is a vital necessity. Today, in the era of Big Data, mapping has expanded far beyond the cartographic field. We map every aspect of our lives: the physical space in which we live, our bodies and, at the same time, our mental processes, the fields of knowledge that form the basis of our cultural existence, the various realms of science, our social connections and our emotional life, and virtual space, which plays an important role in our present lives. The mapping systems constitute a central component in the formulation of our social, cultural and political existence. Mapping expands our knowledge about the world and changes the ways we comprehend it in a way that raises ethical questions linked to relations between the private and the public and to interpersonal relationships.

Critical academic inquiry into cartography began at the beginning of the 1990s and led to widespread artistic activity related to maps and mapping.[2] In 1994, a comprehensive exhibition at the Museum of Modern Art in New York focused on maps and their world of images, paving the way for additional exhibitions that extended the discussion of other aspects in this realm.[3] This exhibition, titled *Mapping*, was a response to the new theoretical discourse that was developing around the critical theories of postmodernism and changes in the perception of space resulting from the far-reaching geopolitical changes that had taken place some years earlier. It related to a world deeply immersed in an accelerated process of globalization that accompanied the geopolitical changes at the end of the Cold War. Events taking place at that period not only redesigned the political map of the world and its borders but they also emphasized the individual differences between areas that, in the past, had been classified in accordance with simple categories such as "East and West" or "North and South."[4] The economic changes taking place due to new technologies of information and media processing also affected the interpretation of space.

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2 Jeremy W. Crampton and John Krygier, "An Introduction to Critical Cartography."

3 See the press release for this exhibition: https://www.moma.org/documents/moma_press-release_327685.pdf. Accessed 3 November 2016.

4 Denis Cosgrove, "Introduction: Mapping Meaning," 4.

The present essay discusses new perceptions of spatial organization in the sphere of geographic cartography and their utilization in marking borders. It deals with various mapping practices, some traditional and others based on the possibilities posed by novel technologies for gathering, organizing, and presenting spatial knowledge. It examines the approaches created by a political reading of mapping through mechanisms of revealing and concealing – whether by exposure of an existing political reality or as an invitation to action based on comprehension enabled by the very act of mapping. My essay explores the effect of map design on the interpretative systems derived from them and the influence of the act of mapping itself on the reorganization of the mapped space. In this framework, I propose viewing the various phases of mapping as a political act, which, in certain cases, "acts against itself," or, in other words, undermines the act of mapping.

I propose investigating the new meanings of the concept of border and the act of border marking in the new phases of cartography using three metaphors relating to three possible modes of motion in space that do not constitute separate categories but rather different prisms through which we may view this act:

- The "zoom" enables an overview to create a general world picture (using satellite technologies), and alternatively, facilitates a full presentation of mapped objects as they are becoming closer. The process of mapping itself thus is deconstructed at the time when the connection between the map and the mapped world is defined.
- "Displacement" is based on the performative aspects of space. It enables a description both of the changes in the geographic locations of geopolitical power centers in the world and the shifts in international information centers and their gradual transition from national states to giant companies operating in the realm of mapping knowledge in recent years.
- Assimilation is the new state of mapping; it abolishes the external point of view of the map creator and map user by turning the structure of the subject into a factor of special significance in both the mapping and navigational process. Most importantly, assimilation embodies the potential of democratization and self-definition, which are at the center of new mapping practices.

An analysis of these concepts is relevant both in relation to maps of defined instrumental value in the space they map and in relation to artistic works using mapping as a symbolic or subversive act challenging the conventions of cartographic creation and design.

1 The Zoom – The Map as a Picture of the World and Deconstruction of the Map

In his essay "The Age of World Picture" (1938),[5] Martin Heidegger contended that the basic event of modern times is the conquest of the world as picture. He did not mean the creation of a picture that imitates reality but rather the creation of a picture that is a consequence of the projection of a conscious process inextricably connected to the investigated subject. The conquest of the world as picture, as Heidegger describes it, is an expression of the paradigm of modernity and the scientific research that lies at its foundation, and therefore, also a paradigm of the philosophical discourse of rationalism. The possibility of seeing the embodiment of the world as a picture through the act of mapping thus exists far beyond the technologies of cartographic representation in their traditional sense. As such, it concerns the ways we construct systemic perceptions of reality in space: via organizations of political and economic power structures, imaging methods of the natural sciences, logistic control of the transfer of merchandise, the financial systems which support it, and so forth.

The techniques of world conquest as picture have changed considerably since Heidegger's time. Present cartographic technologies enable a detailed view and a previously unknown scale. The new possibilities that turn the world into a picture, among them the ability to create simulations of living spaces, blur previously clear and distinct borders between territory and map, between the real and the virtual, and between the map and three-dimensional computerized simulation. These innovations undermine the customary relations between reality and its representation by mapping. Baudrillard's proposition in "Simulacra and Simulation",[6] according to which the distinction between the signifier and the signified loses its validity, becomes even more convincing.[7] This blurring recalls the often cited "map allegory" of Luis Borges, which describes an empire for which cartographers have drawn a detailed map covering all of its territory while concealing the real substantive territory under it. Today's digital mapping practices and the new methods of representation seemingly enable the mapped information entirely to represent the reality it aims to signify. Digital maps seemingly lose a central characteristic, that is, the built-in gap between the mapped reality and the map itself by the change in scale.[8] The use of three-dimensional imaging as a new mapping format also creates a new illusion

5 Martin Heidegger, "The Age of World Picture," 115–54.

6 Jean Baudrillard, "Simulacra and Simulation," 166–184.

7 According to Baudrillard's way of thinking, even the subject, which in Heidegger's perception is dominant in the world picture, becomes an image in the world of images. See Marc Jongen, "On Anthropospheres and Aphrogrammes: Peter Sloterdijk's Thought Images of the Monstrous," 203.

8 See, for example, how the map Census Dotmap, describing the population distribution of the United States, enables representation of all of those counted at a ratio of one to one, making use of the digital enlargement tool in zoom. http://www.coopercenter.org/demographics/Racial-Dot-Map

of "real" space that may affect how we act within it after acquiring the ability "to experience" the space in various situations and scales.

The zoom in and out features enabled by interactive maps suggest a parallel to the photographed field. Film theoretician Vilem Flusser sees the photographing apparatus as a programmed modality of social production of space. The act of creating a spatial-temporal scale, assimilated within the camera, structures the scale between the photographing apparatus, the user, and the world.

> The photographer's gesture as the search for a viewpoint onto a scene takes place within the possibilities offered by the apparatus. The photographer moves within specific categories of space and time regarding the scene: proximity and distance, bird- and worm's-eye views, frontal and side-views, short or long exposures, etc. The Gestalt of space-time surrounding the scene is prefigured for the photographer by the categories of his camera. These categories are an a priori for him. He must "decide" within them; he must press the trigger.[9]

Contemplating the changing meaning of the factor of scale as a result of digital technologies, cultural theoretician Paul Virilio argues that the more we expand our representational ability to higher resolutions and greater scales, the less we are able to deal with phenomena on an individual or a collective basis.[10] As early as the 1990s, he cautioned that the quantity of information flowing down the informational highway would ultimately lead humanity to a "great accident" caused by the inability to control the enormous quantities of information.[11] In 2008, in an exhibit he curated in partnership with Raymond Depardon at the Cartier Center in Paris entitled "*Native Land, Stop Eject*,"[12] he deals with contemporary worldwide migration as an expression of the effects of time-space representations on decentralization processes and the disintegration and collapse of customary territorial and national perceptions.[13] Through the attempt to derive action patterns from large information structures, based on external perspectives, *inter alia*, he investigates the significance of the attempt to organize information by mapping in space.[14]

Like Heidegger, Virilio strongly objects to the homogenization of knowledge by adopting a definition of technological science as based on the construction of rational images in order to establish what, in his opinion, is incorrectly perceived as

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9 Vilem Flusser, "Towards a Theory of Techno-Imagination," 198.

10 Benjamin H. Bratton, "What We Do is Secrete: Paul Virilio, Planetarity and Data Visualization."

11 Paul Virilio, "Speed and Information: Cyberspace Alarm!"

12 http://nativeland-stopeject.com/r1php3.

13 Paul Virilio, *Lost Dimension*.

14 The work "Exit," which was created especially for this exhibition by architects Diller Scofidio + Renfro, and by Ben Rubin, Laura Kergen and Mark Hansen, writes and "rewrites" translations of various aspects of information about the phenomenon of global migration and outlines their paths through the act of mapping.

a more advanced comprehensive view of the world. He undercuts our naïve position in relation to the meaning of the visual translation of information in creating a picture of the new world, and he tries to problematize this type of thinking. In his view, the creation and demand for spatial images represent the inability to demarcate the definitions of political geography through the use of permanent terms and the accepted practices of outlining borders. Because global visualization describes a universal method of monitoring particular events in relation to a general system, it must be critically tested. The relationship between local and global in the contexts of "big data," therefore, requires deviating from locating general action patterns and accepted border markings.

Let us now examine a work of art that critically engages with "big data" and the problematics of zooming. Representations of political geography through mapping are at the basis of the sound installation by artist Tom Tlalim titled "Concerning Time We Remain Divided." This installation involves mapping spatial geographical information about the population increase of Jerusalem while trying to outline invisible borders existing in the city. Based on statistical data whose narrative is heavily loaded with historical and political implications, the installation attempts to investigate the reality of life in Jerusalem diachronically. At the same time, it allows a passage between various time levels, referencing concepts of history and memory in the geopolitical space of a divided and contested city with its problematic developmental past and complex demographic history.

This work of art uses a GIS system[15] that analyzes geographical information. A specially developed music software program that translates data into sound turns the streamed data into a musical structure. This software generates music heard from amplifiers placed along one of the walls of the gallery, creating a three-dimensional acoustic space. The city, with its dense housing patterns, each of which corresponds to a single sound, is thus "played" in the gallery space, inviting visitors to experience its expansion and compression from a detached viewpoint. It stimulates them "freely to reflect, absorb, and examine different viewpoints before moving on."[16] The optical dimension of this work affords a visual reflection of these urban structures and adds further stratification and complexity to the visitor's experience of the installation.

At the basis of Tlalim's work is the awareness of the significance of new technologies to the critical display and analysis of "big data" in a multimedia artistic platform. By using the immaterial medium of sound, the installation creates an interface based on a system of information translation that transforms the physical into the auditory. Put differently, Tlalim explores new information technologies as a

15 The GIS system is a geographical information system, enabling a spatial analysis and working simultaneously on several levels of information, while creating complex queries. By a process of interpolation, new information is created as levels of spatial data. The installation is based on the translation of information received to a musical structure and a three dimensional physical system.
16 *Aggiunte*: *Architettura in Continuum*, 32.

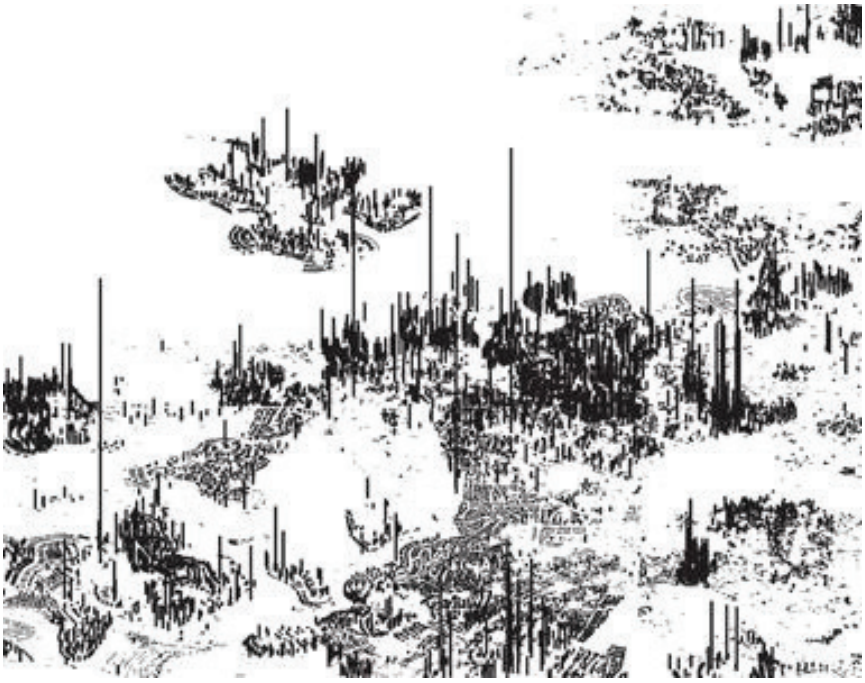

Figure 1: Tom Tlalim, "Concerning Time We Remain Divided," 2008.

resource for a critique of social and political conflict over tangible places through the seemingly removed and ethereal experience of sound in the otherwise peaceful art gallery. He thus makes it possible to view systems of change, multi-layeredness, and growth in a changing spatial scale.

2 Displacement: Cartography and Power

In recent decades, the understanding that power holders maintain their presence in society partly through their input into the representation of space though mapping has replaced the customary perception of maps as objective representations of space based on scientific principles.[17] Michel Foucault's proposition that power and knowledge are intertwined has contributed to this and to many other revised perceptions in cultural studies. By controlling the sources and representations of knowledge, he asserted, power holders perpetuate their grip on society.[18] From a historical point of

17 John Hardly, "Deconstructing the Map," 328.
18 Michel Foucault, *History of Madness*.

view, it may be argued that the drawing of maps was a type of intellectual activity with scientific "clout" that literally imprinted on paper social conventions, religious faiths, imperial aspirations, colonialism, and eventually capitalist interests. No wonder that European colonial expansionism and the structures of power relations that it generated lie at the basis of modern cartography.

Although the first attempts to map the world had already occurred in the eighth century B.C.E.,[19] until 2005, only fifteen percent of the world had been mapped on a geo-codable level. Four years later, however, this percentage doubled.[20] The most mapped areas were those whose mapping served capitalist interests, such as construction, paving streets and roads, defining borders, areas of control, regions of responsibility and enforcement, and tourism and vacationing.

The changes in the geopolitical system during the past decades in general, and in the past few years, in particular, have seen the development of new economies in geographic areas that were marginal in the past and have become international centers of power. Even in the newly mapped areas, however, mapping practices and their objects generally aid capitalist and political interests.

Maps serve governments as a primary planning tool. They are the basis for all strategic thinking about the allocation of the state's territory and its exploitation. On a practical level, one can take action only with regard to what exists on a map. The decision about what to map or not has important political, economic, and humanitarian implications, as the case of Israel's handling of Arab settlements shows. Through the years, various disputes have revolved around the mapping of Arab settlements on official state maps. Recently, the decision to adopt the Prawer plan to regularize land ownership among the Negev Bedouins has raised public awareness of the disputes concerning the Bedouin dispersion.[21] The public discussion has exposed the great gap between governmental mapping of this population and the actual situation on the ground. Whereas official state maps present only the legally recognized settlements, they do not record about forty percent of the Bedouin population living in the dozens of unrecognized villages. Most of these villages lack basic services such as a connection to the country's electricity grid and to water and sewage infrastructures. Marking these areas as empty territory thus represents shirking responsibility for the population of these villages. A coexistence forum for civil equality in the Negev has published an alternative map of the area, indicating unrecognized villages and supplying information about them.[22] Presenting an alternative to the official state maps, this map underlines the power relations between the state's agencies and an existing unrecognized population.

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19 *The History of Mapping*, https://en.wikipedia.org/wiki/History_of_cartography.

20 From a lecture by Lalitesh Katragadda, "Making maps to fight disaster, build economies, Ted Talks, uploaded on 13 Jan 2010. https://www.youtube.com/watch?v=p_p-Ex5KR4g.

21 "The Arab Bedouin and the Prawer Plan. Ongoing Displacement in the Naqab," 27 Jan 2013.

22 http://www.dukium.org/map/?lang=he (Hebrew).

In his early writing, Edward Said defined maps as a power technology used by colonialism to impose and legitimize its rule.[23] According to Said, colonial regimes were able to draw their own maps of the territories they ruled based on information gathered by their technologically advanced naval expeditions. This accumulated information enabled the metropolis to wield its superior knowledge over the colonized subjects, who lacked access to this information.

In his article "Palestinians under Siege, Putting Palestine on the Map" (2000),[24] Said calls for a change in the discussions on the future of Palestine, charging it with a new spatial discourse. The need for this change emerged from the negotiations of the Oslo Agreements, in which, according to Said, the Palestinians were in an inferior position because they "lacked maps." In this context, he proposed viewing mapping as a form of political resistance, an "opposition to the act of mapping by the act of mapping itself." Mapping is an act of protest against what Said terms "contemporary colonialism," which utilizes erasing in order to eradicate any traces of its policies of erasure. The map is, for him, a certain type of witness – a subject without an object.[25] Maps are perceived not only as an operative tool for activity in the field but also as an explanatory tool enabling the presentation of alternatives to the interpretations of the physical features of borders drawn by the maps themselves. The association Visualizing Palestine, which uses infographics and mapping to disseminate the Palestinian narrative as part of a comprehensive campaign to enlist support for their cause, published in 2013 a series of maps comparing the restrictions on movement of the Palestinian population on the West Bank's roads to the travel options of Israeli citizens living in the same area. These maps revealed a hidden system of borders existing within the larger West Bank that are not visible in customary border markings.

Following this Palestinian campaign, the Jewish settlers of Judea and Samaria (the Israeli/Jewish terminology for the West Bank) presented their positions through an act of mapping. The series of maps disseminated by the organization "My Israel" expresses the position of the settlers, who use belligerent rhetoric when they define these maps as "powerful explanatory ammunition."[26]

Although the two sides in the conflict use seemingly similar tactics, the difference between their maps is noteworthy. The Israeli side tries to justify its claim through hardcore geographic data. Its maps highlight the short distance of the West Bank Palestinian cities from the major centers of population within pre-1967 Israel and

23 See the reference to this issue in Mohamed Hamoud Kassim Al-Mahfedi, "Edward Said's 'Imaginative Geography' and Geopolitical Mapping: Knowledge/Power Constellation and Landscaping Palestine."

24 Edward Said, "Palestinians under Siege: Putting Palestine on the Map."

25 See the reference to Said's writings on this subject by Eyal Weizman in the marathon on mapping that took place at the Serpentine Gallery in London in 2010. http://vimeo.com/24511077.

26 http://myisrael.org.il/maps./

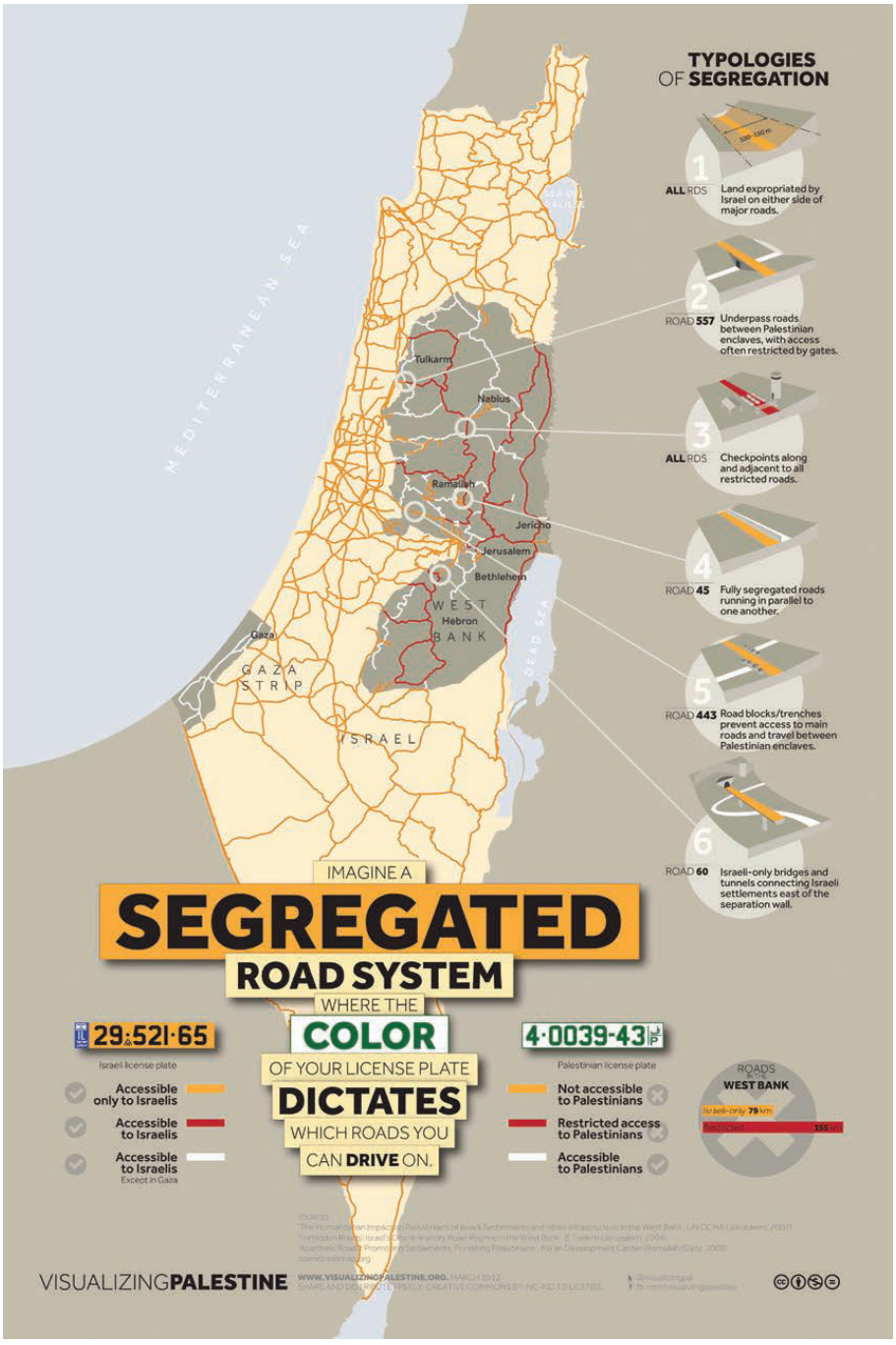

Figure 2: Visualizing Palestine, 2013

emphasize topographical features such as the location of strategic hilltops in the West Bank that dominate the narrow stretch of the Israeli coastal line, where most of the Jewish population resides. In contrast, the Palestinians choose to map the West Bank in terms of the movement of the Israeli occupation, not on the basis of physical or common geographical features. Their initial assumption is that spatial politics are determined by the active operating powers, whereas the marked borders symbolize only one of the spatial policing systems existing in the area.

Today, when mapping practices have become accessible to the public at large – via new technologies and applications – in ways that were previously impossible, mapping processes are offering new perspectives. The integration of diagrammatic visualization and technologies of remote sensing and intensified computer abilities enable researchers in fields such as climate modeling, genetics, and epidemiological research of populations to create visual representations of global processes as "networks." They can also link non-sequential sources of information with tools that produce meaningful information in relation to various geographic areas. One may say that in the current era, power lies in the hands of those who command knowledge, not necessarily with those who control the land. The significance of land control has not been reduced but rather has expanded by turning the map into a central interface of databases.

In the past, creating maps demanded wide-ranging professional skills and vast monetary means, both of which were available only to the wealthy and the powerful. Mapmaking thus remained almost completely in the hands of state agencies. Maps could strengthen the representation of the strong populations within the state and conceal or efface weaker ones whose existence the state had no interest in representing or acknowledging.[27]

Today, collaborative platforms have expropriated the exclusivity of map creation from the hands of the few.[28] The rise in map literacy among the public – and the dissemination (via the Internet) of applications for creating maps – enable anyone who has access to the Internet and basic understanding in mapmaking to create maps with relative ease and at low cost. It should be noted, however, that these new mapping practices enable the powerful to adopt them in order to maximize and strengthen their power by channeling political and economic power systems that suit their own interests.

In this context, it is appropriate to investigate one of Google's central strategic developments: its mapping project, with which it strengthened the company's control over sources of global information. Although this project is one of the main catalysts for the accelerated mapping process we are currently witnessing, it exemplifies

27 Jeremy W. Crampton, "Maps as Social Constructions: Power, Communication and Visualization."
28 It is important to point out, however, that some mapping platforms for collaborative mapping were created by giant firms (such as Yahoo, Apple, and Google) or have been bought by them (for example, Waze).

more than anything else the link between control over the mapping systems and control over sources of knowledge. The political implications of such unprecedented concentration of technological power and access to data are clear. One of the central factors explaining Google's success in expanding the influence of its mapping project is its unique interfacing with methods of photography that the company has been developing in recent years. This interfacing finds expression in the greatest possible range of everything connected to scale: starting from mapping at an astronomical scale via the use of satellite pictures and ending in photographs at a particularly high resolution of specific items on the ground.[29] Google's maps appear in traditional Euclidean mapping form or in a hybrid version that includes aerial photography. This hybridity connects mapping to photography's indexicality. The map alternates its traditional symbolic representational nature with the iconicity of the photographic image with which the average user can interact more intuitively.

Google's change in the mapping process, however, is comprehensive and has far-reaching implications in relation to the significance of the photographic act itself. It involves deconstruction of the map into its textual components by amalgamation with photographic images. Google's street view platform enables the viewer to wander through a photographed three-dimensional space that is, largely, an alternative to the traditional map and provides an experiential yet virtual "acquaintance" with the mapped area. Parallel to the experiential dimension provided by this platform, however, it creates textualization of the space via applications of artificial intelligence based on its metadata.[30] The cameras function in this context like an OCR spatial scanner, translating the visual surface into information assimilated into maps that mark their borders based on categorization systems and textual tagging. When tagging is "taking over," space becomes disassembled from its spatial continuum and implements a new organizational principle whose source is in the logic of a networked database in which a borderline becomes insignificant.

3 Assimilation – Mapping as a Potential for Fostering Change

As mentioned above, new forms of cartographic representation not only give expression to new spatial qualities but may also participate in a change of conventional divisions and hierarchies and the borders between them. Deleuze and Guattari's concept of the rhizome as a metaphor for non-hierarchical spatial connections, open

29 As was done, for example, in the Google Art Project, based on spatial practices.

30 See Yael Eylat Van-Essen, "The Image as a Networked Interface: The Textualization of the Photographic Image."

and unplanned, is one of its expressions. From a cultural standpoint, the significance of their concept is that relations between phenomena that were previously considered as separate and fixed, connected to space and having rigid patterns of dissemination and identity, appear today as random and unstable. Examples of such fluidity may be seen in the unraveling of the connection between place of work and community, between ethnicity and nationality, and between religious practices and identity.[31]

In their essay *A Thousand Plateaus*, *Deleuze* and Guattari propose a perception of a map and topography that differs significantly from the visual regime of rationalism. [32] According to this view, the map relates totally to experience and to the connection with the real that constructs the subconscious. Based on this perception, James Corner proposes relating to maps not as a means of reflecting reality but rather as a means of designing worlds within which people live, in order to expose hidden potential for collective enabling enterprises. [33] Mapping, therefore, not only functions as an agent of knowledge but also represents a creative practice and a liberating instrument. Corner views mapping not as an act of duplicating or imposing reality but rather of exposing that which previously did not exist or was inconceivable. Mapping contains the potential for new eidetic and physical worlds to emerge. Corner relates to Deleuze and Guattari's distinction between the concept of "tracing," which reflects investigation of well-known courses, and the act of mapping, which conceals within itself the potential to reveal both the past and the present. In his opinion, maps reveal not only what already exists and relate not only to surface physical characteristics (topography, rivers, roadways, access roads, and buildings) but they also include the concealed powers existing in its performative aspects.

Such an approach can be seen, for example, in the act of "dérive" of the Situationists in the 1950s, who wandered the city while responding to the contours of the surroundings and the meetings that this unstructured wandering invited rather than repeating expected and well-known patterns.[34] In contrast to conventional mapping based on an external view, this way demands an internal view: the map is part of a space of perceived experience within which power matrices and various exchange systems exist.[35]

Recent years have seen a large and growing number of maps based on the use of means for identifying the geographic locations of those involved in their preparation.

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31 Cosgrove, "Introduction: Mapping Meaning," 5.

32 Gilles Deleuze and Felix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, 12.

33 Corner, "The Agency of Mapping: Speculation, Critique and Invention," 213.

34 Guy Debord, *Theory of the Dérive*.

35 This approach to mapping derives from the view of space as a process of construction, termed by Henri Lefebvre as "production of space." According to Lefebvre, the human condition is characterized by rebalance between human activity and the material space within which the individual acts. Space, therefore, is not a "geographical place" in which human activity takes place but rather activity created by people. See Henri Lefebvre, *Production of Space*.

Used in many communities around the world, these maps are designed to serve various political motives – whether in subversive contexts such as presenting alternatives to the mapping systems of governments and capitalist interests or as an expression of establishment political-economic neo-liberalism, aiming to create a collaborative process in reconstructing the community. They are prepared using applications for collaborative mapping such as Open Street Map, Google Map Maker, Ushahidi, Geo-Wiki, and others. They are based on the movements of individuals in space and are interfaced with GPS and GIS technologies using cellular telephones and other tools.[36] This represents a significant fact in the process of mapping: by navigating a body in space and time, the act of mapping is detached from its symbolic dimension. The process enables identification of the subject in a wider context, connecting feelings and memory with habitus and experiences in the field. Instead of being a static epistemological representation, the visible element, in the long term, becomes ontological, located in time and occurring in the place where it is mapped – that is to say, linked to life itself.

In this way, the map becomes a cartographical text that is "more real" than "real" because it is assimilated into specific moments of life. The subject, as the one who organizes the space, is no longer required to find him/herself within the mapped place, as this place "does it for him/her" using satellite and computer coding systems. This type of mapping has turned into one of our contemporary life routines. Applications like Waze organize space in terms of identifying our location and our movement within it. With this type of application, we are no longer exposed to a space with borders defined in advance, within which we must find our place, but the opposite. We are located in a space that is theoretically infinite, located in relation to us and in direct connection to our movement in it. In this way, our bodies become an agent, and, therefore, a central factor, in the creation of space.

In this context, I propose regarding spatial simulations as a new type of mapping. In recent years, computerized simulations of urban spaces have become a new format for mapping cities. Instead of two-dimensional maps, signifying the contours of structures, roads, paths, and trails, navigation through space is three dimensional, enabling entrance into structures themselves, as we know from computer games. The map created in this manner represents space in a completely different way, generating new alignments that partition space and enable or block movement through it. The perception of borders on maps of this type is connected to ways of moving through dynamic urban space that mingle internal and external space.

The Israeli Defense Forces (IDF) have been using this type of simulation for some years in preparing to fight in urban areas on the West Bank and in the Gaza Strip. Before

36 In this context, one may ask whether the new systems based on democratization and cooperation in the mapping process carry out this promise – and whether they may conceal hidden mechanisms controlled by new power holders.

moving into these areas, the soldiers' training includes virtual physical simulation as preparation for operational activity. Eyal Weizman, in his 2008 article, "Walking Through Walls," shows how the IDF has adopted new strategies of moving lengthwise and widthwise through a city as a basis for military activity in the occupied territories – strategies that, ironically, philosophers such as Deleuze and Guattari considered as a means to subvert the repressive power of the state. [37] Weizman illustrates this strategy by referring to the activity of the IDF in the Balata refugee camp in 2002, during which the Israeli military forces operated in contradiction to the accepted spatial logic and moved through houses, blasting openings in walls to clear paths alternative to the passages between the houses. Although this tactic had been known for a long time before three-dimensional simulation techniques and the development of other military technologies, it is interesting to see how the new mapping practices affected the way the army moved through the area.

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The three metaphors of movement through space in relation to the concept of a border discussed in this essay suggest various perspectives for understanding the meanings derived from contemporary acts of mapping. I have used these perspectives to show the changing concept of border, which previously represented a binary perception of attribution. In certain contexts, the border signifies dynamic systems based on instability or changing points of view; in other contexts, borders lose their relevance.

The acknowledgement that mapping has been destabilized by new technologies but still functions as a central scientific and cultural paradigm has formed the basis for the discussion of three metaphors: zoom, displacement, and assimilation. The importance of discussing this current issue with critical tools stems not only from the substantial questions it raises about our behavior in a world that is represented or constructed by the act of mapping but also because of its direct connection to databases and to new systems of information organization. These systems have affected both access to maps and their means of production, leading to an exponential rise in their use.

The intensified attention to mapping has led to a rise in the number of maps whose motives are clearly critical and aim to underscore facts and phenomena not previously visible. The eventual goal of this type of mapping is to undermine or challenge mapping systems generated by the centers of power. In the Israeli context, this entails widespread activity focused on mapping in relation to the Israeli-Palestinian dispute over the same piece of land. Salient among these attempts has been the work of human rights organizations such as Zochrot and B'tselem. In promoting their goals, these organizations utilize historical maps from before the establishment of the State of

37 Eyal Weizman, "Walking Through Walls."

Israel in 1948 that show Palestinian settlements that now are concealed from the eye of the Israeli public or maps of Israeli settlements in the West Bank after 1967, some of which are illegal even according to Israeli law. The use of maps as a critical tool is part of a wider cultural phenomenon of revealing material that has been censored (such as the documents on WikiLeaks) or repressed in the past.

Beyond this recent phenomenon and its critical dimensions, we are currently witnessing new models of mapping. In contrast to the conventional models of cartography of the past centuries, which aimed at visualizing "real" geographic space, the mapping of the non-visible currently has been gaining public validity. This tendency stems not only from new technologies enabling the mapping of phenomena that lie under the surface or are invisible to the human eye but also from the new status of the act of mapping as a process of bodily assimilation. In this new type of viewing, systems of visibility and border marking based on different spatial perceptions specify what is exposed and what is hidden. As I have attempted to show, these new types of viewing have dramatically changed the meanings and the scope of mapping.

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