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chapter one

Towards a Theory of Interpretation:
Cartographic Semiosis

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Abstract

Over the last 10 years a new theory in the interpretation of cartography has taken shape. In her overview of the various interpretative approaches that have variously contributed to the present critical approach, the author identifies semiotics as one of the trails principally worth pursuing. A semiotic approach, namely a theory of cartographic semiosis, effectively shifts the emphasis from maps intended as a mediation of territory to maps taken as agents, whereby actions to be carried out on territory are determined. This perspective may be defined as cartographic hermeneutics, since it undermines the very semiotic notion of map analysis: the study of maps relies not on autonomous semiosis but on a second level (or meta-semiotic) semiosis that is deeply rooted in and strictly related to first-level, territorial semiosis. In particular, the author focuses on two concepts: self-reference and iconization. The former, which constitutes the core of cartographic communication, is used to indicate the map's ability to be accepted as such (by its mere existence) and to communicate independently of the intentions of the cartographer. The latter is the communicative process that results in circumstances and contingencies being communicated as truths (thanks to the self-referential nature of the map). Hence, as a model, the map does not represent territory but replaces it. Iconization means that direct knowledge of the world is sidelined, with the greater relevance being given to the knowledge generated by the map itself.

Keywords: cartographic semiosis, self-reference, iconization, J.B. Harley, C. Jacob, F. Farinelli, semiotics of territory, cartographic communicative systems, geography and cartography.

Résumé

Une nouvelle théorie relative à l’interprétation de la cartographie a été élaborée au cours de la dernière décennie. Dans son survol des différentes méthodes d’interprétation qui ont contribué à la méthode critique actuelle, l’auteure indique que la sémiotique est une des possibilités qui vaut vraiment la peine d’être envisagée. Avec la méthode sémiotique, à savoir une théorie de la sémiographie, les cartes, qui servaient auparavant pour la médiation du territoire, sont maintenant devenues des agents qui déterminent les actions à effectuer sur le territoire. Ce point de vue peut être considéré comme de l’herméneutique cartographique, puisqu’il ébranle la notion sémiotique d’analyse de cartes : l’étude des cartes repose non pas sur une sémiotique autonome, mais sur une sémiotique de deuxième niveau (ou métasémiotique) qui est étroitement liée à une sémiotique territoriale de premier niveau. Les auteurs se concentrent plus particulièrement sur deux concepts : l’autoréférence et la symbolisation. L’autoréférence, qui constitue le fondement de la communication cartographique, fait référence à la capacité d’une carte d’être acceptée telle quelle (par son existence même) et de transmettre les données sans égard aux intentions du cartographe. La symbolisation est un processus de communication qui représente diverses présomptions et eventualités qui sont diffusées comme s’il s’agissait de vérités (en raison de la nature autoréférentielle de la carte). Par conséquent, en tant que modèle, la carte ne représente pas le territoire, mais elle le remplace. La symbolisation fait en sorte que la connaissance directe du monde devient secondaire, et qu’une plus grande importance est accordée aux connaissances générées par la carte elle-même.

Mots clés: sémiographie, autoréférence, symbolisation, J.B. Harley, C. Jacob, F. Farinelli, sémiotique du territoire, système de communication cartographique, géographie et cartographie.
1. Society and Cartography

Never has there been such a rich variety of approaches, techniques, and theories regarding the problematic nature of the relation between a geographical map and its social role. Focused on the theme of “Mapping the Elsewhere,” the last International Conference on the History of Cartography, held in Madrid, offered a good survey of the concepts scholars are now applying in an attempt to analyse (1) the role of a map within the social group that produced it; (2) the ways in which a map reflects the specific historical period to which it belongs; and (3) the policies or projects that may have been behind its creation.

It is clear, therefore, that we have now moved far away from those positivist histories of cartography that focused solely on the technical aspects of the construction of maps, and on the clarity and evidence of their content (in other words, on the map’s supposed objectivity). With the jettisoning of the idea that maps are simply mirrors held up to the world, cartography has been seen as an exercise in the intellectual appropriation of the world by humankind aiming to achieve mastery over its surroundings. This approach has led to a “rediscovery” of the dual nature of the map: (1) as a social product that can reveal the ways in which a given society constructs its own specific knowledge of territory; and (2) as a means of communication that not only permits the circulation of that territorial knowledge but also plays an independent role in that process of communication (functioning as an agent in its own right). The study of “cartography” now embraces this duality with a whole range of interpretative approaches that aim to look at both the constructive and the communicative processes at work in a map. In effect, the focus of attention has shifted from “how much reality is reproduced” to “what the map communicates with regard to the significance and meaning of territory.”

The last decade, therefore, has seen maps studied using a number of different methodologies and theoretical/critical approaches, none of which the history of cartography can afford to ignore.

The aim of this article is to trace the phases in the emergence of this interpretive approach in order to underline its most innovative features and to argue that there is now a clear epistemological framework to be adopted in the study of maps. At the same time, my aim is to bring out the crucial role played by geographical studies in the changes that have been brought about. In effect, such studies have not only highlighted the problem of maps seen as exemplifying some sort of metageographical discourse, they have also revealed that the map is in fact a sophisticated “self-referential” instrument in the analysis of which semiosis—the generation of signs—plays a central role (as, by definition, a “self-referential” system is capable of generating meaning independently of the intentions of the person using it).

Starting from these premises, therefore, I will now look at the various interpretative approaches that, to differing degrees, have made a contribution to the method of critical interpretation now being applied—approaches that might be described as focusing on the study of the map-as-object, deconstruction, and semiotics.

2. The Study of the Map-as-Object

This is an important step beyond the positivist approach because, rejecting exactitude and closeness to reality as the sole criteria in the interpretation of a map, it looks at a map as a documentary source of knowledge. What is studied, therefore, is not the clarity or evidence of the information the map contains but the social context within which it is created. This change, of course, which dates back to the first half of the twentieth century, has paved the way to a re-evaluation of the import and the meaning of maps as records of the relationship between human beings and their surroundings. It was at this time that the first tentative steps were taken to promote maps as tools that can effectively be applied to a variety of social agendas. As a documentary source, a map will feature prominently in pedagogy and in politics, in the military, in public administration, in religion, and in science. Eventually maps may be perused as territorial records even as the main research thrust is aimed at inspecting their structural aspects. In the latter case, all aspects of the construction of a map are taken into consideration, including the sort of material on which it is drawn, the graphic techniques used, the reason behind its creation, the body or person who commissioned it, the cartographer’s knowledge and ability to express that knowledge, the map’s commercial circulation, and—in some cases—its role as a model or prototype for later cartographic works. These studies, which refocus attention on the rarity or interest of an individual document, also encouraged a new interest in the history of cartography by antiquarians and collectors, with the result that well-known scholars of proven competence in the field of the history of cartography worked in such areas. However, with the exception of a few rare cases, no great contribution was made to critical reflection upon the map as such.

During the same period, however, some scholars focused on the social aspects of maps, which would lead to a substantial development in the critical discourse regarding cartography. In Italy, foremost among these was Roberto Almagià (1923), who considered that the value of the map-as-document lay not in its metrical rendition of reality but in the importance of its content. And “content” here was not just that information we would nowadays refer to as “referential.” It also included
what we might call “social” information. Hence, the importance of a map lies in the fact that it is a document that reveals the territorial praxis of a given society at a given period in its history. This is why Almagià reintroduced into the critical discussion of cartography those “territorial images” that had previously been denied the status of “geographical maps” – that is, administrative maps and charts. Before this, such works had been considered to be rather ingenuous sketches of territory and nothing more. How could they be legitimately described as works of cartography when they were not bound by indications of scale or type of projection and were often of uncertain authorship? Almagià, however, took them to be the greatest expression of the territorial policies that the states of the early modern period were beginning to develop and apply. And his claim that they were works of cartography led him, in the first half of the twentieth century, to include them in the *Monumenta Cartographica*, one of the greatest products of that new interest in maps as an object of scholarly research. Designed to replace the often deficient nineteenth-century collections of maps, these *Monumenta* were large-format works that reproduced the maps in such a way that they could be combined with texts highlighting their importance as documentary sources. The significance of this work becomes even clearer when we realize that these volumes are still widely used and consulted. And as the importance of maps was recognized, people began to reflect upon how maps function as a means of communication and upon the ideological implications that, as a social product, a map must inevitably contain. This critical evaluation of maps was first exemplified in the studies of J.B. Harley, known to all historians of cartography, reflecting an attitude Harley put most succinctly when he commented that “maps are too important to be left to cartographers alone” (Harley 1989, 2). The figure who first broke new ground in this deconstruction of maps was J.B. Harley, whose theoretical work began in the 1980s. Looking at the communicative results of a map, he saw the need for an approach that laid the foundations for such deconstruction, that is, the exploration of various, perhaps conflicting, discourses that might raise new problems in cartographic interpretation. Starting from the definition of the deconstruction of a literary text put forward by Jacques Derrida, that is, the exploration of the *aporie* (impasse) between rhetoric and thought/ideas, Harley aimed to achieve three ends: (1) to challenge the epistemological myth (created by cartographers) which argued that there was a cumulative acquisition of objective knowledge created by striving towards greater similitude with reality; (2) to uncover the social role of maps and their power in consolidating an existing order of the world; and (3) to allow cartography to take its place in interdisciplinary studies of the representations and constructions of knowledge (Harley 1988).

Harley did not reject the importance of map production techniques, only the idea that cartography could be reduced to the study of these techniques. His starting point was that such technical rules are influenced by a series of social factors whose presence one should be able to read within the finished map. He argued that a good part of the power of a map derives from these social factors disguised within an apparently neutral science that supposedly exists outside society but that, at the same time, serves to legitimize social order. For Harley, precision and accuracy in rendition were the new talismans of power and its exercise – and the culmination of their talismanic authority was to be seen in the modern-day use of computers to draw maps (Harley 1988).

His insistence that the map embodies a language took up three points: one arising from Jacques Bertin’s studies of
the semiotics of graphics, another from Erwin Panofsky’s studies of iconology, and the third from the results of the sociology of knowledge. These would lead Harley to reiterate the idea of cartographic knowledge as a social product linked to the interests of power, thus throwing new light on the connection between cartography and ideology (Harley 1988).12

Harley’s key contribution, however, was his intuition of the crucial relation between cartography and geography, highlighting the inexplicable rupture between the two disciplines (inexplicable because, given that it takes territory as its object of representation, the map must necessarily make reference to geography).

Harley hoped for the emergence of a social theory that would be a starting point for reflections on the hidden implications of cartography. And this is where the limitations of this approach begin to emerge. For how can a “social theory,” understood in the most general terms, not produce results that are equally general and generic on map interpretation? Perhaps the weak point in his work is the failure to recognize that any such theory – while of course reflecting social issues – must be specifically geographical in nature. I will have occasion later to point out how, once one has such a theory, one can achieve quite unexpected results.

Harley’s approach would open the way for a number of scholars. Here, perhaps, we should mention two scholars, Christian Jacob (1992) and Franco Farinelli (1992), who both focus on the question of the language of cartography even while pursuing different objectives.

Jacob’s starting point is that the persuasive power of a map rests not only on socio-political factors but also on the fact that the map meets a fundamental need of the individual; that is, it serves as a tool of a “poetics of space,” providing an image of how the world might be. Through his study of the architecture and the combinations of figurative codes used in cartography, Jacob arrives at the conclusion that a map is less an object than a function, an instance of social mediation that lends itself to numerous interactive situations (construction work, project design, operations upon terrain, teaching, discursive exchange), and that this is why, even when its diffusion is subject to restriction or monopoly, it is a social object, a strategic instrument of power (Jacob 1992, 458). Jacob focuses on the complex dialectics at work within a map, which is anchored not in some generic “knowledge of territory” but in the socially consolidated knowledge that makes up “geography.” For our purposes, his most significant work is L’empire des cartes (1992), wherein he uses a synchronic structuralist approach to the entire history of cartography, taking it as a single whole in order to bring out the theoretical problems raised by maps and their graphic components. Jacob also explores the various stages in the perception and interpretation of cartographic works as such.

As a result of Jacob’s studies, geographical maps are no longer “obvious.” His analysis of the various stages in their history, of the different ways they are produced and the intellectual choices behind their content and graphics, makes it clear that the nature and functions of “the map” are a legitimate area of study.

For his part, Farinelli follows in the footsteps of Harley to provide a basis for a critique of geographical knowledge with a particular emphasis on the ideology of maps. He traces the development of cartography from this viewpoint of ideology and thus comes to argue that the changes within it are linked with those in the political organization of the state. Firm in his conviction that maps have been used as interpretative models for geography, Farinelli (1983) finds it necessary to examine how maps affect geographical epistemology. He looks into the communicative function of a map to show (1) that what a map conveys is invariably subjected to ideology and (2) that, once accepted uncritically, a map’s message may deeply impinge on the very notion of territory, a notion geographers will inadvertently pick up. Farinelli also argues that the map has its most dangerous influence on the very concept of “space.” And through his studies of geographical cartography, he demonstrates that “bourgeois” geography arose only when the spatial logic imposed by the cartography of the previous period had been abandoned (see Farinelli 1983). At that point, the world became a complex made up of individual, mappable, and, therefore, observable components. The cartographic image was the decisive proof of the concrete existence of an object (if it could be given a symbol and a name, its “reality” could not be doubted). Hence, human geography as an act of knowledge rests not on concepts but on the simple act of representation.

4. For a Semiotic Study of Maps: The Hermeneutical Approach

Unlike the deconstructive perspective, the hermeneutical approach elaborates on the idea of the map as a tool of intervention between society and territory and concludes that maps, in that type of relationship, play a crucial role. Hermeneutics focuses on the role of maps as agents capable of deploying self-referential information to effectively mould human intervention on territory. In other words, maps handle a complex geographical space by reshaping it as a cartographic space on the basis of which action is performed.

Before looking at the results this approach has achieved up to date, one should point out that it is just one of a number of different forms of reflection upon cartography that have set themselves a common aim: the application of semiotic sciences to the interpretation of maps. I need only mention here the North American studies of Denis Wood and John Fels (1986) and, at a later date, of Alan
MacEachren (1995). Both these approaches focus on the semiotic functioning of maps, although from different angles and with varying degrees of formalization. Their specialized field is, I think, worth endorsing because it is currently one of the most structured and most vibrant lines of research. And while innovation, of necessity, involves the creation of operational knowledge, these approaches have already been produced and subjected to critical scrutiny within the scientific community.

Various discussions of cartographic semiosis have emerged in recent years. These discussions define this theory as a “hermeneutical approach” because it falls within the realm of semiotic studies while remaining in fact self-sufficient. Unlike other approaches, cartographic semiosis claims that a semiotic study of maps cannot be set aside from a semiotic study of territory. On the assumption, borrowed from geographical theory, that the social significance of territory is to be found in its semiotic setup, this approach holds that maps rely on meta-semiosis (or second-level semiosis), since their language is moulded on territorial language (or first-level semiosis). Because of this, and for reasons I will discuss below, two aspects of cartographic interpretation must be pointed out: (1) that the name given on the map is seen not as one sign among many others but as the one whereby all cartographic information is arranged; and (2) that semiosis – the process whereby information is produced and transmitted – takes place in the presence of an interpreter, who has a double function as a territorial agent and as someone who communicates within a given society.

This theory has been tested within the specific context of cartographic data collected in the West on both European and colonial territories (Casti 2001a). That is precisely the cultural milieu in which a map takes on distinctive relevance both as an ideal tool of territorial conquest and as an instrument of self-confirmation of colonialist policies. Since this theory addresses the functioning of territorial symbolic systems taken all together, however, it can be applied to virtually any cultural context.

It bears repeating here that the present analysis aims at deconstructing, de-locating, and re-encoding the theoretical consistency of geographical maps seen as powerful mimetic tools that go beyond their intended ends and rise above the cultural issues that originally shaped them. Let us start, then, by outlining the theoretical cartographic assumptions on which cartographic semiosis is based.

4.1 Maps and the Process of Territorialization

It should first be made clear that this approach sees “territory” not exclusively as an empirical given, but as a process through which a society transforms natural space and imbues it with man-made significance and meaning.

The multiplicity of procedures in action upon territory can be broken down schematically into three large categories that together make up the process that for this reason is called territorialization: (1) denomination, (2) reification, and (3) structuralization.

The first of these, denomination, involves the control of symbols, that is, those operations aimed at the intellectual modeling and appropriation of territory, namely the attribution of names to points on the surface of the earth which are thereby identified as places. Reification is the exercise of material control, that is, the physical construction and appropriation of “territory.” Finally, structuralization involves the creation of operational contexts for the performance of social projects. Given its relevance in the present discourse, it should also be reiterated that when we use this term we are referring to the attribution of names that reflect the values of the society that performs them. And the cultural import of names used in this way is signalled by the fact that they are called “designators.” Hence, designators are “abbreviations of descriptions” and, in a more or less clear-cut way, “agglomerates of concepts” that pinpoint on territory the cultural values on which the functioning of its society relies. Denomination is a complex process in which different meanings come into play, depending upon the type of designator used and on the types of values it can convey. Using the categories of designation proposed by Angelo Turco (1988), one might say that “referential” designators are intended to set referential frameworks. That is to say, the map reader uses them to orientate herself or to move around within the space, as in the case, for instance, of the Grand Canyon, Colorado, or Fifth Avenue in New York. Albeit in time encrusted with additional meanings, these designators were originally coined on account of their visual impact or the location they pinpointed in a series of references. “Symbolic” designators convey socially produced meanings; in other words, they are strictly bound up with the ideas and metaphysical values of the society that produced them. They refer to sets of values that bear upon religion (San Francisco, St. Lawrence, Mecca), history (New York), politics (Washington), or other fields. Furthermore, “performative” designators, like symbolic ones, contain socially generated significance; but, unlike them, they relate to what can be empirically ascertained as true (Mount Soufriere, the Great Salt Lake, Hot Springs Mountain, or Reykjavik).

Using this schema, we can see that a designator contains all the qualities of the object to which it refers. Cartographic signification is, in fact, so condensed that it can be understood only through a reading that is both denotative and connotative. The first level of reading is that of the referential designator, which is explicitly codified in order to create a referential framework, that is to say, an evident, superficial meaning. The second level
of reading becomes necessary for symbolic and performative designators, because here we must recognize the sedimentations of cultural, technical, and “historic” values generated by a society, which can be understood only through a deeper level of investigation. Evidence of the social importance of connotation can be traced by the fact that place names are changed as soon as a society or its transformative projects is altered. For example, Saint Petersburg was renamed Leningrad after the Communist Party came to power in Russia; Leopoldville became Kinshasa after independence restored the basic values of the Congolese state. And more recently, Iraq’s Saddam Hussein Airport was renamed Baghdad Airport by the Anglo-American coalition. Ultimately, a name echoes a given social or political project. Once that project or the society it addresses changes, territory is renamed. What is beyond doubt, then, is the fact that by using performative and symbolic designators, societies attach their values to territory. However, what I want to insist on here is an aspect of this process that has yet to be recognized. In such contexts the map, far from being merely an intellectual appropriation of territory, performs a central role as the means of representation whereby denomination is put into effect. The crucial consequence that emerges, therefore, is the symbiosis between denomination and cartography, and thus, as I have already noted, the principal role of the name within cartographic communication. Hence, the map is not solely the place within which one performs the intellectual appropriation of territory. It is also a denominative projection, because it conveys the meaning(s) enclosed within the designator. To do this, it accompanies the designator with other codes, which – as we shall see – are called denominative surrogates because of the communicative function they play and which take on some of the values/meanings to be conveyed and communicate them as significant. The designator Chicago, for instance, encompasses the meanings of the various functions associated with the city, such as a residential, political, economical, or educational space. One of these will be highlighted on the basis of the denominative surrogates that go with it. Its blueprint emphasizes its importance as a living space. The conventional symbol refers to the number of inhabitants, marks its political-administrative role, and so on.

In short, I am arguing not only that the map is a product of denomination, within which we can see at work the same dynamics as those within designators, but also that, at the same time, the map itself is also a semiotic field within which the use of signs, different from those of the lexical code, triggers off a second process of semiosis. The map, therefore, starts with geographical designators, but its mechanisms of communication involve the combination of these with other codes.

We should not forget that, from a structural viewpoint, the map is a system that attempts to master and order a complex of information by identifying the most relevant geographical features and arranging them in the same sequence in which they are perceived in reality. This means the use of various linguistic codes (involving names, numbers, shape, and colour), various structures, the geometrical structure of the sheet itself, and the symbolic structure within which the signifiers of the other codes are collected (see Figure 1a).

So, even at this first level, the map is a sort of hypertext, and as such it plays a role in what it communicates in a self-referential way. Now, if we return to our starting premise – the importance of the designator – and if we consider the designator as the element that imposes some sort of hierarchical order on the surrogates present in a map, we can see the full potential of the cartographic projection of names upon reality. The designator is the crux of the process whereby information is actually produced, using a double communicative system, both

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Figure 1. The map seen from the structural and from the communicative perspectives.

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cartographica (volume 40, issue 3)
analogue and digital, which will be discussed shortly (see Figure 1b).

**4.2 THE MAP AS A LOCUS OF SEMIOSIS**

Having seen that the map can function as a hypertext, we must now see this capacity in relation to the production and communication of meaning that takes place in/through that map. Here we must look at the figure of the interpreter who uses such a document to obtain information and pursue objectives. His or her presence makes the map a locus of semiosis within which the signs become vehicles of significance.

As noted by Charles Morris (1946), signs convey something the moment their meaning is established or interpreted by someone. In fact, focusing on this sign-as-vehicle, which in this case involves the designator combined with other signs, we can see that it rests on three procedures: (1) the formation of meaning, (2) the associations that develop thanks to the juxtaposition of signs, and (3) the interpretation made by the recipient of the information. Thus we can see the areas within which to investigate the rules of cartographic semiosis as such, though at a second level. At a semantic level, meaning is produced through the encoding of signs. At a syntactic level, new meaning or significance is conveyed by the relationship between signs. And at a pragmatic level, the map appears as both an object of interpretation and the framework for social praxis (Figure 2).

It is not possible to provide here a detailed analysis of the specific impact of each of these domains on cartographic communication, especially since this information has been widely exemplified and made available elsewhere. It will suffice to restate the fact that the map must be considered a complex communication system, the relevance of which rests not on the information it is used to contain but on that which is generated by the process initiated by an interpreter (Casti 2000, 37–41). It should equally be noted that, insofar as Casti triggers a decoding of both the cartographic and of the territorial language, the interpreter acts as a mediator between the two levels on which the semiotic approach takes place: the geographic level and the linguistic level. The hermeneutical slant of this approach consists in de-locating the geographical map to enact a re-encoding that may disclose its elaborate impact in the production and the circulation of territorial meaning. This line of research is grounded in the awareness that the interpretation of the map belongs to territorial action and thereby foreshadows strategies of production, use, and mediatization of territory.

This approach sheds light on some fundamental aspects of cartographic representation. It becomes clear that by reproducing space on the principle of analogy, where objects are in the same layout and with the same proportional size as perceived in reality, the map draws on a particular topology. This produces a cognitive organization of space, that is, a procedure that locates objects in space around an observer, who, in turn, is located in space thanks to the relationships between him or herself and those objects. All this has brought about a reassessment, both technical and ideological, of the map’s compositional features – its orientation, viewpoint, and centred representation – which has in turn produced analytical and theoretical evidence of their social relevance. At the same time, it has been demonstrated theoretically that every single designator in a map is subject to certain prescriptions that, in some way, sanction its social meaning or significance. Attention is
focused on certain aspects rather than others by procedures through which surrogates neutralize excess information and prescribe certain possible interpretations on the basis of what is included and what is excluded (Casti 2000, 151–73).

In effect, the real change in approach comes from the fact that the map is no longer seen solely as an important instrument in the intellectual appropriation of territory: it also serves as a crucial instrument in reinforcing the entire process of territorialization. In certain social–historical contexts, the map becomes the system whereby an entire community posits its relations to the world. Let us think, for instance, of the maps drawn during the age of discoveries and great explorations, where the progressive expansion of space went hand in hand with the accretion of geographical knowledge. The Mediterranean, featured throughout the fourteenth century as the one and only subject of maps, was gradually marginalized with respect to the ocean system following the discovery of America. Again, borders are delineated via maps, which set beforehand the geographical features to be later detected on territory, as in the case of rivers. Waterways are roughly mapped to demarcate borders, and if a field trip reveals inconsistencies, map lines are privileged. Throughout the colonial era, maps served as mediation tools whereby projects were enforced and courses of action decided in theory over territory that was unknown except via the maps themselves. The project of territorial re-evaluation promoted by French colonialists in Africa was carried out on the ground with information gathered from the thematic maps drawn with that specific intent (Casti 2001b, 429–50). Thus cartography seems to be the product of a culture that generates a culture. It takes the cognitive patrimony of a particular society and uses it to enrich territorial knowledge. It puts itself forward as an autonomous means of communication. It presents itself as an innovative interpretation of the world generated within the mechanisms of territorial or social control established by the society that produces it.

4.3 THE CARTOGRAPHIC ICON

The detailed investigation of the way cartographic semiosis functions thus brings us to continue to consider the relation between map and territory. Starting from the observation that the former is the model of the latter, we can point out that the map offers the opportunity to focus on certain information and push other information into the background (or dissipate it altogether). I have already indicated that, from a technical point of view, this modelling of territory is performed through the use of surrogates to combine names with certain characteristic details or features. The result of that combination is what I would define as the cartographic icon, which plays an important role in the interpretation of the map: it takes the referent of the designator, models it in some way, and then introduces it into the exchange of communication via self-productive mechanisms. To be more precise, its result is not simply an addition of the meanings of the designator and surrogates that compose it. The icon, which functions independently of the process that produces it, transforms as well as combines. We can therefore be justified in saying that the icon takes the designator and invests it with certain content, thus establishing the way in which it can serve in territorial praxis.

In the icon, as in the designator, we can see two levels of communication: the denotative and the connotative. In short, once placed on the sheet, the icon acts in two ways upon the designator: first, it offers a figurative representation of its location, and thus strengthens its referentiality; second, it highlights certain aspects, whose importance is determined by a particular social context (see Figure 3).

For example, on a road map of Canada, the icon used to identify Ottawa references the city by locating it on the west bank of the river bearing the same name and by indicating it as a major node on the road network connecting it to neighbouring towns (see Figure 4). Ottawa’s political and administrative relevance as a capital city is signalled both by the point size of the font and by a specific symbol (a star). In addition, these signals differ from the ones used, for instance, to identify Hull or a smaller town such as Plantagenet. Furthermore, the self-referring information clustered around this icon conveys the idea that we are dealing with an important city, a political or administrative centre that one can easily reach. Hence, the icon is the key feature in the generative process embodied in the map that not only elaborates and communicates information but also produces it. To use a geographical expression, the icons are tributaries of the
communicative means – that is, the map – in which they appear. Hence, they respond, on the one hand, to the communicative mechanisms at work in visual representation (those analysed by the semiotics of visual communication) and, on the other hand, to those hyper-textual mechanisms whereby information is produced through self-generating processes. Let us therefore take a brief look at the systems of communication at work in a map.

4.4 SYSTEMS OF COMMUNICATION: THE ANALOGICAL AND THE DIGITAL

In any communication, the encoding of the signs used can be of two types: the analogical or the digital. There is a third system, the iconic, but because this is the result of a composition of the first two, it can be considered as second-order, even if, as we will see later, it does develop methods of operation and function that are entirely specific to it and not derivative of the other two. Within processes of communication, the analogical and digital can be used either separately or together. They form the poles around which the process is performed; and, given that they convey the properties of an object in different ways, the same communicative process might tend to favour now one, now the other (Fileni 1984). But semiotic analysis of the systems of communication used in maps also brings out another important aspect. Contrary to popular belief, the map is not an analogical model of reality, but a system that uses both the analogical and the digital systems in a very particular relationship to each other. The analogical system can be seen at work in the topography of the map and is indicated by the rules that establish how the information is to be located within the map. The placing of the objects and their size in relation to the size of the support itself may respond to rules of perspective and proportional reduction, but they are not examples of “transformation” in the mathematical sense of the term. By this I mean that no access key is required to be able to understand them. The map aims to show objects as they are to be found in the real world, which is understood as a continuum that is subject to certain physical laws. And to do this it relies on differentiation; that is, one object is different from others because it is located in one specific place and because it is
shown with specific characteristics. For its part, the digital system transmits information about a specific geographical object through the use of various codes (colour, number, shape, etc.) that are intended to isolate only certain aspects of the referent of the designator. In other words, the digital system aims to create distinctions in order to convey what makes an object that object and no other.

From the above it will be clear, however, that the relation between the digital and the analogical is not simply contrastive/oppositional, although it can be so at times (Turco 1987, 123–33). Within a map, it is the analogical system that constitutes the “context” for the operation of the digital system. Indeed, the analogical cannot even be seen in total isolation from the implications of a digital system, because, as we have already observed, the presence of the two systems together can bring the third system, the iconic, into play. This third system organizes the information from another, implicitly cultural, point of view. The icons do not show reality as it is; rather, they show how it appears within a particular theory of the world. It is through the action of icons that what is represented becomes conceptualized and is communicated through a dynamic process that offers a particular vision of the world. Hence, the iconic system draws on the map’s ability to transmit the cultural values attributed to or invested in a specific territory. And, of course, it should be reiterated that such connotations perhaps do not actually belong to the territory itself but, rather, are the products of the map itself, as we shall observe in the section devoted to iconization (section 4.6 below).

4.5 THE SELF-REFERENTIAL WORLD OF CARTOGRAPHY

The full weight of this last statement becomes more obvious when we bring in one of the very first results of cartographic semiosis: self-reference. In the course of this discussion I have repeatedly mentioned self-reference as one of the properties of maps. By “self-reference,” I mean the ability of a map to be accepted as such and, at the same time, to play a role in communication that is independent of the intentions of the cartographer who produced it. Because of cartographic self-reference, names and symbols on a map do not merely replicate empirical data of a physical, natural, or anthropic kind. Rather, in accordance with their own autonomous sets of rules, they produce additional meanings that affect the very perception observers have of the places that fall under their cognitive scrutiny. This self-reference is the result of the type of communicative system used and of the action of the icon in developing denomination. Names, shapes, and colours — in short, the entire language of the map — play a part in this “self-generating” mechanism. In effect, the map becomes self-referential because it shows itself capable of conditioning information upon the things it depicts. This means that, once created, the map is a system of signs endowed with a life of its own; it develops independently of what preceded it and of the intentions behind its original creation.

In addition to this “internal” aspect of cartographic self-reference, there is also an “external” one. The very interpretation of a map is bound up with the stratification of cartographic documents over time and the accumulated experience of the people called upon to read them. Such experience and stratification defines what constitutes “a map,” influences the way it is perceived, and constructs the “memory” of the people interpreting it, thereby broadening its scope of action.

In effect, the map’s ability to serve as a representation rests on its ability to regulate the complexity of the real world by applying metrics that make it possible for interpreters to perceive geographical as cartographic space. It is this that makes it possible for the map to direct multiple courses of action determined on the basis of this “newly created reality.” The final outcome is, as we will see shortly, iconization, or the ability to establish how territory should be conceived and experienced.

One can, in fact, invert the claim that “the map is not the territory” and claim the very opposite: the map becomes territory as such. And it is this paradox that leads to the full development of a map’s self-referential capacity. The map does not offer itself as territory; it actually presents itself as existing at a higher level than brute reality. By way of example, consider the map used by Italian army officials to approach the city of Adwa in the course of Ethiopia’s colonization. Having been drawn with this specific aim, this map featured only those elements that the cartographer deemed essential for a swift approach to the city. In fact, by featuring only mountains to be used as signposts for the approach and neglecting survey morphology, the map propagated the misconception that plains must exist between those mountains. This information, self-referential in its kind, originated from the fact that the author of the map had used contour lines to mark mountain ranges. In accordance with topographic convention, it was perfectly legitimate for others to infer that the absence of contour lines identified flatlands. Although challenged by real-world experience — the fact that the landscape looked completely mountainous — this information induced army officials to proceed with the intent of reaching the plains supposedly marked on the map and of launching an attack from there. The Abyssinians were thus given a chance to attack, and eventually managed to defeat, the Italian army. Even though, in this case, cartographic self-reference played into the cartographer’s mistake, it turned out to be successful because it was granted preference over territory. To conclude, I will claim that maps turn their point of weakness into their strong point. As a model, they cannot duplicate reality, but they can
Iconization marks the high point in the map’s production and conveyance of meaning and significance. It can be defined as the communicative issue whereby the self-referential mechanisms of the map are used to convey conjectures as truths.

In short, the message conveyed by the map can actually replace reality. By instilling the information it generates with relevance – as a real reflection of the characteristics of territory – it can determine behaviour. This is because iconization takes the meaning generated by a map and introduces it into a circuit of communication by exploiting the main functions of the map itself: description and conceptualization. In looking at these two functions, we should recall that the map meets two basic needs in the intellectual appropriation of reality. First, it offers a description that presents the features of the territory that could be perceived through direct observation of the real world; second, it offers a conceptualization of the world, applying the categories of representation (which embody an interpretation) in order to say how the world “works.” It will then be possible for us to distinguish between maps that favour description as their communicative mode and maps that are instead elaborated on a worldview only partially adherent to established canons of real-world mimesis. Nonetheless, the important point here is the relationship between this and what has already been stated about the map’s function in turning territory into discourse: the map causes a shift in communication from the level of description to the level of enunciation. It has been pointed out how the body of communicative procedures used by the icon to “show” the statement conveyed in this discourse can be traced back to the map’s use of figurative rendition, the ultimate effect of which is iconization. The effect of iconization is to shift the communication from the level of description to that of conceptualization. The message conveyed now contains a social meaning as well. This means that regardless of whether the map intends to convey concepts or “mere” descriptions, the very use of figuration results in the production of icons. The result is that the reliability attributed to the description is also attributed to the concept. In other words, iconization promotes the use of the map as a theory one can rely on to assess all the information involved by activating a system in which various pieces of information and concepts are made to circulate endlessly and in different forms upon the double plane of cartographic communication: to describe and to conceptualize.

This is all the more evident when the map represents territory removed from the society where the map is drawn. Consider, for instance, a colonial map of Africa reflecting typical Western values by mapping features in the form of material achievements (e.g., a monument, a building) or in a layout based on geometry (urban layout, road network, borders). Such a map fails to account for other values, namely symbolic ones that underpin African society. Consequently, insofar as they ignore the cosmological value system on which African society is rooted and operated, cartographic documents obliterate its very functioning. Thus iconization produces two main outcomes: first, it denies these cosmological values and thereby African territorial layout; second, it ascribes to African territory the unfamiliar, homogenizing values of the colonizing culture.

Many examples from colonial cartography illustrate this point. Think, for instance, of the typical African village, in which the territorial layout relies on an internal hierarchy and a power structure conveyed by the arrangement of huts. In most cases this arrangement was neglected by colonial cartographers, who perceived it as a random and chaotic jumble and drew their maps accordingly. Self-reference qualifies the African village as a built-up area devoid of functional order. Furthermore, iconization adds force to the perception that it is less important than a neatly laid out, functional, and fully equipped colonial town. Similarly, the sacred area of wooded land where relations between individuals were established and where villagers performed their sacred rituals was represented as a mere feature of the natural landscape that cartographic self-reference conveyed as irrelevant because of its small size. Iconization, in turn, came to obliterate the woods’ social importance and fed that social importance into the circuit of colonial interests as a small group of trees. On a final note, we can consider mountains that Africans associated with gods and thus were excluded from appropriation – even giving names to these mountains was not permitted. To Western cartographers, a mountain was simply yet another discovery; it was named, using colonial designators, and surveyed just like any other territorial feature. Iconization took over by ranking the mountain according to its elevation, in keeping with colonial appraisals. All territory was thus represented on the basis of Western criteria and managed accordingly.

Iconization can be found also in maps that represent territory within the society where the maps are produced. Let us consider a current tourist map of Death Valley, California. The valley’s territorial layout is based on the road network and on tourist and surveillance facilities, all of which provide a detailed and exact representation. Self-reference acts upon this description by extending its informational layout to the whole desert, which, despite unfavourable natural conditions, is thus featured as territory that has been fully – both physically and intellectually – appropriated.
Intellectual appropriation takes control where material, anthropic intervention ceases and uses denomination to induce syntactically the idea of a fully anthropomorphized area. Designators scattered over the entire desert serve to mark its complete subjection, and iconization takes over, first using all these data to convey the notion that the area is safe and then extending its value judgement to the whole enterprise whereby wilderness has been turned into a social asset.

At this point, therefore, one might claim that the map is an operative mechanism that says the world must be of a certain type and that it must function in a certain way. The map itself is an icon, defining the term in its widest possible sense to mean an instrument by means of which one carries out a metamorphosis of the world. But the map also embodies a shift in perspective. The fact that it is a representational mechanism capable of mimesis means that it has greater communicative ability than brute territory itself, and thus it ends up taking the place of that territory. The map’s effectiveness as a mimetic device comes from its implicit equation – map = territory – an equation that cannot possibly be defined objectively, unless as a potential tool whereby consistency in the relation between society and its space is claimed to be attainable and attained. This power of mimesis, as highlighted by a semiotic analysis of cartography, is what enables a map to compromise and alter the meaning of territory.

5. Society, Cartography, and Geographical Sciences

The above discussion of development in the theories of cartographic interpretation now brings us to one unavoidable question: What skills and abilities are required by the person interpreting a map? This question arises from the fact that cartographic interpretation is one of those specialist areas in which, I believe, the possession of a certain “expertise” is necessary. Avoiding banal prescriptions as to the characteristics an interpreter must have, I will limit myself here to what I consider the most fruitful of the above-outlined approaches to cartographic interpretation: the semiotic. Given that this approach moves at a meta-geographical level and thus calls into play a second level of interpretation, it would seem that a necessary starting point is a thorough knowledge of the first level – that is, of geography itself.

Obviously this does not mean that the interpreter must belong to one of a certain group of disciplines (geography, history, urban planning, etc.); rather, it means that he or she must possess the instruments suitable for such cartographic analysis, instruments provided by knowledge of territorial theories as such. And a more radical question that emerges from the positing of territory as a complex system is whether maps are capable of demonstrating that complexity. Having freed maps from those beliefs that saw them as an instrument that merely registered reality, can we now say that maps are capable of conveying the deep significance of territory?

Cartographic semiosis has shown not only that maps can convey complex information but also that this information is always the product of iconization, and that it is connected with reality but cannot simply be superimposed upon it. In short, it has been shown that, as a model, a map replaces rather than represents territory. What is more, a study of maps reveals that the result of the communicative process they set in action is even more radical. Maps ultimately call into question the material significance of territory itself. Icons underline the relevance of what is created and imposed by the map itself. They shift aside the actual physical substance of the real world.

And here another intriguing question arises, which, however, lies outside the scope of the present discussion. As a mechanism of mimesis, what role does the map play within the world of the Internet, which is by definition concerned with the creation of a non-material world? In spite of numerous attempts to master the role of cartography on the World Wide Web, that question still seems to be unanswered. More research and more theoretical analysis are necessary for an adequate reply. Perhaps, once again, the solution lies in further study of the various aspects of mimesis at work in a map.

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Notes

1. These approaches are still widely practiced and enjoy high standing in the history of cartography, as exemplified in the various volumes of The History of Cartography (Harley and Woodward 1987; Woodward and Lewis 1998).
2. For an overview of the dawning antiquarian interest in maps see Harvey (1999).
3. It should be reiterated, however, that these studies analysed and threw light upon the relations between printing and cartography. As an example of such works, one needs only mention Woodward (1996).
4. Here one need only mention Almagià’s investigation of various important documents – including the “Carta del
tornitorio veronese detta dell’Almagia” – which enabled him to date them and put them in social context. See Almagià (1923).

5. In most cases, these works were produced by unknown technicians and land surveyors who used cartography as a tool for surveying projects commissioned by public or private bodies. But sometimes they were produced by great cartographers – or by men who would go on to become such – and, in these cases, the administrative maps contained important innovations at both technical and conceptual levels. For a recent discussion of this latter point regarding the administrative cartography of the Venetian Republic, see Casti (in press).


7. Among these, in the Italian context, one should mention Marinelli (1881). However, in spite of the fact that Marinelli was one of the first to take a catalogue raisonné approach, the absence of photographic reproductions (inevitable, given the date of publication) means that his book is now of little use as a work of reference.

8. These great collections, which began to appear at the end of the nineteenth century, cover many regions, including Africa and Egypt (Kamal and Faut 1926–1951); Portugal (Armando and Teixeira da Mota 1960); Japan (Kazutaka and others 1972); Yugoslavia (Škrivanic 1974); Germany (Meurer 1984); the Netherlands (Schilder and Stopp 1986–2003); and Belgium (Watelet 1995).

9. Harley wrote 140 articles and contributed to numerous books, including “The Map and the Development of the History of Cartography” (Harley 1987).

10. I am referring to the focus of attention on certain aspects (filigree, heraldic devices, etc.), which are certainly important in the interpretation of a map but should, I think, be left to specialists of certain antiquarian/artistic disciplines.

11. For the radical position he took – and his belief in his own ideas – see the debate published in *Concepts in the History of Cartography: A Review and Perspective* (Blakemore and Harley 1980; also see Gutsell 1982). On this point also see Gould (1995).


13. Though this analytic approach brings together a limited number of researchers, its importance to the interpretation of maps has in some way been officially recognized by the creation of the Commission on Theoretical Cartography, a working group of the International Cartographic Association (ICA). It should also be mentioned that the heads of that working group have set up a series of discussion papers entitled *Diskussionsbeiträge zur Kartosemiotik und zur Theorie der Kartographie*, published in Dresden under the editorship of Alexander Wolodtschenko and Hansgeorg Schlichtmann (respectively president and vice-president of the Commission). All in all, the Commission brings together around 20 scholars from all over the world. See the Web site of the Commission on Theoretical Cartography (http://rcswww.urz.ut-dresden.de/~wolodt/tc-com) for more information.

14. Among the many contributions posted on the ICA Web site (www.icaci.org/), I would like to call attention to Wolodtschenko (2003).


16. More precisely, reference is made to questions of complexity (Turco 1988). It should be noted that these studies rely on findings in the fields of semiotics and linguistics thanks to the work of scholars such as Algirdas Greimas (1990) and Ferdinand de Saussure (1966), who resist disciplinary classification. To a higher degree, this line of research touches upon the two borderline disciplines related to the philosophy of language and especially to the research of Charles Morris (1946). Morris’s concepts have been elaborated with a view to formalizing a semiotic theory of territory that has proved fruitful and worth pursuing. See, for instance, Turco (1994b).

17. I deal specifically with “designators” rather than “toponyms” because my intent is to reclaim the social import of a name, well beyond etymological–linguistic constraints. While toponymy is the science of place names, denomination goes back to a semiotics of territory. More specifically, denominational analysis addresses two issues: (1) the symbolization of a given place and (2) suggestions as to how that place ought to be perceived and experienced in society (see Turco 1999, 177–78).

18. The word “reykjavík” in Icelandic translates into English as “bay of smokes” or “bay of steam.” Let us not forget that the distinction between designators is integral to the research on territorialization. Analogies with the terminology developed by J.L. Austin and others (especially Austin 1962) as part of their speech act theory should be avoided.

19. In fact, the designator is an abbreviated description of reality, a “concentrate” of meaning that includes all the qualities of the object thus identified (Turco 1988, 79–93). With regard to *denotation* and *connotation*, I draw upon the classic semiotic distinction between denotative or primary codification and connotative or secondary codification (see Turco 1994b, 372–73).

20. I refer to the current capital city of the Democratic Republic of Congo. Towards the end of the nineteenth century, Kinshasa became an important trading post on the Congo River. On the initiative of the Anglo-American explorer Henry Morton Stanley, the city was renamed Leopoldville in honour of the Belgian King Leopold II. In 1966, the designator Leopoldville, clearly a vehicle for
European values, was replaced with the basic designator Kinshasa, corresponding to the name of the village located in that same place in the nineteenth century.

21. This was done to reaffirm the coalition’s resolve to liberate the country from Saddam’s dictatorship and return it to the Iraqi people.

22. Important clues to be kept in mind in cartographic interpretation are given not only by designative names but, more generally, by all the captions on a map that refer to the relation between society and territory and provide information about it.

23. A denominative surrogate can be any figure, number, colour, or even the position of the name itself on the map, intended to make explicit the quality of the object represented on the map. The term “surrogate” refers to the fact that a missing name is replaced with, or surrogated by, another sign (figure, number, colour, or even position on the map). On the projection of names, see Casti (1998, 65–96).

24. In fact, the use of various structures facilitates the conveyance of information, and the interrelation between different codes brings out what might remain obscured in one individual code. For the results in communication of the passage from a single-structure system to a multi-structural language, see Cassirer (1955, 1961).

25. Here I take up the model proposed in Morris (1946), which moves away from an analysis of the sign in itself and thus transcends the confines of logic semiotics (C.S. Peirce) or linguistic semiotics (Ferdinand de Saussure). Morris adopts a functional, organic view of language geared towards pragmatics and reflects upon a sign’s communicative aspect and its nature as a sign-vehicle, that is to say, for our purposes, as a designator that incorporates information and conveys it in the presence of an interpreter. Let us not forget that cartographic semiosis proposes a study of the geographical map as a symbolic operator and, as such, is not directly concerned with the analysis of the workings of the sign in itself, as suggested by MacEachren (1995). What cartographic semiosis favours is a study of how the interpreter involved in the process of territorialization is affected by the study of the map itself.

26. What I am arguing here is that the present analytical approach aims at investigating meta-semiosis, which is rooted in territorial semiosis.


28. It has been argued that the orientation of the map depends on the position of the viewer. It should also be remembered that, even though the viewer is positioned ideally outside the real world, the properties of his or her perceptive, self-centred space are still assimilated and conveyed through a language that hinges on a designator in its referential function.

29. It is worth noting that I use the word “icon” in a sense so far unknown in the context of cartographic studies. “Icon” refers here to a semiotic figure that is, as such, capable of producing information and processing it in a communicative sense. The word therefore carries a different meaning than when it is used by authors who have focused on the semiotic analysis of maps. Drawing upon Peirce, for instance, MacEachren (1995, 222) claims that the icon is “a sign-vehicle that refers merely by virtue of characters of its own.” Dealing in his turn with the iconic code, Wood (1992, 117) holds that “it governs the manner in which graphic expressions correspond with geographic items, concrete or abstract, and their attendant attributes.”

30. I am thinking here of the two levels as discussed in semiotics: see Eco (1986, 181–83) and Sonneson (1998, 187–89).

31. It is worth pointing out that the use of figurative procedures in the creation of such icons not only develops the information communicated by the designators but also intensifies it. Such procedures are spatial organization, in which topography serves to reinforce the referential nature of the map, thus working at a denotative level; figuration proper, in which visual codes are used to highlight the distinctive features of the referent; and iconization, which combines the results of spatial organization and figuration and imbibes the designator with social implications or values. The result is that the latter becomes symbolic and/or performative (see Casti 1998, 70).

32. In order to underscore the city’s role, the label for Ottawa is printed in red on the coloured version of the map. Red is not used for labels of other cities.

33. On the semiotics of vision see Arnheim (1974). Rudolf Arnheim’s work played a central role in the research on the semiotics of vision while also promoting parallel studies in art history and art experimentation (Hockney and Stangos 1993). The studies of hyper-textual systems carried out by Lotman (1985) and Greimas (1990) were followed by those from the field of art history, such as Panofsky (1991), Arnheim (1974), and Gombrich (2000), which in turn gave rise to a separate branch classified as visual communication science. The aim of this discipline is to examine communicative processes and their self-referential implications. See, among others, Bettetini (1991), Appiano (1993), and Fontanille (1995).

34. The analogical and digital systems are also to be seen at work in the biological conveyance of information, which in certain ways might be considered as a “primary level of communication.” However, in such biological “communication” iconization is totally absent, revealing the latter’s purely cultural status (see Wilden 1978, 601–95; see also Wilden 1980).

35. On this subject, Bateson (1979, 110) takes up a phrase of Korzybski – “the map is not the territory” (1998) – and argues, “we see the map as some sort of effect summating differences, organizing news of differences.”

36. Memory means that the interpreters of a document work within codification that has already taken place,
and sedimentation over time has consolidated the various attributions of significance and meaning. In the same way, the connection between the signs obeys rules of visual perception. The information conveyed is not the sum of that conveyed by each icon but the result of the interaction between those pieces of information. In short, the interpretation of a map relies on recognition of the ways in which a map defines itself as such (see Casti 2000, 140–44).

37. For a thorough discussion of this instance see Casti (1996, 17–79).

38. See note 29 above.

39. With respect to British colonial cartography, one instance can be found in Brambilla (2004, 263–316).

References


Towards a Theory of Interpretation: Cartographic Semiosis


