

THE SPACE OF CARTOGRAPHY

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All perceiving is also thinking, all reasoning is also intuition, all observation is also invention

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There is a type of contemporary space which, as such, remains practically unnoticed even by those who are responsible for its creation. This could be explained by the fact that these spaces have no specific location, their essence being of a symbolic, conceptual kind. I'm referring to the forms for the graphic representation of spatial milieu: maps. As it will be explained below, maps are themselves places that substitute those of the represented reality; they are surrogate spaces operating primarily through analogy and abstraction.

The production and use of this peculiar space have important consequences in the actual configuration of physic milieus on any scale, be it architectural, urban or territorial. Cartographic historians and critics insist in the fact that maps, whatever be their medium or the quantity of information contained in them, do not possible present the depicted milieu directly or transparently – despite the panoptic vocation of the most advanced georeferenced information systems. Instead, maps are powerful and sophisticated instruments that allow us to structure our environment by “providing versions of truth for human minds to apprehend”. The idea of every form of spatial representation entailing the performance of a particular action over the depicted object underpins the ensuing inquiry about cartographic production and its transformational capabilities.

For the RAE [Royal Spanish Academy] a map is “a graphic representation of the Earth or part of it on a plane surface”. This definition is not entirely satisfactory, as it does not allow the possibility of employing other media than the plane surface nor that of the represented object not being coincident with the terrestrial surface or contained in it - neither does it allude to the map's relational and conventional nature. The concise definition offered by Robinson and Petchenik in 1976 seems more appropriate and undoubtedly better informed than that of our academicians: the map is defined as “a graphic representation of the milieu” – significantly, Robinson himself would later modify and widen this definition in a substantial way by substituting the word ‘milieu’ for “relationships and spatial forms”. Graphic must be understood in a broad sense, as opposed to logic: in this regard, the definition refers to the use of the image, instead of the word, as the basis for representation.

The etymology of the term ‘map’ is revealing: it results from the shortening of the Medieval Latin term *mappa mundi*, “napkin of the world”, thus alluding to the cloth that served as medium for this kind of representation in that age. Apparently, Quintiliano attributed a Punic origin

to *mappa*, as contraction of Talmudic Hebrew *menafa*, “fluttering banner”. It is significant that the original term refers at the same time to the represented space (the world) and that employed for its representation (the cloth), so that it can be stated that already at its inception, the word ‘map’ is endowed by that aforementioned essential characteristic: in any of its possible forms, the map is itself a space that substitutes other space, the so-called ‘milieu’ (or ‘environment’) which is represented on the former's surface. Another characteristic revealed by the word's etymology, is the coexistence of two disparate scales in the same object, evidenced in the literal meaning of *mappa mundi*, in which two antithetical (in regard of their size) objects are convoluted.

As a matter of fact, the use of scale in maps is one of their essential characteristics, as it makes possible to meld into a single image sets of objects which are separated in reality and, accordingly, perceived discretely. Robinson and Petchenik, closely following Piaget's cognitive theories, alluded to the way in which scale actually transformed sets of objects from a state of separation into one of proximity, thus making it possible to operate infralogically with them. Unlike logical-mathematical operations, which are based only on similarities and differences attributable to distinct objects in a system discontinuously perceived - i.e. operations formulated in terms of logical classes, relationships or numbers; the so-called infralogical operations have no indexical character but are referred to relationships in the space-time continuum, thus leaning towards the formation of complex configurations stemming from groups of objects simultaneously perceived. So the map's scalar reduction permits reality, informed and populated by a multiplicity of entities, to be structured and so, apprehensible, as a system of spatial relationships by the fundamental principle of placing in the proximity of the map-medium those objects that our perception and experience yield as detached and scattered.

If the self, when confronted to any sort of spatial representation, operates in a similar fashion to how she would decode an environment, that is because of her ability to transpose certain aspects of reality onto a sort of ‘mental screen’ – what has been deemed as ‘cognitive map’, unavoidably preceding the object ‘map’. This skill for (so to speak) ‘making a stock of the situation’ is as a matter of fact a very complex, inherently human function that implies an acute sense of spatialness, which would be crucial in the origins and development of general consciousness. Out of such subjective spatialization (i.e. the ability of transposing to a mental space some aspects pertaining to external reality) the map would be born.

Implicitly, the result of the projection of reality features onto a smaller medium is assumed to be somehow analogous to the depicted milieu. The analogy is evidenced in the assumption of the map's presenting the structure of the territory; that is to say, the representational

space (the map) is assumed to keep the existing spatial relationships between its referents, be they geometrical properties as much as (in so crucial a manner that it remains paradoxically unnoticed) those topological properties of contiguity, separation, order, inclusion and continuity - i.e. those most primitive spatial relationships that ignore metric or perspective relationships. In other words, the maps not only preserve angles, relative distances, areas, shapes, etc.; but, truism though it may seem, it is all the more important that they present continuous areas as continuous, open or closed shapes as such, or that contiguous objects appear in adjacency, or that objects in, out or between other are shown in the same manner.

The analogy between the map's structure and the territory's should not be understood as the former merely imitating the latter: the map is not the passive, mimetic reproduction of a supposedly objective external reality, but an authentic invention that results in the effective construction of the milieu by means of its representation. That is, the structure presented by the map is analogous to that contained in the territory because the latter is actually built through the representational act. Since the 18th century, philosophers have speculated about the possibility of our cognition being possibly explained only by subjective apprehension. In this manner, our experience of the external reality, even that emanating directly from perception, reveals itself as being profoundly mediated by our judgment. In regard of spatiality, Cassirer explained it in masterly fashion: “when we attribute a certain size, position, and distance to things in space, we are not thereby expressing a simple datum of sensation but are situating the sensory data in a relationship and system, which proves ultimately to be nothing other than a relationship of pure judgment”. More recently, epistemological constructivism has proved that our knowledge of the reality is to a great extent an invention by the subject. Consequently, space is considered to be actively built by the observer, as a product of the dialectic interaction between the ‘bulks’ or ‘fixations’ distinguished in the milieu and the ‘connections’ subjectively imposed between them. In regard of spatial representation, as long as the map contains a structure for whoever uses or elaborates it, such structure is being transferred into the milieu, where nothing is organized a priori. This process may be related to what Corner described as mapping's “double-projective nature”, in reference to the existence of a first projection from physical to symbolic space, in which some objects of the environment are selected and grouped in coherent systems, and a second inverse projection, where these systems are codified and used so as to operate certain spatial transformations over the environment.

In this double projection the convolution of mapping and design is disclosed: the architect's relationship to the environment in which she works is identically articulated through the project. One of the project's primordial functions is to make apparent (to re-present) precisely

those spatial characteristics that the designer extracts from the milieu, in order to organize them in a coherent system of relationships and meanings – the raw materials of the architectural work. As with the map, onto the project's virtual, symbolic space the building's future uses are arranged, thus actively constructing what later will be built, "real" space.

Abstraction is the other essential operation in cartography, for the making of any map entails the process of selecting whatever information is judged to be relevant for the purposes that have led to its elaboration in the first place. Selection is consubstantial to map-making, as the world, in all its infinite complexity, is ultimately non-apprehensible by our knowledge and consequently reality is not representable in itself. Some cognitive theories relate this characteristic to the adaptive nature of evolution, making a point of considering that the formation of mental maps is inherently bound to the human condition as a vital process for our species' survival. In this manner, the so-called cognitive maps are thought of as an ability deeply rooted in our evolutionary baggage, one that makes possible for the self to reduce the surrounding environment to its indispensable elements, disposing of those not immediately necessary. This double subjective process of selection/omission, present in our remotest origins as a species, persists at a collective level in our current cartographic practices - which can be so regarded as an indicator of the culture that produces them. Quite similarly to the formation of cognitive maps in the self's mind, abstraction operates in the map as one of its most salient features: the map's usefulness is measured against its ability to reduce external data to the minimum, indispensable quantity of information permitting its intended use. A map's alleged neutrality is cancelled by the selectivity inherent in any cartographic process: the operations of selection, reduction, omission and classification are inevitably performed by the map-maker, who may or may not be aware of their profound implications, according to a series of conventions

stemming from a society to which the map belongs.

To summarize, it is by means of both analogy and abstraction that the map qualifies as surrogate space: in terms of cognition and operation, the surrounding space is substituted by the space used for its representation. We tend to operate on the map only to translate thereafter those actions into the real space depicted in it, and this we do on the basis of a firm belief in that cartographic elaborations are unmistakably analogous to reality. As Stephen Hall has put it:

"Reading a map represents a profound act of faith. Faith in the map-maker, in technologies of measurement (and the science that underlies them), in the idea of map – that the unique mosaic of boundaries and symbols corresponds to real space in what we like to call the real world."

This 'faith in the map' has been further explained by the geographer Jan Broek as a result of the implicit elaborateness of every carto-graphic representation, which is equaled to a persuasive quality compulsorily operating as an interface between map-maker and map-reader. Unlike any written text, the map's graphic language does not allow it to express by itself the limits of the techniques used in its elaboration: therefore the essentially interpretative nature of mapping is unavoidably concealed. As a consequence, unable to evaluate the map's "tacit dimension", the receptor gets used to considering the map as a precise, innocuous reproduction of the environment, thus favoring the aforementioned replacement of representational space for physical space. Two common cartographic procedures contribute to this phenomenon, further intensifying such belief in the map's naturalism and objectivity: the disguising of the point of view, not coincident to any possible observer, and the concealment of the map's very authorship.

Leaving aside the map's masks, what underlies this phenomenon of spatial surrogation is the

pervasiveness of the idea of space in our conception of the world: if it is the bidirectional transposition is possible between the structures of objects in both maps and reality, if we can operate on the map as if our actions took place in the represented milieu, it is precisely because both map and environment share that elemental condition of spatiality – the fact that every object shares a relative position.

To sum up, from a number of theories about knowledge, it is accepted that, even if postulating the existence of an external material world, the human being cannot have a direct, immediate experience of it. Under this approach, reality (our conception of that ontological world) reveals itself as an invention emanating from the subject; spatial apprehension, even in the most elemental perception of our surroundings, is actively constructed by the observer from disordered sensations. As aforesaid, by performing successive operations of selection, schematization and formation of synthetic images, mapping allows us, not only to discover or identify the materials and relationships that populate our milieux, but more importantly, to structure it in coherent systems that are instantly recognizable. In any of its manifestations, graphic representation of spatial environments proves to be one of the most powerful tools in the effective construction of anthropic space.

Confronted with this ascertainment, the currently-ruling modes for spatial representation, with their emphasis on the geometrical fact, in the record and management of huge quantities of geo-referenced data, almost exclusively obtained by means of intricate remote-sensing technologies, not only presented as paradigms of accuracy and expediency, but as objective, aseptic, transparent representations of reality. It might be put into question the extent to which these representations condition the form of the contemporary landscape, the place that corresponds in reality to the surrogate space of the map.