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The resurgence of maps.
The relevance of "where?" and spatial thinking

I. INTRODUCTION

We live in an increasingly globalized world, inter-linked, virtual and mobile-connected (Castells, 2001; Ilharco; 2010). Permanent Internet connection almost everywhere and the so-called IT's enable us to develop plenty of activities irrespective of where we are. Both the Internet and the multiple devices available make space and time smaller, with location being more and more vague. However, geolocation and management of spatial information through the use of maps are experiencing considerable increase in our everyday life. Three out of four people using the Internet claim to be regular users of street maps and geographical information (Crespo y Fernández, 2011 p. 403).

The huge amount of information available is provoking a surge in new forms of communication in a more synthetic way, with the visual power of image as a key feature. The rising number of visual solutions oriented to handling a greater number of concepts in less time reinforces a range of media, be it graphic, photographic, videographic and, obviously, cartographic. Circulation of geo-referenced map information fosters the rise of media which are more concise than written language, thus making maps experience exponential growth.

Such upsurge of both cartography and Geographic Information Technologies (GITs) does not just end at their use when looking for a location or a route. The scientific community has been including this process in the so-called "Neogeography" for the last few years. GITs have eventually strengthened the innovative paradigm of Neogeography by piecing together conceptual elements, generation of big data, online map viewers and voluntary cartography (Cortizo, 2015, p. 8). All of these provide powerful capacity of generating geo-referenced data for the layman. Such data might even be generated unnoticeably by users through geolocation apps in mobile devices, which may be understood as the socialisation of access to GIS's.

This article is aimed to reflect on the significant boost of maps and their use in everyday relationships. Changes undergone by Geography and the development of cartography are analysed herein through the so-called "Neogeography", targeting the paradox implied by the fact of a globalised and Internet-linked world where spatial location becomes, thanks to the Net itself, more and more relevant. Users also become map creators through standard apps; development of cartography increases among people lacking knowledge in both spatial thinking and cartographic language.

II. COMMUNICATION IN THE 21ST CENTURY

Management of information has constituted ground for conflict throughout History, being restricted to a limited number of individuals linked to power. Nowadays, this is rather different. Old ways of obtaining information and the linearity with which it was received have been shattered to pieces. Internet and 2.0 web rise have provoked a major change in human relationships, from sender-receiver to bi-directional flow, where everyone can be

sender and/or receiver. Information changes continuously, even being modified in real time. All that seemed permanent turns ephemeral, distant becomes close, everything is connected via a network. Bauman used the term "liquid society" to define a status of the post-modern society, where solid industrial and post-industrial structures become flexible, pliable and liquid (Bauman, 2003). A challenge that can be faced in the present century will be the ability to manage and optimise the flow of information that we receive so we do not get overwhelmed. Change has been even greater with the shift in formats. Manuel Castells compares the "network society" with the Industrial Revolution or with Gutenberg's invention of printing. He also compares the influence of the "Internet Galaxy" as opposed to the "Gutenberg Galaxy" (Castells, 2001). It can be stated that the change provoked by the appearance of the Internet has been of a greater proportion than that of printing or television (Pons, 2013, p.20).

III. GEOGRAPHIC INFORMATION TECHNOLOGIES

The growing use of maps and GIT's stems from a whole series of interwoven elements which has become known as Neogeography (Capel, 2012; Guimet, 2015¸ Bosque, 2015), Geotechnosphere (Buzai, 2014*a*) or Geomatics 3.0, taken as an interactive dynamic system between both real and virtual worlds (Ariza, 2015, p.190). Core elements are global access to geolocation or geo-reference, improved and more inexpensive hardware (IT system's physical parts) and software (logical parts of said system) as well as increased availability of geo-referenced data.

Geolocation (or geo-reference) is based on a particular object's location on the Earth's surface according to a coordinate system (either geographic or flat coordinates). Major development has arisen through satellite geolocation capacities implemented in most state-of-the-art mobile devices (Saxena et al., 2014).

The set of both physical and logical elements (hardware and software) make up the IT system. Physical devices (laptops, tablets, smartphones) have boosted, become cheaper and diversified. In turn, devices are equipped with massive apps, platform and networks handling spatial information (software). Special attention must be paid to Geographic Information Systems (GIS); from a range of pay software to FOSS (Free Open Source Software)-based tools and webmapping. The target audience of this technology is very large (Batty et al., 2010),

enabling everyone to create and spread cartography simply and free (Hudson-Smith et al., 2009). The apps interact in a fast and user-friendly way with social networks, thus generating new geo-referenced information. Some social networks are even based directly on location through mobile devices: LBSNs (Location-Based Social Networks). The use of apps has skyrocketed, mainly due to their user-friendly handling as well as to their communicative capacities. However, it must be said that apps largely implement poor visual solutions.

Data are other fundamental elements of Neogeography, bearing a common feature of the spatial component, private, public or citizens' (Beltrán, 2015, p. 103). Massive data package generated through multiple sensors and devices is known as Big Data: diverse data, intentionally or unintentionally generated, covering not just geo-referenced data (Gutiérrez et al., 2016). Such data utterly change the working unit: from the administrative territorial unit to the individual, linking geographic analysis to ordinariness and human-scale approach, showing a fresh approach to reality. They associate a coordinate not only with everyday reality but also with feelings (Buzai, 2015). The universe of intersubjectivity emerges from the meaning of locations tracked through the social networking system (Cerda, 2015). Individualised information displays a subjective component, close to behavioural paradigms rather than to quantitative ones.

Another activity which best represents Neogeography is VGI (Volunteered Geographic Information, Goodchild, 2009) Collaborative Geography, which goes as far as to speak about SIG's "wikification" (Sui, 2008), the most remarkable benchmark being OSM (Open Street Mapping)¸ which mentions "wikiprojects" as public gatherings in different cities and dates with the purpose of generating cartography. Both the quality and the processing of such data is seriously hampered by the enormous amount of information with such diverse sources. An increase in standardisation of activities consequently proves to be necessary in the light of rising number of techniques of capturing and processing information available to non-experts who create sets of spatial data (Ariza, 2015).

Multiple approaches to Neogeography allow structuring information, dealing with complex issues and enable decision-making. Spatial thinking becomes a transversal skill to be taken into account in this new century, when both mobility and geolocation are key features for our day-to-day performance. Contrary to what might seem, learning spatial thinking does not directly result from the use of devices equipped with geolocation tools (Metoyer

et al., 2015) Geography involves spatial analysis; it can (and it must) take advantage of the need for spatial literacy.

IV. THE MAP: SYNTHETIC IMAGE OF THE PLACE

Technically speaking, everything is image. A significant part of our information (textual, visual, graphic animated…) is obtained through screens located in different devices with a common link. The use of images has boosted, in particular their circulation through social networks. Among the variety of visual communication, maps are one of the earliest ones. Maps display spatial information in a synthetic way (Maceacheren, 1995, with their success being due to monosemy, by which each and every sign displayed on them has an only meaning in the map legend (Bertin, 2005, p. 6). This gives maps a universality similar to musical scores or to mathematics, thus enabling them to have a global perception which fully matches both the Internet and the 2.0 web.

Maps are the visual expression of spatial information. "Where?" is one of the most basic question words which are intrinsic to our existence. "Nearly everything that happens takes place somewhere" (Longley et al., 2015). Cartography has long been a science attached to power, a "science of the princes" (Harley, 2005, p. 46). The power of maps does not lie either with them being scarce and exclusive or with the degree of technicalization and complexity of the tool being used. Occasionally, sketches or freehand maps become more useful than computer-generated ones. A map's true potential can be found in the relationships that it displays, in the way that it is displayed and in the map's ability to communicate. Topology goes far beyond the locational function, enabling a high degree of abstraction (Lefort, 2010, p. 13). Maps have the capacity of disrupting our perception of the territory and of the facts happening there. Not only do representations describe the world but they also provide a perception of it which is not devoid of subjectivity and opinion by making the observer set up their own image of the world (Hernández; 2006, p. 198). Maps' communicative capacity is one of the main approaches of cartography (Robinson et al., 1987, p. 12).

The profusion of cartography generates undesired uses, with an increasing number of people creating and spreading maps. Maps are shown to us de-contextualised and without all the key elements which are necessary for their interpretation. Modern cartography has made a sig-nificant effort through GIT's in order to standardise the rules of cartographic composition (Slocum et al., 2005, p. 6). Fordian cartography has democratised the use of maps even though it has brought about a significant increase in the number of documents with both low communicative and aesthetical value: the so-called "Cartor-rhea" (Capel, 2009). We tend to think that a camera with better quality takes better shots, which is only partially true; in fact, it is the person deciding on the frame or the exposure who becomes the defining feature of an excellent photograph. Previous learning proves to be key to communicate, especially when we refer to images and maps. Technologies have managed to increase the number of images and maps of all kinds which are available. Any event happening anywhere in the planet is shot, photographed, mapped and made available to everybody within seconds. A larger number of moments and places depicted does not entail, however, a qualitative improvement in their rendering.

V. DEBATE AND CONCLUSION

After all the debate that has been addressed herein, the need for in-depth discussion on the relevant approaches that the 2.0 has produced is clearly perceived. We are currently involved in a deep process where reality and our way to engage with it are changing continuously. Formats evolving towards digital backgrounds have provoked exponential growth of image as media, enabling massive circulation of visual information with far cheaper costs. Cartography involves a kind of image which includes spatial information having accompanied us for centuries in an elitist way; currently, the access to such images has become democratised. In addition, popularisation of geolocation technologies has allowed larger profusion of maps, with equally larger use of maps generating a continuous feedback effect. The more maps and geo-referenced information is used, the more geo-information is produced, thus bringing about more possibilities of use.

The power to manage images and spatial information has not implied, in turn, an approach to training for their use. Previous knowledge in map reading and cartographic expertise does not go beyond the technical functionality of tracking elements in the map, which results in underuse. Cartography is a tool for analysis and communication which increases users' spatial thinking skills. Consequently, spatial thinking becomes a must. Expertise in it, together with new technologies is likely to mean significant improvement in our ways to communicate and

make decisions in the current century. Lack of training in such skills makes us favour larger literacy, both visual and spatial.

Place and location are soaring with the cloud's virtualisation and globalisation. Academic geography is increasingly taking into account the change that society is experiencing regarding the relationship with the environment through ICT's. Matching Neogeography with academic geography is necessary (Goodchild, 2009, p. 83). The challenge must be introducing expertise into the huge amount of data produced by the novel status of hyper-linking. New data do not display structures but processes, which involves the need to develop new analytic models (Bosque, 2015, p. 170). Innovative techniques do not challenge the relevance of either spatial analysis or cartographic communication. There are multiple processes, techniques and methodologies entailed by the geographic discipline in order to apprehend the Earth's surface phenomena, many of which have been standardised through GIS. Throughout the sixties and seventies, the focus was on the "S" for system, through computing and programming; the decades of the eighties and nineties meant a shift to the "I" for information, through collection of reliable data. The 21st century, in turn, focuses on the "G", interpretation of the society of geographic information (Buzai, 2015, 59). It is for this reason that a bond must exist between convergence and co-existence, the potential of which being greater together than separately as far as evolution of data, information and expertise is concerned.

Buzai defines Global geography as a science used by a number of other sciences through standardisation and digital circulation (Buzai, 2014*a*, p. 21), a consequence of the multidisciplinary and transversal nature of geography itself, which has caused many an epistemological issue from its shaping as a modern science back in the 19th century (Capel, 1981; Ortega, 2000). Geography stands between natural, social science and humanities; it must be close and useful for the individual's life. This need for closeness has not been conveyed by academic geography, which has supported such distant claims from the thoughts and feelings of the community and has caused its scarce social and professional recognition. Geography is commonly associated with the subject of Geography as is taught at educational institutions; analytical geography vs the descriptive geography of official curriculum; nomothetical geography vs descriptive geography. Both transversal and multidisciplinary features may well mean a rebirth of geography via the surge of maps and the need for larger visual and spatial literacy.