

Ancient Greek Cartography and its relevance for Modern Geographical Education: From Geodesy to Networks

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Abstract

The ancient Greek cartographers have been among the world's most significant. Their work is usually briefly mentioned in Cartography and Geography courses, all over the world, and only some of them, such as Ptolemy, Eratosthenes, Skylax, Strabo, Ipparkhos and Ekataios are widely known. However, these are not the only ones. Yet, there have been other ancient Greek cartographers also, less well known, or almost unknown to modern cartographers, whose works may appear astonishing by modern standards. Yet, considering their work is important nowadays, given the increasing significance of the convergence among geosciences, history and archaeology.

Oddly enough though, the high importance of the ideas of ancient cartographers and their achievements has rarely ever been studied from within a modern perspective, either in Greece or in other countries. For instance, it has passed unnoticed in Cartography courses the fact that ancient maps also served for managing the networks of ancient cities, instead of depicting precisely defined boundaries among states (a situation very much resembling today's networks of cities).

Consequently, this paper aims to: a) give an overview of the main achievements of the most important ancient Greek cartographers, b) present the significance of these achievements in the context of Modern Cartography and c) highlight the points to which their concepts and ideas about the world can be of relevance to modern Geographical Education.

Concluding, the use of ancient Greek maps in Geographical and Cartographic Education can be useful in: i) raising interest in the development of cartographic thinking through the centuries, ii) raising further interest in the legendary maps of the Spanish and Portuguese navigators, iii) raising interest in preserving cartographic records, iv) learning to discover how perceptions of the world have changed and how they can be traced within recurrent modes of human attitudes.

Keywords: Geographical Education, Cartographic Education, Ancient Greek Cartography.

1. Ancient Greek Cartographers

As it is well known, Cartography flourished in ancient Greece. The maps of ancient Greek cartographers have been useful for more than one and a half thousand years, even after the middle ages. As the geosciences in some cases converge with history and archaeology (Papadimitriou & Papadimitriou 1999), it is important to consider ancient cartography from a modern perspective. We would be tempted to claim that in our era of GIS, satellite imagery and GPS, ancient maps would be of historical significance only. But would they?

We may remember that the thesis that the earth is spherical was first proposed by Pythagoras (Πυθαγόρας, 580-500 b.C.). It is interesting that he suggested this shape, not because he *found* earth to be a sphere, but because he thought it *ought* to be a sphere, because the sphere was the most perfect of all geometrical shapes.

Later, Aristotle (Αριστοτέλης, 384-322 b.C.) posed his well known concrete arguments why the earth should be a sphere (because of the curvature of the sea, the change of azimuth of stars, the change of the earth's shadow during the lunar eclipses etc).

Dating and locating the originals of ancient maps is always difficult (Salway 2005), but worth the effort since they raise several cultural and other issues, which can be relevant to contemporary debates (Lloyd 2004, Harley & Woodward 1989). For instance, as Smith (2005) suggested, ancient maps served for managing the networks of ancient cities instead of precisely defined boundaries among states, a situation very much resembling today's networks of cities, from the "European banana" (i.e. Barcelona-Marseille-Nice-Genova) to the "Brazilian archipelago" of cities spreading all over a huge country such as Brazil. Oddly enough though, the high significance of the ideas of ancient cartographers and their achievements has not rarely ever been put in modern perspective, neither in Greece nor in other countries.

2. A fresh look at ancient Greek Cartographers

Apart from Pythagoras and Aristotle, certain other ancient Greek scientists and cartographers are well known by name, but it seems that their contributions have been disregarded in modern Historical Cartography. Hence, from this research, it is conjectured that it appears important to consider the following:

- a) *The first grid of coordinates* was proposed by Dikaiarhos of Messina (Δικαίαρχος ο Μεσσηνίος, 300 b.C.). He measured the earth's dimensions by using a grid of longitudes («κάθετος») and latitudes («διάφραγμα»). His system of coordinates had its zero point at the island of Rhodes, in the Aegean Sea.
- b) The concept of the "*1st Meridian*" (now passing from Greenwich) was first proposed by Marinus of Tyros (Μαρίνος, 1st century a.D.). He was the first to choose a meridian passing from the Canarian islands (Νήσοι των Μακάρων) for the measurement of geographic longitudes.
- c) Taking into account various sources related to the works of Posidonius (Ποσειδώνιος ο Απαμειεύς, 135-51 b.C.), Dikaiarhos, Ipparhos (Ιππαρχος ο Ρόδιος, 180-120 b.C.), we conclude that the ancient Greek cartographers had: I) a characteristic way to present Europe with respect to Asia, II) presented the earth as a disc floating on an ocean, III) presented the Aegean sea at the center of the world, IV) had achieved to measure the dimensions of the earth as a sphere and V) had invented coordinate systems of longitudes and latitudes.
- d) It is also interesting to notice the use of maps in ancient Greece for *geopolitical* reasons. For instance, Aristagoras of Militos (Αρισταγόρας ο Μιλήσιος) presented a map on a bronze plate to Spartans hoping to motivate them against the Persians (but he failed to). He had depicted the lands they would conquer on his map.

3. Ancient Greek Cartography in Cartographic and Geographical Education

As relates to the educational value of the ancient Greek maps, taking into account the work of Zeigler (1988), atlases "can provide a professional writing experience for students in both introductory and advanced cartography classes". In this paper, it is suggested that the ancient Greek Atlases of Ekataios, Anaximander, Eratosthenes and others can be useful as teaching tools even today. In most Latin American countries to mention the mathematician Eratosthenes is compulsive while teaching the first courses of the Geography curriculum. His contribution to understand and calculate (with remarkable accuracy) the size and shape of the Earth, as well as several astronomical distances, and the invention of the armillary sphere, are few only of his scientific achievements that students in these countries admire and respect.

The benefits of use of ancient Greek maps in Geographical Education can be useful in: i) showing how spatial and cartographic thinking developed through the centuries, ii) raising interest in the maps of the legendary Spanish and Portuguese navigators of the 15th and 16th c., iii) raising further interest in preserving cartographic records, iv) learning to discover how perceptions of the world have changed and how can be traced within recurrent human attitudes towards the world around us.

4. Conclusions

While cartographic technologies develop by leaps and bounds, education needs to consider the historical stages of development of Cartography also. This happens in several sciences: university courses typically refer to the first stages of development of a discipline. Yet, Cartographic education can be different, because raising interest in ancient maps not only explains better, how the discipline evolved throughout the centuries, but also elucidates aspects of map-making that can prove to be interesting, even by modern standards.

References

- Harley, J.B. & Woodward, D. (1989) "Why Cartography Needs Its History" *Cartography and Geographic Information Science*, v.16, n.1, pp. 5-15.
- Lloyd, G. (2004) "Ancient Worlds, Modern Reflections", *Oxford Scholarship Online Monographs*, February, pp.1-222.
- Papadimitriou, F. & Papadimitriou, A. (1999) "Landscape Instability and the Mycenaean World" Lamia (Greece): Ministry of Culture- 14th Directorate of Prehistoric and Classical Antiquities, Proc.Intern. Symp. on "The Periphery of the Mycenaean World" (Lamia, 17-24 September 1994), pp.5-6.
- Salway, B. (2005) "The Nature and Genesis of the Peutinger Map" *Imago Mundi: The International Journal for the History of Cartography*, v.57, n.2, pp. 119-135.
- Smith, M.L. (2005) "Networks, Territories, and the Cartography of Ancient States" *Annals of the Association of American Geographers*, v.95, n.4, pp. 832-849.
- Zeigler, D. J. (1988) "Critical Atlas Reviews: Writing to Learn About Maps" *Cartography and Geographic Information Science*, v.15, n.4, pp. 357-362.