

Geometric Geodetic Triangulation of the Amorgos island – Greece (Part of Triangulation of the Hellenic world)

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INTRODUCTION AND GENERAL DEFINITIONS

Triangulation is the use of triangles for surveying or measuring

Geodesy is the science concerned with the:

- Establishment and maintenance of national and global three dimensional geodetic networks
- Measurement and analyses of geodynamic phenomena (earth rotation, earth tides, crustal movements, etc.).
- Determination of the earth's gravity field

(Committee on Geodesy of the U. S. National Academy of Sciences, 1978)

The archaeological sites of the temples, sanctuaries, altars, etc., of the ancient Hellenic world are not accidentals, but they have predetermined by the help of calculations, which imply high mathematical (geometrical, arithmetical, geodetic and astronomical) knowledge, thousands of years ago. The use of triangles to estimate distances, goes back to the 6th century BC, when the Greek philosopher Thales is recorded, as using triangles to estimate the height of the pyramids, by measuring the length of their shadows, at the moment when his own shadow, was equal to his height.

Reading several texts, among them Aristotle's Politics, Plato's Laws, Pausanias' Description of Hellas, etc., has shown us that temples and cities were situated in specific positions, for some reason. Thus, the distance from Delphi to Athens or Olympia is exactly 660 stages and the isosceles triangle formed is part of a perfect heptagon. The distance from Sparta to ancient Smyrna or the "idaion andron" in Crete is exactly 2198 stages. The distance from Dodoni to Athens or Sparta is exactly 1700 stages. These are only a very few examples, they proved that all ancient cities in ancient Hellas were situated in co-ordination to one another and that the distance between them was so accurate, that only in a few circumstances, the difference varied on a few cm.

Triangulation today is used for many purposes, including surveying, navigation (GPS), metrology, astrometry, binocular vision, model rocketry and gun direction of weapons. Moreover, an international team of astronomers led

by Ohio State University, has examined dark matter in the outer reaches of our galaxy in a new way. For the first time, they were able to employ triangulation, to estimate the location of dark matter and calculate its mass.

MATERIALS AND METHODS

The present work, for the first time, as far as we know, experimentally examines the theory of Triangulation in Amorgos island – Greece. The measurements were carried out on the map by the ruler and compass, as well as using suitable software¹. The map of the Amorgos island, was scanned by a plotter (resolution 300 dpi, 3265X2520X24b)².

To be examined and investigated the following question is disposed, on the base of the criterion: the number of triangles.

RESULTS

We have found in Amorgos, numerous isosceles triangles among temples-churches, based on the golden number phi (Divine proportion) $\Phi=1,618033\dots$, as well as on the number pi, $\pi=3,14159\dots$. Moreover, several right triangles were observed. It is noteworthy and quite interesting that, even if Amorgos is a small island, there are so many ancient remains of temples and orthodox churches (including chapels), not accidentally arranged along the island.