ARTS, SCIENCE AND CARTOGRAPHIC SPACES : ANAMORPHOSIS ON THE ODE FOR DELOS

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Abstract
In 1987, our cartographic laboratory (LCT.Strasbourg) applied for a participation in a CNRS* Thematic Research Plan, called «Art creation and scientific knowledge ». We submitted a project entitled: "From objective to subjective space: transformation trials on the Cycladic area".
At the time, computer cartography was not well developed yet. However it was a very promising new tool to test new map transformations:
- *Geometrical transformations, in order to act upon geographical shapes ,*
- *Numerical transformations to benefit from mathematical and statistical data treatments.*
The scope was not to use the computer capabilities to produce faster previous maps and images, but to draw something new. The scientist, as well as the artist, was pushed on using these new techniques to create new features. It was an unusual position for techniques and digital tools, to be waiting for authors, whose question was: what to do with the present hardware and software? We chose to apply these tools to space perception.

Key words : catrografic anamorphosis, iconologie experimentale

1. Techniques and transformations

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2. Spaces to be transformed

The earth surface representation depends on the goal the cartographer is looking for but it also depends on the way we perceive the space we are living in.

Since 1781 *(Critique of pure reason)* I.Kant differentiates the empirical knowledge, gained from experience, from the "pure" or theoretical knowledges which are mind constructions. His space concept is an *"a priori"* intuition which leads to a *"colourless, flavourless, warmless"* abstraction whose properties may be expressed through the Euclidian geometry. When mapping, this pure space is described through X,Y coordinate systems : latitudes, longitudes, plane rectangular Cartesian coordinates, plane polar coordinates. This **Cartesian space** (as called by *A.Moles, E.Rohmer,* 1977) is mainly used in surveying and mapping.

As for the empirical space, used in thematic cartography, we call it geographical space or, better, "**psychological space**". It is the earth space where geographers localize their observations. The quantitative and qualitative characteristics which are linked to the localized observation, are called Z attributes; for instance, height above sea-level, temperature, population density, languages.

The thematic inventory maps are supposed to show an objective space. These maps are an attempt to summarize the many elements entering a landscape. But they always result from the author's choices: they mainly express the author's interest for a specific phenomenon. They display a subjective information. That is not enough to create an artistic domain because information is not personal perception.

The **artist's space** is not dealing with quantitative values but with a selection of features gathered in his memory and transformed in his mind. The facts are filtered through his personal affective interest. They become "perceived". It is the reason why we chose to start from a work of art, dealing with a psychological space, to obtain a special type of perception maps. It was Callimaque's Ode to Delos.

3. Scenography for Callimaque

Callimaque was an ancient poet from Cyrene, living in the Ptolemaic Alexandria, around 290-285 BC. There is no copyright on his work whose main part was lost. What remains today is an "Ode to Delos" in which the Cycladic Islands provide cartographic scenery for the multiple Hera's jealousy quarrels. The purpose was to adapt the cartographic scenery, both to Delos and to the actors' displacements among the islands.

As Delos is a very small island located at the archipelago center, and in order to focus attention and threats on this point, it appeared sensible to apply an unipolar anamorphosis on it. In the today softwares, this transformation is called magnifier effect. In 1987, we tried to apply several distances on the X,Y coordinates of the simplified digitalised shorelines. The choice was between quadratic, cubic, logarithmic distances from one central point.
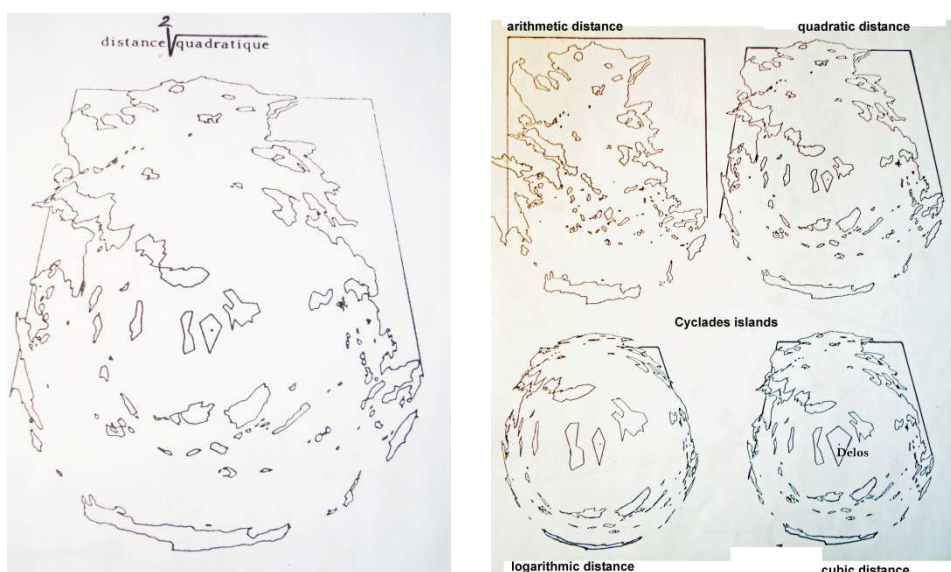
Figure No1. Unipolar Anamorphosis Centered on Delos

As an example, the log. distance had already been used by T. Hägerstrand in 1957, to build a migration map around the Swedish city of Asby. For our subject, the choice of the quadratic distance was better. On the transformed map, Delos appears large enough and the continental shapes are not too much distorted.

On this geographical stage, Callimaque sets two types of actors: those belonging to the Hera's camp, who are static ones, and those who are flying across the islands to avoid Hera's fury.

On the west side of the Egean Sea, Hera reigned in Argos, where its "heraion" is today still standing up. On the north side, at the top of the Hemos mountain, in Thrace, she shettled his best beloved son, Arès, the strong warrior. On the east side, on the Mimas summit, in Asia Minor, close to the Samos heraion, she posted another sentry called Iris, the gods' messenger, whose scarf is the rainbow. All the islands were well kept watch on. Not a single one dared to help any Hera's enemy. Unfortunately, Leto became like an enemy: where to fly?
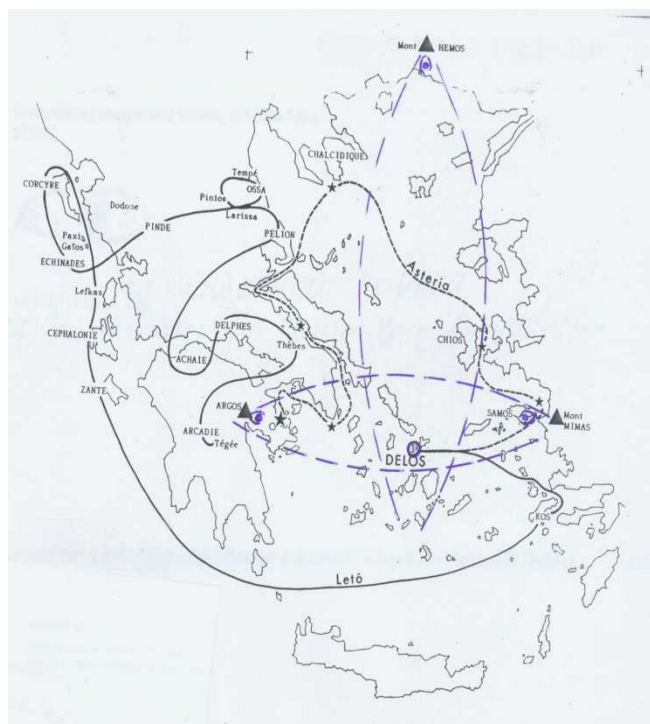

Figure No2. Leto's fleeing and Asteria's wandering according to Callimachus' hymn on Delos

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Zeus, Hera's husband, was known as being an indefatigable seducer and Leto could not avoid to get pregnant from the first of the gods. She could not find an island willing to hide and welcome such a compromising person. The coasts were disappearing when she was looking at and the shorelines were withdrawn when she attempted to land. The log. anamorphosis is a pretty good answer to try to reject the shorelines in an inaccessible zone, around the map.

In her sea wandering, Leto met another Zeus's victim: the nymph Asteria who succeeded in avoiding the god's advances by diving deep into the sea. But, doing so, she was transformed into a floating island, always moving through the Cycladic maze. For the sailors, she was like a mirage and nobody dared go near by. But Asteria was ready to welcome Leto: as soon as Leto walked on, the floating island fixed itself and became Delos.
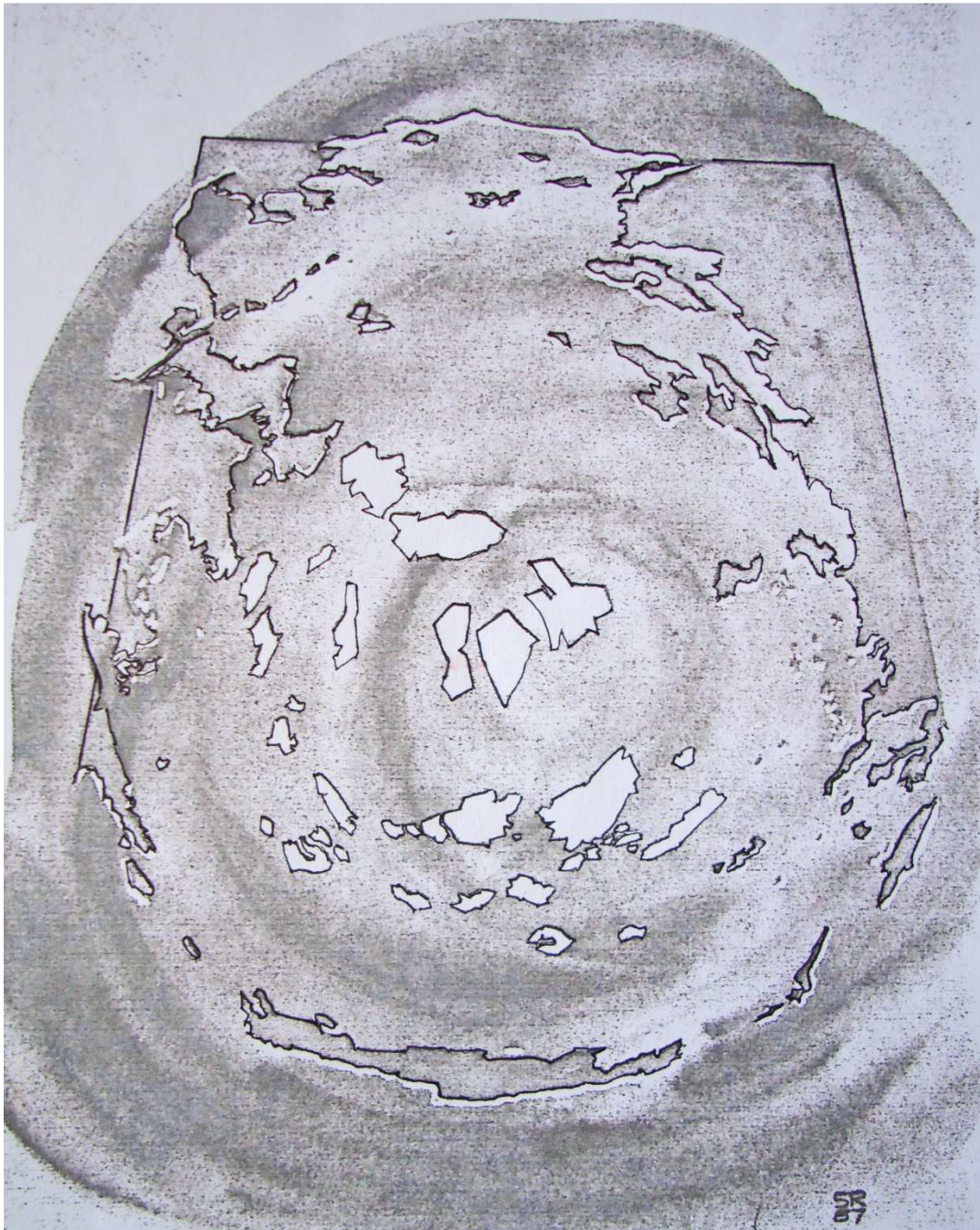
Figure No 3. Cyclonic wave decor, version a "the Cycladic round"

In front of such a co-operation, Hera forgave Asteria for giving Leto a bare island, just good enough for seals and sea monsters. Finally, on this narrow rock, Leto gave birth to the twins Artemis and Apollo.

When using the arithmetic distance, Delos remains small and invisible. With the logarithmic distance, Delos is magnified and all the other islands around are like dancing a round: they enter into a dynamic Cycladic circle. With the quadratic distance, the Hera-Ares-Iris grid covering the Egean Sea is easier to locate. In order to dramatize the story, the quadratic distance image was enhanced with threatening clouds and waves.
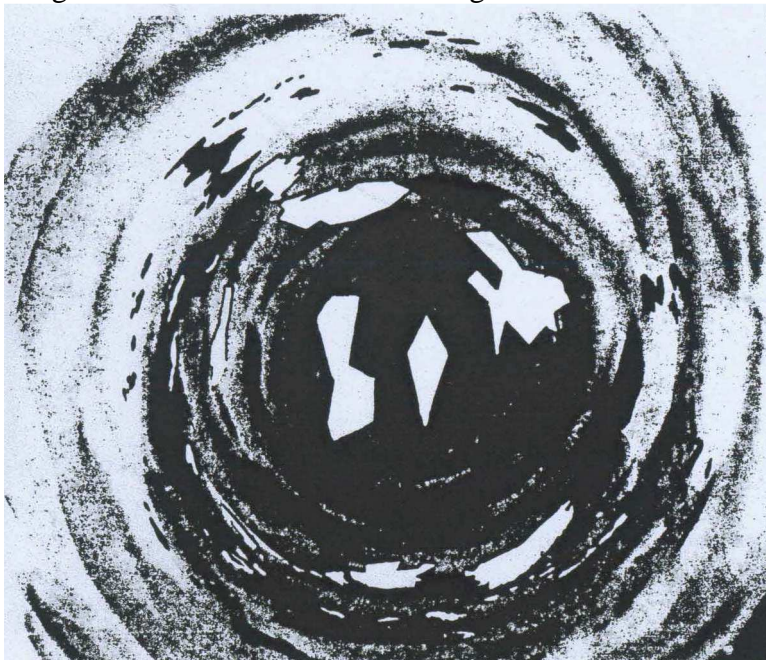

Figure No 4 Cyclonic wave decor, version c for menacing timesfrom the hymn on Delos

These transformed maps (anamorphosis) were obtained by using the Azmap software, written by J.W.Cerny (1971).
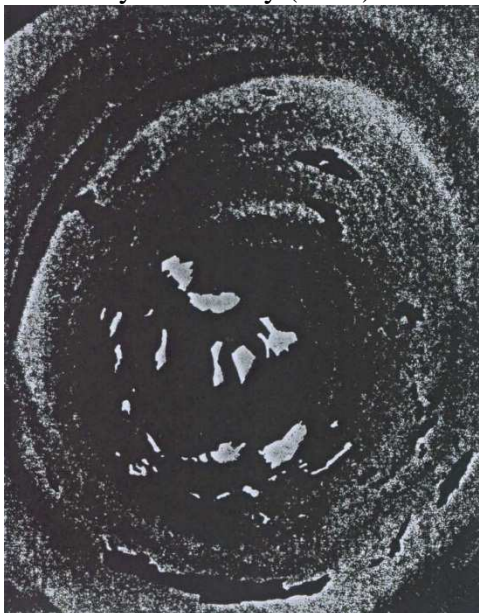

Fig.5

Fig.6

Figure No 5 Cyclonic wave décor for menacing times, vercion c
Figure No6 Symbolic wave décor: The east-west waves carry the veil of Iris and the red of Hera's wrath the meridial waves are tinted with the bloody red of war by Ares.
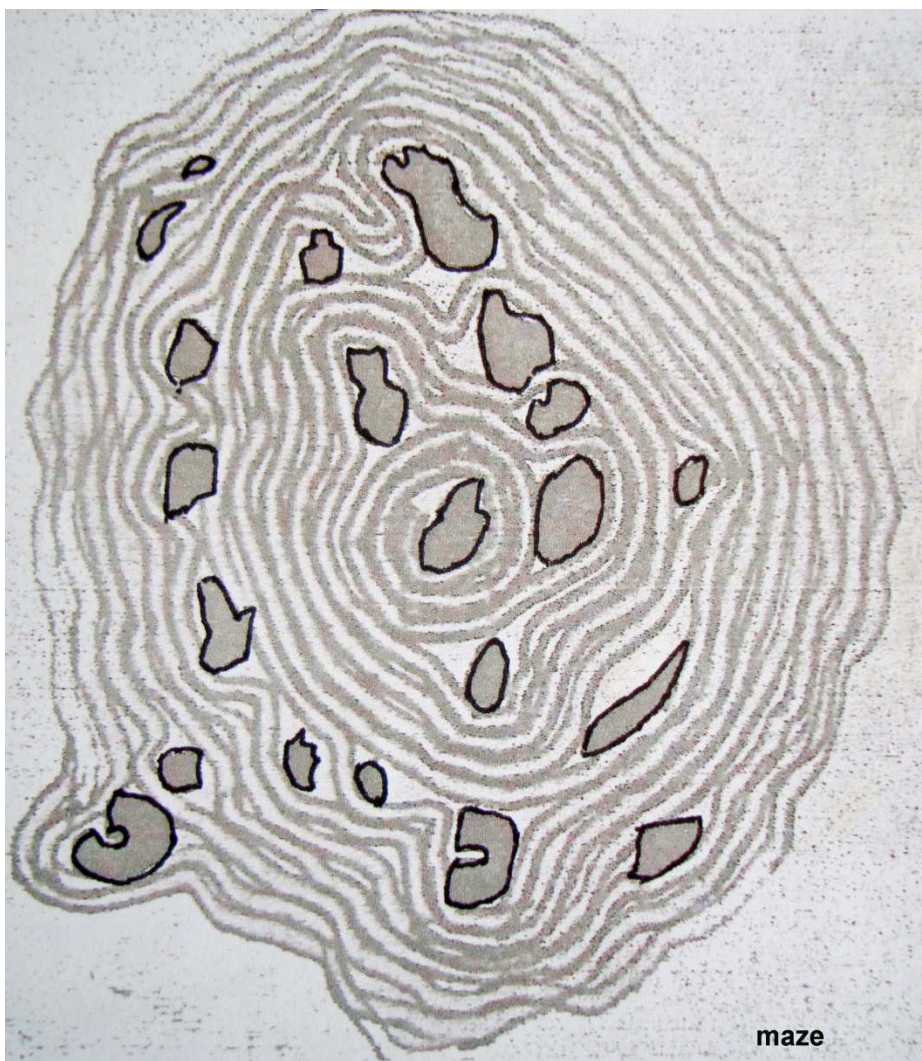

**Figure No 7 Cyco-symbolic wave decor: they evoke the maritime labyrinth,
in bot hits protective and troubling aspects**

4. Egean cruises

As it is a pleasure to stroll among these Islands, we tried other experiments.

With Azmap, the transformation starts from a single central point: we call "unipolar" the resulting anamorphosis.

But, instead of focusing on a single island, the today inhabitants, sailors or tourists, may be interested in several more or less attractive places. In order to express the different degrees of attractiveness, it becomes necessary to use a multipolar software.

The Cartesian space to work on must be a grid where to locate attractiveness attributes. For instance, the quantitative attributes, here selected, are the following ones: number of connections by ferry-boats between harbours, number of passengers for each island. This grid must be able to react to these weighted attributes by transforming the island shapes in relation with the number of visitors. The biggest the attractiveness, the biggest the island.

The software we used for such a multipolar transformation was prompted by an engineering research on tank surface distorsions related to different internal gas pressures. We adapted the software Struct, to our Cartesian grid and we called it "Hercule". This was an other attempt to link science, technique and attractiveness perception.
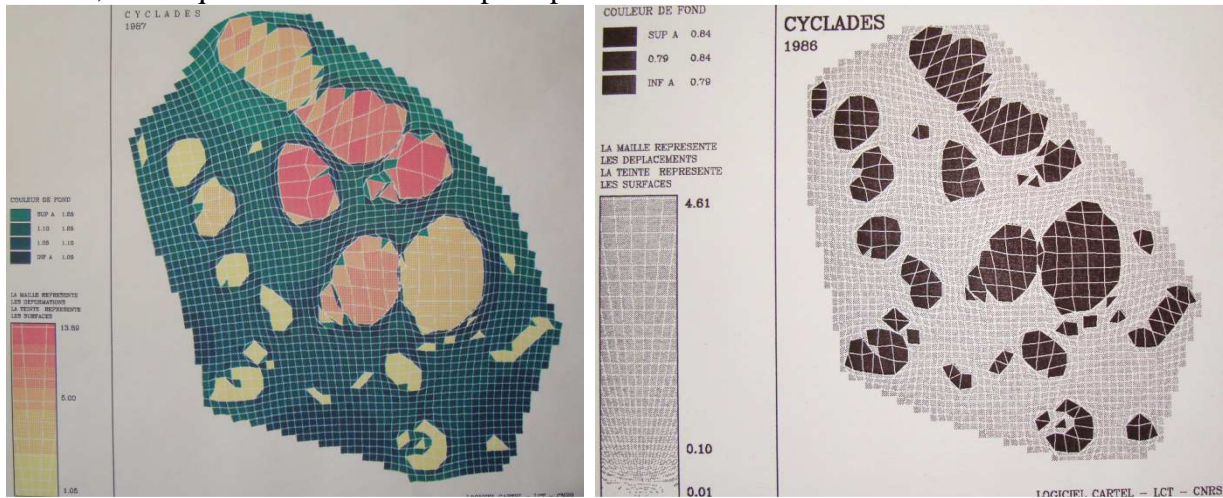

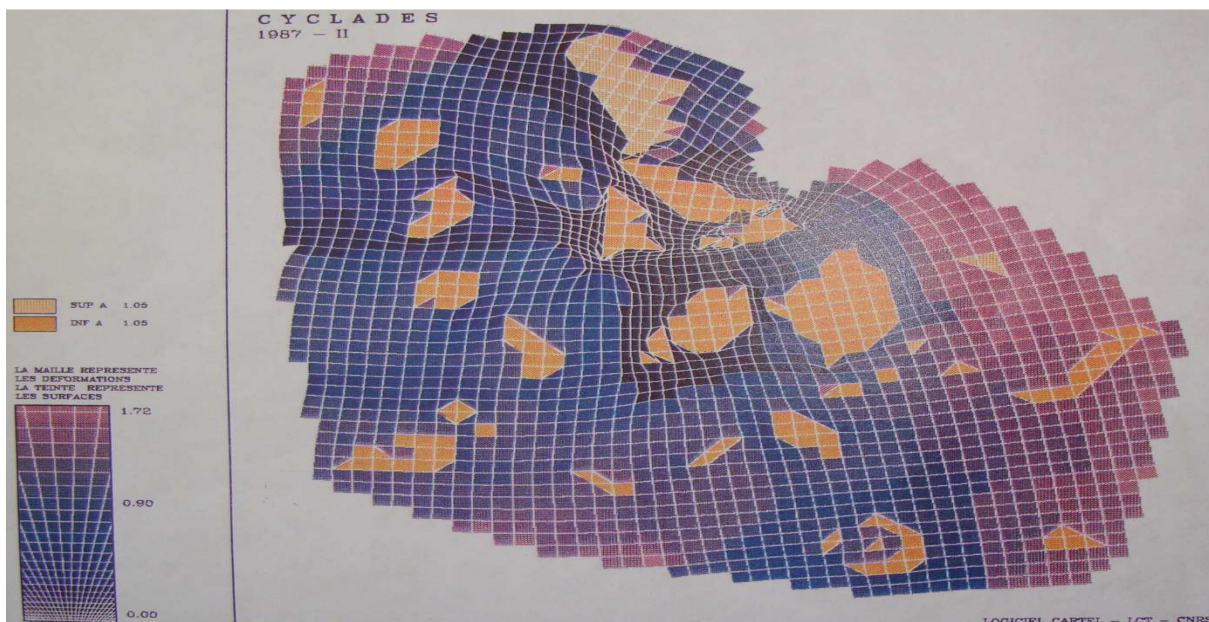**Figure No 8 Boat connection density in Cyclades.**

Figure No 9 Passenger density in Cyclades)

The authors apologize for the bad quality of the copies of copies of very old figures.

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