

# Origin of Las Cañadas (Tenerife).

## Stability analysis of large landslides.

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In the island of Tenerife (Canary archipelago) a topographical accident exists called The Cañadas. It's an altiplanicie with elliptic form, whose greater axis is over 13 Km. and the minor axis over 7 Km. It is situated in the central part of the island and approximately 2000 m on the level of the sea. The Cañadas are found surrounded in all the south part for some steep walls of to 500 m of height. In the north part they are delimited by the volcanic building of the Teide-Pico Viejo.

Many theories exist, all they very unlike, upon their origin. At present, are two the most accepted theories:

- Origin due to a sliding: defends that a great sliding, more exactly the sliding of Icod, had its head in the present wall of Las Cañadas. As fruit of this movement, produced by an explosive series of eruptions, at present we have the scar of the wall of Las Cañadas.
- Origin due to calderas collapses: it has been a boiler collapses succession what has shaped the current form of Las Cañadas. Therefore, Las Cañadas is a calderas. In consequence of each collapse (thinks that it has had three) a great sliding it has happened herself. The last collapse, produced does 175 thousand years, formed the boiler of Diego Hernández and the sliding of Icod. This, therefore, did not have its origin in the present wall Las Cañadas.

The objective of this tesina is that of explaining the origin of Las Cañadas. Already the relation has been seen that exists among Las Cañadas and the sliding of Icod, therefore, to carry out a study of stability of the landslide of Icod would be able to clear up certain doubts and choose another of the theories before exposed. For complying with the objective, have been carried out a study of the following themes:

- Bibliographical study of the authors that have tried this problematic one.
- Geological Study of the zone.
- Study of stability of the sliding of Icod utilizing the method of the equilibrium limit.

Also, like introduction and to compare the obtained results, there has been realized a study of stability of the current relief of the north hillside of the Teide and Icod's valley.

The most important theme here treaty has been the study of stability. To the hour to carry out the study many limitations have arisen, some of them are:

- Study of a sliding that dates of some 175 thousand years produced in an active volcanic region.
- Great ignorance of the internal geology of the island.
- Non-existence of data of parameters ground of the materials of the zone of study.

To minimize the mistakes caused by this lack of information, two possible topographic models have been created to recreate the ancient topography. Also they have been carried out analysis of sensibility of the geothenic parameters (basically the angle of friction internal and the cohesion) of all the cases studied.

After carrying out all the calculations and to interpret them carefully, some conclusions have been obtained, the most important are:

- The causative factor of Icod's landslide has been an earthquake, this power to be caused by different geological phenomena: explosive eruptions or a calderas collapse.
- It Remains totally discarded the option, that an only sliding had its origin (head) in the present zone of the wall of Las Cañadas.
- Is very possible, that after being happened the first sliding, to exist seismic replies that unchained a followed by small slidings. Difficultly these would reach the wall of Las Cañadas.
- Finally, the origin of Las Cañadas remains indeterminate, but some before existing options have been eliminated.