

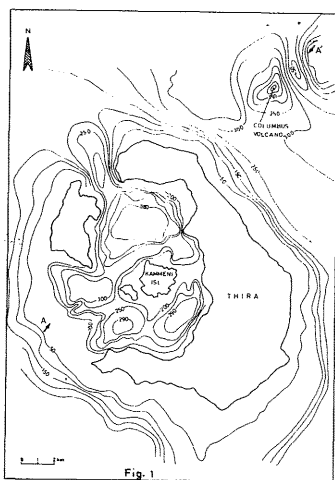
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Geologic Controls of the Santorini Caldera and the Columbus Volcano

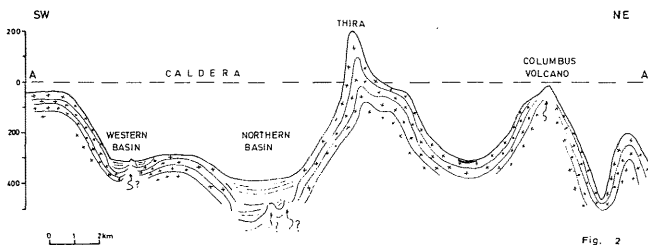
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The marine sectors of the Santorini volcanic island complex and the surroundings was extensively studied during the years 1987 and 1989 by the Marine Geology department of IGME. Preliminary results of the 1987 research were presented during the 3rd Santorini Congress (Perissoratis and Angelopoulos, 1989).



Within the Santorini Caldera four basins can be distinguished (fig.1) one north of Kammenni (northern basin) and three south of it (western, southern and eastern basins). All basins have flat bottoms, with maximum depth ranging from 280 to 390m, and are filled by fine grained loosed sediments having thickness from 90m at the northern basin to about 20 m at the western. The stratification in the basins (fig.2) is subhorizontal and in the seismic profiles two sectors, an upper opaque and a lower more transparent, were discerned. The deeper structure of the basins and its relation with the land geology indicate that the northern one is younger than the other three.



The subhorizontal structure of the basin floor sediments is locally disrupted by piercing domes that are from 5 to 12m high and from 200 to 700 m wide, giving the impression of intrusions that were effected after the formation of the basins. Five such domes were mapped, three of which are located at the northern, one at the western and one at the southern basin. Apparently these "intrusions" postdate the sediments which were deposited during the Minoan eruption (fig.2).

Petrographic study carried out at the coarse fraction of the surface sediments revealed abundance of authigenic iron oxides at the northeastern sector of the northern basin, attributed probably to local hydrothermal action (Bostrom et al 1989).

All these indicate that there are other locations of recent hydrothermal activity, within the caldera, except the well known ones at the Kammenni island.

Another area which was extensively examined was the Columbus Volcano. This is a cone-shaped feature lying at about 7 km northeast of Thira. It erupted last time in 1950, and during that eruption its cone rose a few meters above sea level (Fyticas et al 1989). Subsequent erosion lowered the cone top below sea level. The research conducted now indicated that the cone feet lies at a depth from 300m to the southwest to 490 m at the northeast. The cone top is at 18 m below sea level. It is about 150 m wide and barren of loose sediments which are present only at the lower parts of the cone attaining thickness up to more than 20m. A few boulders were retrieved from the cone top which consist of andesitic tuff while the surface is covered by manganese, iron and other oxides, with abundant organisms (sponges, shells etc.).

The hydrothermal activity which is present at the Columbus Volcano and the NE part of the northern basin is apparently correlated with the known "Kammenni line", a northeast-southwest trending fault zone in the Santorini complex.

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