

Notes on the Volcanic of S. Miguel Island

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The island of S. Miguel is part of the Azores, an archipelago composed of nine volcanic islands situated between the European and American continents. Aligned in a general WNW-ESE trend, between latitudes 37° -40° N and longitude 25° -31° W, the Azores islands show a very special geotectonic setting, at the triple junction of the Eurasian, African and North American lithospheric plates.

The island of S. Miguel, the largest (747 km²) and most densely populated of the Azores presents three active stratovolcanoes with calderas (Furnas, Sete Cidades and Fogo), with a long record of explosive eruptions. In the last millenniums several basaltic eruptions have occurred in the so called "Picos Volcanic Complex", an area lying between the volcanic massifs of Sete Cidades and Fogo composed of about 200 scoria cones (often along fractures) and associated lava flows. The basaltic nature of lava flows (especially *aa* and *pahoehoe* type) and the relative youthfulness of the formations make this area potentially rich in lava tubes. In fact, more than 60% of all the known caves and pits in the island of S. Miguel are situated in this zone.

In spite of its volcanospeleological wealth, only very recently, from 1988 and through the initiative of the environmental association "Amigos dos

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Açores" more detailed studies of the volcanic caves on S. Miguel were begun. The first known notes refer above all to the lava tubes which exist in the city of Ponta Delgada, being of essentially informative and historical interest. In the year of 1990 some field work took place under the title of "Projecto Bioespel-S. Miguel", the main objectives of which were to localize, photograph and map most important caves and pits in the island.

Given their scientific, pedagogical and touristic interest, 10 of the 22 known volcanic caves in S. Miguel were studied. In the Água de pau cave, the second in length, one should note the beautiful combinations of stalactites and several 1989 of new species of coleoptera. The Pico Queimado pit, besides being the deepest, is a volcanic conduit where was situated a vent of the basaltic eruption of 1563. Among the several caves studied, the Carvão cave, situated in the city of Ponta Delgada is worthy of note, extending for over 1000 meters, close to the surface and in a general NW-SE direction. Its beauty, large dimensions, urban situation and easy access, make this cave clearly suitable for touristic visits. It is therefore essential to legally protect the volcanic cave S. Miguel and carry out the necessary and urgent work of recovery.

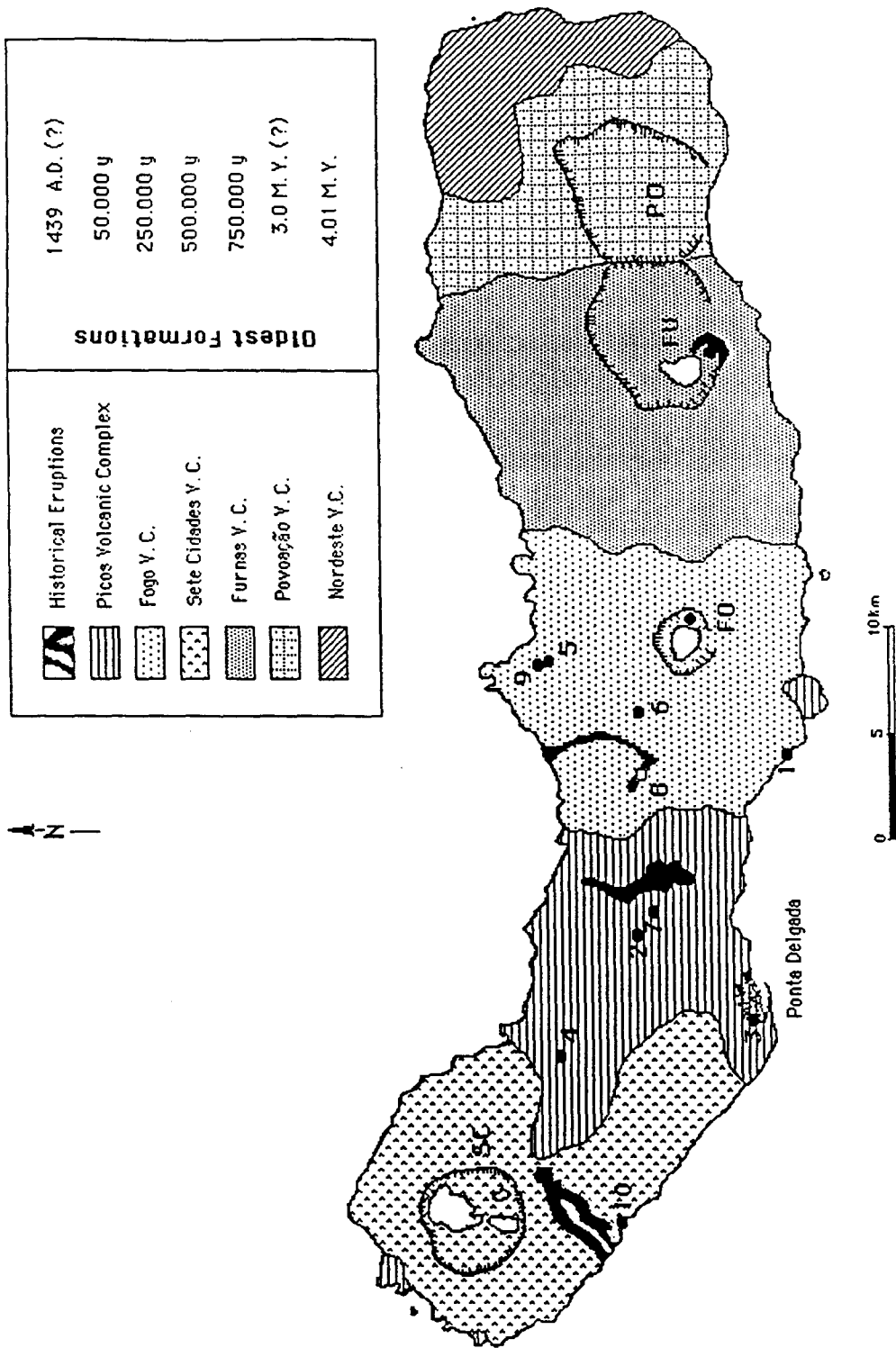


figure 1. S. Miguel Volannostratigraphic Sketch
 Adapted from forjaz, 1984 e 1985; in Queiroz, 1990.

Table 1. S. Miguel caves main features

Name	C-cave P-pit	Geographic Coordinates	Altitude (m)	Total Lenght(m)	Geological Setting	Age (years)
1-Água de Pau	C	37° 42' 55" 25° 31' 48"	15	323	F.V.C	>>6500?
2-Batalha	C/P	37° 47' 27" 25° 38' 25"	245	52/9.5	P.V.C	4.000-4.600
3-Carvão	C	37° 44' 14" 25° 40' 51"	20	>980	P.V.C	>4.600?
4-Enforcado	C	37° 48' 49" 25° 41' 36"	235	185	P.V.C	<4.000
5-Escadinhas	C	37° 49' 03" 25° 29' 00"	135	31	F.V.C	4900
6-Espueleto	C	37° 47' 23" 25° 30' 29"	210	188	F.V.C	4790
7-Pico da Cruz	C	37° 47' 06" 25° 37' 22"	260	98.5	P.V.C	<4.00
8-Pico Queimado	P	37° 47' 08" 25° 32' 45"	285	37	Hist	1563 A. D
9-Ribeirinha	C/P	37° 49' 14" 25° 29' 04"	150	54.5/5	F.V.C	4990
10-Feteiras	C	37° 48' 06" 25° 47' 51"	35	22	SC.V.C	≈20.800

F.V.C- Fogo Volcanic Complex; P.V.C- Picos Volcanic Complex ;

SC.V.C- Sete Volcanic Complex

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