

# NEW DISCOVERIES OF LAVA TUBES RELATED TO CUEVA DEL VIENTO IN ICOD DE LOS VINOS (TENERIFE, CANARY ISLANDS)

JUAN J. HERNÁNDEZ PACHECO \* and PEDRO OROMÍ \*\*

\* Museo de Ciencias Naturales, Santa Cruz de Tenerife, Canary Islands

\*\* Depto. Biología Animal, Universidad de La Laguna, Tenerife, Canary Islands

The area of Icod de los Vinos is by far the richest in lava tubes not only in Tenerife but also in the Canarian archipelago. It is located below the northern side of Pico del Teide, a big stratovolcano originated during the so called Subrecent Series III (COELLO, 1989). This huge accumulation of lavas and pyroclasts started growing some 150.000 years ago and is still in activity: the last eruption occurred in 1798, and abundant fumaroles are yet steaming in and around the crater. Some of the lavas of this actually 3,717 m high peak flowed northwards during the last few thousand years, forming narrow channels along the steepest slope of the proper Teide, and more expanded lava fields at lower altitudes, especially between 800 m a.s.l. and the sea shore. Most of the recent lavas covering this area were olivine-augite basalts of pahoehoe type (MONTORIOL POUS & DE MIER, 1974), and originated a complex network of lava tubes especially abundant over the town of Icod; some of the caves (Cueva de San Marcos and Cueva de Punto Blanco) also reached the coast and open at the sea cliffs. These lavas are quite recent and thus hold just a thin soil layer upon, which allows the development of Canarian pine forest at unusual low altitudes; instead, older terrains in the northern slope of the island at these heights are normally covered by subtropical laurel forest, which needs deeper and more humid soils. Concerning to Icod area, many vineyards and other cultures are now occupying the best terrains in the surroundings of the town, while the pine forest only remains on the projecting lava ridges, which are generally made up of less fluid lavas. Therefore, the lava tubes are mainly under cultivated land and houses, and very rarely under the forest or the original scrub. This is very important for the conservation of the cave environment, since many chemicals and remains of sewage have been found in water samples from the Icod caves.

Many lava tubes are known in the upper part of Icod (see HERNÁNDEZ PACHECO et al., 1995) but Cueva del Viento is by far the longest one, and probably one of the most labyrinthine together with Cueva de Don Justo, in El Hierro. Many speleological teams have surveyed this complex cave (MONTORIOL POUS & DE MIER, 1974; WOOD & MILLS, 1977; HERNÁNDEZ et al., 1995) that reached some 14 km when Cueva del Sobrado was joined in 1988 to the proper Cueva del Viento by members of Grupo de Espeleología de Tenerife Benisahare (see OROMÍ & MARTÍN, 1995). It was considered and rejected again for several times as to be the longest lava tube in the World (MONTORIOL POUS, 1971; HALLIDAY, 1972a, 1972b; WOOD, 1973). Actually this is not an extraordinarily long tube between the most distant points, but the complex network comprises many kilometers of interconnected galleries. The origin of this kind of tubes have been a matter of discussion; MONTORIOL POUS & DE MIER (1971, 1974) support that labyrinthine caves are straight related to steep terrains, while WOOD & MILLS (1977) suggest this is the result of several factors affecting the lava mobility (high effusion rate \*copiar de Wood

The upper part of the cave is the most labyrinthine, forming a tridimensional network of interconnected tubes, from which diverge downwards three independent long galleries: Cueva de los Ingleses in a deeper level, Cueva de las Breveritas (the longest one, continued by Cueva de los Piquetes) and Cueva del Sobrado (see HERNÁNDEZ et al., 1995). The latter had its own independent entrances, one close to and the other at the very end of the cave at the lowest point known at that time. This was not a typical collapsed skylight, but a connection of the lava tube to a natural pit almost completely filled of stones. One of us (HERNÁNDEZ) investigated among the old local people, and was informed that some 80

years ago a woman fell down, and after she was rescued the pit was filled up of stones and debris to prevent new accidents. But it was said that in the bottom of the pit there was a continuation of the cave, and the Cabildo de Tenerife (local government) gave the permission and funds for excavations. After removing many tons of debris, two new branches appeared at different depths of the pit: Cueva Petrólea and a still unnamed gallery, both going up parallel to the main gallery of Cueva del Sobrado. The bottom was finally reached on June 1994, and a big lava tube was discovered. This was the downwards continuation of Cueva del Sobrado, starting at the bottom of the pit and extending for some 2 km away (see LAINEZ, 1995). It is a remarkable tube with an average inner dimensions much bigger than in the rest of Cueva del Sobrado; in the whole Cueva del Viento something similar is only found in Cueva de los Ingleses, actually underlying Cueva de las Breveritas and also connected with it through a vertical pit, but internal with no skylight.

This main new tube - first called Intuition Cave - is almost unbranched and the floor is of extremely rough lava, in contrast to the generally smooth substrate prevailing in Cueva del Sobrado up from the pit. Speleothems are abundant and varied, especially the secondary mineral concretions, very well preserved for it had probably never been visited by people before. The roots are very scarce, surely because of the depth with regard to the surface. However, the only remarkable branch named Gallery D (see survey in LAINEZ, 1995) is quite different, with much smaller dimensions, its floor is very even and slender roots hang from the roof.

In general the fauna is very scarce when compared to Cueva del Sobrado or any other reasonably unspoiled part of Cueva del Viento. Again Gallery D is an exception, having provided most of the specimens of troglotic animals known in the cave. However, this little fauna is far from being comparable to the rich and varied communities found in the upper part of Cueva del Sobrado.

Probably one of the most interesting findings when this new tube was explored, were the abundant subfossil bones spread all along the cave. Most of them belong to *Canariomys bravoii* Crusafont & Petit, a giant extinct rat which occurred in Tenerife until not very long ago. Most of the lava tubes in the region of Icod had remains of this rodents, although they have been already collected or destroyed by cave visitors. Better preserved specimens with parts of the skin were found in a cave in the easter part of the island; they were in an aboriginal burial, mixed with tools and human remains, which demonstrates the extinction has been relatively recent. The arrival of guanches to Tenerife has been estimated approximately 2,600 B.P. (ONRUBIA PINTADO, 1987). According to HUTTERER & OROMÍ (1993) these big rats were common visitors of the caves and even they could use lava tubes regularly; the remarkable abundance of skeletons in these caves in contrast to their scarcity in surface deposits supports this hypothesis.

Also frequent were skeletons of bats, especially in the deepest part of the tube some 1,500 m far from the entrance. This suggests that probably there was another entrance now collapsed, for these animals rarely reach such inner distances in lava tubes in the Canary Islands.

First author of this paper was the responsible of the discovery and exploration of this new branch of Cueva del Viento; he planned and managed the works of clearing debris in the pit, and devised an ambitious project to destinate a small part of Cueva del Sobrado to public visits, and protect all the rest of Cueva del Viento by law. He was extremely enthusiastic and he worked very hard, but unfortunately he died before accomplishing his wishes. As a hommage to him the speleologists involved in this project have named the new branch Galería Hernández Pacheco.

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