The last of the Atlanteans

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The origin of the Canary Islands has long been related to the myth of Atlantis, the continent described by Plato. When its hypothetical sinking in the ocean occurred after a tremendous volcanic eruption, only its highest mountains remained jutting out, which corresponded to the islands of Madeira, Azores, Cabo Verde, and the Canaries. This legend has heaped more mystery on the origin of the first inhabitants of the Canary Islands, but the *Guanches*, generic name for the Canarian aborigines, were descendents of the Berbers and settled on the seven islands until the conquest by the Castilians between 1402 and 1496 (Fig. 1). The *Guanches*, nevertheless, were the inhabitants of the island of Tenerife, the *Canarii* of Gran Canaria, the *Gomeritas* of La Gomera, the *Majos* of Lanzarote and Fuerteventura, the *Bimbaches* of El Hierro, and the *Benahoritas* or *Auaritas* of La Palma. They were estimated to arrive at the islands in several waves coming from tribes in Northern Africa from the 5th century BC [2]. The Guanche society was divided in different social strata. Each island was broken into territories whose king was the *mencey* in Tenerife (Fig. 2) or the *guanarteme* in Gran Canaria.

The language of the Guanches was the *tamazight insular*, a group of extinct languages derived from the Berber languages or *imazighen*. Due to the isolation of the islands and the Guanches being ignorant of the art of navigation, these languages could only be understood by inhabitants of neighboring islands. The transcribed alphabet was *tifinagh*, which presumably has a Punic origin. Another means of communication over the abrupt island orography was

whistling. There is a true whistling language used to “hold a long distance conversation” over the deep gorges. At present, this language is lost in all the islands except in La Gomera, where the Gomero whistling is Oral and Intangible Heritage of Humanity since 2009 (Fig. 3; <http://www.tagaragunche.com/areas/2/gomera.php?mod=new&pag=18&idnew=2173&listN=2>).

The Guanche technology was very rudimentary. Stone, clay, animal skins, or wood were the main raw materials. Their fundamental activities were sheepherding, agriculture, picking, fishing and shellfishing on the shore, and craftwork. They dwelt in natural caves or lava tubes, although they also built stone shelters and huts.

The aboriginal priests were the *guadameñes*. The religious beliefs were very similar between the different islands, but each population had their own gods, mainly female deities or determinate symbols, such as beneficent or evil representations of animals or clay idols. They also worshipped sacred places like the *Teide* volcano (Fig. 4).

They practiced embalming techniques, aimed at preserving the body of the dead, similar to those carried out by other ancient civilizations. Their purpose, associated with religious beliefs, was to protect the corpse and also show its social relevance.

Several researchers have studied plenty of skulls found on the islands, coming to the conclusion that the Guanches carried out some surgical procedures on the skull, such as scarification, cauterization, and trepanation. They had mainly therapeutical purposes, but the magic–religious objective cannot be discarded. The trepanations had similar features to those found in other civilizations in South America, Europe, Northern Africa, or the South Pacific. The techniques were mainly scraping and drilling, and the burrholes were placed more frequently in the left frontal and parietal areas. They were done basically in adults,

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Fig. 4 The Teide, sacred placed known as *Echeyde* (hell) where *Guayota* (devil) lived (personal photograph)

Dr. Martínez Pastor was a disciple of one of the founders of Spanish neurosurgery, Dr. Sixto Obrador Alcalde, and began his activity in Las Palmas de Gran Canaria in April 1960, when he operated on a brain tumor of a girl aged 14 (Fig. 6). We can therefore say that the first surgery on the islands was a pediatric case. He worked on his own in several clinics on the island until 1964, when Nuestra Sra. Del Pino Hospital (the would-be Hospital Dr. Negrín) was inaugurated. In 1970, he moved to the Mother and Child Hospital at Hospital Insular, the other big hospital on the island, which had also been opened up

recently. His post was taken up by Dr. Cesáreo Rosas, who did his training as a neurosurgeon in Barcelona, in Dr. Adolfo Ley's Department, who was a disciple of Percival Bailey. Dr. Rosas had a solid experience, standing out especially in pediatric neurosurgery. Since 1975, the

Fig. 5 Trepanation. Archaeological Museum of Tenerife

Núm. <u>1</u>	NEUROCIRUGIA
	Cama núm. <u>1</u>
	Fecha <u>7</u> abril 1960
Nombre <u>TERESA</u>	
Edad <u>14</u> Clínica <u>San Jose</u>	(Benf ^a)
DIAGNOSTICO <u>Tumor cerebral</u>	
ANESTESIA <u>eter-oxigeno</u>	Operador <u>Dr. M. Pastor</u>
	Ayudante <u>Dr. Valentin Armas</u>
Anestesista: <u>Dr. Jimenez Ruiz</u>	Instrumentista <u></u>
OPERACION PRACTICADA <u>Craniectomia temporal derecha. Abierta la dura madre, se hace una puncion cerebral en el tercio medio del lobulo temporal cayendo sobre un quiste tumoral del que se aspiran unos 15 c.c. de liquido oscuro fibrinoso. Fenestracion hasta localizar la cavidad quistica de pequeño tamaño, decidiendose hacer una lobectomia de unos 7 cms. dejando abierto el cuerno temporal del ventriculo.</u>	

Fig. 6 First neurosurgical intervention in the Canary Islands

Neurosurgery Department of Nuestra Sra. Del Pino Hospital was consolidated. Its first chief was Dr. González Fera, and in 1981 Dr Carrillo Yagüe, definitively launching the neurosurgical activity on the island (Historia del Servicio de Neurocirugía del Hospital Dr. Negrín. Luis M. Carreira Goñi. http://10.136.26.52/medica/neurocirugia/archivos/historia/historia_del_servicio_de_neurocirugia_h_dr_negrin.pdf).

It was precisely *Dr. González Fera*, together with *Dr. Vera Reyes*, who developed neurosurgery since 1962 on the neighboring island of Tenerife. Like in Gran Canaria, there were no public hospitals, and the first surgeries were done in several private clinics and especially at the Institute of Pathology of the Nuestra Señora de los Desamparados Civil Hospital, nowadays venue of the Archaeological Museum of Tenerife.

Dr. Vera Reyes did his neurosurgical training with Dr. Pennybacker at Oxford and founded in 1969 the Neurosurgery Department of the Nuestra Señora de la Candelaria Hospital.

Dr. González Fera was a disciple of Dr. Norlen of Goteborg, from the Swedish school of Dr. Olivecrona. After his stay in Gran Canaria, he was promoted to the second neurosurgery professorship in Spain and created our department at the Hospital Universitario de Canarias in 1971, with the important collaboration of his first pupil, Dr. Ginovés Sierra. With the passing of time, our department grew, new techniques were incorporated, and 15 new neurosurgeons were trained. One of them, Dr. García Marín, the present chief of the department, has encouraged the formation of multidisciplinary units, such as the Neurooncology Unit, the Spine Unit, the Medico-Surgical

Epilepsy Unit, and the Pediatric Neurosurgery Unit among others. In this precise field, Dr. Martel Barth-Hansen in Tenerife and Granado Peña and González Ollejón in Gran Canaria have made their contributions, due to their work especially in the management of cranial synostosis and spinal dysraphisms.

At present, the four neurosurgery departments in the Canary Islands assist an average population of 2,150,000 people and a great amount of cases from the more than 12,000,000 tourists that visit the Canary Islands annually. All the neurosurgical conditions can be treated, and we count on a wide range of diagnostic and therapeutic techniques, such as microsurgery, radiosurgery, interventionist neuroradiology, neuronavigation, neuroendoscopy, minimally invasive surgery, intraoperative neurophysiological monitoring, etc.

Throughout its history, Canarian neurosurgery has contributed significantly to the development of Spanish neurosurgery. During these years, 20 new neurosurgeons have trained in Tenerife and Gran Canaria. many of which are currently working at hospitals all over the country. Moreover, our hospitals have been the workplace for other colleagues coming from the mainland as well as from other countries, a fact that has enriched our daily practice even further.

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