FOSSIL BIRDS FROM THE BUJERO DEL SILO, LA GOMERA (CANARY ISLANDS), WITH A DESCRIPTION OF A NEW SPECIES OF QUAIL (GALLIFORMES:PHASIANIDAE)

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ABSTRACT. The fossil vertebrate fauna from the Pleistocene of La Gomera (Canary Islands, Eastern Atlantic Ocean) is described. Remains of fossil bird and reptile species have been found, but there seem to be an abscence of autochthonous terrestrial mammals. An extinct species of quail, *Coturnix gomerae* n.sp. is described. This new quail has been found only on La Gomera.

INTRODUCTION

La Gomera is the central island of the Western Canary Islands. It is a small volcanic island, with a roughly elliptical shape (29x33km) and a very high relief. Its area is 378,75 Km^2 and the highest peak, the Garajonay, 1487m, is situated in the middle of the island. Deep canyons, heavily eroded, irradiate from the Garajonay to the sea, and give La Gomera its characteristic physionomy. The oldest rocks of La Gomera (basal complex) are 15 to 20 million years old (Fuster 1985). The emersion of the island would have taken place before 12 million years ago (Cantagrel 1985). Immunological studies on the Gomera's gecko, *Tarentola gomerensis*, that suggest that this species was

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separated from the group *delalandii* 14 million years ago (Joger 1984), are in agreement with this hypothesis.

There is very little knowledge about the fossil vertebrate fauna of La Gomera. Recently Hutterer (1985) has studied the fossil lizards *Gallotia* (Sauria: Lacertidae) of La Gomera. His study is based on 256 bones found on three palaeontology deposits that probably belong to the Upper Pleistocene (Barranco de Chinguarime, Barranco de Machal i Barranco de Santiago) and one archaeological site (Barranco de Chinguarime: 510 ± 50 AP).

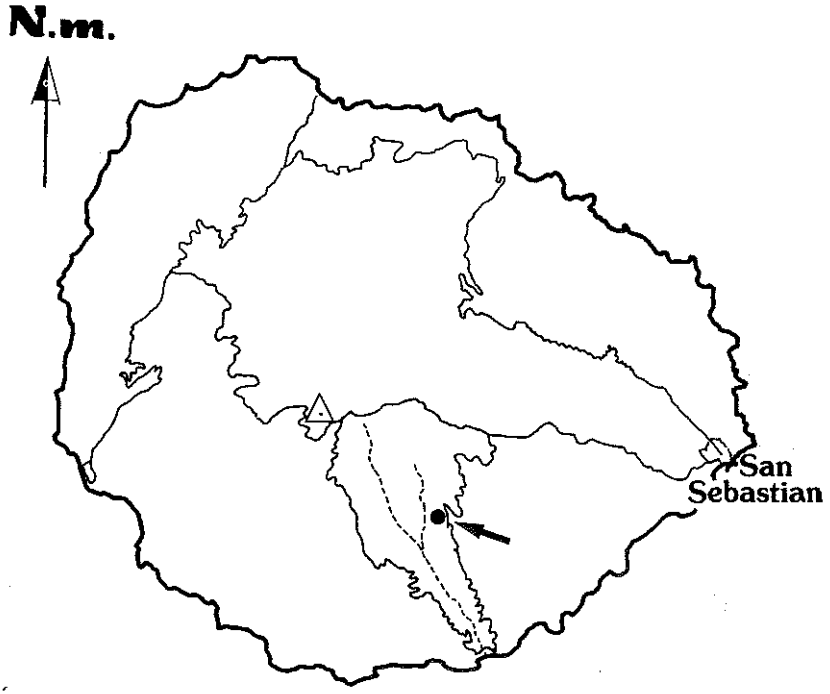

Figure 1. La Gomera, showing location of the Bujero del Silo

The kind directions of Dr Pere Oromi and José Luis Martin Esquivel made it possible the study of a new fossiliferous deposit on La Gomera, the Bujero del Silo (see figure 1). This is the most important cave of the island. The first fossils were found by J.L. Martin Esquivel, October 21, 1983 and December 9, 1983. The cave was latter prospected in search of fossil bones by Miguel Trias and

Josep Antoni Alcover on July 6, 1985. The cave is very small, with a triangular hall 15 m long and 9 m high, that communicates to the outside by a narrow chimney 17,50 m long. The mouth of the cavity is very small and it is situated on the base of a small crag 15 m high, and 650 m above sea level. The UTM coordinates are 28RBS828071. The topography of this cave is illustrated in figure 2. Martin et al. (1986) have published some data about this cave.

The cave has acted in the past as a natural funnel that has allowed the accumulation of bones. The fossils were found either buried (1 to 5cm) in clay sediments transported by water, or were scattered on the floor of the cave. Some fossils were found inside fissures.

We have obtained 1675 bone remains from mammals, birds and reptiles. The few mammal bones found belong to domesticated species introduced in La Gomera by man. The remains of birds and reptiles are more abundant and include species that belong to the primitive fauna of La Gomera. There are 1398 reptile bones that belong to *Gallotia*, and 271 bird bones. The fossil bird bones are the object of this work.

The fossiliferous deposit of the Bujero del Silo probably had a double origin. Some of bones were from animals that had fallen into the cave. Other bones were transported into the cave by birds of prey (Barn Owls or Buzzards) that used the cavity as a sheltered roost or nesting site.

The deposit is very recent. Nearly all the bones were deposited during the Upper Pleistocene, but probably there are later depositions. The bones are not mineralized and are in a very good state of preservation. Nearly all have the same external appearance. They often present a thin coat of clay. Some bones are more recent (for instance, those that belong to the mammals and *Neophron*) and are not coated with clay.

In this paper we have used the following acronyms to designate the name of the scientific collections of the comparison material and where the collected material was deposited:

DZUL:Collection from the Department of Zoology (Vertebrates), University of La Laguna, Tenerife, Canary Islands.

TFMC: Bird Osteology Collection of the Museo de Ciencias Naturales, Santa Cruz, Tenerife.

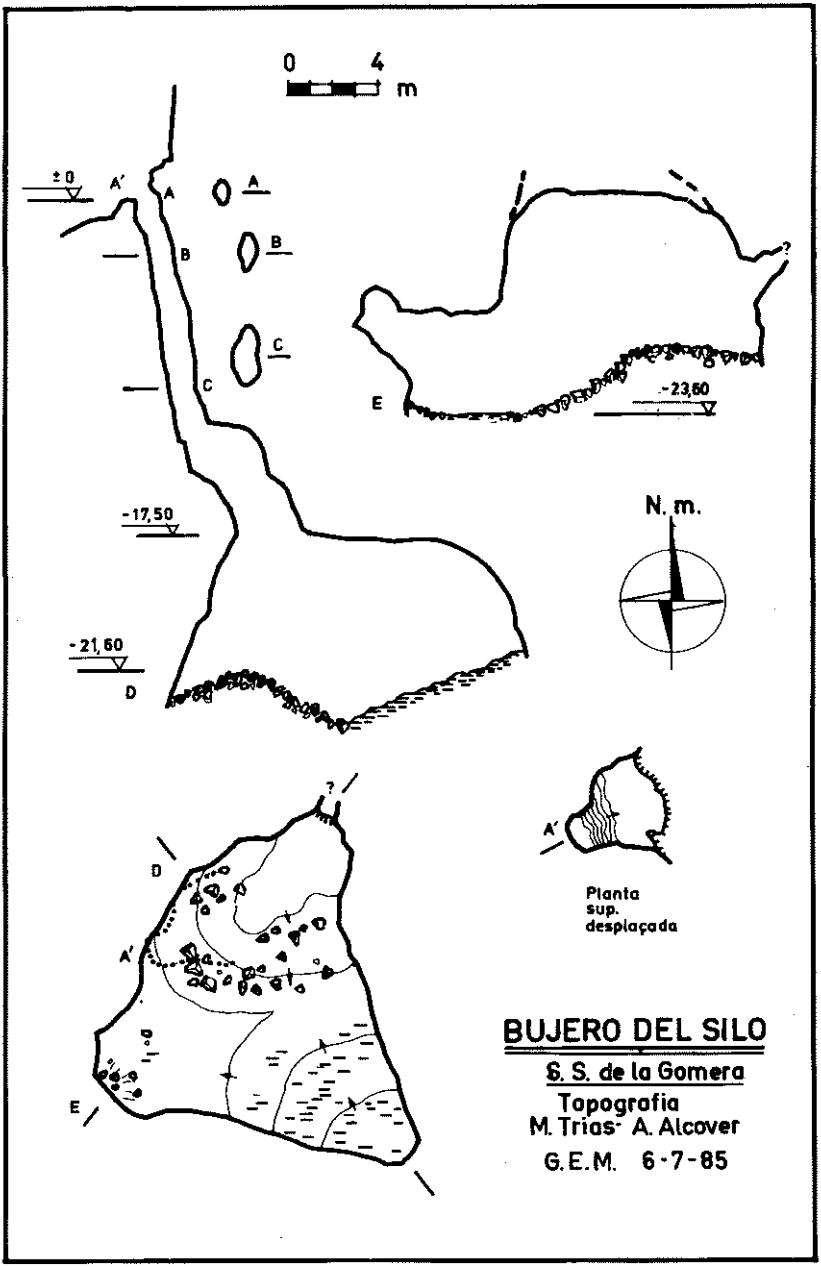

Figure 2. Topography of the Bujero del Silo

MNCM: Vertebrate Collection Museu de la Naturalesa de les Illes Balears, Ciutat de Mallorca, Balearic Islands.
NMNH: Bird Collection from the National Museum of Natural History, Washington, USA.

SYSTEMATICS

The references that are used to report the distribution and/or the systematics of the birds from the Canary Islands are Bannerman (1963), Pérez (1983), Martin (1987) and Morino (1988). Herein we will follow our own systematic criteria, that often agrees with those used by either the authors mentioned above. The fossil distributions of the species mentioned are from Mourer-Chauviré (1975) and Cassoli (1980).

Order Accipitriformes

Family Accipitridae

Genus *Buteo*

Buteo buteo insularum

MATERIAL: 31 specimens, that represent a minimum number of three individuals. DZUL 1740-42, MNCM 4837: humerus; DZUL 1747-49, 1751, 1756: ulna; DZUL 1752, 1764-67: fragmented radius; DZUL 1761-63: carpometacarpus; DZUL 2010-11: first phalange of the II anterior digit; DZUL 1753-55: coracoid; DZUL 1750: synsacrum; DZUL 1743-46: femur; DZUL 1757-59: tibiotarsus; DZUL 1760: tarsometatarsus. (plate 1)

The Buzzard *Buteo buteo* of the Canary Islands belongs to the subspecies *insularum*. The individuals of this subspecies are smaller than the nominate subspecies. The bones found in the Bujero del Silo share the same osteological characters with the individuals of *Buteo buteo buteo* used for comparison. Nevertheless its measurements are very different. The Buzzard from The Bujero del Silo is smaller. Although we do not have recent comparitive material of *Buteo buteo insularum*, the bones from the Bujero del Silo are attributed to this subspecies. This systematic attribution is based on the differences in the body size found when comparing them with European Buzzard material. *Buteo buteo insularum* is the only Buzzard of the Canary Islands. Nowadays it still breeds on La Gomera.

Neophron percnopterus

MATERIAL: 10 bones, from the same individual. DZUL 1720: fragment of skull, fragment of humerus, 2 fragmented ulna, fragment of synsacrum; MNCM 3826: fragmented humerus, femur, fragmented coracoid, carpometacarpus, scapula, furcula.

The remains of *Neophron percnopterus* present a very different aspect than the rest of bird and reptile bones; probably the reason for this is a more recent deposition. The Egyptian Vulture does not breed now on La Gomera. Martin (1987) reports that it became extinct on this island in the last 30 years.

Family Falconidae

Falco tinnunculus

MATERIAL: 39 specimens, that represent a minimum of seven individuals. DZUL 1768: fragmented skull; DZUL 1769-74, MNCM 4836, 20448: humerus; DZUL 1775-82, MNCM 20451-52: ulna; MNCM 20463: carpometacarpus; DZUL 1783-85: fragmented carpometacarpus; DZUL 1786-87: synsacrum; DZUL 1788-96: femur; DZUL 1797-801: tibiotarsus.

A small Kestrel is well represented in the Bujero del Silo. Nowadays there are two subspecies of kestrels, *Falco tinnunculus*, living in the Canary Archipelago. The subspecies *canariensis* is found on the islands of Gran Canaria, Tenerife, La Gomera, El Hierro and La Palma, while the subspecies *dacotiae*, with a smaller body size (Morino 1988), is found on the islands of Lanzarote and Fuerteventura. It has not been possible, because of the lack of osteological comparison material from these two subspecies, to identify to which subspecies the bones we have found belong. The actual distribution of the two subspecies of kestrel make us believe that the remains from the Bujero del Silo belong to *Falco tinnunculus canariensis*.

The main skeletal measurements of the kestrel from the Bujero del Silo are shown in table 1. Some bones are from juveniles. From this, we now know that the kestrel was breeding on La Gomera during the Upper Pleistocene.

Falco sp.

MATERIAL: 2 specimens, that represent a minimum of one individual. DZUL 1896: ulna; DZUL 1897: tibiotarsus.

Two bones testify the presence of a Falcon of the size of *Falco pelegrinoides* or *Falco peregrinus*. We have not been able to compare the material with skeletons of the Barbary Falcon, or any other falcon (as *F. biarmicus*) of the same size that lives in North Africa. For this reason it was not possible to specifically diagnose of the falcon bones from the Bujero del Silo.

Order Columbiformes

Family Columbidae

Genus *Columba*

Columba junoniae

MATERIAL: 22 specimens, that represent a minimum of three individuals. DZUL 1802, MNCM 20447: humerus, DZUL 1803-04: fragmented humerus; DZUL 1805-07, MNCM 20450: ulna; DZUL 1810-11: radius; DZUL 1812-13: fragmented carpometacarpus; DZUL 2009: first phalange of the II anterior digit; DZUL 1808-09: coracoid; DZUL 1899-900, 2008: scapula; DZUL 1814-15: femur; DZUL 1816: fragment of a tibiotarsus; DZUL 1817: fragment of a tarsometatarsus.

On La Gomera there are two species of pigeons living in the laurel forests: *Columba junoniae* and *Columba bollii* (Emmerson & Martin, in press, Morino 1988). Both species have similar body size and osteology (Alcover and Florit 1989). It has been only possible to compare the remains from the Bujero del Silo with one skeleton from each of these two species (*Columba junoniae*: MNCM 1260, from the Island of La Palma; *Columba bollii*: DZUL 500, from the Island of Tenerife). The bones of *C. junoniae* were slightly larger than those of *C. bollii*, but at the present we do not know the diagnostic value of these differences in size. The osteological differences that we have found are minimal, and they concern the humerus, the carpometacarpus, the coracoid and the tarsometatarsus. The pigeon from the Bujero del Silo presents osteological characteristics that agree more with *Columba junoniae* than with *Columba bollii*. These characters are: a large insertion surface for the deltoid muscle in the humerus, a small concavity in the *trochlea carpalis* near the *procesus extensorius* of the carpometacarpus, a more robust coracoid that presents a bigger *facies articularis humeralis* and the more developed *cavitas glenoidalis interna* of the tarsometatarsus. The rest of the bones are attributed with some

reserve to *C. junoniae*. Further biometric and morphological studies of the two Canarian Laurel Forest pigeons are necessary.

Some of the *Columba* bone remains from the Bujero del Silo belong to juveniles. These bones document that *C.junoniae* was breeding on La Gomera during the Upper Pleistocene.

Fossil bones of Laurel Forest pigeons have already been found on Gran Canaria (human settlement of La Aldea; Alcover & Florit 1985) and on Madeira (Pieper 1985).

Order Galliformes

Family Phasianidae

Coturnix gomerae n.sp.

HOLOTIPUS: DZUL 1852: tibiotarsus.

PARATIPUS: DZUL 1822, MNCM 20449: humerus; DZUL 1825-27, MNCM 20453: ulna; DZUL 1830-31, MNCM 20462: coracoid; DZUL 2016, 1832-1851, MNCM 20454, 20457-58: femur; DZUL 1852-55, MNCM 20459-60: tibiotarsus; DZUL 1867-1871, MNCM 20461: tarsometatarsus; DZUL 2013-15, MNCM 20465: synsacrum. (plate 2)

OTHER MATERIAL: ; DZUL 1823-24: humerus fragments; DZUL 1828-29: ulna fragments; DZUL 2017-23: femur fragments; DZUL 2024, 1856-66: tibiotarsus fragments; DZUL 1872-73: tarsometatarsus fragments.

TOTAL: Including the holotype there are a total of 78 bones, that represent a minimum of 14 individuals.

DISTRIBUTION: The species is only known on the Island of La Gomera, Canary Islands, Eastern Atlantic.

STATUS: Extinct. Presumably it became extinct after the arrival of Man to La Gomera.

DERIVATIO NOMINIS: From the name of the island (La Gomera) where the first remains of the species have been found. Note that this name is not a derivative of Gomera (as *gomerensis*) but of La Gomera.

DIAGNOSIS: A species of *Coturnix* that is characterized for presenting hind-limbs that are longer and essentially more robust than those of *Coturnix coturnix*.

COMPARISON MATERIAL: *Coturnix coturnix*: MNCM 11200: El Hierro, Canary Islands; MNCM 12884: Mallorca, Balearic Islands; MNCM 12163: bones from different individuals, Berastegui, Guipuzcoa, Basque Country; TFMC 1,2: Punta del Agua, Montaña Clara, Canary Islands; NMNH 290381,3: Africa; NMNH 603419,31, 34,36, 39: Bahig, Matruh, Egypt; MNNH 603436,41: Burg el Arab, Matruh, Egypt; MNNH 605034: Eilot, Israel. *Coturnix delegorguei*: NMNH 431505: Nyamandnlovu, Zimbabwe. *Coturnix coromandelica*: NMNH 490724: National Zoological Park, Washington.

DESCRIPTION: *Coturnix gomerae* has been compared with 22 specimens of *Coturnix coturnix* from the Basque Country, the Balearic Islands, the Canary Islands, Egypt and Israel. We have also compared it with one specimen of *Coturnix delegorguei* from Zimbabwe and one specimen of *Coturnix coromandelica* from the National Zoological Park of Washington.

According to Johnsgard (1988), there are 8 species of living quails of the genera *Coturnix* in the world. Three live in Africa: *Coturnix coturnix*, *C. delegorguei* and *C. adansonii*. It is with these species that the quail from the Bujero del Silo must be compared. *C. delegorguei* and *C. adansonii* present a Sub-saharan range of distribution. We were not able to use osteological material for comparison from *C. adansonii*. Nevertheless this species is very small (body weight, 43-44g) and the size of the bones of the *Coturnix* from the Bujero el Silo exclude it from belonging to *C. adansonii*. *C. delegorguei* has also a smaller body size when compared with *C. gomerae* and *C. coturnix* and the measurements given by Johnsgard (1988) distinguish it clearly from *C. coturnix*. In tables 2 and 3 we give the osteological measurements of *C. delegorguei* together with the measurements of *C. coturnix* and *C. gomerae*. The biometric differences between the three species are evident.

The humerus of *C. gomerae* and *C. coturnix* are essentially identical in size. The distal epiphysis presents a less robust construction in *C. gomerae*. The ulna of *C. gomerae* when compared with *C. coturnix* is more curved, shorter and stouter. The diaphysis and the proximal and distal epiphysis are wider in *C. gomerae*.

The hind-limbs of *C. gomerae* are very long and robust when compared with *C. coturnix*. The femurs of *C. gomerae* are 10.85 percent longer than those

of *C. coturnix*, while the diaphysis and the proximal and distal end of the epiphysis are 30.08, 15.62 and 23.34 per cent wider. The *lineae intermuscularis cranialis et caudalis*, the *impressiones obturatoriae* and the *impressio ansae musculus iliofibularis* of the femur are much more marked in *C. gomerae* than in *C. coturnix*. In *norma lateralis interna* the *condylus medialis* presents a more rounded shape in *C. gomerae*, and the shaft of the bone is more curved in *C. coturnix*.

The tibiotarsus of *C. gomerae* are also longer and more robust when compared with *C.coturnix*. The condyles of the tibiotarsus are proportionally bigger in *C. gomerae*, while the *incisura intercondylaris* is more deep. The *crista patellaris* and the *crista cnemialis lateralis* are clearly more developed in *C. gomerae*.

The tarsometatarsus of *C. gomerae* when compared with *C. coturnix* is only slightly longer, but much more robust. The distal trochleas are more separated and wider in the tarsometatarsus of *C. gomerae*.

Order Strigiformes

Family Tytonidae

Tyto gracilirostris

MATERIAL: 3 specimens, that represent a minimum of two individuals. DZUL 1874-75: 2 humerus missing the proximal epiphysis; DZUL 1878: femur.

These remains from the Bujero del Silo belong to a small sized Barn Owl. Two forms of the Barn Owl (*Tyto*) live in the Canary Islands: *alba* and *gracilirostris*. Usually *gracilirostris* has been attributed as a subspecies of *T. alba*. In this article, we will follow the growing tendency nowadays to consider as separate species some island forms that have been in the past documented as well separated subspecies. (vgr.: *punctatissima* of the Galapagos -Steadman 1986- *insularis* and *glaucops* of the Antilles, Western Indies -Olson 1978-). The differences between *Tyto alba* and *Tyto gracilirostris* are detectable on the plumage (*T. gracilirostris* has a gold-yellow or dusky-cinnamon breast), the body size (*T. gracilirostris* is much smaller) and osteologically. La Gomera is one of the Eastern Canary Islands and it is separated from the Western Islands by Tenerife and Gran Canaria. On these two islands the present form of Barn Owl is *T. alba*, thus isolating the fossil *T. gracilirostris* of the Gomera from the

present day distribution of *T. gracilirostris*. *Tyto gracilirostris* has also been found in the human settlement of La Aldea, Gran Canaria (Alcover & Florit 1989). This distribution of fossil and living Barn Owls suggests that they invaded the Canary Islands on two occasions. *Tyto gracilirostris* formed part of the prehuman vertebrate fauna of the Canary Islands, and would have been recently replaced on some islands by *Tyto alba*. In Madeira a similar replacement has occurred. A small barn owl is present in the Fossil record (Pieper, pers. com. to J.A.Alcover 5.7.1990), while the species that lives nowadays is *Tyto alba*.

Order Passeriformes

Family Muscicapidae

Turdus sp.

MATERIAL: 6 bones, that represent a minimum of six individuals. DZUL 1879-84: humerus. 10 other bones of medium sized passeriforms have been attributed with some reserve to the genus *Turdus*: DZUL 1885-88: 4 ulna; DZUL 1889-93: 5 femur; DZUL 1894: 1 tibiotarsus.

It is very difficult to distinguish morphologically the different species of the *Turdus* genera (Weesie 1987). The only species of *Turdus* that breeds on the Canary Islands is an endemic form of the Blackbird, *Turdus merula*. No osteological material of this island subspecies is available. During the migration the following thrushes can be seen on the islands: *T. torquatus, T. pilaris, T. iliacus* and *T. philomelos*. The remains from the Bujero del Silo are from a small sized *Turdus* (*iliacus, philomelos, merula*).

Family Corvidae

Pyrrhocorax pyrrhocorax

MATERIAL: 1 bone, that represents a minimum of 1 individual. DZUL 1736: ulna.

The presence of the Chough in the Bujero del Silo testifies to probably a bigger distribution area in the past. The chough now only breeds on La Palma, with some sporadic observations on other islands. This species has disappeared

recently from some Mediterranean Islands (vgr. Mallorca, Menorca and Eivissa), as well as continental areas.

Corvus corax

MATERIAL: 16 bones, that represent a minimum of two individuals. DZUL 2012: fragmented skull; DZUL 1721: premaxilla; DZUL 1723-24: humerus; DZUL 1725-26, 1730: ulna; DZUL 1728: radius; DZUL 1731-32: carpometacarpus; DZUL 1727: femur; DZUL 1735: tibiotarsus; DZUL 1729: distal fragment of a tibiotarsus; DZUL 1722, 1733: tarsometatarsus; DZUL 1734: proximal fragment of a tarsometatarsus.

A subspecies of the Raven *Corvus corax tingitanus* is distributed throughout the Canary Archipelago. It can be very abundant on some of the Eastern islands (especially on El Hierro). The presence of the Raven at the Bujero del Silo is not strange.

Family Fringillidae

Carduelis chloris

MATERIAL: 2 bones, that represent a minimum of one individual DZUL 1737: a fragment of skull DZUL 1738: premaxilla.

The findings clearly belong to the Greenfinch *Carduelis chloris*. The Greenfinch (*Carduelis chloris aurantiiventris*) breeds on the Islands of Tenerife and Gran Canaria. The Greenfinch found in the Bujero del Silo does not seem to be as old as the rest of other species. They do not have a coat of clay neither do they seem to be very mineralized. The deposition must have taken place much later than the rest of the materials studied in this cave.

Passeriformes, family through species indeterminate.

MATERIAL: 10 specimens. DZUL 1739: humerus; DZUL 1895: femur; DZUL, 8 bones with no catalogue number.

This category consists of passerine post-cranial elements that are impossible to specifically determine accurately.

Aves, order through species indeterminate.

MATERIAL: DZUL 1876-1877:2 specimens. 51 specimens. DZUL, without catalogue number.

This material consists mainly of avian post-cranial elements (ribs, phalanges, vertebrae) and bones that are to fragmentary for identification or that have not enough diagnostic characteristics.

DISCUSSION

The ornithofauna of the Bujero del Silo is poor in the number of species but is very interesting. There are 271 bird bones that represent a minimum of 11 species. Some general conclusions can be drawn from this sample of the palaeornithofauna of La Gomera.

In first place the absence of mammals is an outstanding fact. The autochthonous mammalian fauna of the Canary Islands includes only a few species of Chiroptera, Insectivora and Rodentia (for references see Molina & Hutterer 1989). Autochthonous terrestrial mammals have been found on Lanzarote, Fuerteventura and the neighbouring Islands (*Crocidura canariensis, Malpaisomys insularis*), Gran Canaria (*Crocidura osorio, Canariomys tamarani*) and Tenerife (*Canariomys bravoi, Crocidura osorio*). Up to the date no autochthonous terrestrial mammals have been found on EL Hierro, La Palma and La Gomera. The fossil record of these islands is very incomplete. The discovery of the fossiliferous deposit of the Bujero del Silo, with more than 1600 bones, including birds of prey that are potential mammalian predators, suggest that the primitive fauna of La Gomera did not have mammals, or if there were any mammals their distribution on the island would have been restricted. The authors believe that it is more probable that in the past no terrestrial mammals lived on La Gomera, although the presence of mammals can not be completely excluded.

Also outstanding is the absence of Procellariiformes in the Bujero del Silo. This could be explained by the situation of the deposit (distance from the coast and the altitude). The Shearwaters and their allies are very important on the eastern islands (Lanzarote, Fuerteventura and their small neighbour islands). On these islands remains of Procellariiformes are found in all the known deposits, including those that are far from the coast. The absence of Procellariiformes in the Bujero del Silo is probably related to the great distance

that separates La Gomera from the Canary-Saharan shelf. This is a highly productive area that in the past must have fed all the Procellariiformes form the Eastern Canary Islands.

From the deposit of the Bujero del Silo we now know some bird species that have lived in the past on La Gomera. This is the case of *Coturnix gomerae* n.sp., *Tyto gracilirostris*, and *Pyrrhocorax pyrrhocorax*. The last two species can still be found on some of the other islands of the Canary Archipelago. *Coturnix gomerae* is an endemic of the Canary islands that has disappeared recently. Up to the date the only known range of distribution of this species is limited to La Gomera, although its distribution on other islands or the existence of any other Quail related with this species, can not be excluded. *Coturnix gomerae* raises to four the number of endemic birds of the Canary Islands that have recently become extinct. The other species are *Carduelis triasi* of La Palma, *Puffinus holeae* and *Puffinus olsoni* of the Eastern Islands (Alcover & Florit 1987, Walker et al. 1990, McMinn et al. 1990).

Coturnix gomerae presents similar adaptations to other species of birds, isolated on islands, that have a more terrestrial form of locomotion than their ancestors. The morphology of the hind limbs indicates adaptations to a more walking life than *Coturnix coturnix*. The wings of this species were also probably slightly shorter than *Coturnix coturnix*. Insular bird species that reduce their flying ability present usually the distal elements the wing more reduced than the proximal elements. The humeri of *Coturnix gomerae* and *Coturnix coturnix* have the same length, while the ulna of *C. gomerae* is shorter. No other distal bones of the wing are available. These bones must have been even more reduced than the ulna. The robust hind-limbs and synsacrum indicate that *Coturnix gomerae* also weighed more than *Coturnix coturnix*. The combination of a greater weight with a slightly shorter wing would mean that the wing load was higher in the extinct Canarian Quail. *Coturnix gomerae* was not a flightless bird, but it certainly was not as good at flying as *Coturnix coturnix*. *Coturnix gomerae* must have been a sedentary species of the Canary Islands, although it could have crossed the channels that separate the different islands of the Canary Archipelago.

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Table 1. Skeletal measurements (in millimetres) of *Falco tinnunculus* from the Bujero del Silo. Average measurements; number of individual specimens and range. The abbreviations used are the following: GL, greatest length; BP, breadth of the proximal end; BD, breadth of the distal end; SBS, smallest breadth of the shaft.

	GL	PB	DB	SBS
Humerus	47.58 n=4 45.80-49.80	11.00 n=1	9.17 n=5 8.85-9.30	4.16 n=5 3.90-4.30
Ulna	53.45 n=6 51.95-56.45	6.25 n=10 5.95-6.75	5.29 n=10 4.90-5.70	3.14 n=10 2.95-3.35
Metacarpus	31.22 n=3 30.75-31.60	8.43 n=3 8.25-8.65		
Femur	42.47 n=9 41.65-43.65	7.28 n=10 7.00-7.45	7.46 n=8 7.20-7.80	3.71 n=10 3.50-3.95
Tibiotarus	56.75 n=1	6.30 n=2 6.25-6.35	5.08 n=3 5.00-5.25	3.33 n=4 3.20-3.40

Table 2. Wing skeletal measurements (in millimetres) of *Coturnix gomerae*, *Coturnix coturnix*, *Coturnix delegorguei* and *Coturnix coromandelica*. Mean, standard deviation, range, number of individual specimens; (s). GL, greatest length; BP, breadth of the proximal end; DP, diameter of the distal end; BD, breadth of the distal end; DD, diameter of the distal end; SBS, smallest breadth of the shaft.

	gomerae	*coturnix*	*delegorguei*	*coromandelica*
Humerus GL	35.81 ± 1.2827 33.70-37.00, n=5	34.59 ± 1.1001 32.6-36.2, n=18	33.70 n=1	30.20 n=1
Humerus BP	8.05 ± 0.2090 7.75-8.25, n=7	8.17 ± 0.3933 7.60-9.00, n=17	7.65 n=1	7.20 n=1
Humerus DP	4.11 ± 0.1787 3.80-4.30, n=8	3.99 ± 0.2097 3.67-4.45, n=18	3.52 n=1	3.45 n=1
Humerus BD	5.71 ± 0.3660 5.40-6.10, n=4	5.49 ± 0.2642 5.00-5.90, n=18	5.10 n=1	4.90 n=1
Humerus DD	3.37 ± 0.1500 3.20-3.50, n=4	3.41 ± 0.2003 3.15-3.80, n=18	3.05 n=1	2.90 n=1
Humerus SBS	2.70 ± 0.1080 2.55-2.90, n=7	2.46 ± 0.1536 2.20-2.70, n=18	2.22 n=1	2.35 n=1
Ulna GL	29.11 ± 0.9058 27.90-29.90, n=4	30.09 ± 0.9768 28.6-31.6, n=19	29.68 n=1	27.30 n=1
Ulna BP	5.14 ± 0.2274 4.90-5.50, n=5	5.00 ± 0.1786 4.65-5.25, n=19	4.62 n=1	4.55 n=1
Ulna DP	3.40 ± 0.1172 3.25-3.50, n=5	3.29 ± 0.1398 3.05-3.50, n=19	3.05 n=1	2.95 n=1
Ulna BD	3.98 ± 0.1387 3.90-4.10, n=5	3.74 ± 0.1120 3.55-4.00, n=19	3.40 n=1	3.37 n=1
Ulna DD	2.61 ± 0.1387 2.40-2.75, n=5	2.469 ± 0.1276 2.20-2.70, n=19	2.25 n=1	2.25 n=1
Ulna SBS	2.46 ± 0.1169 2.30-2.65, n=6	2.248 ± 0.1271 2.07-2.50, n=19	2.00 n=1	1.85 n=1
Coracoid GL	22.65 ± 0.1414 22.55-22.75, n=2	22.63 ± 0.7153 21.62-23.6, n=16	21.59 n=1	
Coracoid SBS	2.21 ± 0.0763 2.15-2.30, n=3	2.24 ± 0.1404 1.99-2.50, n=16	2.04 n=1	1.91 n=1
Coracoid BD	8.05 n=1	7.64 ± 0.3692 7.13-8.44, n=16	7.17 n=1	

Table 3. Leg skeletal measurements (in millimetres) of *Coturnix gomerae*, *Coturnix coturnix*, *Coturnix delegorguei* and *Coturnix coromandelica*. Abbreviations as in Table 2. Btr: breadth of the central trochlea.

	gomerae	*coturnix*	*delegorguei*	*coromandelica*
Femur GL	40.92 ± 1.077 39.05-43.0, n=12	36.915 ± 1.204 34.7-39.4, n=18	35.30 n=1	31.90 n=1
Femur BP	7.18 ± 0.291 6.60-7.75, n=17	6.21 ± 0.210 5.80-6.57, n=18	6.05 n=1	5.30 n=1
Femur DP	4.53 ± 0.214 4.25-4.95, n=15	3.91 ± 0.212 3.60-4.20, n=18	3.80 n=1	3.15 n=1
Femur BD	6.50 ± 0.217 6.00-6.85, n=21	5.27 ± 0.252 4.90-5.80, n=18	4.90 n=1	4.77 n=1
Femur DD	5.24 ± 0.263 4.85-5.70, n=16	4.52 ± 0.190 4.15-4.77, n=18	4.55 n=1	3.70 n=1
Femur SBS	3.07 ± 0.114 2.85-3.30, n=24	2.36 ± 0.152 2.20-2.80, n=18	2.25 n=1	2.05 n=1
Tibiotarsus GL	48.84 ± 1.369 48.2-51.3, n=5	45.27 ± 1.069 43.5-46.65, n=17	43.60 n=1	
Tibiotarsus BP	6.67 ± 0.425 5.90-7.15, n=7	5.19 ± 0.319 4.25-5.60, n=17	5.20 n=1	
Tibiotarsus DP	7.49 ± 0.498 7.00-8.20, n=5	6.52 ± 0.273 6.10-7.05, n=16	6.25 n=1	
Tibiotarsus BD	5.10 ± 0.145 4.90-5.35, n=11	4.28 ± 0.162 3.95-4.60, n=18	4.15 n=1	
Tibiotarsus DD	4.80 ± 0.168 4.50-5.10, n=11	4.41 ± 0.169 4.10-4.70, n=18	4.27 n=1	
Tibiotarsus SBS	2.54 ± 0.117 2.35-2.70, n=11	2.21 ± 0.125 2.00-2.45, n=18	2.10 n=1	
Tarsometatarsus GL	27.31 ± 1.055 25.6-28.5, n=5	26.64 ± 0.763 25.05-28.0, n=17	26.55 n=1	24.10 n=1
Tarsometatarsus BP	5.51 ± 0.124 5.30-5.60, n=5	4.69 ± 0.159 4.30-5.00, n=17	4.42 n=1	3.97 n=1
Tarsometatarsus BD	5.98 ± 0.157 5.70-6.15, n=6	4.96 ± 0.270 4.50-5.60, n=17	4.40 n=1	
Tarsometatarsus BTr	2.51 ± 0.144 2.30-2.70, n=6	2.00 ± 0.118 1.77-2.20, n=17	1.77 n=1	1.75 n=1
Tarsometatarsus SBS	2.95 ± 0.294 2.55-3.40, n=7	2.52 ± 0.196 2.30-2.90, n=17	2.37 n=1	2.10 n=1

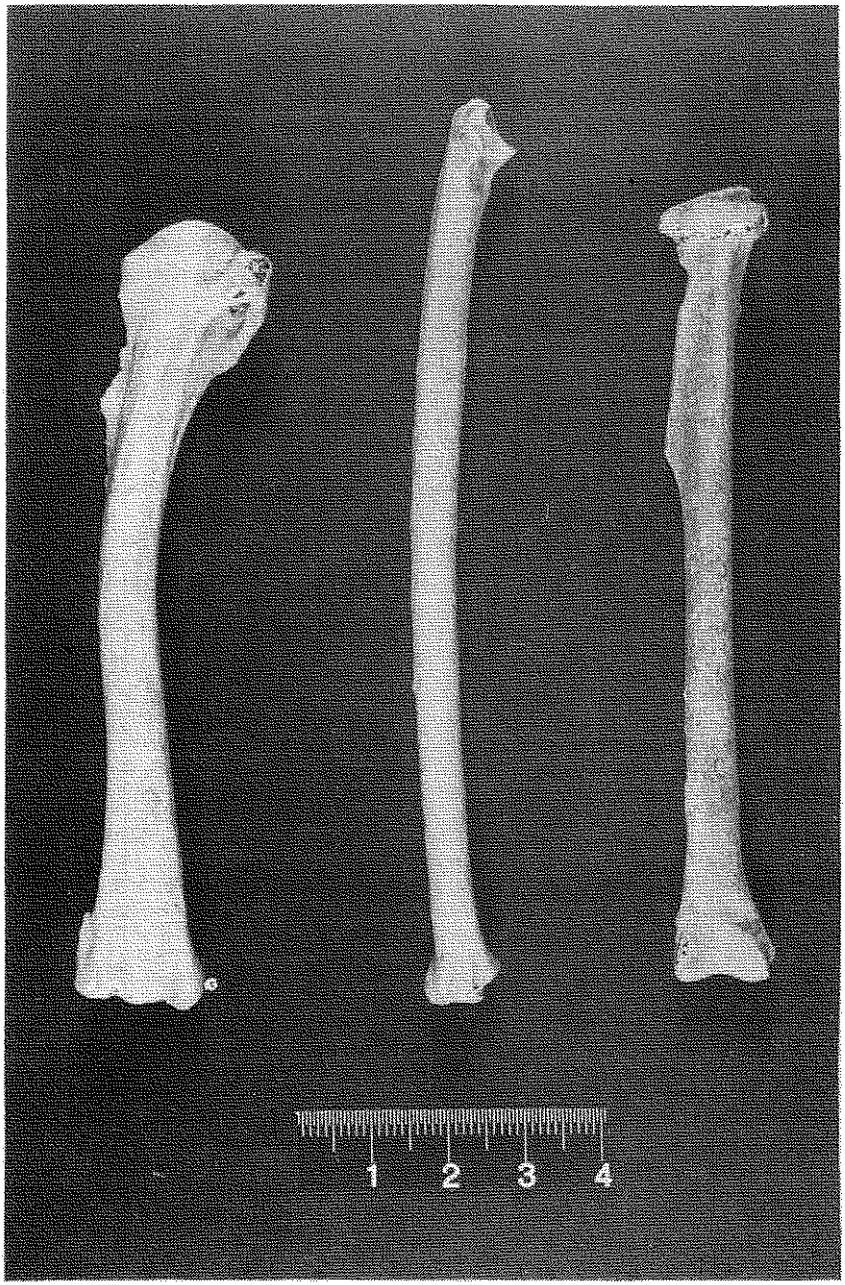

Plate 1. *Buteo buteo insularum* from the Bujero del Silo. Humerus, DZUL 1742; ulna, DZUL 1756; tibiotarsus, DZUL 1757.

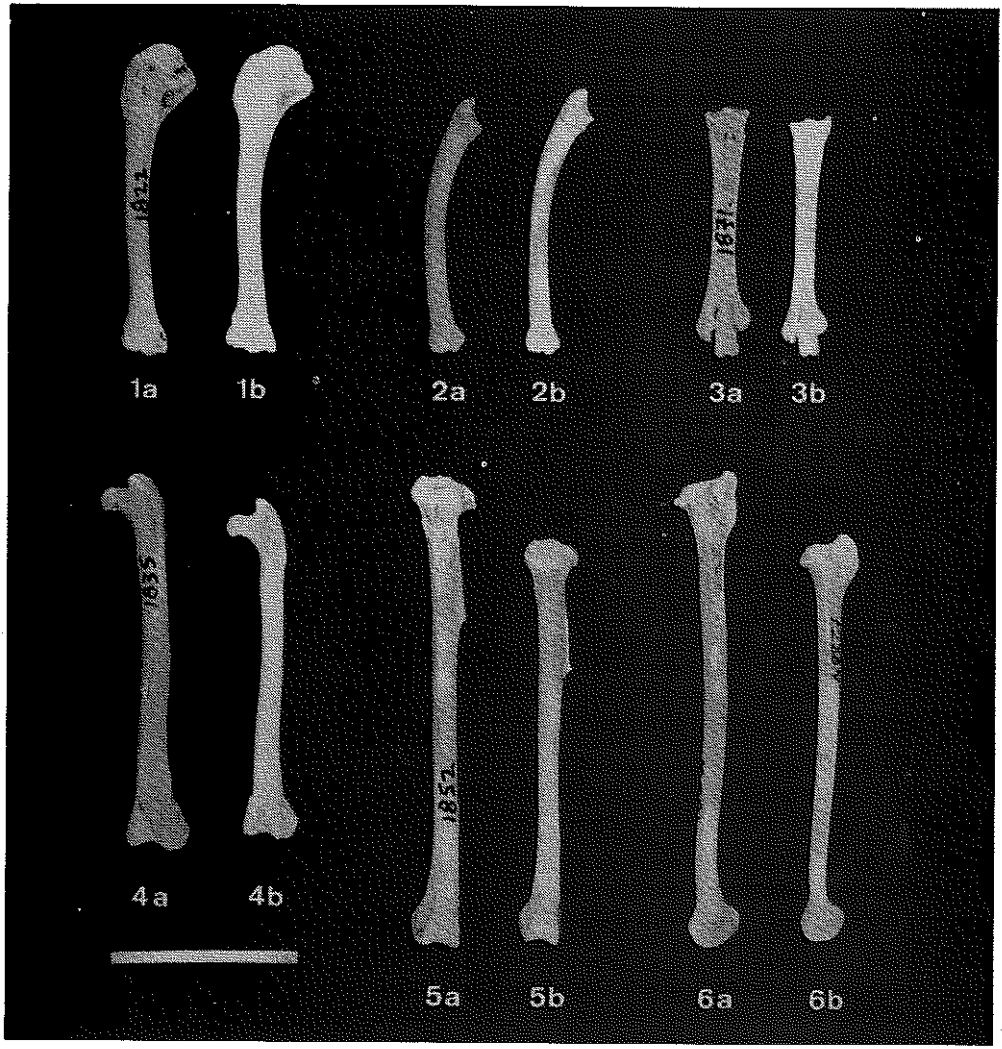

Plate 2. Dorsal views of the humerus of *Coturnix gomerae* (1a: DZUL 1822) and *Coturnix coturnix* (1b: MNCM 12884); dorsal views of the ulna of *Coturnix gomerae* (2a: DZUL 1827) and *Coturnix coturnix* (2b: MNCM 12884); dorsal views of the tarsometatarsus of *Coturnix gomerae* (3a: DZUL 1871) and *Coturnix coturnix* (3b: MNCM 12884); dorsal views of the femur of *Coturnix gomerae* (4a: DZUL 1835) and *Coturnix coturnix* (4b: MNCM 12884); plantar view of the tibiotarsus of *Coturnix gomerae* (5a: holotype, DZUL 1852) and *Coturnix coturnix* (5b: MNCM 12884); lateral view of the tibiotarsus of *Coturnix gomerae* (6a: holotype, DZUL 1852) and *Coturnix coturnix* (6b: MNCM 12884). Scale: 2cm