

their origin to periodical floodings of the cavern, during which the remains that lay scattered over the cavern floor, near the mouth, were washed further within and were buried in the muddy sediments of the water.

The state of mineralization in which the remains of the Hippopotamus, the Stag, and the Bear are, indicates that these animals occupied the Maltese area contemporaneously.

Further researches will, I have no doubt, lead to other discoveries, and it will therefore suffice for the present to simply place on record these, the first tangible evidences of the former occurrence of carnivora in the Maltese area.

NOTICES OF MEMOIRS.

Dr. C. I. FORSYTH-MAJOR—ON THE FOSSIL-REMAINS FROM SAMOS.

C. I. FORSYTH MAJOR, LE GISEMENT OSSIFÈRE DE MITYLINI. EXTRAIT DE SAMOS, ETUDE GÉOLOGIQUE, PALÉONTOLOGIQUE ET BOTANIQUE. Par C. De STEFANI, C. I. FORSYTH MAJOR, et W. BARBEY. (Lausanne, Bridel, 1892.)

SEVERAL ancient authors, as Ælianus, Heraclides, Ponticus, and others, speak of the former existence of monsters on the Isle of Samos, and mention expressly that their bones—which are claimed by Plutarch to be the remains of the Amazons slain by Bacchus—are still to be seen in the island.

This induced the author, when visiting Samos for other scientific purposes, to search for fossil bones; and he was fortunate enough to find a rich deposit of them in the vicinity of the village of Mitylini, in the eastern part of the island, imbedded in a volcanic tufa, alternating with strata of sandy marls and gravels. These same deposits had been seen and described almost fifty years ago by Admiral (then Lieutenant) Spratt, who failed, however, to discover fossils in them. The following is a complete list of the Vertebrate fauna of Samos, compared with other deposits in which a certain number of species have been found agreeing with those of Samos.

From the following comparison it may be seen, that of the 43 Mammalian species from Samos, 25 at least are represented equally at Pikermi (Greece), 13 at Maragha (Persia), 7 at Baltavar (Hungary), 7 at Mont Leberon (France), so that the contemporaneity of all these deposits, and many others less well known, is placed beyond doubt.

Whilst the majority of Palæontologists assign all these deposits to the older Pliocene, the author adduces reasons for which, in accordance with the views of Professors Boyd Dawkins, Depéret, Gaudry, and others, he holds them to be Upper Miocene. He points out that the other view is to be traced back to Dr. Theodor Fuchs, who regarded a very recent deposit of fossil shells near the sea-shore at Raphina, four miles distant from Pikermi, as contemporaneous with the Pikermi beds. If this view were correct, the Pikermi beds would have to be assigned to the uppermost Pliocene, or even to the Pleistocene, so that Dr. Theodor Fuchs must have been led into an error of observation.

LIST OF ANIMAL REMAINS FROM SAMOS SHOWING THEIR OCCURRENCE ALSO
IN OTHER LOCALITIES.

	Samos.	Concord. (Spain.)	Mt. Leberon, (France.)	Croix-Rousse, (France.)	Baltavar. (Hungary.)	Fikermi, (Greece.)	Troy. (Asia Minor.)	Maragha. (Persia.)
MAMMALIA.								
Primates.								
Fam. CERCOPITHECIDAE.								
<i>Mesopithecus Pentelici</i> , Wagn. ... ..	?	...	...	...	x	x	...	...
Carnivora.								
Fam. FELIDAE.								
<i>Machairodus</i> , sp.	x	...	...	...	...	...	...	...
<i>Felis Neas</i> , Major	x	...	...	...	...	...	...	...
Fam. HYAENIDAE.								
<i>Lycyaena Chaeretus</i> , Hens. (Gaudr. et Lart. sp.)	x	...	...	...	...	x	...	...
<i>Hyaena eximia</i> , Roth et Wagn.	x	x	x	...	x	x	...	x
Fam. VIVERRIDAE.								
<i>Ictitherium Orbigny</i> , Gaudr.	x	...	x	...	...	x	...	...
— <i>robustum</i> , Gaudr. (Nordm. sp.)... ..	x	...	...	...	...	x	...	...
— <i>hipparionum</i> , Gaudr. (Gerv. sp.)	x	...	x	...	...	x	...	x
Fam. MUSTELIDAE.								
<i>Mustela palaeattica</i> , Weith.	x	...	...	...	...	x	...	...
<i>Promephitis Larteti</i> , Gaudr.	x	...	...	...	...	x	...	...
<i>Meles maraghanus</i> , Kittl.	x	...	...	...	...	...	...	x
Artiodactyla.								
Fam. ANTILOPIDAE.								
<i>Palaeoryx Pallasii</i> , Gaudr. (Wagn. sp.)	x	...	...	...	...	x	...	x
— <i>rotundicornis</i> , Maj.	x	...	...	...	...	x	...	...
<i>Protoryx Carolinae</i> , Maj.	x	...	...	...	...	x	...	...
— <i>longiceps</i> , Maj.	x	...	...	...	...	...	...	x
— <i>Gaudryi</i> , Maj.	x	...	...	...	...	...	...	x
— <i>Hippolyte</i> , Maj.	x	...	...	...	...	...	...	...
<i>Helicophora rotundicornis</i> , Weith.	x	...	...	...	...	x	...	x
<i>Gazella deperdita</i> , Gaudr. (Gerv. sp.)	x	x	x	x	x	x	...	x
<i>Gazella</i> , sp.	x	...	...	...	...	...	...	...
<i>Gazella</i> ?	x	...	...	...	...	...	...	...
<i>Prostrepsiceros Woodwardii</i> , Maj.	x	...	...	...	...	...	...	...
<i>Prostrepsiceros</i> (?) sp.	x	...	...	...	...	...	...	x
<i>Palaeoceros Landermayeri</i> , Gaudr. (Wagn. sp.)... ..	x	...	x	...	...	x	...	x
<i>Tragoceros Valenciennesi</i> , Gaudr.	x	...	...	...	...	x	...	...
— <i>amalthaeus</i> , Gaudr. (Roth et Wagn. sp.)	x	x	x	x	x	x	x	?
Fam. OVIDAE (?).								
<i>Oriotherium argalioides</i> , Maj.	x	...	...	...	...	...	...	...
<i>Capra</i> ?	x	...	...	...	...	...	...	...
Fam. GIRAFFIDAE.								
<i>Samotherium Boissieri</i> , Maj.	x	...	...	...	...	...	...	x
<i>Palaeotragus Roueni</i> , Gaudr.	x	...	...	...	...	x	...	?
<i>Helladotherium Duvernoyi</i> , Gaudr. ... ..	?	...	...	...	...	x	...	...
Fam. CERVIDAE.								
<i>Dremotherium</i> (?) <i>Pentelici</i> , Gaudr.	x	...	...	...	...	x	...	...
Fam. SUIDAE.								
<i>Sus erymanthius</i> , Roth et Wagn.	x	...	...	...	x	x	x	x
Perissodactyla.								
Fam. EQUIDAE.								
<i>Hipparion mediterraneum</i> , Hens.	x	x	x	x	x	x	x	x
— <i>minus</i> , Pavlow ... ..	?	...	...	...	...	...	...	...

	Samos.	Conceud. (Spain.)	Mt. Leheron. (France.)	Croix-Rousse. (France.)	Balazar. (Hungary.)	Pikermi. (Greece.)	Troy. (Asia Minor.)	Maragha. (Persia.)
Fam. RHINOCEROTIDAE.								
<i>Rhinoceros pachygnathus</i> , Wagn....	x	...	...	...	x	x	...	...
— <i>Schleiermachersi</i> , Kaup. ...	?	...	...	x	...	x	...	...
Proboscidea.								
Fam. ELEPHANTIDAE.								
<i>Mastodon Pentelici</i> , Gaudr. et Lart. ...	x	...	...	...	x	x	...	x
— <i>turicensis</i> , Schinz. ...	x	...	...	...	...	x	...	...
Fam. DINTHERIIDAE.								
<i>Dinotherium</i> , sp. ...	x	...	...	...	...	...	...	...
Ancylopoda.								
Fam. CHALICOTHERIIDAE.								
<i>Chalicotherium Pentelici</i> , Gaudr. sp. ...	x	...	...	...	...	x	...	...
Rodentia.								
Fam. MURIDAE.								
<i>Acanthomys Gaudryi</i> , Dames ...	x	...	...	...	...	x	...	...
Chiroptera.								
Fam. ?								
Incomplete cranium of indetermined genus. ...	x	...	...	...	...	...	...	...
Edentata.								
Fam. ORYCTEROPODIDAE.								
<i>Orycteropus Gaudryi</i> , Maj. ...	x	...	...	...	...	...	...	...
REPTILIA.								
Testudinata.								
Fam. CHERSIDAE.								
<i>Testudo</i> , sp. ...	x	...	...	...	...	...	...	...
AVES.								
Ratitae.								
<i>Struthio Caratheodori</i> , Major. ...	x	...	...	...	...	...	...	...
Carinatae.								
Fam. CICONIIDAE.								
<i>Amphipelargus Majori</i> , Lyd. ...	x	...	...	...	...	...	...	...
<i>Acis</i> ...	x	...	...	...	...	...	...	...

The almost universal view that the fauna of the Upper Siwaliks is the eastern continuance of the Pikermi fauna, must likewise be abandoned. The two have not one species in common. The former is doubtless more recent than the latter, in which the number of still living genera is much less. In the fauna of Pikermi and Samos there are wanting such living genera as *Anthropopithecus*, *Macacus*, *Semnopithecus*; *Canis*, *Ursus*, *Mellivora*, *Lutra*; *Elephas*; *Equus*; *Hippopotamus*; *Camelus*, *Tragulus*; *Rhizomys*, *Lepus*. characteristic of the Siwaliks on the one hand, and partly of the Upper Pliocene of Europe on the other. Neither can any of the Antelopes of Pikermi and Samos, although showing relations to living African forms, be identified with living genera (with the single exception perhaps of *Gazella brevirostris*, Gaudr.), whilst among the Siwalik Antelopes we find no less than five living genera at least, viz. *Bose aphus*, *Hippotragus*, *Gazella*, *Tetraceros*, *Alcelaphus*.

Short characteristics are given of several particularly interesting members of the Samos fauna. The author adduces reasons for considering *Chalicotherium* (*Ancylotherium*) to be neither an Edentate nor a Perissodactyle, but forming a separate order.

Amongst the Ruminantia chiefly worthy of mention is a member of the Giraffidæ, the *Samotherium Boissieri*, a complete skull of which has recently been added to the British Museum. The male possessed horn-cores implanted directly on the roof of the orbits; the females were hornless. A near relative of the *Samotherium* was the *Palæotragus Roueni* (Pikermi, Samos), which hitherto has been considered as an Antelope.

The *Criotherium argalioides*, chiefly represented by four nearly complete crania in the British Museum, is a most curious form of Ruminant, showing some affinities to the Antelopidæ and Ovidæ, though it cannot be assigned to either of these families. In the form of the horn-cores it resembles the *Budorcas* of Assam and Thibet.

The new genera *Protoryx* and *Prostrepsiceros* are considered to be the forerunners respectively of *Hippotragus* and *Strepsiceros*, both living African Antelopes.

A species of *Orycteropus*, the first true Edentate found fossil in the Old World, has been already recorded in this MAGAZINE on a former occasion (See GEOL. MAG. Dec. III. Vol. VI. 1889, p. 431).

Amongst the scanty Avian remains deserves mention a *Struthio*, represented by a femur and part of the pelvis, scarcely to be distinguished from the African Ostrich.

The principal collection of the Samos fossils has been presented by its owner, Mr. William Barbey, to the College Gaillard at Lausanne. A second collection, important chiefly for its complete specimens of Ruminants, is actually in the British Museum. Smaller collections of duplicates have been presented to the museums of Geneva, Lausanne, and the Pythagoras Gymnasium at Vathy (Samos). Lastly a smaller collection brought from Samos by Dr. G. von Bukowski, of the Geologische Reichsanstalt of Vienna, is deposited in the Geological and Palæontological Museums of the Vienna University.

REVIEWS.

I.—THE FOSSIL FISHES OF THE BRITISH COAL MEASURES.

“ON THE FOSSIL FISH-REMAINS OF THE COAL MEASURES OF THE BRITISH ISLANDS. Part I. PLEURACANTHIDÆ.” By JAMES W. DAVIS, F.G.S., F.L.S. Sci. Trans. Roy. Dublin Soc. [2] vol. iv. pp. 703–748, pls. lxxv.–lxxiii. 1892.

THE British Coal Measures have probably yielded more remains of fishes than the corresponding horizon in any other country, and the collections of these fossils are now very extensive. At the time when Agassiz was preparing his “Poissons Fossiles,” they were almost the only Upper Carboniferous fish-remains accessible to him, and they thus comprise many of the types of his species; but since those early researches, most of the publications on the