

# FOREWORD

At a time when the media carry news of scientific discoveries to every corner of the world, there can be few who are no longer aware of Lebanon's remarkable "fish" deposits. Every amateur collector, scientist, or simple fossil-lover knows these "stone fishes", which are displayed - along with others of every age from every continent - in so many museums and souvenir-shop windows.

Long before it became an independent country, travelers had already made Lebanon famous for its local stones bearing the impressions of fishes, and it is likely that the oldest writings on fossil fish referred to these same Lebanese rocks. No one now questions the fossilization of these fishes and other marine animals, or their presence on mountain tops far from present-day shores. However, this has not always been the case...

Four major deposits, said to be of "fossil fish" but in fact containing many other animals, mainly invertebrates along with some vertebrates and plants, are to be found within a few miles of Jbeil (the former Byblos). The deposits at Haqil, Hgula, and En Nammoura<sup>1</sup> are still worked for their contents of fossils or for their lithographic limestone, although the Sahel Alma deposit is now closed.

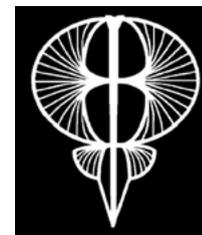
Why are these Lebanese fishes more often exhibited and sold than those from other more prestigious deposits such as Green River in the United States, Monte Bolca in Italy, Solnhofen in Germany, or Ceara in Brazil? The reasons are simple. As rich as those deposits may be, none can compete with the Lebanese ones in terms of numbers of individuals. Along with the big specimens (most of which have remained in Lebanon), entire beds of small fishes have also been preserved, enabling large numbers of amateurs to bring home a souvenir from the Land of Cedars. The third reason is that for many years no attempt was made to safeguard these fossils, in contrast with what was done at the deposits mentioned above, which are duly protected by national laws. The Lebanese fossils accordingly departed by the container-load to far-off destinations, never to return.

Since 1994 an awareness of the value of the national paleontological heritage (more than 200 genera and 500 species of fish, crustaceans, sea urchins, worms, insects, plants, etc.) has taken hold, as a result of efforts by the owners of the deposits, informed collectors, and fossil-lovers. This has been demonstrated by the establishment of a Museum of Fossils at Byblos, designed under the aegis of UNESCO and the *Direction générale des Antiquités du Liban*.

Whatever financial resources were deployed for this Museum, and however many scientific contributions it received, nothing could have been done without the assistance of the Lebanese families who own the land.

Whether as a compendium of images, a scientific manual, or simply an 85- to 100-million-year stroll through the Land of Cedars, this book is a thank-you to those families, who enlisted in the protection of Lebanon's heritage.

This book is not exhaustive: Lebanon's fauna and flora are much too extensive to be properly represented in these pages, and the great majority of the fossils come from the personal collection of the Abi Saad family, but it does provide a brief glance at the life that once existed at a certain time and place.



1. According to the international nomenclature the names of the locations where the deposits are located should be transliterated as follows:  
*Haqil, Hgula, En Nammoura, and Sahel Alma.*

# THE RECORD OF DISCOVERIES

## First discovery and earliest writings

According to James W. Davis, the discovery of fossil fish deposits in Lebanon dates back to Antiquity. In 1887, this author wrote that “They were first found and their nature discussed by Herodotus, some 450 years before the birth of Christ.”

Unfortunately, an exhaustive search in Herodotus’ *Histories* was in vain. Although the nature of fossils as objects is discussed in his works, and although he mentions the possibility of advances and retreats of the sea, there is nowhere any reference to fishes, or even to fossil shells from the Near East.

It therefore appears that the earliest reference to these deposits dates back to the writings of the Bishop of Palestine, Eusebius of Caesarea. This author writes in his *Armenian Chronicles* (3<sup>rd</sup> century): “That Noah’s Flood covered the highest mountains is for me the truth, and I say that the witness of my eyes confirms it: for I have seen certain fishes, which were found in my lifetime on the highest peaks in Lebanon. They took stones from there

for construction, and discovered many kinds of sea fishes which were held together in the quarry with mud, and as if pickled in brine were preserved until our times, so that the mere sight of them should testify to the truth of Noah’s Flood.”

However, the most celebrated if not the oldest text is unquestionably that of the Sire de Joinville, Seneschal of Champagne. In his book about his foreign crusading, *Des Saintes Paroles et des Bonnes Actions* (1248), first published as *Histoire du Roi Saint-Louis* in 1547, he includes a short memoir that, while it may not focus on holy words and worthy actions, nevertheless still delights us today with its freshness and its astonishing gullibility. Describing the King’s stay in Sayette (now Saïda), the author writes as follows: “While the King was at Sayette, they brought him a stone in the form of husks, a most wonderful thing, for when a husk was lifted we found between the two stones the shape of a fish of the sea. The fish was of stone, but there was nothing lacking in its shape, neither eyes, nor bones, nor color, nor anything that might make it other than if it were alive. The King called for a stone and found a tench within it, brown in color and just as a tench should be.”



*Saint Louis receiving the envoys of the Old Man of the Mountain.*  
Painting by G. Rouget, engraved by E. Rubierre;  
Nineteenth century.

Il soit bon signeur l'oy par la grace de dieu roy de France & de navarre  
 Jehan sur de comte de flemme hay & chancelier de France & de navarre  
 chancelier sur il est bon vous aussy comte de flemme le marquis que au d'icelle  
 que & autres apparus de flemme & par ce sur que vous en d'icelle que  
 vous fait vous n'avez fait pour d'apartoy pour d'icelle a d'icelle  
 & de ce sur que & d'icelle mandy que vous serez a d'icelle p' vous d'icelle  
 de tout que le flemme & foute il moy semble sur que vous foute d'icelle  
 & de & de ce sur que & d'icelle mandy que ce & d'icelle  
 fustoy d'icelle a la monneye du moy & d'icelle sur foute d'icelle p'z que  
 ce ne p'ce que bonhomme. Je vos lettres me d'icelle le foute  
 d'icelle & d'icelle & d'icelle d'icelle d'icelle d'icelle d'icelle  
 & plus sur que ce p'ce & d'icelle d'icelle d'icelle d'icelle d'icelle  
 d'icelle au il d'icelle p'ce sur ce & d'icelle d'icelle d'icelle d'icelle  
 ne d'icelle au d'icelle que le foute d'icelle d'icelle d'icelle d'icelle  
 sur d'icelle d'icelle d'icelle d'icelle d'icelle d'icelle d'icelle d'icelle  
 d'icelle d'icelle d'icelle d'icelle d'icelle d'icelle d'icelle d'icelle  
 que d'icelle d'icelle d'icelle d'icelle d'icelle d'icelle d'icelle d'icelle

Extract from Joinville's manuscript to Louis IX.  
*Histoire du Roi Saint-Louis*, Paris, 1248 (1547).

We must now wait for a century and the memoirs of Laurent d'Arvieux, which appeared after his death in 1735, to read a paragraph about these fishes with the following gnostic conclusions: "On several occasions I have witnessed disputes among scholars on the causes of this phenomenon. Some said that these fishes were buried under the soil by the upheaval which happened during the Flood. Others maintained that it was merely a trick of nature. I report the phenomenon: it is quite true and may serve to disturb the minds of those who wished to deepen the mystery."

The astronomer Giacomo Filippo Maraldi ushered in the eighteenth century with an article published in 1703, entitled *Diverses observations de physique générale*, in which he reports having seen "such dried Fishes in Stones that had been taken in Phoenicia in the Neighborhood of the Town of Biblis, now called Gibeal, on Mountains that are almost inaccessible & 15 Miles distant from the sea."

The explanations he gives for the presence of these fishes on the mountain tops now appear somewhat amusing. For example, he repeats the ideas of Theophrastus about seeds travelling with the

water up into the mountains, and observes with surprise: "Who could have carried these Fishes [...] into the Earth & up onto the Mountain heights? It is likely that there are underground Fishes just as there are underground waters and these waters [...] rise as vapor, perhaps carrying with them very light eggs and seeds, after which, when they condense and become water again, these eggs may hatch and become Fishes... And if these water currents - already far above the level of the sea & perhaps as high as the mountains - should accidentally either dry up or take another course among the sands, and finally in whatever manner abandon the Animals that lived there, they will remain dried up and covered by the soil, which becoming petrified will petrify them also."

It is surprising that such surmises, to explain the presence of fossil fish on the "mountain heights", should have been made in the century of the Enlightenment, whereas in Antiquity Herodotus had already explained the presence of fossil shells within the earth by the retreat of the sea.

## First illustrations

It was only in 1708, in his work entitled *Piscium querelæ et vindiciæ*, that Johann Jacob Scheuchzer, mentioning the existence of fishes from Lebanon, presented illustrations of them for the first time, among other fossils of various provenances.

In 1714 Corneille Lebrun mentions the presence of fossil fishes in the vicinity of Tripoli. In the chapter entitled *Pierres dans lesquelles il paroît des ressemblances de poissons*, the author shows a specimen's part and counterpart and states: "These stones are found on a mountain-top a few hours' distance from Tripoli. When they are whole, one sees nothing on the outside, but when they are broken by throwing them on the ground or striking them against something they split apart rather like slates, & when they are split open in this way one usually sees on each of the two pieces the likeness of a fish, or rather its bones. In order to have these stones I purposely sent a person to the mountains with a donkey, and he brought me quite a large quantity, among which I found one, by chance, which was split in such a way that on each side of the stone one saw half of the fish's bones, & the pieces closed so exactly, that when they were brought together it was as if the stone was unbroken..."

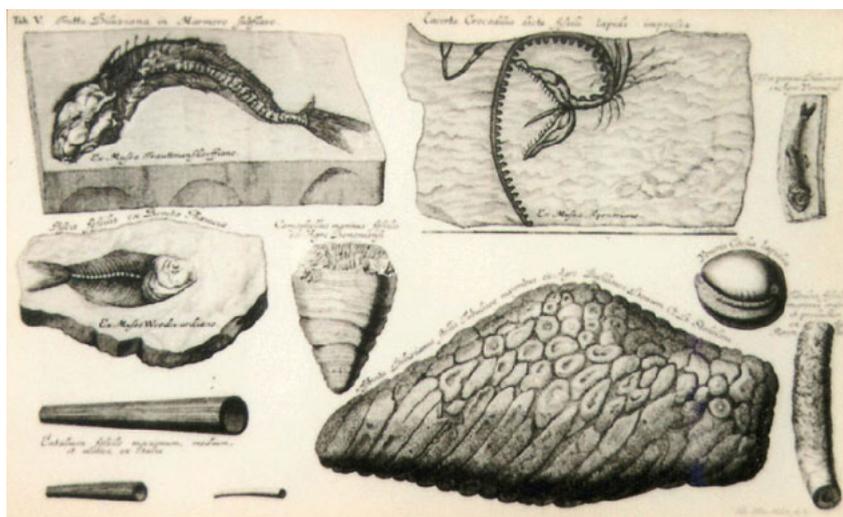
## Stones, impressions, or fishes?

Treatises and catalogues increasingly often report Lebanese ichthyolites and stony fishes. Thus in 1729 John Woodward notes the presence in his collection of "three skeletons of very fine fishes, with heads, gills, traces of skin, and tails."

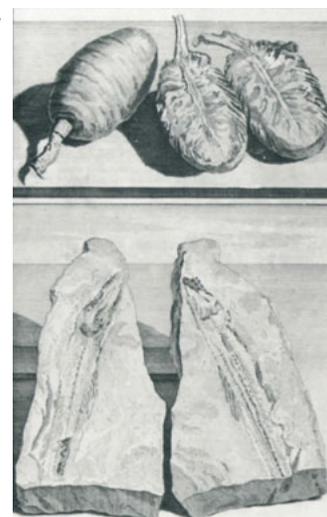
Louis Bourguet, in his *Traité des Pétrifications*, published in 1742, notes that "all those who like Travel Books are aware that Fishes are found in grayish stones on a Mountain in Syria a few leagues from Tripoli" but he considers that only fishes found in slates are really "petrified", and that the others (including those from Lebanon) "have simply been dried, embalmed, and hardened".

Nevertheless, this author advanced the science by finding that these fishes had undergone "a number of accidental displacements" and by observing that "these irregularities can only reasonably be attributed to movements of the water & material that surrounds the Fishes, against the various bodies that were swimming together, and to the various reciprocal forces of the beds, as they were compressed."

Unfortunately, the author concludes, in full agreement with the ideas of his time (Flood), by stating that these few details



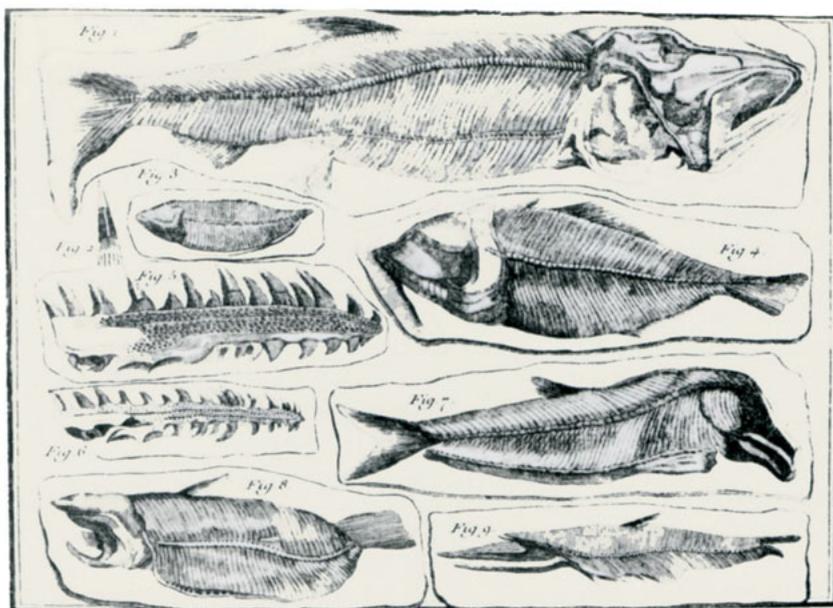
C. Lebrun, *Voyage au Liban* 1714, p. 308.



J.J. Scheuchzer, in *Piscium querelæ et vindiciæ* (1708, pl. V), under the caption *Piscis fossilis ex Beryto Phœnice*, shows a fish from Lebanon (probably an *Armigatus brevissimus*).

were sufficient to make known “to those who are unaware of them, the precious monuments of the universal flood which once so drastically changed the *Earth*. I say *universal flood*, because it is impossible, in accordance with my enlightenment inclinations, to otherwise explain the origin of the whitish stones, the *marbre bâtard*, and the split boulders of limestone and black metallic slates; because some of them are found on the tops of certain mountains, like those in *Syria & China*, and others form very substantial & high massifs” “[...] all the places concerned are so closely related to the main mountain chain that one cannot establish the origin of one without including the origin of the others, such that one must necessarily seek a universal cause, & not a particular one.”

In 1786 Jean-Étienne Guettard, in his *Mémoires sur différentes parties des Sciences et des Arts*, mentions and illustrates “the stones of Mount Lebanon on which there are impressions of various fishes”, and finds, on the contrary, that “these so-called impressions should rather be called fish skeletons inlaid in the stone. In fact, when we examine these supposed impressions closely, & even with a magnifying glass, it is easy to see that the skeletons of these fishes still exist in a more or less perfect condition.”

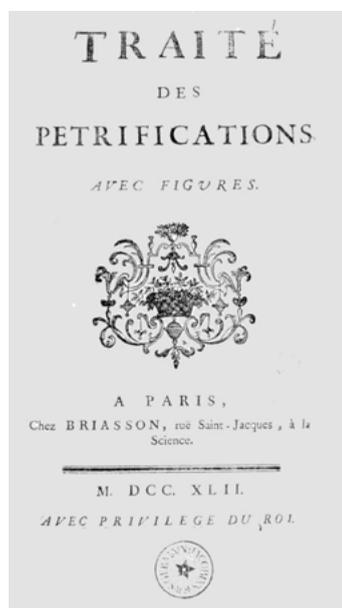


The first identification of the nature of the enclosing material would come from this author, who describes it as “an entirely calcareous stone. It is a fine marly white, or a little brownish.” After testing the rock by attacking it with (dilute nitric) acid, he concludes: “One could therefore mistake this stone for a limestone mixed with a little clay, & this small amount of earth must prevent it from being included with the calcareous shales.”

Based on the geographic location given by the author, this would be the Sahel Alma deposit.

Constantin-François Volney, in the account of his *Voyage en Syrie et en Égypte pendant les années 1783, 1784 et 1785*, published in 1787, and Barthélemy Faujas de Saint-Fond in his *Essais de Géologie ou Mémoires pour servir l'histoire naturelle du Globe*, published in 1803, are among the travelers and naturalists who reported, were enraptured by, or interpreted these impressions, but all such writings remain more anecdotal than scientific.

Cover of the book *Traité des Pétifications* by L. Bourguet, 1742.



J.-É. Guettard, *Nouvelles collections de Mémoires sur différentes parties intéressantes des Sciences et des Arts*, 1786.