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The Guadeloupe Skeleton

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The following comments concern the human skeleton found in limestone on the island of Guadeloupe (references 1 through 30). Bill Cooper[28-30] makes three important claims about the skeleton:

(1) the skeleton is Miocene in age and/or stratigraphic position;
(2) the skeleton was buried rapidly and violently; and
(3) the limestone cannot be formed by present processes.

I wish to comment on each of these in turn, after reviewing the history of the specimen.

GUADELOUPAN SKELETON HISTORY

Apparently the British Museum specimen is one of many skeletons found near Moule on the island of Grande-Terre, Guadeloupe. After visiting the area, Ernouf,[1] Dauxion-Lavaysse[2] and Duchassaing[9 12] each refer to more than one skeleton. Lyell[6] mentions 'several' skeletons, and Reynal de Saint-Michel[22] refers to many skeletons.

General Ernouf, an early nineteenth-century French military commander of Guadeloupe, is the first known person to mention the skeletons. In an 1804 letter to Faujas-Saint-Fond at the French Museum of Natural History in Paris, Ernouf refers to skeletons on the 'famous' coast near Moule.[1] This may mean that even at this early date the skeletons were known beyond the boundaries of Guadeloupe. Dauxion-Lavaysse writes that Ernouf sent for a naturalist, M. Gerard, from Brussels near the end of 1804 to excavate the skeletons.[2] In his 1804 letter, Ernouf had promised the best specimen to the museum in France.[1] I think it can be assumed that at least one of Ernouf's specimens was sent to France. Lyell (1832),[6] Usher (1854),[10] and Southall (1875)[15] each mention that one skeleton, apparently with a skull, was in the Royal Cabinet in Paris. Duchassaing (1855) mentions a nearly complete skeleton in the Museum of Natural History in Paris.[11] Dauxion-Lavaysse (1813) saw one of Ernouf's nearly complete specimens, but with some of its features barely distinguishable.[2] His vague description does not fit the British Museum specimen, and he may or may not be describing the specimen in France.

In 1810 the English under Sir Alexander Cochraine landed on Sainte-Marie, Guadeloupe and forced General Ernouf to surrender control of the island.[31 19] Among other things Cochraine captured a headless skeleton which Ernouf had apparently excavated from near Moule.[19] Cochraine brought the specimen to England and presented it to the British Museum in the name of the Lords of the Admiralty. The skeleton was accessioned by the museum in 1813[19] and described in 1814 by Charles Konig, a keeper of Zoology and Botany at the British Museum.[4] The skeleton is mentioned as being in the British Museum in 1814,[3] 1820,[5] 1832,[6] 1837,[7] 1854,[10] 1866,[14] 1875,[15] 1880,[16] 1915,[20] 1931,[25] and 1983.[28 29 30] In 1814,[3] 1866,[14] 1915,[20] and 1931[25] the skeleton was listed as being on display in the Mammal room on the second floor of the museum. In 1983 the specimen is mentioned as being in the collections of the British Museum, but not on display.[28 29 30] This skeleton "attracted a great deal of attention at the time of its discovery",[25] had "excited the public" by 1814,[4] began to "assume degree of importance" by 1820,[5] was "much valued" in 1837,[7] "celebrated" in 1846,[8] and "famous" in 1899.[17] The skeleton also caused a "scientific sensation"[15] and "some controversy",[16] specifically in regard to its age. According to Shepard and Moultrie, the skull of the British Museum specimen was taken from Guadeloupe by Mons. L'Herminiere. In August, 1816, L'Herminiere left the skull in the Museum of the Literary and Philosophical Society of South Carolina. The museum bought the specimen in November, 1816, and Moultrie described it in 1837.[7]

GUADELOUPAN SKELETON AGE

Table 1 lists all the sources of which I am aware that mention this skeleton's age or the age of others in the same limestone deposit. For each source the table summarizes how old the author thought the

Table 1

Date/Author	Age of Skeletons	Justification of Age
1804[1]: Ernouf	No specific age comments. Lists a few possible origins, all refer to earlier island history. Implies a recent origin for the skeleton.	Local traditions (inter-island war, damaging storm, or cemetery).
1813[2]: Dauxion-Lavaysse	No specific age comments. Thinks a cemetery. Implies a recent origin.	Skeletons lying East-West; Stone tools similar to ones made and used today.
1814?[4]: Banks	Recent.	None.
1814[4]: Konig	Doubts recent origin, but age not settled; "a late period may, perhaps, be assigned . . .".	Limestone very hard, and unlike any rock known to be forming.
1832 + [6]: Lyell	No specific age comment; Implies recent origin.	Similar to forming rocks; Fossils of living animals.
1837[7]: Shepard	Recent.	Rock has a "manifestly recent mineral character".
1847[9]: Duchassaing	"l'origine moderne de ces depots n'est plus contestee" (the recent origin of these deposits is no longer contested).	Modern clay vessels, Fossils of living animals, Dog calcaneum, Flint; Active formation of rock.
1854[10]: Usher	No specific age comments; Implies skeletons are old.	None.
1855[12]: Duchassaing	Since European discovery of America.	Modern clay pottery; rock now forming; piece of blue glass found with skeleton.
1855[11]: Owen	"comparatively recent origin".	None.
1875[15]: Southall	". . . Indians killed in battle two centuries ago".	None.
1915[20]: Museum Guide	". . . probably does not date back further than the historic period in that region"	None.
1961[22]: Reynal de Saint-Michel	Recent (Post-500 A.D.).	^{14}C date of 500 A.D. for base of formation; Modern Pottery, Jewellery, Figurines, Stone Tools, Cooking Utensils.
1968[23]: Oakley	Probably not more than two centuries old.	None.
1976[25]: Edwards	". . . probably not very ancient".	None.
1981[26]:	". . . proved to be less than two hundred years old and not a fossil at all".	None.

skeletons were. Also listed are the evidences each author used to justify his age. Some early investigators (e.g. Konig[4] and Usher[10]) thought the skeleton might be old. By 1855, however, the decidedly recent origin of the specimen had been widely accepted. Cooper is alone among recent investigators to insist on an ancient age or stratigraphic position of the specimen.

Cooper claims that 'conventional geologic dating' gives an age of 25 million years.[28] Allow me to explain how 'conventional geologic dating' works. There are three primary dating methods used by geologists: one superpositional, one by means of fossils, and another by radiometric dating. Superpositional dating places a rock in its proper vertical sequence with respect to other rocks. Conventionally, the rocks lying above the one of concern are considered younger and those lying below are older. Superpositional dating of the Galibis Formation (the rock in which the skeletons were found) puts it as probably the most recent of all the rocks in the area. Besides loose gravel or sand, nothing has ever been reported to overlie the formation. Cooper intimates that Duchassaing described a reef overlying the formation.[28 30] Duchassaing[9] described both a reef raised two to three metres above sea level and the Galibis Formation in the intertidal zone. He did not, however, claim that they were ever in direct contact.

Unfortunately no author has explicitly described the rock upon which the Galibis is resting. It is my impression that the various authors are not describing a rock unit sitting upon rock, but rather a rock unit lying atop loose beach sand. All who have seen the formation describe it as lying in the intertidal zone of a beach. No one has reported the formation elsewhere. Lyell[6] and Reynal de Saint-Michel[22] each describe the formation as paralleling the slope of the beach into the sea. It may be concluded from this that the formation is lying atop beach sand. This conclusion is also consistent with the Gabilis' proposed modes of origin. Ernouf[1] and Dauxion-Lavaysse[2] felt the formation might have been deposited on the shore in a storm. Reynal de Saint-Michel,[22] Southall,[25] and Oakley[23] each felt that loose beach sand was continually being cemented together to form the Galibis and similar formations. In summary, superpositional dating places no rock as younger than the Galibis. The Galibis is possibly of more recent origin than even some of Guadeloupe's unconsolidated beach sands.

To date by means of fossils one first finds and lists all the fossils in the rock. Then one determines the time range for each fossil. The time range is the interval of time during which the fossil has been observed to occur from other localities. The age of the rock should lie in the interval of time during which **all** the contained fossils would have been expected to live. Table 2 lists all the fossils and artifacts reported from the Galibis. The conventionally established time range for most of the items is also given. Although I did not find range information on all the items it is very clear that a Miocene age is inconsistent with the evidence. The rock should date from between the European discovery of America and the recent by fossil dating.

The high cost of dating and inavailability of datable materials causes radiometric dating to be done only rarely in geology. Reynal de Saint-Michel, however, reports that a carbon-14 date has already been obtained for the Galibis. The base of the formation (the oldest part) was dated at about 500 AD. Radiometric dating concludes that most of the Galibis, including **all** the skeletons, is younger than 500 AD.

A consistent answer is given by all three methods of 'conventional geologic dating', and all qualified investigators. The Galibis can in no way be considered Miocene in age or stratigraphic position. The Guadeloupan skeleton is recent in origin. The woman whose skeleton Cooper studied lived within the last four centuries.

GUADELOUPAN SKELETON BURIAL

Cooper also alleges that the Guadeloupan skeleton was buried by rapid and violent natural processes.[28] The remarkable preservation of some portions of the skeleton is claimed as evidence for rapid burial. Significant amounts of damage to the skeleton is used as evidence of violent burial. It is important to clarify at this point the various stages in the formation of a fossiliferous rock. The first stage is the deposition of the sediment. Secondly is the burial of the animal or plant into the sediment. Finally, the sediment is transformed into rock (lithified) and the included organism transformed into a fossil. These three events may occur simultaneously or independently at very different rates. One or two events may occur rapidly and the others slowly. In the case of the Galibis each event appears to have occurred at different times and at very different rates. The bodies appear to have been contained in graves dug out of the already (long?) existent loose sand. Ernouf considered it possible that the skeletons were from a graveyard.[1] Dauxion-Lavaysse felt that the East-West orientation of the bodies indicated that they were from a graveyard.[2] Konig doubted this theory because Dauxion-Lavaysse had not been clear in his description.[4] Reynal de Saint-Michel was also convinced that the skeletons were from a graveyard. In fact he noted that the skeletons were usually lying in either a foetal or outstretched position as might

Table 2

Object found with skeletons	First Known Appearance	Before 1492	Recent
arrowheads[14]	Pliocene	X	X
charcoal (not specific enough for age)	—	—	—
clay pottery[12,14,22]	Holocene	X	X
cooking utensiles[22]	Holocene	X	X
figurines[22]	Pliocene	X	X
flint[9]	Holocene	NO	X
glass (blue-coloured), with skeleton	Holocene	NO	X
jewellery[22]	Pleist.	X	X
stone clubs[2]	Pliocene	X	X
stone mortars and pestles[2]	X	X	X
tusk fragment[4] (not enough information to identify)	—	—	—
Bulimulus guadaloupensis (Brugiere) 1783[6,9,12] (old name: *Bulimus guadeloupensis* Brugiere, 1783)	?	X	X
Bulimus octonus Brugiere, 1789[9,12]	?	X	X
Canis sp. Linnaeus 1758[9]	Turolian*[32]	X	X
Cardisoma cernifex (Herbst) 1796[12]	Holocene*[38]	X	X
Coccoloba usifera Linnaeus[9]	?	X	X
Fissurella barbadensis (Gmelin) 1790[12]	Oligocene*[37]	X	X
Gecarcinus lateralis (Freminville) 1835[12]	Holocene*[39]	X	X
Gorgonia flabellum Linnaeus, 1758[9,12]	Holocene*[34]	X	X
Helix (similar to *H. acuta* Muller, 1774)[4]	?	?	?
Helix josephinae Ferussac, 1821[12]	?	X	X
Littorina muricata (Linnaeus) 1758[4] (old name: *Turbo muricatus* Linnaeus, 1758)	?	X	X
Millepora miniacea Pallas, 1766[4] (= *Polythrema miniacea* Linnaeus)	Danian[35]	X	X
Porites clavaria Lamarck, 1816[12]	Eocene*[33]	X	X
Turbo pica Linnaeus, 1758[4]	U. Cret.*[36]	X	X

Earliest appearance of the genus.

NOTE: The following list contains the ages mentioned above and the ages conventionally applied to them[40]:

Holocene: 10,000 years ago to present.
Pleist. (= Pleistocene): 2 million to 10 thousand years ago.
Pliocene: 5 to 2 million years ago.
Miocene: 25 to 5 million years ago.
Turolian (part of the Miocene): 10 to 6.5 million years ago.
Oligocene: 38 to 25 million years ago.
Eocene: 55 to 38 million years ago.
Paleocene: 65 to 55 million years ago.
Danian (part of the Paleocene): 65 to 60 million years ago.
U. Cret. (= Upper Cretaceous): 97.5 to 65 million years ago.

have been expected had they been buried. A relatively soft sediment is necessary in order to bury bodies. This means the sediment had already been deposited but had not yet been transformed into rock.

A well preserved skeleton does not necessarily mean that the skeletons had been buried rapidly. In the case of human burial the bodies were buried rapidly but may well have decomposed soon thereafter had the sediments not been solidified into rock. Sand is very permeable to the flow of oxygen and water, thus allowing for relatively rapid oxidation and decomposition. The lithification of the sediment must have occurred after burial, but by the above arguments, not long after. Other evidences of rapid lithification include shells and coral with original colour,[4:115] a dog heelbone with organic matter,[9] and underground grape stems preserved in place.[9]

Damage to the skeleton does not necessarily mean that the body was buried violently. Since evidence indicates this is a cemetery, the damage may well have occurred **before** burial. Among island traditions are stories of these people having died in combat or in canoes overtaken in a storm.[1] Either of these accounts could explain the damage to the skeletons, **without** the damage occurring during burial. In this case the damage to the bodies should be reinterpreted as that which caused the death of the people and not necessarily related to their mode of burial. It is certainly not necessary to invoke a rapid and violent burial to account for the evidence.

GUADELOUPAN SKELETON LITHIFICATION

Cooper also claims that the limestone could not have been formed by present processes. In 1814 Konig did not know how the limestone came to be.[4] By 1832, Charles Lyell was claiming that the rock was the kind ". . .known to be forming daily. . .".[6] He writes that "similar formations are in progress in the whole of the West-Indian archipelago, and they have greatly extended the plain of Cayes in St. Domingo, where fragments of vases and other human works have been found at a depth of twenty feet". Duchassaing described the sand's lithification process as he understood it.[9] He felt that water laden with dissolved calcite continually runs down from inland limestones. As the water permeates the beach sands, the calcite precipitates, cementing the sand particles together. Reynal de Saint-Michel claimed that in his day the beach sands were being subjected to a very active phenomenon of consolidation. It is the opinion of all those who carefully studied the area that the Galibis is a limestone which not only **can** be formed by present processes, but **was** formed by observable processes.

The process Duchassaing[9] described is similar to the explanation for the formation of beach rock. Stringer has already proposed that the Galibis is an example of beach rock.[29] Cooper counters the beachrock origin with several points.[30] His first point is that beachrock formation ". . .is an almost imperceptibly slow process".[30 34] Cooper's footnote at this point states that "it is certainly not a sudden or violent process, and could not account for the damage to the remains". As I have argued above, the lithification of beach sands does not have to account for the damage to the skeletons. Nor does beachrock formation have to be sudden. Beach rocks are, however, often very rapidly formed. Full lithification has been known to occur in less than a single year. Cooper's second point is that tides would erode away newly precipitated calcite and transport the bodies too much to allow for the lithification of the sand. Beach rocks are found only in intertidal zones and wave splash areas. It is currently thought that it's the meeting of calcite-ridden fresh water with salt water which promotes precipitation of the calcite. Tides promote the precipitation and not the dissolution of calcite. Only in areas of special beach geometries and tidal regimes do tides have enough kinetic energy to transport things about. It is very unlikely that tides would disrupt buried bodies as Cooper suggests. Lyell claims that cementation of sands occurs as deep as twenty feet below the surface. Even storms would be unlikely to move bodies if they had been buried so deeply. Cooper's third argument is that a member of the British Museum's Department of Mineralogy said they knew of no beach rocks being formed in the area. It may be that in the exact location of the fossils no beach rock is being formed at present.

Beachrock formation, however, is patchy, both in geography and time. The right amount of water which contains the correct amount of dissolved carbonate, as well as the right type and location of sand are all necessary to make beach rock. These requirements are fulfilled in new places at any given time and during few times at a given locality. The fact that beachrock formation is not now occurring at the Galibis locality does not mean it could not have been actively forming four hundred, two hundred, or even two years ago. We have the eye-witness testimony of Duchassaing (1847)[9] and Reynal de Saint-Michel (1961)[22] as evidence that it **was** occurring at those times. Furthermore, beach rocks are currently forming at a number of localities in the Carribean, including the island of Grande-Terre itself. It is thus not at all unreasonable to assume the Galibis may be a beach rock.

SUMMARY

The Galibis formation and all contained fossils are **not** Miocene in age. The Guadeloupan woman represented by the skeleton in the British Museum was not buried in the Noachian Deluge. Following a violent death between 1500 and 1800 AD she was buried in the sands of Guadeloupe. Soon thereafter the sands were lithified, preserving the body and contained fossils. The Guadeloupan skeleton is, however, an excellent example of rapid lithification, and thus should be of interest to the creationist for this reason.

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