A SPECIAL TROPICAL ISLAND BEACH

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In England, is it raining? Is it pouring? Are you wet? Are you cold? Miserable?

Well, how about a change?

Then, how about a visit to a warm tropical beach with palm trees swaying in a gentle soft breeze, pure-white sands, and a gorgeous blue-green sea with gentle waves lapping on the deserted shore.

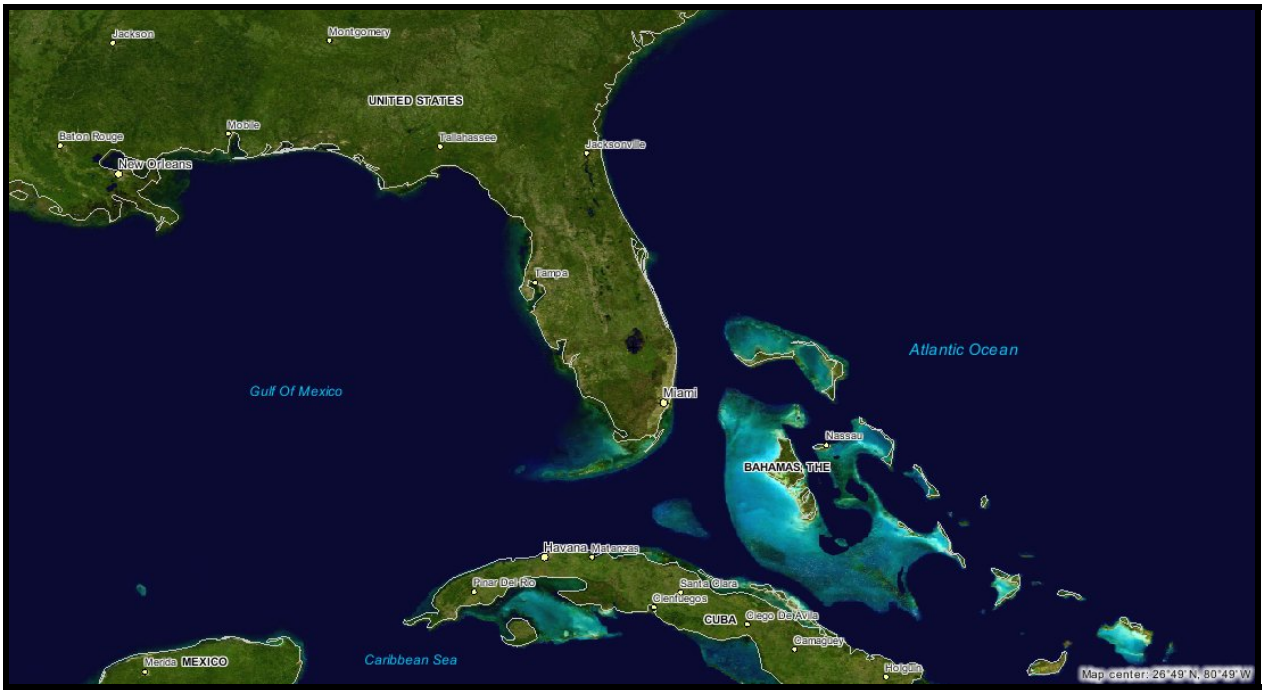
It is not a dream but a real place!

Joulters Cay, Bahamas (photo: Kendall, 2005)

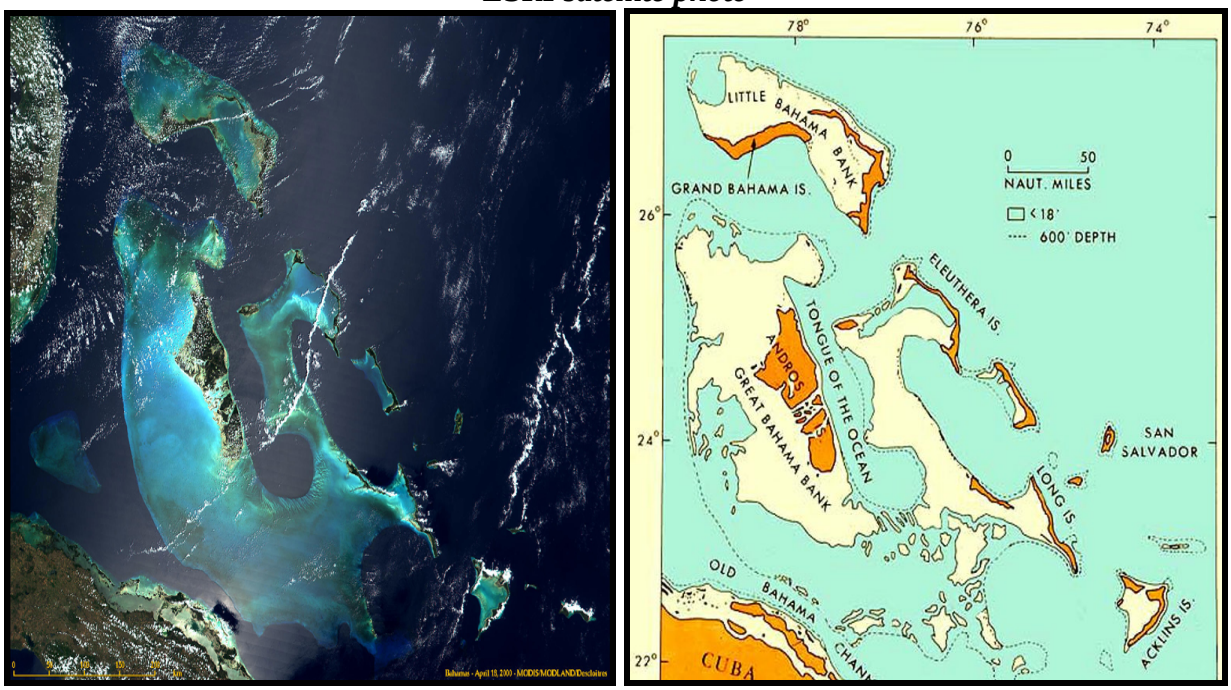
And what about those pure-white sands?

Well, on tropical islands, the sands are usually carbonate (limestone) sands composed of many different skeletal remains.

But on this particular island, things are different.

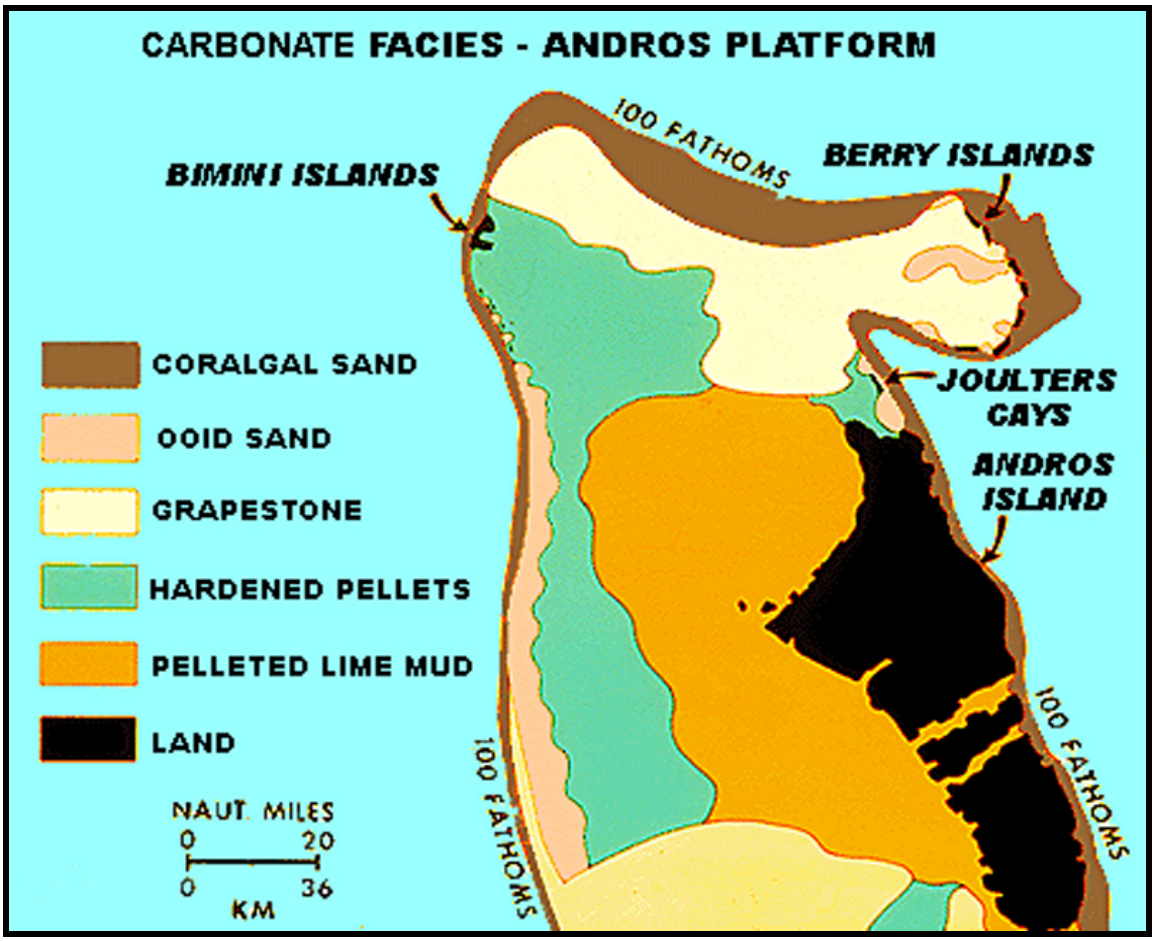


ESRI satellite photo



Bahamas (maps from: Kendall, 2005)

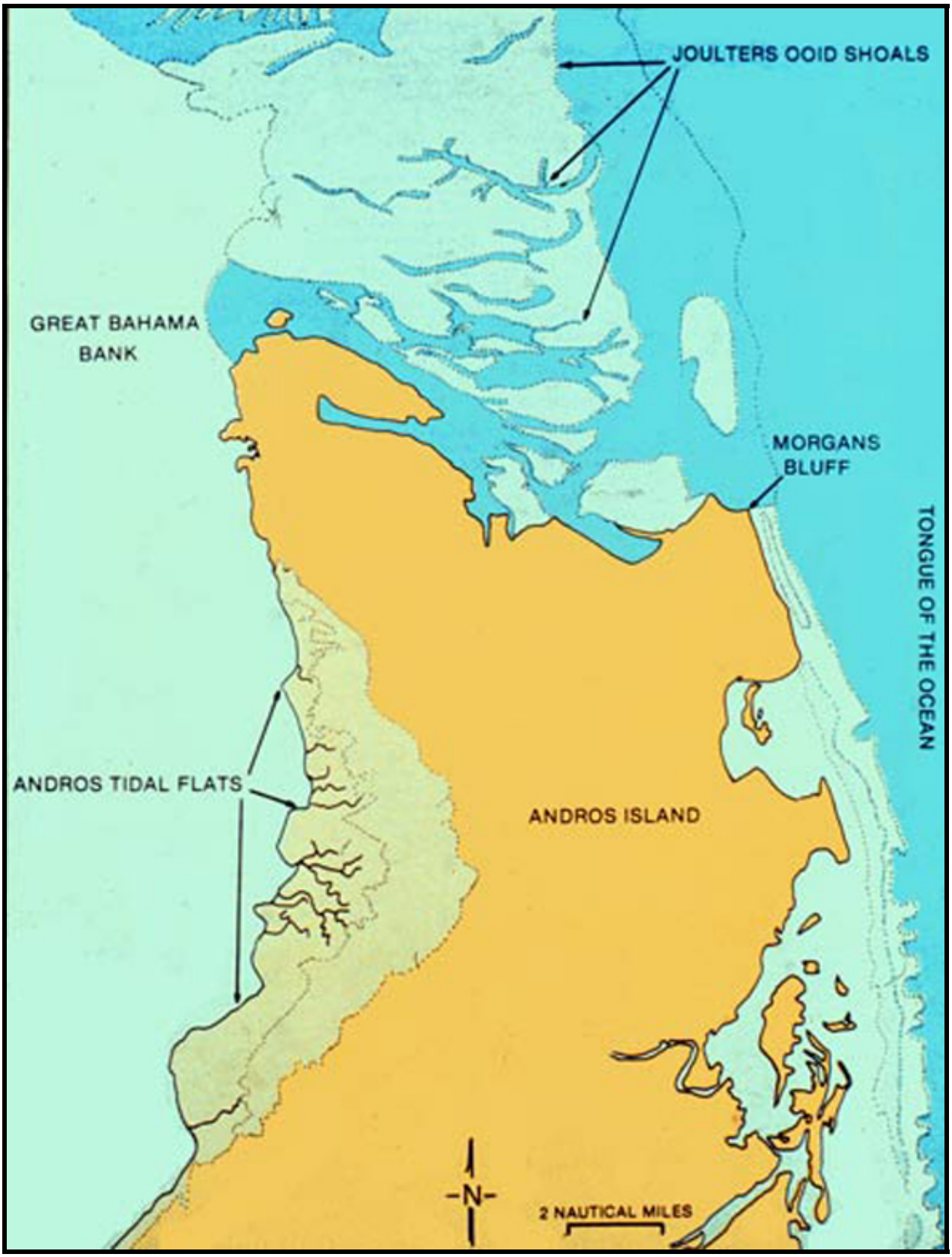
Here the white sands are ***"ooids"***, and the island is one of the three Bahamian Joulters Cays, off the northernmost tip of Andros Island.



Bahamas (map from: Kendall, 2005)

The ***ooid*** deposits are in large mobile shoals located between the Cays, or islands.

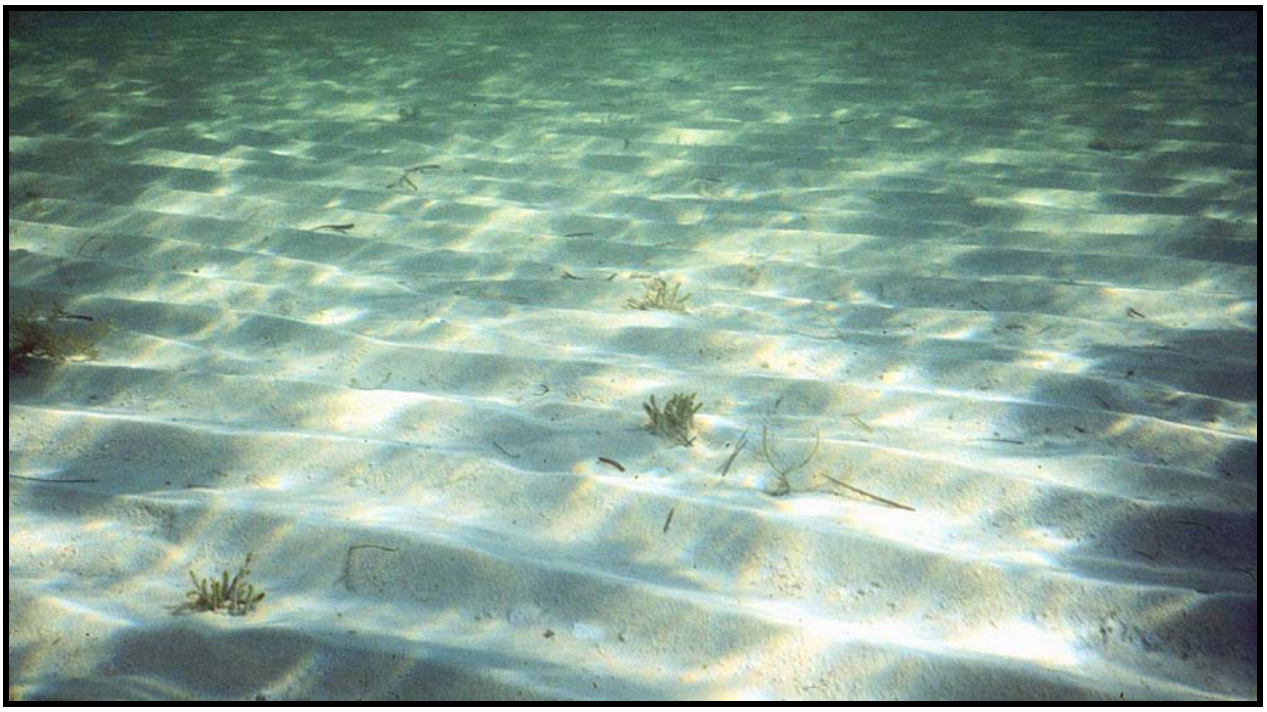
Joulters Cay, Bahamas (photo: Kendall, 2005)



Bahamas (map from: Kendall, 2005)

The shoals here are a series of bars on a large shallow sand flat of about 400 km2 in size.

Ooid beach deposits Joulters Cay, Bahamas (photo: Kendall, 2005)



Joulters Cay, Bahamas (photo: Kendall, 2005)

The islands are also composed of ***cemented ooids*** (called ***"oolite***"), [sometimes called ***egg-stones*** in the USA] forming sand ridges, about 3m high and 50m apart.

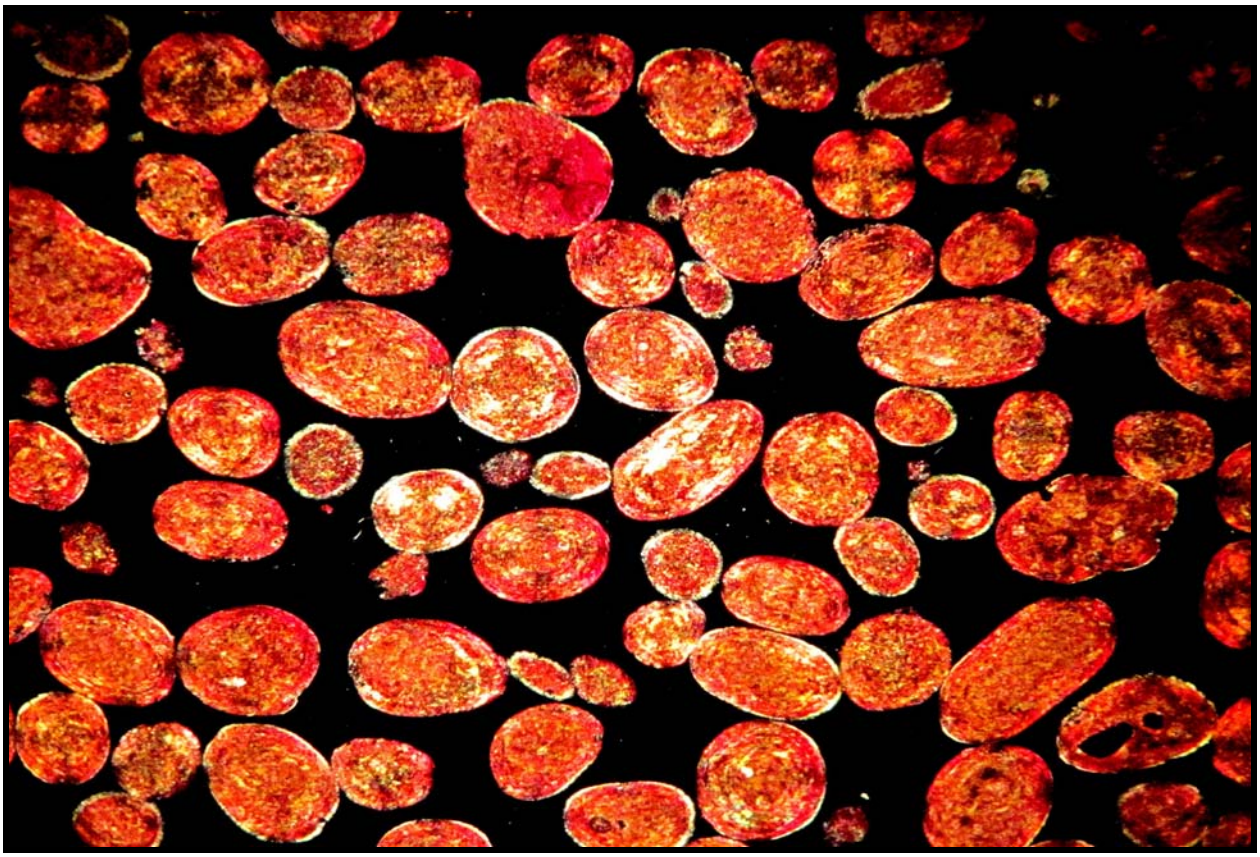
Ooid sand deposits on the beach (photo: Kendall, 2005)

Great, you say, but what is an "**ooid"**?

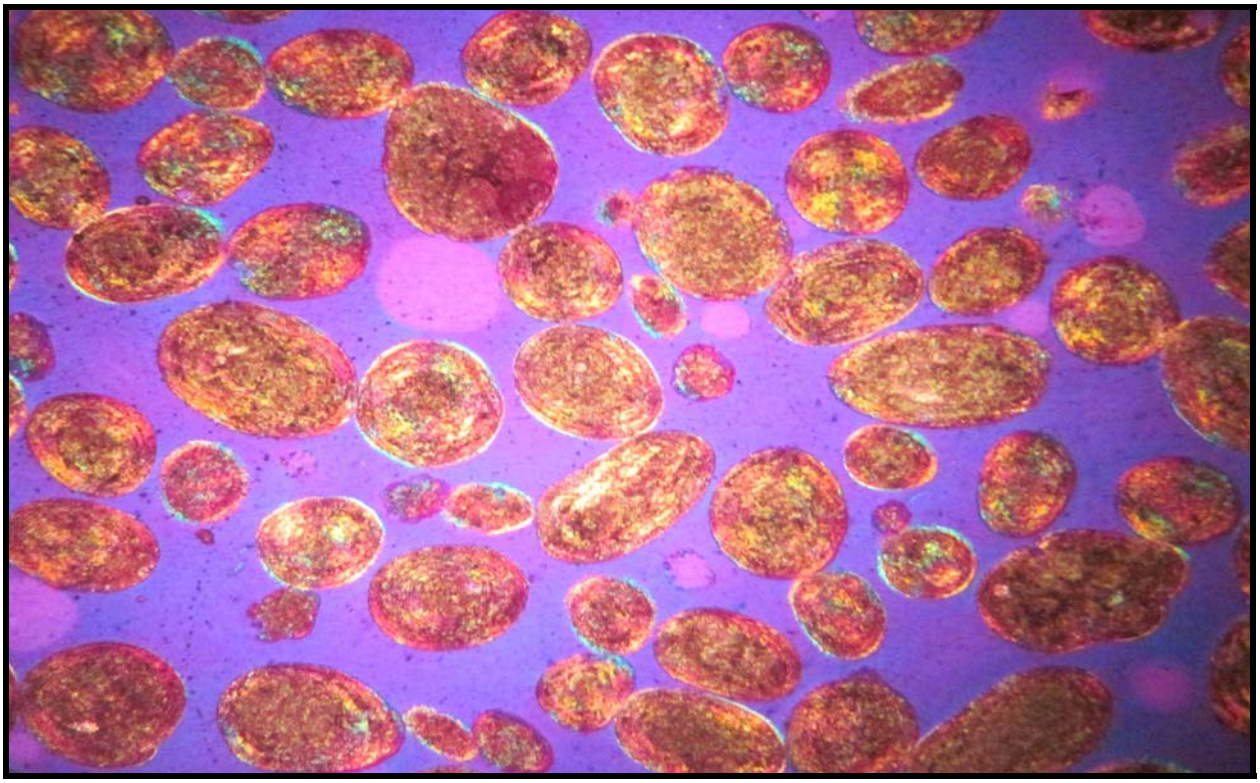
An ***ooid*** is a small (ranging from 0.25 to 1 mm in diameter), round, or oval, concretion, resembling fish-roe, with many successive concentric layers about a central nucleus. The nucleus is usually a foraminifer, algal particle, or a shell fragment.

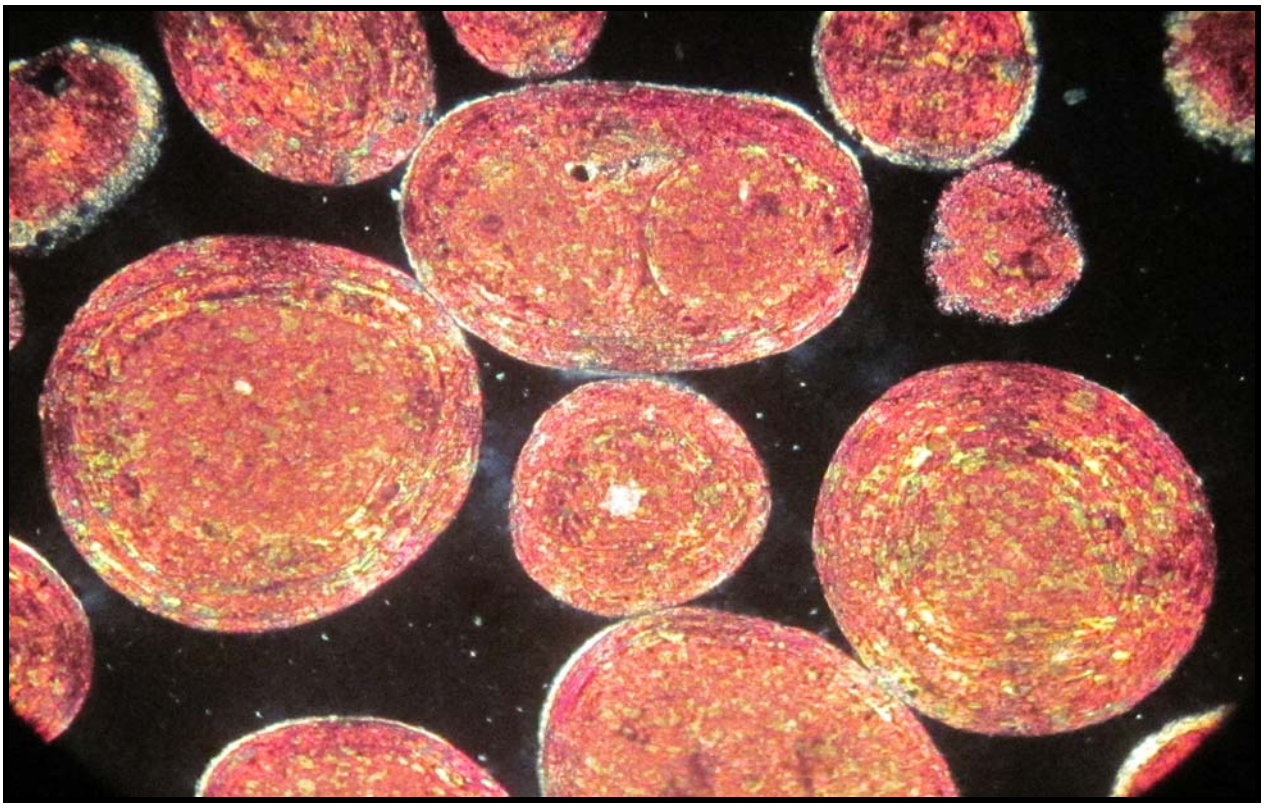
The ***ooid*** is formed chemically in warm agitated shallow water by bacteria and algae precipitating aragonite (a form of calcium carbonate).

Here, this author investigated these ***ooids*** under the microscope, in the following micrographs of thin-sections.

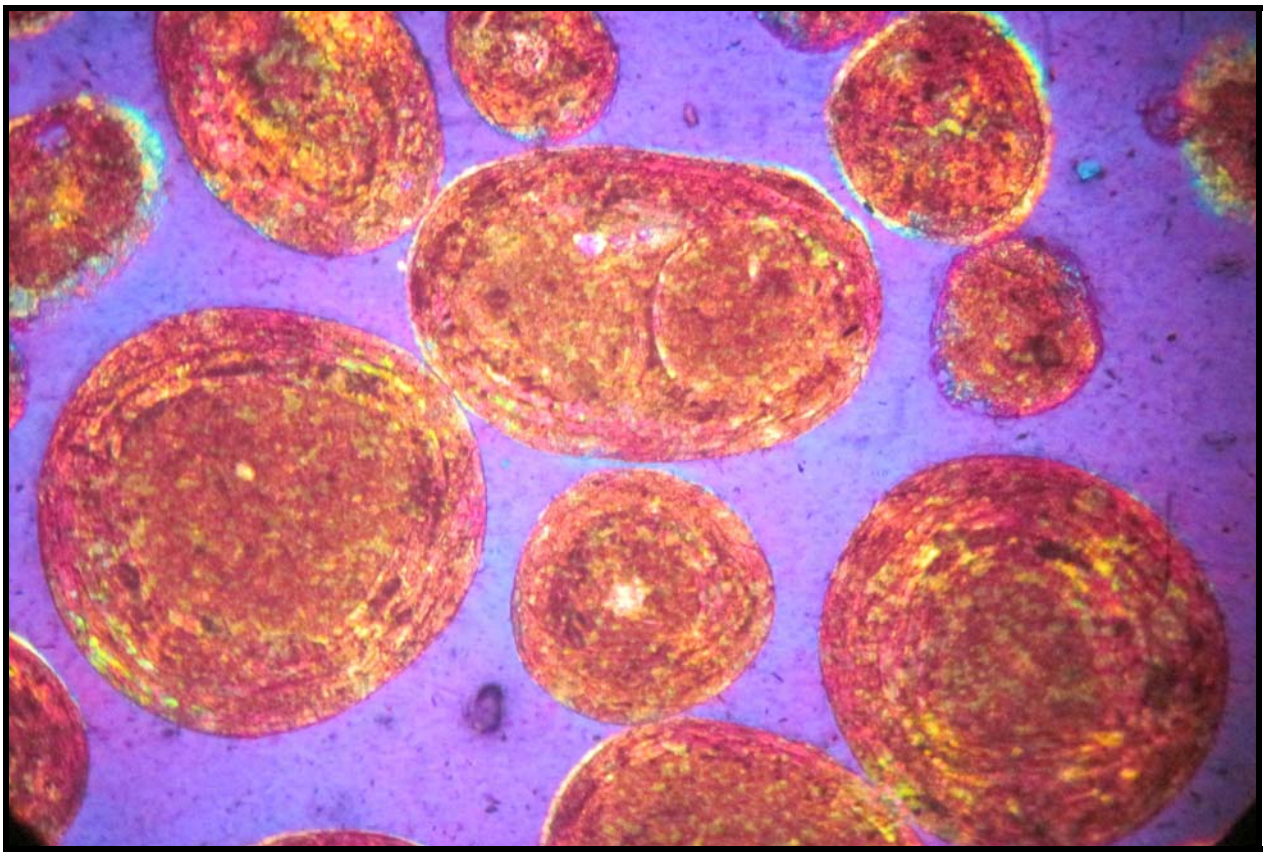


Ooids and a grapestone (composed of ooids) under crossed-polars X120 magnification

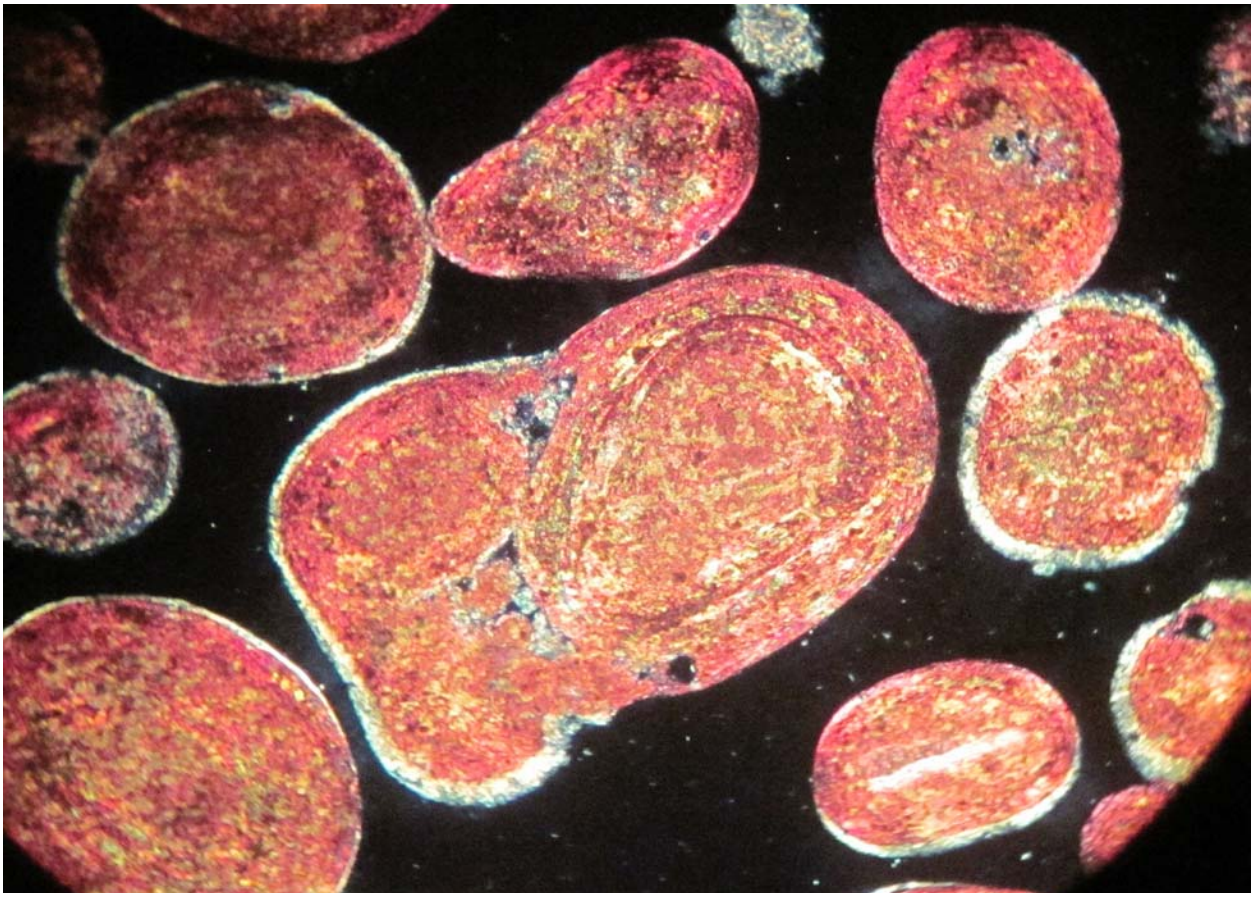




Ooids and a grapestone (composed of ooids) under crossed-polars X340 magnification

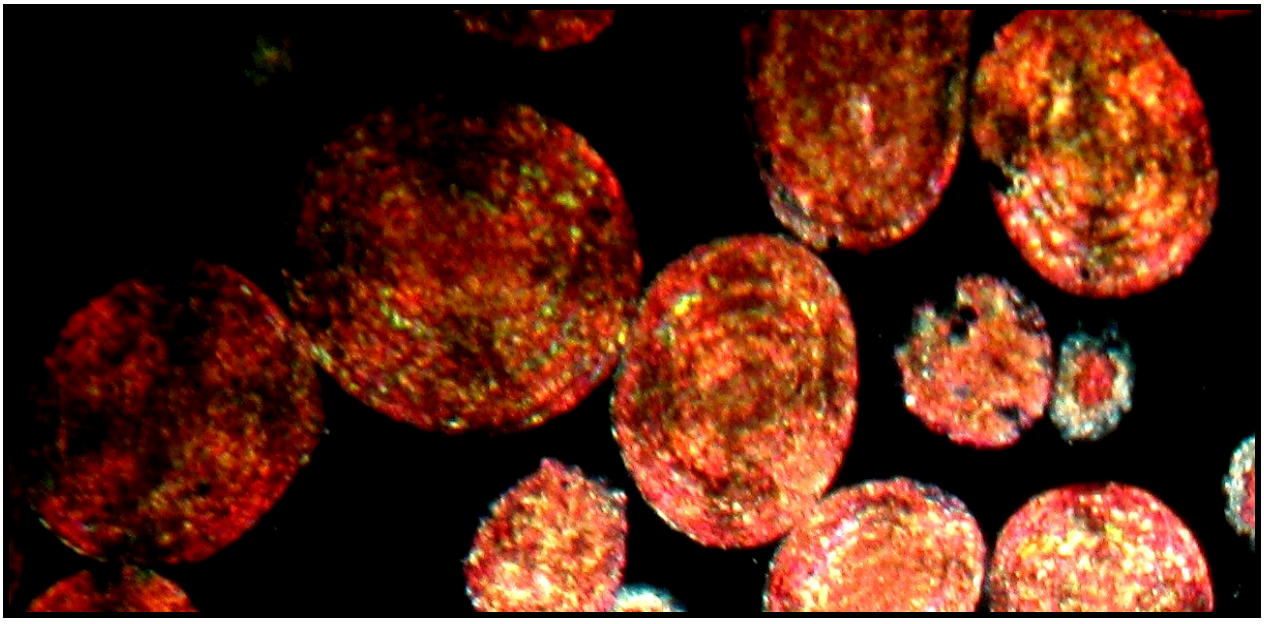


Ooids and a grapestone under crossed-polars, retardation plate, X340 magnification

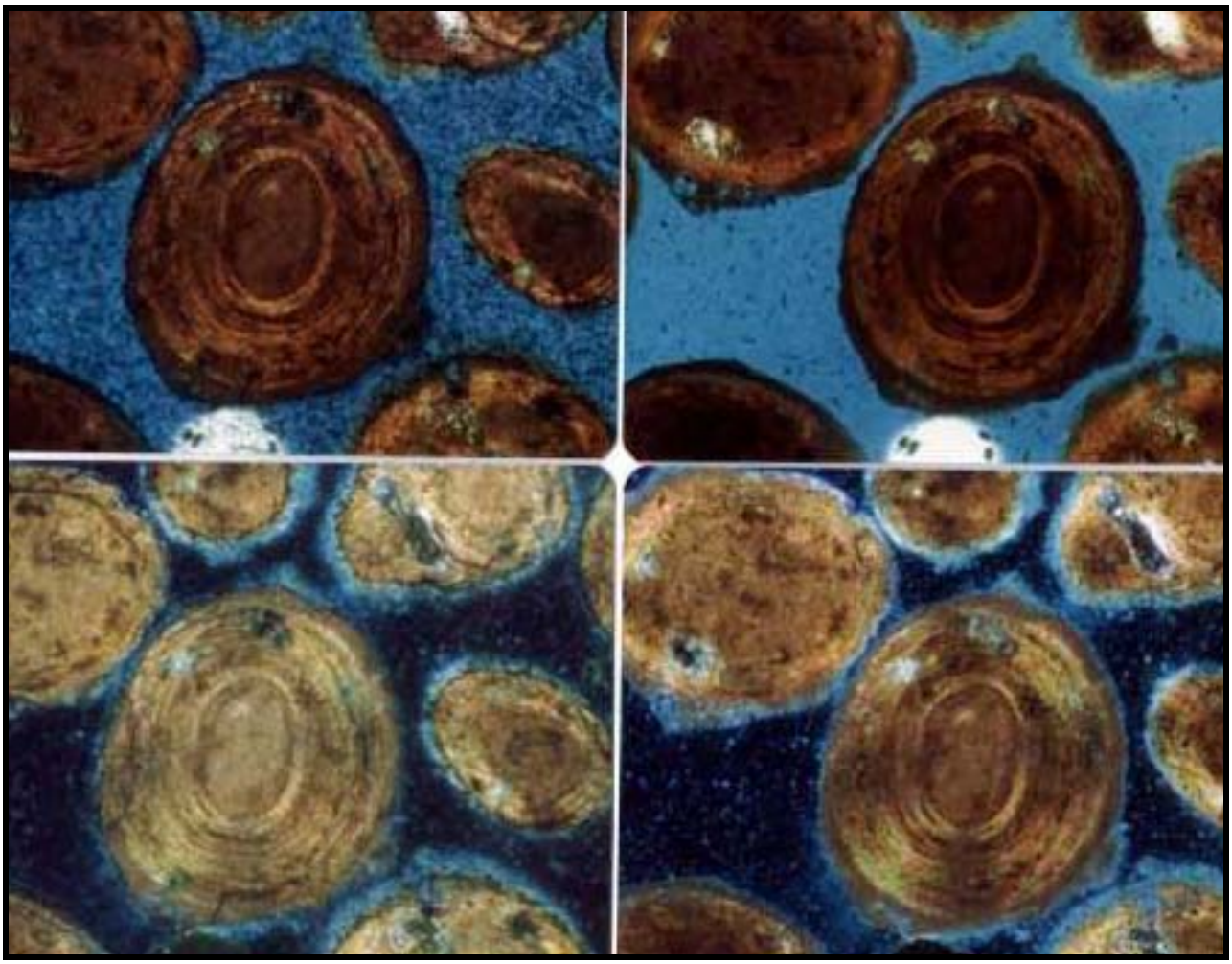


Ooids and a grapestone (X340 magnification) under crossed-polars

The **ooid** is a thing of beauty - the tangential aragonite crystals show a pseudo-uniaxial cross under crossed-polars X340 (below).



Ooids showing the pseudo uniaxial-cross



Joulters Cay ooids at X340 magnification.

Ooids were embedded in blue epoxy resin. The half-round, white (top photos) and black (bottom photos) objects at the center base of photo are a small air-bubble in the blue epoxy.
(Top left) polarized light in air: ooid banding and the outer band appears dark: central nucleus more obvious: interior banding distinct with some indications of past signs of initial spalling or chipping.
(Top right) polarized light under oil: ooid banding and the outer band appears even darker: blue plastic is clearer and lighter: central nucleus less distinct: interior banding less distinct with less clear past signs of initial spalling.
(Bottom left) crossed-polarized light in air: ooid banding determined as freshly deposited micritic cement: ooid interior more distinct and center ooid interior banding
(Bottom right) polarized light under oil: ooid banding appears even darker: central nucleus less distinct: pseudo uniaxial-cross clearly seen

It is interesting to note that oolite, rock composed of ooids, is found throughout the fossil record, from the Pre-Cambrian of Antarctica to modern-day Bahamas and Arabian Gulf.

So, sands on a tropical island can be unique.

Next time you visit a warm tropical island beach, it might be worth your while to bring a microscope rather than a bucket and shovel.

Joulters Cay ooids, Bahamas (photos: Kendall, 2005)

Oh, well - Back to reality.

In England, is it still cold and raining outside?