sediments from the reefs make up only a small proportion of the total accumulation. There are broad stretches of shallow water with sandy bottom which are not near to any coral growths. The sand in these areas has a high proportion of fecal pellets, oöids, and other nonskeletal carbonate grains (that is, grains which are not actually pieces of the skeletons of animals or calcareous plants). These nonskeletal grains are now being formed continuously, and are present at numerous levels deep in the Banks, as revealed by deep core drillings.

Fecal pellets are formed by small marine animals, especially burrowing worms and snails, but also by several other types. These animals eat large quantities of the finer particles (lime mud), in much the same way that burrowing earthworms do in terrestrial soil. The marine worms, snails, crustaceans, etc. extract the organic food material from the mud, and then expel the leftover lime mud in compacted pellets. These pellets are held together for a time by the mucus which they derived from the animal's intestine, and are later cemented together by very fine crystals of calcium carbonate which form inside the pellet, and sometimes over its surface. A high proportion of these pellets permanently retain the ellipsoidal shape in which they were formed in the intestine. In a few parts of the Bahama Banks they make up as much as 30% of the total sediment covering the bottom.[2]

Oöids (sometimes called "oöliths") are another important type of sand grain found in abundance on many parts of the Banks. A mass of oöids together is called "oölitic sand," or "oölite" if it has been lithified to form rock.[3] Oöids are sand-sized grains which have one or more coats of microscopic-size, needle-like crystals of calcium carbonate around them. Sometimes the "nucleus" (original part which received the coatings) is a very small fragment of a marine shell, but it can be practically any small sand particle. When an oöid which has several coats of crystals is cut in two, the coats show as concentric rings (as in Figure 21). One remarkable feature is that the crystals of these layers are arranged in very orderly patterns. When they are viewed under high magnification the arrangement is often found to be radial (with the "needles" pointing outward from the center). These needle-like crystals are composed of one of the pure forms of calcium carbonate which is called aragonite.[4]

The formation of oöids is one of the many slow but orderly processes which goes on in the sea. However, they can form in only very special environments. There must be (a) warm, very shallow water, (b) a moderate amount of turbulence, such as is produced by a strong ocean current coming up over the western edges on to the Bahama Banks, (c) the proper amount of calcium carbonate and carbon dioxide, and (d) probably one or more kinds of organic action by algae or bacteria. When these conditions are present the crystalline coatings are gradually precipitated on to the grains as the ocean current causes them to roll back and forth on the bottom.

The final type of carbonate grains which we will mention here