thicknesses of some of the chalk layers on it, we should briefly consider a few of the more common types of shell material which are produced in the water of the open seas. There are numerous kinds of organisms which produce what are called "non-calcareous" skeletons, composed mainly of silicon dioxide; but we will here put the greater emphasis on the chalk-forming organisms. (The skeletons of the latter are often spoken of as carbonate or calcareous in composition.)

The first (and most voluminous) of these calcareous types which we will consider here are those of the great group known as the Foraminifera. Figure 28 shows four species of these, of the genus Globigerinoides, taken from the western Pacific floor. There are 18,000 species of these organisms known, and approximately one-third of all ocean bottom is covered with calcareous "ooze" which contains a high percentage of Foraminifera shells. When a great amount of this ooze accumulates, a deposit of chalk is often formed.

The Foraminifera have usually been classified as animals, though they possess only one living cell. In animal classification systems they are closely related to the amoeba, and they obtain their food in the same manner as the amoeba. Tiny food particles are brought into the shell from the sea water through very small openings in the walls of the shell, and are then digested in food vacuoles, as in the amoeba. The many species of these organisms which float in the open sea are buoyed up by bubbles of gas which are present in their protoplasm. The Foraminifera are very abundant in the upper layers of water in nearly all parts of both tropical and temperate oceanic regions. As these organisms die their shells begin to slowly sink toward the bottom, to take their place as a part of the sediments. Since the size of most of these shells is very small, the process of sinking to the bottom is an extremely slow one, because smaller particles sink through the water more slowly than larger ones. Many of the Foraminifera are of a size which requires from several days to a few weeks to sink through 3,000 feet of nonturbulant water.

The other of the two most abundant chalk-forming organisms of the open sea is the group which produces what are called "nannofossils" (Greek nannos, dwarf, + fossil) when they sink to the bottom. Many of the test holes drilled during the recent Deep Sea Drilling Project explorations have passed through thick beds of nannofossil chalk. The most important of the organisms which contribute to this nannofossil chalk are the type of unicellular algae which are called "coccolithophores." (The prefix cocco is from the Greek word kokkos, referring to round objects. Thus the name coccolithophore literally means "the round stone bearer," or the organisms which produce tiny round calcareous plates.) Each of these microscopic-sized, unicellular plants has a cell wall or shell which has several very small, disc or button-like, calcium carbonate plates on it. These plates are known as "coccoliths," and make up more than 50% of some chalk sediments. Two types of these coccoliths from the western Pacific floor are shown in Figure 29a and Figure 29b. Notice particularly the very small size of these plates, as indicated by the high magnification. In fact, the smaller of these