lar to that of the basal Kingak and the Hot Zone, is not developed in the study area.

The upper Kingak Shale and the Torok/Seabee Formations are of a similar organic facies that is characterized by relatively low quantities of hydrogen-poor organic matter. Both intervals were deposited as foresets in a progradational sequence. The former extended toward the south during the Jurassic and the latter toward the north during the Cretaceous. The organic facies of these intervals are the result of clastic dilution, increased input of terrigenous organic matter, and increased bioturbation during early burial.

FRIEDMAN, GERALD M., Rensselaer Polytechnic Inst., Troy, NY

Coexisting Reefs and Terrigenous Muds in Java Sea

A rugged tectonic backbone, deeply weathered and stream-incised, composes the island of Java, Indonesia. Streams laden with fine-grained terrigenous sediment spill out into the marine setting of the Java Sea. Longshore drift moves the fine-grained suspended sediment load from points of discharge parallel to the coastline. Hence, although the Java Sea lies beneath the equator, carbonate sedimentation is essentially inactive along the coast. Reefs and skeletal facies, however, develop and become abundant about 25 km (16 mi) offshore, away from the influence of terrigenous sediments and freshwater plumes from rivers. The reefs, known as the Pulau Seribu Group, occur on the shelf at a depth of 30 to 40 m (100 to 130 ft) and are elongated in an approximately east-west direction. Storms pile up skeletal debris on the reef flats, thus building up islands that develop beaches and locally become vegetated. The skeletal debris is mostly composed of particles of corals, mollusks, echinoid spines, foraminifera, and red and green algae.

FRIEDMAN, GERALD M., Rensselaer Polytechnic Inst., Troy, NY

Problem of Cements in Classifying Carbonate Rocks, Especially Reefs

Classifications of limestone are based on the relative concentrations of micrite and sparite. These classifications are based on the idea that, in calm waters, tiny particles of lime mud are (1) available and (2) able to settle on the bottom and remain there, whereas in agitated waters, particles of microsize remain in suspension and are not deposited. Two problems limit this reasoning: (1) lime mud from low-energy deposits commonly filters into underlying high-energy deposits, or waters flowing through pores may effect such a transfer of lime mud, and (2) an even more complicated problem is the biochemical precipitation of cryptocrystalline cement in reefs. Cryptocrystalline cement that precipitates within millimeters to centimeters of the surfaces of reef rock looks just like micrite. As bioerosion converts the solid colonies of reef organisms into skeletal particles that are cemented rapidly beneath the surfaces of the reef by cryptocrystalline cement, the unwary geologist is tempted to term reef rock a biomicrite or wackestone or complain the "the reef core is represented by lithified lime mud." Hence, case histories abound where unwary geologists confused reef rock for low-energy lime-mud facies.

FRITZ, WILLIAM J., Georgia State Univ., Atlanta, GA, and SYLVIA HARRISON*, Univ. Montana, Missoula, MT

Sedimentary Sequence from 1980 and 1982 Mount St. Helens Sediment Flows: A Model for Older Volcaniclastic Deposits

Sediment flows resulting from May 18, 1980, and March 19, 1982, eruptions of Mount St. Helens produced a three-unit sequence that provides a model for interpreting similar deposits in the rock record. After the 1982 eruption, rivers rapidly reestablished pre-eruption channel levels and downcut through the new flows, allowing examination of the internal structures before extensive modification by reconstruction projects.

The depositional sequence consists of a basal graded to massive layer (Unit 1) of large clasts in grain-to-grain contact overlain by a distinctly finer-grained stratified unit (Unit 2) of similar thickness. The top unit (Unit 3) contains very large matrix-supported clasts and transported log debris. Grain size and total thickness of the sequence varies from 3.5 m (11 ft) thick, 40 cm (16 in.) boulders, and coarse sand in proximal flows above Camp Baker to 0.5 m (1.5 ft) thick, coarse sand, and silt in distal flows on the lower Cowlitz River. This sequence resembles some fluvial deposits, but clearly formed during extremely rapid deposition related to mudflows. We have noted similar Tertiary volcaniclastic sediments and believe Mount St. Helens sediment flows provide a model for interpreting volcaniclastic deposits often considered dominated by fluvial processes.

Three Unit Sequence from 1982 Sediment Flow North Fork Toutle River Sec. 2, T. 3 E., R. 10 N.