sion of marine facies at all these localities developed synchronously in response to changes in global sea level.

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Silicoflagellate Biostratigraphy of Upper Monterey and Lower Sisquoc Formations, Lompoc, California

Fifty-three samples of a late Miocene marine diatomite were processed for silicoflagellates. Four genera and 13 species: *Cannopilus schulzi, Dictyocha aspera, Dictyocha fibula, Dictyocha pentagona, Dictyocha pseudofibula, Distephanus boliviensis, Distephanus quinquangellus, Distephanus speculum, Mesocena diodon, Mesocena elliptica,* and *Mesocena polyactus* were found. Counts were made of the species present and relative and total abundances were calculated. Two biostratigraphic zones (in ascending order), *Dictyocha pseudofibula* Acme-Zone and *Distephanus speculum* Acme-Zone were recognized. These zones appear to correlate to Bukry's *Dictyocha pseudofibula* Zone and *Distephanus speculum* Zone from DSDP Leg 18, Site 173, in the northeast Pacific. These zones overlap Barron's *Nitzchia fossilis* Partial-Range-Zone, *Rhaphoneis amphiceros* var. *elongata* Partial-Range-Zone, and *Nitzchia reinholdii* Concurrent-Range-Zone.

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Neogene Lacustrine Diatom Biostratigraphy of Western Snake River Basin, Idaho and Oregon

The western Snake River basin of Idaho and Oregon contains a thick sequence of continental sediments that range in age from at least middle Miocene to Holocene. Some of these sediments are diatomaceous and contain distinctive forms that are biostratigraphically useful. The Sucker Creek Formation (Barstovian–middle Miocene) can be characterized by the occurrence of *Coscinodiscus(?) miocaenicus.* The Poison Creek Formation of Barstovian(?)-Clarendonian age (middle to early late Miocene) contains *Coscinodiscus(?)* sp. cf. *C. gorbunovii* v. *gorbunovii.* The upper Miocene (Hemphillian) Chalk Hills Formation is highly diatomaceous and is characterized by the presence of primitive forms of *Stephanodiscus* at its base and by extinct forms of *Cyclotella* in its upper part. Ash correlations within the Chalk Hills Formation demonstrate that fossil freshwater diatoms can be used to time-correlate lacustrine sediments. The Glenns Ferry Formation of Pliocene (Blancan) age is dominated at its base by species of *Cyclotella* and *Stephanodiscus.* Benthic and epiphytic diatoms are most common in the upper Glenns Ferry Formation. The lower to middle Pleistocene (Irvingtonian) Bruneau Formation contains modern species of *Stephanodiscus, Cyclotella,* and *Melosira.* Careful morphologic comparisons of these and other diatoms of the western Snake River basin with similar forms in other regions may shed light on the feasibility of a model of worldwide Neogene lacustrine diatom biochronology.

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Gypsum Deposits of Fish Creek Mountains, Imperial and San Diego Counties, California

The largest deposit of gypsum in California occurs in the Miocene Split Mountain Formation. It is located at the north end of the Fish Creek Mountains, in Imperial and San Diego Counties, about 70 mi (113 km) east of San Diego. The deposit consists of up to 200 ft (65 m) of massive rock gypsum, lying at the top of the Split Mountain Formation. Selenite and celestite occur in scattered pockets. Anhydrite is present as erratic lenses in the gypsum, and interbedded clay occurs near the top and bottom contacts of the deposit. Minor impurities in the gypsum include varying concentrations of chloride salts and fine-grained, opaque manganese and iron oxides. The deposit is underlain by nonmarine gray conglomeratic sandstone, and in complete sections is overlain by marine shale and poorly consolidated sandstone of the Miocene Imperial Formation. Both contacts appear conformable and gradational.

The gypsum outcrops as erosional remnants, which have been preserved in a shallow synclinal basin 3 mi (4.8 km) long and 1 mi (1.6 km) wide. The general dip is 15 to 30° toward the synclinal axis, with sharp local contortions. The overlying Imperial Formation has been eroded away making estimates of the original thickness impossible. Overburden is nonexistent and the gypsum forms smoothly rounded hills, capped by a thin layer of gypsite.

The origin of this deposit appears to fit the "modified bar hypothesis," which suggests that calcium sulfate was precipitated in seacoast lagoons where evaporation took place rapidly, and periodic influx of seawater across shallow bars added new increments of salts. Gradual sinking of the lagoon allowed accumulations of great thicknesses.

The rock is mined in a side-hill bench quarry, crushed at the quarry site, and then shipped by private narrow-gauge railway to a calcining and wallboard plant at Plaster City, 25 mi (40 km) to the south.

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Miocene Geologic History of Southern Salinian Block, California—Perspectives from a Stratigraphic Study of Monterey Formation

A better understanding of the Miocene geologic history of the southern Salinian block is aided by a stratigraphic and paleoenvironmental study of the Monterey Formation. Extensive subsurface and surface data enable construction of isopach, paleobathymetric, age-relationship, and paleogeographic maps that document the depositional history of the Monterey Formation. Isopach maps show that the formation ranges up to 1,400 m (4,500 ft) thick beneath Cuyama valley. Other areas of maximum accumulation occur in the northwest Caliente Range and the Indian Creek area. Offset of isopachs north of Barrett Ridge suggests approximately 15 km (9 mi) of post-middle Miocene right slip on the San Juan fault.

Age-relationship maps of the upper and lower contacts of the Monterey Formation for the area from Cuyama Valley to the northern La Panza Range indicate that both the top and base of the formation become younger toward the northwest—the base ranging from Saucesian to Relizian and the top from Relizian to Mohnian. Paleobathymetric maps, based on the distribution of benthic Foraminifera, are plotted on four time slices: late Saucesian, Relizian, Luisian, and early Mohnian. These maps also indicate that the Cuyama basin filled from the southeast to the northwest, and they reflect the migration of maximum subsidence in that direction during the Miocene.

The relationship of general stratigraphy to structural features in the Cuyama basin shows that certain faults and anticlines were active during the deposition of the Monterey Formation. Specifically, the Cox fault zone and South Cuyama