Booth 24 Clark, Fred E. № 4474

DISTRIBUTION OF HOLOCENE BENTHIC FORAMINIFERA AND ASSOCIATED WATER MASSES, TROPICAL SOUTHWEST PACIFIC OCEAN.

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A suite of 62 surface and near surface samples has been examined for its benthic foraminiferal faunas. The cores sampled ranged from 110 to 8900 m water depth, and are distributed across the tropical southwest Pacific Ocean, north and east of Australia. A total of 606 species were identified. Census data was obtained for each sample, and species found in statistically significant fractional abundances (88 in all) were analyzed using a new Q-mode clustering algorithm (Error Weighted Maximum Likelihood) based on fundamental statistical hypotheses.

With the aid of this analysis, as well as a consideration of the faunas themselves, eleven benthic foraminiferal assemblages were identified. The assemblages characterized several water masses. Subtropical Lower Water (Upper Salinity Maximum), Antarctic Intermediate Water - Oxygen Maximum, and Antarctic Intermediate Water - Salinity Minimum were each represented by a single assemblage, this latter one on the Lord Howe Rise. The Deep Oxygen Minimum was represented by a pair of very dissimilar assemblages, one of them being a remarkably low diversity fauna apparently controlled by abundant clastic material of volcanic origin. A pair of assemblages with near coincident depth ranges spanned both the Deep Oxygen Minimum and Deep Water, without any apparent means to discriminate between the water masses. Antarctic Bottom Water (AABW), primarily below the lysocline but above the calcite compensation depth (CCD), was also represented by a pair of distinct assemblages with near coincident ranges. Very near the CCD, a Mixed Calcareous/Agglutinated Abyssal Assemblage characterized AABW, while below the CCD, the eleventh assemblage, the Abyssal Agglutinated Assemblage, was found, with only a few corroded calcareous specimens accompanying the agglutinated benthic faunas.

Booth 25 Earley, Patrick J. № 25361

RADIOLARIAN, PLANKTONIC FORAMINIFERAN, AND PHYSICAL AND CHEMICAL EVIDENCE IN SUPPORT OF THE INITIATION OF THE ANTICIPATED 1991 EL NIÑO OFF SOUTHERN CALIFORNIA.

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Climatic groups at two major oceanographic institutions and a number of government laboratories predict an El Niño for 1991. Results from two oceanographic cruises off San Diego in June suggest that at that time conditions similar to those in June of 1983 (prior to the strongest El Niño ever recorded, 1982-83) had developed. Sea surface temperatures were from 19.5 to 20 degrees centigrade from all nearshore to ten miles offshore stations and isothermal down to five meters at the CTD stations; that combined with the presence of *Spongaster pentas*, a radiolarian indicative of the Eastern Tropical Pacific, suggest that these shallow warm waters were transported along the coast from the Eastern Tropical Pacific. This is especially significant because during the 1983 El Niño *Spongaster pentas* dominated only during the peak of the El Niño in August. Below this shallow Eastern Tropical Pacific water to about 100 meters appears to be a mixture of California Current and central Gyre waters. Support for this low salinity water being of such a mixed origin comes from the dominance of the California Current radiolarian *Pterdinium spinipes* and foraminiferans *Globigerina bulloides* and *G. quinqueloba*, and presence of Gyre radiolarians such as species of collosphaerids and the foraminiferans *Globigerinoides ruber* and *Hastigerina pelagica*. Below 100 meters are higher salinity waters containing subsurface to low latitude and intermediate radiolarians such as styliodictids, *Cornutella profunda*, and theocalyptrins all suggesting modified California Current water to intermediate water. These conditions are similar to those in June of 1983, and further development may result in an El Niño as strong or stronger than the strongest ever recorded in 1982-83.

Booth 26 Casey, Richard E. № 25357

PHAEODARIAN RADIOLARIAN EVIDENCE FOR BOTTOM WATER OXYGEN CONCENTRATION FLUCTUATIONS DURING EL NIÑO AND ANTI-EL NIÑO PERIODS.

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Phaeodarian radiolarians have skeletons with an admixture of organic matter. The basin waters in the Santa Barbara Basin, southern California continental borderland, are usually low in oxygen and result in varved sediments containing phaeodarian remains. In an investigation of these varves it was noticed that phaeodarian radiolarians were absent from the 1983 El Niño layer but present in the other varves. Field observations suggest that the Santa Barbara Basin bottom waters were oxic during the 1983 El Niño. This was probably due to a reduction in primary productivity of the surface waters resulting in less organic matter raining into the basin and using up oxygen in the basin. Continued investigations showed that earlier El Niños were marked by the absence of phaeodarian radiolarians also, and earlier anti-El Niños by their presence.

Booth 27 Groh, John M. № 25358

FORAMINIFERA AND OTHER ORGANISMS ASSOCIATED WITH THE HYDROTHERMAL VENT SYSTEMS OF THE SALTON SEA.

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Benthic foraminifera, nematodes, barnacles and sulfur bacteria are associated in an ecosystem adapted to the hydrothermal vent systems of the Salton Sea, southern California. These vents are similar to their deep-sea counterparts in that they occur in rifted environments, are covered by salt water, and their ecosystems are based on sulfur emissions and chemosynthesis. These vents are different in that they are shallow (with "mud pot" equivalents onshore), have a very thick sediment cover and therefore not as hot, and there appears to be no similar bacterial symbiosis as with the deep-sea vents. The chemosynthetic bacteria form the main base of this food chain and come out of the vents as clumps, and grow on the sediment surface as a bacterial mat. Barnacles ring the vent entrances and eat the bacterial clumps. The benthic foraminifera *Quinqueloculina subdecorata* and *Triloculina sidebottomi* may well be endemic to these vents in the Salton Sea system. Also the benthic foraminiferan *Streblus beccarii* is brought into the vent area as an expatriate, and *Bolivina striatula* may well be meroplanktonic and float into the vent regions. These vent foraminifera probably feed on bacteria and/or the elevated concentrations of nematodes at the vents (these nematodes feed on the bacteria).

Booth 28 Kontrovitz, Mervin № 29333

THE TAPHONOMY OF OSTRACODE SHELLS: SEQUENTIAL DEGRADATION

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Taphonomy of ostracodes is often mentioned in the literature, but little is offered about specific consequences for fossils. Results of solution experiments and simulated diagenesis were integrated with observations of alteration features of fossils, including those from metamorphic rocks which provide real taphonomic sequences. Results indicate that shell deterioration is predictable.

In exterior view, the epicuticle (EPI) undergoing dissolution first develops pits about 700 µm across. With further degradation, spines appear worn, pores enlarge 25-50%, and patches of EPI are lost. Exposed is exocuticle (EXO), with fine pits (1000 µm) and solution tracks, 1000 µm across; the EXO too is lost in patches. The pits form between the mesh of the relatively insoluble organic network. As the EXO continues to degrade, margins of the central muscle scars are etched and the scars are then dissolved, leaving holes. Continued removal of the EXO reveals the endocuticle (END) with its coarser organic mesh and larger pits between fibers. This sequence is compatible with Bate and East's (1972) carapace model.

Recrystallization and pyritization destroy the lamellae listed above; casts and molds do not retain layers or the pits. Secondary mineralization seen in fossil ostracodes is imposed on the shell surface as it exists at the time. Therefore, it is possible to interpret the fossils as being molds or casts (Sohn, 1986), shells or portions of shells (calcite and organic), replacements, or recrystalized, with a concomitant appreciation of information loss.

Booth 29 Peebles, Mark W. № 4166

TAPHONOMY OF FORAMINIFERA FROM DEEP (30-60 M), TROPICAL CARBONATE PLATFORMS, NICARAGUAN RISE, CARIBBEAN SEA.

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Banktops of Nicaraguan Rise platforms are relatively deep and swept by the Caribbean Current, which flows over and around the platforms at velocities that may exceed 250 cm/sec. Dominant sponge-algal biofacies reflect abundant nutrients supplied by topographically induced upwelling. Foraminifera were picked from sediment samples collected from water depths of 30 to >350 m. Taphonomic character of each assemblage (>/= 300 specimens) was ranked in six catagories; abrasion, breakage, dissolution, bio-erosion, encrustation and cementation/recrystallization.

Bank-top and slope assemblages are dominated by large, bioeroded specimens, which exhibit extensive breakage but limited abrasion. Arborescent encrusters (e.g., Homotrema rubrum) are rarely found whole, while non-arborescent encrusters (e.g., Nubecularia sp.) are commonly intact. Cementation is uncommon, but when found can be extensive. Encrustation and dissolution are rare. Specimen size range is a function of current exposure.