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Pyroxene crystals occurring in highly deformed gabbros and pyroxenites from central Australia showed inhomogeneous deformation. Apart from the well-known translation glide system {100} [001], the system {100} [010] has also been observed. Plastic deformations represented by rotations of the vibration directions of the optical indicatrix in different domains within a kinked or bent pyroxene crystal are complex. Such deformations cannot be interpreted by a simple glide system, a homogeneous shear, or a single plane bending. The movement is three-dimensional or non-conservative (Orlov, 1966), i.e., gliding occurs on more than one slip plane or has a composite slip direction.

An X-ray study showed that there are at least three types of inhomogeneities in a kinked crystal: in the kink, in the host, and at the kink boundary. A remarkable change in the type of Laue asterism from host to kink was observed. Striae in Laue reflections representing additional slip systems or complex rotations are found only in the host. It is suggested that the initial stage of kinking is by means of single slip, and domains within the kink boundaries may be considered isolated from later stresses in a broad sense. Striae developed in the host by complex deformation occurred subsequent to kink formation. The asymmetry of kink angles across the kink boundary must, therefore, be attributed to complex mechanisms such as non-uniform plastic flow, rotation of fragmented domains or slip in several glide systems.

THE USE OF LEAD-210 AS A HEAVY METAL TRACER IN THE SUSQUEHANNA RIVER SYSTEM

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A detailed Pb-210 study of the Susquehanna River system in the northeastern U.S.A. has been done. The West Branch of the Susquehanna River (WBSR) is massively affected by acid mine drainage and is low in pH and high in dissolved (<0.4μm) Pb-210, Fe and Mn. Along its course iron hydroxide is precipitating at a pH of between 4 and 4.5, and the Pb-210 supplied by the acid mine water is diminished by about 25% as a result of dilution. As the WBSR enters the valley and ridge province of the Appalachians it has a Pb-210 concentration of ~0.2 dpm/l. At this juncture it receives a considerable influx of alkalinity from tributaries draining carbonate terranes, resulting in neutralization of the sulfuric acid and increase of the river pH to around 6.5 to 7. This pH adjustment is accompanied by the precipitation of Fe and Mn. Due to the slow rate of Mn removal from solution, the Mn precipitation extends a considerable distance down-river from the point of acid neutralization. Analyses for Pb-210 in the river at points in or below the region of Mn precipitation show that Pb-210 is rapidly scavenged from solution onto suspended particles. From the data it is possible to calculate the removal rate of Pb from water in the presence of Fe and Mn hydroxides and other particles. At a pH of 4 to 4.5 Pb removal is nonexistent relative to the river flow rate, but at a pH of 6.5 to 7 the Pb-210 data indicate a residence time of <0.5 day for dissolved Pb.

SALT DIAPIRS ON THE SAO PAULO PLATEAU: BRAZILIAN CONTINENTAL MARGIN

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the Sao Paulo Plateau consist of s

NT CRINOID BIOSTRATINOMY

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University of Michigan, Ann Arbo

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the fossil record. The effects of
burial by different sediment type
the echinoderms are under investig

OMAGNETISM OF WESTERN UNITED STAT

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ACER IN THE SUSQUEHANNA RIVER

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LATEAU: BRAZILIAN

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, Lamont-Doherty Geol. Obs.
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ophysical investigations of the Sao Paulo Plateau have revealed the istence of a large field of sedimentary diapiric structures. In ril, 1974, detailed geological/geophysical surveys of several indivi- al diapirs were conducted to determine whether these structures are lt or shale domes. Thermograd measurements reveal that thermal adients at the crest of the diapirs are roughly two times higher than e regional gradient for the Sao Paulo Plateau. Multigrad profiles ross the diapirs reveal progressive changes in thermal gradient sistent with the changes predicted for piercement structures of gh thermal conductivity (such as salt domes). Piston cores from the est of the diapirs penetrated sediments as old as Middle Eocene. e salinities (34 to 37 °/oo) of interstitial waters contained in sedi- nts younger than Eocene are approximately the same as the salinity the overlying seawater. In contrast, abnormally high salinities of to 50 °/oo were measured in the interstitial waters of Eocene sedi- nts. These values suggest an underlying high concentration of salt. us, these data confirm that at least some of the diapiric structures the Sao Paulo Plateau consist of salt domes.

ENT CRINOID BIOSTRATINOMY

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decomposition of comatulid crinoids was observed in the laboratory at several localities in the backreef and forereef areas at covery Bay, Jamaica. The effects of environmental energy, rapid rial, and scavenging on the decomposition process were evaluated. er 1-2 days in the marine environment, Nemaster rubiginosa under- t loss of the ventral disc, fading of the original color, and the achment of the distal arm tips, many pinna, and most cirri. In y instances the arms were strongly flexed dorsally by the dorsal ments of the brachials after the relaxation or decay of the ventral cle fibers. With time the arms began to fragment into 1-3 cm ments. After 6 days the calyx (less cirri) remained intact with rt arm segments attached to it. Those specimens which were placed agitated environments underwent much more rapid rates of disarticu- ion (2 days were required for their complete disarticulation) than se which were situated in quieter settings. When specimens were tected from scavengers by cages of differing mesh size, those in finer mesh cages exhibited better preservation. Rapid burial was d to greatly increase the preservation potential of the crinoids, arently by protecting specimens from scavenging and mechanical and logic disturbance. Crinoids which were buried and then exhumed er 6 days were well preserved with retention of color, distal arm s, pinna, cirri, and ventral disc. These results are of signifi- ce to the paleoecological interpretation of echinoderm deposits the fossil record. The effects of temperature, anaerobic conditions, burial by different sediment types on the decomposition processes the echinoderms are under investigation.

OMAGNETISM OF WESTERN UNITED STATES LATE QUATERNARY LAKE DEPOSITS

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