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estuarine facies trends perpendicular to the major depositional strike and contains fine sandstone and siltstone with medium to small-scale trough cross-beds, scour structures, and current ripples. The sediments of the Muddy Sandstone were deposited along the margin of a tide-dominated, regressive epicontinental sea.

PALEOLATITUDE DISTRIBUTION OF PHANEROZOIC EVAPORITE DEPOSITS

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Evaporite accumulation at the present day occurs largely within 50° of latitude of the equator. Within this belt most evaporite accumulates in the atmospheric high pressure zones of the subtropics in each hemisphere. Little is deposited in the intervening equatorial low pressure zone. This bimodal distribution with respect to latitude is attributable to the global regime of atmospheric circulation. It is paralleled by a similar bimodality in the modern distribution of average marine surface salinity and of hot deserts. When due allowance is made for subsequent continental displacement, the distribution of evaporite deposition at least since the Permian and probably throughout the Phanerozoic conforms remarkably well with the modern model. Contrary to some previous suggestions, the northern hemisphere evaporite zone seems not to have migrated consistently through time in either the poleward or the equatorward direction. This is shown by a series of diagrams in which evaporite deposits for each of ten subdivisions of Phanerozoic time are plotted according to inferred latitudes of original deposition. The persistence of essentially the same pattern of evaporite accumulation for most or all of Phanerozoic time suggests that atmospheric circulation and the distribution of marine surface salinity and of hot deserts have also long adhered broadly to the modern model. Nevertheless, Permian to Jurassic time appears to constitute an episode when evaporite deposition was higher than usual. This may be because it was also an episode of continental assembly in between episodes of dispersal of the continents.

RIFT ZONES IN THE SOUTH-CENTRAL SNAKE RIVER PLAIN, IDAHO

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Identification of rift zones and associated vents is essential to understanding the eruptive history and structural trends in the Snake River Plain. Three new rift zones north of American Falls are reported here. The major rift system in the central Plain is the Idaho Rift System which extends from Craters of the Moon N.M. south through the Wapi Lava Field for a total length of 100 km. The southern area contains at least five rift zones: 1) Inferno Chasm Rift (defined here), which strikes N 40°W and is composed of four lava cones, each having a summit vent; 2) Queen's Bowl Rift, which strikes N 10°E; 3) King's Bowl Rift set, which strikes N 10°W and is defined as part of the Idaho Rift System (Printz, 1970); 4) an unnamed rift zone, which strikes N 20°E and is here defined on 3 vents on the margin of, and within the Wapi Field; and 5) an unnamed set of fractures northwest of the Wapi Field, which strike N 45°E. The first 3 rift zones are adjacent to each other and are parallel. On the basis of geomorphology and superposition, Inferno Chasm Rift vents appear to be oldest and those of King's Bowl, the youngest—a sequence suggesting that eruptive activity shifted westward. The vents of the fourth, unnamed rift

zone exhibit approximately the same geomorphic stage as those of Inferno Chasm Rift zone and may be a southern extension of the Idaho Rift System. The last rift zone consists of subparallel and an echelon fractures that apparently have no associated flows or vents. Their prevailing NE strike makes it unlikely that they are associated with the other rift zones. The five rift zones described here agree with the general northeasterly and northwesterly vent-trends suggested by Malde (1965) to be characteristic of the eastern Plain. Additional studies and geologic mapping of the area will define the rifts and their relations within the Plain.

WELDED TUFFS AND LAVAS OF THE McDERMITT CALDERA, NEVADA-OREGON

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Alkali-rhyolite welded tuffs cover a large area in northern Nevada and adjacent Oregon, between McDermitt and Denio. The tuffs consist mostly of gray and greenish-gray aphyric alkali rhyolite containing 73-75 percent SiO_2 , 3-4 percent Na_2O and 4-1/2 to 5-1/2 percent K_2O . Inter-layered are green and brown alkali rhyolite tuffs (65-72 percent SiO_2) with alkali-feldspar and quartz phenocrysts. A complete color, compositional, and textural gradation exists between these rocks, although different varieties are commonly in sharp contact. Vitric tuff is exceedingly sparse, and eutaxitic texture is absent. Most of the rocks have laminar flowage structures such as foliation, lineation, and tight minor folds. Groundmass compositions of the porphyritic alkali rhyolites are only slightly more silicic than the whole rocks, therefore settling of crystals to hidden depth is necessary to produce a magma differentiated to the extent of the observed tuffs. A zone of arcuate faults clearly defines the north half of the caldera. These have substantial displacements south-side-down and prominent topographic expression. To the south, matching arcuate faults are absent. The east side is more complexly faulted with little west-side-down displacement. There are no faults on the west side. Ash-flow eruption was apparently followed by collapse involving hingelike motion, with large fault displacements on the north side decreasing to zero at a hinge line farther south. Later lavas cover limited areas within the caldera. The lavas range broadly in composition from quartz latite (63 percent SiO_2) to rhyolite (75 percent SiO_2) and are distinctly more aluminous than the welded tuffs. Generation of these magmas may have involved assimilation of sedimentary rocks.

STRUCTURAL EVOLUTION OF THE MILLIGEN AND WOOD RIVER ALLOCHTHONS, SOUTH-CENTRAL IDAHO

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The Milligen and Wood River allochthons underlie an area 80 km (50 mi) long in a NNW-SSE direction and 40 km (25 mi) wide in the Wood River area, south-central Idaho. The Milligen allochthon--approximately 1220m (4,000 ft) thick--is composed of the Milligen Formation, 1220 + m (4,000 + ft) of tightly folded Devonian deep-water siliceous marine clastic rocks that overrode a gneissic complex in the Pioneer Mountains, and the Mississippian Copper Basin Formation, a flysch sequence to the south. The Wood River allochthon, which lies in thrust contact on the Milligen allochthon is about 915 m (3,000 ft) thick; it contains about 4,575 m (15,000 ft) of Pennsylvanian and Early Permian basin deposits of limy siltstone, sandy limestone, quartzite, and a basal conglomerate. We con-