

AN ULTRAMAFIC INCLUSION FROM THE WEEKS ISLAND SALT DOME, SOUTH LOUISIANA

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ABSTRACT

Mines in Gulf Coast salt domes commonly encounter entrained clastic sedimentary material. The clastic sediments include red, brown, green and yellow sands, silts and clays in brecciated seams which may represent shear zones within or between salt stocks. In January of 1992, miners encountered a hard, dark-gray block of distinctive lithology within a clastic inclusion zone at the 1,000 foot level of the Morton Salt Company's mine at Weeks Island, Iberia Parish, Louisiana. The square block measured approximately 18 inches on a side and had a depth into the freshly exposed salt face of a few inches. Thin-section petrography established that the dark gray rock is an altered ultramafic porphyry. Phenocrysts of serpentinitized olivine, pyroxene and amphibole occur in a groundmass dominated by serpentine and opaque materials.

This new occurrence is significant because it extends the known range of mafic and ultramafic igneous activity within the Gulf area. Olivine nephelinites and their differentiation products are widely distributed in the Austin-San Antonio-Brackettville areas of central Texas, both as intrusions and extrusions and are probably related to the Balcones fault zone. Potassium-Argon dates for these rocks published by Adams and Baldwin (1971) range between 85 and 63 million years. Other igneous "plugs" are known or inferred from subsurface data. In 1976, Braunstein and McMichael briefly described an intrusive body of "altered porphyritic basic rock" from offshore St. Bernard Parish, Louisiana (Chandeleur Sound), at a depth of 7,200 feet. The rock was dated at 82 M.Y., \pm 8 m.y., although the published cross section implies intrusion through (or possibly onlap of) early Tertiary Midway strata.

There is no published record of foraminifera or other paleontological materials to enable the sediments to be dated, although late Triassic or possibly Jurassic sporomorphs from the salt have been reported by Jux (1961). It is normally concluded that the entrained clastic sediments are younger than the salt and were picked up during the salt's upward diapirism, although salt domes in the Arabian Gulf contain blocks of material that are clearly from the older underlying basement rocks, apparently "sucked" from below the rising salt mass.

The age of the new block of altered porphyritic peridotite is problematical. If a real consanguinity exists between the Weeks Island sample and these other examples, a late Cretaceous age - similar to the ages discussed above - may be realistic; the sample itself is not a promising subject for dating. Another possible interpretation exists. The serpentinitized peridotite (and the associated red clastics) may have been derived from beneath the salt, in a manner comparable with the Arabian Gulf examples. The red sands may therefore correlate with the Triassic Eagle Mills Formation of North Louisiana and the peridotite may thus represent a sample derived ultimately from the upper mantle beneath the Gulf, brought near to the late Triassic surface by tectonics or volcanism early in the Mesozoic opening phase. This scenario is highly speculative but raises some interesting possibilities for future consideration.