Salt Domes

Q. Could you elaborate on "salt domes" - what they are, causes, etc.

A.
Salt domes are a natural occurrence when thick, heavy sandstones and shales are deposited on top of thick (1000's of feet) rock salt layers. So we start with a time in the earth's history when sea water is being evaporated in long narrow embayments like today's Red Sea. The attached map of the early Jurassic Period shows that early phase of the breakup of North America, South America, and Africa continents. The long narrow sea ways separating the three continental masses were the site of thick accumulations of rock salt as sea water in those sea ways evaporated over 10's of millions of years. Later as the continents moved further apart evaporation stopped and newly formed major river systems began to cover the salt layers with thick deposits of sand and shale which with continued deposition were lithified into sandstones and shale, both heavier than the salt of the evaporates. The difference in density of the rock salt layers and the overlying heavier sediment layers causes the salt to rise up through the sediments until it reaches a depth where the unconsolidated sediments are essentially the same density as the salt, about 1000 feet below the ocean floor.

The shapes of the salt "intrusions" into the sediments are extremely varied; usually following local weaknesses like faults in the sediments but often being "circular" in map view which results in salt columns or break loaf shaped masses called plugs.

To complicate matters, the worlds best oil and gas source rock shales are often deposited before, under, the rock salt as the very first results of the incipient break up of the continents. Today similar organic rich sediments are being deposited in the Rift Valleys of Central Africa where future fragmentation of today's Africa will deposit thick salt layers as the oceans invade the Rift Valleys. Oil and gas generated in the pre-salt source rocks are thought to migrated up into the overlying sandstones and shales by processes that are as yet unclear.

See links:

http://en.wikipedia.org/wiki/Salt_dome

Images:
http://www.google.com/search?q=salt+dome&hl=en&rlz=1T4GZAG_enUS431&prmd=imvns&tbm=isch&tbo=u&source=univ&sa=X&ei=5qs2T4DPO6S62wXBtJWbAg&ved=0CDMQsAQ&biw=1600&bih=593

http://www.worldenergysource.com/articles/text/halbouty_WE_v3n2.cfm