The Salinas basin has predominantly barren surface anticlines. The heavy oil giant, San Ardo, was found accidentally on a surface syncline. Finding new traps in this basin requires stripping back the stratigraphy to the time of accumulation, generally late Miocene. One starts at the top with the best available surface geology and geomorphology. The tilted Gabilan Mesa peneplain surface can be untilted by isopaching the thickness from the Mesa surface to the top of the Miocene. At this point we have a map of the structure before the late Pliocene to Recent deformation. San Ardo shows up at this point with 400 ft (122 m) of closure exactly coinciding with the present outline of the oil field and matching the 400-ft (122 m) oil column, in marked contrast to the present day structure contours on the producing horizons. Further isopaching of discrete stratigraphic intervals within the upper part of the Miocene produces a picture of the structure shortly after the deposition of the producing zones. In addition, shoreward sand strandlines and seaward sand shale-up lines can be defined. Analysis of this geologic history also shows the probable location of deltaic areas and longshore bars. Early loci of oil accmulation and wedge edges of permeability are apparent from this synthesis. Several small oil fields of the Salinas basin have been found deliberately by unraveling the subtle geologic history to the time of accumulation and deposition.

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Worldwide Review of Seals for Major Accumulations of Natural Gas

About 62% of the caprock seals for the world's 176 giant gas fields are shales and about 38% are evaporites. These two lithologies make up essentially all of the caprock for the 2,650-Tcf of gas expected to be recovered from these fields. Caprock thickness data is lacking from many fields, but 20 to several hundred meters are typical.

Optimal conditions for seal preservation occur in areas which had a comparatively simple geologic evolution. Complex fold belts and overthrust belts are commonly subject to seal destruction. Of the world's 25 largest gas fields, 21 are in cratonic settings and four in fold belts; those in fold belts have evaporite seals.

Lateral continuity of caprock has a favorable impact on the retention of gas over large areas such as the Arabian platform.

Gas hydrate accumulations illustrate both seal and reservoir. Seal destruction is caused by changes in the phase equilibrium.

Considerable multidisciplinary research still needs to be done to quantify knowledge of seal prediction for giant gas fields.

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Buried-Hill-Type Oil Fields in Northern Part of China

Large-scale exploration for oil and gas started in north China during the 1960s, with Tertiary formations considered the main exploratory objective. In 1975, oil finds in Sinian dolomite beneath the Tertiary unconformity led to the discovery of the prolific Renqiu oil field, a buried-hill type. Since then, there has been intensified exploration for buried-hill oil pools. To date, more than 40 buried-hill oil and gas pools, and nine suites of oil-bearing formations, have been discovered. Reserves from these oil fields constitute 22% of the regional total, and current production accounts for 30% of the total. The success ratio in the exploration for hydrocarbons in the buried hills is 10 to 30%.

Based on the distribution of source rocks, and the pattern of oil migration, the buried-hill oil fields are categorized as follows: (1) hydrocarbons migrated into the reservoir through the unconformity surface and the fault planes, (2) through the unconformity surface, (3) through the fault planes, and (4) through the fault planes and then along the unconformity surface.

Two main types of the buried hills are classified according to the characteristics of their development during the Tertiary: (1) subsidence type, and (2) elevation and denuded type. The two types of reservoirs form a composite oil and gas accumulation zone with distinctive reservoir sequences. These factors provide a theoretical basis for finding various types of oil and gas pools on different parts of the buried hills.

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Mississippian Continental Margins of Conterminous United States

The paleogeographic, paleotectonic, and paleobathymetric reconstruction of continental margins around the present western, southern, and eastern sides of the conterminous United States can be defined for a brief span (about 1.5 m.y.) of Mississippian time. Interpretations are made by applying a biostratigraphic and sedimentological model for the Deseret starved basin of Utah and Nevada to recently published shelf-margin studies. The time span is that of the middle Osagean *anchoralis-latus* conodont zone. Precise dating and paleobathymetric interpretations are based on the biostratigraphy and paleoecology of conodonts, and also of corals, calcareous and agglutinate foraminifera, and radiolarians. At this time, a shallow tropical sea covered most of the southern North American craton and was the site for sedimentation of a broad carbonate platform. Surrounding this carbonate platform was a starved trough comprising several bathymetrically distinct starved basins. These starved basins lay on the inner (continentward) sides of foreland basins that were bordered on their outer sectors by orogenic highlands. The highlands formed in response to convergences or collisions with the North American continent by an oceanic plate to the west, by South America to the south, and by Africa and Europe to the east. During a eustatic rise of sea level that accompanied the orogenies and reached its maximum during the *anchoralis-latus* zone, the carbonate platform prograded seaward and carbonate sediments cascaded over the passive shelf margins to intertongue with thin carbonate slope deposits and very thin (~10 m) phosphatic basinal sediments. Simultaneously, thick (~500 m) flysch and deltaic terrigenous sediments, such as the Antler flysch on the west and the Borden and Pocono deltaic deposits on the east, were shed into the outer parts of the foreland basins from active margins along the orogenic highlands. This Mississippian reconstruction provides a unique opportunity for comparing and contrasting shelf-slope boundaries in parts of contemporaneous passive and active margins on three sides of a Paleozoic continent.

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The Time is Now for All Explorationists to Purposefully Search for Subtle Trap