and on regional isopach maps of subsurface units within the Pierre Shale. Local thickening of shale marks the position of the shelf margin. Sandstone geometries may reflect ancient shelf features. Small-scale facies over 305 m may represent large sand waves such as are observed on modern shelves. The elongate northwest-trending lenses are similar in size and geometry to modern marine sand ridges, and the large area of sandstone may have been the site of close-spaced sand ridges.

SILBERLING, N. J., U.S. Geol. Survey, Denver, CO, and DAVID L. JONES, U.S. Geol. Survey, Menlo Park, CA

Mesozoic Accretionary Tectonics of Alaska

Most of Alaska represents an enormous mosaic of allochthonous tectono-stratigraphic terranes, each characterized by a distinctive pre-Tertiary stratigraphic and tectonic history. More than 40 terranes presently are recognized, ranging in size from thousands of square kilometers to unique tectonic blocks having outcrop areas of only a few square kilometers. With a single exception, all of these pre-Tertiary terranes evidently are allochthonous with respect to North America and to one another. Some are best interpreted as displaced parts of the continental margin, but others—particularly in southern Alaska—may be exotic to North America. Paleomagnetic studies show that some terranes such as Wrangellia, have been transported as much as 3,000 km.

Amalgamation of different terranes prior to final emplacement can be documented or inferred in a few places, but most of Alaska was tectonically assembled from individual lithosphere fragments and microplates during late Mesozoic time by complex accretion. Various schemes have been proposed for rotation and/or offset of northern Alaska into its present position. In south-central Alaska, southwest-trending terranes generally parallel the present-day Aleutian trench system. Outcrop patterns of rocks within these terranes point to mainly convergent late Mesozoic accretionary tectonics involving the development of nappes. Subsequent strike-slip faulting of these terranes is relatively minor, but original Mesozoic accretion of these belts may have involved large-scale transform displacement along the northwest-trending parts of the Tintina trench and ancestral Denali fault systems. Significant tectonic displacement continues only along the active strike-slip faults in southeast Alaska and accretion is limited to the mechanically related Aleutian trench system.

SILVER, BURR A., BERNIE B. BERNARD, and TIMOTHY DREXLER, Univ. Oklahoma, Norman, OK

Oswego Limestone, Aline-Lambert Fields, Oklahoma—Source, Reservoir, and Trap

The unitized Aline-Lambert field covers about 150 sq mi (241 sq km) in Alfalfa County, Oklahoma. Aline field produces oil from two or more porous zones in the Oswego Limestone whereas the Lambert field produces primarily gas but locally contains a thin oil column. Porous and permeable zones are discontinuous in this gas-solution drive reservoir. Gas-water and oil-water contacts in the field drop to the southeast at about 20 to 45° in the direction of regional dip. The trap is a porosity pinch-out.

The Oswego Limestone is composed of intercalated mudstones, wackestones, and packstones that range in thickness from 30 to 40 m. Maximum production in the field is from wells that penetrate a complex system of phylloid algal mounds. Distribution of the mounds is controlled by a break in slope from shallow shelf waters into a deeper water, northeast-trending embayment. Porosity values within the field range from 6 to 12%; permeabilities vary from 2 to 300 md. Porosity and permeability in non-producing wells in the area average 5% and 4 md. Five stages of cementation and partial dissolution have been recognized. Texture and isotopically light carbon values of the later stage cements suggest that they were in part formed during biochemical degradation of organics.

Initial correlation of hydrocarbons produced from the reservoir suggests that the Oswego was the source. Samples of the Oswego, juxtapositional strata, and oil and gas were processed and analyzed chromatographically for correlation studies. Organic extraction schemes involved the standard separation of alkane and aromatic fractions by column chromatography. Hydrocarbon fractions were analyzed by gas chromatography using glass capillary columns and flame ionization detection. In addition, total organic-carbon percentage in rock samples was determined by combustion and the resulting carbon dioxide was analyzed for its carbon isotopic composition. The resulting $\delta^{13}C$ values suggest a relation between indigenous organic matter and the later stage cements.

SIMONEIT, BERND R. T., Inst. Geophysics and Planetary Physics, Univ. California, Los Angeles, CA, and R. P. PHILP, Inst. Earth Resources, CSIRO, North Ryde, Austral.

Effects of Basalt Intrusions on Kerogens in Unconsolidated Oceanic Sediments in Guaymas Basin, Gulf of California

Pleistocene sediments in Guaymas basin, Gulf of California, have been intruded by sills. Their organic matter was thus subjected to thermal stress. Samples from DSDP/IPOD Sites 477, 478, and 481 and from unaltered material from Sites 474 and 479 were analyzed to characterize the lipids and kerogens.

The lipids of the thermally unaltered samples are derived primarily from algal and bacterial detritus. The samples near the sill contain the distillates; those closest to the sills contain essentially no lipids. The pyrograms of the kerogens from the unaltered samples reflect their predominantly autochthonous microbial origin. The pyrograms of the kerogens of the altered samples reflect the thermal effects by demonstrating a reduction in the complexity of the products, when compared with the unaltered samples. Kerogens adjacent to the sills produced little or no pyrolysis products.

The effects of intrusions into unconsolidated sediments resulted in in-situ pyrolysis of the organic matter as confirmed by these data.