vein-lining calcites exhibit systematic compositional changes with both time of deformation and with geographic position relative to major thrust faults. These isotopic changes in vein mineralization and pressure-solution products, together with the textural evidence for calcitization of host-rock and vein dolomite, suggest that these rocks were open to allochthonous fluid migration during deformation.

BUDNIK, ROY T., Bur. Econ. Geology, Austin, TX

Basin and Range-Age Reactivation of the Ancestral Rocky Mountains in Texas Panhandle: Evidence from Ogallala Formation

The Ogallala Formation (Neogene) is a widespread syntectonic alluvial apron that was shed eastward from the Rio Grande rift and related uplifts in Colorado and New Mexico during Basin and Range extension.

In the Texas Panhandle, the Ogallala completely buried Ancestral Rocky Mountain (Pennsylvanian) structures. Renewed movement on these older structures during the Neogene influenced the thickness and facies distribution of the Ogallala. The Ogallala thickens into the Palo Duro, Dalhart, and Anadarko basins. Major distributary channels on Ogallala alluvial fans coincide with the axes of these basins, whereas major interchannel areas overlie intervening uplifts. Second-order structures subtly influenced the unit as well. For example, in the Carson basin, a Pennsylvanian rhomb graben along the Amarillo uplift, the Ogallala is over 250 m (820 ft) thick compared with 90 m (275 ft) in adjacent areas. Within the Palo Duro basin, local highs controlled the distribution of thin, interchannel flood-basin and lacustrine deposits. Thicker, braided-stream channel deposits follow local lows.

Later movement on the Amarillo uplift broadly folded the Ogallala. The southern high plains surface subtly reflects basement structure, with topographic highs overlying basement highs, suggesting post-Ogallala deformation within the Palo Duro basin.

The Amarillo uplift is approximately perpendicular to the Rio Grande rift and parallel to the direction of Basin and Range extension. Thus, the stress field that produced the rift may have caused strike-slip movement and reactivation of the Carson basin along the Amarillo uplift.

BURCHFIELD, MARGARET R., Oklahoma Geol. Survey, Norman, OK

Oil and Gas Fields of Oklahoma

At the end of April 1983, there were 3,088 active oil and/or gas fields in the state of Oklahoma, as well as 32 officially named abandoned fields, according to the Nomenclature Committee of the Mid-Continent Oil and Gas Association. Oil and/or gas fields are located in 73 of Oklahoma's 77 counties, and represent over 4 million acres (1.5 million ha.) in surface area.

The Oklahoma Geological Survey has prepared a new, up-to-date map of all officially named oil and/or gas fields in the state, at a scale of 1:500,000. Each field is outlined, assigned an index number for reference, and designated by color code as either an oil field, gas field, or combination oil and gas field. As an improvement over oil and gas field maps available from commercial sources, the OGS has attempted to define better the geographic boundaries of each field. An alphabetical listing of all fields with their reference numbers and locations is featured on the map, along with a listing of smaller fields that have been combined into Oklahoma's major oil and gas "trends."

The map is designed for use as a reference by all oil and gas professionals in the state. The OGS oil and gas field map has been prepared in conjunction with the development of a computerized oil and gas field file for Oklahoma. Production of updated versions of the map in future years will be facilitated by digitization of information shown on the present map.

CALDWELL, J. H., P. S. VALUIKAS, R. M. PLATEK, and R. R. CASAVANT, Gulf Research & Development Co., Houston, TX

ISIS—Gulf's Interactive Interpretation System

For 2 years, Gulf Exploration and Production Co. has successfully used a powerful computer system for interactive graphic interpretation of large and diverse volumes of exploration data. This proprietary system, developed by Gulf Research and Development Co., is called ISIS (Interactive Seismic Interpretation System). Some of the capabilities of ISIS are demonstrated using videotape recordings of 3 actual interpretation sessions. The first session comprises interactive log analysis—editing formation evaluation, and tying between wells. The second session involves regional mapping from a large data base of seismic lines and well logs. Numerous access and display features allow projects exceeding 20,000 line-mi (32,000 line-km) to be instantly available at the interactive station, replacing large volumes of paper records. Horizons can be carried around loops and tied, then posted and contoured automatically. The third session demonstrates detailed reservoir characterization at a mature field. Over 225 digitized well logs are gridded and then analyzed using interactive graphic software originally developed for 3D seismic surveys.

CAPEN, ED, ARCO Exploration Co., Dallas, TX

The Exploration Decision: How Much Skill? How Much Luck?

Winning or losing on a simple flip of a fair coin has nothing to do with skill and absolutely everything to do with luck. Calling the flip should be one of the lowest paying jobs around, as no schooling whatsoever is required—a monkey in the zoo would suffice. Winning the 100-m dash at the Olympics has virtually everything to do with skill—reaction to the starting gun, the start, leg and arm motion, and concentration, for example.

The exploration decision (with elements of both luck and skill) requires a mixture of several talents if it is to bring forth the highest satisfaction, however measured: organizational abilities, factual knowledge, odds (chance) knowledge, calculation/assimilation knowledge, information integration skills, and perhaps even some mysticism. We want to examine the exploration decision process in a way that will allow us to get a better handle on the worth of these talents and the value of the information they deliver.

If we fail to come up with anything better, we can always award the decision job to the (choose one): (a) best salesman, (b) best dresser, (c) best oil finder, (d) nearest engineer, (e) most charismatic, (f) banker's nephew, (g) Bozo, the Gorilla.

CARBALLO, JOSE D., Marathon Oil Co., Houston, TX, and LYNTON S. LAND, Univ. Texas at Austin, Austin, TX

Holocene Dolomitization of Supratidal Sediments by Active Tidal Pumping, Sugarloaf Key, Florida

Sugarloaf Key is an area of active tidal pumping where Holocene dolomitization is occurring. Calcium-rich dolomite is found in a 0.25-10-cm thick surface crust which transgresses a thin layer of carbonate mud overlying the karsted Pleistocene Miami oolite. Radiocarbon ages of the crust range from 160 to 1,420 y.B.P. with a corresponding increase in dolomite content from 0% to 80%.

The relatively high permeability of the underlying Pleistocene oolite and low permeability of the Holocene carbonate mud results in a tidal lag between surface waters and the partly confined aquifer. Consequently, seawater is pumped upward and downward through the Holocene sediments during spring tides. The highest concentrations of dolomite are found where the sediment layer is thinnest and tidal pumping is most effective. Limited analyses of surface and subsurface water samples taken at intervals throughout the pumping cycle suggest that the dolomitizing fluid is essentially Florida Bay water, very slightly modified by sulfate reduction.

The earliest diagenesis of the sediment is by precipitation of dolomite cement which occurs as 0.1 to 0.3 μ subrounded crystallites that show no distinct crystal form. During further cementation, and somewhat later replacement, dolomite forms as 1 to 5 μ euhedral rhombs. The dolomite rhombs, which are poorly ordered, result from the recrystallization of many smaller preexisting crystallites. X-ray diffraction data indicate that the recrystallized dolomite is better ordered and less calcium-rich than the dolomite composed of crystallites.