zation began early in the burial history, after some compaction, ending before stylolites could develop. Hydrology may have been influenced by recharge areas in the northeast, but groundwater flow was mainly through carbonate-sand bodies; these bodies mainly controlled dolomitization patterns. Later dolomite was precipitated from warmer waters expressed through many of the same conduits. Ste. Genevieve dolomites may be early-stage, high-porosity analogs of many sequences of coarser saccharoidal dolomites.

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Faults Offsetting Land Surfaces in Southeastern Houston Metropolitan Area, Texas

Ninety-one faults with an aggregate length of more than 170 km have been mapped recently within a test area of 500 sq km in southeastern metropolitan Houston. Of the four oil fields in this area, three are associated with known salt domes and the fourth is thought to overlie a more deeply seated dome. Eighty-seven of the 91 faults are confined to two complex but well-defined curvilinear grabens that are closely related to the oil fields and underlying domes. A north- to northeast-trending graben connects the South Houston and Mykawa fields. A second graben, which trends southeast, intersects the first graben over Mykawa field, turns east to Webster field, then continues northeast to Clear Lake field and extends northeast beyond the map area toward Goose Creek field. The four faults that appear to be unrelated to the grabens include one fault extending northward into the mapped area from the Hastings dome, two faults that are probably regional growth faults, and one fault whose origin remains unexplained.

The pattern of faulting requires a genetic link between the faults and salt domes. Thus, the faults are natural geologic features, probably of Tertiary age. However, most offset of the present land surface appears to have occurred within the last half century. Although scarps in excess of 1 m exist today, only a few that have a 1-ft contour interval can be recognized on topographic maps that were surveyed in 1915-16. Although some allowance must be made for equipment and film, the number of faults that can be recognized on aerial photographs has increased dramatically since 1930 when large-scale coverage was first obtained. Moreover, present rates of offset on the 48 faults known to be active exceed the estimated average prehistoric rates by several orders of magnitude. Evidence that fault movement has increased sharply during the last few decades supports the hypothesis that recent withdrawal of subsurface fluids has triggered or accelerated movement along these ancient and natural planes of weakness.

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Pyritization in Shells of Living Bivalves

Several specimens of *Mercenaria mercenaria* and *Guekensia demissa* collected alive in early August from tidal marshes on St. Catherines Island, Georgia, were found to have a prominent brass-yellow material on part of the outer surface of their shells. On some individuals this may occur as a surficial coating, for a portion flaked off one specimen revealed an apparently unaffected outer shell surface. In another specimen, however, thin sections and sections examined by scanning electron microscopy (SEM) showed the material extended into the shell, following planes of weakness, such as growth lines and microborings, and replaced aragonite.

In thin section, the material is opaque to transmitted light and appears much like framboidal pyrite under oblique reflected light. Studies by SEM reveal a massive outer region grading into loosely packed masses of spheroids about 0.1μm in diameter. Energy dispersive X-ray analysis identified iron and sulfur as the principal components of this material. Preliminary X-ray diffraction studies on mechanical preparations of the outermost region of the shell were hampered by the low concentration of the material relative to aragonite; despite this, the strongest pyrite peak (311) was detected in both diffractometer and powder camera results. No other iron sulfides could be identified.

These observations strongly suggest that we are observing the process of calcium carbonate replacement by pyrite in a modern sedimentary environment.

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West Siberian Basin

The West Siberian basin ($\sim$3.4 $\times$ 10^6 sq km) is one of the largest structural-sedimentary basins of the world. The basin was relatively undisturbed by post-Triassic tectonism and erosion and is little changed from its original form when Early Jurassic deposition began about 180 m.y. ago.

The large Khanty structural high in the central part of the West Siberian basin is nearly 1,000 km long and 400 km wide. The axis bears five large domes, separated by depressions. The Khanty arch was a structural entity throughout the Mesozoic and is quite clearly the locus of greatest oil occurrence.

Although the depositional history of the basin was one of continual incursion and retreat of the sea, three megarhythms are recognized in the sedimentary fill: Triassic-Aptian, Aptian-Oligocene, and Oligocene-Quaternary. Continental sediments predominate at the base of each megarhythm, and largely marine and nearshore sediments are present at the top. Megarhythms are made up of macro-, meso-, and microrhythms, each of which has its transgressive and regressive phases. The search for paleoshorelines and related stratigraphic traps seems to be yet in an early stage.

Three major productive areas are recognized in the basin. In the west, near the Ural Mountains, oil and gas are produced from Upper Jurassic sandstones that pinch out against basement blocks. Along the middle