the best targets for exploration.

A modified fit between the facing margins of the South Atlantic, based on the correlation of geologic features, shows oil provinces to alternate between the two continents, indicating a segmented rather than symmetrical partition of the underlying rift sequence. Basement highs on one margin correspond to base lows on the other, filled with a rift sequence acting variously as heat conductor, source rock, and reservoir.

The breakup of Africa and South America resulted from their differential rotation. Ductile deformation at the tip of the northward propagating rift increased sharply where transversel "tough" tectonic elements held up and eventually deflected the propagating rift. In such areas, as in the Campos and Reconcavo oil provinces, continued differential rotation of the separating continents, without corresponding rates of rift propagation, created anomalous stress concentrations resulting in horizontal rotation and translation of small crustal blocks. The higher oil reserves of these areas, compared to the low averages of the South Atlantic, and their pattern of oil field distribution reflect the tectonic movement of these crustal blocks.

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Politics and Hydrocarbon Resources

Politics has been a major factor in many countries' development and use of hydrocarbon resources. Not generally known is that proved and potential hydrocarbon resource appraisals may be inflated or deflated because of political as well as economic considerations. For petroleum and natural gas, some producing countries have long used political means to establish "proved" reserves that may be far higher, or lower, than might be considered prudent. The case of Mexico (where oil and gas reserve estimates were inflated through political maneuvers because of that country's major borrowing needs) and others will be examined.

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A Model for Fracture Genesis—Application to Mesaverde Group, Piceance Creek Basin, Colorado

Natural fractures play an important role in determining gas production from the low-permeability reservoirs of the Mesaverde Group in the Piceance Creek basin, Colorado. The importance of natural fractures is evident from the number of natural fractures observed in core and from the high in-situ permeabilities measured in well tests as compared to the low permeabilities measured in core. An understanding of the natural fracture systems requires knowledge of variations in the state of stress and changes in the physical and mechanical properties of the different sedimentary layers during the evolution of the basin. Geologic processes such as burial, diagenesis, tectonics, uplift, and erosion, and their resultant effects on the overburden, pore pressure, temperature, and strain were included in an elastic-plastic model to approximate the stress history of the basin. These data, coupled with an extended von Mises failure criterion derived from laboratory experiments of the rocks in question, were used to predict the relative time and type of fracturing, and the lithologic layers in which a fracture was likely to occur. Observations of fractures in 4,200 ft (1,280 m) of core (1,200 ft, 365 m, of oriented core) from the Mesaverde Group taken from the United States Department of Energy's 3 closely spaced wells near Rifle, Colorado, have been used to document the genesis of natural fractures and substantiate the model results. Empirical information such as the present state of in-situ stress determined from hydraulic fracture stress tests and anelastic strain recovery measurements of oriented core, paleostrain directions and magnitudes determined from analysis of calcite twin lamallae, and current temperature and pore pressure provided data as well as checks on the accuracy of the model.

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COGS—Computer Oriented Geological Society

The Computer Oriented Geological Society (COGS), based in Denver, Colorado, is a professional organization of geologists and geophysicists that actively encourages application of computers to natural resource exploration and development. Founded in December 1982 as a user-oriented group, COGS is a network of earth scientists who both gain and contribute ideas and information regarding geologic computer applications. Dedicated to self-help and low-cost solutions, COGS offers a forum for discussion of common problems and allows new members to benefit from others' experience.

COGS membership ranges from geologists who are merely curious about the use of computers to geologist/programmers who write and market commercial geologic software. Most members own or have access to a computer, most often a microcomputer. The rapidly growing membership consists of more than 160 geologists and geophysicists in 12 states and 2 countries.

Monthly meetings feature a technical presentation followed by discussion. COGS has heard presentations concerning computer-aided mapping, species-diversity statistics, interactive geophysical modeling, double-Fourier analysis, and telecommunications, among others. Future presentations will include expert systems, geologic data-base management, well-log analysis, trend-surface analysis, and economic analysis of oil and gas prospects.

In addition to the monthly technical meeting, COGS publishes a catalog of all known geologic software for microcomputers, a membership directory, and a monthly newsletter. It also sponsors occasional workshops addressing some aspect of geologic computer work, co-sponsors the conference "GeoTech '84: Personal Computers in Geology," and distributes a diskette of public domain programs of interest to the geologist.

The diskette features 13 programs, for generating an oil well decline curve, printing a township plat map, analyzing well logs, and others. As more programs are incorporated, it is likely that the diskette will be replaced by a collection of 3-4 diskettes providing a core of general purpose geologic programs available to all geologists.

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Eustatic and Structural Control of Submarine-Fan Sedimentation, Conception Fan, Santa Barbara Basin, California

Eustatic sea level lows provide an opportunity for submarine-fan development; topography and structure, however, can control depositional-sequence geometry. Analysis of high-resolution seismic data provides a basis to evaluate the evolution and geometry of the Pleistocene-Holocene Conception fan. The fan formed in the restricted, tectonically active Santa Barbara basin. It consists of 4 vertically stacked depositional sequences, each bounded by nondepositional unconformities. The unconformities are defined by seismic-sequence boundaries and were formed during sea-level falls that are related to Pleistocene glacio-eustatic changes. Each depositional sequence consists of lowstand, sand-rich facies (fan channel, levee, and lobe) topped by highstand, mud-rich facies. The geometry of the depositional sequences tends to be rectilinear, not arcuate, because lateral progradation is restricted by topographically high structures.

The modern fan surface and the Holocene depositional sequence provide a good analog for the older, underlying depositional sequences. The fan surface is characterized by 4 main channels, 2 of which head into submarine canyons incised into the shelf. Submarine canyons that fed the other 2 channels are now filled and have no topographic expression. In addition, numerous partially buried channel segments occur in the interchannel areas. The Holocene depositional sequence consists of lenticular and sheet-drape deposits interpreted to be channel, levee, and lobe facies. The facies geometry suggests that Mutti's topographic compensation, channel migration, and avulsion were typical processes on Conception fan.

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Sedimentology and Depositional History of Neogene Gravel Deposits in Lower Tornillo Creek Area of Big Bend National Park, Texas

Neogene gravel deposits in the lower Tornillo Creek area of Big Bend National Park, Texas, record the filling of a small structural basin formed during Basin and Range tectonism. Four lithofacies are recognized in the Late Miocene La Noria member (informal name): (1) a medial braided-stream lithofacies consisting of upward-fining packages