

common-reflection-point seismic system. On a reflector near the Danian the structure exhibited closure of about 600 ft (1,830 m) over an area of 13,500 acres (5,463 ha.). What appeared to be a graben or downfaulted block covering part of the crest of the structure was referred to as the "collapsed area" on the original seismic maps. Seismic time sections showed two crests, with reflectors turning sharply downward into this central "graben."

A discovery and three evaluation wells, testing up to 3,850 BOPD, were drilled outside the central "graben." Later, when permanent platforms were installed in the Ekofisk field, a well was drilled in the center of the "collapsed" area and found 1,033 ft (3,149 m) of pay. Actually, there was no graben or collapsed area; the seismic anomaly which gave rise to this expression proved to be a velocity phenomenon due to the tremendous thickness of hydrocarbon-saturated, porous limestone.

Cumulative production from Ekofisk was 420,629,516 bbl of oil and 337 Bcf of gas sold through October 1978. Six satellite fields are being developed, four of which are on production as part of the Greater Ekofisk complex. Some of the Ekofisk wells have produced at rates greater than 20,000 BOPD. Estimates of proved reserves of the Greater Ekofisk complex indicate that it is a multi-billion barrel field.

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#### Mechanisms of Basin Subsidence

The accumulation of sediments in interior and continental-margin basins constitutes a load on the lithosphere which sags because of the sediment weight. Studies of the geometry of deformation suggest the lithosphere responds to these loads either by local compensation of an Airy-type crust or regional flexure of a strong rigid crust. Sediment-loading models of either type cannot, however, explain the substantial thicknesses of shallow-water sediments observed in deep boreholes in these basins. Other factors, such as thermal cooling of the lithosphere, crustal stretching or "necking," or deep crustal metamorphism, must therefore contribute to the subsidence. By quantitatively accounting for the subsidence due to surface loads, the subsidence caused by these other factors can be isolated.

We have used biostratigraphic data from commercial boreholes in the Mississippi embayment, the North Sea, and the Atlantic-type continental margin off the East Coast of the United States to examine the origin of the subsidence of these basins. From these data we determined the depths to stratigraphic horizons during basin development. Using the sediment-loading models the sediment layers at each basin were progressively "backstripped" and the depth at which the basement would have been in the absence of sediment loads was calculated. Corrections for the effects of compaction, water depth, and "eustatic" changes of sea level were included.

The "backstripped" basement depths indicate there is a recognizable component of the subsidence of these basins which is caused by processes other than adjustments to the weight of the sediments.



**AAPG-SEPM-EMD 1980 ANNUAL MEETING**  
**June 8-11, 1980**  
**Denver, Colorado**

The 65th annual meeting of AAPG, the 54th annual meeting of SEPM, and the 3rd annual meeting of EMD will be held in Denver, Colorado, June 8-11, 1980. The summer date has been chosen to accommodate members interested in having their families join them for a late spring visit to the spectacular Rockies. Mark your calendar now and plan to join us in the Mile High City.



In keeping with the convention theme "What's New—Advances in Exploration Science," papers are being solicited for a technical program which will emphasize the latest developments in (1) discoveries, exploration trends, and areas of significant activity; (2) new or novel applications of existing technology (applied science); and (3) development of new principles and concepts (basic science).

Technical sessions will be organized by AAPG, SEPM, and EMD. Interplay between these groups is planned through several jointly sponsored paper sessions. Poster sessions, open to each of the professional groups, are also planned.

Author candidates for both oral-paper and poster-session participation are requested to submit titles and