

Special Noon Meeting

PITFALLS IN SEISMIC INTERPRETATION

by Paul Tucker and Howard J. Yorston

Many pitfalls in seismic interpretation are concealed beneath seemingly straightforward reflections. But these can be avoided. They can be classified into three groups; those caused by velocity, those due to the geometry of the reflector, and those resulting from recording and playback.

Regional velocity changes seldom give trouble, but within small, deep, intermontaine basins, a false indication of basinward thinning is sometimes observed. Of greater concern is the abrupt change in velocity due to an equally abrupt structural change; the fault which creates false reversals, the reef with its underlying "high", the surface or seafloor irregularity with its coincidental subsurface reversal. The depth section can be used to avoid these pitfalls, providing it is not in itself a pitfall.

The geometry or shape of the reflecting surface is equally tricky. It can turn synclines into anticlines, reverse the throw of faults, superimpose one structure on another by sideswipe, and create a diffraction-anticline.

Our latest, and perhaps most serious pitfall is computer-derived. The recording and playback can mess up both the structure and stratigraphy. Here real structures can be suppressed, false bedding created, faults smeared, and all of the geology lost. Only through constant rapport between the geologist, the interpreter and the processing engineer will these recording and playback errors be avoided.

We will first demonstrate the geologic phenomenon that leads to these errors, then use seismic models to explain their origin, and finally provide simple validity tests for spotting the pitfalls.