

SEISMIC REFLECTION APPLIED TO SEDIMENTOLOGY

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Seismic data continually improve our picture of stratigraphy, a fact which led eminent specialists to define a special terminology to describe the features observed in seismic stratigraphy. This new science is growing fast in two directions:

The first one, a qualitative direction, lies in seismo-facies characterizing the reflection units i.e. interval velocity, continuity, configuration, amplitude and frequency in terms of lithofacies and depositional environments. Such an interpretation requires a good knowledge of the criteria by which the seismic units are defined.

The second one, a quantitative direction, is based on the synthetic seismogram, the first seismic model derived from a well which gives a close relation of the seismic trace with the stratigraphy. This modelling was extended in two and three dimensions, in order to duplicate time-sections. The seismic traces were inverted into seismo-impedance traces to investigate lateral variations in facies and to localize hydrocarbon occurrences.

Progress in the recording of high frequencies and in wavelet processing now permits the extraction of sedimentological information formerly hidden in the reflected signal. This information concerns the depositional sequence, and may be compared to the information obtained from well logs (electro-facies). However, with well logs, prediction of the environment is made vertically, whereas seismic allows control in two dimensions. Nevertheless calibration of well data is essential, and this requires close cooperation between geologists and geophysicists.

This paper presents examples from land and marine surveys, showing the successive steps of the interpretation.
