

Holostratigraphy of the Chalk of the North Sea

Haydon W. Bailey

Network Stratigraphic Consulting Ltd.

Chalk is a biogenic rock. It was formed from the plate like remains of microscopic golden brown algae called coccolithophores. Billions of these plates form the matrix into which bioclastic fragments of other organisms, including echinoderms, sponges, bivalves, foraminifera and radiolaria, all become buried.

When you consider it, Chalk is quite a peculiar rock, deposited during a period of extremely high sea levels, when sea surface temperatures were equally high and the North Atlantic Ocean was beginning to open, allowing a proto-Gulf Stream to develop. Early water mass gyres from which brought warm, well oxygenated flows into a semi-enclosed, cul-de-sac formed by a submarine, failed rift graben, which we now recognise as the North Sea Basin.

If you regard the deposition of chalk as being the result of a very slow rain of minute calcareous particles, which built up continuously, unaffected by tectonic movements and deposited as a drape, smothering underlying structures in a thick blanket of white mud, then think again. In order to understand the Chalk of the North Sea we have to recognise the affect of extra terrestrial cyclicity on algal blooms, the catastrophic impact of mass flow deposits triggered by earth quakes and the affects of major fault movements. Only by considering the composite factors which resulted in the deposition of the Chalk and applying a holistic analysis of all the constituents present in this most singular of rock types can we come to a better understanding of how it came to be deposited and why it represents one of the biggest reservoirs of hydrocarbons in Europe.