
PNG Micropalaeontological Special

WA Branch Technical Meeting - 22 January 1998

Late Tertiary Reefs Of New Guinea And The Philippines

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A reef is defined in the dictionary as "A narrow ridge of rocks or sand, often of coral debris, at or near the surface of water." When people think of reefs they usually think of the Great Barrier Reef of Queensland or the atolls of the south Pacific. These are what are usually called biohermal reefs. The living reef on the surface is made up of coral and algae which require warm, shallow, clear water to survive. They therefore form on submarine volcanoes or structural highs.

About 14 years ago I attended a lecture on limestones and reefs by Gerald Freedman of New York in Jakarta. He showed a series of slides taken of cores cut in a modern day reef. There was nothing in the cores below the top living reef that would indicate that the hole penetrated a reef. Most people seem to think a reef consists of solid masses of coral and algae.

A paper was published on reefs of the Salawati Basin, western Irian Jaya which are the main oil reservoirs. It was based on a report by an Indonesian geologist who used only electric logs to draw his conclusions. He did not examine any actual samples. There was no palaeontology or petrology carried out on any of the wells. This meant that there had been no petrological, age or environmental data available on which to base their conclusions. Based on my work in Papua New Guinea, my own results from Irian Jaya and other published data I came to the conclusion that these so called reefs were not reefs in the sense of biohermal reefs and were in fact deep water deposits made up mainly of reworked shoal limestone. The "reefs" are believed to be mounds of this reworked limestone or pinnacles formed by erosion of the limestone and represent a paleo karst topography.

Geophysicists see a big bump on a seismic section and therefore call it a reef. This could be a valid geophysical term but it unfortunately conjures up visions of bioherms. I think this is unfortunate because they may not know exactly what they are looking for, the time of burial, oil generation, migration and accumulation.

I have found a similar situation in the Gulf of Papua and offshore Palawan Island in the Philippines.

I think it is time for a major review of the late Tertiary limestones of this region as I believe it would lead to the discovery of considerably more oil and gas. Being pinnacles of a karst limestone rather than isolated reefs I believe that the large grids presently used in seismic surveys must miss a lot of prospects. Costs, however, could be the limiting factor to shooting small grids.