

STRATIGRAPHY AND PALAEOGEOGRAPHY OF HYDROCARBON-BEARING PERMIAN ROCKS OF SAUDI ARABIA AND OMAN

STEPHENSON, M. H. British Geological Survey, Nottingham, UK.

Permian rocks form the chief Palaeozoic petroleum reservoirs of the Arabian peninsula. The lower oil-bearing glaciogene part of the sequence (the Al Khlata Formation and part of the Unayzah Formation) is succeeded by fluvial/aeolian clastics and by widespread carbonates of the Khuff Formation. Palynological correlation indicates that the Al Khlata and Unayzah formations are in part coeval and range in age from latest Carboniferous to Sakmarian, in the case of the Al Khlata, and at least Early Permian to Artinskian-Kungurian in the case of the Unayzah. The Unayzah Formation is unconformably overlain by the gas-bearing basal Khuff clastics and palynology suggests that a hiatus lasting from the Artinskian-Kungurian to the Changhsingian (new Permian classification) is represented by the unconformity. Similar evidence suggests that the basal Khuff beds of central Arabia are broadly synchronous. The palynological assemblages of the lower glaciogene beds are like those of similar lithologies of Northern Gondwana, including the glaciogenics of the Chacoparana Basin (Argentina), the San Gregorio Formation (Uruguay) and the Salt Range (Pakistan), in that they contain abundant cold-climate zonate spores. Assemblages of Southern Gondwana (Australia, Antarctica, India) rarely contain such palynomorphs and are dominated by cheilocardiod spores and monosaccate pollen. This suggests climate-driven phytogeographic differentiation within Early Permian Gondwana. The assemblages of the Khuff clastics are similar to those of the arid/hot climate European Zechstein sequence. The palynology of the Permian Arabian sequence therefore demonstrates a climate change attributable to the northward drift of the subcontinent through the Permian.