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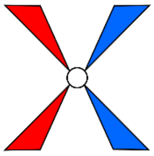
<tr><td><653/c></td><td rowspan="2">edge of the platform where a continuous sequence of oolites is though to be present. These oolites are likely to be similar to those present in Rustenburg-l, where a thin unit of cross-bedded oolitic grainstones about 2 m in thickness, is present at the base of the platform sequence (Fig. 28). These oolites were probably deposited as part of the coastal sand-barrier complex as it prograded basinwards, before becoming stabilised at the edge of the platform. They are characterised by the presence of primary intergranular pores and leached intragranular pores (Fig. 29a) but the total porosity does not exceed 10%. Generally, the lower unit of the Z3 Carbonate consists of tight, dolomitised carbonate mudstones with porosities and permeabilities rarely exceeding 3% and 3 mD, respectively (Fig. 28). The lowermost sediments of the unit commonly display an apparent porosity on wireline logs, which rapidly decreases upwards from the base of the formation (Fig. 28). This, however, is caused by the presence of clay minerals in the carbonates, which decrease in abundance upwards away from the Grauer Salzton and result in an anomalous log response. It does, nevertheless, have one benefit in that it makes the identification of the Z3 Carbonate relatively easy because when combined with the leaching profile at the top of the formation, it gives the sonic log a characteristic D-shape which is unique to the Z3 Carbonate (Fig. 28). At some localities, late leaching has enhanced the reservoir properties of the slope mudstones, although not as commonly as in the Z1 and Z2 Carbonates. An example of this can be found in Tønder-2, in southern Denmark, where very intense leaching has taken place (Clark 1980a). This has corroded and removed dolomite crystals to form an excellent porosity composed of both intercrystalline and intracrystalline voids (Fig. 29d). Some porosity was lost, however, as leaching progressed and the dolomite host became compacted around patches of replacement anhydrite (Fig. 29c; Clark 1 980a) but despite this, porosities of 20% and permeabilities of 20 mD have survived. In this particular case, the porosity is present in basin plain sediments (Clark and Tallbacka 1980) and therefore the potential pay is only a few metres in thickness. By analogy with the Z2 Carbonate, however, similar porosities could also be expected to be developed in base of slope sediments where the pay zone would be thicker and the rocks would make more attractive reservoirs. One problem that is more commonly encountered in the Z3 than in the Z1 or Z2 Carbonates, is that the sediments are widely affected by cementation and replacement by halite. The reason for this is that the formation is sandwiched between</td></tr>
<tr><td rowspan="3">

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<tr><td>thick units of halite</td></tr>
<tr><td>(Fig. I) and consequently the pores are prone to infill by the latter. In Rustenburg-l, the porosity and permeability that was initially observed from wireline logs and cores, was very low and did not exceed 1% and 0.2 mD, respectively (Fig. 28). This is because the intragranular pores have been occluded by a late-stage halite cement (Fig. 29a; Clark 1980a) and, only after washing the core plugs in freshwater, were porosities obtained that were more typical of the platform carbonates. At the same time, a vuggy porosity was also created in the lower unit of carbonate mudstones but this was found to have resulted from the dissolution of patches and veins of</td></tr>
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	replacement halite (Fig. 29b and c) and as such cannot be expected to be present away from the areas where replacement has occurred. Prediction of porosity in the **Z3 Carbonate** can be done in the same way as for the **Z2 Carbonate**, using either facies or isopach maps (Figs. 4c). However, as detailed facies maps are only available from Poland (Peryt et al. 1978), reliance has to be placed on isopach maps in most areas. These can be interpreted in a similar way to the maps of the **Z2 Carbonate**, with **a belt** of **porous oolitic grainstones** coinciding with **the thickest part** of **the formation**. Between **this belt** and **the basin margin**, **lagoonal sediments** can be expected and **beds** of **porous bioclastic grainstone** may occur locally in this situation. Basinwards of the zone of **maximum thickness**, **a wedge** of **slope and basin plain sediments** is present and **porous dolomites** may **occur rarely** at **the foot** of **the mud-wedge**. FIG. 29. Pore types in the **Z3 Carbonate**: (A) Intergranular and intragranular pores in an **oolitic grainstone** from Rustenburg-l. These pores have been occluded by **halite** cement (scale bar 1 mm) (B) and (C) Irregular **patch** (B) and **vein** (C) of **halite** that have replaced a **carbonate mudstone** from Rustenburg-l. These may be dissolved during core preparation and analysis to produce an anomalous vuggy porosity (scale bar 0.2 mm in B, and 1 mm in C) (D) **Porous dolomite** that has been compacted around **patches** of replacement **anhydrite** from Tønder-2 (scale bar 1 mm); (E) SEM photomicrograph of **corroded crystals** from the **porous dolomite** illustrated in Fig. 29d, showing both intercrystalline and intracrystalline porosity (scale divisions 10 microns). Collapse Breccias A less commonly developed reservoir that is found in Zechstein **carbonates**, is the so-called **collapse breccia**. These have formed in response to influxes of meteoric water during phases of uplift and exposure, and may be