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accidentally. Similarly, hydrocarbon generation during the maximum burial in latest Paleogene-Early Neogene time and migration in a structural setting different of that of today, may have caused the wide, but haphazard distribution of hydrocarbon shows in places which have no easy access to present-day kitchens: asphalt or heavy oil in Mesozoic limestones in the Vosges and Schwarzwald foothills, the heavy oil accumulation in basal Eocene limestones of the Allschwil-1 well W of Basel; and, most relevant, the find of an oil-impregnated fragment of Liassic in a probably Middle Miocene tuff breccia by Sauer et al. (1955: 365) in the foothills of the southern Black Forest:

They describe a tuff breccia filling a volcanic pipe, from a well drilled near Müllheim, in which they found a fragment of Liassic rock which showed, when smashed, droplets of oil. On circumstantial evidence, the volcanic explosion was dated as younger than the regional uplift and erosion of the Paleogene discussed above, and older than latest Miocene, viz. as probably Middle Miocene. Other fragments indicate that the pipe pierced a sequence reaching from the Paleozoic to the basal Tertiary. We regard the presence of live oil in that fragment as a strong indication for oil generation before the Neogene inversion viz. during the max. burial in the (?) Aquitanian.

Summarizing we see that in the Upper Rhine graben between Strasbourg and Mulhouse

- no Late Paleozoic source rocks are present;
- migration paths from the Toarcian source rock into Buntsandstein reservoirs, the original main target, are complex, so that it is difficult to predict whether and eventually where it could materialize;
- most of the strata overlying the Buntsandstein are permeable, a reliable seal only occurring c. 100 m above the top of the Middle Buntsandstein reservoirs;
- the reservoir quality of the Grande Oolithe, our main target in the later phase of the venture, is highly variable; porosities range from porous (Meistratzheim-1) to tight (Artzenheim-1);
- hydrocarbon generation most probably occurred before final structuration; during and after the Neogene uplift, early accumulations may have escaped to the surface or remigrated to new traps along paths which hardly can be predicted.

Adding up these negative elements for the Mesozoic play in the southern Rhine Graben, it becomes now clear, that exploration for hydrocarbons in the Mesozoic of the southern Graben was fraught with a very high risk. The fact that hydrocarbon generation apparently preceded the final structuration, makes a systematic search for, and the prediction of, hydrocarbon-filled traps difficult, in particular as the depositional record of the structural development is partially removed by erosion and, in a large part of the area discussed, is blurred by halokinesis.

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