Stratigraphy, geochemistry, petrography, and temporal evolution of the final stages of eruption at Rockeskyllerkopf, West Eifel volcanic field, Germany

Nesha D. Trenholm and Cliff S.J. Shaw
Department of Geology, University of New Brunswick, Fredericton, NB E3B 5A3

The Quaternary volcano Rockeskyllerkopf, in the West Eifel volcanic field, is a composite volcanic complex erupted on to dolomite of Devonian age, ~500 ± 100 ka BP. The eruption style evolved as interaction with ground and surface water decreased; from maar-like deposits to a scoria cone topped by a lava flow. The scoria cone is the focus of this study.

Within the upper most section of the Rockeskyll quarry,

Atlantic Geology, 2005, Volume 41, Number 2-3

the scoria cone and lava flow phase are well exposed in a near perfect radial cross section through the volcano. The scoria cone was erupted in three main stages: a) The initial crater wall building stage (~10 m thick) is characterized by poorly-layered to massive, subangular, welded, vesiculated lapilli, that average 1.25 cm in size. The middle five meters include a succession of coarsening upwards, ash to 6 cm lapilli, layers. b) The second stage (~14 m thick) exhibits well-developed, large scale layering, with the majority of the units containing lapilli up to 6 cm and bombs as large as 1m. The lapilli are rounded to subrounded and vesiculated, bombs range from vesiculated to weakly vesiculated and rounded to angular. c) The final stage of the crater wall formation (~12 m thick) is characterized by a reduction in lapilli size and finer layering. These deposits comprise ~2 cm sized vesiculated, rounded to subrounded lapilli, with sparse bombs up to 15 cm.

Overlying the crater wall deposits are crater fill deposits that disconformably overlie the layering in the wall. These fill deposits are up to 2.5 m thick and are composed of poorly layered and poorly sorted lapilli averaging 2 cm. Draped over the entire crater wall unit, from the bottom of the crater to the outer most exposure of the wall, are two welded scoria with ash layers. The next stage of eruption was dominated by effusive eruption producing spattered material including fragments with flow structures as well as bread crust bombs that filled and spilled over the crater wall.

The evolution of eruptive styles and materials produced, examined through detailed stratigraphic sections, will be correlated with geochemical and petrographical variations. This allows us to build up a picture of the textural and chemical evolution of the youngest deposits in the Rockeskyllerkopf volcano.