



A history of dealing with preferential flow in hydrology (or not?)

Keith Beven

Lancaster University, Lancaster Environment Centre, Lancaster, United Kingdom (k.beven@lancaster.ac.uk)

Preferential flows were recognised long before the equilibrium concepts of Edgar Buckingham and Lorenzo A. Richards were developed and became the dominant underpinnings of soil physics in the 20th century. This success of “soil physics” was effectively in denial of all the evidence that Buckingham-Richards theory was inadequate to deal with water flows in field soils. It was effectively based on the wrong experiment but, despite an increasing recognition of the importance of preferential flows, Buckingham-Richards theory remains the basis for most models of soil water. It is also suggested that more rigorous hypothesis testing is required in soil physics and hillslope hydrology, using both flow and tracer data. This might lead to a new paradigm in representing the details complexity of flow in soils in applications at larger scales.