



Water, solute and heat transport in the soil: the Australian connection

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The interest of Peter Raats in water, solute and heat transport in the soil has led to scientific and/or personal interactions with several Australian scientists such as John Philip, David Smiles, Greg Davis and John Knight.

Along with John Philip and Robin Wooding, Peter was an early user of the Gardner (1958) linearised model of soil water flow, which brought him into competition with John Philip. I will discuss some of Peter's solutions relevant to infiltration from line and point sources, cavities and basins. A visit to Canberra, Australia in the early 1980s led to joint work on soil water flow, and on combined water and solute movement with David Smiles and others. In 1983 Peter was on the PhD committee for Greg Davis at the University of Wollongong, and some of the methods in his thesis 'Mathematical modelling of rate-limiting mechanisms of pyritic oxidation in overburden dumps' were later used by Peter's student Sjoerd van der Zee. David Smiles and Peter wrote a survey article 'Hydrology of swelling clay soils' in 2005. In the last decade Peter has been investigating the history of groundwater and vadose zone hydrology, and recently he and I have been bringing to light the largely forgotten work of Lewis Fry Richardson on finite difference solution of the heat equation, drainage theory, soil physics, and the soil-plant-atmosphere continuum.