

OF CLAYS, COLLOIDS, AND COMPOSITES

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I decided on the above title for my Bailey Lecture because of its factual simplicity. That is, clays can behave as layered minerals, charged colloids, or particulate fillers of composite materials. The title also has a certain resonance with the theme of CMS2004: “Gorges, Clays, and Coulees”. Other than that this lecture is by and large a recollection of my interest and research in clay science.

I was introduced to clay mineralogy in 1960 when I was an honours student in soil science at the University of Adelaide, Australia. Because of his own interest in the swelling potential of soil clays, my supervisor (J.P. Quirk) suggested that I looked into the relationship between layer charge density and swelling ability of montmorillonite. My subsequent PhD thesis, jointly supervised by J.P. Quirk and D.J. Greenland, was concerned with the swelling (in water) of montmorillonite-organic complexes. Over the years many other scientists, including S.W. Bailey, have directly or indirectly influenced the direction of my research. My interest in, and involvement with, clays and clay minerals culminate in the recent compilation of the *Handbook of Clay Science* in collaboration with my co-editors, F. Bergaya and G. Lagaly.

Here I will outline some developments and advances in clay research that have occurred over the past 4 decades, with special reference to the clay-organic interaction. Wherever appropriate, I will give examples of practical applications, and point out potential research topics. Since much of the information is taken from the work of other people, I am acting as both spectator and player.