

1135-01-438

Ursula H Martin* (ursula.martin@cs.ox.ac.uk), **Christopher D Hollings** (christopher.hollings@maths.ox.ac.uk) and **Adrian Rice** (arice4@rnc.edu). *What does Ada Lovelace's correspondence with Augustus De Morgan tell us about her ability?*

Ada Lovelace (1815-1852) is famed as the author of a paper explaining the workings and potential of Charles Babbage's unbuilt analytical engine. She learned most of the mathematics she needed in a remarkable correspondence course that she took with Augustus De Morgan. She worked through his textbook on differential calculus, supplemented by patching the gaps in her knowledge through more elementary textbooks. Discussions with De Morgan show her grappling with material at the frontier of current knowledge, for example divergent series, and the subtleties of Peacock's Permanence Principle. We pinpoint Lovelace's keen eye for detail, fascination with big questions, and flair for deep insights, which enabled her to challenge some deep assumptions in her teacher's work, and suggest that her ambition, in time, to do significant mathematical research was entirely credible, though sadly curtailed by her ill-health and early death. (Received September 03, 2017)