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The Society traces its origin to the *Philosophical Society of Australasia* founded in Sydney in 1821. The Society exists for “*the encouragement of studies and investigations in Science Art Literature and Philosophy*”: publishing results of scientific investigations in its Journal and Proceedings; conducting monthly meetings; awarding prizes and medals; and by liaison with other learned societies within Australia and internationally. Membership is open to any person whose application is acceptable to the Society. Subscriptions for the Journal are also accepted. The Society welcomes, from members and non-members, manuscripts of research and review articles in all branches of science, art, literature and philosophy for publication in the Journal and Proceedings.

## Editorial

Sometimes an Editor gets lucky. This issue of the Society's Journal is one such time. I had no need to search for a topic to pen this Editorial on, as one just presented itself as the Journal came together over the past few months – the importance of *analysis* when studying a problem and seeking better understanding about its nature. Analysis is, of course, fundamental, to the scientific process, and at the heart of any interpretation of data, whatever field it arises from. But analysis can be a two-edged sword. Used well it informs, and provides depth to interpretations. Used inappropriately it can do the opposite, leading to mis-understanding, and yielding conclusions that are wrong, possibly with unfortunate consequences for decisions taken as a result. Proficiency in the many methods of analysis, and an appreciation of what information might sensibly be extracted from a data set, as well as what is inappropriate, or simply not warranted, is a necessary and indispensable element in gaining knowledge and understanding from it. On the other hand, making decisions based upon a belief or a gut feeling, without seeking to undertake just a little analysis on the issue at hand, may serve to perpetuate a misunderstanding, and lead to inappropriate actions.

The need for *just a little analysis* is the subject of David Wilson's – the winner of the Society's 2013 Edgeworth David Medal – opening discourse to this issue of the Journal, in this case focussed on applications for improving public health. Analysis can, of course, be complex. Sometimes it may

be presented as unnecessarily so, and the mathematical techniques applied then serve to obfuscate the issue. However complexity may lie at a problem's heart, and inappropriate simplification to make it apparently tractable might not be the way to inform understanding. Bruce Henry, Head of the School of Mathematics at UNSW, gives us an applied mathematicians response to the matter of analysis and its application.

Two other articles in this Journal also contain analysis at their heart. John Page tells us about the development of engineering simulations, and how they may be used to provide insight into the behaviour of some complex systems, in particular for the development of virtual reality systems. Brett Gooden, in a completely different application, examines how an organism from the early days of evolution on our planet, the Ediacaran *Dickinsonia*, might have been able to breath – through developing a simplified physical model for the process that is then amenable to a quantitative analysis regarding the rapidity of oxygen diffusion.

The two other articles to this issue are firstly from the Society's James Cook Medallist, Brien Holden and colleagues, on the important public health issue of correcting refraction error in vision, and secondly from John Nichols who applies an analysis to data on the performance of bond wrenches.

Michael Burton  
Hon. Secretary (Editorial)  
15 December, 2014

