

# **"As our Island of our Knowledge Grows, So Does the Shore of our Ignorance"**

Yakov Ben-Haim  
Yitzhak Moda'i Chair in Technology and Economics  
Technion – Israel Institute of Technology  
Haifa, Israel  
Zurich, 5 November 2019

The physicist John Wheeler is reported to have said: "We live on an island surrounded by a sea of ignorance. As our island of knowledge grows, so does the shore of our ignorance."<sup>1</sup> Wheeler's insight is that, for every epistemic rat that we kill or rat hole that we plug, numerous new ones crop up. Solving one problem is a relief, until we realize that new and unanticipated problems have emerged. In this lecture we will explain the following three assertions. First, there is a fundamental epistemological reason for the impossibility of knowing how much yet remains to be discovered. The potential for human knowledge is not at all like oceans and continents that can be inventoried. This is especially true in human affairs involving discovery, invention, deceit, etc. Second, computer simulation is a powerful tool for exploring the implications of existing knowledge. It can also explore the realm of the possible. It is less useful in adjudicating between alternatives that, given current knowledge, are viewed as impossible. Only testing in the real world can adjudicate between seeming impossibilities. Third, we can explore the implications of our ignorance by abstract analysis. For this we must model uncertainty in a very unstructured and non-committal manner; info-gap decision theory is one useful tool.<sup>2</sup> Nonetheless, reality-checks by experience and experiment are ultimately essential.

---

<sup>1</sup> John Archibald Wheeler, *Scientific American* (1992), Vol. 267.

<sup>2</sup> Yakov Ben-Haim, 2018, *Dilemmas of Wonderland: Decisions in the Age of Innovation*, Oxford University Press.

Yakov Ben-Haim, 2006, *Info-Gap Decision Theory: Decisions Under Severe Uncertainty*, 2nd edition, Academic Press.