

gence (the biological Universe)? Dick then looks at the ways in which the concept of cosmic evolution has entered the human consciousness in contemporary society, in part through the writing and television programs of the late Carl Sagan. I have no doubt that the late Sir Patrick Moore also played an important role in this regard. Consequently, the idea of cosmic evolution has been

... interwoven into the fabric of society well beyond its scientific content ... [although] The ultimate meaning of cosmic evolution is not yet apparent ... (page 328).

The final chapter, on “The Meaning of Discovery”, reviews the findings of the preceding 328 pages of this book by looking first at “The Natural History of Discovery” and finally at “Beyond Natural History: The Evolution of Discovery”. We are warned that although the scheme presented in this book accommodates most astronomical discoveries,

... we should take care not to shoehorn *all* discoveries into this structure ... [as] *There are interesting exceptions* ... [and] each of the components of discovery – detection, interpretation, and understanding – has its own *gray areas*. (pages 331–332; my italics).

Dick then discusses problems associated with the definition of ‘discovery’ and sings the merits of collective discovery. Thus,

... Galileo detected what we now know to be the rings of Saturn in 1610, Huygens interpreted them as such in 1655, and Maxwell showed how such an object could exist in theory in 1857 – a process encompassing more than two centuries. To say what is often said, that Galileo discovered the rings of Saturn, is to do violence to history, to conflate discovery beyond recognition, and to do a disservice to the beauty and complexity of science and discovery. The same may be said for other classes of astronomical objects. (page 336).

He then looks at the role played by developing technology in the occurrence and pace of discoveries, and produces Figure 11.1, a fascinating histogram that plots the number of discoveries against time for the past 450 years. This shows distinct decadal peaks that reflect Galileo’s access to the telescope in 1610, William Herschel’s use of large telescopes in the 1780s,

and a “... mountain of discoveries in the twentieth century, three times greater than the sum of the previous 350 years.” (page 338). The data used in compiling this diagram are assembled in a 23-page Appendix (number 2), at the end of the book.

Figure 11.1 automatically raises the thorny question of “Are we at the end of discovery or only the beginning, or somewhere in between?” (page 339). Different astronomers offer different answers, depending very much on how the term ‘discovery’ is defined. Only time will tell!

Ending the book are the two previously-mentioned appendices, 58 pages of Notes, a short “Select Bibliographical Essay”, a glossary and a detailed Index.

I hope that the foregoing account imparts some of the flavour of this remarkable book. It is an intellectual banquet, but too large for most of us to consume in just one sitting. It is composed of different courses: first an introductory entrée, followed by a main course comprising historical narrative garnished with theory provided by the history of science, and then a dessert that looks at the the present and the future of astronomical discovery. It is masterfully written (as are all of Steve Dick’s books), and is full of thought-provoking ideas and discussion. At just US\$45.00 it is very well-priced, and should join the bookshelf of many astronomers—not just those committed to the history of astronomy.

## References

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- Waluska, E., 2007. Quasars and the Caltech-Carnegie connection. *Journal of Astronomical History and Heritage*, 10, 79–91.

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## CORRIGENDUM

Unfortunately there is an error in the caption of Figure 4 in the following research paper, that was published in the July/August issue of this journal:

Steinicke, W., 2015. William Herschel and the ‘Garnet Stars’:  $\mu$  Cephei and more. *Journal of Astronomical History and Heritage*, 18(2), 199–217.

The new figure caption should read:

Figure 4: Herschel’s ‘large 20-ft’ telescope, shown here at Datchet in its original form (after Dreyer, 1912: Volume 1, Plate B).