

Abt's volume illustrates that the fixity of that designation was by no means assured before these various contexts had been navigated.

Abt's account, then, will not only be of interest to Egyptologists or archaeologists. Instead, it will be of interest to anyone who deals with academic institutions and their place in the world. For instance, *American Egyptologist* provides a useful account of the early history of the University of Chicago. It details the institutional policies that led to the employment of a scholar like Breasted, and to the place of his Oriental Institute within institutional strategy and development. It also details how funding for these policies was negotiated and obtained, whether through local, Midwestern sources or otherwise. Indeed, the volume provides an account of the University of Chicago that sheds new light on its meaning, especially considering how widespread and international Breasted's work for the institution was. It is, then, of relevance to a wide range of scholars, from historians of America to historians of the colonial world.

Ultimately, some criticisms can also be levelled. At 402 pages, the body of the volume's text is rather lengthy, and could perhaps have been judiciously trimmed. For example, the quotations used in the book are often overlong. Additionally, an element of the heroic lingers throughout the volume; despite treating Breasted and his Oriental Institute as very much of a certain time and place, the genre of biography chosen by Abt may have militated against moving away completely from an account of a 'great man' and his achievements. Meanwhile, Abt's volume does not make use of local, Arabic sources in order to understand Breasted's position within the societies in which much of his work actually took place. However, this criticism can also be levelled at the majority of published work on archaeology in the Middle East. Until there is a wider shift to understanding local material, this situation seems set to continue, and it would be unfair to single this volume out as problematic.

Ultimately, *American Egyptologist*, with its voluminous footnotes and copious useful illustrations, provides a major contribution to the wider understanding of (amongst others) Egyptology and archaeology. It also contributes to an understanding of how the place of those disciplines was negotiated within the wider academy and the world. It should, then, be of great use and relevance to a wide range of scholars.

WILLIAM CARRUTHERS
University of Cambridge

K. MARIA D. LANE, *Geographies of Mars: Seeing and Knowing the Red Planet*. Chicago and London: The University of Chicago Press, 2011. Pp. xiv + 266. ISBN 978-0-226-47078-8. \$45.00 (hardback).

doi:10.1017/S0007087412001252

Mars and its canals have long been fertile ground for historical analysis. The claim, first made in 1877, that straight dark lines could be seen on the planet, and the subsequent furore over whether or not these markings were evidence of extraterrestrial life, are by now well-known stories. In the last decade in particular there has been a resurgence of interest in this topic, combined with an array of impressive, thoughtful and complex reanalyses of these events. David Strauss's biography *Percival Lowell* (2001) has reconsidered the character and stature of astronomy's most vociferous advocate of the artificial-canal hypothesis. Robert Markley has linked the themes of ecology, literary representation and planetary astronomy in *Dying Planet* (2005). Robert Crossley has illuminated the rich relationship between fiction and science through humans' long history of *Imagining Mars* (2011). Martin Willis has examined Lowell through Victorian and modernist ways of seeing in *Vision, Science and Literature, 1870–1920: Ocular Horizons* (2011). And Jennifer Tucker has explored the public reception of photographs of Mars's canals in *Nature Exposed* (2005). Taken as a whole, these works – which build on Michael Crowe and Stephen Dick's pioneering histories of the plurality-of-worlds question – are a fine illustration of the

considerable historiographic gains our field has made in the last quarter-century. They have taken an episode that astronomy's own disciplinary histories have often suppressed as a silly mistake and rightly returned it to the heart of late nineteenth- and early twentieth-century history of science.

So why return to Mars? A consistent theme that underlies the above works has been the ability of the planet and its canals to act as a cultural mirror apt for the integration and synthesis of scientific, social and political narratives. K. Maria D. Lane's *Geographies of Mars* brings to this fruitful mix of literary and historical scholarship a fresh geographical perspective, and represents the most impressive interdisciplinary study of Mars yet. The book breaks a great deal of new ground and is exemplary of how the 'geographical turn' can reinvent well-studied episodes within history of science.

The book's structure builds out from geography's most concrete relationship with Mars – the map – to encompass the cultural geography of place and the political geography of race and empire. Lane begins by cogently arguing for the powerful role played by cartographic representation in establishing views of Mars as irrigated and inhabited. The ascendancy after 1877 of a specific kind of map – detailed, clear, abstract and ultimately geometrical – projected a scientific authority that only waned after the slow rise of planetary photography. The power of this visual authority was linked, Lane then suggests, to an equally influential shift in the locations in which Mars science was conducted. As observatories began to move away from metropolitan centres in search of better seeing conditions, the credibility of Martian observations became intimately connected with mountain sites and the privileged high-altitude vision that they enabled. Exploiting this relationship relied upon then-popular geographical tropes of heroic exploration, and the relative success of both the advocates and the opponents of the canal hypothesis was in part determined by astronomers' ability to cultivate such representations. In a shift in focus towards the broader cultural meanings of Mars science, Lane then analyses the contrasting public intellectual projects of Lowell and Alfred Russel Wallace, skilfully making the case for re-evaluating their message about inhabited Mars within the context of political and philosophical debates surrounding empire, race, technology and human progress. The final chapter then takes us 'Toward a cultural geography of Mars', and considers the small step from irrigated Martian landscapes to broad speculations about the physical and social characteristics of the Martian 'Others'. It has been a weakness of Martian studies generally that the rich output of imaginative fiction about the planet has been an all-too-tempting distraction, deflecting scholars away from analysis of the canals as a scientific concern. Lane avoids this pitfall by considering instead the 'imaginative geographies' of both Mars and Earth, seen here as reflections of the interwoven nature of science, politics and public culture in the early twentieth century. From this Lane draws out some (admittedly pretty broad-brush) distinctions between British and American responses to the idea of the superior Martian, and relates these to national attitudes towards imperialism. Here, quite clearly, geographical tropes 'allowed Mars to become a site of projection for terrestrial concerns' (p. 215). This climax encapsulates one of the book's great strengths, namely its success at making seemingly bizarre claims about Mars begin to make sense when analysed through the geography of scientific practice, representation and reception.

The book's only real flaw is its reliance on an anachronistic and simplistic conception of late nineteenth- and early twentieth-century astronomy's power structure and publications hierarchy. For example, calling Percival Lowell, the director of a state-of-the-art observatory with a large staff, an 'amateur' obscures more than it reveals. The claim that any sort of relevant distinction can be made between 'amateur' and 'professional' astronomers in this era needs to be handled with great caution, or else we risk treating one of the principal products of the Mars canal debate as one of its causes. Likewise, Lane's reliance on a supposed separation between 'astronomical journals' and 'the popular press' repeats the common error of assuming a binary conflict between inhabited-Mars theories promulgated by the latter and sceptical criticism forwarded by the 'professionals'

who only ‘reluctantly’ deigned to communicate outside the former (p. 12). In fact, the genres and modes of discourse employed by the actors within this debate are as complex as they are varied, though of course it is traditional histories of astronomy, rather than Lane, which deserve most of the criticism for the persistence of this binary perspective. Another small but frustrating flaw of the book is the poor standard of referencing. The endnotes are often vague and the bibliography conflates, for example, the works of Edward Pickering and his brother William (two men who had very different opinions about Mars), whilst some articles are listed with the wrong title and certain others are listed without volume or page information. Such criticisms are, however, greatly outweighed by how much the book does extremely well. Lane’s geographical perspective impressively enhances our understanding of the Mars canal saga.

JOSHUA NALL
University of Cambridge

PHILLIP. R. SLOAN and BRANDON FOGEL (eds.), **Creating a Physical Biology: The Three-Man Paper and Early Molecular Biology**. Chicago and London: The University of Chicago Press, 2011. Pp. ix + 319. ISBN 978-0-226-76783-3. £22.50 (paperback).
doi:10.1017/S0007087412001264

I will confess that until I read this book I was one of those legions, mentioned within, for whom the Three-Man Paper (henceforth 3MP) was a familiar reference due more to its mythical status in the history of science than to its substance. Even though I had cited the reference in a paper about genes and mutations, three words sum up what I knew about the 3MP until now: gene, green and Max Delbrück. Sloan and Fogel’s translation and treatment of the paper goes a long way toward filling in the gaps, as well as toward correcting various myths and misconceptions about it.

The 3MP – the English title of which is ‘On the nature of gene mutation and gene structure’ – was first published in German in an annual-reports-type publication of the Göttingen Academy of Sciences in 1935. Its cover was green. Max Delbrück was indeed one of the three authors, but no more substantial or significant a contributor than the other two men, Nikolai Timofeëff-Ressovsky and Karl Zimmer, each of whom contributed a different disciplinary element to the collaboration. The paper became the stuff of many legends among scientists, as the direct inspiration for Erwin Schrödinger’s famed *What Is Life* (1944) and, through that conduit, the spur for an exodus of physicists to biology; as the singular impetus for the birth of molecular biology; and paradoxically, in the view of one of its own authors, as a paper that went unnoticed in its time due to the obscurity and short-livedness of its parent publication. As the various contributors to the volume have shown, the myths not only present exaggerated or otherwise distorted accounts of the 3MP’s impact, dissemination and content, but also, in doing so, have underplayed its genuine importance in history. Comprising a translation of the original publication accompanied by commentaries from contemporary scholars, *Creating a Physical Biology* not only provides access to the content of the 3MP, but also sets it in its proper historical and philosophical context.

Five essays make up the context portion of the book, which is divided into three main parts following an introduction by the principal authors: a historical section with three essays, one of them by Sloan, a philosophical section with two, and finally the translated paper itself with a brief preface by the translator (Fogel) and a compilation of the references that appeared in the paper. The historical section, especially, brings to light how intellectual and technical advances in radiation biophysics and photosynthesis contributed to the marriage of quantum physics and biology that occurred in this paper. As William C. Summers points out, what was special and new about the 3MP was that it was the first attempt to apply the tools of the newly developing quantum physics to addressing questions about the specific biological phenomenon of gene mutation. Taken together, the five contextual chapters provide a comprehensive, if not harmonious, account of different aspects of the content and influence of the 3MP, complete with an example of the