THE PACIFIC CIRCLE

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PACIFIC CIRCLE NEWS

Recent and Forthcoming Publications and Scholarly Activities by Circle Members

Brett M. Bennett and Joseph M. Hodge, eds. *Science and Empire: Knowledge and Networks of Science Across the British Empire, 1800-1970*, PalgraveMacmillan, 2011.

Catherine Jami, *The Emperor's New Mathematics: Western Learning and Imperial Authority During the Kangxi Reign, 1672-1722*, Oxford University Press, 2012.

Ryan Tucker Jones, "A 'Havlock Made among Them': Animals, Empire, and Extinction in the Russian North Pacific, 1741-1810," *Environmental History* 16:4 (2011), pp. 585-609.

Warwick Anderson and Hans Pols, "Scientific Patriotism: Medical Science and National Self-Fashioning in Southeast Asia," *Comparative Studies in Society and History* 54:1 (2012), pp. 93-113.

Warwick Anderson, "Racial Hybridity, Physical Anthropology, and Human Biology in the Colonial Laboratories of the United States," *Current Anthropology*, 53 (April 2012), forthcoming.

HSS NEWS

The History of Science Society has moved. The new address is:

History of Science Society
440 Geddes Hall
University of Notre Dame
Notre Dame, IN 46556
USA

Phone: (574) 631-1194

The seventh joint meeting of the BSHS, CSHPS and HSS will be held in Philadelphia on July 10-13, 2012. This meeting has no stated theme; papers and panels on all topics in the history of science are welcome. Inquiries regarding the conference can be directed to info@hssonline.org.

The 2012 Annual Meeting of the History of Science Society will be held on November 15-18, 2012, in the Sheraton San Diego (California) Hotel and Marina. The Philosophy of Science Association will also be meeting and the conferences will open with a joint plenary on "Kuhn's *Structure of Scientific Revolutions*, 50 Years Later." Questions? Please visit http://www.hssonline.org.

FUTURE MEETINGS, CONFERENCES, and CALLS FOR PAPERS

12–14 April 2012. Fourth Conference of the Australian Association for the Advancement of Pacific Studies, to be held at the University of Wollongong. For more information, please visit: www.uow.edu.au/arts/UOW106714.html.

24–25 May 2012. "Community and the Sea in the Age of Sail," to be held at Aalborg University. This meeting will explore the history of ships, port cities, oceangoing and empire. Among the topics: historical agency within oceangoing communities; port cities and the shaping of oceangoing communities; rhetoric of class, race or gender; and power and struggle in the shaping of oceangoing communities. Keynote speakers include Prof. Marcus Rediker (University of Pittsburgh, USA) and Prof. Clare Anderson (University of Leicester, UK). For more information, please contact heinsen@cgs.aau.dk.

30 May – 1 June 2012. Conference on the Watercraft of Aboriginal and Torres Strait Islander Peoples, to be held at the Australian National Maritime Museum. For more information, please contact: nawi@anmm.gov.au.

24–27 June 2012. 93rd Annual Meeting of the AAAS, Pacific Division, to be held at Boise State University in Boise, Idaho, and co-located with the Snake River Section of the American Chemical Society and the Northwest Region of Sigma Xi, the Scientific Research Society. For additional information, please email aaaspd@sou.edu.

2–5 July 2012. 4th International Conference on the History of Medicine in Southeast Asia, to be held in Solo (Surakarta), to coincide with the meeting of

the International Association of Historians of Southeast Asia. The committee looks forward to papers and panels on all aspects of the history of health and medicine in Southeast Asia. Please send inquiries to Laurence Monnais at laurence.monnais-rousselot@umontreal.ca.

12–16 July 2012. Ninth International Congress of the History of Oceanography (IXHO-IX), to be held in Athens, Greece. The theme is: "Oceanography in the Age of Globalization." For information, please visit the Congress website at www.seok.gr or contact Dr. George Vlahakis, the local organizer. Email: gvlahakis@yahoo.com.

2–10 August 2012. 34th International Geological Congress, to be held in Brisbane, Queensland. Symposia topics include Geoheritage, Geoparks and Geotourism. Field trips will be included as part of the meeting. For information, please visit the Earth Sciences History Group at http://eshg.gsa.org.au.

4–7 October 2012. Annual Meeting of the Society for the History of Technology (SHOT), to be held at the Copenhagen Business School, Copenhagen, Denmark. For information about SHOT and the meeting, please visit http://www.historyoftechnology.org/.

18–20 October 2012. The 1st IHPST Asian Regional Conference, to be held at Seoul National University. Goals for the meeting include: 1) strengthening the links between HPS and science education in Asia; 2) showing different connections between the sciences and the humanities; 3) exchanging experience of research and implementation of HPS&ST in Asia and 4) establishing an academic platform for HPS&ST in Asia. For information, please visit www.ihpst2012.snu.ac.kr.

5–8 December 2012. Conference of the European Society for Oceanists, to be held in Bergen, Norway. The theme is "The Power of the Pacific: Values, Materials, Images." Questions? Please visit: http://esfo2012.com/en.

16–19 June 2013. 94th Annual Meeting of the AAAS, Pacific Division, to be held in Las Vegas, Nevada. Questions? Please contact Dr. Roger Christianson at rchristi@sou.edu.

8–12 July 2013. The 12th Pacific Science Inter-Congress, to be held at the Laucala Campus, University of the South Pacific, Suva, Fiji. The theme is "Human Security in the Pacific." Sessions will include, but not be limited to, biodiversity, governance, food and health, ocean development, climate change, sustainable development, and trade and economic integration. Contact the Pacific Science Association for additional information at www.pacificscience.org.

BOOK, JOURNAL, EXHIBITION and RESEARCH NEWS

Modern Asian Studies 46:1 (January 2012) is a special issue devoted to "Everyday Technology in South and Southeast Asia." Articles include consideration of rubber plantations in colonial Indochina, small garden machines in the Mekong Delta, sewing machines in colonial Dutch Indonesia, traffic and street life in colonial British India, and several others on radios and railways in the region.

Muse: Art, Culture, Antiquities, Natural History, the official magazine of the University of Sydney's museums, includes two articles of possible interest in the March 2012 issue: Tony Gill, "Drawing on Old Sketches for New Insights," about William Sharp Macleay's fish sketches (pp. 10-11) and Kirk Huffman, "Kava: A Pacific Elixir" (pp. 24-25).

The History of Medicine in Southeast Asia website is now up and running at http://www.fas.nus.edu/sg/hist/homsea/index.html. The site includes information about conferences, professional contacts and materials. For further information about HOMSEA, please contact: homsea@gmail.com.

The Hawaiian Journal of History invites authors to submit original, unpublished, documented articles on the history of Hawai'i, Polynesia, and the Pacific. For more information, please visit www.hawaiihistory.org.

Papers and other materials from the inaugural Asia-Pacific Underwater Cultural Heritage Conference are now available on line at: http://www.themua.org.

The AAAS Pacific Division has established a website for students. The site contains information about research and travel grants, as well as about other awards and aides. Please visit http://associations.sou.edu/aaaspd/Students/Students.html.

SELECTED RECENT PACIFIC BIBLIOGRAPHY

BOOKS and BOOK CHAPTERS

The Albatross and the Fish: Linked Lives in the Open Seas, by **Robin W. Doughty** and **Virginia Carmichael**, University of Texas Press, 2011.

All the Fish in the Sea, by **Carmel Finley**, University of Chicago Press, 2011.

Australian High Country Owls, by **Jerry Olsen**, CSIRO Publishing, 2011.

Australia's Wild Weather, by **Mark Tredinnick**, National Library of Australia, 2011. (See pages 10 - 11 for review.)

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Burke and Wills: The Scientific Legacy of the Victorian Exploring Expedition, edited by **E.B. Joyce** and **D.A. McCann**, CSIRO Publishing, 2011.

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The Great Melbourne Telescope, by **Richard Gillespie**, Museum Victoria Publishing, 2011. (See pages 12 - 16 for review.)

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ARTICLES and ESSAYS

"Another America: Russian Mental Discoveries of the Northwest Pacific Region in the Eighteenth and Early Nineteenth Centuries," by **Martina Winkler**, *Journal of Global History* 7:1 (2012), pp. 27-51.

"Australian Pirate Tales," by **Stephen Gapps**, *Signals* 97 (Dec 2011 – Feb 2012), pp. 22-26.

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"Colour Change in Darwin's Frogs (*Rhinoderma* darwinii, Dumeril and Bibron, 1841) (Anura: Rhinodermatidae)," by **Johara Bourke**, **Carlos Barrientos**, **Juan C. Ortiz**, **Klaus Busse**, **Wolfgang Bohme** and **Theo C. M. Bakker**, *Journal of Natural History* 45:43&44 (2011), pp. 2661-2668.

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"Discovery of a Remarkable New Species of Black Fungus Gnat (Diptera, Sciaridae) from Termite Nests in Malaysia," by **Mitsuaki Sutou**, **Munetoshi Maruyama**, **Takashi Komatsu**, **and Taisuke Kanao**, *Journal of Natural History* 46:15&16 (2012), pp. 969-978.

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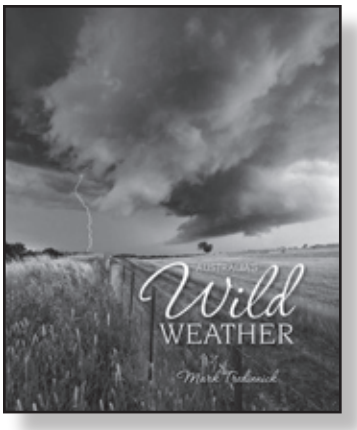
BOOK REVIEWS



Mark Tredinnick, ***Australia's Wild Weather,*** Canberra: National Library of Australia, 2011, Pp. 155; Color and B&W Photos. Notes. Cloth: AUS$105.00 and ISBN 978-0-642277237. Paper: AUS$39.95.

Climate scientists and climate historians who see the title of this book and grab it off the shelf will most likely be expecting something very different. It is not, as they will soon discover, a somewhat scientific treatise on present or past extreme weather in Australia. In appearance it is a 'coffee table book' and in content it is substantially a collection of photographs of weather-related phenomena taken from the collection of the National Library of Australia, with a linking text of reflections and some explanation.

Even more unexpected, the text has been written by a poet and essayist, Mark Tredinnick. As he comments, "I am not an expert on the weather. I am a writer… Weather is a passion of mine, part of a larger addiction to landscape" (p. 140).

The photographs are excellent, the work of about fifty photographers

including some of Australia's greatest, such as Frank Hurley, Max Dupain, Olegas Truchanis, Harold Cazneaux, Bruce Postle, Mark Strizik, Nicholas Caire and Peter Dombrovskis. There are brief biographical endnotes on each photographer.

Some of the photographs show beauty (snow and ice in the mountains, and morning mist), some show damage (Darwin after it had been largely destroyed by cyclones in 1897 and 1974), some show imminent threat (rain storms, dust storms and bushfires) and some show tragedy and hardship (drought and flood). At least one is amusing (middle-aged women having a picnic under their umbrellas while waiting for the events to start on the last day of the Melbourne Olympics) and one bemusing (a happy family in their backyard, the children playing in a paddling pool, while smoke from a bushfire billows threateningly in the sky behind them).

The first section of the book and text is a general essay or series of personal reflections on the author's experiences and travels in relation to the nature of the weather in Australia. A sample passage is:

> The Weather of Who I Am
> I go the way the weather goes, though not always in sync; eddies of energy rise and fall in me, travel me in a ceaseless, undulant, sometimes turbid and recursive circuit. The world that is my body is travelled [sic] by weather. We are creatures made largely, like the planet, of water; we are physical beings under the sun, moving in space, small wildernesses of microbes and energies, and all the rest of it… (p. 3).

The second part discusses and illustrates more specifically the elements of the weather – rain, wind, cyclones, dust, etc. Tredennick's reflections and descriptions are in places complemented by passages that indicate a level of research into the nature of Australia's weather and climate, as can be seen in lists of some of the major flood and drought periods since European settlement. His Acknowledgements indicate that he consulted climate scientist Ailie Gallant, who presumably had some input in the more scientific passages.

While I am unable to recommend this book to people seeking a deep understanding of the complex reality of Australia's wild weather, the photographs are well worth studying and for those of us in the Pacific Circle with a literary and poetic bent the text will be worth a read.

Don Garden
University of Melbourne

Richard Gillespie, ***The Great Melbourne Telescope,*** Melbourne: Museum Victoria Publishing, 2011, Pp. 188; Color and B&W Photos and Illustrations. Chronology. Bibliography. Notes. Index. Paper AUS$29.95 and ISBN 9781921833052

and

Nick Lomb, ***The Transit of Venus: 1631 to the Present,*** Sydney: New South Publishing and Powerhouse Museum Publishing, and University of New South Wales, 2011, Pp. 228; Color and B&W Photos and Illustrations. Glossary. Bibliography. Index. Cloth AU$49.95 and ISBN 9781742232690; Paper US$24.95 and 9781615190553.

On January 18, 2003, Australian brushfires driven by strong winds and hot summer-time temperatures, swept into the outskirts of Canberra. To the west of the city, Mount Stromlo and the nearby suburbs were the first and hardest hit by the terrifying firestorm. Four people died and more than 500 houses were destroyed. By the end of the day the astronomical observatory on the mountain was in ruins, and The Great Melbourne Telescope, subjected as it was to temperatures that are believed to have reached 1000 degrees Celsius, did not survive.

The news too spread like wildfire. The media – including the *Sydney Morning Herald* in Australia and *Sky & Telescope* in America – would all-too-soon be informing their readers of the burnt-out observatory domes, and of the incinerated tubes of the historic instruments that they housed. The pictures were not pretty: Six telescopes were lost in the blaze, including The Great Melbourne.

After the smoke had cleared, one thing was obvious: Richard Gillespie and his Aussie countrymen would have their work cut out for them: The task of restoring – if at all possible – the Great Melbourne Telescope, and of returning it to its original site at the Melbourne Observatory. It would be a Herculean task, requiring a team of astronomers, engineers, and others. Even today, the task remains unfinished.

It is tempting to think that Richard Gillespie saw something rising, like the proverbial phoenix, from the ashes of the fire, that he snatched up his notebook and his pencil and his camera, and that he began beating the bushes for a good story – because he found one.

Indeed *The Great Melbourne Telescope* is a not only a good story: It is a very good story.

Described as "one of the great hidden stories" of 19th century Australia, this tale-of-a-telescope is about much more than a telescope. Designed by leading British astronomers and erected at the Melbourne Observatory in 1869, The Great Melbourne Telescope – a 48-inch reflector ensconced in a lattice tube and mounted on massive bluestone piers – was, at the time, the second largest telescope in the world. Fully equipped with a clock drive to compensate for the Earth's rotation as it locked in on its heavenly targets, this new-kid-on-the-block was a "Masterpiece of Engineering" and more: With movements that were "surprisingly smooth and steady" it could accommodate the burgeoning demands of astrophotography at a time when idiosyncratic hand sketches from behind the eyepiece were being superseded by the objectivity of photographic plates.

But the Great Melbourne Telescope, with or without a camera, had a very specific job for which it had been especially built and for which it was especially well suited: To explore the physical nature of the "nebulae" that were visible in the southern skies: Were these "fuzzy stars" – these "nebulae" – really "clouds" of gas, and hence the nesting places of nascent suns, or were they something else? Were they, perhaps, incalculably vast "cities" of individual stars, of suns already born and swirling about in their own "island universes" outside the Milky Way?

The questionable existence of "island universes" would involve generations of telescope-wielding truth-seekers in what has come to be known to historians of astronomy as the Great Debate. In America, the Great Debate would go public in 1920 when astronomers Harlow Shapley and Heber Curtis faced off at the Smithsonian Institution, Curtis arguing that at least one "nebula" – known to astronomers as M31 – was indeed an island universe. Although the name "island universe" is a misleading phrase with a contentious origin, we now know that Curtis was at least partially right: Today, M31 is better known as the Andromeda Galaxy, something about which Victorian-era astronomers knew little.

But even as the work of the Great Melbourne Telescope fueled the debate about celestial fuzzies with drawings and photographs, and even as the imported instrument – made in Ireland – was aimed by foreign hands and peered through by foreign eyes, it became a symbol of Australia's rising prestige in the global scientific community, a

community that had been dominated hitherto by foreigners, especially Europeans.

Australian astronomers found it difficult to extricate themselves from foreign influence. They sometimes were compelled to look to the Mother Country – Victorian England – for support, and when they found it they took it. The Royal Society of London (which approved the design of the Great Melbourne Telescope, and inspected and praised the instrument when it was finished) proved a helpful ally, as did Cambridge University: Astronomers George Airy and John Herschel, both Cambridge alumni, played their parts, as did the Cambridge mathematician George Stokes; William Wilson, another Cambridge alumnus, was an outspoken advocate of placing a Southern Telescope in Australia; and when Albert Le Sueur, who studied under Stokes at Cambridge, was appointed the first director of the Melbourne Observatory in 1866, he remained for a period in Cambridge to be trained for his new responsibilities by yet another Cambridge alumnus – the eminent mathematician and astronomer John Couch Adams.

But European – especially British – attachments were not always blessings. The Crimean War (1854-1856) had aborted early plans for a Southern Observatory wherever it might be located, and it wasn't until the following decade that such an observatory was finally established in Melbourne in 1863. One suspects that it was the indefatigable William Wilson who best understood the several advantages of the Melbourne site when – in his 1856 "Report on the Steps taken in England to provide a Telescope for Observing the Nebulae of the Southern Hemisphere" – he touted its latitude, the transparency of its atmosphere, and the wealth and energy of its citizens as cogent reasons for locating a fully-equipped, state-of-the-art national observatory at that location.

In 1849 the British Association for the Advancement of Science had already called for a large reflecting telescope to be erected in the Southern Hemisphere, but where? And why? The hoi polloi in England and Australia had little interest in "speculative astronomy" and preferred the "practical science" of the heavens for which other observatories (like the one at Greenwich) were already well-known: the provision, for example, of a timekeeping service that had not only a practical payoff for civilians but for others too: It enabled naval captains to rate the error of their chronometers, and thus to calculate their longitude at sea. But wasn't there already an astronomical observatory, in operation since 1853, at nearby Williamstown, and wasn't it charged with keeping time, and wasn't that enough? As Gillespie points out, it was (only?) astronomy of this kind – astronomy as a "practical science" – that had a "legitimate claim" on government funds.

Even after its arrival at Melbourne in 1868, it took the better part of two years, from 1869 to 1871, to get the Great Melbourne Telescope erected and working

properly. And the government institution of which it was a part – still a "colonial observatory" Gillespie reminds us – was still engaged in practical astronomy. Indeed, its principal telescope was not the Great Melbourne at all: It was, instead, a transit instrument that was used to establish the positions of stars as they crossed the meridian – the immediate practical application of which practice was nothing other than "the determination of local time and the rating of ships' chronometers, essential for the safe navigation of ships from Australia to the rest of the world." On the other side of that world Astronomer Royal George Airy, wedded as he was to the utilitarian tradition of the observatory there at Greenwich, would have been pleased: He had, in fact, already described, in 1863, what he believed to be a Colonial Astronomer's proper duties – all nineteen of them, including the rating of ships' chronometers – and "speculative astronomy" was not among them.

Great as it was as a telescope, the Great Melbourne had mixed success as a photographic instrument. In 1872 photos of the Moon taken with the telescope were sent to Britain, and in 1883 the first photos from the Southern Hemisphere of the Orion Nebula (M42) were taken with new dry-plates. But the attempt to catch Venus as it ambled across the face of the Sun during its 1874 transit met with failure, as did the attempts by Joseph and Andrew Turner to photograph the Carina Nebula, an effort that tended to produce fuzzy images because of the long exposure time required.

And yet by the time Prince George and Prince Albert – both grandsons of Queen Victoria – visited the Great Melbourne Telescope in 1881, the heavenly spyglass had already become the city's scientific icon: Not only "a key instrument" in an international research program on nebulae, but a "focal point" for the public understanding of science.

But the Great Telescope wouldn't remain in Melbourne forever. In 1944 the Melbourne Observatory closed, and in 1945 the telescope was moved. Now fatefully relocated to the Mount Stromlo Observatory, it was rebuilt in 1992 for the purpose of studying Massive Compact Halo Objects (MACHOs) in order to find evidence (which it did) of the existence of the so-called "dark matter" that continues to perplex astronomers to this day.

But no one need be perplexed by Gillespie's book, a book in which *scientific facts* and *historical facts* form the warp and woof of a single narrative. Nor is Gillespie's narrative devoid of the sorts of serious philosophical questions that all attentive readers should ask: If, for example, "speculative astronomy" – from the study of "island universes" to the search for "dark matter" – is, to "ill-informed" politicians and their ilk, nothing more than an "ornamental" pursuit, why are they so indulgent of a peacetime pastime? Is it because they expect peacetime competences

to have wartime applications – as when the astronomical observatories at Stromlo were transformed, during World War II, into ad hoc factories for war-time objectives: the production of glass lenses not for astronomical telescopes but for gun sights to assist in the war effort? Or is it because wartime competences have peacetime applications – as in the adaptation to the MACHO project of electronic cameras developed for American spy satellites? Because the citadels of science have not always been put to peaceful purposes, readers should ruminate about these Faustian issues as they study Gillespie's book: For what purpose – vanity, wealth, power – do men continue to lust after knowledge? And do they build great astronomical observatories for the same "noble purpose" that they once built great Gothic cathedrals?

As a historian of science and the head of the History and Technology Department at Museum Victoria, Richard Gillespie seems to enjoy focusing his attention on the special and sometimes delicate relations that always prevail among practicing scientists, the institutional bodies that encourage or restrain them, and the political, social, and economic forces from which they cannot escape. There is little doubt that the excellence of his book is the product of his wide-ranging interests and talents. As a man who writes with eloquence about his book's astronomical center as well as about its astronomical periphery – from the omnipresent political machinations to the evanescent but transformational "gold rush" of 1851 – he is an author who has evidently done a good amount of archival work, traveling three countries – Australia, England, and Ireland – to sleuth about for the relevant materials. These materials evidently included not only the *Correspondence Concerning the Great Melbourne Telescope* (printed by the Royal Society of London in 1871): They must have included as well – and even more happily – some of the surviving but more personal correspondence of several Victorian gentlemen – astronomers George Airy and John Herschel among them, to name just two – who knew how to write (and to preserve) proper letters: These men did not leave their footprints – read "e-mails" – in the sand, and Richard Gillespie has emerged triumphant. It has taken him a good many years – and lots of good luck in finding the relevant paper treasures – to piece his story together, and historians of astronomy should appreciate and commend his efforts: They were probably much more Olympian than the casual reader of his book will understand, but they have not passed unnoticed by this writer.

As Fred Watson, of the Australian Astronomical Observatory in New South Wales, has opined: "If ever there was a book that all Australians interested in their cultural heritage should read, this is it." My hope is even larger: That Gillespie's book will find an appreciative audience well beyond the borders of his own country.

In his new book, *Transit of Venus, 1631 to the Present*, Dr. Nick Lomb – an astronomer at the Sydney Observatory and the author of the *Australian Sky Guide* – has produced what may be his most timely publication to date.

In anticipation of the approaching transit of Venus of June 5-6, 2012 – a celestial spectacle that has been seen but rarely and that will not be repeated until the year 2117 – Dr. Lomb has cooked up both a titillating textual treat and a full-bodied visual feast, and whether his readers choose to nibble at the book meditatively or to ingest it voraciously in a single sitting, they are sure to come away licking their lips and drooling for more.

But if a book – any book – is meant to be not simply a gourmand's goodie bag but a treasure trove of information and enlightenment, then the essential question that a mindful reader of Lomb's book should be asking as he reads is: How far away is the Sun, how do we know, and why is it important that we know?

Schoolchildren will be able to tell you that the Sun is about 93 million miles from Earth. Lomb will tell you much more. And he will tell you well, like the good and gentle story-teller that he is: sympathetic to beginners, ever eager to please, and full of surprises.

Perhaps the first surprise that will present itself to some readers will be their discovery that the will-o'-the-wisp in the transit-of-Venus chase was precisely this number: some 92,955,807 miles, give or take a hair. It is what astronomers call the Astronomical Unit (AU), and for centuries – as they gamely pursued the Astronomical Unit and fearlessly chased the elusive and wispy quarry to the far corners of the globe – astronomers have sometimes made (or unmade) their reputations by shaving hairs – a million miles here, a million there – from the face of the AU: The Sun couldn't <u>really</u> be so far away, could it?

Well, why not?

To the utter delight of all historians of astronomy (well, perhaps not all of them), there is, in the transit-of-Venus story, a full cast of *dramatis personae*, many of them asking this very question, and Lomb introduces his readers to some of them: Nationalist or narcissist, neophyte or nincompoop, it matters not, for all the world's a stage. Still it is the heavenly body itself, not the Earth-bound bipeds leering at it, that is always front and center.

This requires some skillful choreography, to be sure. But Lomb is as deft with the dance as he is punctilious with the pen, and he has refused to torture his audience with a soporific and tedious tome honed only for the astronomical cognoscenti. Instead, having found a trustworthy midwife (publisher), he has given birth to a divinely delectable brainchild, a 228-page femme fatale, fully worthy of its Venusian

namesake: a breezy, modest-sized, coffee-table type book complete with a nectar-and-ambrosia text and lots of retinal stimuli that are sure to entice the reader into turning the pages.

The textual treat is presented in a series of brief, easy-to-digest chapters covering the history and science of Venusian transits in chronological order, from the first predicted transit (in 1631), to the first observed transit (in 1639), to the first observed in America (in 1761), to the first observed in Polynesia (in 1769), to the first observed in Australia (in 1874), to the first observed from space (in 2004). For observing the approaching transit of 2012 – only the eighth transit of Venus to occur since the invention of the telescope – Lomb provides observing tips for novices (never look directly at the Sun!) as well as tabulated transit information for several major cities where (weather permitting) the spot-on-the-Sun spectacle will be either partially or wholly observable. These include several "down under" cities in Australia and New Zealand, and even more "up over" locales in the United States, Europe, and Asia.

The visual feast includes a cornucopia of images, and a discerning eye will see in those pictures how the history of visual representation – in astronomy and elsewhere – has unfolded itself over time: Pictures dating to the 18th century and the days of Captain Cook are hand-made drawings from the pre-photographic period; others, from the 19th century, showcase, in black-and-white, the state-of-the-art photography of the day; and others still, showing the 2004 transit (the first of the 21st-century pair), appear in full-color images, some intentionally enhanced with space-age aplomb to produce "unreal" pictures of what the unassisted human eye is utterly incapable of seeing. And in cases where the images are of spherical objects such as Venus or the Sun, it is especially noticeable that the square (9-by-9-inch) format of the book works to some advantage, as a circular image can be easily and symmetrically inscribed inside a square to completely fill the page. This, clearly, is no accident. Such things happen only by design. And the author and the publisher, working as a team, surely deserve some credit here.

But there is still more credit to spread around. Without sidetracking the reader with too much detail, a multitude of short ancillary passages have been inserted into the book in separate "boxes" – stylistic asides that provide, Hamlet-like, important information about what is transpiring, or has already transpired, onstage. These sections include a summary of "fast facts" about Venusian transits; a description of Venus's physical attributes; a biography of Johannes Kepler, who predicted the 1631 transit; a biography of Jeremiah Horrocks, who predicted and successfully observed the transit of 1639; a brief treatment of the problem of "finding longitude" at sea; a discussion of the results of the 1761 transit; a biography of Captain James Cook,

who observed the 1769 transit from Tahiti; a discussion of the notorious "black drop" effect, which repeatedly tarnished the transit observations; an analysis of the results of the 1769 transit; a discussion of nineteenth-century astrophotography; a treatment of the results of the "British and Colonial" observations of 1874; a description of the results of the American efforts of 1874 and 1882; a layout describing, with both text and pictures, some of the harvested results of NASA's Magellan spacecraft which, after being launched from the space shuttle Atlantis in 1989, spent four years in orbit around Venus; a spread on the 2004 transit-of-Venus observations made with the Swedish Solar Telescope from the island of La Palma; and another spread on NASA's TRACE satellite with which, for the first time in history, a transit of Venus was observed from space. There are, in addition to these several separate asides, three others that will be of special interest to Australian readers: a biography of Australian astronomer John Tebbutt, a description of the Great Melbourne Telescope, and a description of the photoheliograph used at the Melbourne Observatory during the 1874 transit. And of the last three "asides" in the book: one discusses the usefulness of the transit method in the modern-day search for Earth-like exoplanets, another explains "How a Transit of Venus Works", and the last provides tips for "Observing the Transit Safely" when it occurs in 2012. These timely "asides" are, in most cases, no more than one or two pages. Are they distractions? Yes, they are. But they are delicious ones: sweet treats that allow the reader to skip around at leisure and, like picking up and sniffing at all the tempting truffles stuffed into a box of expensive chocolates, always certain of biting into something delectable.

There are, of course, elements more central to the transit-of-Venus story that Lomb could have discussed that he did not – elements less "patriotic" than the peripheral material on an Australian telescope or an Australian observatory or a comet hunter (John Tebbutt) from Down Under perhaps, but worthy elements nevertheless. He could have asked (and answered) the question: What were the practical benefits of knowing the Astronomical Unit (the Earth-Sun distance) to modern-day precision? The question is a good one, and the answer belongs in the four-page "aside" of Lomb's book called "Finding Longitude" where inquisitive readers (in Australia and elsewhere) might be pleased to learn that the Astronomical Unit was historically related to the tables of "Lunar Distances" printed in the *Nautical Almanac*. In fact, the numbers (actually predictions) found in those tables gave the transit-of-Venus chase a real utilitarian goal, one that was publicly discussed by George Forbes in 1874. Forbes, a Cambridge-educated astronomer and a member of the British 1874 transit-of-Venus expedition to Hawaii, wrote with illumination:

> The transits [sic] of Venus will aid materially in perfecting the Lunar Tables [in the *Nautical Almanac*]. The motions of the moon are rendered irregular by the disturbing attraction of the sun. But we cannot determine with great accuracy

> either the amount or the direction of the sun's attraction upon the moon until we know accurately the sun's distance. Hence if we wish to be able to compute tables of the moon sufficiently correct for the exact determination of longitude, we must employ every means in our power to perfect our knowledge of the sun's distance.

This could have been another little surprise in Lomb's otherwise delightful goodie bag of surprises. It wasn't. And that's too bad.

This is, of course, but a critic's cavil: a small "sin of omission" that is easy to forgive. Unfortunately, there are little "sins of commission" in Lomb's book too. And while readers outside Australia will welcome a book from Down Under that discusses its subject matter with both authority and dexterity, some will predictably take exception to the liberties Lomb takes when he lapses into anecdote and first-person narrative (p. 180), or when, into the astronomical and historical facts, he chooses to interject his opinions: Was Cook's "most famous voyage" (p. 48) his first – the one that, after his observations from Tahiti of 1769 transit of Venus, led him to the discovery of Australia? Or was it his last – the voyage that led him to the discovery of Hawaii? And did Cook name the group of Pacific islands neighboring Tahiti the "Society Islands" in honor of his English patrons at the Royal Society of London (as at least one scholar in Hawaii has proposed), or did he so name them because of "their proximity to each other" as Lomb (p. 93) suggests? Lomb's answer to the first question is easily understood once his readers discover (from the Bibliography) that he is also the author of another book, published in 2004, and entitled *Transit of Venus: The Scientific Event that Led Captain Cook to Australia*.

Because the transit-of-Venus story is such a big story – it has included an international, intergenerational community of scientists and has now spanned nearly four centuries – the author of *Transit of Venus* is to be forgiven his peccant peccadilloes: They are minor. And because Lomb is so obviously well-qualified to write about transits of Venus – three of which (those of 1874, 1882, and 2004) have been observed in his home country – he is also to be forgiven when his effusive enthusiasm for – and his obvious knowledge of – the history of astronomy in Australia overtakes his narrative, and American devotees of the heavens will be especially happy to see that he has propitiated his Sydney-based sinning by including in his book a glorious selection of worshipful images from NASA.

But have no doubt: Overall, Lomb's book gives a good, authoritative, smoothly written, and richly illustrated summary discussion of transits of Venus in general, and the author is to be commended for an especially rich treatment of the relationship between Venusian transits and the history of astronomy in Australia. Taken as a whole, Transit of Venus should be a welcome addition to the libraries of both casual

readers as well as professional historians of science who know little or nothing about the history of astronomy Down Under.

For those wishing to pursue the transit-of-Venus story beyond the pages of Lomb's book – and the story is really much, much larger than can be easily assimilated into just one medium-sized, coffee-table type book – the Bibliography includes references to books, journal articles, and web sites that will push the reader in the right direction.

Although, after bringing so much excitement to the world for nearly four centuries, the approaching transit of Venus may appear anticlimactic to some, Lomb encourages his reader's to observe, if at all possible, the once-in-a-lifetime event when it occurs in June.

His words, like his book, should not go unheeded.

Michael E. Chauvin, Ph.D.
Independent Scholar

SUBSCRIPTION and STAFF INFORMATION

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Prof. Peter H. Hoffenberg
Editor, *Bulletin of the Pacific Circle*
Department of History
University of Hawai‘i
Honolulu, Hawai‘i 96822 USA

Phone: (808) 956-7675
Fax: (808) 956-9600
Email: peterh@hawaii.edu

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