

Giovanni Schiaparelli's map of linear 'canals' on Mars sparked a debate that lasted for more than 80 years.

ASTRONOMY

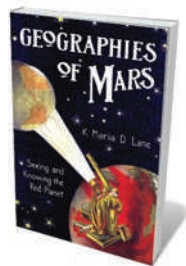
Martian illusions

The Mars canal controversy is a reminder to be cautious when interpreting alien worlds, notes **Michael Carr**.

Present-day Mars is dry, cold and inhospitable, yet we know from rovers and orbiting satellites that it has a rich geological and climate history. Past conditions may even have been benign enough to support forms of life. The possibility of life on Mars is, of course, not a new idea. In the late nineteenth and early twentieth century, the public was captivated by reports of canals on Mars, supposedly built by an advanced civilization in response to a desiccating planet.

Maria Lane's meticulously researched *Geographies of Mars* describes the canal controversy. She explains the intellectual and social factors that fed into the canal concept and its broad acceptance. The view of Mars as an "arid dying, irrigated world peopled by unfathomably advanced beings" grew from the geopolitics of European imperialism and US expansionism, Lane argues. Modern Mars is not discussed.

The basic story is familiar. Following the close opposition of Mars to Earth in 1877, Italian astronomer Giovanni Schiaparelli published a cylindrical-projection (Mercator) map of the red planet's surface. It showed numerous linear features, which he termed *canali*, that did not appear on other portrayals. The reality of the lineaments was initially questioned, mainly by British astronomers. But after their independent confirmation in 1886 by the European observers François Terby and Henri Perrotin, there was an explosion of canal sightings. By the end of the nineteenth century, most of the published



Geographies of Mars: Seeing and Knowing the Red Planet

K. MARIA D. LANE
University of Chicago
Press: 2010. 266 pp.
\$45

maps showed Mars's surface criss-crossed by a spider-web pattern of canals.

The US astronomer Percival Lowell added 116 new canals to Schiaparelli's map, and forcefully argued in highly publicized talks, books and magazine articles that the canals were built by intelligent beings. This 'sensation' sputtered out after 1910 as better photographs of Mars failed to reveal the features. Nevertheless, the canal idea died hard.

In 1961, French astronomer Audouin Dollfus published drawings showing canals, and in 1964, US astronomer Earl Slipher published photographs that he claimed removed any doubt about the canals' existence. Linear features were even portrayed on some of the charts that my colleagues and I used in 1971 during NASA's Mariner 9 Mars mission.

How did this come about? Lane suggests that presenting the canals in cartographic form gave them authority. The maps made implicit claims about the surface of Mars, conveying certainty that the same features would appear in the same place. Initially,

most observers simply published sketches of what they had seen. In 1878, English astronomer Nathaniel Green also published a Mercator map. Green's map was subtly shaded and lacked canals, whereas the features of Schiaparelli's were crisply defined. Owing to its clarity, Schiaparelli's map became accepted, as were his Mediterranean names for Martian landmarks.

Another factor in the acceptance of the canals was the superior observations claimed by those who promoted the canal idea. Lowell scorned observing conditions in Europe and the eastern United States, preferring to do his work in the western state of Arizona, with its mountains, dry air, isolation and environmental purity. He capitalized on contemporary enthusiasm for the wilderness, claiming that mountains were places of transcendence and divinity, sites of purity and vision. The view of astronomers as explorers conquering mountains and undergoing hardships for the cause of science was promoted, and comparisons were made with the polar expeditions of Robert Falcon Scott and Robert Peary.

Most sensational was Lowell's proposal that the canals were irrigation channels built by intelligent life, an idea that captivated public attention and provoked disagreement among scientists and commentators. By the 1890s, Mars was widely viewed as a vast desert, and its habitability was argued in that context. The most prominent debaters were Lowell and British biologist Alfred Russel Wallace.

Wallace claimed that the biological conditions necessary for life were not met on Mars. He noted that temperatures were unlikely to be warmer than on the Moon, and that there seemed to be little water. Lowell acknowledged that conditions were harsh but held the view that they were not severe enough to kill off all life. If one accepts Lowell's maps and their clearly artificial patterns as representing the truth, then his conclusions had some logic. But it is still a puzzle as to why Lowell and his followers became so convinced that they could see the spider-web patterns. Lane suggests that the inhabited Mars theory was also tied to the perceived objectivity of maps. When that objectivity faltered with the acquisition of better photography, so did belief in intelligent Martians.

Lane does not discuss the contemporary implications of this saga. An obvious analogy is the 'Face on Mars' controversy, in which a face-shaped hill seen in a poor-resolution image taken by the Viking 1 orbiter in 1976 was interpreted by some as evidence of an advanced civilization. Later, when images of much higher resolution showed that the hill was not face-shaped at all, a government conspiracy was invoked. Similarly, isolated hills have been interpreted as pyramids and surface streaks as runways.

Lane criticizes the process of naming features on the nineteenth-century Mars maps as

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nationalistic manoeuvring. The astronomical community today is sensitive to this issue; for example, large river channels are now named using the word for Mars or star in various languages, and small craters are named after towns and villages from across the globe.

Professional astronomers have criticized Lowell for his cultivation of the media. Some planetary scientists today are similarly uneasy about the part that publicity plays in the Mars

exploration programme. Discoveries and their implications are kept confidential and announced with great fanfare at press conferences before being presented and challenged at scientific meetings. As a consequence, a more sensational interpretation of a newly discovered feature can get the most attention, irrespective of its merit.

After the Viking Mars landers failed to detect life in the late 1970s, geneticist Norman

Horowitz cautioned that the seductive idea that life could have started on Mars means we should take care in interpreting new findings and presenting them to the public. Lane's book reminds us that is still good advice. ■

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SCULPTURE

The brain in a nutshell

Martin Kemp explains the resonances of Pascale Pollier's autopsy-inspired sculpture.

Medicine has long used visual representation in ambitious ways. This is particularly true if we include the illustrated herbals inspired by the great five-volume encyclopaedia by Dioscorides (AD 40–90). Because art has traditionally centred on issues of human existence, medicine has also inspired many artists.

Recent works based on medical themes have tended to use metaphor and allusion rather than direct illustration. A striking example is provided by Belgian biomedical artist and poet Pascale Pollier, in a sculpture currently on show in the exhibition *Picturing Science* at the Riverside Gallery in Richmond, near London.

Her intense piece is enigmatically entitled *Autopsy in a Nutshell*. A bell jar, into which two coils of wire enter, contains a magnifying glass, two light-emitting diodes and a jointed stand with two sprung clamps. The beaks of the clamps grip a small model of the human brain and half of a walnut shell, the inside of which has been minutely remodelled to match the inside of a cranium.

As the title suggests, it was inspired by Pollier's witnessing of an autopsy. The first version of the piece was commissioned by Belgian learning expert Bernard Lernout, a great aficionado of Leonardo da Vinci and a fan of Michael Gelb's historically eccentric but creatively ingenious book, *How to Think Like Leonardo da Vinci* (Delacorte Press, 1998). Lernout directed Pollier to Gelb's seven Leonardesque "principles": curiosity (*curiosità*), demonstration (*dimostrazione*), sensation (*sensazione*), smokiness or ambiguity (*sfumato*, a layered paint effect), art-science (*arte/scienza*), embodiment (*corporalità*) and the connections between things (*connessione*).

Pollier picked up on three of these: demonstration, defined by Gelb as "learning



Autopsy in a Nutshell (2006) exploits more than the visual similarity between the brain and a walnut, as revealed on closer inspection (bottom).

Picturing Science

Riverside Gallery,
Richmond, UK
Until 26 February
2011.

from experience"; art-science, as balancing the properties of the two sides of the brain; and connection, as

the need to see the big, linked-up picture. Her modestly sized, elaborate and detailed construction does not illustrate an autopsy, rather its making is framed by Gelb's three principles. Her artwork invites us to read meaning into the conjunction of objects. Faced with an image as powerful as that of a brain removed from its bony container, we can take up her invitation.

But why the walnut? It clearly exploits the visual resonance between a furrowed walnut plucked whole from its halved shell and the wrinkled configuration of the brain. It also refers to the ancient and cross-cultural idea of the microcosm and macrocosm, which highlights similarities of form and function across every scale in nature and the wider Universe. Old herbal medicine in both Western and Eastern cultures used this doctrine to help determine the source of treatments. A herb or fruit that resembles a human organ was seen as potentially efficacious for treating a disease of that organ.

Before we smile patronizingly at such ancient mysticism, it is curious to note that walnuts could have an effect on some ageing disorders of the brain. The late James Joseph and his team at Tufts University in Boston, Massachusetts, reported in the *British Journal of Nutrition* in 2009 that a diet including walnuts seemed to improve cognitive function in ageing rats.

As happens in the best scientifically orientated artworks, a visual starting point opens up a range of associations across historical and contemporary practice. ■

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