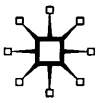
Imagining Outer Space

European Astroculture in the Twentieth Century

Edited by

Alexander C. T. Geppert
Emmy Noether Research Group Director
Freie Universität Berlin

palgrave
macmillan



First published 2012 by
PALGRAVE MACMILLAN

Palgrave Macmillan in the UK is an imprint of Macmillan Publishers Limited, registered in England, company number 785998, of Houndmills, Basingstoke, Hampshire RG21 6XS.

Palgrave Macmillan in the US is a division of St Martin's Press LLC, 175 Fifth Avenue, New York, NY 10010.

Palgrave Macmillan is the global academic imprint of the above companies and has companies and representatives throughout the world.

Palgrave® and Macmillan® are registered trademarks in the United States, the United Kingdom, Europe and other countries.

ISBN 978–0–230–23172–6

This book is printed on paper suitable for recycling and made from fully managed and sustained forest sources. Logging, pulping and manufacturing processes are expected to conform to the environmental regulations of the country of origin.

A catalogue record for this book is available from the British Library.

A catalog record for this book is available from the Library of Congress.

10 9 8 7 6 5 4 3 2 1
21 20 19 18 17 16 15 14 13 12

Printed and bound in Great Britain by
CPI Antony Rowe, Chippenham and Eastbourne

5

Projecting Landscapes of the Human Mind onto Another World: Changing Faces of an Imaginary Mars

Rainer Eisfeld

> *Reporter*: Is there life on Mars?
> *Returning Astronaut*: Well, you know, it's pretty dead most of the week, but it really swings on Saturday night.
>
> Popular NASA joke

I Deceptive world

For centuries, the planet Mars continued to deceive terrestrial observers like no other celestial body in our solar system. Believing to discern ever more distinct features on Mars through earth-bound telescopes, astronomers designated these as continents, oceans, even canals, to which they gave names. With exceedingly rare exceptions, however, these markings did not correspond to geomorphological, or rather areomorphological, structures. Actually, they originated from the different reflectivity of bright and dark surface regions changed in its turn by wind activity which has continued to transport and deposit fine dust across the planet. Space probes, rather than telescopes, were needed to explain these processes and to shed light on the Red Planet's true characteristics.[1]

Until robotic explorers arrived, no other planet seemed to offer such clues for educated guessing – first to the conjectural astronomy of the nineteenth century, subsequently to the science fiction of the latter part of that period and the twentieth century. Conjectural astronomy was the term used, in the wake of Bernard de Fontenelle's 1686 *Conversations on the Plurality of Worlds* and Christiaan Huyghens's 1698 *The Celestial Worlds Discover'd, or Conjectures Concerning the Habitants, Plants and Productions of the Worlds in the Planets*, to denote that branch of the discipline which engaged in hypothesizing on 'the living conditions and natural environments of other celestial bodies.' While expected to be not directly contradicting astronomical observations, such suppositions were, to a high degree, matters of interpretation, often based on 'few definitely established and unambiguous data.'[2]

In contrast to the discipline's mathematical branch, conjectural astronomy was intended to bridge the widening rift of mutual incomprehension between the humanities and the sciences. From the seventeenth to the nineteenth century, the

encyclopedic outlook on learning, so central to the Enlightenment, included both the spiritual and the material world. Inexorably, however, the progress of scientific research fostered specialization. Conjectural astronomy, in contrast, increasingly resorted to manifest speculation, relegating stellar and planetary astronomy to the role of ancillary sciences in the service of a preconceived, stoutly held idea, based on philosophical considerations: that intelligent life existed throughout the universe, including the solar system's planets.

German astronomers Wilhelm Beer (1797–1850) and Johann Heinrich Mädler's (1794–1874) mid-nineteenth-century assumption that it would 'not be too audacious to consider Mars, also in its physical aspects, as a world very akin to our earth,'[3] went unchallenged in its time. By 1906, however, when American astronomer Percival Lowell (1855–1916) published his spectacular – and highly speculative – interpretation *Mars and its Canals*, scientists were debating issues such as the composition of the Martian atmosphere or the planet's climate controversially and much more skeptically. Within a year, a devastating rebuttal by British biologist Alfred Russell Wallace (1823–1913) appeared under the title *Is Mars Habitable?* Wallace answered the question in the negative: Realistic temperature estimates precluded animal life; low atmospheric pressure would make liquid water – let alone Lowell's supposed irrigation works – impossible. Science and fiction were irrevocably parting ways.

A mere decade after Beer and Mädler had published their treatise on the solar planets' physical properties, the term 'Science Fiction' was introduced in 1851 by British essayist William Wilson in his work *A Little Earnest Book upon a Great Old Subject*. When coining the expression, Wilson referred to a 'pleasant story,' 'interwoven with [...] the revealed truths of Science,' itself 'poetical and true.' By the 1890s, the emerging genre included not merely pleasant, but definitely unedifying tales putting mankind at the mercy of technically superior beings from other celestial bodies. The planetary novel was coming into its own: no longer were planets conceived as self-contained distant places. Rather, their inhabitants might seek out other worlds with either benevolent or inimical intent.[4]

Mars, supposedly older than the earth (according to what was then believed about the formation of the solar system), particularly fired the imagination. Intersecting around the turn of the century, conjectural astronomy and science fiction served as vehicles for succeeding generations to 'project [their] earthly hopes and fears' onto Mars.[5] These pipe dreams and nightmares came to vary, not least according to the economic, social, and political upheavals that would figure uppermost in men's minds during successive periods. Two examples:

In the wake of the October Revolution, Soviet author Alexey Tolstoy (1883–1945) and movie director Yakov Protazanov (1881–1945) imagined during the early 1920s that it would take the arrival by spaceship of a terrestrial revolutionary, Gusev, to whip the exploited workers of Mars into a proletarian uprising against their despotic ruler Tuskub: 'Follow me, Martian Comrades, and organize a society of workers. The Union of the Soviet Socialist Republics of Mars' (*Aelita*, 1924). The 'world' to be revolutionized did not need to be identical with earth...

By the mid-1950s, with female emancipation considered a dire threat in many quarters, a British film portrayed Nyah, *Devil Girl from Mars*, landing her flying saucer by a country tavern, telling the male customers that the birth rate on her home planet had fallen alarmingly after the introduction of matriarchy. For breeding purposes, her planet needed men, she explained. Rather than, in post-Victorian resignation, 'closing their eyes and thinking of Mars,' however, the British males put up embittered resistance.[6]

Looking at the 'mainstream' of the ways in which successive generations of astronomers and science fiction – their treatises, novels, short stories, movie scripts – depicted an imaginary Mars, we may discern a sequence of faces attributed to the planet on which this chapter will subsequently focus: An *Arcadian Mars* (1865 ff.) exhibiting 'all the various kinds of scenery which make our earth so beautiful'; a highly civilized *Advanced Mars* (1895 ff.) crisscrossed by immense canals; a forbidding *Frontier Mars* (1912 ff.) where the rugged adventurer might again come into his own; a *Cold War Mars* (1950 ff.), source of an assault on the earth, or haven for refugees after our planet would have perished from nuclear war; finally, a *Terraformed Mars* (1973 ff.), again with strong frontier undertones, lending itself to human colonization and exploitation. While these 'types' would often overlap – with the frontier metaphor, in particular, persisting into the present – each type set the tone for a generation.

II Arcadian Mars

'Life, youth, love shine on every world |...| This divine fire glows on Mars, it glows on Venus.'[7] With unmatched fervor and elegance of style, Camille Flammarion (1842–1925) argued the case for intelligent extraterrestrial life during the second half of the nineteenth century, bolstered by the authority of the renowned astronomer who, in 1887, founded the Société Astronomique de France. Flammarion's description of the Martian environment, in his very first work *La Pluralité des mondes habités*, is quoted *in extenso* here, because it would inform the astronomical and popular discourse on the Red Planet for nearly a generation:

> The atmospheres of Earth and Mars, the snowfields seasonally expanding and shrinking on both planets, the clouds intermittently floating over their surfaces, the similar apportionment of continents and oceans, the conformities in seasonal variations: all this makes us believe that both worlds are inhabited by beings who physically resemble each other. |...| In our mind's eye, we behold, here and there, intelligent beings, united into nations, vigorously striving for enlightenment and moral betterment.[8]

In 1840, Beer and Mädler had drawn the first chart of Mars. Capital letters denoted observed 'regions' – darker spots on bright ground.[9] The letters used by Beer and Mädler remained in use for two and a half decades, until Richard Proctor replaced them by the names of Mars observers on the map he composed in 1867. Proctor also 'improved' on the way his compatriot John Phillips (1800–1874) had,

three years earlier, designated darker parts as 'seas' and brighter, reddish tracts as 'lands.' Proctor's chart showed continents and islands, oceans and seas, inlets and straits. These features had a suggestive effect. They seemed to portray a second – albeit smaller – earth, with just a different division into zones of land and water.

The suggestion was deliberate. Proctor depicted Mars as a 'miniature of our earth,' waxing hardly less rhapsodically than Flammarion about the prettiness of the place:

> The mere existence of continents and oceans on Mars proves the action of [...] volcanic eruptions and earthquakes, modelling and remodelling the crust of Mars. Thus there must be mountains and hills, valleys and ravines, watersheds and water-courses. [...] And from the mountain recesses burst forth the refreshing springs which are to feed the Martia[n] brooklets [...].[10]

And in a brilliant phrase, which Percival Lowell would later reclaim for entitling his final book, Proctor called Mars 'the abode of life' – for if no life existed, 'all these things would be wasted.'

Proctor (1837–1888) was an Honorary Secretary of the Royal Astronomical Society. Like Flammarion's work, his study of our solar system's planets, subtitled 'under the light of recent scientific researches,' continued to be reprinted until the advent of the twentieth century. Public fascination was spurred further when the Mars opposition of 1877 led to the discovery of two small moons by Asaph Hall (1829–1907) – and to the observation, by Giovanni Schiaparelli, of markings that the Italian astronomer took for *canali*, channels furrowing the planet's surface, some of which he compared to 'the Strait of Malacca, the very oblong lakes of Tanganyika and Nyassa, and the Gulf of California.'[11] After Schiaparelli reported that some of the lines he had sighted between 1877 and 1882 ran for 4800 kilometers, attaining a width of 120 kilometers, it came as no surprise that Flammarion was among the first to comment: 'One may resist the idea, but the longer one gazes at [Schiaparelli's] drawing, the more the interpretation suggests itself [...] [that] we are dealing with a technological achievement of the planet's inhabitants.'[12]

In the minds of some of the period's foremost astronomers, the image of a lush and youthful Arcadian Mars would soon begin to give way to that of a much more ancient world – possessing no natural water-courses, but rather artificial waterways surpassing anything so far constructed on earth.

III Advanced Mars

As judged by a present-day astronomer, after Giovanni Virginio Schiaparelli (1835–1910) taught a whole generation of observers how to see Mars, it became eventually 'impossible to see it any other way. Expectation created illusion.'[13] If channels discernibly divided Mars to the extent of making its topography 'resemble that of a chessboard,' if several such *canali* even 'form[ed] a complete girdle around the globe of Mars' – could they any longer be interpreted as natural attributes, 'like the rilles of the moon'?[14] Might they not more convincingly

be explained as non-natural features, as *canals* serving a purpose which had to be derived from the planet's characteristics?

The landscape of Advanced Mars, which from 1895 was construed by Percival Lowell in response to Schiaparelli's revelations, differed dramatically from that of Arcadian Mars. No more stately oceans, impetuous rivers, swift water courses or refreshing springs. A much grimmer environment predominated on earth's neighbor-world: 'The rose-ochre enchantment is but a mind mirage. [...] Beautiful as the opaline tints of the planet look, [...] they represent a terrible reality [...] [a] vast expense of arid ground [...], girdling the planet completely in circumference, and stretching in places almost from pole to pole.'[15]

Erudite descendant of a wealthy Boston family, excelling in mathematics and literature, composing Latin hexameters at 11 and using his first telescope at 15, Percival Lowell became enthusiastic about Flammarion's impressive compilation *La Planète Mars* (1892) and his views on the habitability of the planet. In 1894 he founded his own observatory near Flagstaff, Arizona Territory, with the express purpose of studying the conditions of life on other worlds, particularly on Mars. From his first 12 months of observations, Lowell drew conclusions which he immediately published in a book that 'influence[d] and shape[d] the imagination of writers' such as Wells and Lasswitz.[16] The darker regions of Mars he took to be 'not water, but seasonal areas of vegetation,' with the planet depending, for its water supply, 'on the melting of its polar snows.' Then came the clincher:

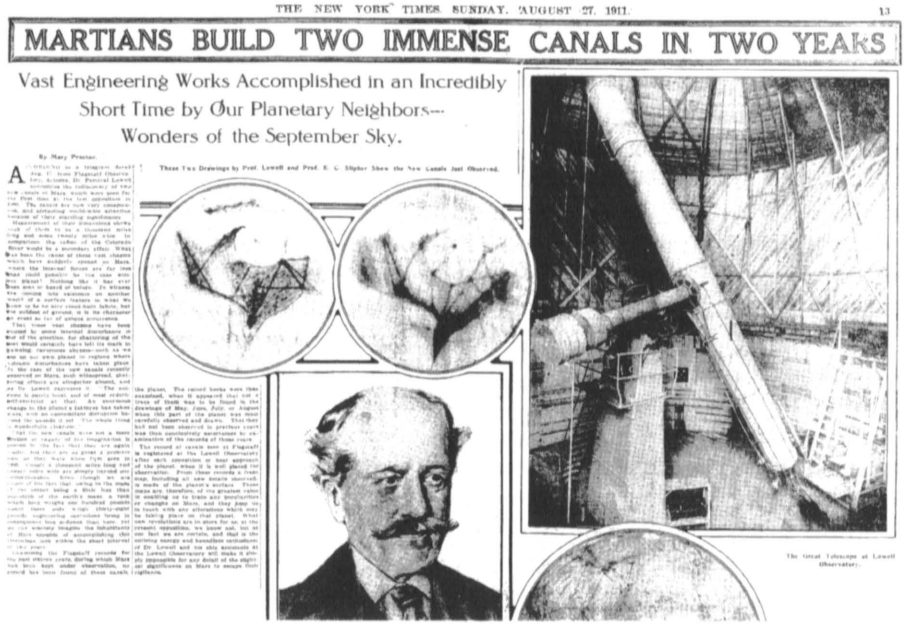
> If, therefore, the planet possess inhabitants, [...] irrigation, upon as vast a scale as possible, [...] must be the chief material concern of their lives [...] paramount to all the local labor, women's suffrage, and [Balkan] questions put together.[17]

After the ironic aside, Lowell turned his attention to the canals which, he held, were dug precisely for such 'irrigation purposes':

> What we see is not the canal proper, but the line of land it irrigates, dispos[ing] incidentally of the difficulty of conceiving a canal several miles wide. [...] What we see hints at the existence [... of] a highly intelligent mind [...] of beings who are in advance of, not behind us, in the journey of life.[18]

Much later, Carl Sagan (1934–1996) would famously quip that, most certainly, intelligence was responsible for the straightness of the lines observed by Lowell. The problem was just 'which side of the telescope the intelligence is on.'[19]

While the nineteenth was turning into the twentieth century, canals – like automobiles, dirigibles and airplanes – had come to symbolize progress, the triumph of technology over nature. In 1869, the Suez Canal had reduced the sea route to India by 10,000 kilometers, permitting Phileas Fogg and Passepartout to accomplish their imaginary journey around the world in 80 days. Work on the Panama Canal had begun in 1880, and even if the first French effort had foundered, a second American construction attempt was under way. Canals, whether on earth or (supposedly) on another world, continued to make for headlines: On 27 August 1911,



THE NEW YORK TIMES SUNDAY, AUGUST 27, 1911. 13

MARTIANS BUILD TWO IMMENSE CANALS IN TWO YEARS

Vast Engineering Works Accomplished in an Incredibly Short Time by Our Planetary Neighbors—Wonders of the September Sky.

By Mary Proctor.

These Two Drawings by Prof. Lowell and Prof. E. C. Slipher Show the New Canals Just Observed.

The Great Telescope at Lowell Observatory.

Figure 5.1 Astronomer Percival Lowell (1855–1916) could hardly have hoped for more favorable publicity. On 27 August 1911, the *New York Times* waxed eloquently on two Martian 'canals' recently identified by Lowell Observatory.
Source: Courtesy of Lowell Observatory Archives, Flagstaff, Arizona.

the *New York Times* captioned a one-page article. 'Martians Build Two Immense Canals in Two Years,' its headline read: 'Vast Engineering Works Accomplished in an Incredibly Short Time by Our Planetary Neighbors'(Figure 5.1).

And Lowell's arid, aging Mars offered a further fascinating perspective: A community that had forsworn armed conflict, unified by a common endeavor, valiantly fighting its imminent doom, demonstrated to war-torn earth what a civilization might achieve once it had overcome strife and hate.[20] Sunlight might be converted into electricity on Mars' high plateaus, stones into bread by extracting protein and carbohydrates from rocks, soil, air and water. And material advancement might release additional energies needed for moral improvement: Such was the vision offered by Kurd Lasswitz (1848–1910) in his 1897 novel *Auf zwei Planeten*, intended to confront the imperialist powers of Europe with the notion of a world governed by reason. While an abridged English translation would only appear by 1971, the book was immediately translated into a number of other European languages and a popular German edition, which continued to be reprinted, was published in 1913. Until the Nazis branded the book as 'un-German,' the novel sold 70,000 copies in Germany.[21]

Lasswitz portrayed a Mars on which the 'colossal effort' required by irrigation had united the original 154 states into a single league. Thanks to the canal

system – and here Lasswitz sounded like pure Lowell – 'the desert region was traversed by fertile strips of vegetation nearly 100 kilometers wide which included an unbroken string of thriving Martian settlements.'[22] A one-year mandatory labor service for both sexes helped maintain the network of canals. The discovery of anti-gravity had made Martians 'the masters of the solar system,' permitting them to construct a wheel-shaped space station 6356 kilometers above earth's North Pole. Due to terrestrial arrogance, the first contact between men and 'Nume' ended in the occupation of Europe by the league of Martian states and the establishment of a protectorate aimed at 're-educating' mankind.

Wielding power over the earth, however, worked to morally corrupt the Martian conquerors. When they threatened to extend their protectorate to the United States, American engineers secretly succeeded in copying Martian arms and taking over their space station. Faced with a choice of violating their highest values by resorting to a war of extinction, or leaving the earth, the Martians chose to depart. Terrestrial nations formed not only an alliance, but went on to adopt new constitutions in a Kantian 'spirit of peace, liberty and human dignity.'[23] A peace treaty with Mars ensured coexistence on the basis of equality.

However, an alternative scenario might be imagined, derived from the hypothesis that Martians had failed 'in attempting to safeguard the habitability of their planet.' In that case, might not beings with minds 'vast and cool and unsympathetic' feel tempted to resort to aggression, pitilessly exterminating mankind in search of 'living space'? Rather than Lasswitz's pacifist vision, the result would be the social-Darwinist *War of the Worlds* that Herbert George Wells (1866–1946) envisioned in the same year. Skillfully, Wells gave the debate about the significance of the surface features on Mars a new twist. 'Men like Schiaparelli,' he wrote, 'failed to interpret the fluctuating appearances of the markings they mapped so well. All that time the Martians must have been getting ready.'[24]

Contrary to what a cursory reading of his tale might suggest, Wells did not depict the inhabitants of Mars – a Mars, it should be repeated, much older than the earth, according to prevailing opinion – as alien monstrosities. Rather, regarding their appearance, he projected on them those 'characters of the Man of the remote future' which he had predicted as the final stage of human evolution in an earlier essay:[25] an expanding brain and head, diminishing bodies and legs, unemotional intelligence, nourishment by absorption of nutritive fluids – blood in the case of the Martian invaders – atrophy of ears, nose and mouth, the latter 'a small, perfectly round aperture, toothless, gumless, jawless.' Wells's Martians were not so much invaders from space as invaders from time, 'ourselves, mutated beyond sympathy, though not beyond recognition.'[26]

Lasswitz, in a Kantian vein, had intended to confront Europe's imperialist powers with the alternative notion of a world governed by reason and peace. Wells's *War of the Worlds* remorselessly held the mirror up to contemporary colonialism (Figure 5.2). During 1897–98, Imperial Germany occupied the Chinese port of Jiaozhou; China had to cede a further part of Hongkong to Great Britain; France consolidated its position in West Africa; the United States annexed the Hawaiian Islands. In Asia, in Africa, in the Pacific, native populations were being subjugated

Figure 5.2 The action of *War of the Worlds* was moved to California for the 1953 film version by producer George Pal (1908–1980) and director Byron Haskin (1899–1984). Promotional posters depicted the alien's arm as symbolizing the Martian attempt to seize and colonize the earth.
Source: Author's archive.

or pushed back. 'Are we such apostles of mercy,' Wells asked rhetorically, 'as to complain if the Martians warred in the same spirit?'[27]

Finally, Wells could count not only on an audience turned receptive by a spate of recent novels – such as George Chesney's *The Battle of Dorking* (1871), William Butler's *The Invasion of England* (1882), William Le Queux's *The Great War in England* (1894) – to the notion of French and (more frequently) German raids on England. Moreover, these authors had already begun to explore a theme on which Wells focused his attention in *The War of the Worlds*: the disappearance of any distinction between battle fronts and zones where civilians might feel reasonably safe, the expansion of mechanized 'total' warfare to engulf entire populations.[28]

Such total war was raging in China 40 years later, after Japanese armies had invaded the country in 1937. For a brief moment, it had been avoided in Europe after Czechoslovakia had yielded, under British and French pressure, to the Munich Agreement. The war scare was still fresh in many Americans' minds when CBS, on 30 October 1938, aired *The War of the Worlds* as a 60-minute radio play, directed by Orson Welles (1915–1985), with the action transferred to New Jersey. Presented as a series of increasingly ominous news bulletins, the first half of the broadcast produced mass hysteria: All over the United States, people 'were praying, crying, fleeing frantically [...] Some ran to rescue loved ones. Others [...] sought information from newspapers or radio stations, summoned ambulances and police cars.'[29] An estimated 250,000 people believed the United States to be

under attack by either Germany, Japan – or indeed from Mars. In a bewildering world troubled by prolonged economic depression, wars and political crises, many Americans thought anything might happen.

By that time, H. G. Wells had turned social reformer, slowly despairing of men's folly. His last ideas about an invasion from earth's 'wizened elder brother' Mars, published under the title *Star Begotten* shortly before Orson Welles's broadcast, differed considerably from his first – though not without a self-deprecating glance back:

> Some of you may have read a book called *The War of the Worlds* – I forget who wrote it – Jules Verne, Conan Doyle, one of those fellows. But it told how the Martians invaded the world, wanted to colonize it and exterminate mankind. Hopeless attempt! They couldn't stand the different atmospheric pressure, they couldn't stand the difference in gravitation. [...] To imagine that the Martians would be fools enough to try anything of the sort. But –[30]

But if they resorted to cosmic rays instead? Modifying the genetic structure of unborn children, creating new beings that were, in fact, *their* spiritual children? That was the obsessive idea with which the tale's protagonist wrestled, until he discovered that his wife, their son – that he himself was star begotten, a changeling. The change, however, was benevolent, meant to salvage mankind – 'a lunatic asylum crowded with patients prevented from knowledge and afraid to go sane'[31] – from stupidity and immaturity by making humans more flexible, more open-minded, more innovative. Mature Martian civilization emerged as a *deus ex machina* for solving, by imperceptible intervention from outside, those pressing problems which mankind found itself unable to surmount.

IV Frontier Mars

Implying, as it did, that the Red Planet's inhabitants would beat humans to accomplishing spaceflight, the idea of Advanced Mars ran counter to deeply engrained expansionist impulses of the imperialist age. Small wonder the tabloid journalist Garrett Putnam Serviss (1851–1929) immediately responded to Wells's tale with a serial in the sensationalist *New York Evening Journal*, published in 1898. Entitled *Edison's Conquest of Mars*, it depicted the 'wizard of Menlo Park,' aided by Lord Kelvin and Wilhelm Conrad Röntgen, as devising both a disintegrator ray and an electric spaceship (admittedly based on the operating principles of the Martian machines). Financed by the great powers, 100 spaceships – armed with 3000 disintegrators – were built and flew to Mars, where they wreaked havoc by forcibly opening the 'floodgates of Syrtis Major,' thereby deluging the planet's equatorial regions. Lasswitz had already attributed the defeat of his Martian conquerors to American engineering talent and 'daring.' By presenting an entire arsenal of innovative weapons, Serviss left no doubt about America's claim to global leadership: technologically superior, the 'new world' had outrivaled the 'old' as the torchbearer of progress.

As regards the image of the Red Planet, Serviss's tale did not set a new trend. Lowell's arid Mars was taking hold in the public mind, and Serviss's vast oceans

and floodgates were just too wildly off that mark. Concerning stylistic treatment of his subject and the moral of the story, however, Serviss's lurid account marked a significant change away from 'highbrow' European-style literature. The new perspective was fully brought to bear by American cowboy, gold miner, salesman and – in the end – novelist Edgar Rice Burroughs (1875–1950) who wrote *A Princess of Mars* in 1912 (Plate 4). He rechristened Mars, gave it the name Barsoom – and henceforth Mars exploration would be 'as much a re-creation of the past as a vision of the future.'[32]

With Burroughs, American science fiction authors started to build on a 'forceful [...] cultural tradition' that would eventually inspire the US space program no less than it initially spurred 'romantic vision[s]' of exploring, even colonizing Mars: the myth of America's western frontier.[33] 'Lowbrow' pulp fiction would henceforth provide the medium for two generations of writers including, subsequent to Burroughs, most prominently Leigh Brackett (1915–1978). Due to the existence of a virtual 'entertainment industry'[34] with international outlets, American pulp writers took the lead from European authors in projecting their fantasies onto the Red Planet. Burroughs and his heirs retained Lowell's deserts and canals, but discarded the idea of a sophisticated Martian civilization. Instead, they fantasized towns, ancient beyond imagination, lying in the southern hemisphere of Mars, their outskirts touching the shores of the dried-up Low Canals that once discharged their waters into the now dust-blown bed of a long-vanished ocean. The towns, once ruled by pirate kings, bore names such as Jekkara, or Valkis, or Barrakesh. Their women – partly resembling Indians, partly Mexicans – wore tiny golden bells chiming temptingly. Barbarian tribes came to these places from distant deserts, such as Kesh and Shun. A Terran spaceport did exist at Kahora, not far from Olympus Mons. But only hard-boiled adventurers dared approach the Low Canals, after having galloped across the Drylands on half-wild saurians. They had 'the rawhide look of the planetary frontiers about them' and wore their ray-guns low in their holsters. Because Barrakesh, Jekkara, Valkis were towns outside the law.[35]

The scenario was Leigh Brackett's, dreamt up during the 1940s. Like its American counterpart, the 'planetary frontier' signified no demarcation line, as the term was understood by Europeans, but rather the advancing rim of settlement, site of the violent clash between savagery and civilization. After the US government had announced, in 1890, the 'closing' of the frontier in its statistical meaning of less than six inhabitants per square mile, the frontier – 'by transcending the limitations of a specific temporality' – came to be projected from the past into the present and even the future. Creating a specific 'moral landscape,' depicting the course of American history as progress through violence (or, as Burroughs would have it in *A Princess of Mars*), the myth of the frontier has continued to provide patterns of identification and legitimization for individual and collective attitudes and behavior to the present day.[36] The rugged individualist, the onward-thrusting pioneer, the hardy adventurer, all armed *and morally justified* to shoot or to slash in a stereotyped black-and-white situation of good versus evil: These are the vivid images evoked by the frontier metaphor. They re-emerged in 'the "space opera"

(as opposed to "horse opera")' with the 'typical structures and plots of westerns,' but the 'settings and trappings of science fiction.'[37]

Burroughs virtually defined the sub-genre, creating the quintessential space opera character: Captain John Carter, a 'gentleman of the highest type' and former plantation owner from Virginia, who had proved his prowess in the Civil War, and who was magically teleported from Arizona – where he had been battling Apaches – to Mars.[38] Burroughs made no effort to conceal that John Carter was modeled on Captain John Smith, a seventeenth-century Virginian colonist who figured prominently in another American legend – the narrative of Pocahontas, Indian 'princess' of the Powhatan tribe. Supposedly, Pocahontas (at the tender age of 12 or 13) had become enamored of Smith and had rescued him from torture by her tribe. After arriving on a Mars peopled by warlike black, red, green and yellow races, Burroughs's John Carter met and married the 'incomparable' princess Dejah Thoris, daughter of the Jed (ruler) of Helium, chief of a red-skinned people that exhibited 'a startling resemblance [...] to [...] the red Indians of [...] earth.'[39] In *The Princess of Mars* and Burroughs's subsequent Mars novels, it was Carter's task to repeatedly save Dejah Thoris, with the extraordinary physical powers lent to him by Mars' lesser gravity, from a fate 'worse than death.' To leave not the slightest doubt about the tradition he was embracing, Burroughs chose this context to revive another stereotype of frontier melodrama: With 'a cold sweat,' his main protagonist reflected that if he should fail, it would be 'far better' for Dejah to 'save friendly bullets [...] at the last moment, as did those brave frontier women of my lost land, who took their own lives rather than fall into the hands of the Indian braves.'[40]

Frontier Mars became a place where only-too-familiar characters lounged in the doorways of earth's latest colony – Northwest Smith for one, created in 1933 by writer Catherine L. Moore (1911–1987), 'tall and leather-brown, hand on his heat-gun'; where everybody understood the 'old gesture' when that gun was drawn with a swift motion, sweeping 'in a practiced half-circle'; where John Carter, Northwest Smith and their likes fought human or half-human tribes; where conflicts were invariably 'resolved' by resorting to weapons. An 'extension of our original America,' with 'Martians await[ing] us' whom 'we [could] assimilate to our old myths of the Indian,' Frontier Mars was destined to remain a very parochial planet, familiar rather than alien.[41]

V Cold War Mars

'Watch the skies!' moviegoers were counseled in 1951 at the end of the science fiction film *The Thing from Another World*. The Cold War had turned hot in Korea. Who knew what the communists, 'masters of deceit' (J. Edgar Hoover), aggressively pushing from outside, subversively boring from within, threatening 'the continuance of every home and fireside,'[42] might have up their sleeves?

Two years later, the 10-year-old stargazing protagonist of *Invaders from Mars* did watch the skies at night, only to observe a flying saucer landing and burrowing

in the sandy ground across from his home. Everyone who investigated next morning – the child's father, his mother, a neighbor girl, two policemen, finally the local chief of police – was 'transformed' in succession, displaying an implant in the neck and behaving robot-like. *Invaders from Mars* recounted not just an invasion, but a 'conspiracy,' an emerging 'fifth column' of concealed infiltrators. Neither parents nor friends could be trusted anymore – a patent allusion (including the unfeeling attitudes displayed by affected adults) to rampant paranoia about the supposed subversion of American life by Communists. The invaders themselves were depicted as puppets, telepathically controlled by a 'supreme intelligence.' As might be expected, the military – alerted by the boy's school psychologist and her friend, an astrophysicist – arrived in time to save the day and blow up the Martian saucer.

By the beginning of the decade, movies were America's most popular entertainment; only from the mid-1950s would they be outranked by television. *Destination Moon* (1950) made the idea of space travel not only plausible but fascinating. *The Thing from Another World* (1951) brought the idea of creatures from other planets coming here to vivid life. From 1950, too, the screen added Martian landscapes to those portrayed in the printed media. Both *Rocketship XM*, Kurt Neumann's bleak movie of humans arriving on a Mars destroyed by nuclear war, and *The Martian Chronicles*, Ray Bradbury's seminal novel of the Red Planet's colonization against the backdrop of atomic war eventually engulfing earth, came out during that year. In *Rocketship X(pedition) M(oon)*, the first manned spaceflight to earth's satellite was thrown off course by a swarm of meteors and forced to land on Mars. The crew found themselves in a post-nuclear wasteland, deducing 'from artifacts and ruins so radioactive they can't approach them that there had once been a high civilization on Mars, but that atomic warfare reduced the Martians to savagery.' Mutated Martians attacked the expedition, killing two and wounding a third crew-member. The rest of the crew escaped, but the rocket ran out of fuel on its return flight and crashed. A year before, the Soviet Union had detonated its first nuclear device. President Truman had ordered development of the hydrogen bomb in early 1950. 'The idea that we now had the potential to wipe out civilization entirely was beginning to permeate mass culture' – and was projected onto Mars by 'the first film to expound such a grim warning about our possible future.'[43]

The Soviet explosion and Truman's announcement drew an immediate response from a 30-year-old writer, Ray Bradbury (1920–), who felt that man might 'still destroy himself before reaching for the stars. I see man's self-destructive half, the blind spider fiddling in the venomous dark, dreaming mushroom-cloud dreams. Death solves it all, it whispers, shaking a handful of atoms like a necklace of dark beads.'[44] On 6 May 1950, *Collier's* magazine published one of Bradbury's most powerful stories, 'There Will Come Soft Rains.' It had no human protagonists. Rather, it focused on the final 'death' of an electronically programmed house, left standing empty among glowing radioactive ruins, after its occupants had perished, their images – as had happened in Hiroshima – 'burnt on the wood in one titanic instant.'[45] The story was included by Bradbury as a chapter in his loosely-knit classic of the same year, *The Martian Chronicles*, intended by the author to 'provide

a mirror for humanity, its faults, foibles, and failures [...] an allegory transplanted to another world.'[46]

Before being killed off by chicken pox, which American colonists had introduced to Mars, the planet's golden-eyed 'natives' had inhabited crystal houses at the edge of the canals that – attuned to nature – 'turned and followed the sun, flower-like.'[47] The settlers not only brought chicken pox. They also brought gas stations, luggage stores and hot-dog stands. With their hammers, they 'beat the strange world into a shape that was familiar, they bludgeon[ed] away all the strangeness. [...] In all, some ninety thousand people came to Mars.'[48] But the majority left again when flashing light-radio messages from earth reported that there was war and that everybody should come home. To those who had remained on Mars, the night sky soon offered a horrible sight: 'Earth changed [...] It caught fire. Part of it seemed to come apart in a million pieces. [...] It burned with an unholy dripping glare for a minute, three times normal size, then dwindled.' Humans had turned two worlds, Mars and earth, into 'tomb planet[s].'[49]

However, Bradbury – influenced by both Burroughs and Brackett – had also decided 'that there would be certain elements of similarity between the invasion of Mars and the invasion of the Wild West.'[50] The frontier myth held that America and its democracy would be reborn at every new frontier between the Atlantic and Pacific – and beyond. One family, more fortunate than the folks annihilated in 'There Will Come Soft Rains,' had escaped the inferno on earth (with rumors maintaining that a second one had also made it to Mars). The father had promised the children that they would set out for a picnic and would see Martians. Now they were gazing at their reflections in a canal – and the Martians stared back at them. The implication was evident. Bradbury's 'intensely critical examination' of the frontier myth – of 'the shallow and mercurial properties of America's predominant cultural construct' – notwithstanding, Mars emerged as another 'virgin land' (Henry Nash Smith) where America might both survive and regenerate.[51] The Frontier Mars image, in other words, had proved its adaptability to the hydrogen bomb age, reducing Cold War Mars to a mere variant of an already familiar theme. And, as would soon become evident, the frontier metaphor had not exhausted its usefulness.

VI Terraformed Mars

For American engineer Robert Zubrin (1952–), the writing presently 'is on the wall': 'Without a frontier from which to breathe life,' Zubrin holds, 'the spirit that gave rise to the progressive humanistic culture that America for the past several centuries has offered to the world is fading.' The engineer is convinced that the creation of a new frontier presents itself 'as America's and humanity's greatest need.' And he believes 'that humanity's new frontier can only be Mars.' Zubrin, and the Mars Society, formed in 1998 on his initiative, consider privately funded Mars flights and the establishment of a permanent Mars base as just initial steps. To fulfill the planet's mission of reinvigorating terrestrial civilization, its atmospheric

and surface conditions need to be dramatically changed by a long-term project. Mars must be 'terraformed.'[52]

According to the *Shorter Oxford English Dictionary*, terraforming implies a process of planetary engineering, aimed at creating an extraterrestrial environment that would be habitable for humans. First use of the term has been credited to science fiction writer John Stewart ('Jack') Williamson in a 1942 novella. The concept started to gain a certain scientific acceptability after Carl Sagan had published an article in 1961 on introducing algae into the atmosphere of Venus to slowly change that planet's extremely hostile conditions. In 1973, Sagan followed with a piece 'Planetary Engineering on Mars,' kicking off the debate with regard to the Red Planet. To terraform Mars, both atmospheric pressure and surface temperature would have to be raised. The 'global warming' process – basically comparable to that which earth is presently experiencing – would require an increase in 'greenhouse gasses,' such as carbon dioxide or more powerful fluorocarbons, for which several ways have been proposed, and the subsequent build-up of a hydrosphere providing the water necessary to sustain life. The idea was, of course, picked up by science fiction – most elaborately by Kim Stanley Robinson in his trilogy *Red Mars/Green Mars/Blue Mars* (1992–96). The work focused on the century-long conflict between 'Greens,' whose sense of mission prompted them to contaminate the Red Planet with robust mosses and lichens at every opportunity, and the 'Red' environmentalists who were finally driven underground.[53]

As before, such imaginary landscapes have revealed more about the desires, the hopes, the anxieties of those who designed them, than about any future 'green' or 'blue' Mars. While Zubrin took care to link the emergence of a terraformed Martian frontier to the promotion of values such as individualism, creativity and belief in the idea of progress, his basic approach was far more hard-nosed:[54]

> If the idea is accepted that the world's resources are fixed, then each person is ultimately the enemy of every other person, and each race or nation is the enemy of every other race or nation. The inevitable result is tyranny, war and genocide. Only in a universe of unlimited resources can all men be brothers.

Put differently: Either a new frontier will be opened up – or containment, rather than self-containment, will become the 'natural' order of things... Objections against such reasoning were the exception. In terms reminiscent of Bradbury, but more starkly, historian Patricia Limerick in her contribution to the 1992 volume *Space Policy Alternatives* emphasized the social-Darwinist consequences of 'rugged individualism' that had shaped the 'conquest' of the American West, including greed and corruption, violence against 'aliens' (Indians and Mexicans), environmental destruction. She rejected the simplified picture of westward expansion painted in 1893 by historian Frederick Jackson Turner (1861–1932) – the famous Turner thesis again extolled by Zubrin – because it had 'denied consequences and evaded failure.'[55]

Because of 'America's pioneer heritage, technological pre-eminence, and economic strength, it is fitting that we should lead the people of this planet into space,' the Paine Commission had stated in 1986. Chaired by an earlier NASA Administrator, it included UN Ambassador Jeane Kirkpatrick, former test pilot Charles Yeager and retired Air Force General Bernard Schriever (who had directed IRBM Thor and ICBM Atlas development). In their report, tellingly entitled *Pioneering the Space Frontier*, the members had proposed to 'stimulate individual initiative and free enterprise in space,' and had resolved that 'from the highlands of the moon to the plains of Mars,' America should 'make accessible vast new resources and support human settlements beyond earth orbit.'[56] This was no space opera. This was a National Commission on Space, appointed by the President of the United States, issuing a declaration that was 'vintage 1890s [...] with a fervent optimism and cheeriness that might well have made Frederick Jackson Turner himself a bit ill-at-ease. [...] a picture of harmony and progress where historical reality shows us something closer to a muddle.'[57]

Abstracting and reducing from reality, the frontier myth has created a historical cliché. Clichés, as Richard Slotkin – among others – has reminded us, may serve to interpret new experiences as mere recurrences of familiar happenings, reflecting a refusal to learn. Identifying Mars as merely another 'frontier,' projecting a moral purpose on the adoption of that so-called planetary frontier to human settlers' needs, tops a tradition of invoking a cultural stereotype that must be classed as highly problematic.

Notes

1. Victor R. Baker, *The Channels of Mars*, Austin: University of Texas Press, 1982, 3–4. This chapter's argument is partly based on Rainer Eisfeld and Wolfgang Jeschke, *Marsfieber*, Munich: Droemer, 2003. Much like Robert Markley's subsequent *Dying Planet: Mars in Science and the Imagination*, Durham, NC: Duke University Press 2005, the book discusses both the imagined Red Planet and the actual Mars progressively unveiled by robotic missions.
2. Wilhelm Beer and Johann Heinrich Mädler, *Beiträge zur physischen Kenntniss der himmlischen Körper im Sonnensysteme*, Weimar: Bernhard Friedrich Voigt, 1841, vii.
3. Ibid., 124–5.
4. Brian Aldiss and David Wingrove, *Trillion Year Spree: The History of Science Fiction*, London: Paladin, 1988, 603 n. 47; Martin Schwonke, *Vom Staatsroman zur Science Fiction: Eine Untersuchung über Geschichte und Funktion der naturwissenschaftlich-technischen Utopie*, Stuttgart: Ferdinand Enke, 1957, 43.
5. Carl Sagan, *Cosmos*, New York: Random House, 1980, 106.
6. This brief reference to the British film goes back to Eisfeld and Jeschke, *Marsfieber*, 163. *Devil Girl on Mars* was subsequently discussed by Robert Markley, *Dying Planet*, 227–9.
7. Camille Flammarion, *Les Terres du ciel*, Paris: Marpon & Flammarion, 1884, 208.
8. Camille Flammarion, *Die Mehrheit bewohnter Welten*, Leipzig: J. J. Weber, 1865, 51–2, 71. Flammarion published the book as a 20-year old.
9. Before the Mariner 9 space probe permitted production of the first 'reliable map,' more than 130 years would elapse. See Oliver Morton, *Mapping Mars: Science, Imagination, and the Birth of a World*, New York: Fourth Estate, 2002, 37–8.
10. Richard A. Proctor, *Other Worlds than Ours* [1870], London: Longmans, Green, 3rd edn 1872, 85, 109–10.

11. Giovanni Schiaparelli, *Astronomical and Physical Observations of the Axis of Rotation and the Topography of the Planet Mars: First Memoir*, 1877–78, trans. William Sheehan, MS, Flagstaff, AZ: Lowell Observatory Flagstaff (Archives), 1994, 124.
12. Camille Flammarion, 'Découvertes nouvelles sur la planète Mars,' *Révue d'Astronomie populaire* 1.7 (July 1882), 218; Camille Flammarion, 'La Planète Mars,' ibid. 1.7 (July 1882), 216.
13. William Sheehan, *The Planet Mars*, Tucson: University of Arizona Press, 1996, 85.
14. Schiaparelli, *Astronomical and Physical Observations*, 123, 124.
15. Percival Lowell, *Mars as the Abode of Life*, New York: Macmillan, 1908, 134.
16. Mark R. Hillegas, 'Martians and Mythmakers, 1877–1938,' in Ray B. Browne, Larry N. Landrum and William K. Bottorf, eds, *Challenges in American Culture*, Bowling Green, OH: Bowling Green University Popular Press, 1970, 150–77, here 156.
17. Percival Lowell, *Mars*, Boston, MA: Houghton Mifflin, 1895, 122, 128–9.
18. Ibid., 165, 208–9.
19. Carl Sagan, 'Hypotheses,' in Ray Bradbury et al., eds, *Mars and the Mind of Man*, ed. New York: Harper & Row, 1973, 13.
20. Percival Lowell, *Mars and its Canals*, New York: Macmillan, 1906, 377.
21. Franz Rottensteiner, 'Kurd Lasswitz: A German Pioneer of Science Fiction,' in Thomas D. Clareson, ed., *SF: The Other Side of Realism*, Bowling Green, OH: Bowling Green University Popular Press, 1971, 289.
22. Kurd Lasswitz, *Auf zwei Planeten* [1897], Frankfurt am Main: Zweitausendeins, 1979, 98.
23. Ibid., 875.
24. H. G. Wells, *The War of the Worlds*, New York: Pocket Books, 1953, 2.
25. H. G. Wells, 'The Man of the Year Million' [1893], in David Y. Hughes and Harry M. Geduld, eds, *A Critical Edition of the War of the Worlds*, Bloomington: Indiana University Press, 1993, Appendix III, 291–3.
26. Frank McConnell, *The Science Fiction of H. G. Wells*, Oxford: Oxford University Press, 1981, 128, 130.
27. Ibid.
28. Ibid., 132–3.
29. Hadley Cantril, *The Invasion from Mars: A Study in the Psychology of Panic*, Princeton, NJ: Princeton University Press, 1940, 47.
30. H. G. Wells, *Star Begotten*, London: Chatto & Windus, 1937, 50–1.
31. Ibid., 167–8.
32. Howard E. McCurdy, *Space and the American Imagination*, Washington, DC: Smithsonian Institution Press, 1997, 2.
33. Ibid., 233–4.
34. Benjamin S. Lawson, 'The Time and Place of Edgar Rice Burroughs's Early Martian Trilogy,' *Extrapolation* 27.3 (March 1986), 203–20, here 209.
35. Leigh Brackett, *The Secret of Sinharat*, New York: Ace Books, 1964, 8.
36. Richard Slotkin, *Gunfighter Nation: The Myth of the Frontier in Twentieth-Century America*, New York: Atheneum, 1992, 4–5, 6–7, 14, 24.
37. Lawson, 'Time and Place,' 213.
38. Edgar Rice Burroughs, *A Princess of Mars* [1912], New York: Random House, 2003, xxiii–iv, 14–15.
39. Ibid., 152.
40. Ibid., 75.
41. Catherine L. Moore, 'Shambleau' [1933], in *Northwest Smith*, New York: Ace Books, 1981, 2, 3; Leslie A. Fiedler, *The Return of the Vanishing American*, London: Paladin, 1972, 25; Lawson, 'Time and Place,' 208.
42. J. Edgar Hoover, *Masters of Deceit: The Story of Communism in America and How to Fight It*, New York: Pocket Books, 1958, vi.
43. Bill Warren, *Keep Watching the Skies: American Science Fiction Movies of the Fifties*, Volume 1: *1950–1957*, Jefferson, NC: McFarland, 1982, ix, 2, 11.

44. Ray Bradbury, quoted in William F. Nolan, 'Bradbury: Prose Poet in the Age of Space,' *Magazine of Fantasy & Science Fiction* 24.5 (May 1963), 8.
45. Ray Bradbury, *The Martian Chronicles*, New York: Bantam Books, 1951, 185.
46. Sam Weller, *The Bradbury Chronicles*, New York: William Morrow, 2005, 156, 159.
47. Bradbury, *Martian Chronicles*, 2.
48. Ibid., 86.
49. Ibid., 158, 172.
50. Bradbury, as quoted in Weller, *Bradbury Chronicles*, 155.
51. Gregory M. Pfitzer, 'The Only Good Alien is a Dead Alien: Science Fiction and the Metaphysics of Indian-Hating on the High Frontier,' *Journal of American Culture* 18.1 (Spring 1995), 51–67, here 58.
52. Robert Zubrin, *The Significance of the Martian Frontier*, www.nss.org/settlement/mars/zubrin-frontier.html (accessed 15 August 2011).
53. Carl Sagan, 'Planetary Engineering on Mars,' *Icarus* 20.4 (December 1973), 513–14; Christopher P. McKay, Owen B. Toon and James F. Kasting, 'Making Mars Habitable,' *Nature* 352 (8 August 1991), 489–96; Christopher P. McKay, 'Restoring Mars to Habitable Conditions: Can We? Should We? Will We?,' *Journal of the Irish Colleges of Physicians and Surgeons* 22.1 (January 1993), 17–9.
54. Zubrin, *Significance*.
55. Patricia Nelson Limerick, 'Imagined Frontiers: Westward Expansion and the Future of the Space Program,' in Radford Byerly Jr., ed., *Space Policy Alternatives*, Boulder, CO: Westview, 1992, 249–62.
56. Paine Commission, http://history.nasa.gov/painerep/parta.html (accessed 15 August 2011).
57. Limerick, 'Imagined Frontiers,' 253–4, 256–7.

Plate 4 Edgar Rice Burroughs's 'Princess of Mars,' as imagined on the cover of the 1925 German translation.