

Mars. The very word conjures up images of an exotic planet its red sands inhabited by little green men running around desperately trying to find a way destroy our precious planet Earth. A planet brought alive in western culture by science and fiction unfathomably far-reaching in their influence. A planet that has consistently been the subject of heated scientific, political and cultural debate, especially since the wealthier nations of the west have begun to grapple with the reality of Martian exploration. Yet in all the furious debate that takes place in arenas as different as an academic classroom is from a United States Congress deliberation, the study, understanding, and science of Mars are all considered from a unilaterally western point of view. Issues are treated as if astronomy were a science practiced solely by the Europeans, that Mars was a planet no other people had ever heard of.

We give Kepler sole credit for understanding how the orbit of Mars around the sun worked, never pausing to consider that Arab astronomers such as Al Bitruj and Gars al Din had already made major advances in this direction successfully challenged the limits of Ptolemaic science by rejecting the concept of perfect circles well before him. We never take note of the achievements made even earlier by the Vedic Scientists of India in gathering observational data on the motions of Mars and developing rather sophisticated mathematical analysis of these motions. Nor do we ever give any credit to the phenomenal achievements of the archaeoastronomer Mayans in tracking Mars.

But it is more than just the science of the outside world that the western school of thought consistently overlooks. That's almost understandable if unjustifiable - the major

breakthroughs in modern science and technology have after all occurred in the western world. There has been great deal of attention focused on the role of mythology in our perceptions of astronomy, yet this too tends to be focused in terms of classical myths, never looking beyond those decidedly limited borders to enhance our frame of reference. The western world has named Mars after the Roman and Greek god of war. Excellent arguments have been made for the effect this has had of leading us to associate the planet Mars with violence, destruction and impending doom. Yet it seems that people seldom stop to consider what other cultures associate with the planet Mars. There are tribes in Western Africa who relate Mars with femininity and the menstrual cycle. But interestingly enough, in Middle Eastern and Indian culture, the planet is associated with war, presumably without any real influence from the western associations since the two worlds were very much separately functioning.

It's important to pay attention to the knowledge and cultural associations of astronomers outside the western world when one attempts to study the planet Mars. There is, however, a severe shortage of accessible material about Mars in non-western cultures. When I started the research process for this essay I expected to have a surplus of reference material I would be able to draw upon; the reality was quite different. It was clear nevertheless clear that the Arabs, the Vedic Indians and the Mayans had made meticulous studies and observations of the planets, and Mars had become a source of interest to astronomers from all three regions of the world.

THE MAYANS

The Mayans are believed to have devised a table of the motions of Mars in the almanac known as the Dresden Codex (Justeson, 98), the ring number of the almanac cycle, 352, approximately the same as the interval from conjunction to retrograde motion in the Mars cycle. The 1:3 ratio of the Martian synodic cycle corresponded to the ritual cycle of 78 days in this Mayan calendar. It is also believed that the Mars – Saturn stationary point was an occasion for a battle or a raid (Justeson, 109). This point was marked as the death date of an aged ruler, and occurred in the middle of the war season. There is a picture on the Dresden Codex beneath a reference to the New Year, depicting the maize god sitting beneath a sky band from which a creature known as the “Mars beast” is dangling (Bricker, 235), suggesting that the planet Mars and its representative icon beast were associated with the ritual of the New Year ceremonies, Mars being a morning rising star on the date specified in the Codex. Indeed, the Mayans not only knew how long it took for the planet to return to the same place in the sky, but recent research at Tulane university has suggested that they might have been on their way to determining how long it took for Mars to orbit the Sun, which was a much harder proposition. Archaeoastronomers agree that the Mayans recognised the heliocentricity of the universe, unlike the western scientists who believed themselves at the centre of celestial orbits for so many centuries. The degree of precision found in the Mayan Dresden Codex almanac is truly astounding. While there has been some amount of scepticism as to whether this was a mere coincidence, it seems fair to infer from the frequent references to the planet Mars that the planet was indeed an important fulcrum of astronomical reference to the Mayans.

ARAB MIDDLE EAST

The Arabic word for the Planet Mars is " al - Mirrikh." (Encyclopaedia of Islam, 127). Arab astrologers often refer to the planet as "al Nahs al asghar", however, a phrase which translates as "the minor misfortune." Mars is credited with the highest number of ominous omens and effects such as war, revolutions, death, conflagrations, etc.

A Persian poem from the 1600 A.D. by Abdullah the Satirist of Shiraz entitled "Mirrikh", reveals the meaning of this symbolic association in the Arab-Islamic Setting:

Like Mars, red planet of the evening,
Rising o'er breasts of tender earth in spring,

So gleams thy podex, beautiful Habib,
My brother and my lover and my king!

For Mars is like a rose and ball of fire;
For Mars is like a serpent with its sting.

There is a pain, an ecstasy, a woe,
A joy, athrob within the wondrous thing.

The dull and boneless devotees of twat --
Leave them to grovel; we are well a-wing.

Yet twitch that podex, like the wandering way
Of Mars within the everlasting ring.
So shall my member, like the nightingale.
Salute thee with melodious twittering.

Clearly, Mars is associated with images of passionate pain. It is an entity that is mystical and mysterious. What is most striking, however, is that if you apply western perceptions and associations of the concept of Mars to this poem, they seem oddly appropriate. This can be interpreted as yet more evidence of the common ground that is the foundation of

human associations with universal phenomena such as planets in the dark night sky.

Mirrkh, or Mars, is also a central image in another poem by the same author, Abdullah of Shiraz, entitled "The Atheist":

Blue Mushtari strove with red Mirrikh
which should be master of the night-
But where is Mushtari, where Mirrikh
when in the sky the sun doth shine ?

"The Atheist" is, as the poem title suggests, a poem of desperation expressing disillusionment with orthodox Islam; the image of Mars is clearly used to enhance the aura of doom and passion that overwhelms the persona of the poem.

The Fatimids from the west came to Egypt in 969 A.D. They settled in the North, and then Under Jawhar Al Saqally, their commander in chief, issued orders for a new city to be built as their military capital and the royal seat of the Fatimid Caliphate. (Kennedy, 180). The planet Mars was in ascendant at the time, which was considered an omen of triumph and divine blessing. The new city was hence named "Al Qahir", the word for Mars in the Fatimid dialect of Arabic. Over the years, with the demise of the Fatimid caliphate and with western colonial influences, the city came to be known as Cairo. The phonetic root of the city's name in "Al Qahir" remains clear; Cairo remains rooted in its history of triumph and victory.

Equally important, however, are the impressive scientific observations and analyses carried out by Islamic astronomers of all the movements of the stars, including the planet

Mars. What is clear is that while the Arab astronomers might have built on and borrowed from the western science of Ptolemy, many of them did not allow themselves to be bound for it. As mentioned in the introduction, Gars ad Din, an Iraqi astronomer showed little respect for fundamental Ptolemaic principles like the equant and the eccentric deferent. (Heinen, 22). He noted that the observed diameter of Mars did not correspond with accepted theoretical diameters. Al Bitruj in his "Islamic Response to Greek Astronomy" delved further in to the specifics of the positions of celestial bodies, devoting a fair amount of attention to trying to understand the observed idiosyncrasies of the movement of the planet Mars (117). The astronomer Ibn al Haytham went so far as to question the whole range of Ptolemaic astronomy, thus developing a system of observational mathematics that could predict the position of the planets with reasonable accuracy (King, 388).

INDIA

The tales and scientific theorising of the motions of Mars and the other 4 planets of the Vedic Solar system are found in the pivotal work known as the Rgveda. The Rgygveda in fact contains a reasonable approximation of the period of orbit of Mars in terms of the Vedic Calendar. Hindu mythology dating back this far (2600 BC). While the Lord Shiva the destroyer was separated from his consort Uma and sitting in deep contemplation, a drop of his sweat fell down on to the earth. From the sweat was born the auspicious child, "Mangala." As the child grew older, he engaged in his own meditation, and the intensity of his meditation he generated heat so strong that it ignited a flaming fire around him. The gods were so pleased by his fervent devotion that they made him the planet Mars,

Mangala being the most frequently used name for the planet Mars. It is also referred to as Angaraka, Bhumija, both words connoting fire in Sanskrit; or by the name Skanda which means red in Sanskrit (Kak, 319). Hindu mythology also suggests that those afflicted by pain, wounds and sores are relieved by praying to Mars, perhaps appeasing the destroyer god Shiva by praying to his hotly burning son Mangala. In Hindu astrology, the planet Mars is identified with the war god Karthikeya. Mars is fiery, male, and warlike. It is the lord of the day Tuesday, and it rules over the north-eastern direction. (Astrovision, astrovisionindia.com/Mars.htm).

In the later Puranas and Siddhantas (1926 BC), the order of angular sizes of Venus, Jupiter, Saturn Mars and Mercury are correctly identified although the exact ratios determined were not quite right (Kak, 324). The Puranas even attempted to approximate the distance from the earth to Mars with their unit of measurement, the Yojana, an approximation many astronomers believe may well have been reasonably accurate. While we cannot be sure of the exact magnitudes of the units, the ratios of various figures calculated in the Puranas are consistent with those we now know to be true using modern western methodology (Kak, 335).

THE FAR EAST

The Japanese believed that Mars was associated with element of fire. Accordingly it was also associated with the Summer Season, and the Southern Direction. (Nakayama, 49). These associations were built in to the studies of the Asada School, the principal school of astronomical observation in Japan, even after the institution adopted western methods

of observation with western modern instruments such as telescopes. The Chinese referred to Mars as “Ying Huo”, “The sparkling deluder.” When it was Stationary in the Lunar Mansion, astrologists in ancient China considered it a very bad omen. (Xiaochun, 450).

“There is a part of our psyche that thrives on the mystery and the majesty of the dark night sky. The dark night sky compels us to ask the harder questions about ourselves that no earth-based stimuli can provoke” (Reed, 15). Fascination with the sky is a human characteristic, universal to all peoples. Mars appears in the night sky as a bright, distinctly reddish star. This has been a consistent perception of astronomers from cultures across the world. It appears that as a species, human beings have similar reactions to and understandings of colour. Mars is also the fastest moving and brightest of the outer planets, which has attracted and held the attention of stargazers across the planet since the dawn of mankind.

It seems particularly pertinent to consider the study of Mars from wider and more global cultural standpoint as we begin serious deliberations about a manned trip to Mars. A mission to Mars should be an international mission. Why? As made obvious, human beings across the planet have a wealth of skills, insights, and assets to contribute to such an effort. There are a wealth incredibly intelligent, competent and qualified people who would be indispensably valuable to making such a challenging undertaking a success - and they're not all American, or European for that matter.

The western disciplines and methods of science and learning are certainly effective and excellent; yet there are other approaches and endeavours in that go on in areas of the world without the west taking any notice of it. As the sections considering the perceptions of Eastern astronomers of the planet Mars reveals, human beings have a lot more in common with each other, even when it comes to beliefs and perceptions of situations, than modern society leads us to believe. We are brought up in a world where we are expected to emphasise the differences between us. When we debate the prospect of a manned mission to Mars, too many people insist on a national mission on the grounds that cultural differences will cause dissent and lead to the disintegration of the flight crew as a team. But by looking at a global history of astronomy, the most obvious lesson learnt is that we aren't all that different. And we're all fascinated by and committed to many of the same things. It is worth considering the possibility that cultural differences might actually enhance the productivity and team spirit of a space crew to Mars - its much easier to get sick of people exactly the same as you are; on a 6 month space flight it seems crucial to have a wide breadth of experiences to share and draw upon for social reasons as much as reasons of practical proficiency.

“The truth about Martians [must be] recognised. We are the Martians. It is the destiny of Earthlings to become Martians... some of the magic, sky wonder and worship will follow”(Reed, 93). Regardless of whether or not one approves of the inherent urge to colonisation that permeates the NASA Reference Mission to Mars (I for one think it's a bad idea), if we do plan to attempt to alleviate the problems associated with over-population and environmental abuse that we have inflicted on our own planet by running

away to colonise and possibly terra-form Mars, it is important to keep in mind that the people most affected by these socio-economic and environmental problems are the people of the third world and non-western cultures. Exacerbation of population pressures in the third world means that these are the people who would need most urgently to benefit from the potential colonisation of Mars. It is therefore important to have representatives of non-western cultures involved in the initial stages of discovery and exploration that transpire on the Red planet. It is also important to give their historic scientific achievements particularly in this field of study note and credit.