The Exploration of Mars: Was Percival Lowell Right?

By Steve Colbern

Since ancient times, people have been fascinated with Mars. It is the most nearly Earthlike planet in our solar system, and has invoked both fear and wonder in nearly every society in recorded history. To the Romans and Greeks, the planet was the God of War, and feared strife on Earth when it became bright, in the heavens. Who can blame them; it is an impressive sight!

Many of you saw how bright Mars appeared last summer, at its last opposition¹ and in the opposition of 2003. These last two oppositions of Mars were the closest in over 60,000 years; Mars was less than 35 Megamiles distant in 2003.

After the telescope had been sufficiently perfected, astronomers attempted to map the planet. The first investigator to draw some surface features of Mars was Sir William Herschel, around 1785. The first real map was drawn by Flammarion, et. al., and was improved upon by Giovanni Schiaparelli, using an 8” telescope.

These early investigators found that Mars had some atmosphere, prominent white polar caps, which waxed and waned with the seasons, and large, persistent light and dark areas. The light areas were light orange, or burnt ochre in color, and did not vary much.

By contrast, the dark areas varied in size and color with the seasons, from brown, to dark green. Small blue-green areas resembling oases in the Martian desert were seen, along with the larger ones. The seasonal color changes of the dark areas were believed to be due to the presence of vegetation.

At each opposition of Mars, Schiaparelli also observed, and mapped, strange linear markings connecting the dark areas. These markings were very narrow, very straight, and difficult to observe, requiring nearly perfect atmospheric conditions for their resolution. Some of these lines ran across the planet for thousands of miles. He called these lines “canali”, or “channels”, in Italian.

¹ This is when Mars is directly opposite Earth, or in contact with an imaginary line running between the sun and the Earth, and projecting outward.
In 1894, Dr. Percival Lowell founded the Lowell Observatory in Flagstaff, Arizona, dedicated to the study of the planets, and particularly Mars. He chose this location because of its altitude, and exceptional atmospheric conditions for astronomy. Dr. Lowell proceeded to spend over twenty years in the intensive study of Mars, using his 24" Clarke refracting telescope, which was built especially for this purpose.

Lowell, along with co-workers V M, and E C Slipher, reportedly confirmed the existence of the canals, as well as the seasonal changes of the polar caps, which he believed to be composed mainly of water ice. The seasonal changes in the blue-green areas were thought by the Lowell Observatory staff to be definitely due to vegetation. He also estimated the density of the Martian atmosphere at ~60 mBars, or about 1/17th of our own\(^2\), and believed it to be composed of carbon dioxide, nitrogen, and oxygen.

Although not all astronomers agreed that Lowell had seen Martian canals, enough experienced observers did, to keep the debate raging. Lowell did experiments proving that a 5-10 mile-wide line could be visible, with his telescope, at high magnification, from 35 million miles away, if enough contrast existed. He also photographed the canals for the first time in 1905.

Because of their length, unnatural straightness, and the fact that they formed a network connecting the blue-green “oasis” areas, Lowell claimed that the canals were an irrigation system constructed by intelligent Martians. This, of course added to the controversy. Lowell found that the canals were far more easily seen in the Martian summer, and often did not show up at all in winter, which fit well with his ideas of Martian vegetation. His books *Mars and its Canals*, and *Mars as the Abode of Life* disseminated his findings about Mars to the public. These books were very popular, and lectures by Professor Lowell nearly always drew crowds\(^3\).

Mainly due to Lowell’s research, belief in a Martian civilization was thought sufficiently likely that Orson Welles’ War of the Worlds radio broadcast caused a panic in 1935!

Ground-based research on Mars continued until the early 1960s, with an especially extensive study being done during the 1954 and 1956 oppositions. William H. Sinton, and Gavriil Tikov did separate spectroscopic studies of Mars, which detected spectral lines possibly belonging to chlorophyll. Their work also detected methane in the Martian atmosphere, which, on Earth is nearly always a product of biological processes.

In 1965, shortly after the dawn of the Space Age, the US and the Soviet Union were engaged in a race to get the first spacecraft to Mars. In that year, the US launched the Mariner 4 spacecraft, which was the first successful flyby of Mars\(^4\). It carried cameras, along with an IR spectroscope, and returned grainy, black-and-white photos of less than 10% of the planet.

\(^2\) This was based on the albedo of the Martian atmosphere, the Martian gravity (0.38g), and comparisons with Earth.

\(^3\) Professor Lowell continued his research on Mars until his death in 1916. He was buried on the grounds of his observatory. The Slipher’s continued the Mars research, after Lowell’s death.

\(^4\) The Soviets tried many times to send spacecraft to Mars, without notable success. In 1971, they finally landed a spacecraft on the planet, which failed 90 seconds afterward. NASA often jokes about a “Cosmic Ghoul”, concerning the high failure rate of Mars missions. If he exists, he must be a staunch anti-communist!
NASA announced that the pictures showed a desolate, frozen, cratered moonscape, no canals, no water, no vegetation\textsuperscript{5}, and no lost civilization.

The radio occultation data derived from the spacecraft’s signal, as it went behind Mars, was used to calculate an atmospheric pressure of ~6 mbar, or $1/170^{\text{th}}$ of ours. This pressure is near-vacuum, and pure, liquid water cannot exist for long.

The Martian atmosphere was found, spectroscopically, to be mostly CO\textsubscript{2}, with 3\% N\textsubscript{2}, 2\% Ar, and only 0.13\% of oxygen\textsuperscript{6}. The Mariner 4 data was used to espouse the “Dead, Dry, Mars” paradigm that we have heard for the last 40 years.

\textbf{Sinton’s IR Data on the Martian Atmosphere}

\textbf{Mariner 7 IR Data on Martian Atmosphere}

Two more US flybys of Mars followed, one of which, Mariner 7, also detected methane. Mariner 9 was the first spacecraft to orbit Mars, and did the first space-based mapping of the planet.

In 1976 the two Viking landers touched down successfully on Mars, leaving their respective orbiters to continue mapping the planet, at higher resolution than had Mariner 9.

\textsuperscript{5} NASAs Dr. Carl Sagan attributed the seasonal changes of Mars to “dark dust blowing around” even though no good evidence existed to suggest that enough dust was transferred to cause the changes.

\textsuperscript{6} Oxygen is such a reactive gas that the presence of even this small concentration may require the presence of plant life. On Earth, the only known source of free oxygen is plant photosynthesis.
The landers carried the first instruments designed to test for microbial life in the Martian soil. It was found that the soil gave off oxygen on contact with water. Soil and atmospheric tests showed no liquid water in the soil, but the atmosphere was constantly at 100% humidity, or saturated with water vapor. Frost formed frequently at the Viking II landing site, during the Martian winter.

The composition of the Martian atmosphere tested as:

- Carbon Dioxide (CO2): 95.32%
- Nitrogen (N2): 2.7%
- Argon (Ar): 1.6%
- Oxygen (O2): 0.13%
- Water (H2O): 0.03%
- Neon (Ne): 0.00025%

The atmospheric pressure was reported to vary seasonally from 6-9 mBars.

Life tests on the soil showed inconclusive for photosynthetic activity\(^7\), but positive for metabolic activity on contact with a nutrient solution. The positive test was explained by NASA as a reaction of the nutrient broth with an unknown oxidizing agent in the Martian soil\(^8\).

The kinetics of the reaction, however, were more consistent with bacterial than with chemical action. Dr. Gilbert Levin, the designer of the experiment\(^9\), still claims that his experiment detected the presence of living Martian microbes. This type of experiment is nearly infallible in detecting the presence of Earthly microbes\(^10\).

The first pictures from the landers showed a grey-blue sky, and a rocky, rust-colored, Arizona desert-like landscape, with faint blue-green patches on some of the rocks. These patches were later found to vary in intensity with the Martian seasons. Later press release photos then showed the view with the red sky, and almost bright red landscape that we have most often seen in the media\(^11\). Which view is correct?

\(^7\) This was the pyrolytic release experiment, which cooked samples of Martian soil exposed to C14O2, and light, to look for the incorporation of C14 into organic compounds. Seven of nine results seemed to show a small amount of activity, but the results were said to be inconclusive.

\(^8\) NASA hypothesized that such an oxidizing agent could be formed by the action of strong UV on Martian soil, since, according to NASA estimates, the planet does not have enough oxygen to form an ozone layer. NASA also argued that the UV would kill any living organism. EC Slipher, of the Lowell Observatory, showed that the Martian atmosphere is far less transparent to UV, and near UV, than to visible light. Urey (1959) hypothesized that the CO+ ion may serve the same UV-absorbing function in the Martian atmosphere as ozone does in Earth’s. A NASA monograph on the Martian atmosphere (NASA Space Vehicle Design Criteria Report SP8010, pg 28 (1974)) also confirmed that the Martian atmosphere absorbs, or scatters UV, and mentions CO+, or CO2+ ions as the possible UV-absorbing species. The actual UV flux at the Martian surface has never been measured.

\(^9\) This was the labeled release experiment, which measured the rate of synthesis of carbon 14-labeled CO2, from carbon 14-labeled nutrients. Dr. Levin did extensive analysis of the Viking labeled release data, during, and after, the Viking program.

\(^10\) Early in 1977, NASA announced their conclusion that the Viking landers had found no evidence of Martian life.

\(^11\) NASA evidently ignores its own color calibration charts on the spacecraft, and even the lander’s American flags, which are good color charts, in themselves.
Since Rayleigh scattering\textsuperscript{12} should occur in a carbon dioxide atmosphere, just as it does in nitrogen/oxygen, there is no good reason to believe that the Martian sky should not be normally blue, except during a dust storm.

Hubble Space Telescope views of Mars also support a blue Martian sky, as the limb of the planet is blue in these images.

Later photos from the Pathfinder, Spirit, and Opportunity landers/rovers also showed the blue sky/Earth-desert-like landscape, when the correct combination of filtered photos, from the raw data is used.

The NASA press release Martian surface photos are very inconsistent in color, with a few blue sky/natural shots being released, but with the red-sky variant being the norm.

\textsuperscript{12} Rayleigh scattering scatters blue light preferentially.
Winter Ground Frost at the Viking II Landing Site

Besides the expected craters and dunes, the orbital photos from Mariner 9, and the Viking orbiters showed river valleys, along with the largest canyon (Valles Marineris, or Valley of Mars), and the largest mountain (volcanic Nix Olympica, or Mt. Olympus) in the solar system.

The presence of the river valleys proved that large amounts of liquid water once existed on Mars, and the rusty surface strongly suggested the past presence of much higher concentrations of atmospheric oxygen.

The orbiters also photographed a mesa in the Cydonia region, over one mile across, which had the appearance of a carved human face. Computer enhancement of the image showed what appeared to be teeth in the mouth, and a pupil in the right eye.
Seasonal Changes in Green Patches on Rocks at Viking I Landing Site

The image analysis of this so-called “Face on Mars”, by Viking Imaging Team scientists Vince DiPietro and Greg Molenar, started a heated debate, when they concluded that it has a high probability of being an artifact of some past civilization. DiPietro and Molenar also pointed out a group of several pyramidal “structures”, several miles from the Face, which they claimed might be artificial as well.

In 1989, the Soviets made their last attempt to explore Mars, in the form of their Phobos 2 probe, which was to get the first close-up views of Phobos\textsuperscript{13}, the largest of the two moons of Mars.

The spacecraft was to approach within 50 meters of Phobos, and release two landers, one of which was a “hopper”, which could move about on the surface. The probe took close-up photographs, and detected a steady outgassing from Phobos’ surface, which was most likely water vapor, but contact was lost with the spacecraft shortly after it had released the landers.

It was speculated that the spacecraft had suffered a collision with another body, as a nearby object was photographed in space, near Phobos 2, just before loss of contact.

\textsuperscript{13} Phobos is a small body, approximately 12 miles X 17 miles across, Deimos the other moon of Mars, is even smaller, ~3 miles X 5 miles; both are probably captured asteroids.
The loss of the spacecraft was officially listed as being caused by a malfunction of its main computer.

There was a long gap in which NASA undertook no further Mars missions. The next Mars orbiter, the Mars Observer, was launched in 1992, but contact with the spacecraft was lost shortly before insertion into Mars orbit.

The cause of the failure was not known with certainty, but was thought to have been due to a fuel tank explosion during the Mars orbit insertion rocket burn. The Mars Observer spacecraft was to have done high-resolution mapping of the Martian surface.

The next lander mission, the Mars Pathfinder, did not touch down until 1997. This lander carried a small rover, with which to extend its sampling capabilities, but did not have instruments with which to search for life.

The mission was a success, although NASA continued releasing its “Red Sky” version of Mars images taken by the Pathfinder lander.

Shortly after the Pathfinder landing, the Mars Global Surveyor spacecraft successfully arrived in Mars orbit to fulfill the high-resolution surface mapping mission, originally undertaken by the lost Mars Observer.

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14 The spacecraft cameras were to have had roughly 1 meter/pixel resolution. The Viking Orbiters had a resolution of only about 3 meters/pixel.
Mars Global Surveyor is still operating at the present time, after having mapped most of the planet, and taken thousands of extraordinary images. Some of these images appear to confirm much of what Professor Lowell thought about Mars. Large areas of possible vegetation, including moss-like plants, bushes, and trees are shown. The objects in the images display a fractal, Fibonacci branching pattern, seen on Earth only in living organisms.

Most of the areas which appear to be large tracts of vegetation are located near the Martian South polar region, from 75 degrees, to 85 degrees South latitude. The location fits well with the hypothesis that these objects are vegetation, since the South Polar Region of Mars should have the most liquid water on the planet, during its summer. The reason for this is that the Southern polar cap is larger than the Northern, and sometimes disappears entirely during its warmer summer. As the Southern Polar cap melts, it would supply water for the plants. Temperature measurements, taken by the Mars Odyssey spacecraft confirm that temperatures at the Martian South pole are frequently well above freezing during the summer.

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15 The Mars Global Surveyor spacecraft cameras have a maximum resolution of ~1.5 meters, somewhat lower than that of the lost Mars Observer.
16 January, 2006. MGS was joined in Mars orbit by the Mars Odyssey spacecraft, in 2001. It took over the mission of the Mars Climate Orbiter, lost in 1999, when a navigational error caused it to burn up on atmospheric entry.
17 Special thanks to J. P. Skipper, at the Mars Anomaly Research web site, www.marsanomalyresearch.com, for wading through the vast volume of MGS data for evidence of Martian vegetation, and water.
18 The “trees”, if that is what they are, are giants, some measuring over a kilometer across!
NASA has said publicly that, in view of the Mars Odyssey temperature data, the Martian polar caps must be composed mainly of water ice, as it is frequently too warm for carbon dioxide ice to exist there.
An image of at least one possible lake was also seen in summer, near the South Polar “forests”. This is further evidence that liquid water can exist on the Martian surface, at least for short periods, as well as supporting the hypothesis that the “forests” really are living Martian plants.

In more equatorial areas of the planet, a dark green, or blue-green film, or layer, is often seen on the surface. This layer resembles the lichens, and algae, which often grow on rocks on Earth.

There is always more green in valleys, where the atmospheric pressure would be highest, and also near the bases of peaks and mesas, where runoff would be expected (see Mars Express images).

Many straight “canyons”, several miles wide, have been seen in the MGS images.

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19 The Mars Polar Lander (1999) was to have landed in the South Polar region, in the general area where the “forests”, and “bushes” are seen. Contact with the lander was not regained after the landing sequence. An independent search of the MGS image data by the National Imaging and Mapping Agency (NIMA) found three pixels in the prospective landing area, which were consistent with the lander’s heat shield, aeroshell, and “an intact lander, sitting on the surface, with its solar panels deployed”. NASA took issue with their report, saying that it was based on “noise in the data”. The NIMA, in turn, said they stood by their conclusion. NASA officially listed the cause of the failure as faulty design, and inadequate testing, which caused the lander’s radar altimeter to sense the landing gear deployment as proximity to the ground, causing premature engine shutdown.

20 If any surface water has dissolved salts, it could remain liquid at near-freezing temperatures, without rapid evaporation. If one factors in the fact of 100% humidity in the Martian atmosphere, the presence of liquid water up to the maximum temperatures found on Mars is a possibility. The alternate explanation for the apparent presence of liquid water in some of the MGS images is that the atmospheric pressure is higher than we have been told.

21 The color of this layer can be best seen in the Mars Express Orbiter, and Spirit and Opportunity Rover images.
Some of Lowell's Canals?

These formations are all over the planet, often intersect, as Lowell stated of his canals, and are about the width that Lowell calculated for the lines he had observed from Earth. The formations are frequently flanked by objects which resemble bushes, or brush-like vegetation, and have slightly raised, perpendicular structures in the center. These could be sandbars, caused by running water, or pressure ridges due to the presence of subsurface ice.
Seeps of liquid water into these “canals” are also seen frequently, especially near the Martian North pole. More possible artifacts were also seen by the MGS spacecraft. The “Face” in Cydonia

MGS Face

1→2: correction for bad lighting angle
2→3: correction for low viewing angle

MGS View of the Face on Mars

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22 This is, interestingly enough, where Lowell stated that most of the canals originate.
was re-imaged, at high resolution, after a protracted struggle with the NASA/JPL bureaucracy, and much foot-dragging on their part\(^\text{23}\).
The new images confirmed the reality of the teeth, and pupil in the right eye socket, along with nostrils, not previously seen. The left side of the “Face” appears collapsed, as if hollow. The eyes and mouth are symmetrical, however.

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\(^\text{23}\) This “foot-dragging” included attempts to pass off an improperly processed MGS image of the face, as the “best” available, and an attempt to present low-resolution, laser altimeter data of the face, from the Mars Odyssey spacecraft, as having higher resolution than the MGS cameras! Their goal, apparently, was to “debunk” any suggestion of artificiality. A good high-resolution image was finally obtained, after JPL reluctantly yielded to congressional pressure.
The “Head on Mars” in Syrtis Major

High-resolution views of the Cydonia “structures” near the “Face” were also obtained, confirming their regular shapes, and possible artificiality.

In addition, an enormous shape, resembling a carved human head was seen in the Syrtis major region\textsuperscript{24}. Other possible artifacts include strange, “ribbed”, tube-like structures\textsuperscript{25},

\textsuperscript{24} This artifact, if that if what it is, is 12 miles wide, and has not been mentioned in the press, as yet.
which appear very common all over the planet, shapes and pictures in the ground, and objects resembling roads, and triangular structures. This new evidence prompted the former head of the US Naval Observatory, Dr. Tom Van Flandern, to publish a presentation, in 2001, entitled “Artificial Structures on Mars”. This presentation summarizes the evidence for artificiality gathered as of that year. This “tubes” are ~30 m in diameter, and appear translucent. The “rib” material is also highly reflective. Please see his Meta Research web site, at www.metaresearch.org, for the presentation, along with other fascinating data.
In 2003, the European Space Agency (ESA) Mars Express spacecraft arrived in Mars orbit to begin a mapping mission\textsuperscript{27}. The spacecraft immediately began sending back spectacular color photos of the Martian surface, which show a lot of green coloration, and tend to confirm the earlier MGS data showing vegetation. The green in the Mars Express images, as in the few available color MGS images, is most intense in low-lying areas of the local terrain, where water would tend to collect. Areas of lowest elevation, where the atmospheric pressure would be highest, also have more common, and more intense green areas. Hubble Space telescope images, as well as images from amateur astronomers, also show large areas of green on Mars\textsuperscript{28}.

\textsuperscript{27} The spacecraft also deployed its Beagle 2 lander before entering orbit, but contact was not reestablished after descent. This lander had instruments with which to search for life.

\textsuperscript{28} Many of the amateur images, especially those taken during the close opposition of 2003, also show faint linear markings. Some of the images appear very similar to the photos of the canals shown in EC Slipher’s book, “The Photographic Story of Mars”. 
The NASA Mars Odyssey spacecraft is also designed to take color images, but after operating for nearly five years, very few of these images have been released to the public\textsuperscript{29}. Unfortunately, the resolution of the Mars Express spacecraft High-Resolution camera is only 12 meters/pixel, as opposed to the much higher (1.5 meters/pixel) camera resolution of the Mars Global Surveyor. The Mars Express spacecraft has also only mapped 10\% of the planet, thus far. Hopefully, the Mars Express will map the entire planet in its next few years of operation, thus providing an independent Mars image gallery. The Mars Express also spectroscopically (re)discovered methane in the Martian atmosphere\textsuperscript{30}, along with ammonia, formaldehyde, and hydrogen sulfide. On Earth, these gases are all generated by living organisms. The ESA seriously considered formally announcing the existence of life on Mars, after these discoveries, but then decided against it.

In spite of their reluctance to confirm Martian life, the European Space Agency appears, so far, to be somewhat more forthcoming with their Mars data than is NASA\textsuperscript{31}. In 2004, the next pair of US spacecraft landed on Mars. These are two rovers, named Spirit and Opportunity. They are more advanced versions of the Sojourner rover, sent with the lander on the Pathfinder mission.

\textsuperscript{29} Not releasing these images to the public in a timely manner is illegal, and violates the NASA charter.

\textsuperscript{30} This was presented as a new discovery. It is not known if the ESA knew of the previous indications of methane in the Martian atmosphere.

\textsuperscript{31} This may be changing, as the ESA recently dismissed the green color seen in one of their images of Gusev crater (the Spirit rover’s landing site) as an “error in processing”. This seems unlikely, in view of the fact that multiple image sources show green coloration on the Martian surface.
The rovers carry color and black and white cameras, meteorological instruments, and microscopic imagers. Both rovers have been operational for over one Martian year, and have made incredible discoveries. These include mud, springs, or geysers, possible plant life, and possible fossils.

In spite of the significance of these discoveries, they have been virtually ignored by the media, and the public. This is, in large part, due to the fact that NASA is still clinging to its policy\(^\text{32}\) of presenting Mars as a dry, frozen, dead, planet, where liquid water cannot exist.

Most of the rover images presented by the NASA/JPL community are not in color, and the vast majority of color images that have been released have the “red sky” coloration, seen in the Viking and Pathfinder press release images.

\(^{32}\) Or is it more properly called a cover story?
Fortunately, NASA is releasing the raw data\footnote{Unfortunately, there is some evidence of image tampering in some of the frames that goes beyond color imbalances. On the positive side, the censorship, if that is what it is, is not all-inclusive. There are still many incredible things to see in the rover images.}, and those who are technically sophisticated enough to use Adobe Photoshop can make their own approximate true color images of the Martian surface\footnote{Three images, using filters L4 (red), L5 (green) and L7 (blue) (L6 is also acceptable for blue) are combined electronically to make the true color images. Many NASA press release images are made with a near infrared filter, rather than a red one. This overemphasizes the red, as there is likely more near-IR in the Martian environment than red light.}.

Mars Express View of a Martian Riverbed-The Reull Valles

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Hubble Space Telescope View of Mars at Opposition

Fram Crater-Mud in Possible Geyser-Spirit

Fram “Impact” Crater in NASA Press Release Image
Indeed, this is what any serious researcher of Mars must do to get true color images of the Martian terrain traversed by Spirit and Opportunity.
The rover landing sites are on what are thought to be old, ocean, or lake bottoms. Spirit landed in Gusev crater, an impact crater, which formerly contained a lake. Opportunity landed in the Meridiani Planum Region, at the Eastern end of Valles Marineris, which is thought to be an ancient ocean bed. These sites were said to be chosen so as to maximize the possibility of discovering water, life, and fossils.

Endurance Crater Wall-Opportunity

NASA has apparently done a good job of achieving these goals, as the images appear to show wet ground, mud, possible geysers, and numerous possible fossils of ocean life.

Blue-Green Soil and Possible Mud-Opportunity
Rover Soil Track-Showing thin Blue-Green Layer -Possible Photosynthetic Microbes-Opportunity

Possible Trilobite Fossil-Spirit
Rover Microphoto Leaked to Media-Possible Lichen
What appear to be fossil trilobites, urchins, shrimps, and crinoids have been seen in images from both rovers. Images of possible fossils are surprisingly abundant, and appear astonishingly similar to sea life on Earth. It is likely that many of the rock fragments in certain areas imaged by the rovers are fossils, or their fragments. The famous “Martian Blueberries”, which litter the bottom of Gusev crater, may, in fact, be the “heads” of fossil crinoids.

35 Special thanks to Sir Charles Shults, at Xenotech Research web site, www.xenotechresearch.com, for discovery of the trilobite and crinoid images.
None of these discoveries have been announced in the media, however, and NASA continues to officially deny that the images show any of the above phenomena. This, in spite of the fact that, according to Moriba Jah, a member of the JPL navigation team for
Possible Liquid Water in Depressions Left by Rock Abrasion Tool-Opportunity

Possible Mud-Spirit
Possible Liquid Water in Depression Left by Rock Abrasion Tool - Opportunity
(complete view of top image from above composite)
View of Terrain at Meridiani Planum-Opportunity

Possible Geyser-Opportunity
the Mars Reconnaissance Orbiter\textsuperscript{36}, half of NASA planetary scientists now believe that the rover images show fossils. A much higher percentage of planetary scientists worldwide, now reportedly believe (privately) that there is at least microbial life extant on Mars. The larger significance of the discovery of life on Mars is that it makes the idea of Panspermia, the theory that life came from space\textsuperscript{37}, much more likely.

During the twentieth century, living microorganisms were discovered inside several carbonaceous chondrite, and stony meteorites. At least one meteorite, thought to be from Mars, also showed microfossils. Most scientists dismissed these results as being due to contamination from Earth, but if correct, they would mean that microbial life is probably everywhere! This may indicate that complex life forms would arise anywhere there is some air, and some liquid water. In this case, complex life, perhaps even intelligent life, would be common in the universe.

In order to confirm the Mars findings, to everyone’s satisfaction, it will be necessary to mount a manned expedition to the planet. Only then will this controversy be put to rest. Unfortunately, this may be politically difficult. The expense, the agenda of the

\textsuperscript{36} Another high-resolution orbital mapping spacecraft, now on its way to Mars. Camera resolution of the MRO is said to be < 1 meter/pixel.

\textsuperscript{37} Dr. Fred Hoyle originated this theory in the 1930s.
governmental secrecy machine, and the fact that JPL has a vested interest in keeping the space program robotic\textsuperscript{38} would all work against it. It is only to be hoped that President Bush's space agenda will include the manned expedition, which has been so long in coming, and that the official secrecy surrounding these great discoveries concerning Mars will soon end. At that time, Mars will be revealed as the living planet that Percival Lowell had first discovered and envisioned.

\textbf{Hillside Showing Possible Vegetation-Opportunity}

\textsuperscript{38} Special thanks to Dr. Tom Van Flandern, for revealing this.
Amateur Mars Image Showing Obscuration of Surface Features in Blue Light
MARS

June 21, 2003

Blue (Astronomik II)

Red (RG610)

R(G)B

268°
02 H 24 UT

266°
02 H 17 UT

266°

276°
02 H 59 UT

279°
03 H 08 UT

290°
03 H 55 UT

294°
03 H 31 UT

290°

Color mode (+ UV / IR cut)

Seeing 5-7 / 10 Transparency 5 / 5
180mm newtonian - Toucam Pro
Altitude 23-27°

Ls 207
Dia 15,1''
De - 21,1

Christophe Pellier
Mars

CM017
LS 231

C14 @ f39 taken with a ST5 CCD from Houston Texas July 29 2003 at 09:34 UT

R-rgb
R

2003/07/29 00:00(UT)
LS=220.85° D1r=21.85°
C, M. =246.75°
P =343.49°

Mars, July 29 2003, 00:00:00 UT
Scteq X-1/12 Lat 81N
Celestron 9.25 @ f5.5
(c) D. Dierick, 2003
Possible Bacteria in Mars Meteorite ALH84001

Possible Bacteria in Efremovka Meteorite