

# Meteors, Mars & Extraterrestrial Life

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# Life in the Universe?

- Is it rare or common?
- No one on earth really knows.
  - Evolutionists don't agree.
  - Creationists don't agree.
- Admittedly, the media tends to see the matter in black & white:
  - Evolutionists: life as common.
  - Creationists: life as unique.



# Evolutionists Don't Agree

- Of course, most media attention & federal money goes to those who think it common.
  - Why would a talk show host feature a guest who thinks there is life only on earth?
  - How do you get government funding to look for radio signals from extraterrestrials if you don't think there are any within radio range?
- Yet biologist Ernst Mayr and physicist Enrico Fermi both feel intelligent life is very rare or even unique to earth.



# Creationists Don't Agree

- Here, too, a range of opinion.
- Bible-believers realize there is at least one intelligent race beside humanity—angels.
- In his science fiction trilogy, CS Lewis pictured intelligent life as quite common.
- On the other hand, the *SCP Journal*, after a survey of the possibilities, thought life unique to earth.



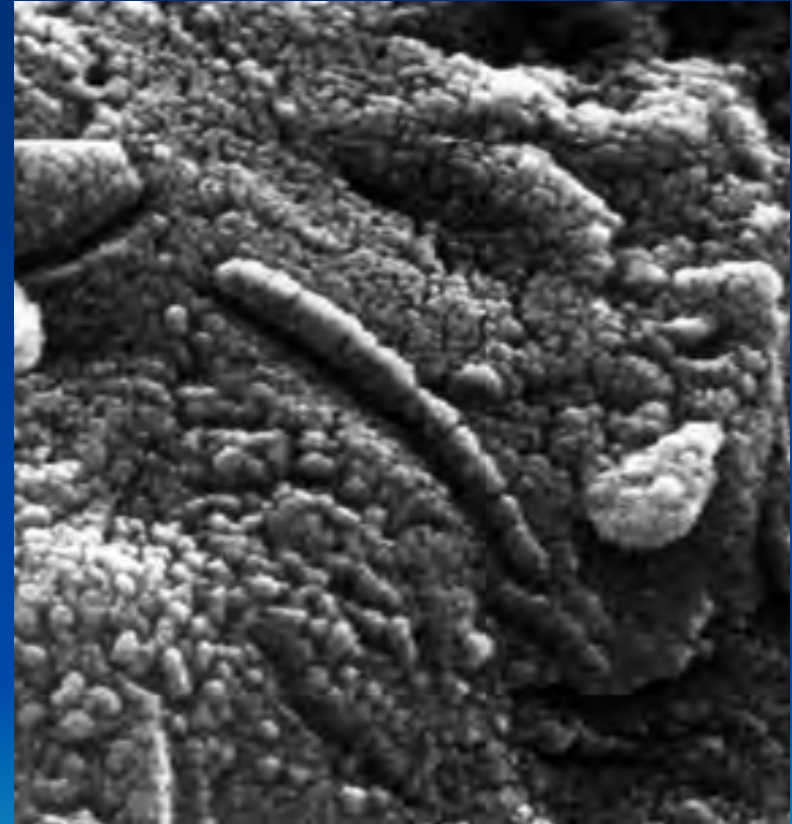
# Enter the Mars Rock

7 August 1996. A NASA research team of scientists at the Johnson Space Center ... and at Stanford University ... has found evidence that strongly suggests primitive life may have existed on Mars more than 3.6 billion years ago.



# The Mars Rock

The NASA-funded team found the first organic molecules thought to be of Martian origin; several mineral features characteristic of biological activity; and possible microscopic fossils of primitive, bacteria-like organisms inside of an ancient Martian rock that fell to Earth as a meteorite.



# The Proposed Scenario

- Some 3.5 billion years ago, when water was abundant on Mars, a rock there was cracked. Water seeped in, depositing carbonate minerals.
- Primitive bacteria lived a while in the crack, leaving evidence behind.
- Just 15 million years ago, the rock was blasted into space by a meteor strike.



# The Proposed Scenario

- The rock went into orbit around the sun.
- About 13 thousand years ago, the rock fell to Earth on the Antarctic ice sheet.
- The rock was brought to the surface by ice movements & discovered in 1984.
- Since then, it has come to be recognized as Martian and very old.
- Evidences of life were recently found in it.





# Is this fantasy?

- To a layperson, it sounds preposterous.
  - A rock from Mars?
  - Found on Earth?
  - Found near the South Pole?
- Gimme a break!
  - I bet this is some stunt by NASA to get money to send astronauts to Mars!



# Is this fantasy?

- No doubt, NASA would like to send an expedition to Mars, or at least a series of sophisticated robot landers.
- But the evidence that this rock is a meteorite from Mars is really quite good.
- Let's see.



# Meteorite from Mars?

- Scientists have recently concentrated on Antarctica as the best place to find meteorites. Here meteorites are:
  - Less likely to shatter striking ice than rock.
  - Easier to spot on ice than on dirt.
  - Less likely to be contaminated by earth-life.
- Our particular rock, ALH 84001 has a thin, dark, glassy coating, the distinctive fusion crust from its fiery descent thru the atmosphere.



# Meteorite from Mars?

- OK, so the rock is a meteorite.
- Why should we think it is from Mars rather than the asteroid belt, where most meteors arise?
- We have a detailed analysis of the Mars atmosphere from the Viking landers.
  - The gas bubbles trapped in ALH 84001 have the same composition.
- The mineral composition of ALH 84001 puts it in a category (SNC meteorites) we think is most likely from Mars.



# Meteorite from Mars?

- So, if this rock was once on Mars, how did it get here?
- The scenario above (panels 6 & 7) is a guess based on the various radiometric ages given in the rock, but the identification as Martian does not depend on this scenario or these ages.
- The big question is, does it really contain evidence of primitive Martian life?



# Martian Life Inside?

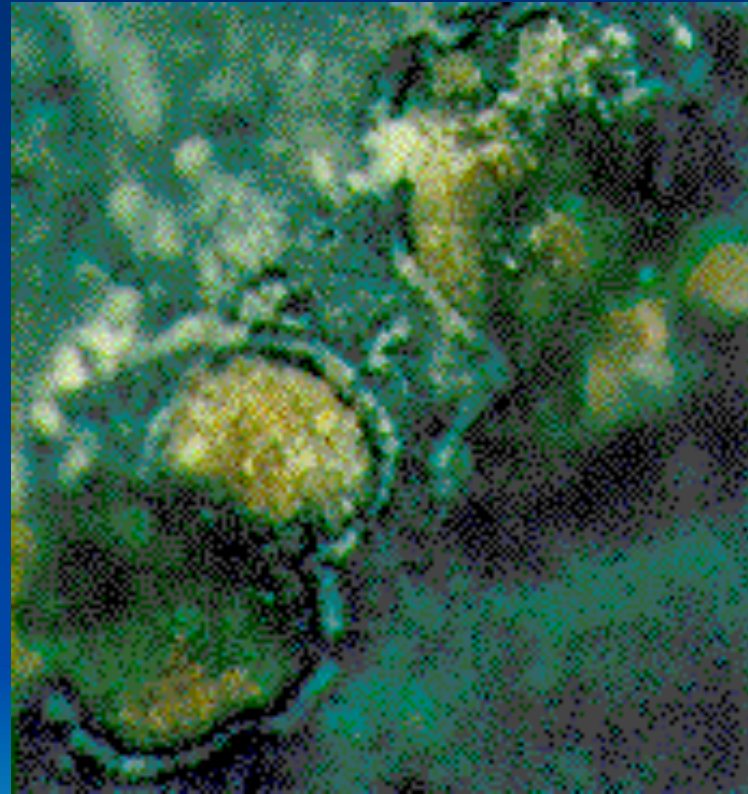
- Investigators agree there's no life in the rock now.
- The big debate: Did the rock...
  - once have life, which left evidence behind?
  - never have life, the evidence is inorganic?
- The debate centers on microscopic globules of carbonate in the rock.



# Carbonate Globules

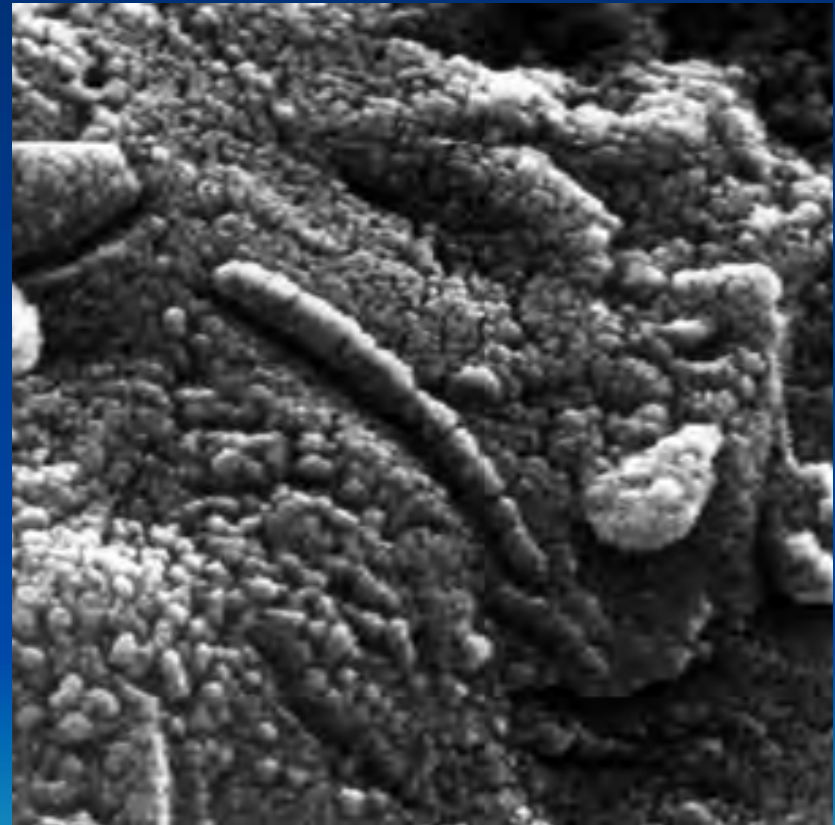
These globules have several features that suggest very small bacteria lived in them.

- (1) Shapes that resemble bacteria have been found in the cracks.
- (2) Microscopic mineral grains of the sorts produced by bacteria
- (3) Chemicals called polycyclic aromatic hydrocarbons (PAHs)



# Shapes

- These worm-like shapes resemble some bacteria found on earth.
- However, these are much smaller than any known earth-life.
- They are similar in size to hypothetical nano-bacteria.





# Microscopic Mineral Grains

- These grains consist of an iron oxide called magnetite, and two sorts of iron sulfide called pyrrhotite and greigite.
- Though any of these can be formed by inorganic processes, their presence together is thought to be very unlikely for inorganic formation.



# Polycyclic Aromatic Hydrocarbons

- PAHs form from the decay of living things, including bacteria.
- They can easily be formed in other inorganic ways, but ...
  - They don't look like contaminants from Earth.
  - They don't look like the kind of PAHs found in space.
  - They are more common deep in the rock than near its surface.



# Opposition to These Claims

- In general, it is agreed that the rock is a meteorite, from Mars, and contains the minerals and structures noted.
- Some claim these materials were formed here or on Mars by inorganic processes.
- Others claim that some of the materials are organic, but they are a result of contamination after the rock reached Earth.



# Opposition to These Claims

- Now over ten years after NASA's announcement, scientists are still divided on a verdict.
- Most think this may be evidence of life, but that it is too uncertain to be decisive.



# What To Make of This?

- Probably this question will remain unresolved until there is a detailed study of the Martian surface.
- Recently, robotic vehicles and photos from space have shown that Mars once had and still has water that occasionally flows.



# What To Make of This?

- If these materials turn out not to be biological, we need make nothing of this.
  - It fits with the idea that life is rare or even unique to Earth, but it doesn't prove it.
- If these really turn out to be fossils from early in Martian history, then we will learn that life has existed on more than one planet in our universe.



# Life on Mars?

- Those who believe life is common (and have been troubled by theoretical calculations to the contrary) will feel vindicated, and will make much of this in the media.
- But life on Mars may mean nothing more than one of the following:
  - It was transported from Earth by the solar wind.
  - It was transported by a meteor from Earth to Mars, just as ALH 84001 came to us in the opposite direction.
  - God created life on Mars as well as on Earth.



# Lessons for Christians

- Meanwhile, we Christians should be cautious about taking hard-line positions on questions for which Scripture has not provided answers.
- We already face strong hostility from many in academia and the media who are not beyond emphasizing off-the-wall statements made by conservative Christians that make the Bible & Christianity look ridiculous.





# Lessons for Christians

- We need to have enough reliable information in our hands to speak responsibly to those we are able to influence.
- We need to point out where evolutionists are going beyond the data themselves.
- We need to distinguish between where we as creationists have explicit biblical and scientific support and where we are guessing.

# Lessons for Christians

- The Lord will honor our attempts to be faithful to Him.



# The End

