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UFO UpDates Mailing List

Re: Bushes on Mars?

From: **Lan Fleming** <apollo18@swbell.net>
Date: Wed, 07 Jun 2000 19:42:53 -0600
Fwd Date: Wed, 07 Jun 2000 22:03:32 -0400
Subject: Re: Bushes on Mars?

>Date: Wed, 07 Jun 2000 09:26:49 -0400 (EDT)
>From: Bob Young <YoungBob2@aol.com>
>Subject: Re: Bushes on Mars?
>To: Updates@sympatico.ca

>>>Sublimation certainly happens on Mars at colder temperature, the
>>>only question is does evaporation ever occur. At the pressures
>>>observed it can't. It probably hasn't rained on Mars for
>>>billions of years.

>>As far as I know, water does not sublimate at earth-atmosphere
>>pressure. Period. Snow drifts shrink in size without leaving
>>puddles of water because the melt water evaporates as fast as it
>>melts - except, of course, when the drifts melt fast enough to
>>leave puddles of water - or run-offs or mudslides down mountain
>>slopes.

>Lan, List:

>You are saying that sublimation never occurs on Earth, even when
>the temperature is below freezing?

I guess it's better to never say never. I was being overly simplistic. It's more than just a question of atmospheric pressure. If the partial pressure of water vapor in the air is lower than the equilibrium vapor pressure at a given temperature and the humidity is less than 100%, then there could be sublimation. The equilibrium vapor pressure is 6 millibars at 0 Centigrade. If the water content in the air is such that the partial pressure of water vapor is less than 6 millibars at 0 C, then sublimation might be possible at that temperature. The equilibrium vapor pressure becomes progressively lower with decreasing temperatures, requiring increasingly dry air for sublimation to occur. One reference book I have says the water content in air ranges from 3% in wetter climates down to about 0.1% in dry and cold climates. I think that corresponds to a range of partial pressures of roughly 30 millibars down to 1 millibar. Sublimation might occur toward the lower end of that pressure range. But I'm really not sure if there is anywhere on Earth where the weather conditions favor sublimation of water ice. I've been in cold climate locations, but none that were dry enough to notice any snow drifts subliming. In Chicago, where I'm originally from, whatever snow falls seems to stay there until Spring if it's not shoveled or salted away (that's unfortunate, since it gets pretty cruddy looking by the middle of February).

>>Mars' atmospheric pressure ranges from 6 to 9 millibars,

>>depending on altitude, temperature, and weather conditions. The
>>triple point pressure of water, where solid, liquid, and gas can
>>coexist, is .006 earth atmospheres, or about 6.1 millibars.
>>Liquid water can exist above the triple point pressure whenever
>>the temperature rises above the freezing point: 0 degrees
>>centigrade. Therefore, a naive conclusion would be that there is
>>often liquid water on Mars when the temperature rises above 0
>>degrees centigrade, which it routinely does during the summer.

>>But sophisticated "mainstream" scientists have made various
>>assumptions to nudge the effective triple point of water on Mars
>>to a pressure above the range of Mars atmospheric pressures so
>>that they can conclude there can be no liquid water on Mars, and
>>therefore no life. According to Dr. Gil Levin, those assumptions
>>have been proven wrong by the data collected by Pathfinder. Yet
>>this conclusion based on what appear to be incorrect assumptions
>>has been misrepresented as a fact that everybody seems to
>>accept.

>Thanks for outlining the controversy.

You might be interested in seeing Levin's paper on the question
of water on Mars. The URL is:

<http://www.biospherics.com/mars/spie2/spie98.htm>

My reading of this paper is that there is no question that if
you were on Mars and put a cup of water outdoors, it would not
boil away. Liquid water is stable at Mars atmospheric pressures
over a temperature range of about 5 to 15 degrees C above 0. The
controversy seems to be over whether the frost and snow on Mars
accumulated overnight will melt during the day before it
sublimes. Levin cites a number of factors favoring melting over
sublimation that were discovered by the Viking landers and by
Pathfinder. These factors were unknown at the time when the
papers were written that led everybody to conclude that there
could be no liquid water on Mars. Levin & son apparently are the
only ones who have re-examined the earlier conclusions in the
light of the "new" (as of the 1970's) Viking data.

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