

Anthropogenic Global Warming Imbroglia : When in Trouble, Exploit Whole Planets :

The Fraud that Venus is a “Sister Planet” to Earth

The Fraud Promoted in Popular Culture : Venus Underwent a “Runaway Greenhouse Effect”

In my erudite opinion, no object in the Solar System, other than perhaps Earth, is the subject of more agenda-driven lies and fraud than the Planet Venus.

<https://www.youtube.com/watch?v=AgZU5uvM5Ok>



In a recent news program, Cornell University graduate Bill Nye posed the following debate question:

“Do you agree that the planet Venus is warm because it has a lot of carbon dioxide in its atmosphere? And when I say warm, I mean warm enough to melt lead on its surface. Do you agree with that?”

In this very same debate, Nye had the audacity, the duplicity and inveracity to admonish his opponent, who was clearly incompetent on this point, by babbling: *“I think you’re throwing a red herring in there.”*

You cannot be a graduate of what was formerly one of the finest educational institutions in history, one that is world renowned for its participations and discoveries in the Space Sciences, and ask the beguiling question that Nye asked . . . it confirms a person that either has zero knowledge, zero integrity, or some combination of both.

If I had been in that debate I would have exposed Nye as the hoaxster. Climate bolsheviks like Nye have long beguiled the unsuspecting, non-esoterically initiated lay person with the fraud that the Planet Venus is a “sister” or a “twin” to Earth. The underlying agenda is the notion that carbon dioxide drives the climate of Solar System orbs, and that Venus is the most frightening example of that notion. This, and related rants are not merely misstatements by the climate bolsheviks; what follows is a discussion indicating blatant dishonesty and outright fraud.

We begin with a personal perspective on a key individual in this hoax; another individual connected to my alma mater.

In 1978 I completed Bachelor's degrees in Mathematics-CompScience and Physics-Geology at the State University of New York at Albany (SUNYA). I turned down an offer by SUNYA to go on to a Master's in solid state physics. The offer had been made by Dr. Hasram Bakru, then Director at the SUNYA Nuclear Accelerator Laboratory where I had been employed as the Chief Technical Consultant to the Accelerator Engineer, Mr. Art Habriel. Instead I moved to Ithaca, New York for a Master in Business Administration (MBA) at Cornell University. I was already familiar with Dr. Carl Sagan, a professor at Cornell's Space Sciences Department.



My familiarity included the many letters exchanged between my father Victor Sheridan and Sagan; primarily concerning cosmology. Instead of detailed, direct answers, the Sagan responses were condescending, sometimes unrelated, and arrogant; displaying annoyance rather than deference to the erudition of my father.

By June 1978 I was renting a house in Caroline, New York, close to the Cornell campus, from Dr. Jaroslav Langmier. Jerry, as his friends called him, was a Lead Scientist at a highly regarded Ithaca, New York company called Ithaco Space Systems. Jerry was thoroughly connected to the Ithaca community, including the folks who live in Cayuga Heights, New York; an area that is dominated by 7 and 8 figure real estate, most of which is owned by Cornell affiliated people.

At a Cayuga Heights party that I attended with Jerry, several were gathered when a handsome gentleman approached us wearing a sports jacket and turtleneck sweater. Upon proximity, Jerry blurted:

“Carl! So good to see you. But I must say, you seem to be on TV more than you’re in the lab!”

Such was part of the reputation Sagan had in the closed Ithaca/Cornell community. Later I attained greater insight into Sagan through a man who became a close personal friend: Dr. Thomas Gold. It was Gold that “bailed out” Sagan when the latter failed tenure at his prior employer: Harvard University. Gold hired Sagan in 1971 into the Cornell Space Sciences department, where the former had been its director for many esteemed and productive years.

My personal perspective on Sagan, for a long time, remained positive. Although I am not a showy type, that behavior has its place. In fact, to this day no other individual has made a greater contribution to popularizing science, astronomy and cosmology in particular, than Carl Sagan. But therein was the trap: He was indeed “on TV more than he was in the lab.” As such, the TV and movie roles that Sagan enjoyed were characteristically a presentation geared for so-called “popular culture” at-best, and at-worst an agenda driven dribble that catered to an alleged “consensus” (**sound familiar!?**), not the stoic, unglorified, apolitical, hard-won and sometimes boring truth.

In terms of the details, in terms of the excruciating labors that truly characterize genuine scientific advancement, Sagan was left behind. When that latter state-of-affairs was laid to bare, Sagan would characteristically resort to polemics and diversions at-best. In other instances he indulged, in the opinion of many, in outright falsification. Such is the case with Sagan's opinions and statements on subjects ranging from intellectual competitors such as Immanuel Velikovsky, to Earthly topics such as “global warming,” and most relevant to this attachment, Solar System orbs like Planet Venus.

The second subtitle of this attachment regarding popular culture is generous. Anyone erudite in these subjects understands that the notion of Venus undergoing a greenhouse effect, let-alone a “runaway greenhouse effect” is an impossibility. But before we educate a New York Attorney General, let us look, with the intellect of a kindergarten child, at a greenhouse:



As a kindergarten student knows, hot air rises. So it is no surprise that when greenhouse manufacturers offer temperature control, their primary mechanisms are vents located AT THE VERY TOP where the temperature reaches maximum, and control is most effective.

This simple reality is apparently beyond the intellect of characters like James “*death trains*” Hansen, who ostensibly spews an opposite physicality during his popular culture rants about Venus.

In a recent video he babbled:

“ Once the planet gets warmer and warmer then the oceans begin to evaporate, and water vapor is a very strong greenhouse gas, even more powerful than carbon dioxide. So you can get to a situation where it just; the oceans will begin to boil, and the planet becomes so hot that the ocean ends up in the atmosphere, and that happened to Venus. Ya know. That’s why Venus no longer has carbon in its surface. Its atmosphere is made up basically of carbon dioxide, because it had a runaway greenhouse effect. ”



Other than his statement regarding the primacy of water vapor, the rest of Hansen’s Big Media rant are nonsense. In fact, given his intimacy with the NASA Pioneer probes to Venus, Hansen can be given no quarter. Carl Sagan, the original instigator of the “*runaway greenhouse effect*” farce, also has no excuse since the Pioneer data was in his possession, as was the data from the highly successful Soviet probe series called Venera.

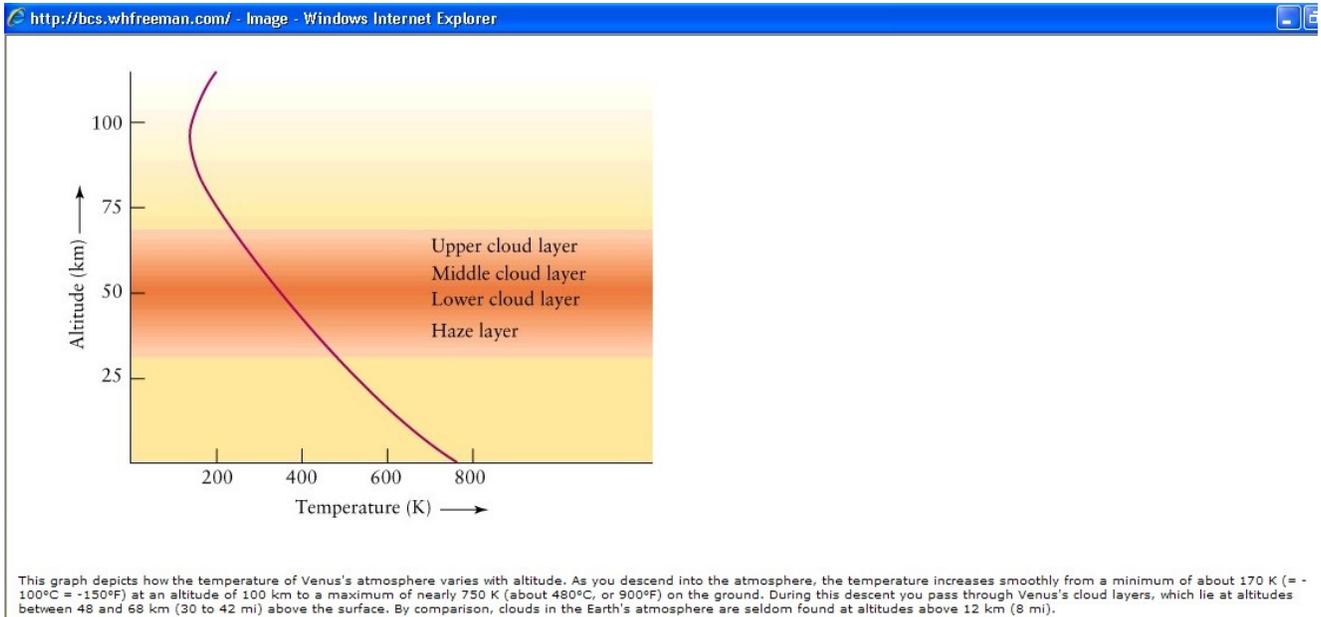
Nothing in either probe data set supports the pre-probe speculations of Hansen, Sagan and other climate bolsheviks that Venus is a “sister planet” or that Venus underwent a “runaway greenhouse effect.”

It is well known that both the American and Soviet data refuted these fairy tales. This refutation ranges from (1) the planetary albedo of Venus, (2) its atmospheric temperature gradient, and most importantly (3) the thermal energy imbalance of Venus. And its retrograde rotation demolishes any notion that Venus is a twin! The integrity of Sagan, Hansen, Nye and their AGW ilk?

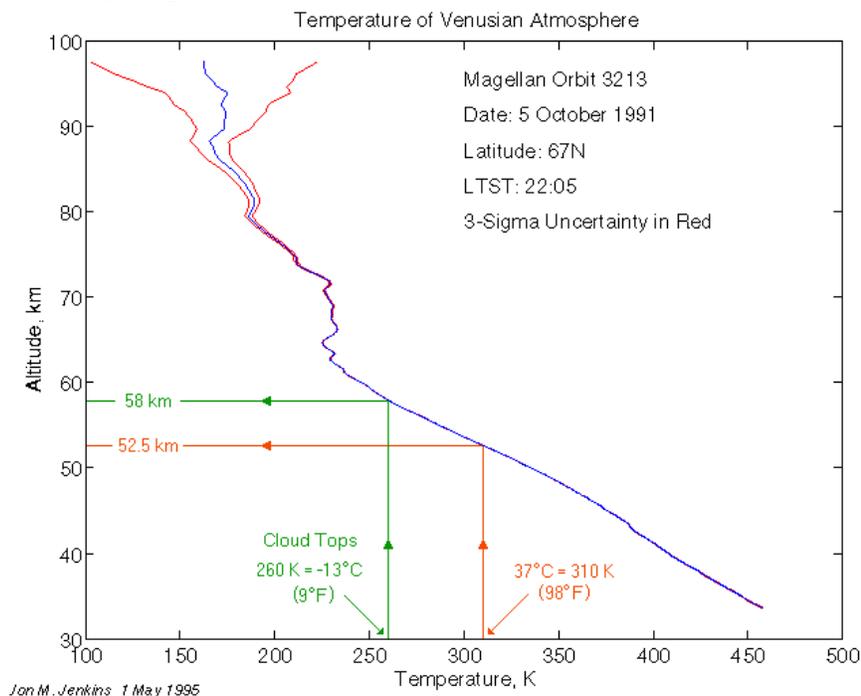
http://historicspacecraft.com/Probes_Venus.html#Pioneer-Venus

Remember the above picture of a greenhouse, where the highest temperatures are known by kindergarten students to be at the highest point, and conversely that the lowest are found at the floor/ground? Is that what the probe data says about Venus? Of course not . . .

What is ironic about our “multicultural education system” and its feel-goodery approach to hard science, is that (implicitly) it must instill cognitive dissonance. In a course by the W.H. Freeman Company, titled Astronomy Online (which I took), Module 11 discusses the planet Venus. As you might expect it promotes the popular culture fairy tale that its temperatures are due to a ‘runaway greenhouse effect.’ But in that very same module, the course offers the following, essentially accurate depiction of the atmospheric temperature gradient of Venus:



This community college level course is accurately depicting what was obtained by numerous 1980s probes, and duplicated by Magellan in 1991:



Note Mr. Attorney General the Module 11 caption (first graph on Page 4 of 19 above):

“ The graph depicts how the temperature of Venus’s atmosphere varies with altitude. As you **descend** into the atmosphere, the temperature increases smoothly from a minimum of about 170K (= -100°C = -150°F) at an altitude of 100km to **a maximum** of nearly 750K (about 480°C or 900°F) **on the ground.** ”

On March 1, 1982 the Soviet Venera 13 probe survived for only 127 minutes because the temperature ‘on the ground’ of Venus was nearly 900°F! **A greenhouse turned upside down?!**

Although the details are beyond the scope of this attachment, in order to swallow the notion that a greenhouse or a “runaway greenhouse effect” dominates the conditions and evolution of Venus you must simultaneously delete from the science courses the Second Law of Thermodynamics. Herein lies cognitive dissonance, an intrinsic psychosis of climate bolshevism . . . but let us return to popular culture.

Right there, in those simple and widely accepted data charts, for all to see including attorneys general, is a blatant **evidentiary** refutation of the ‘runaway greenhouse effect’; the fairy tale instigated by Sagan, and promoted by James Hansen. The last time I checked Mr. Attorney General, your profession relies on evidence . . . not heresy, not arm-waving, not fear mongering; you rely on EVIDENCE!

Refutation Item (1) on Page 3 above lists the albedo of Venus. If you visit the NASA ‘Venus Fact Sheet’ website you find the following data (screenshot, first column depicts Venus, second is Earth):

Bond albedo	0.90	0.306
Visual geometric albedo	0.67	0.367
Visual magnitude V(1,0)	-4.40	-3.86
Solar irradiance (W/m ²)	2613.9	1367.6
Black-body temperature (K)	184.2	254.3

A calculation that non-multi-culturally educated kindergarteners can perform reveals that the total radiant solar energy absorbed by the Venusian atmosphere is 261 watts per square meter, whereas that absorbed by Earth’s is 949 W/m². That means that Earth’s atmosphere absorbs nearly FOUR TIMES the solar energy of that absorbed by Venus’ !

<http://nssdc.gsfc.nasa.gov/planetary/factsheet/venusfact.html>

Please keep in mind that 4X multiplier (which favors Earth) as you read the following. Refutation Item (3) on Page 3 above lists the thermal energy imbalance of Venus . . .

All of the temperature data regarding Venus, obtained from every probe format (descending and landing, Venusian orbital or remotely stationed) indicates the same hard fact:

The energy blaring FROM Venus dwarfs that received by it from the Sun.

This well-known fact, one that Sagan, Hansen, Nye and the climate bolsheviks are fully aware of, is a condition referred to by astronomers as “thermal imbalance.” This is just further evidentiary proof that the surface temperatures depicted in the graphs above do **NOT** result from a ‘runaway greenhouse effect.’

We should now introduce you to another well-known fact: What other planets have this condition of being in a state thermal energy imbalance? And given that Earth is NOT one of them, what does that fact portend for the nonsensical, popular culture fairy tale that Venus and Earth are twins, and therefore had the same parents, the same birth place, and at the same time?

Do you see that famous “Red Spot” on the surface of Jupiter?



Also at that NASA ‘Venus Fact Sheet’ website you find the following data (screenshot):

Venus Observational Parameters

Discoverer: Unknown
Discovery Date: Prehistoric



The NASA notion that the discovery of Venus occurred prior to humans recording their Earthly history is not a mistake, **it’s a bold-faced lie.**

The fact that ancient peoples provide excruciating details of the emergence of Venus is obscured in esoteric ancient texts, and not limited to the many plagiarisms contained in the Hebrew Bible. But the records found in these texts do not comport with the “accepted dogmas” promoted by modern popular cultural, especially the fund-raising agenda of TV and movie star Dr. Carl Sagan. Hence the true historical records are censored.

The alleged controversy surrounding this esoteric discussion includes a debate that took place in 1974, at the American Association for the Advancement of Science between Sagan and Dr. Immanuel Velikovsky.

In my research I have found many people that are highly qualified to present the truth regarding these Venus topics. But none connect all of the topics more astutely, especially in regard to the frauds listed in this attachment, than Mr. Charles Ginenthal.



Attached below is a chapter from the Ginenthal book, Carl Sagan and Immanuel Velikovsky, entitled:

“SAGAN’S EIGHTH PROBLEM : THE TEMPERATURE OF VENUS.”

Here and elsewhere you will find detailed discussion of the many connected issues presented by the above cover letter and this attachment in-particular. As I read Ginenthal’s book, I became increasingly repulsed by the documented behavior and statements of Dr. Sagan. In fact, I now view him with measured disdain.

To assist your knowledge of these subjects, and that of other recipients, I uploaded a presentation at a cosmology conference in 1996 by Mr. Ginenthal, which was dedicated to the excruciating details of the planet Venus:

<https://vimeo.com/149979095>

“Charles Ginenthal on the Realities of Planet VENUS”

One of the most troubling realities presented by Ginenthal is the practices in so-called science wherein it is increasingly acceptable to censor evidence, and the scientists that obtain such; as well as the psychotic behavior that Ginenthal identifies as the process of “ad hoc hypotheses.” Note that these topics were being discussed over a decade PRIOR to ClimateGate.



Mr. Attorney General, you’ll note that Ginenthal focuses his video and book discussions on EVIDENCE.

Summary

Venus is not a twin or sister planet to Earth.

Venus did NOT undergo a ‘runaway greenhouse effect.’

The atmosphere of Venus has a temperature gradient (versus altitude) that is the EXACT OPPOSITE of the standard, well-known conditions that characterize a greenhouse.

Venus does not support the hype that *“it’s fate will be ours if we do not limit the amount of carbon dioxide we humans are emitting into our atmosphere.”*

Venus is so young that it is referred to by those that have studied it as a “new born babe.”

Venus exhibits a thermal imbalance very similar to that of Planet Jupiter.

If you deleted all of the carbon dioxide from the atmosphere of Venus its temperature would be minimally effect IF AT ALL.

If we turned off the Sun, the temperature of Venus would remain essentially unchanged for at least a billion years.

The Velikovskian theory of Venus is more probable and vastly more evidentiary than that of Dr. Carl Sagan.

**Carl Sagan
and
Immanuel
Velikovsky**

by

Charles Ginenthal

SAGAN'S EIGHTH PROBLEM

THE TEMPERATURE OF VENUS

THE GREENHOUSE EFFECT

Sagan's entire argument respecting the temperature of Venus is that it is heated by a runaway greenhouse effect. He states that, "We now know from ground based radio observations and from the remarkably successful direct entry and landing probes of the Soviet Union that the surface temperature of Venus is within a few degrees of 750 degrees K...The surface atmospheric pressure is about ninety times that of the surface of the Earth, and is comprised primarily of carbon dioxide. This large abundance of carbon dioxide, plus the small quantities of water vapor which have been detected on Venus, are adequate to heat the surface to the observed temperature via the greenhouse effect." (1) Therefore, according to Sagan, Venus' heat is derived from the Sun from an atmospheric phenomenon. Velikovsky's thesis is that Venus is a new planet in the early cool down state and that its heat is derived from its hot core which is producing the high surface temperature.

A greenhouse requires four elements to produce heat above average from sunlight. One of these elements is a glass-enclosed structure through which light can pass and which will stop the heated air inside from escaping to mix with the surrounding atmosphere and dissipating. The second requirement for the process is plenty of light entering the glass-enclosed structure which is converted from short wave radiation to long wave radiation. The other two requirements are water and carbon dioxide in sufficient quantities to trap and hold the long wave radiation so that it does not radiate away quickly. Water and carbon dioxide do this work extremely well. But can sunlight in a deep, heavy carbon dioxide atmosphere with practically no water raise the temperature of that atmosphere to about 900 degrees Fahrenheit, which is a temperature that will melt lead?

VENUS' WATER AGE

Venus certainly possesses sufficient carbon dioxide. But what about the quantity of water? Andrew Young, cited earlier, and Louise Young have this to say about water in Venus' atmosphere; "...studies at radio wavelengths have established once again that there is no more than 0.1 or 0.2 percent water vapor in the lower atmosphere, and the true value is probably close to 0.01 [1/100 of a] percent. The cloud tops are drier still." (2) Therefore, the requirement of sufficient water vapor to do the job is not established.

This raises an interesting question. If Venus went through the same early evolution as the Earth billions of years ago, it would have over time out-gassed an ocean of water at least comparable to that of the Earth. Young and Young tell us that,

"If one assumes that Venus once had as much water as the Earth has now, it is necessary to explain how all but one part per million of it was lost. There is a known mechanism by which a planet with abundant water could lose a large portion of it: Water vapor in the upper atmosphere could be dissociated by ultraviolet radiation and the hydrogen could be lost to space, either by thermal escape or through the influence of the solar wind. That effect, however, could not produce an atmosphere so thoroughly desiccated as that of Venus. Of the water Venus has today, very little reaches the upper atmosphere and therefore, it is not dissociated; at the present rate Venus would not have lost a significant amount [of water] in the history of the solar system." (3)

If we accept the present gradualist assumption that the Earth and Venus had similar early histories, both planets would early have had atmospheres and water. The presently accepted notion for the development of oceans is the "outgassing hypothesis" presented by W.W. Rubey in 1951. The hypothesis suggests that gases expelled by volcanoes and hot springs contain steam [water], carbon dioxide, nitrogen and carbon monoxide. This process, it is believed, can explain the atmospheric constituents of the Earth. Thus, the seas of Venus would take at least as long to form as those of the Earth. However, this outgassing process continues all throughout the 4.6 billion year history of planets so that the depth of the oceans steadily increases over the aeons. If this is so, even if Venus had lost its first atmosphere and oceans say 3 or 4 billion years ago, (after the first atmosphere and water of the planet was removed by the solar wind and a new atmosphere of carbon dioxide was baked out of the surface rock) then outgassing during the subsequent 3 to 4 billions years would have produced a new ocean of smaller depth. Protected by the new atmosphere, this ocean would not, nor could not have escaped from the planet.

William K. Hartmann in *Moon and Planets*, 2 ed. (Belmont CA 1983), pages 430-431, informs us that on Venus, "The H₂O is too heavy to escape thermally in the lifetime of the solar system. Thermal escape of H [hydrogen], produced by photodissociation of the H₂O was thought to have caused the loss of H₂O from Venus. However, Pioneer discovered the 285-K exosphere temperature, and calculations show that the H escape time from such an exosphere is 20 Gy! [20 billion years] So, how could H and hence, H₂O have been depleted? If the exosphere had once been heated to 1,000 K or so, the H escape time could be brought down to a tiny fraction of the age of the solar system. In any case, Pioneer scientist (Stewart A. and others, 1979, "Ultraviolet Spectroscopy of Venus: Initial Results from the Pioneer Venus Orbiter", *Science*, Vol. 203, p. 777) concluded, "if Venus ever possessed a large amount of water, it cannot have lost it by escape mechanisms known to be operating now".

Lawrence Colin in the book *The Planets*, (N.Y. 1985) tells us, "Overwhelming evidence suggests that in its past Venus had much more water, perhaps as much as the Earth today -- a whole ocean". (page 282) (emphasis added)

Kelly J. Beatty in an article titled "Venus the Mystery Continues", *Sky and Telescope*, Vol. 63, (1982), p. 134, asks,

"Where has all of Venus' water gone? Theorists have asked this question for years. It doesn't make sense to them that a planet so like the Earth in size and distance from the Sun should have 10,000 to 100,000 times less water. After all, the pair have comparable amounts of carbon dioxide and nitrogen, so the water was probably there at the outset, but has somehow disappeared over geologic time."

Thus, even when we accept the established views of geophysicists, we face a contradiction. Based on the established view, Venus should have enormous amounts of water vapor in its atmosphere, but this is not the case. Why?

The evidence clearly implies that whatever water Venus did possess was burned off in its early history when it was a stupendously hot, brilliant comet. Thus, its lack of water is in full harmony with Velikovsky's thesis.

If, as Velikovsky claims, Venus is a new planet, then it has not had time to outgas sufficient new water vapor into the atmosphere and therefore, it should have very little or practically none, which is the case. The amount of water vapor in Venus' atmosphere contradicts the view that Venus is an ancient planet. If the amount of water is one one-hundredth of one percent as Young and Young inform us [or even less], then Venus could be no older than 10,000 to 20,000 years.

DOES SUNLIGHT REACH VENUS' SURFACE?

The second requirement of the greenhouse is sufficient light to heat up the atmosphere. Sagan states, "Venera 9 and 10 missions...obtained clear photographs, in sunlight of surface rocks. Velikovsky is thus, certainly mistaken when he says (page ix) "light does not penetrate the cloud cover..." (4)

Lewis M. Greenberg, however, has this to say, "When four Venus probes plunged toward the planet's surface -- two in daylight and two in darkness (according to *Popular Science*, April 1, 1979, page 67).

"One instrument carried aboard each probe was a nephelometer designed to detect clouds by monitoring variations in light. Within each nephelometer was a sensitive radiometer that reacted to even small changes in outside light. Those radiometers showed only gloom around the two probes dropping through darkness -- until the temperature sensors failed." (emphasis added)

"At almost exactly that instant, the radiometers detected a faint glow in the atmosphere. The glow grew brighter and brighter" as the space probes left the cloud cover above them. (5)

If the clouds were fairly dark, then the light that was observed to get brighter and brighter must have been coming from the surface of Venus and not from the Sun. As one moves nearer to a source of light, the light becomes brighter, thus the light that was observed could not have been sunlight. It is also quite clear that the clouds trap, reflect and occlude most of the sunlight that enters Venus' atmosphere. Sagan, nevertheless, argues that the light observed could only be sunlight that allowed Venera 9 and 10 to take clear pictures. But did the Venera 9 and 10 probes carry flood lights? Professor Greenberg informs us that,

"Soviet scientists recently disclosed new information about Venus obtained from the Venera 9 and 10 landing of October 1975. The findings were presented at a space research meeting (COSPAR) in Philadelphia. V.A. Avdeusky, deputy director of the Soviet Space Flight Control Center, announced that pictures of Venus' surface by Venera 9 revealed a rock-strewn terrain which cast distinctive and unanticipated shadows.

"As reported in the *Philadelphia Inquirer* of June 14, 1976, "The atmosphere of the surface [of Venus] was much brighter than scientists had expected. The photographs showed very dark shadows even when flood lights were turned on." (emphasis added)

"According to Avdeusky, there should not be any shadows because sunlight was diffused by the [15 kilometer thick] cloud cover. He and M.Y. Marov of the Institute of Applied Mathematics of the Soviet Academy of Sciences, said that indicated a direct light source on the surface, but they could not guess what that was." (emphasis added)

"In reporting on the same meeting, *Science News*, (Vol. 109, June 19, 1976, p. 388) noted that, "The Venus clouds turn out to be more tenuous than anyone had thought...more like a haze than heavy clouds. As a result, the surface illumination is brighter than anyone expected and photography is much easier there. With the Sun at a 30 degree angle from the zenith, the light flux at the surface is about 100 watts per square meter, an illuminance of about 14,000 lux." M.V. Keldysh, a former president of the USSR Academy of Sciences, observed that "this value corresponds to the illuminance at the terrestrial mean latitude in the daytime with overcast clouds.

"Although it discussed the surface light on Venus in some detail, *Science News* significantly refrained from explicitly ascribing the source of the light to the Sun. Thus, the surface illumination of Venus still remains an inexplicable puzzle to conventional thought for it evidently cannot be attributed to solar light..."

"Thus, the data so far retrieved from the latest Soviet space probes go a long way towards confirming Velikovsky's conclusions about the planet Venus. At the same time, this new information is a telling blow to Carl Sagan's claim

[SCV, p. 82 BB, p. 117]...that "Venera 9 and 10 missions...obtained clear photographs in sunlight [sic] of surface rock." So it is clearly seen that the light on Venus' [surface] is not sunlight." (6)

Only a small amount of hazy sunlight reaches the surface of Venus, the rest is produced by some sources in Venus' atmosphere near or at the surface. This accords well with Velikovsky's hypothesis that there are chemical fires on Venus.

A REAL GREENHOUSE

So far, the amount of water needed to trap sunlight is not established and sunlight of sufficient quantity is also greatly in question. However, the greenhouse model for Venus lacks one of the most important properties. Clark R. Chapman in his book *The Inner Planets* explains what is basically wrong with the thinking of meteorologists regarding the greenhouse effect.

"It was recently pointed out to embarrassed meteorologists who have debated the relevance of their greenhouse calculations that this effect may not be important for greenhouses. Outside ground warmed by the Sun heats adjacent air, which then floats upward to where the barometric pressure is less. The air parcel expands, cools and settles into equilibrium. Meanwhile, at the ground, the warmed air is replaced by cooler parcels from above. This process...warms upper regions and keeps the air near the ground from getting too hot. Air on Earth begins to convect whenever the temperature begins to drop with altitude more quickly than about 6 1/2 degrees C per kilometers [of altitude]. So except in an inversion, when the upper air is relatively warm [er than the surface] convection maintains the 6 1/2 degrees C -- per kilometer profile, which is why mountain tops are cool. The reason it is warmer inside than outside a greenhouse is mainly that the [glass] roof keeps the warmed up air inside from floating away by convection...There is no lid on Venus and the dense carbon dioxide is free to convect." (7)

The super hot air of Venus, therefore, must rise and carry away the surface heat of the planet to the upper atmosphere where there is no covering. There the heat will radiate back to space. This upward motion or convection of gas by heat will allow it to pass right through a cloud. Hence, Venus must convect and radiate heat into space from its surface long before the surface reaches anything like 750 degrees K. In order to achieve a relatively high surface temperature, Venus requires a cover encapsulating the entire planet to keep the hot air at the surface from mixing with the freezing cold air of the upper atmosphere. There is no such mechanism that can halt the mixing and convection of the hot surface air with the cold upper atmosphere. This is an immense problem for the greenhouse effect of Venus.

THE SECOND LAW OF THERMODYNAMICS

What is most unusual is that Sagan has it just the opposite way around. He has the clouds of the atmosphere which are cooler convecting downward to the hotter surface to heat it. A basic college physics textbook, *Physical Science* by Verne H. Booth and Mortimer L. Bloom defines the "Second Law of Thermodynamics" thus, "Heat does not of its own accord flow from cold regions to hot regions". (8) Velikovsky long ago pointed out that the heat gradient of Venus shows that heat is flowing from the surface of the planet to the clouds. Sagan's hypothesis has the clouds absorbing most of the Sun's light. It is there in the clouds where the short wave radiation is converted to long wave radiation. The clouds have to be hotter than the surface in order for the air to move downward. Richard A. Kerr, the editor of *Science* tells us that, "Perhaps the most perplexing of the atmospheric problems lingering after Pioneer is the 460 degrees C temperature at the bottom of the [Venus] atmosphere. The much ballyhooed greenhouse effect of Venus' carbon dioxide atmosphere can account for only part of the heating, and evidence for other heating mechanisms is now in a turmoil. The question concerns how the Sun's energy behaves once it penetrates the highest clouds. When Pioneer Venus' probes looked at the atmosphere, each one found more energy being radiated up from the lower atmosphere than enters it as sunlight." (9) (emphasis added) How can cooler clouds convect to a hotter surface? Velikovsky knew this and showed long ago that Sagan's greenhouse theory violated the second law of thermodynamics. R.E. Newell states, "I have previously raised objections to the greenhouse theory though most have been rejected for publication. But recently even the greenhouse advocates have begun to note certain problems. Suomi et al [in the *Journal of Geophysical Research*, Vol. 85 (1980), pp. 8200-8213] notes that most of the visible radiation is absorbed in the upper atmosphere of Venus so that the heat source [the cloud cover] is at a low temperature while the heat sink [the surface] is at a high temperature, in apparent violation of the second law of thermodynamics." (10)

Thus, why is the surface hotter than the clouds? And how does one explain this phenomenon? Sagan explains it this way in the *Cosmic Connection*. "I had earlier proposed a specific theory in terms of the greenhouse effect to explain how the surface of Venus could be at such a temperature. But my conclusion against cold surface models did not depend upon the validity of the greenhouse explanation: it was just that a hot surface explained the data and a cold surface did not. (11) (emphasis added) Sagan is unable to explain this phenomenon and Velikovsky also pointed out that a few years ago Sagan wrote, "An explanation of how the surface (of Venus) stays as hot as it does is one of the key unsolved problems in understanding the Venus environment." (12)

John S. Lewis: "The Atmosphere, Clouds and Surface of Venus," in *The Solar System and its Strange Objects*, ed. Brian J. Skinner, (Palo Alto CA 1981), page 93 tells us that, "It is not yet known whether the familiar greenhouse effect can provide such high [Venusian] surface temperatures in a rigorously self-consistent model." If the model was truly correct it would do just that.

Therefore, how does one somehow get cooler air from the clouds down to heat the hotter surface? The answer is that the Hadley Cell does it, or so we are told. The Hadley Cell mechanism works in the following way. Sunlight heats the clouds which move away from the equatorial regions of Venus to the polar regions. Thus, in the polar regions the hot air moves down to the surface and the air there spreads around the planet. So far so good. However, there is one little problem with this scenario. In order for the Hadley Cell mechanism to work, the polar surface regions must be cooler than both the equatorial surface regions and the clouds. However, Shane Mage has presented reports of the surface temperature that proved "Above the poles [of Venus] temperatures are now shown to be 40 degrees Fahrenheit higher than at the equator". (13) According to Billy P. Glass in *Introduction to Planetary Geology*, (N.Y. 1982), page 312, "The warmest part of the atmosphere (of Venus) visible to the Pioneer Venus orbiter is the North Polar region". Therefore, hot clouds from the equator will not travel to the hotter poles unless one wishes again to violate the second law of thermodynamics. The motion of the Hadley Cell must be reversed and the hot air at the poles must travel toward the equator where the surface is also hotter than the clouds. This catch-22 situation makes it extremely improbable that Venus is heated by a greenhouse effect.

V.A. FIRSOFF'S OBJECTIONS

Let us examine several other interesting problems with Sagan's greenhouse theory. V.A. Firsoff, the British astronomer, raised the following objection to Sagan's hypothesis:

"Increasing the mass of the atmosphere (Venus has 91 Earth atmospheres) may intensify the greenhouse effect, but it must also reduce the proportion of solar energy reaching the surface, while the total of available energy must be distributed over a larger mass and volume. Indeed, if the atmosphere of Venus amounts to 75 air masses...the amount of solar energy per unit mass of this atmosphere will be about 0.01 of that available to the Earth. Such an atmosphere would be strictly comparable to our seas, and remain stone cold. Unless the internal heat of Venus were able to keep it at a temperature corresponding to the brightness temperatures [of Venus] microwave emission." (14)

According to Firsoff, the greenhouse effect will not heat Venus very much hence, its heat must come from below the surface.

Firsoff, in his book *The Interior Planets*, expands on this.

THE RUNAWAY MECHANISM

Shane Mage has also raised some very interesting problems regarding Sagan's greenhouse theory. He writes,

"The crucial part of this (greenhouse) theory is expressed by the term *runaway*: the massive envelope of Venus would have been formed when, after Venus lost its primordial atmosphere, thus exposing its surface to the intense heat of the young Sun; solar radiation boiled the CO₂ out of surface carbide rocks, increasing the massiveness and hence, radiation trapping capacity of the envelope until all available CO₂ was released and temperature-equilibrium attained.

"It is this 'runaway' mechanism that has now been invalidated by the argon-36 discovery. According to Pioneer experimenter Dr. Michael McElroy (in the *Washington Post*, Dec. 11, 1979, p. A6), "The atmosphere of Venus contains as much argon-36 as you would expect from a planet's original atmosphere". But if Venus never lost its primordial atmosphere, the 'runaway greenhouse' would never have had the chance to get started because the surface of Venus would always have remained shielded from direct solar radiation." (17)

It follows that the Sun could never have heated the unshielded surface of Venus and CO₂ could never have been liberated to create the greenhouse effect.

VENUS' NEON AND ARGON AGE

Anthony Feldman in his book *Space*, (N.Y. 1980), page 85, informs us in the same general context that,

"A recent discovery about the composition of the Venusian atmosphere has cast doubt on the popular theory accounting for the formation of the solar system. The theory suggests that the Sun and planets formed at the same time.

"The innermost planets -- Mercury, Venus, Earth and Mars -- are thought to be small and rocky because the Sun drew their lighter constituents away. If this idea is correct, the closer a planet is to the Sun, the less likely there is to be lighter gases in the atmosphere. But in the atmosphere of Venus, the opposite appears to be true. In particular, there seems to be 500 times as much argon gas and 2,700 times as much neon as in the atmosphere of Earth.

"The greenhouse effect cannot be magnified *ad lib*. Doubling the thickness of the greenhouse glass may enhance its thermal insulation, so raising its temperature, but it will also cut down the transmitted sunshine, so reducing its heat. In the end, the procedure becomes self-defeating; the loss of sunshine is no longer compensated by increasing insulation, and the temperature of the greenhouse begins to drop. The sea is a perfect "greenhouse" of this kind -- none of the obscure heat from the bottom can escape to space. But it is not boiling hot, in fact, it is not much above freezing point. Sagan's deep atmosphere would behave in exactly the same way...

"For all the seeming refinements of mathematical treatment, the basic reasoning is very simple. In a convective atmosphere, the temperature decreases upward at a constant rate (adiabatic lapse) so that however cold such an atmosphere may be at its upper boundary, any arbitrarily high temperature can be reached at its base if the atmosphere is made sufficiently deep. If though the atmosphere is heated by the Sun from above, this reasoning is naive; a deep atmosphere will cease to be convective (adiabatic) at a certain level below the tropopause and become isothermal -- the temperature will stop rising.

"An adiabatic atmosphere of a mass envisaged by Sagan is possible only if it is heated from below. In other words, the surface of Venus would have to be kept at a high temperature by internal sources." (15)

According to Glass, in *Introduction to Planetary Geology*, (N.Y. 1982), page 311, "The pressure at the surface (of Venus) is approximately 90 bars, which is equivalent to the pressure in the ocean on Earth at a depth of nearly 1 km below sea level". That is a depth in the ocean of 3,000 feet. Even at the equator at a depth of 3,000 feet, the ocean is only about 40 degrees Fahrenheit or 8 degrees above freezing. Firsoff claims that Venus totally covered by an ocean of gas equivalent to a shallow ocean would not get as hot as Sagan's greenhouse model requires.

Ralph E. Juergens who first cited this material added that, "An atmosphere of a mass even greater than that 'envisaged by Sagan' has, of course, been shown to exist on Venus. Probes have also established it to be an adiabatic atmosphere, with temperatures decreasing upward from the surface at a fairly constant rate..." (16) Venus, like the ocean, is supposedly heated by sunlight from above, but the ocean is warmer at the top and cooler toward the bottom; and at a certain depth downward, the temperature is almost uniformly cool. The same should occur on Venus. Instead, Venus' heat falls steadily from the bottom to the top in the opposite direction as the ocean's thermal gradient.

"So far scientists cannot explain why these gases were not drawn away from the planet during the birth of the solar system." The author then draws this startling conclusion, "Further discoveries about Venus may soon force a revision of the most basic ideas about how the Sun and the planets were formed."

ASHEN LIGHT

Mage adds one final telling blow to Sagan's greenhouse hypothesis saying,

"The most striking disclosure by Professor Donahue (Dr. Thomas Donahue, University of Michigan physicist who designed the experiments performed in the Venusian atmosphere) however, is his statement that, 'as we approach the surface of the planet from a distance about ten miles above the night side, a faint glow was detected that got brighter and brighter and brighter until the probes touched down'. That glow, I think, is almost literally the surface and some of the gases in the atmosphere on fire. Chemical reactions that produce light, I think, are occurring in that high temperature environment where many reactive gases were found out by mass spectrometer."

"This picture of a 'chemical soup' containing 'many reactive gases' and 'almost literally on fire' supports the thesis of an extremely young Venus. If its atmosphere were many millions of years old, (as Sagan contends) reactive gases would have been consumed aeons ago. Only as a newborn planet could Venus reasonably be expected to have an atmosphere still on fire." (18)

THERMAL BALANCE

This brings us to Sagan's criticism of Velikovsky's views of the temperature of Venus. He states, "...Velikovsky is trying to say here that his Venus...is giving off more heat than it receives from the Sun, and that the observed temperature on both the day and night sides are due mostly to the 'candescence' of Venus than to the radiation it now receives from the Sun. But this is a serious error. The bolometric albedo (the fraction on sunlight reflected by an object at all wavelengths) of Venus is about 0.73, entirely consistent with the observed infrared temperature of the clouds of Venus of about 240 degrees K; that is to say, the clouds of Venus are precisely at the temperature expected on the basis of the amount of sunlight that is absorbed there." (20) Sagan claims that Venus is in thermal balance; the amount of solar radiation absorbed by Venus is equal to the amount of energy emitted by Venus. If Venus had additional heat from its core, then obviously it would emit more heat than it receives from the Sun. Venus would have a thermal imbalance if Velikovsky's theory for its heat production is correct.

Professor Greenberg, however, informs us that,

"...we have Sagan...clearly on the record against Velikovsky's thermal prediction for the planet Venus" his "position has been adamant and unyielding. It is, therefore, gratifying to discover that there is now tentative evidence indicating that Venus does indeed radiate some 15 percent more energy than it receives from the Sun. This most recent finding was reported in *New Scientist*, 13th November, 1980, under the title "The Mystery of Venus' Internal Heat" (p. 437). It is reprinted...with permission of *New Scientist*...working with data from the Pioneer Venus orbiter, F.W. Taylor, ...found that Venus radiates 15 percent more energy than it receives [from the Sun]. To keep the surface temperature constant, Venus must be producing this extra heat from within'.

"All the inner planets, including the Earth, produce internal heat from radioactive elements in their rocks. But Taylor's observations of Venus would mean the planet is producing almost 10,000 times more heat than the Earth -- it is inconceivable, according to present theories of planetary formation, that Venus should have thousands of times more radioactive elements than the Earth does. Taylor's suggestion is met with skepticism -- not to say sheer disbelief -- from other planetary scientists." (21)

Reginald Newell informs us that, "The presence of an internal heat source would naturally lead to an energy imbalance at the top of the [Venus] atmosphere and this has, in fact, been observed (albeit there are certain experimental uncertainties) with about 10 w/M2 more energy leaving the planet than arrives from the Sun". (22) If the greenhouse theory should be found inadequate, then this imbalance may be far greater than 15 percent.

Sagan briefly mentions Jupiter which is in thermal imbalance, that is, it emits more heat than it receives from the Sun. He states, "In 1949, Kuiper...suggested that Jupiter gives off more heat than it receives, and subsequent observations have proved him right. But of Kuiper's suggestion, *Worlds in Collision* breathes not a word." (23) What Sagan breathes not a word about is how the thermal imbalance resembles that of Venus. Ralph E. Juergens informs us that in *Nature*, for September 6, 1974, "When Pioneer 10 scanned the dark side of Jupiter in 1973, its sensors found that infrared emission from that region, as in the case with Venus, is as intense as that from the Jovian sunlight hemisphere. This was hailed as confirmation of earlier indications that Jupiter gives off more heat than it receives from the Sun." (24) But what is ever worse for Sagan is the fact that Shane Mage pointed out that on Venus the "equatorial night side temperatures (is shown to be) 4 degrees Fahrenheit above the day side level". (25) Thus, one of Venus' hemispheres during the 58 long day period when it is in the darkness of night time emits 4 degrees Fahrenheit more temperature than the opposite hemisphere that is in daylight.

THERMAL BALANCE DENIED

If Venus' atmosphere and surface are in thermal balance, the atmosphere should not rise and expands and then fall and contract periodically like a pulsating star. However, in *New Scientist*, Vol. 58 (1973), page 72, we find the following:

"Astronomers are well enough acquainted with periodic variations in the light of stars, but a variable planet is a different matter. However, the planet Venus shows regular changes in the spectrum of its atmosphere according to four scientists at Caltech's Jet Propulsion Laboratory. The strength of carbon dioxide lines in the Venusian atmosphere swing through a four day cycle [in the *Astrophysical Journal*, Vol. 181, p. L5].

"Over 20 years ago, Gerard Kuiper noted day-to-day fluctuations in the infrared spectrum of Venus, but no one has yet got to the bottom of the basic cause of these changes. In order to study the oscillations, A.T., L.G., and J.W. Young and J.T. Gerstahl obtained spectra nightly during the autumn of last year [1972]. Their data on the carbon dioxide line show an unmistakable oscillation.

"The observed variation is not exactly periodic, but more akin to a relaxation oscillation in which the amplitude builds up on successive cycles and then suddenly collapses. In order to produce the observed changes, the cloud deck of Venus must be moving up and down by as much as one kilometer, simultaneously over the entire surface of the planet. Such a large atmosphere oscillation requires a high input of mechanical energy. This condition is difficult to account for in the case of a slowly rotating planet heated uniformly by the Sun's rays [greenhouse effect]. Therefore, the cycle variations point to some unexplained deep-seated property of the atmospheric dynamics."

Gases expand when heated and contract when cooled. It appears that the surface heat is building up in the lower atmosphere of Venus causing it to expand and heat the layers above it which also expand until the upper layers dissipate the excess heat and the atmosphere then contracts to repeat the process. A physicist, Leopold Strabismus (his humorous pseudonym meaning cross-eyed) at the author's request undertook to calculate the amount of energy necessary to raise the Venus atmosphere 1 kilometer over the entire planet. Basically, the entire atmosphere must be raised to accomplish this oscillation. One cannot assume that only a small part of the upper atmosphere is raised because there would have to exist a layer in the atmosphere that is hotter than the layers beneath it. The hottest layer of gas is found at the surface; therefore, the point of lift occurs from that point upward. The temperature of Venus falls steadily from the surface.

What Strabismus found was that based on "equations of state in thermodynamics" he could obtain the "measured sea level atmospheric pressure of Earth [as it] coincides with results from the kinetic theory of gases". Dr. Strabismus has taken this demonstration one step further by showing that "the total [gravitational] weight of

Earth's atmosphere, divided by Earth's surface area yields the same result." This same set of equations which derive the Earth's atmosphere pressure when applied to the atmosphere of Venus should derive the pressure of Venus' atmosphere at its surface.

Strabismus states, "Specific weight versus altitude figures were obtained for Venus, via NASA. [But when the equation was] applied to these figures [it] led to a COMPUTED surface pressure for Venus well in excess of the MEASURER surface pressure of 90 bars." The surface pressure should be greater based on this equation of state analysis; therefore, some force must be pushing upward against the weight of the atmosphere. That is, even without raising the atmosphere one inch, a force is clearly lifting up the atmosphere. This is in total defiance to what is required of an atmosphere in thermal balance.

However when "This pressure [is] driven through an atmospheric shell of one kilometer, thickness at the topopause of Venus, [it] yields an energy of 2.96E+23 foot pounds, each time the cloud layer is raised". The energy is over 29 trillion, trillion foot pounds. The raising of the Venus atmosphere occurs about 80 times a year. Thus, the 29 trillion, trillion must be multiplied by 80, yielding 2.32 trillion quadrillion foot pounds of energy per year. The Sun's radiation produces nothing like that amount of energy in the Venus atmosphere, but a hot volcanic surface can provide the necessary energy.

An atmosphere in thermal balance does not behave as described above. Of this oscillation Sagan breathes not a word.

LIES, DAMNED LIES AND SAGAN'S CHART

This brings us to Sagan's chart which he claims definitely proves that Venus is not cooling down as Velikovsky claims. Sagan had stated earlier that "The steps in reasoned argument must be set out for all to see". And "Experiments must be reproducible". (emphasis added)

Seven years prior to Sagan's first presentation of his criticism, Velikovsky wrote a paper titled "Venus, a Youthful Planet" which was published in the April 1967 issue of *Yale Scientific Magazine*. Velikovsky outlined the experiment by which he claimed that his hypothesis could be proved correct or incorrect. In the article he stated,

"I maintain that Venus' temperature is slowly, but unmistakably decreasing. A measurement from the ground surface of Venus cannot be performed with methods now available with accuracy sufficient to detect the phenomenon in a matter of a few years; but, with a bolometer or thermocouple, a drop, even if in only fractions of a degree, could be detected from the cloud surface of Venus; such measurements need to be repeated at each successive synodical period of Venus of which there are five in eight terrestrial years. It is understood that only figures obtained by one and the same observatory and from the same surface segments, preferably all taken during a quiet period of

the Sun, can be profitably compared. On this new test, I am once more prepared to rest my case." (26) (emphasis added)

Sagan then informs us that "An unbiased presentation of a microwave brightness temperature of Venus...are exhibited in Figure 1 below". (27) If indeed Sagan wishes to offer an "honest experiment" respecting this test, one would expect Sagan to have made sure that his chart does not violate any of the criteria which Velikovsky outlined as the basis for testing the cooling of Venus. In going over the chart, I find that Sagan has, in fact, departed from employing any of these criteria whatsoever mentioned by Velikovsky. First of all, the spacing of the measurements show by their random places along the time line that these measurements were not "repeated at each successive synodical period of Venus". If these measurements were taken only at "successive synodical periods" they would be uniformly spaced. They are not.

Secondly, if the measurements were taken, as Velikovsky's carefully outlined experiment requires, there would be 5 measurements every eight years; but Sagan's chart has the first six measurements in a 3 year period, the next seven measurements in a 5 year period, the next nine measurements in another 5 year period and the next four measurements in a year and a half period.

The measurements appear not all from the "same observatory" or of the "same segment" of Venus' cloud surface, nor do we know the behavior of the Sun during these measurements.

Ralph E. Juergens remarks,

"A new feature of Sagan's "A.A.A.S. paper" is a figure purporting to show that contrary to Velikovsky's expectation that Venus must be cooling off with the passage of time, "an unbiased" compilation of data shows nothing of the kind...What he (or someone else) has assembled to prepare this figure is the history of microwave brightness temperatures for Venus, as inferred from observations since about 1957. Since these observations were made, in general, at different wavelengths as the years went by, what they actually show, if anything, is a progression of probings toward the truth of Venus' high temperature. In no way do they indicate the thermal history of Venus; the only history illuminated is that of the technological improvements in radio telescopes." (28)

Apparently Sagan doesn't seem to know the difference between the history of the technological improvements of radio telescopes and the thermal history of Venus. He also seems to think that violating all Velikovsky's criteria for an experiment is reproducing Velikovsky's experiment. Sagan has stated "There is a planetary double standard at work" regarding Velikovsky's hypothesis. (29) However, looking at this evidence of Sagan's, one wonders if there are any standards whatsoever at work regarding his chart.

Juergens above remarked that "this is Sagan at his worst". But perhaps it might be more precise to state that Sagan's chart which disregards all of Velikovsky's criteria for this experiment is really poor Sagan at his best.

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A THERMODYNAMIC ANALYSIS

"George E. Talbot also carried out an analysis of whether Venus may or may not be cooling and he sent his fully quantitative analysis to Science. Dr. Talbot at the time was "doctor of science at Indiana Northern Graduate School...He is a scientist and author whose experimental background is divided between research and engineering applications. His scope and competence in mathematical physics and physical chemistry are evident from his two-volume *Philosophy and Unified Science*, published in 1977 by the international firm of Ganesch and Co. in Madras. Dr. David Lee Hilliker's introduction to this work lists some additional publications of Talbot, including a book in thermodynamics (*Electronic Thermodynamics*). Talbot also holds a basic patent, with D.R. Paxton, in the field of thermodynamics and is the creator of SPLAT, a program for nuclear radiation shielding. He has been chairman of the Dept. of Mathematical Studies at Pacific State Univ. in Los Angeles and presently earns his living making thermal predictions for complex space applications. Talbot's biography is to be found in *Who's Who in the West*, and in *Who's Who*, published out of Cambridge, England." (30)

Here is what Talbot states about the attack by Sagan and others respecting Velikovsky's theory of Venus' temperature.

"Suffice it is to say here that allegedly "divesting attacks" on Velikovsky's thesis of the recent origin of Venus are based upon incorrect thermal reasoning, and this is not a matter of opinion, but of thermodynamics and heat transfer. The calculations given in *Scientists Confront Velikovsky* are not being criticized for being simple and clear -- these are virtues. The criticism is based upon their demonstrable irrelevance." (31)

What Talbot presents is that a candescent Venus 3,500 years ago, would be at a temperature about 750 degrees K, its present measurement today; and this is based on the law and physics of thermodynamics. He states,

"...the relevant point is proven in a fully quantitative manner that a massive molten body -- quantitatively, a mass equivalent to Venus and having the Venus surface area and molten at between 1,500 degrees K and 2,000 degrees K will transfer heat internally by flowing magma and will radiate its heat in such a way that in exactly 3,500 years its temperature is expected to be exactly 750 degrees K, which by measurement it is." (32) (his emphasis) Talbot adds this about Sagan's greenhouse model, "It is really impossible to argue intelligently that the present measured temperature of Venus can be deduced exactly from a (greenhouse) model which is "naive" or "inappropriate." (33)

When we compare Talbot's fully quantitative proof with Sagan's "biased" chart, we see the difference between Talbot's science and Sagan's science fiction.

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Sagan states that Velikovsky, "believes that Mars, being a relatively small planet, was more severely affected in its encounters with the more massive Venus and Earth and therefore, should have a high temperature...in the same section he badly states, "Mars emits more heat than it receives from the Sun" in apparent consistency with his collision hypothesis. This statement is dead wrong." (34)

Velikovsky's answer is as follows: "Sagan starts this section with the discussion of the temperature of Mars and accuses me of wrongly stating that according to the data known before the publication of *World in Collision* in 1950, "Mars emits more heat than it receives from the Sun"...Sagan says, "This statement is however, dead wrong."

"But, *Sky and Telescope*, March 1961, reported Sagan's opinion: 'It has long been known that the observed surface temperature of Mars is about 30 degrees centigrade higher than would result from the Sun shining on an airless planet at its distance.'"

In the *McGraw Hill Encyclopedia of Science*, Vol. 8, (1971), an article titled "Mars", Velikovsky informs us that, "Between the theoretical and observed temperature values of Mars -- reflecting as a grey body -- there is an actual excess of heat given off by Mars". (35)

Sagan has told us in both *Scientists Confront Velikovsky* and *Broca's Brain* that, "The temperature of Mars has been measured repeatedly...and the temperature of all parts of Mars are just what is calculated" and that "Mars emits more heat than it receives from the Sun...is however dead wrong...What is more, this was well-known in the 1940's." (36) However, in complete contradiction, Sagan informs us in *Sky and Telescope* for 1961 that, "It has long been known that the observed temperature of Mars is at 30 degrees centigrade higher than would result from the Sun shining on an airless body". Thus, about 20 years after it was known that Mars is not hotter than expected, Sagan tells us it is hotter than expected.

Sagan adds, "It is difficult to understand this set of [Velikovsky's] errors and the most generous hypothesis I can offer is that Velikovsky confused the visible part of the electromagnetic spectrum...with the infrared part of the spectrum...But...Mars turns out to have exactly the temperature everyone expected it to have, we do not hear of this as a refutation of Velikovsky's views. There is a planetary double standard at work." (37) After learning of Sagan's contradictory statements respecting the temperature, I am in full agreement with him that there is indeed a "double standard at work".

Sagan remarks that, "The conclusion is clear, Mars, even more than Venus, by Velikovsky's argument, should be a "hot planet". (38) This remark is, of course, based on Sagan's belief that Mars should be a "hot planet" in terms of his interpretation of Velikovsky's hypothesis of the temperature of Mars. But to be quite accurate, it is really Sagan's misinterpretation, represented as Velikovsky's hypothesis of the temperature of Mars.

Nevertheless, let us examine Sagan's view of why Mars is supposed to be somewhat warmer than believed. Velikovsky (in *Kronos II*; 2, p. 47) states that "Sagan wishes to ascribe the 30 degree difference to a greenhouse effect produced by the very rarified atmosphere on Mars and for this he assumed the presence of a certain (not proven) quantity of water (vapor? at what temperature?) besides carbon dioxide." Having gone through the greenhouse effect on Venus and having found it wanting we need only cite one source to show Sagan's Martian greenhouse work is ignorant. Martin Caidin in his book, *Destination Mars*, (N.Y. 1972), page 196, writes:

"As one of the Mariner scientists explained, the Martian temperatures have nothing to do with air [atmosphere] of Mars, but with the surface. What we measure with our instruments is the amount of solar radiation, mainly infrared, that strikes and is absorbed by the Martian surface.

"There cannot be air temperature as we understand this term because the Martian atmosphere is so thin it can't retain heat. There simply aren't enough molecules present, so that a thermometer, as we know this instrument, can record variations in temperature.

"The atmosphere of Mars in many ways is like the environment of space. It's so thin it's an atmosphere in scientific terms only."

So much for Sagan's understanding of the temperature of Mars which is like his understanding of Velikovsky's hypothesis of Mars -- pure fantasy.

WHAT OTHER SCIENTISTS SAY

Finally, let us see what other scientists have to say about Sagan's greenhouse effect hypothesis. These were reported by Professor Greenberg.

"The University of Wisconsin's Vener Suomi claims that "the infrared losses from the [atmosphere's] deep layers are too large to be supplied by the sunlight reaching the surface" of Venus. "Thus, the greenhouse effect is unable to account for the high surface temperatures." (See *Science News*, Vol. 116, 11.3.79, p. 308)

"Johnathan Eberhart, Space Sciences editor for *Science News* is also well aware of the greenhouse quandary. He writes, "Venus is very hot

(perhaps 200 degrees hotter than airless Mercury, which is barely half as far from the Sun) that the greenhouse must be an amazingly effective one...the scientists are faced with explaining an almost perfect system and there is still disagreement about whether the job has been done...The questions is still open." (*Sciqwest*, Vol. 53, No. 1, January 1980, p. 12)

"Terence Dickinson -- science writer and the present editor of *Star and Sky* -- remains especially open minded to the question of the greenhouse effect. [He states], "The mathematical models for the Venus greenhouse effect have been controversial, at least in their detailed application, for years now. Although the unexpectedly large [sic] amount of water vapor in the lower atmosphere tends to support the greenhouse theory, Velikovsky's contention of internally generated heat cannot yet be ruled out." (See "Venus - To Hell and Back", *JFO Report*, August 1979, p. 77)

"V.A. Firsoff remains justifiably skeptical where the greenhouse effect is concerned, while in a recent article on Venus for *Science* (1/18/80), Richard A. Kerr failed to endorse that (greenhouse) effect as a foregone conclusion..."

"...Moreover, on Dec. 9, 1978, it was found that 'the region of the highest thermal emission on this day was on the night side of the planet, at roughly 45 degrees N'. This sharply contrasted with earlier observations made on April and May 1977 at an identical solar phase angle, in which the region of intense emission was consistently on the sunlit side of the terminator (the line between day and night). This striking change of appearance indicates that at least some of the major thermal features are not solar fixed. (*Science*, Vol. 203, 23 February 1979, p. 789, emphasis added) (39)

Velikovsky has reported, "Two discoveries made since this paper was written in 1963 need to be recorded. One of them concerns the problem of Venus' temperature. Measurements were made of the 11 cm wavelength emission from Venus, at Green Bank Observatory and reported by K.I. Kellermann in the September 1966 issue of *Icarus*, and strongly suggests that the heat of the ground surface of Venus comes not from the atmosphere above, but from the sub-surface." (40) Professor Greenberg notes, "It should be noted that Carl Sagan was an Associate Editor of *Icarus* at the time. Was he oblivious of Kellermann's findings?" (41)

Werner Von Braun in his co-authored book, *New Worlds: Discoveries From Our Solar System*, (N.Y. 1979), page 129, states, "...scientists would like to be sure that the greenhouse effect is indeed the cause of the hot surface and lower atmosphere. So far it is only a theory, not yet proven by experiment." While Richard A. Kerr, in *Science* for Jan. 18, 1980, pages 292-293, states, "The much ballyhooed greenhouse effect of Venus' carbon dioxide atmosphere can account for only part of the heating".

Reginald E. Newell explains what is wrong with the greenhouse effect theory quite simply with this analogy.

"...imagine a well insulated domestic oven and inquire what happens when only a 10 watt bulb giving an energy input of about 10 w/M² [having a 10

watt bulb on every square meter (about a square yard) of Venus' surface]. Rarely does the air temperature inside the oven rise to 750 K! Now imagine the oven is placed on top of the molten lava of an active volcano; it will soon reach the required temperature. The energy for the process is that which has come by conduction from the process keeping the rock molten. It seems that the latter situation, rather than the former, corresponds to Venus..." [See footnote 10]

If the Greenhouse Effect mechanism is correct it would explain the high surface temperature of the planet; it doesn't, and this is admitted. It would explain why the heat source--the clouds--are cooled than the heat sink--the surface--; it doesn't, and this is admitted. It would explain why the polar regions, which receive the least sunlight are hotter than the equatorial regions which receive the most sunlight; it doesn't, and this is admitted. It would explain the one kilometer expansion and contraction oscillation of the atmosphere; it doesn't, and this is admitted. It would explain the super rotation of the upper atmosphere around the planet in four to five days; it doesn't. Why doesn't it account for any of these phenomena observed in the Venusian atmosphere which a good theory ought to do?

Sagan has told us that, "not all scientific statements have equal weight". To paraphrase him: The science of thermodynamics and the first and second laws of thermodynamics are on extremely firm footing. Sagan has accused Velikovsky of attempting to rescue religion and astrology. What could be more dogmatic than offering a theory that violates the second law of thermodynamics and not explaining how this can be done with a process that circumvents this law? Apparently Sagan has a solution or seems to believe in miracles.

Carl Sagan and Immanuel Velikovsky is an analysis of a scientific debate respecting the theory of Immanuel Velikovsky held at a symposium under the auspices of the American Association for the Advancement of Science [AAAS] in San Francisco in 1974. One of the participants in the debate, Professor Carl Sagan of Cornell University, raised, there and elsewhere, a host of questions and points of severe criticism of Velikovsky's thesis. Charles Ginenthal, the author of this work, has gone into all aspects of this criticism and has exhaustively outlined the evidence with data from the scientific literature.

The analysis is devastating; the definitive response to the Sagan-Velikovsky debacle. It debunks in lucid terms, point by point, each and every issue raised. It is sometimes humorous and often scathingly critical. No one who reads this material will have the slightest doubt about the nature of this further chapter in the "Velikovsky Affair."

Carl Sagan and Immanuel Velikovsky will be hailed by some and decried by others. It reopens this episode of the Velikovsky debate with a thunderous roar. It is must reading for anyone interested in how scientific debates of revolutionary concepts are actually conducted, how evidence is handled, how ethics are trampled. It is a book for the historical record.