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# COSMOLOGY NEWS

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FORMERLY COSMOLOGY NEWSLINK



STRANGE CASE OF THE "FLOATING"  
PHOTOGRAPH  
PSYCHIC NEWS AND THE PARANORMAL  
TIME TRAVEL UPDATE  
SPACE NEWS DATA

MAN ON MARS BY YEAR  
2000  
ASTRONOMICAL  
NEWS

# COSMOLOGY NEWS

## EDITORIAL



SINCE 1972

## INTRODUCTION

COSMOLOGY IS THE SCIENCE OF THE UNIVERSE AS A WHOLE; A TREATISE ON THE STRUCTURE AND PARTS OF THE SYSTEM OF CREATION.

The title COSMOLOGY NEWS(link), as it stood up to January 1993, was formulated from the need to fit together inter-related subjects which may or may not have bearings on each other and perhaps leading to the answers to some of the mysteries of the Earth and of the Universe. In this case, COSMOLOGY NEWS would have accomplished its function.

The title COSMOLOGY NEWS was suggested by Mr. Patrick Dineen, of Co.Kerry, Ireland.

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Letters addressed to this magazine shall be considered for publication unless it is otherwise requested.

No, this is not a new Cosmology Newslink, but one and the same, with a slightly altered title...to just COSMOLOGY NEWS, which was originally to be our name back in 1972 when it was coined by an Irishman who knew of my interest in the paranormal, astronomy, UFOs, space research and the like of, putting all the "eggs in ONE basket" under CNK. But times are a-changing, and there is no need to LINK all the subjects together, but rather to have just all the news of the cosmos-hence-Cosmology News. The issue numbers, however, will run as before, THIS IS NOT NUMBER ONE of a new magazine. In fact a proposed name change by colleague David Prockter suggested just COSMOLOGY. I hope the new look magazine will be to the liking of our readers, and both this magazine and my sister publication WORLD UFO JOURNAL will share the same new technology, and maybe the future will see hopefully an even further improvement, but I am afraid that IS well into the future.

I wish to thank all the advertisers, and subscribers etc who have sent in articles, and donations to help keep CN in circulation. I wish to also thank BME of Dunmow, for their unselfish help in maintaining some of the equipment used to produce this magazine-thanks Martin, Nigel, Julie, and all.(See advert).

The world is still full of unsolved, weird mysteries, and when the paranormal strikes at you personally, when it has not done so in the past, it makes you THINK that the stories you read, and in my case, write, come home to you when it occurs...for example the strange case of the "floating photo" which is depicted on the front cover. *Editor. E HARRIS*

COSMOLOGY NEWSLINK WISHES TO THANK THE FOLLOWING FOR THEIR MATERIAL:

SUSAN READ, STEPHANIE WALES, ELAINE IBIRICU, GENE DUPLANTIER (Canada), Dibley Wollabrooks, THE GUARDIAN, DENVER POST, TORONTO SUN, CINCINNATI ENQUIRER, ROCKY MOUNTAIN NEWS, TORONTO STAR, ROGER LEWIN and all those who helped in CN's production.

# STRANGE CASE OF THE "FLOATING" PHOTOGRAPH

AND OTHER SIMILAR PHENOMENA

By the Editor,

I HAVE BEEN THE EDITOR AND COMPILER OF COSMOLOGY NEWS SINCE 1972 AND DURING THAT TIME I HAVE REPORTED SOME REALLY STRANGE BUT TRUE PARANORMAL PHENOMENA FROM OTHERS.

But when it happens to you, it becomes the physical evidence that you may have been searching for.

In 1980, I took the photo you see on the front cover of a group of people, who for identification are, left to right: Mrs J. Dulieu, my mother-in-law, who died in 1991, Mr. Frank Dulieu-son of Mrs. Dulieu, Mrs. Rita Harris (wife), Mr. Alfred Harris, (my Dad who died 1982), and in front, myself (kneeling) and Angela Harris. There is nothing really remarkable about this picture until about July 1992 when I decided to have the original En-Print enlarged by a Laser Copier machine in a Prontaprint shop in Chelmsford in colour.

The mystery deepens when that same evening I decided to temporarily stick the large as-you-see-it-here photo onto a wall above my bed, and I must STRESS it was well and truly stuck.

I remember that night being very warm, so sticky in fact that to sleep in the bed was too hot and just lay on the top for a while to cool off and finally I went off to sleep.

I knew nothing until the next morning when on opening up an eye to peer at the clock to my left, I noticed-while still half asleep-a colour photo placed neat and squarely on my

bedside bench-chair. I still did not see the significance of this in my half awake state, until with a start I remembered that I had this picture well and truly stuck to the wall above me. It did not frighten me to know that something weird had occurred in the night and that our son SWEARS it was not he who had "crept into the room in the night," he would never do such a thing in the past and never would.

How did a photograph detach itself from a wall to which it was firmly adhered to? Did unseen hands take it from its mounting, float it down to the chair? Did it fall off on its own accord. The answer to the latter was no, because I tested this theory the next day and the photo just fluttered to the ground and lay at a random angle on the bed. Was it a "message" from two of the dead people on the photo, telling my wife and I that all is well? Or did the dead on the photo, not like the photo, or what WAS the message, if any? This is one mystery I have not yet solved despite many thoughts and conclusions of natural explanation. However, the next night, I tried to repeat the phenomena by retracing everything I did the first night. But nothing happened except a few corners of the photo coming loose and just staying fixed in the heat. Has any other reader had anything interesting happen to them like this? YES!

## MYSTERY OF THE LAMP

Mrs. Susan Read, of Stanstead Abbots, nr. Ware, Hertford, England, wrote to me recently about bizarre goings on in her lovely home. She told me that last year her mother had died and she was left with a few possessions of which are throughout her home, there were a few personal, tragic circumstances surrounding the mother's death which had left her devastated by the news.

As we all know, time is a great healer for the bereathed, and although Susan and her children, Tracy 17, Melissa 7, had settled down to normal family life, a few months later, around January-March 1993, inexplicable happening started to manifest themselves. Susan writes:

"Something happened yesterday. My mum had this bedside lamp which my sister Jill gave to me. It used to be in Tracy's room, but I borrowed it for my bedroom. Melissa had been using that lamp for weeks, then last night the bulb blew. I also tried it. Nothing! Then I had to reach behind mum's chest of drawers to switch a TV plug off. I picked up the lamp to move it further on the chest of drawers...so as I leant over to the wall so as not to break the lamp, as I picked it up to move it, the bulb suddenly lit up. I put the lamp back down and the bulb went off. But I couldn't get it to work again. A friend of mine said it must have been a loose connection, although I have tried it again since and nothing! That bulb was tried in several other places in the house and nothing!

Last night my girl, Melissa said she heard the bulb go "ping" in my room before it lit up that night. I'm sure now that my mum's presence is with me in my bedroom. She is always with me in my thoughts. To

clarify all this I'll recap:

The bulb in mum's lamp had **already** blown-what was odd was when I lifted it to reach the TV switch it lit up in my hand as I held it, it had DEFINITELY blown hours before. Melissa heard it "ping"., but wouldn't work later and it wouldn't work either. It only lit as described. "

## ...AND EVEN STRANGER

Susan went on to describe other events:

"Then yesterday things were rearranged in Tracy's room like photos, a mirror, etc., had just changed positions.

Last night she came down hysterical saying someone was leaning over the bed and they'd walked through a closed door. She said she saw my mum's face, and was terrified and would not come down stairs in that state unless she really believed something was there, and asked me to tell mum to go away. I feel comforted though if my mum is doing all these things. It's as if she's still here. I was desperate for her to live when she was in a coma, and I've worn a her wedding ring ever since last September when she died, and was taken off her finger, when it was collected for me by my sister's husband. Do you think there is any significance in those things?"

EDITOR'S FOOTNOTE: Has any readers the answers to both these weird and wonderful phenomena stories. Please let us know at:

CNK PRESS, 16, Newton Green, Great Dunmow, Essex, England, CM6 1DU. Your replies may be published, unless you say otherwise.

Editor's note: I do not like to continue to the next issue, an article if it can be helped. But in some cases where the item is a long one, this unfortunately has to be the case.

THE BOOK OF AZRAEL TELLS US THERE IS NO GOD THAT IT IS MANKIND THAT IS THE CELL OF GOD. It is known as the GODSOUL, the continuation of life past into new and back into spirit, this makes the ALL and each of us individuals, makes ONE. THE ONE AND THE ALL, is the continuation of life, death and rebirth, over and over again. History remembers our past lives, from that, we learn about our mistakes and we mould our present to make our future. We are the makers of what we believe and we decide our fate in that life that we are currently living. That is the ONE, the individual cell, that will multiply and eventually die, but whereas in biology, that is all the cell will do, in our lives, the physical, we do not end our usefulness or our learning. We are reborn into spirit, to rest, to assess and to decide that which we still need to learn, and we are then helped by the GODSOUL. Each of us are the ONE, but together we make the ALL.

A patient in hospital was very near to death. Two doctors, a nurse and myself were all in the room. They asked each other if the vicar should be informed and it was agreed that he should be present to give the last rites.

About half an hour passed and I became aware of a drop in temperature. I looked to the top right hand corner of the room and saw four spirits enter. I turned to the patient and noted that his eyes were open and he seemed to be attempting a smile. "Recognition" I thought, and a smile crept across my face. The spirits were unaware that I was witnessing their arrival. I turned to the doctors and said that we could count the patient down from 10, and he would be gone. They did not believe me, but I counted out loud and slowly reached 1. He passed his last sigh and I watched as his spirit rose to greet those that had come for him. He was smiling and his face was

radiant and he had tears of joy in his eyes. The doctors watched me and asked how I could have known. I told them that I saw his receivers arrive and that was final. They were amazed but if only they could have seen what I saw. It was like watching the wondrous moment of a child being born and feeling the joy and wonder of the parents for the first time. This was a secret birth. A deliverance from pain and suffering, a release of the tormented spirit, returning to his home and family. Words fail me as the description of that moment, it still overwhelms me to recall it, and I have no fear of that point in my rebirth...yea that I should look to it with anticipation and hope that I too will be blessed with such witnesses. Although the vicar had missed out, the spirit had not suffered, indeed, it made no difference.

#### THE THIRD STEP

The third step is to look at what happens when we are reborn. The Bardo Thodol explains the procedure of death thus:-

"There are three symptoms to tell to the dying person.

1. You will feel the symptoms of the earth sinking into to water (a bodily sensation of pressure).
2. A bodily sensation of clammy coldness.(As though body immersed in water).
3. Finally fire sinking into air (A feeling as the body were being blown into atoms)."

These are interesting points, for physically, they explain how the observer can tell if someone is dying, and they also explain to the dying what they should be feeling, and to know that these feelings are normal. Also earth, water, air and fire are the astrological signs of life. (Our zodiac signs are related to these four symbols that just so happen to be the elements of sustained life). Any religious book will tell you that our bodies are returned to the elements, be us cremated by fire, buried into the

earth, ashes released to the wind or in some Indian countries, the bodies are returned to the water of a sacred river. It may strike you as odd how some things can link up in odd ways.

TO BE CONTINUED...

A SPIRITUALIST'S  
VIEW OF THE  
INDIGENOUS AMERICAN  
ANSWER: Elaine Ibiricu

**THE RESOLVE TO CLING TO THE  
REMAINS OF THEIR SPIRITUAL  
HERITAGE**

is an asset to the strength and future survival of the Indian cultures, faced in their contraflow with statistical figures for suicide, drug addiction and alcoholism amongst the highest of any racial minority in the United States. Elaine Ibiricu As Michael Hellicar pointed out in his article "The Noble Tribe of a Broken Heart" (The Star 9/8/88) "I have seen poverty, deprivation, sickness, bigotry and appalling social problems that would make a Third World country blush with shame."

Funnily enough, that is one picture framed in 1988 that never became the masterpiece the media were looking to auction off to our gratuitous indifference. That belonged to 1989, to the pictorial portrayal of the Kayapo Indians of the Brazilian Amazon emerging from the forest in force, in peace; intelligent, human, and wisely concerned Earlier this year (1989) they held talks with the government power company of Brazil, Electronorte, to dissuade them from building a dam on the Xingu River, which forms part of their homeland. But their hopes were soon to be drowned. When will the Indians win? When it comes to finding solutions for mother earth, most nations of the world think they are either guessing the answer at Trivial Pursuits, mortgaging a hotel on a Monopoly board, or reshuffling an unlucky deal at New Market. When will the serious business start and mother earth's most prided mentors be allowed to lead the way?

It was centuries ago when the Indian Agents, the Royal Canadian Mounted Police and missionaries were given the task of extinguishing the last bit of independence in the Indian spirit, or was it 1989? Was it tomorrow?



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At the time of the Declaration of Independence in 1776 there were some 18 inches of top-soil in America. There are only 8 inches left. How much thinner can the Indian spirit be allowed to grow...when it needn't? It is trying to get through to us; if only through our Spirit guides and healers, not to mention the media. And even though the vision of life we have been educated into places spiritual beings and powers in a different hierarchy to theirs, still we are beginning to see much sense

in their ways. The Native Indians, for example, typically asks permission of an animal and often a plant to take its life before killing it. Those accustomed in Western society to give thanks at mealtimes do so to the Creator, and long after that life has been taken. In Native creed, spirit is indwelling and inherent in all things. Even a rock has life. And respect is due to ALL life. Whereas our Bible depicts a God that expects his children to subdue and dominate the earth. the Lakota Indian origin story, to quote but one, tells that the earth is the mother who nourishes everything. They prophesize that a day will come when our mother will beg us to save her. In popular Christian terms this prophesy may mean "The end of the world is neigh. Have faith in God for your salvation." In Lakota terms it means, "Learn to respect the earth, it is as much a part of you as your own blood and bones."

Our well loved author, D.H.Lawrence, whose travels to the American continent inspired his book "The Plumed Serpent", observed of their indigenous people: "The Navajo women, when they weave a blanket, leave on a little piece for their soul to come out at the

end: not to weave their soul into it.- I always think England has woven her soul into her fabrics, into all the things she has made. And she never left a place for it to come out. So now her soul is in her goods and nowhere else." The story wasn't a typical Lawrence romance, but the idea of freeing our imprisoned souls, of putting the well-being of ALL life before that of any single life, is beginning to turn a few heads and to capture a few hearts. And for those of us who see in Spirit a great source of support and understanding, how better could we please our Spirit friends after all the effort they put into our lives?-

**Elaine Ibiricu** 15.7.1989



GOD IS THE LIGHT WITHIN YOU  
Says Hugh De Cruz of Spain

Hugh de Cruz was a bearer of God's light in Spain sending out newsletters of cheer and light of which the above sticker indicates. After 25 years of world wide interest he has now given it all up and his parting words are:

**"Dear Edward in God's light,**  
Rest and relax with the little you have, if unemployed, the world cannot be run anymore this way as the present bureaucracy has to be met by those who work usefully.

Yet the governments do not mention this too much. Whatever government is in power makes no difference at all. Just do whatever God Within You guides you to do.

After April 20th 1992 this work is closed and no more letters will be answered. You can send me just one more copy of your magazine. I have completed my 25 years day and night work now I will rest rest from it all. In my own way I will be planting the light. 10 years ago I planted the inner light in a Swedish Lawyer I was introduced here. Today he has opened up one of the finest Health Centres for Spiritual Inner Healing as well and soon plane loads of Norwegians etc will be flying over for peace of mind. Blessings in the expanding light. HUGH DE CRUZ, Spain.

\*Its a pity CN did not get to really know the NEW AGE UNIVERSAL CHRISTIANITY WITHOUT RELIGION until it was too late. Thanks Hugh for the little that occurred.

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**ELAINE**

Choose 25 numbers between 1 & 78 and send them to me with the place, time and date of birth and any problem details. In return, you will receive your personal reading and character analysis for £12. Send S.A.E to: Elaine Ibiricu, 4, Bradwell Street, Sheffield, S2 3ED, and please note that the box number advertised for me in the last issue is no longer in operation. Thank You.

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**LETTER:(From FORESIGHT)**

**Thank you for the enclosed magazine.** We enjoyed reading it, especially the Time Travel article. Quantum Physics is an interest of mine and I find the idea OF time travel quite acceptable within the framework of current theory. I saw the programme on T.V. and it was quite thought-provoking. Yours sincerely and fratnerally, John W.B.Barklam.

# TIME TRAVEL UPDATE

By  
EDWARD HARRIS, EDITOR & DIBLEY WOLLABROOLS

In the last issue of Cosmology News(link) on TIME TRAVEL, we saw that Dr. David Deutsch, in a BBC television programme of July 1992 had used a computer-a quantum theory one-to see if it was possible to travel in time, but he said, it would only be possible to time travel from the DAY that the time machine was invented, i.e. back to the day it was there, because you could not go back beyond the day that it was not in existence, therefore Time Travel is only possible in one direction-FORWARD. He also thinks that strange phenomena we are seeing in our skies are NOT time travellers coming back into the past, which was my theory too! Maybe one day in the FUTURE, some atomic physicist will come up with something resembling a 'time machine' which could operate not so much physically going back into the past, but to visit the past by catching up with the rays of light which have left us today, and combining this with vibrations of the year being visited in the PAST, but again, whether or not the fact the 'time machine' will only allow travel back to the day it was invented is another matter. Therefore the people of the future may be here already but we just can't see them! Maybe time travel will occur at a different level of vibration, but how these vibrations will be created IS for the future. I proposed to myself a few days ago that I could build a theoretical time travel device in which a person sits, and only permits the rays of light to travel inside the vehicle and not outside the vehicle by bouncing off rotating mirrors and coupling this with sound vibrations of the past at a high velocity

level, the combination of light vibration and sound, trapped inside the device MIGHT DO something; which would be risky to the inventor since he may GO somewhere he had not bargained for and that would be that. On the other hand, he may well have invented a hypnotising machine instead. So, it seems according to the scientists time travellers may not be coming from earth's past as in the last issue, but could they, anything is POSSIBLE...in the FUTURE!

Time travel has now become respectable in the scientific community, and although time travel is at present only theoretical fiction with a mathematical probability of it becoming reality we can only wait and see.

One of our readers, Mr. Dibley Wollabrools, sent us his interesting thoughts on the subject when he read about it in the last issue:  
MY THOUGHTS ON TIME TRAVEL by  
D. Wollabrools

Not having seen Dr. Deutsch's TV programme on time travel, I was interested to read the article on this subject, but it looks as if the BBC have done what they usually do with such concepts, which is to have several very optimistic boffins come out with a few facts that sound suitably amazing without telling the viewer all that much by way of demonstrating that whatever they're talking about is probably just around the corner, without explaining how this is to be achieved; no doubt I also missed a lot of pretty computer graphics too! Interestingly, time travel has never been shown **not** to be possible, which, since time always seems to travel in one direction only, has puzzled

some people, who felt that there ought to be a reason. On the other hand, anti-gravity, which seems to be thought of by the general public as a useful discovery just waiting to be made would require a complete re-write of modern physics to become even theoretically possible!

In fact to a sub-atomic particle, the direction of time doesn't seem to matter very much—such particles are apparently able to suddenly reverse their direction in time completely at random, although only after a minutely short time, they will resume their original direction. This ties in with the fact that anti-matter can be thought of as ordinary matter travelling backwards through time; however, on a larger scale, this freedom disappears, and thus the world and all things in it big enough for us to perceive travel only forwards in time; even an object or a person made entirely from anti-matter, whose individual particles are, mathematically at least, travelling back through time, would appear to be going in the same direction as the rest of us! This ambiguity about the direction of time seems to indicate that, as you and Dr. Deutsch both mention, the future is in some sense just as real as the past is to us normally, which, rather disturbingly, logically removes the possibility of free will and free action.

There are two problems here. Firstly, this is not an idea that people feel happy with, and secondly, quantum physics bases its ideas on a fantastic degree of randomness in the activity of every tiniest part of the Universe (and for those parts with minds, an unlimited freedom to make them up!). This leads to a number of interesting but perfectly logical conclusions, particularly when combined with the recently developed "chaos theory." For instance, the randomness of the Universe is apparently so great that an "ultimate computer" capable of processing infinite amounts of data with infinite speed, if asked to predict the future of the Universe, would only be able to make short-term predictions; the further ahead it tried to see, the larger would grow the inaccuracy, until the predictions

became nothing more than guesswork; likewise, even if this Universe were to be recycled and repeated an infinite number of times, the chances of two Universes exactly the same, or even similar down to such minor details as the planet Earth, ever occurring are infinitely small.

Both these results are arrived at using something called transfinite mathematics, the basic point of which is that all infinities are limitlessly big, but some infinities are bigger than others! Don't worry about it. George Cantor, the man who thought of it, worried about the finer points for too long and went mad.

The point of all this is that a combination of Einsteinian space-time and quantum uncertainty appears to simultaneously prove and disprove a 'determinist' clockwise Universe; the best (theoretical—and controversial!) way out of this dilemma is at present the 'Many Worlds' theory. This comes in two varieties. The Universe is either a single, rigid line stretching from the present into the future (and TOTALLY predetermined, but which, whenever a random event occurs in a non-predetermined way, simply removes the paradox by being totally destroyed, and instantly replaced by another almost the same, but shifted minutely in one direction or another; or, alternatively, the Universe is a single inflexible PAST, branching out at the present into an infinite selection of possible futures (as a diagram, the second would look like the first, except facing in the opposite direction: note that each model would look precisely the same to observers travelling backwards in time). The second model is more popular, simply because more scientists find it aesthetically pleasing! This brings me to the central problem of theoretical time-travelling—the so-called "Grandfather Paradox" using the "many worlds" model, this is resolved as follows: When the time traveller appears in his own past, he creates a rather major unpredicted discrepancy in his own Universe—instantly, that Universe vanishes and is replaced, or throws off a branch—either way, the traveller is no longer in his own Universe (which is now either irretrievably branched off, or

abolished entirely!)...he is in another exactly the same, except for his own presence. Therefore nothing he does can affect his own future, merely that of an exact duplicate of himself-he is entirely at liberty to kill his own Grandfather without ill effects. (For a good example of Hollywood scriptwriters nearly, but not quite, getting the hang of this idea, see "Terminator II"). Note that none of the above has any major effect on the question of precognition, etc., even if the future is no longer certain, the near future at least will be far more likely to go one way than the other. Incidentally, did you know that Nietzsche had that idea about time endlessly repeating in a closed loop? (An idea your editor had himself back in the 1950's and seen in the last issue).

The only remaining problem is, of course, how would time-travel actually be accomplished? According to some theorists, this is very simple-space and time are infinitely connected-distort space and you will distort time; all you really need is a localised, very severe distortion of space, and it may be possible to warp time enough for it to flow backwards. (Stephen Hawkins proposed that if the Universe was to reverse its outward motion and started to converge again then time would run backwards-but he said he had got the maths wrong and that it could not=EDITOR).

Unfortunately, the only obvious way to warp spacetime enough to try out this idea is to create a truly gigantic gravity-field, which needs a truly gigantic concentration of matter; a black hole has been suggested, but it would have to be an exceptional well-behaved black hole, and the chances of successful time-travel would still be very small.

The ideal time-machine would apparently be long, thin ultra massive cylinder spinning at high speed; about 100 neutron stars welded together in a straight line would be perfect. Obviously, this is a project for the VERY distant future, assuming the theory still holds good then. This also answers your objection that time-travel must be impossible, or our descendants would be here already-the 'machine' itself stays put, surrounded by currents of distorted time-the 'chrononauts' must

follow carefully calculated flight paths around it in space ships; but the one thing they cannot do is to travel back in time to before the time at which the device was created-as soon as we get around to building such a thing, instant time-travellers from tomorrow till doomsday-but until then zilch!

One theory has it that you can travel back before the device exists, but that in doing so, you would automatically switch from the Universe that you had been in to another exactly the same, except that an identical, naturally-occurring massive object just happens (somewhat improbably) to exist in exactly the same place as the one you built in your Universe! However, since nothing remotely like this exists anywhere near this planet, it looks as though we'll have to build our own.

I hope you find some of this useful; and I also hope that COSMOLOGY NEWS will appear more regularly in the FUTURE\* and that your sister publication, WORLD UFO JOURNAL continues to improve.

**DIBLEY WOLLABROOLS.**

\*Well Dibley, you can always hop into your time machine and let me know eh?=EDITOR



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Hawking: 'The real star of the film is my mother'

# Brief history of time

Stephen Hawking reviews the film of the book and its aftermath

THE GUARDIAN  
Friday May 1 1992

go, all over the world, people come up to me and say how much they have enjoyed my book. That indicates they have read at least part of it. They may not have finished it, and they have probably not understood everything they read. But I don't think that matters. They have read and understood enough to feel they are not shut out of the big questions, and that with a little more effort, they could understand more.

The book has sold about six million copies around the world. But something on television can reach a far wider audience than any book can. I was, therefore, favourably inclined when Gordon Freedman approached me to make a film, shortly after the book was published. My original idea was that it would be a Horizon-style documentary that followed the book closely, and that was mainly graphics.

However, I now realise that such a film would not have achieved my aim of reaching a mass audience. Whether this film, with its blend of science and material about my life, will reach this goal is difficult for me to judge. I can't think why anybody would want to hear about my early days. But other people who have seen it seem to like it. One thing I can recognise is that the real star of the film is my mother.

## Wormholes!

By The Associated Press

PHILADELPHIA — Want to get somewhere fast, and even get back home before you departed? Cosmic wormholes may be just the ticket one day.

Wormhole travel is years off, probably another five centuries, but some physicists have fun thinking about them.

Cosmic wormholes are tunnels in space connecting distant parts of the universe, said physicist Paul Halpern.

Wormholes could be a great way of traveling for those who can't find a baby sitter or who don't have much vacation time. In theory, wormhole travelers could return home just minutes after — or even before — they left.

DENVER POST - DEC. 25, 1992

**I** FIRST SAW the complete version in Los Angeles in February. I must confess, I was quite apprehensive as to how it would turn out. I was afraid that, on the one hand, it might leave out or trivialise the science, and on the other, that people might be confused or bored. I hope the finished product avoids both dangers.

Of course, the film does not explain the science in the detail the book did. That was inevitable. But I think it gets across two of the key ideas in my book: first, that the universe had a beginning in time. And second, that there is another kind of time, called imaginary time, in which the universe need have no boundary, no beginning or end.

The discovery of ripples in the microwave background reported last week is consistent with this idea, that the universe has no boundary in imaginary time. It does not prove it, but it gives it strong support. This is an exciting time in our quest to understand the universe, and I'm glad that my film will be shown within 10 days of such an important observation.

I have been fortunate in the director of the film, Errol Morris. He is a man of integrity, with a feeling for the issues. It

would have been all too easy to have someone who would have concentrated on the more sensational aspects of my private life, and my medical condition, and who would have treated the science in a superficial way. A friend of mine, who has had several television programmes based on his work, was envious of how the scientific ideas came through on the film.

I wrote my book in the hope of telling a large audience about the progress that was being made in understanding the universe. My aim was to have it sold on airport book-stalls. My agent was polite about this, but he clearly didn't believe it would happen.

A book like mine might appeal to the kind of people that read the New Scientist, or Scientific American. But it was not going to sell like Jeffrey Archer, or Barbara Cartland. I don't know quite how or why it happened, but it did. All over the world it has been breaking publishing records. This has mystified the critics.

**T**HERE have been suggestions that people buy it, but don't read it: that it is one of the Great Unread Books Of Our Time. I don't think this is true. Wherever I

# How to destroy the doomsday asteroid

Roger Lewin

WHEN, in late 1990, the US Congress asked NASA to examine the possibility that an asteroid or comet may soon crash into the Earth with catastrophic consequences, many observers were openly sceptical. The notion of a doomsday asteroid hurtling through space with Earth's number on it was certainly headline-grabbing. But any suggestion that NASA should try to do something about it was considered by scientists to be at best a misguided use of talent and resources.

However, according to a recent paper in the journal *Paleobiology* (vol 18, number 1), species extinction by asteroid impact may be much more common than most people, biologists included, had ever imagined.

David Raup, a palaeontologist at the University of Chicago, has studied the long-term patterns of life on Earth and how extraterrestrial impacts may have shaped those patterns. He concludes that throughout the history of multicellular life—from 600 million years ago—some 60 per cent of all species extinctions may have been caused by impacts of asteroids, comets or other extraterrestrial bodies.

Some of these impacts would have eliminated two-thirds or more of species living at the time. The mass extinction at the end of the Cretaceous period, 65 million years ago, that accounted for the last of the dinosaurs is widely thought to be an example of such a calamity. Other collisions would have destroyed between 5 and 60 per cent of the standing population of species. Extinction levels up to 5 per cent fall into the range of "background" extinction, the result of biotic effects including the overwhelming success of one species over another, or local disasters such as a hurricane that destroys animals and plants unique to one island. Throughout history, background extinction has cumulatively accounted for the loss of 40 per cent of species, a much lower figure than most biologists would have guessed.

Raup arrived at his conclusions by dating asteroid collisions from their impact craters and checking them against known mass extinctions. The two sets of dates coincide closely. Raup acknowledges that his work represents only a "working hypothesis". But, he states, it is "credible and testable".

If it is true that throughout Earth history, 60 per cent of all species have gone extinct through asteroid impact, then the odds are better than even that *Homo sapiens* will end its days in the same way. And NASA might not be wasting its time and other people's money after all. But our spectacular demise might be a million years from now, or maybe two, so why worry over such an unpredictable event?

## Armada of missiles

Asteroid-impact enthusiasts point out that we need to consider consequences short of complete elimination of the species. They cite evidence of an impact equivalent to 20 hydrogen bombs that devastated hundreds of square kilometres of forest in the Tunguska region of Siberia in 1908. More

recently, in 1978, an immense explosion equivalent to 100 kilotonnes of TNT was detected in the South Pacific. Once suspected of being a clandestine nuclear test, the event is now considered to have been an asteroid strike. Had either of these

next 25 years," notes the report.

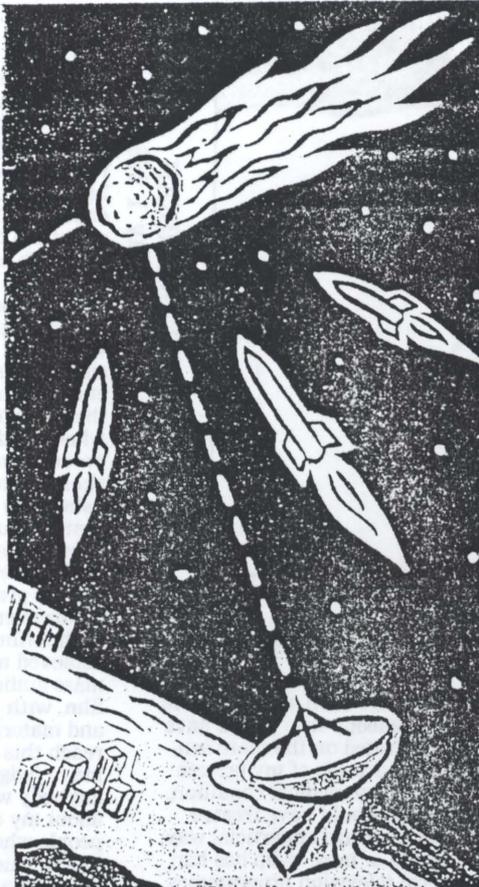
The interception panel states that: "There now exist technically credible approaches to preventing an impact catastrophe provided that the requisite technology capabilities are developed." Earlier this year, in a workshop held at Los Alamos National Laboratory, New Mexico, panel members discussed the feasibility of deploying an armada of 1200 missiles, armed with an explosive power equal to today's entire nuclear arsenal, to deflect a killer asteroid from its path. Edward Teller, developer of the hydrogen bomb, proposed inventing a new explosive device, 10 000 times as powerful as anything we have now. He did not say how.

Reaction to the panels' suggestions has ranged from sarcastic amusement to outrage. Some see self-interest at work, with astronomers and nuclear weapons experts eager to divert substantial funds to their own fields. Weapons scientists, in particular, can be seen to be in search of a rationale for their continued employment, now that the threat of nuclear confrontation with the Soviet Union has disappeared. But the NASA panels insist the problem is real. "Although the annual probability of the Earth being struck by a large asteroid or comet is extremely small, the consequences of such a collision are so catastrophic that it is prudent to assess the nature of the threat and to prepare to deal with it," says the detection panel.

Countless millions of asteroids hug an orbit between Mars and Jupiter, forming a belt that normally poses no threat to life on Earth. Occasionally, however, some are jostled out of the belt to assume Earth-crossing orbits. Some 150 such asteroids with a diameter of at least 1 kilometre have been detected, with two or three new ones discovered every month. The panel estimates that between 1000 and 4000 Earth-crossing asteroids exist with diameters equal to or larger than 1 kilometre. An equal number of comets may pose a similar threat.

Most asteroids with diameters ranging from 10 to 100 metres explode on hitting the Earth's atmosphere, usually with no harmful effects. The larger and denser ones in this range penetrate further. The Tunguska event, for example, is thought to have been the result of a 60-metre asteroid that exploded at an altitude of 8 kilometres. It is estimated that impacts of this magnitude occur every 300 years. Bodies more than 100 metres across strike the Earth once every 5000 years.

The largest of these asteroids release energy so much in excess of known nuclear experience that it is difficult to predict the damage they would inflict. The detection panel report does speculate, however, that: "The impact of a 1-kilometre object could envelop whole states or countries, with fatalities of tens of millions in a densely populated region." Such impacts occur every 300 000 years, and carry the potential to threaten the survival of civilisation;



impacts occurred over London or Paris, for example, millions would have been killed. In January 1991 an asteroid 10 metres in diameter passed between the Earth and Moon, scoring a near miss.

At Congress's request, NASA convened two panels, one to investigate detection of potentially lethal asteroids, the second to look at strategies for intercepting such bodies. The detection panel, chaired by David Morrison of the NASA Ames Research Center, California, published its findings in January. The interception panel, headed by John Rafter of NASA Space Sciences in Washington DC, will report by the end of the summer, although some of its thoughts are already known.

The detection panel recommends an international effort aimed at building a network of at least six, ground-based telescopes with 2 or 3-metre apertures, to be called Spaceguard Survey. The initial outlay would be \$50 million, with annual running costs of \$10 million. Within 25 years, 90 per cent of all asteroids with a diameter bigger than 1 kilometre, which pose a danger to life on Earth, will have been detected. "The Spaceguard Survey is an essential step toward a program... that can reduce the risk of an unforeseen cosmic impact by more than 25 per cent over the



DRAWING BY TERRY BATTEN

huge quantities of ash, dust and vapour into the stratosphere, shrouding the Sun and triggering the equivalent of a

*'The impact of a 1-kilometre object could envelop whole countries, with fatalities of tens of millions'*

"nuclear winter". Objects up to 5 kilometres in diameter, arrive every million years, and cause mass extinction. Agriculture and civilisation would certainly collapse and the future existence of the human species would be in doubt.



According to NASA's detection panel—which took advice from astronomers and palaeobiologists, among others, from Australia, Finland, France, India, Russia and the US—present technology would allow the Spaceguard Survey to discover and track asteroids and short-period comets larger than 1 kilometre in diameter. Long-period comets are

more difficult to follow, because of their eccentric orbits.

The lead time between detection and impact would be crucial in determining the nature of any response. In its preliminary statement, the interception panel suggests that contact with a body on collision course with Earth would be most effective at great distance because "smaller deflections are required so less energy need be delivered". Most asteroids on course to hit the Earth pass by many times before finally making contact. This would allow selection of the optimum time for deflection by explosion. Nevertheless, notes the panel: "The kinetic energy of a mountain-size object travelling at 25 kilometres per second is enormous. . . Powerful explosive devices would be needed to impart enough energy to a large [near Earth object] to perturb it from a trajectory that passes through Earth, or to destroy it."

### Nukes forever

To some observers, the possibility that this whole exercise is a waste of money is less of a concern than the enthusiasm it has generated for deploying massive nuclear arsenals. At the interception panel workshop at Los Alamos, the atmosphere was one of festivity among Strategic Defense Initiative researchers, who see in the project the prospect of future justification of their efforts. "Nukes forever," shouted one participant during the session—not entirely as a joke.

In an editorial, *The New York Times* said: "The world has less to fear from doomsday rocks than from a nuclear armada arrayed against them." Robert Park, a professor of physics at the University of Maryland, says: "Who will protect us from the 'nukes forever' mentality?"

Many biologists find the cries of alarm at the prospects of future putative extinction somewhat ironic. The magnitude of global species loss inflicted by present-day destruction of habitat—in particular the cutting of rainforests—could match the extinction at the end of the Cretaceous. "This extinction may seem less dramatic day by day," says Thomas Lovejoy, Assistant Secretary of the Smithsonian Institution, "but the cumulative effect will be just as great as asteroid impact, and continued human existence just as threatened."

NEW SCIENTIST 6 JUNE 1992

### UFO RESEARCH DIRECTORY of

Organizations and Publications  
for the 1990s

by  
Gene Duplantier

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# Asteroid missed us by a 'hair' — this time

WASHINGTON (AP) — Since you're reading this, the worst didn't happen.

Early this morning, the asteroid Toutatis came and went. Whew!!

Toutatis, 1½ to 3 km (1 to 2 miles) wide, whizzed past Earth, missing us by just 3.5 million km (2.2 million miles), a hair-thin margin of safety in celestial terms. A direct hit, say the experts, would have produced a global disaster.

The asteroid was discovered in 1989 by a French astronomer and named Toutatis after a Gallic god called "protector

of the tribe."

Astronomers say if it collided with Earth, Toutatis could actually be destroyer of the tribe.

"It would be catastrophic if it hit the Earth," said Don Yeomans, a Jet Propulsion Laboratory research astronomer. "It would throw up enough material to shut down the sunlight and the plants would have died. It wouldn't have wiped out everything, but millions and millions of people would expire."

# Comet may hit Earth in 2126

THE WASHINGTON POST

It's not likely, but a newly sighted comet named Swift-Tuttle could collide with Earth on Aug. 14, 2126, according to a circular issued by the International Astronomical Union.

The comet — previously seen during the Civil War — was re-discovered late last month, and many astronomers believe it creates the Perseid meteor shower each August as the Earth passes through the debris that Swift-Tuttle leaves behind.

"(There is) a small but non-negligible chance that (the comet) will hit" the Earth, said Brian Marsden of the International Astronomical Union, a part of the Harvard-Smithsonian Astrophysical Observatory in Cambridge, Mass. "Probably nothing to worry about."

Marsden said his prediction could be wrong by as much as two weeks, meaning that the comet would miss Earth on its next pass — though it could strike at another time.

The icy object's hit or miss hinges on an astronomical wild card known as non-gravitational perturbations — eruptive forces on comet surfaces that act much like thrusters on a rocket.

"This comet is subject to more non-gravitational forces than any other comet I've ever seen," said Geoff Chester of the Einstein Planetarium. "Whether it hits us or not, it's going to be a spectacular show."

Swift-Tuttle returns near Earth every 125 to 135 years; and since its sighting last month, it has displaced Halley's comet as the longest predictable periodic comet.

# NASA calls for worldwide effort to cope with threat of asteroids

The New York Times

A NASA team called Tuesday for an international effort to save Earth from killer asteroids.

In the plan, ground-based telescopes would scan the heavens to warn of impending danger as work began on interceptors that would deflect a doomsday rock headed for the planet.

The team, which studied the issue at the request of Congress, called the odds of a major collision in the next century "extremely small."

But it added that asteroid impacts posed "a significant hazard to life and property" and called for an international effort "to provide insurance for our planet against the ultimate catastrophe."

It gave no cost estimates for the endeavor but said that, if construction began soon, a worldwide network of warning telescopes could be operating by 1997.

Asteroids are the rubble of creation, hurtling through the solar system on courses that sometimes cross Earth's path. The field of asteroid avoidance, once considered laughably paranoid, has grown in size and respectability in the last decade. — Knight-Ridder Tribune News Wire

A killer asteroid is now seen as one large enough to severely disrupt life on impact, scattering enough pulverized rock and dust to block most of the Sun's light.

Agriculture would virtually end, and civilization could wither and die, just as the dinosaurs and many other forms of life are thought by some experts to have been annihilated by the effects of a massive object from space 65 million years ago.

In 1990, Congress asked NASA to study the threat after a half-mile-wide asteroid crossed the planet's path the previous year at an uncomfortably close range.

"The Earth had been at that point only six hours earlier," a House report noted. "Had it struck the Earth it would have caused a disaster unprecedented in human history."

Daily News - 4-1-92

CALIFORNIA

## NASA snaps asteroid

NASA made radar pictures of an asteroid that flew close to Earth last month — getting the best look yet at the kind of object that may have wiped out the dinosaurs and someday could threaten humanity.

The National Aeronautics and Space Administration bounced radar waves off asteroid Toutatis using a 230-foot-wide antenna dish at a tracking station in California's Mojave Desert. The radar echoes were captured by a 112-foot-wide antenna to make pictures on Dec. 8, 9, 10 and 13.

Rocky Mountain News 1-4-93

Friday, October 23, 1992 THE CINCINNATI ENQUIRER

\* Gabfest hostess OP-RAH WINFREY will air a special week of shows dedicated to UFO research, during which she'll confess she's been abducted by aliens from another planet.

# MAN ON MARS BY YEAR 2000

The Toronto Sun, Friday September 25, 1992

## NASA send up Mars probe

PASADENA, Calif. (AP) — The superpowers have hurled space-ships toward Mars for 32 years with some triumphs and many embarrassing failures.

"Any time you launch something into space, it's a challenge and a risk."

"Obviously you've got your fingers crossed," said Arden Albee, a California Institute of Technology.

The NASA lab manages the \$980 million mission.

The Mars Observer depends on a new rocket to hurl it toward the planet. It also has solar panels, instrument booms and an antenna that must deploy properly so the spacecraft can map Martian weather and geology after it starts orbiting the planet late next year.

### MAN ON MARS PROGRAMME GETS GO AHEAD...

America's President Bush in 1990 (May) had this to say:

"I believe that before Apollo celebrates the 50th Anniversary of its landing on the moon; the American flag should be planted on Mars!"

Once again, after the Viking lander, Mars is being used to support a national political vision, and with the space programme stalled and USSR no longer a technological rival, the Red Planet has been invoked to replace the Red menace. This was in part, the words used in a TV programme called: MARS ALIVE on February 6th 1993, and plans to send humans there in a bid to its terraforming. Mars. In this CN we take a long look at how this could be done and some of the problems scientists are having to solve.

## America's return to Mars

Mars Observer is the first U.S. probe bound for the red planet since Viking I and II, launched in 1975.

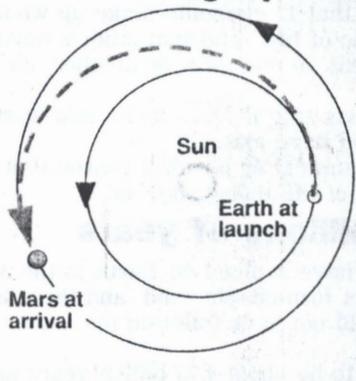
Spacecraft is to assume a 400-km-high polar orbit, taking measurements of the Martian surface and atmosphere. The Observer may also be used to relay signals from Russian Mars probes scheduled for 1994 and 1996.

**Main antenna**  
**Magnetometers**  
**Solar power cells**  
**Laser altimeter** Measures distance from probe to surface  
**Gamma ray spectrometer** Measurements allow scientists to determine chemical composition of Mars surface

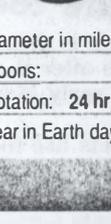
**Camera** Detects objects as small as 10 feet across on Mars surface

The Sunday Sun, September 27, 1992

### 11-month flight path



### Planets compared

	
Diameter in miles: 6,795	12,756
Moons: 2	1
Rotation: 24 hr. 37 min.	24 hr.
Year in Earth days: 687	365

Source: NASA, Jet Propulsion Laboratory

AP/Karl Tate

The World Space Congress, sponsored by the National Aeronautics and Space Administration, the National Academy of Sciences and several international space groups, met in Washington last week.

The international gathering attracted about 5,000 scientists, engineers and astronauts.

— AP

MAN COULD RECLAIM MARS PROBABLY IN THE 21st Century if technology allows him to transform Mars into Earth-like conditions by which is now known as Terraforming. This means releasing natural oxygen present or making an artificial "greenhouse" effect to heat the planet up. We may talk about this in another issue.

# Mars too hard to resist, U.S. scientist says

## Red planet may indeed have been home to life

**T**he first spacecraft destined for Mars in 17 years left Cape Canaveral on Friday. The *Mars Observer* is off on a 725-million-km journey powered by a Titan-3 rocket.

It should reach Mars orbit in 11 months and begin recording weather conditions and mapping the planet. It may answer the age-old question of whether there is — or ever has been — life on Mars. The question hinges on whether or not there once was liquid water on the Red Planet.

And this same question occupied specialists Monday at the World Space Congress.

"It all comes down to water and its essential role to life," said Rocco Mancinelli of the Ames Research Centre.

Bruce Jakosky of the laboratory for astronautics and space physics at the University of Colorado said there is a rich body of evidence that Mars once had a lush supply of liquid water, and there is suggestions from spacecraft studies that the planet still has huge volumes of water locked in the soil as ice.

### No water, no life

Mancinelli said if there was liquid water at some time on Mars, then life could have evolved from basic chemistry, just as many scientists believe occurred on Earth.

Amos Benin of Hebrew University in Israel said studies by the Viking Mars lander and analysis of meteorites from Mars that landed on Earth show the Red Planet has all of the chemical elements for life.

Benin said science knows that 17 elements make up what he called the "chemical code of life" and that studies have confirmed each one is present, in one form or another, on Mars.

Ames scientist Wanda Davis said if Mars had liquid water early in its history, life could have arisen.

With water, there is no chemical or physical reason that would prevent the evolution of life there, she said.

### Life took billions of years

Diverse life is thought to have evolved on Earth in the 3.5 billion years after the planet formed, she said, and there is no reason that early Mars could not have followed the same pattern.

Both planets are thought to be about 4.75 billion years old.

If Mars lost most of its water billions of years ago, then the evolution of life could have been halted at that primitive point.

This prompts suggestions that future missions to Mars should search for fossils of early life forms, the scientists said.

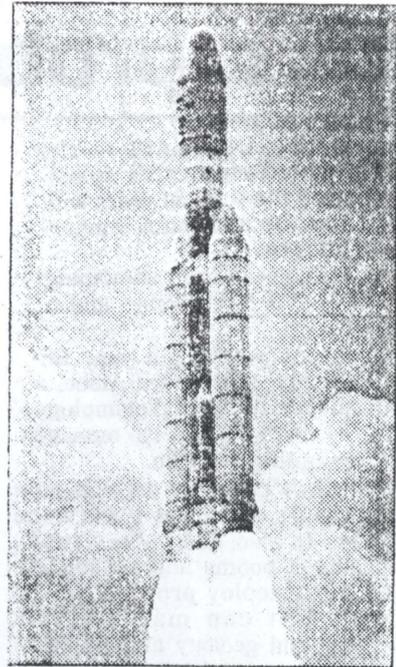
Jakosky said there could be ice accumulated in the soil just a metre or so beneath the surface.

Views of Mars throughout its 687-day year show variations in color that suggest a seasonal collection of ice on the surface at the poles. *Mars Observer* should make all this even clearer.

High-resolution photographs show serpentine features that resemble dry river and stream beds, he said.

There are even alluvial fans, or depositions of soil such as those formed by flooding rivers on Earth.

Much of the water that once was on Mars could have been lost to the planet forever because the planet has only about half of Earth's gravity.



**BLASTOFF:** A rocket lifts off with the *Mars Observer* satellite yesterday.

PASADENA, Calif. (AP) — Sending humans to Mars will cost hundreds of billions of dollars. So why do it when so many people are homeless and starving on Earth?

"I don't think we can stand to have it sitting out there without dinking with it. That's what humans are like," said Arden Albee, Jet Propulsion Laboratory's chief scientist for NASA's unmanned *Mars Observer* mission.

"I don't think there is justification for manned missions except human curiosity, drive and looking toward the future," said Albee, dean of graduate studies at the California Institute of Technology.

Other experts said manned flights to Mars should be attempted because the effort will boost the economy, hasten new technologies, help determine whether life exists beyond Earth, lift the human spirit, and encourage political unity to help solve problems and prevent war on Earth.

"It is precisely because it is in contrast to the inevitable poverty, war and difficulty of ordinary life that leading societies do such adventuresome and historic endeavors," said Caltech professor Bruce Murray, former director of Jet Propulsion Laboratory.

A rocket blasted off from Cape Canaveral, Fla., yesterday with Mars Observer, NASA's first spacecraft in 17 years.

Liftoff was delayed 38 minutes so work could be completed at the pad and the area evacuated. Workers fell behind because of a power problem.

Minutes after being hoisted into low Earth orbit by the Titan rocket, Mars Observer was propelled toward its destination by a Transfer Orbit Stage making its flight debut. An anxious hour passed, however, before NASA learned the upper stage had fired and the spacecraft was on its way to Mars.

For an undetermined reason, data confirming ignition was not sent and NASA had to rely on the

Mars Observer transmitter to learn that all was well.

The spacecraft, which should reach Mars in 11 months, is designed to map the planet and record weather conditions from orbit. It also will search for signs that life may have existed on Mars.

In addition, it will scout for possible landing sites for robots and humans.

The \$980 million mission is expected to last more than three years.

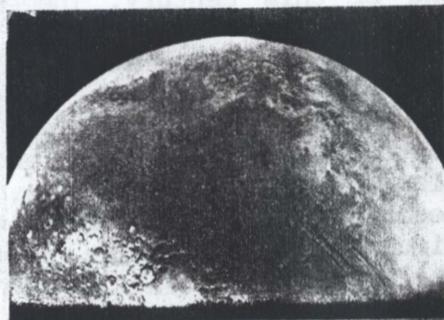
In 1989, on the 20th anniversary of the first moon landing by Apollo astronauts, U.S. President George Bush set a national goal of establishing a manned base on the moon and sending astronauts to Mars, probably within a few decades.

Most estimates show it will cost hundreds of billions of dollars to put people on Mars, said Bevan French, Mars Observer's chief scientist at NASA headquarters in Washington. Spread over 20 or 25 years, that's a small

fraction of the federal budget.

"It's really seed money for the future health and growth of the economy," French said. "We're not spending this money on Mars. We're spending it on Earth. It goes into things like jobs, new technology development . . . Roughly every dollar spent on Apollo generated another \$7 in economic benefits."

"We need to solve our social ills here on the planet. They certainly have the highest priority," said Wes Huntress, NASA's director of solar system exploration.



## Mars is where the action's going to be next century, noted science writer says

By Rosemary Laurent  
REUTERS NEWS AGENCY

MINEHEAD, England — Humanity could be growing fruit and vegetables on Mars in the next century, says science fact and fiction writer Arthur C. Clarke.

"I think Mars is where the action is going to be," Clarke said during a Space Age Festival organized at his home town, a seaside resort in southwest England, to mark his 75th birthday.

"I hope we will return to the moon early next century and establish a permanent base there. But Mars is a much more benign place, which can be made more like Earth."

The visionary scientist, who among other things was the first to describe the geostationary orbit used by communications satellites, has lived in Sri Lanka for 36 years.

He has written more than 600 books, stories and articles. His works include *Childhood's End*, *Rendezvous with Rama* and *2001: A Space Odyssey*, which became an Oscar-winning film in 1968.

Clarke said he is working on a book entitled *Snows of Olympus*, in which he describes gardening on Mars.

"With the engineering we have today, there would be no problem living on the moon or Mars," he said.

"But the question is, do we want to export ourselves, and our pollution

and ways of life, or do we want to leave these astronomical wildernesses as they are now? There are arguments on both sides."

He said that after Mars, he expected the moons of Jupiter to be the next focus of space exploration. "But that may be another half-century away."

Clarke's greatest surprise? "I never dreamed when I started writing about space that it would happen in my lifetime."



ARTHUR C. CLARKE: "No problem living on the moon or Mars," he says.

THE TORONTO STAR Sunday, August 9, 1992

cosmology news' contribution  
TOWARDS A MARS LANDING -2000

IN THE SPRING OF 1989, THIS MAGAZINE BOLDLY WENT WHERE NO SMALL PRESS MAGAZINE HAD BEEN BEFORE, WE BROUGHT OUT A SOUVENIR ISSUE-NO:37 ON THE PROBABILITY OF A MANNED MARS LANDING IN THE YEAR 2002.

IT WAS TO CELEBRATE THE FACT THAT IN 1966 AND UNDER THE NAME OF ANOTHER MAGAZINE OF MINE: "INTERPLANETARY NEWS" WE LAUNCHED A SOUVENIR ISSUE THEN OF THE PROBABLE LANDING OF A MAN ON THE MOON BY THE YEAR 1970. AS WE ALL NOW KNOW, THAT LANDING TOOK PLACE IN JULY 1969. NOW IT IS HAPPENING ALL OVER AGAIN, WITH THE LAUNCHING OF THE MARS PROBE, AND THIS ISSUE AND ISSUE 37 OF CN WILL BECOME SOUVENIR COPIES. I WOULD LIKE TO THANK GENE DUPLANTIER OF CANADA FOR KEEPING ME CONTINUOUSLY UPDATED WITH MARS DATA. The cover of issue 37 was suggested by colleague David Prockter. It was based on Interplanetary News design in 1968.

In 1987, CN(k) said:

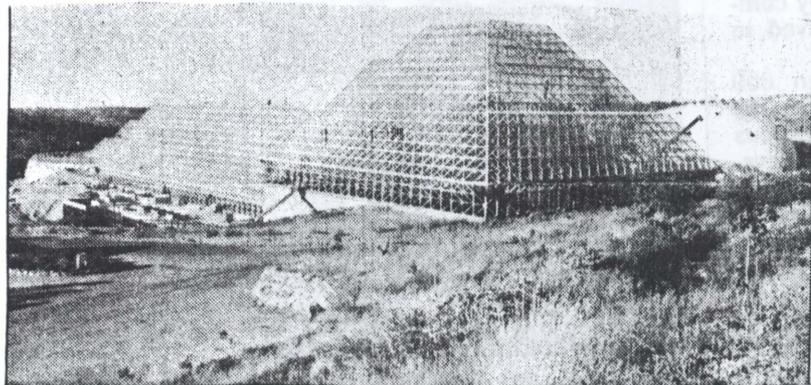
" It is not going to be an easy task to put a man on the planet Mars before the end of this century. Indeed it is going to take a lot of preparation in advance to do so."

In this issue we showed various Mars surface vehicles in design. One was dubbed the Mars Ball, which had inflatable air bags to roll over rocks etc. But the most important item of all, was to find out if man could take along a piece of the Earth, plant it on Mars, and live inside it for one or two years on Mars. One plan was to use parts of the landing craft itself, under the surface. Therefore began the most amazing private experiment on Earth. Scientists created an Earth simulated biosphere. On the edge of the Arizona desert, they built Biosphere 1, which I believe was a small version of Biosphere 2. This enclosed massive construction of engineering consisted of everything scientists thought would sustain life in an Earth environment...air, water, fish, and a varied amount of Earth life such as humming birds, bees, and a host of other things to recycle human waste back into re-use. Also living creatures to help sustain a mini-Earth environment etc.

To see if it would sustain life, and find out what COULD go wrong, which was the purpose of the experiment, 8 scientists locked themselves away in the Biosphere in 1989, and they were to be cut off from the outside world for two years. All the oxygen that they breathe would then come from the plants etc. Biosphere one was a test module, while the real one was being built, to find out what sort of vegetation would have to be used, to provide the perfect exchange of carbon dioxide and oxygen for survival. It was well worth the effort, for now in 1993, things have not been as perfect as when the experiment first began, and if these experiments are NOT tried out in advance and with Mars being 300,000,000 miles from Earth any chance of rescue would be hardly likely for a LONG time.

So what HAS gone wrong. The following newspaper clips, from the TORONTO STAR & TORONTO SUN of Canada gives us the whole story: (Also from the DENVER POST 1.5.92)

## Biosphere oxygen decreases



The New York Times

**NEW CONCERN:** Oxygen levels in Biosphere 2 have decreased, raising concern about the health of inhabitants. Leaders may pump oxygen into the glass-enclosed environment to improve conditions.

### Scientists baffled by change in air

By William J. Broad  
The New York Times

Oxygen levels within the miniature world of Biosphere 2 in Arizona have dropped more than 28 percent since four men and four women were sealed inside the ecological experiment in September 1991, and no one knows why.

Project leaders, expecting the decline to continue, have made arrangements to pump tons of pure oxygen into the 3.15 acres of glass domes if the eight inhabitants of

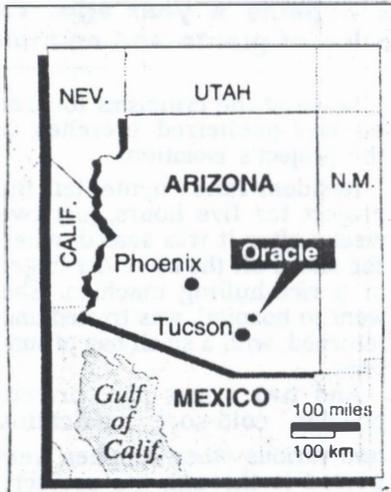
DENVER POST

the \$150 million experiment begin to languish.

The mystery has attracted increasing scientific interest, and one theory is that the oxygen is being removed by a reaction in the soil.

The oxygen content of the Biosphere's air is now equal to that found at an altitude of about 12,000 feet. By volume, the amount of oxygen has dropped to about 15 percent from the 21 percent at sea level.

In an interview, Bill Dempster, director of systems engineering at the project, said emergency action would probably come in six months or so if the oxygen thinned to 13.6 percent — equal to 15,000 feet, near the maximum altitude humans live comfortably in the Andes and Himalayas.



AP/Martha P. Hernandez

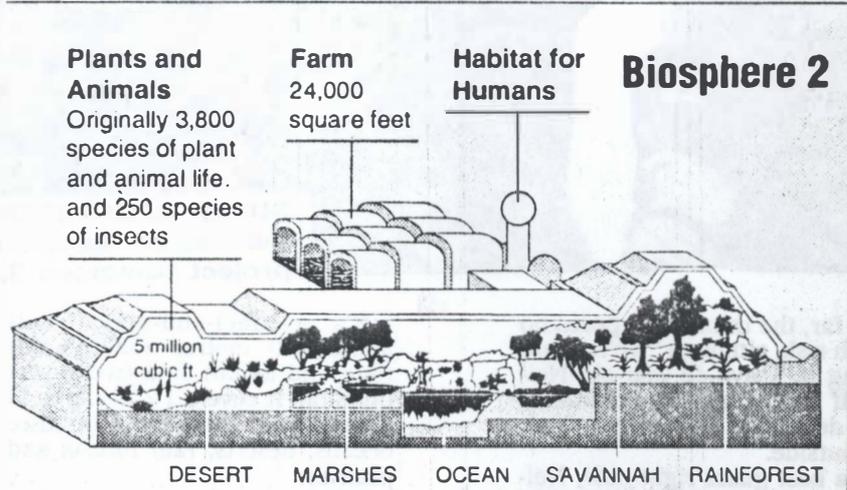
Source: Space Biospheres Ventures, Oracle, Arizona

"We're monitoring the Biospherians very closely," Dempster said. "This whole thing came as a surprise, but it's the kind of mystery Biosphere 2 was meant to investigate."

"It's very unlikely that we'd come out," Dr. Roy Walford, a 68-year-old physician who is the oldest of the eight Biospherians, said from within the domes in a telephone interview last week. "We'd bring in oxygen."

Already, he said, "we're showing some symptoms of oxygen lack; mild headache, sleeping problems at night, fatigue."

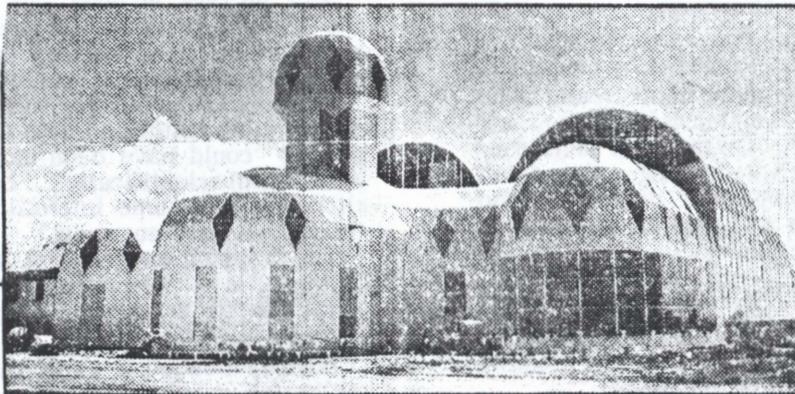
The private project in the foothills north of Tucson began with much fanfare, described as a utopian planet-in-a-bottle where everything would be recycled for two years. But extreme secrecy, charges of fakery and a string of disclosures about less-than-pristine methods led to a credibility crisis.



# Meanwhile,

Saturday, September 26, 1992

# back in Biosphere 2



*'We've lost a couple of headline species but it's clear most of (them) are surviving'*

By Michael Smith  
TORONTO STAR

The air is getting thin inside Biosphere 2.

After a year of more-or-less perfect isolation from the rest of the world, the inhabitants of the artificial eco system in the Arizona desert have a few ups and downs to look back on — and one notable puzzle.

Where is the oxygen going?

Since Biosphere 2 was sealed — a year ago today — the oxygen inside has dropped dramatically: The eight residents are now breathing air as thin as you'd find on top of an 11,000-foot mountain.

In fact, that's the way Biosphere resident Mark Nelson puts it in a telephone interview: "We've been on a very leisurely mountain climb."



**SUPER ECOSYSTEM:** Biosphere 2 residents head into the sealed steel and glass capsule a year ago. The project contained 3,800 species of plants and animals.

So far, the thinner air poses no health risk, although "we're monitoring it," says 45-year-old Nelson. If it gets too thin, organizers may decide to add oxygen from the outside.

The best guess right now, Nelson says, is that the soil inside Biosphere 2 is absorbing the oxygen.

Otherwise, at the halfway point of their two-year mission under glass, the "biospherians" are happy and healthy — and "in great spirits" although they, like the air, are thinner.

All eight have lost weight — mainly because of their high-nutrition, low-calorie diet, but also because cloudy weather over Arizona meant poor crops this winter.

Nelson, for instance, has lost 25 pounds and is down to the 122 he weighed as an undergraduate.

And some of the 3,800 species of plants and animals in the Biosphere have died out, as predicted, because there wasn't enough diversity and flexibility to maintain them.

The bees are gone and so are the hummingbirds, as well as some less familiar animals and plants.

"We've lost a couple of headline species," Nelson admits. "We don't have an exact count but it's clear that most of our species are surviving."

Their project is starting to get some respect from the scientific community.

Biosphere 2 is a private, for-profit venture of Texas billionaire Ed Bass. It's intended to chart the way to building self-sustaining sealed colonies for long space voyages or colonies on inhospitable planets.

It's a steel-and-glass shell about 300 metres (327 yards) long and as tall as a five-storey building. It covers 1.2 hectares (3 acres) and contains miniature oceans, deserts, rain forests and prairies.

The building was intended to be self-sufficient with respect to food, water and air, although power was supplied from the outside.

Although the idea was ge-whiz, the execution was sloppy.

Biosphere 2 started off in a blaze of bad publicity. It was criticized for bad science, for errors in judgment, for poor planning and for just plain tacky promotion.

"For some reason... there was a kind of journalistic hatchet job," says Harold Morowitz, a biophysicist at Virginia's George Mason University.

On the minus side, he says, the project was started by people out of science's mainstream, who were "amateurish" in their approach. "On the other hand, they had private funding — they didn't use taxpayers' dollars — and there's a chance for some useful measurements."

That position is echoed by ecologist Larry Slobodkian, of the State University of New York at Stony Brook, who was initially scornful of the project.

"My current feeling is that they're in a kind of engineering, entrepreneurial mode, not a scientific mode, but I think they're learning," Slobodkian says.

But "they're still there, they're still going and they are actively looking for scientific collaboration," he says. "My general sense is considerably more favorable."

Some of the criticisms focused on well-publicized breaches of the project's isolation.

Resident Jane Poynter left the project for five hours, just two weeks after it was sealed, when she sliced off the tip of her finger in a rice-hulling machine. She went to hospital, was treated and returned, with a small bag of supplies.

And two weeks ago, protein powder, cold-sore medication and various other supplies were passed in through the project's airlock.

But Biosphere spokesperson Chis Helms says the incidents don't destroy the value of the experiment. For one thing, all the exchanges have taken place through the airlock, so no outside air has been allowed in.

And, he says, at least part of the experiment is to see what planners forgot — so they can include it next time.

Ecologist Tom Lovejoy of the Smithsonian Institution says the project "could have been more meaningful scientifically... but there are still some interesting things that have come out."

The dropping oxygen level, for instance, is a "surprise — and surprises are bound to be the most interesting stuff."

Lovejoy headed a panel that suggested ways the project's organizers could improve their scientific credibility — including appointing a director of basic science, setting up a well-crafted science plan, pursuing scientific publication, taking steps to ensure accuracy and establishing a staff of scientists.

The panel also said Biosphere 2 had put commercial concerns — such as technology development

and tourism — and public education ahead of science.

Even so, Lovejoy says "it's not as though you can't learn something from it."

Studying a "large closed ecosystem allows you to ask questions we haven't been able to ask before," Morowitz says, questions such as:

□ How much light do you need to support life?

□ How quickly does the ecosystem produce carbon dioxide?

Nelson says he's excited about the improved scientific atmosphere: "Really good science can and is beginning to come from Biosphere," he says. "We made mistakes, but that's all part of the curve."

Meanwhile, the crew is looking forward to today's celebration, at least partly because they've been on such a strict diet.

Because of that, says Nelson, "we make a big deal out of birthdays and celebrations — pigging out with cheesecake ... becomes very important."

On today's menu? A tempting banana and sweet-potato cake.

✱ A scientific expedition deep into the Canadian Rockies will return to civilization with a live BIG-FOOT. But the beast will escape while on exhibit in New York City and will be shot to death when it tries to jump a turnstile in the subway.

The Toronto Sun, Thursday August 20, 1992

### Emus run amok

SYDNEY, Australia (AP) — Thousands of hungry emus are damaging crops and venturing onto roadways as they flee a drought in the outback.

Flocks of up to 300 of the huge flightless birds are migrating south from dry areas in the states of New South Wales and Queensland. Fences rarely stop emus, which can stand 5 feet tall.

# Far-out planets no longer a far-fetched idea

By John Noble Wilford

The New York Times

The Hubble Space Telescope has photographed broad discs of gas and dust grains surrounding 15 newly formed stars. Astronomers say this is the strongest evidence yet that planets could exist beyond the solar system and may be a common occurrence.

Examining the pictures, astronomers said yesterday, was like looking back and seeing how the solar system probably appeared soon after the sun was formed 4.5 billion years ago.

Even more important, scientists said that Hubble's images seemed to confirm widely held theories about the formation of planetary systems. They provided direct evidence that dust surrounding a newborn star has too much spin to be drawn into the collapsing star.

Instead the material spreads out into a flattened disc and in some cases the grains presumably aggregate into planets.

## FAR OUT



Associated Press / NASA

### Wave at top signals future star.

The Hubble Space Telescope photographs discs of gas and dust around 15 new stars, strongest evidence yet that planets could exist beyond the solar system.

The discovery, announced by the National Aeronautics and Space Administration, was made by Dr. C. Robert O'Dell, an astronomer at Rice University in Houston, while studying the orbiting telescope's photography of the Orion Nebula, a turbulent region that is 1,500 light-years away. In cosmic dimensions that is virtually next door.

Discs of dusty material, probably the size of sand grains, were identified around at least 15 of these nascent stars, each less than 1 million years old. The telescope was unable to detect any clumping of material suggesting the beginnings of planet formation.

Each protoplanetary disc appears to be thick and somewhat more extensive than the current size of the solar system. O'Dell said each disc contained enough material to account for a planetary system similar to the one around the sun.

From an early census of this stellar maternity ward, about 40 percent of the infant stars have these discs. Since Orion Nebula is thought to be a typical region of star formation, the phenomenon of protoplanetary discs must be fairly common, said Dr. Stephen Strom, of the University of Massachusetts at Amherst.

## CLOSE CALL

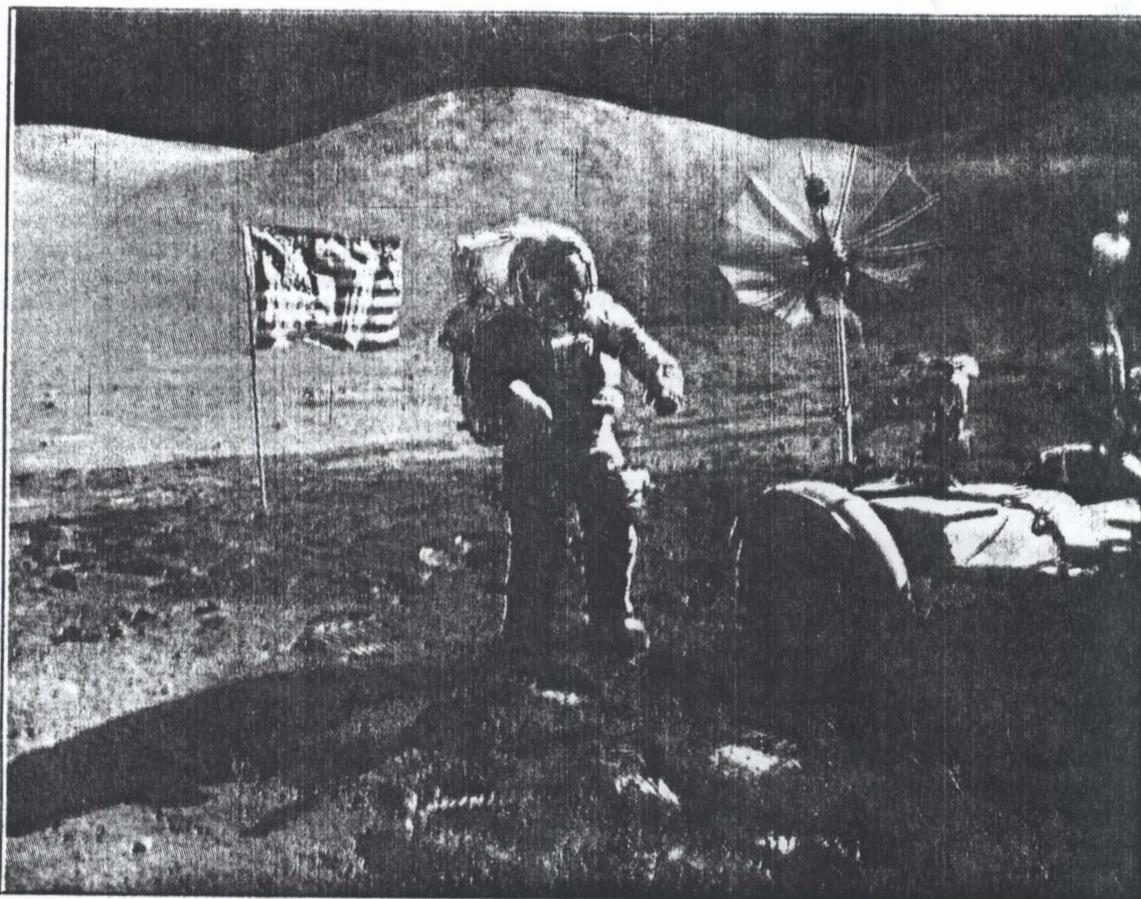
### Asteroid whizzes by Earth

Look out, Earth! Toutatis is coming! Whoops! There it went. Whew! A 1-to-2-mile-wide asteroid was to have whizzed past the Earth around 10 p.m. Monday, missing the planet by just 2.2 million miles, a hair-thin margin of safety in celestial terms. "It would be catastrophic if it hit the Earth," said Don Yeomans, a Jet Propulsion Laboratory research astronomer. "It would throw up enough material to shut down the sunlight and the plants would have died." Yeomans said Toutatis is on an orbit that carries it across Earth's orbit every four years, passing the planet at varying distances.

ROCKY MOUNTAIN NEWS DEC. 3, 1992

# Moon seems farther now

## Mission to moon a distant memory



Associated Press

**DECEMBER 1972:** Apollo 17 astronauts Eugene Cernan, shown, and Harrison Schmitt, who made this photograph, were the last men to walk on the moon.

By Marcia Dunn

AP Aerospace Writer

CAPE CANAVERAL, Fla. — Twenty years later, the words still chill Harrison "Jack" Schmitt, one of the last two men on the moon.

"This may be the last time in this century that men will walk on the moon," President Nixon declared after Schmitt and Eugene Cernan rocketed off the lunar surface on Dec. 14, 1972.

Schmitt has never forgiven Nixon for that remark and says he never will.

"Whether that turned out to be true or not, it was an inappropriate statement for the president of the United States to make," he said.

What's worse, it's proving to be true.

Twenty years after Apollo 17, the last of six manned lunar landings, NASA's plan to send astronauts back to the moon and on to Mars is up in the air. There is no funding for the Space Exploration Initiative this fiscal year and, as Cernan sees it, no vision, no challenge, no derring-do.

"We're talking about a generation ago having gone a quarter-million miles into space . . . and yet today we don't have the capability to go more than 300 or 400 miles from the surface of this Earth," said Cernan, who commanded Apollo 17.

Cernan, Schmitt and Ronald Evans left Earth

on a mighty Saturn 5 rocket on Dec. 7, 1972. Four days later, as Evans orbited the moon in the command ship America, Cernan became the 11th man to walk on the moon. Schmitt was No. 12.

The last footsteps on the moon were Cernan's.

"We leave as we came and, God willing, we shall return with peace and hope for all mankind," Cernan said before following Schmitt into the lunar module for the third and final time.

The mission, and arguably NASA's grandest

era, ended Dec. 19, 1972, when the Apollo 17 spacecraft splashed down in the Pacific Ocean.

"We used to say Apollo 17 was not the end but

rather the beginning," Cernan recalled. "The problem is, neither Jack Schmitt nor I nor Ron Evans ever dreamed that the beginning would be a generation in coming, and maybe it isn't here yet."

Cernan wonders what people will say 100 or 200 years from now "when they look back at the order and sequence we did things in."

"We went to the moon and somehow forgot to keep going," he says.

There's been Skylab and Apollo-Soyuz and the shuttle. Around the turn of the century there probably will be the orbiting space station Freedom. But that's as far as American space travel goes.

Although President Bush in 1989 proposed colonizing the moon early in the next century and later sending astronauts to Mars, little progress has been made due to lack of funding.

### Funding refused

Congress refused to fund the Space Exploration Initiative, or SEI, in the budget year that began Oct. 1.

Michael Griffin, NASA's associate administrator for exploration, had planned to use most of the requested \$32 million to start building the first in a series of robotic lunar probes, precursors to human settlement. He had been aiming for a spring 1995 launch.

"We'll be at least a year later on that and that assumes we get funding" for the next fiscal year, Griffin said. "We're not going to be going to the moon or Mars or indeed anywhere unless there is some added money for NASA. Those things don't come free."

NASA's budget this fiscal year is \$14.3 billion, slightly less than last year's.

It's not just the federal deficit that is hurting SEI, Griffin said. It's the way money for space is appropriated by Congress, and politics, too — Democratic members of Congress were reluctant to support the Bush administration's exploration plans, he said.

Space policy analyst John Pike of the Federation of American Scientists blames the withering moon and Mars support on Bush and Vice President Dan Quayle, head of the National Space Council. He said neither Bush nor Quayle ever asked the two fundamental questions: "Why are we doing it and how are we going to pay for it?"

Bush had set a goal of having astronauts on Mars by the year 2019, the 50th anniversary of Apollo 11, the first manned lunar landing.

### How rather than why

"My disappointment with the SEI program is that the work they

have been doing has primarily focused on how you're going to do it rather than why you're going to do it," Pike said.

Jay Greene, flight dynamics officer for Apollo 17, targets the year 2005 for the next human moon mission, at least in theory.

"Once we get the dollars, five to seven years and we're there," Greene said.

Despite what could have been, the 20th anniversary of the end of Apollo should be a time for celebration, not sorrow, Greene said.

"It's something we did that was really wonderful. It's not sad," Greene said. "I guess what's sad is the fact that there's nothing like Apollo in the future to look forward to. That's sad."

### Is NATO ready for an alien attack?

Despite military cutbacks, Defence Minister Marcel Masse says Canada remains committed to NATO. NATO was established to protect western Europe from a Soviet invasion.

Who is the NATO to which we remain committed supposed to defend western Europe against now — Martians?

MARK MARSHALL  
Toronto

Rocky Mountain Times - 1-5-93 (JPN/1/1993)

## Overhaul space program, panel urges

NASA, other agencies haven't streamlined for post-Cold War era

Reuter

WASHINGTON — The U.S. space program, beset by an organization that is out of step with the post-Cold War world, needs a major overhaul to bring it up to speed and within budget, a White House panel reported Monday.

"The U.S. government's organization of space activities is not appropriate for the post-Cold War era," Vice President Dan Quayle's Space Policy Advisory Board said in a report.

While space exploration and

space business are still important to U.S. interests, the report said the space bureaucracy must be simplified and centralized, and more technology must be shared between government and industry.

The report, released by Quayle's office less than three weeks before he leaves the White House, also targets U.S. space launch capabilities as inefficient and unsafe.

"Current launch capabilities cost too much, lack responsiveness and flexibility and are not sufficiently safe or reliable. A coherent national effort to improve launch capabilities is desperately needed," the report said.

Aside from the launch pad, the

report said widespread duplication of effort and overlapping programs of the National Aeronautics and Space Administration, the Defense Department and the Department of Energy are cutting into the space program's overall effectiveness.

Since the 1986 Challenger disaster, in which seven astronauts were killed, the U.S. space program has faced daunting setbacks, most notably the flawed main mirror in the \$3 billion Hubble Space Telescope and delays and rising costs for the \$40 billion Space Station Freedom.

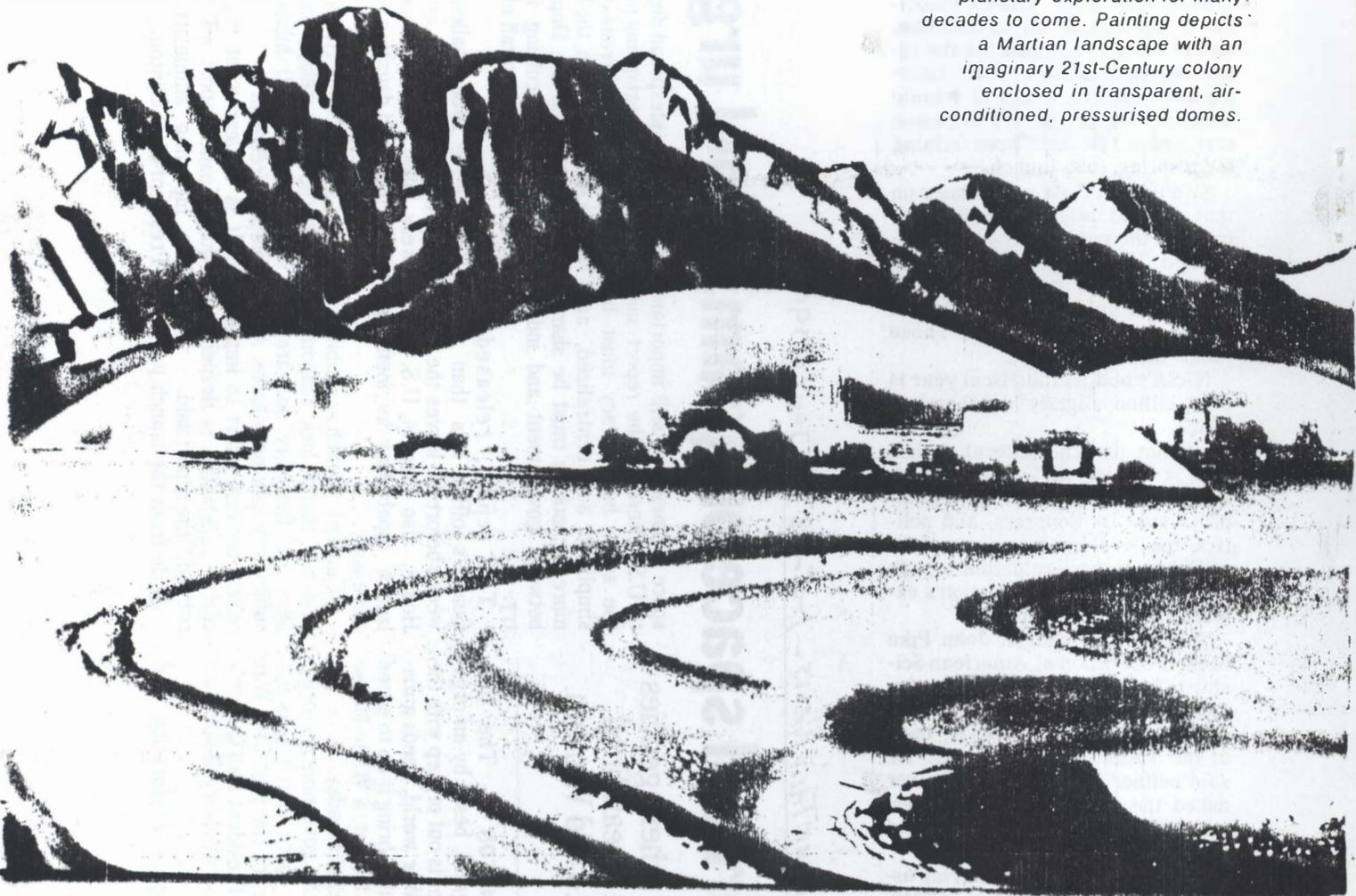
It is unclear what impact the Quayle panel report will have on the incoming administration of President-elect Clinton.

# Keeping an eye on Mars

MAN IS ONCE AGAIN HEADING TOWARDS THE PLANET MARS IN AN ATTEMPT PERHAPS ONE DAY TO COLONISE IT FOR HIMSELF. THIS ISSUE TAKES A LOOK AT WHAT IS BEING DONE, AND THE PROBLEMS WHICH SURROUND THE PROJECT. Keeping an eye on Mars we will all have to do towards the year 2002 or beyond.

(SEE INSIDE FOR DETAILS)

*Beyond the moon the planet Mars is the most important objective of planetary exploration for many decades to come. Painting depicts a Martian landscape with an imaginary 21st-Century colony enclosed in transparent, air-conditioned, pressurised domes.*



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