

Earth calling Mars, come in Mars

W1.6
Mars
‘THE BEAGLE has landed’ (to paraphrase a famous call sign made from the moon’s surface some 34 years ago) — or has it? This was the question that made it a tense Christmas for planetary scientists as they waited with bated breath for that first metallic hello from Beagle 2, the European Space Agency’s Mars probe. The doughty little spacecraft was supposed to phone home after successfully bouncing on to the Red Planet’s surface last Thursday and its silence had a foreboding ring to it. For Mars has a reputation of being the graveyard of exploratory spacecraft.

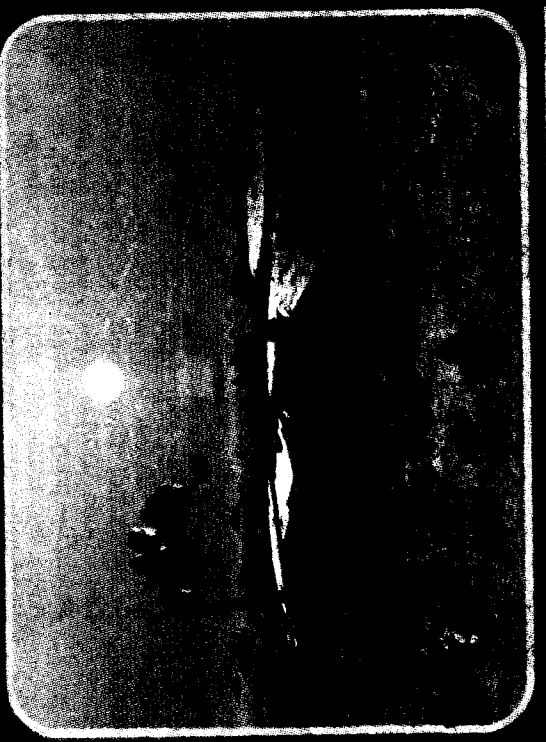
Since 1960, of the 32 probes launched from Earth towards that planet, only nine could actually complete their mission. The others were outright failures, thanks to reasons ranging from the unexpected — as when a Martian storm destroyed NASA’s Polar Lander during touchdown in 1999 — to the bizarre, when careless mission controllers mixed up metric and imperial data and smashed the Mars Climate Or-

biters against the planet’s atmosphere. In fact, Japan’s Nozomi became the latest casualty when a solar flare damaged its electronics earlier this month and had to be abandoned. So it’s good to see space agencies persistently using bold science again in the form of Beagle 2 (and Spirit and Opportunity — NASA’s robotic geologists due for a Martian rendezvous in the New Year) to get to know the Red Planet better.

Both Mars and the Earth were very much alike billions of years ago: a lot of water, warm oceans, rain and similar atmospheric systems. It’s a big puzzle that despite all this, life started on one planet and the other became dry and cold. Or is it possible that Mars also engendered life — even in the form of microbes — and that it has not been made extinct? In the near future, only space probes like Beagle 2 will be able to provide a definitive, or at least plausible, answer as they overcome the odds to explore this intriguing planet.

NO FIRST CONTACT

FATE OF BEAGLE 2 UNKNOWN, BUT HOPE STILL HIGH



Beagle 2 lands Mars Express on 19 December hoping to land on Mars on Christmas Day. (Centre) A simulated image of how the three airbags would separate to release Beagle 2. (Right) A simulation of Beagle 2 at work. — AFP

DAFINGSTADT, Dec. 25. — Europe's quest to seek signs of life on Mars hit a stumbling block today after a miniaturised scientific lab failed to call Earth after its scheduled landing on the Red Planet. Scientists insisted, though, it was still entirely possible that the tiny lander, Beagle 2, had survived and robed the bigger part of the 260-million-euro

(\$325 million) mission was on track. "I'm afraid it's a bit disappointing but it's not the end of the world," Beagle 2's chief scientist Mr Colin Pillinger said in London. Just earlier, Beagle's mothership, Mars Express, had been steered into orbit at the end of a 400-million-km odyssey lasting more than six months. It

was the first time European Space Agency had sent a solo mission to another planet. Mars Express and Beagle 2 are Europe's champions in a friendly and undeclared joust with the USA to confirm whether water exists on the planet touted by futurists as a potential home for humans. Beagle 2 was to have landed near the Martian

equator at 02.54 GMT at a flat basin called Isidis Planitia and dispatch a radio callsign home, relayed by the US orbiter Mars Odyssey. But at 0630 GMT, the ether was agonisingly empty. There were three more chances for getting a signal: late Thursday, and early and late Friday, said Mr Pillinger. — AFP
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OPENING ACCESS TO SCIENCE ^d

Since the first scientific journal appeared in French in 1665, the publication of scientific journals has become an industry in its own right. Scientists scramble not just to be the first to publish a discovery, but also to have their work carried by a journal where it will receive the widest attention. It is estimated that more than a million scientific papers are published annually by over 20,000 journals. Annual subscriptions for some of these can go up to \$20,000. When the first issue of *PLoS Biology*, an online open access monthly journal published by the Public Library of Science, became available last month, the interest and the resultant rush to the website was so great that the server crashed. Open access journals make their content freely available over the Internet. *PLoS Biology* is not the first open access journal; the Directory of Open Access Journals lists over 550. London-based BioMed Central (BMC) was launched four years ago and now has some 150 journals covering a wide range of fields in biology and medicine. But with high-profile backers like Harold Varmus, Nobel Laureate and former director of the National Institutes of Health in the United States, *PLoS Biology* is making a serious bid to become one of those elite journals that have the pick of the best scientific papers.

Open access publishing has been gathering momentum in recent years. Dr. Varmus and like-minded scientists point out that much scientific research, especially basic research, is government funded. So the public ends up paying twice, first for the research and then for getting access to the results of the research. The costs of subscribing to several scientific journals are daunting enough for institutions in Western countries, not to mention those in India and other developing countries. One of India's leading scientific institutions estimates that it currently spends Rs. 5 crores a

year on journal subscriptions. Moreover, conventional journal publication is seen as benefiting publishers rather than the scientists or science. Journals do not pay scientists either for their papers or for reviewing the work of other researchers to judge whether it is suitable for publication (the all important 'peer review'). Scientists would like as many people as possible to read their work, a goal that is not served by high subscription fees and online access charges. But for open access publishing to thrive, the public-spirited ventures must succeed economically. Rather than demand access fees, *PLoS Biology* and the BMC journals collect fees from scientists whose papers they publish, the former requiring \$1,500 per paper and the latter \$500. These fees can be waived if the scientist cannot afford to pay (as is the case in developing countries). Many well-known journal publishers have cast doubts on whether these charges are adequate. They claim that publishing online reduces production costs only by about 20 per cent; there are considerable administrative and staffing costs, including handling the whole peer-review process. *PLoS* and BMC say the fees they collect are sufficient to meet their costs.

Open access publishing depends crucially on widespread backing from scientists around the globe, including India. A good journal can be rejecting up to 90 per cent of the manuscripts it receives. So if open access journals are to maintain their quality and make ends meet by charging for accepted papers, scientists must opt to publish their best work there. In addition, even when papers are published in conventional journals, the pre-print (and sometimes the post-print) versions can often be placed in open electronic archives to ensure free access. Physicists have been doing this for years and scientists from other disciplines, especially biology and medicine, need to follow suit.

Blow to US cloning ban

✓ Science & Tech 2/3 8/11
United Nations, Nov. 7 (Reuters): A UN tradition of seeking broad international consensus in the drafting of treaties has set back a Bush administration campaign for a global ban on medical research on stem cells.

Washington, with backing from the US anti-abortion movement, tried to push a resolution through a UN committee yesterday for the drafting of a treaty that would ban both the cloning

of human beings and so-called "therapeutic" cloning, in which human cells are cloned for medical research.

Cloning research relies on embryo cells, or stem cells, because they can grow into all cells and tissues in the body.

While there is virtually universal support at the UN for a treaty banning human cloning, the international community is deeply divided over therapeutic cloning.

Scientists see it as a promising avenue in the battle against disease while anti-abortion activists and many Catholics see it as the taking of human lives.

Nigerian envoy Felix Awambor said his country hoped for a ban on stem cell studies for fear African women were "most likely to be at risk as easy targets to source the billions of embryos required for scientific experimentation on this issue."

Giant shock wave forces power plants to cut generation

Sun sends a hot-air headache

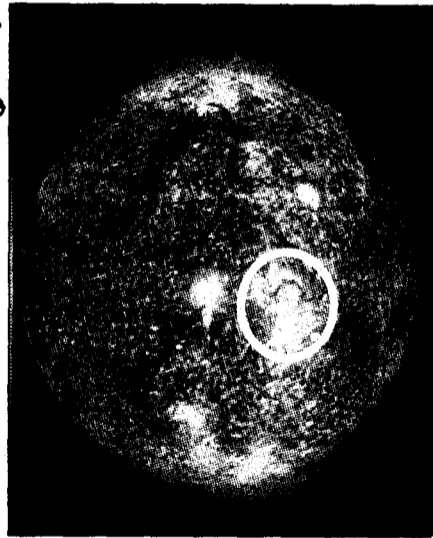
Science & Tech

30/10 (T-1)

London, Oct. 29 (Reuters): A shock wave from the Sun hit the Earth today, the final burst from a solar hurricane that has hampered some space satellite transmissions and led electric grid operators to curb power transmissions as a precaution.

Scientists said the cloud of charged particles unleashed at high speeds by a hyperactive Sun and known as a coronal mass ejection (CME) was travelling at more than 8 million kmph, taking just 19 hours from the Sun.

Power plants from Sweden to New Jersey cut production to limit flow of electricity over transmission grids, preparing to absorb any sudden surge in energy that might result from lingering effects of the storm. The massive bubble of gas is likely to have the biggest impact in Alaska and the Far East.



The image shows several giant sunspots crossing the face of the Sun. The most powerful solar flare in 14 years erupted from sunspot 4866 (in yellow circle) early Tuesday. (AFP)

CMEs come around every few years but the one that came today is one of the strongest. Described as more of a nuisance than a danger to human life, they disrupt mobile phone signals and can cause major headaches for power, satellite communications and navigational companies.

"It arrived at six this morning (11.30 IST) and was going much faster than people thought," Mike Haggood, a space expert at the Appleton Laboratory in England, told Reuters.

"The higher up you are... the bigger the effect you see," said Lucie Green, a solar physicist.

Fortunately, there are not many large power grids in the far north so energy disruptions would be minimised, scientists said.

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Hot-air headache

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S. Street

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But, out in space, it could cause interference with satellites and spacecraft.

"There were some problems starting yesterday because of the effects that precede the arrival of this shock wave from the Sun. Satellites would certainly be affected and that may persist over several days," Hapgood added.

"If you're very unlucky these things can cause power grid failures but it is very rare," Hapgood said.

The effects of a CME could last a few hours or a few days. In 1989, a CME affected power grids in Canada.

"That was the wake-up call. I think most of the power companies are aware of these problems. If they know it is coming they can take precautions," Hapgood added.

Green believes Canada could experience more problems because it is so far north and its power grids stretch east to west, which happens to be the right configuration to be affected by the particles that hit the Earth.

Today's massive CME was propelled towards the Earth by a huge solar flare that erupted yesterday. It was classified as a G-5, the strongest category, and was travelling much faster than other CMEs.

The scale of it and the fact that it was heading towards the Earth is what makes this one so special.

"There is a whole period of activity on the Sun that is driving this. It may continue for a week or two so we may get more of these events coming from the Sun," said Hapgood.

Our date with Mars

14/7 5-1
KOLKATA, July 13. — 27 August will be the Day for Mars watchers: The red planet will come closest to our home in 60,000 years on that day.

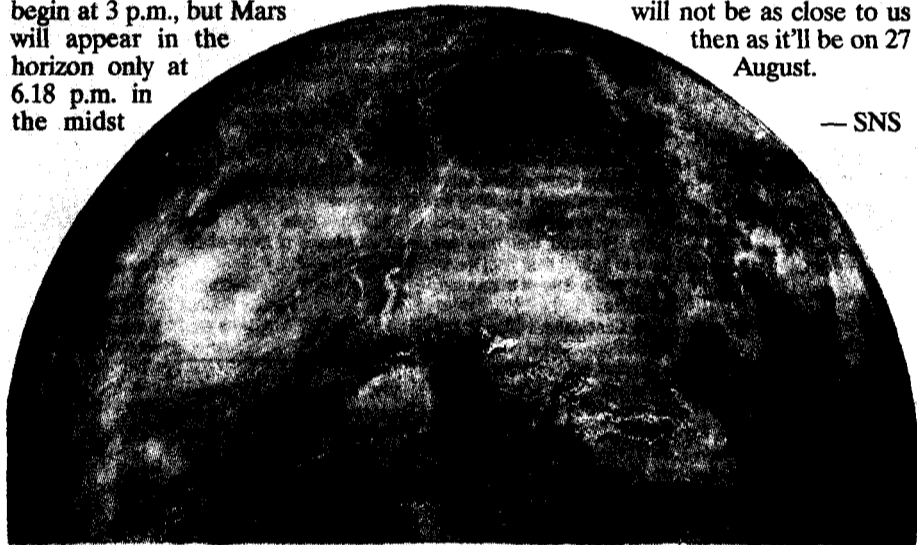
The planet, "getting bigger" since the beginning of May, will be the brightest object in the night sky of 27 August. It'll start "shrinking" again in September, said Dr Debi Prasad Duari, head of BM Birla Planetarium's research and academic wing.

The celestial phenomenon will begin at 3 p.m., but Mars will appear in the horizon only at 6.18 p.m. in the midst

since 5 pm.
of residual sunshine. Kolkatans will have their time after 7.30 p.m. "A simple telescope will be enough to see Mars after 7.30 p.m.," said Dr Duari. The planet will rise high in the horizon around midnight before setting at 5 a.m. the next morning. Though monsoon clouds could mar visibility, "one can certainly catch a few glimpses of the planet," he said.

And those who fail to see the planet this time will get two more chances, in 2005 and 2007. But our neighbour will not be as close to us then as it'll be on 27 August.

— SNS



14 JUL 2003

THE STATESMAN

Conjoined twins die during rare surgery

Singapore: The historic attempt to separate the two adult Iranian twin sisters, who were joined at the head, ended tragically here on Tuesday when Ladan and Laleh Bijani died within 90 minutes of each other during the marathon operation.

Neurosurgeons separated the brains of the 29-year-old twins after two days of delicate surgery, but the sisters died due to massive blood loss.

"Raffles Hospital regrets to announce that the Bijani twins, Ladan and Laleh, have both passed away during surgery to separate them," a hospital statement said. The twins lost a lot of blood as the neurosurgical stage of the 52-hour operation came to its end, the statement said. It was during that stage that the sisters' tightly enmeshed brains were separated.

At a news conference after the deaths, hospital chairman Dr Loo Choon Yong said when complications arose after the brains were separated, surgeons had the option of attempting to stabilise the sisters and transfer them to intensive care, or continue with the most risky part of the surgery. The team of doctors then asked what the wishes of the twins would be, and was informed the sisters wanted to be separated at all costs, Dr Loo said.

Doctors then controlled the bleeding for a while, but Ladan's blood circulation failed. Soon after, hospital spokesman Prem Kumar announced that Ladan had succumbed to massive blood loss at 2.30 p.m. (12 noon IST).

Iranian expatriates in Singapore and locals who had gathered at the hospital then pinned their



Conjoined twins Ladan (left) and Laleh Bijani leave the law faculty at Tehran University last year.

Twinned lives

Throughout history, conjoined twins have appeared in myths, have been worshipped as gods and feared as monsters. Many of them participated in shows and the circus, performing all over the world.

One of the best-known cases of conjoined twins was that of Eng and Chang Bunker, who were born in Siam (now Thailand) in 1811 — hence the phrase 'Siamese twins'. They were joined at the waist by a

tubular band of tissue about 3.25 inches long and about 1.5 inches in diameter. Most of their youth was spent working to support their mother. Their work as 'The Siamese Double Boys' helped them accumulate a small fortune. The Bunker boys married two sisters, Sallie and Adelaide Yates, and fathered 21 children between them. In 1874, Chang awoke to find Eng dead. Several hours later, Chang died.

● Distinct personalities, Page 10

Twins seek separation

Singapore, June 11 (Reuters): Twin Iranian sisters fused at the head said today they were willing to risk death for the chance to live separate lives, even against the advice of specialist doctors.

At a rare and at times emotional news conference in Singapore ahead of their scheduled surgery sometime in July, the 29-year-old sisters Ladan and Laleh Bijani — both law graduates — said physical separation — was a lifelong dream.

Sharing a cream coloured headscarf, they talked of different ambitions and desires. Ladan, the more outspoken of the two, said she wants to be a lawyer and live in her home town in Iran of Shiraz, while Laleh wants to be a journalist in Tehran.

Twins fused at the head occur only once in every two million live births, and successful separation is even rarer. Singapore doctors performed the operation in 2001 on infant

girls from Nepal, but experts say an operation on adult twins is unprecedented.

Keith Goh, a neurosurgeon at Singapore's Raffles Hospital who will lead the surgical team, said he tried to talk the twins out of the operation.

"We spent the last three months trying to dissuade them," he said. "We spelled out the downside to the surgery in very explicit terms."

German doctors had turned away the Bijanis in 1996, deeming that splitting them could prove fatal. But the sisters continued their search for surgeons willing to separate them, arriving in Singapore last November for medical and psychological tests. After seven months, doctors said the operation was possible because the women had anatomically separate brains.

"We don't have any fear of the surgery because we know that every surgery has a high risk," said Ladan.

Singapore experts in neurosurgery, plastic surgery, radiology and anaesthesia will be joined by specialists from the US, France, Japan and Switzerland for the operation, expected to begin in early July and last at least three days.

"We would like to see the face of each other without the mirror," said Laleh.

One reporter's voice wavered with emotion as she asked the two if they had any last wish.

For as long as she could remember, "when we opened our eyes to see the light, we wanted to be separated," Ladan said.

"We want to have different careers after the surgery. I want to be a lawyer and my sister wants to be a journalist like you. We have a lot of work and dreams to do after surgery," Ladan said.

They said they had endured enough sacrifices and compromises because of two very different personalities.

Human genome mapping complete: experts

By Nicholas Wade

Bethesda (Maryland): The human genome is complete and the human genome project is over, leaders of a public consortium of academic centres said on Monday.

"We have before us the instruction set that carries each of us from the one-cell egg through adulthood to the grave," Dr Robert Waterston, a leading genome sequencer, said at a news conference here at the National Institutes of Health. Their announcement marked the end of a scientific venture that began in October 1990 and was expected to take 15 years.

Monday's finishing date, two years ahead of schedule, was timed to coincide with the 50th anniversary of the discovery of the structure of DNA by Dr James D. Watson and Dr Francis Crick. Their article appeared in the April 25, 1953, issue of *Nature*.

Dr. Watson, who became the first director of the human genome project at the institute, was at a conference here on Monday to celebrate the genome's completion. He had sought that goal, he said, realising that a family member's illness would never be treatable "until we understand the human programme for health and disease."

A "working draft" of the human genome sequence was announced with much fanfare three years ago in a White House ceremony. But at that stage the human genome project had completed only 85 percent of the genome and its commercial rival, the Celera Corporation, as well as its own, had attained somewhat more. The project's draft was not a thing of beauty. It consisted of thousands of short segments of DNA, whose order and orientation in the full genome was

The genome is far more accurate. It can be used out of the box, without extra resequencing. The genes and other important elements of the genome are now almost all in their correct position

largely unknown.

Three years later, the international consortium of genome sequencing centers has now put all the fragments in order and closed most of the gaps, producing an extensive and highly accurate sequence of the 3.1 billion units of DNA of the human genome.

The data, perceived as the foundation of a new era of medicine, will be posted for free on genetic data banks.

Celera, whose data are available by subscription, never intended to carry its draft genome to completion.

The working draft of three years ago contained most human genes and was useful for researchers seeking a specific gene. But up to a year ago biologists said they often had to do considerable extra sequencing work on the DNA regions they were interested in.

The completed genome announced on Monday is far more accurate. It can be used out of the box, so to speak, without extra resequencing. The genes and other important elements of the genome are now almost all in their correct position, a vital requirement for researchers seeking to locate a gene that contributes to disease.

Scientists praised the human genome project for its further three years of hard work and for producing a resource of enormous value to

research. But several qualified their admiration by noting that even if the project is complete, the human genome is not. The parts of the genome still missing are of minor importance, but many biologists would like to see them sequenced before declaring the genome finished.

The human genome is packaged in 23 pairs of chromosomes, each a giant molecule of DNA. Though DNA's best-known role is to encode the information needed to build specific proteins, the working parts of the living cell, some of the DNA performs structural roles. This includes the DNA at the tips of each chromosome and at the centre. The tip and centre DNA consists of monotonously repeated sequences whose exact order of units is so hard to determine that the consortium's leaders said from the outset they would not try to do so. N.V.T. News Service

INSAT-3A placed in geostationary orbit

By R.K. Radhakrishnan

CHENNAI, APRIL 14. The latest Indian National Satellite launched from the French Guyanese spaceport Kourou on April 10 will reach its earmarked orbital slot by the end of the week.

In the third and final stages of orbit-raising operation conducted this morning from Master Control Facility (MCF), Hassan, INSAT-3A has been placed in its Geostationary Orbit (GSO).

The manoeuvre was completed by firing the 440 Newton Liquid Apogee Motor onboard the satellite for 3 minutes 41 seconds. The satellite has achieved an orbital period of 23 hours and 48 minutes and is continuously visible to the MCF. The Indian Space Research Organisation (ISRO) said that INSAT-3A is now moving towards its geostationary orbital slot with the planned drift rate of 2 degree a day. It is expected to reach its orbital slot of 93.5 degree east Longitude in the next five days.

MCF is satisfied with the performance of the 440 Newton Liquid Apogee Motor

(LAM), which was used to conduct INSAT-3A orbit raising manoeuvres. The performance of the motor was crucial to 'lifting' the satellite from its Geostationary Transfer Orbit (GTO) (860 km perigee and 36,000 km apogee with an orbital inclination of 2 degree with respect to the equatorial plane) to its present 36,000 km circular orbit with zero degree inclination. The LAM was fired for a total duration of 130 minutes and 23 seconds in three phases on April 11, April 12 and April 14. A total velocity of 1.411 km per second was added by LAM at the Apogee point of the orbit to take the satellite from GTO to GSO.

INSAT-3A had 1,603 kg propellant at the time of its injection into GTO by Ariane-5 launch vehicle on April 10. After orbit raising operations, it has 505 kg of propellant remaining that is sufficient to arrest the drift and park it at its orbital slot as well as maintain the satellite in its orbit and controlling its orientation during its designed life of 12 years.

The deployment of the solar array and the antenna is planned for tomorrow. All

subsystems on the satellite are working normally.

INSAT 4 series

The ISRO chairman, K. Kasturirangan, and the Arianespace CEO, Jean-Yves Le Gall, have announced the signing of launch contracts for two more payloads, the INSAT-4A and INSAT-4B. With this, in the past 22 years beginning with the launch of the APPLE experimental satellite, the European Space Consortium, Arianespace, would have launched 13 ISRO satellites.

Both INSAT 4A and 4B will weigh around 3200 kg and are dedicated telecom satellites with 12 ku band and 12 C band transponders.

The signature also signals the admission by ISRO that its Geosynchronous Satellite Launch Vehicle would not be in a position to launch the 3000 kg class satellites, despite the fact that the GSLV would have completed its developmental flights and would — by the time the 4 series is launched — be carrying commercial payloads.

1 5 APR 2003

THE HINDU

Is cyberspace a lonely place?

Shoma A Chatterji reports on the findings of a concentrated study on the social and psychological effects of Internet use at home

14 APR 2003

THE STATESMAN

TRADITIONALLY, communication is a face-to-face exercise, wherein people can "read" each other's verbal and non-verbal messages in order to get across. Telephones have limited that by taking sight out of the equation and the Internet has served to increase the "words and words only" exercise. Letters, too, are now almost obsolete and if you do not have an e-mail ID, you are written off as a social outcast.

Communication today is largely done through e-mail and "chatting" which portrays lesser interpersonal messages than before. True, we are communicating, but when one sits down to operating in front of a monitor, one isn't spending time in dynamic, interpersonal communication with other live people. People who spend too much time communicating on the net miss the other non-verbal cues of belonging to a social group involving live people.

As we grow up and raise families, the family structure from spouse to children needs the dynamic presence of physical contact in order to become completely social in other contexts. The Internet cannot replace that feeling of group interaction and depression from lack of physical communication is a result of this.

We can communicate all we want and we can do it well on a screen, but telling someone you love them over a modem will never replace telling someone you love them followed by a hug.

In the first concentrated study of the social and psychological effects of Internet use at home, researchers at Carnegie Mellon University found that people who spend even a few hours a week online experience higher levels of depression and loneliness than they would have if they used the computer network less frequently. Participants, who were lonelier and more depressed at the start of the two-year study, as determined by a standard questionnaire administered to all the subjects, were not more likely to use the Internet. Instead, Internet use itself appeared to cause a decline in psychological well-being, the researchers said.

The results of the \$1.5-million project ran completely contrary to the expectations of the social scientists who designed it and to most of the organisations that financed the study. These included technology companies like Intel Corp., Hewlett Packard, AT&T Research and Apple Computer, as well as the National Science Foundation. "We were shocked by the findings, because they are counter-intuitive to what we know about how socially the Internet is being used," said Robert Kraut, a social psychology professor at Carnegie Mellon's Human Computer Interaction Institute. "We are not talking here about the extremes. These were normal adults and their families, and on average, for those who used the Internet most, things got worse." The Internet has been praised as superior to television and other "passive" media because it allows users to choose the kind of information they want to receive, and often to respond actively to it in the form of e-mail exchanges with other users, chat rooms or electronic bulletin board postings.

Research on the effects of watching television indicates that it tends to reduce social involvement. But the new study, titled HomeNet, suggests that the interactive medium may be no more socially healthy than older mass media. It also raises troubling questions about the nature of "virtual" communication and the disembodied relationships that are often formed in the vacuum of cyberspace. Participants in the study used inherently social features like e-mail and Internet chat more than they used passive information gathering like reading or watching

videos. But they reported a decline in interaction with family members and a reduction in their circles of friends that directly corresponded to the amount of time they spent online.

The study tracked the behaviour of 169 participants in the Pittsburgh area who were selected from four schools and community groups. Half the group was measured through two years of Internet use, and the other half for one year. In the beginning and at the end of the two-year study, subjects were asked to agree or disagree with statements like "I felt everything I did was an effort" and "I enjoyed life" and "I can find companionship when I want it". They were also asked to

on a scale of 1 to 5.

By the end of the study, the researchers found that one hour a week on the Internet led, on average, to:

- an increase of .03, or 1 per cent, on the depression scale,
- a loss of 2.7 members of the subject's social circle, which averaged 66 people; and
- an increase of .02, or four-tenths of 1 per cent, on the loneliness scale.

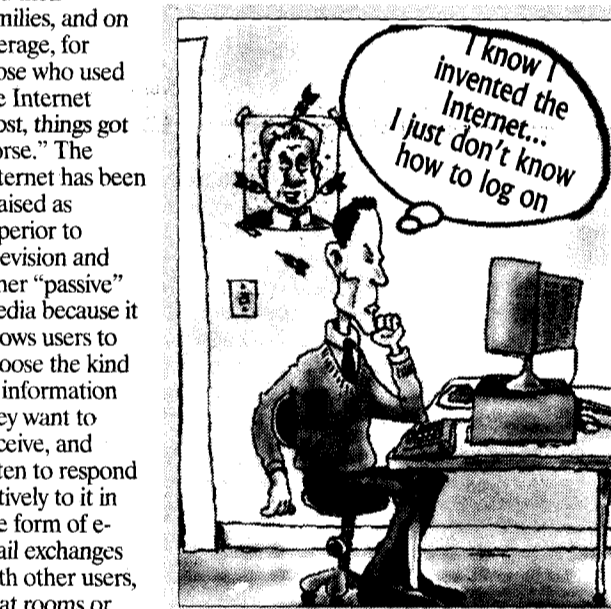
The subjects exhibited wide variations in all three measured effects, and though the net effects were not large, they were statistically significant in demonstrating deterioration of social and psychological life, Kraut said.

Based on these data, the researchers hypothesise that relationships maintained over long distances without face-to-face contact ultimately do not provide the kind of support and reciprocity that typically contribute to a sense of psychological security and happiness, like being available to baby-sit in a pinch for a friend, or to grab a cup of coffee. "Our hypothesis is there are more cases where you're building shallow relationships, leading to an overall decline in feeling of connection to other people," Kraut said.

As the participants of the study were not randomly selected, how the findings would apply to the general population is not clear. Some unmeasured factor may have caused simultaneous increases in use of the Internet and decline in normal levels of social involvement. Moreover, the effect of Internet use would vary depending on an individual's life patterns and type of use. Researchers said that people who were isolated because of their geography or work shifts might have

estimate how many minutes each day they spent with each member of their family and to quantify their social circle.

Many of these are standard questions in tests used to determine psychological health. For the duration of the study, the subjects' use of the Internet was recorded. For the purposes of the study, depression and loneliness were measured independently and each subject was rated on a subjective scale. In measuring depression, the responses were plotted on a scale of 0 to 3, with 0 being the least depressed and 3 being the most depressed. Loneliness was plotted



Letters, too, are now almost obsolete and if you do not have an e-mail ID, you are written off as a social outcast

Thank you for calling. Please leave a message. In case I forget to check my messages, please send your message as an audio file to my e-mail, then send me a fax to remind me to check my e-mail, then call back to remind me to, check my fax.



benefited socially from Internet use.

Several social scientists familiar with the study vouched for its credibility and predicted that the findings would probably touch off a national debate in the US over:

- how public policy on the Internet should evolve; and
- how the technology itself might be shaped to yield beneficial results.

"They did an extremely careful scientific study, and it's not a result that's easily ignored," said Tora Bikson, a senior scientist at Rand, the research institution. Based in part on previous studies that focused on how local communities like Santa Monica, California, used computer networks to enhance civic participation, Rand has recommended that the federal government provide e-mail access to all Americans.

The Carnegie Mellon team comprising Sara Kiesler, a social psychologist who helped pioneer the study of human interaction over computer networks, Tridas Mukophadhyay, a professor at the graduate business school who has examined computer mediated communication in the workplace, and William Scherlis, a research scientist in computer science, stressed that the negative effects of Internet use that they found were not inevitable. For example, the main focus of Internet use in schools has been gathering information and getting in touch with people from faraway places. But the research suggests that maintaining social ties with people in close physical proximity could be more psychologically healthy. *The American Psychologist*, the peer-reviewed monthly journal of the American Psychological Association, will publish the findings.

At a time when Internet use is expanding rapidly — nearly 70 million adult Americans are on line, according to Nielsen Media Research — social critics say the technology could exacerbate the fragmentation of US society or help to fuse it, depending on how it is used.

(The author is a freelance writer and critic)

webcrawler

STANLEY THEODORE

Hawks, doves, military and media

The Iraq war has made the Internet the largest area of activity. This is not only unprecedented but unbelievable

WILLIAM Shakespeare, I'm sure, wouldn't mind his famous quote about the world being a stage and we but players being associated with the war and the Internet. It would be appropriate to say that the Internet is the battlefield and we are the fighters, the pacifists, the hawks, the media and the audience. In the larger context, the Internet could be another world, but the war on Iraq has made it a place where everyone has got space, a voice and a point of view.

It's old news that the net is a world's largest store house of information, but the war has made this the largest area of activity, which is not only unprecedented but absolutely unbelievable. Overall, the medium was best used by anti-war protestors who created history with their sublime use of the Internet. But their vibrant presence brought out the hawks who backed America in its campaign against Saddam Hussein.

Among the war's supporters was Grassfire.net, which started in 2000 with a campaign to ban homosexuals in the Boy Scouts and claimed to use the net for "conservative awareness and activism at the grassroots level". It straightaway took a shot at the anti-war campaign: "As our nation prepares to battle terror, one group calling themselves Not in Our Name and claiming thousands of supporters including Jane Fonda, Oliver Stone and Al Sharpton have openly attacked the President and his desires to free the world from the grip of terror. Their anti-war, anti-American rhetoric is gaining momentum."

It put up an online petition exactly like the anti-war ones saying, "We believe the efforts of the anti-war movement place our nation and our troops at even higher risk. Plus, in a continuing effort to counter the media campaign by the anti-war movement and those in Hollywood who are using their platform to undermine the President's policy, we are conducting a nationwide media and awareness campaign calling on America to support our President and our troops during this time of war."

American celebrities were under severe fire. At petitions.com, the Citizens Against Celebrity "Pundits" put another online memorandum. Its first sentence ran like this, "We the undersigned American Citizens stand against Wealthy Hollywood Celebrities abusing their status to speak for us. We do not believe that they have a clear understanding of how we live, what we fear, and what we support. We believe that celebrities Martin Sheen, Mike Farrell, Tim Robbins, Rob Reiner, Barbara Streisand and others with whom they are using their celebrity to interfere with the defence of our country."

Yet another conservative site was freerepublic.com, which was almost abusive about anti-war. "Last year, as the inevitable war against Iraq drew closer, more and more of the 'useful idiots' of the left began crawling out of the woodwork, organising so-called 'anti-war' protests... Patriotic Americans are countering these misguided terrorist supporting leftists wherever and whenever they show up. Form a group, grab your signs, unfurl the flag and prepare to support your country!"

Among these sites were a section that sharp focused on expressing support for US troops in the Gulf. Grunt.com, removed all frills and rhetoric, urging people to buy bumper stickers and T-shirts in support of the troops. The T-shirts had the motto: "First Iraq, then France" — the dig aimed at the European nation's trenchant criticism of America's proposal to use force in Iraq. The site was full of links to Marine Corps stories, Bullshit pages, freebies, downloads, chat rooms, catalogues and bulletin boards.

Then it was the military that was telling its own story online. The Army, over the ages and around the world, has been the kind of institution that has always been reticent to share information, no matter how innocuous it might be. This went through a dramatic and astonishing change this time. Every conceivable detail about the American operations was put online by the establishment itself. The only things that one did not find mention, and logically so, were the operational and strategic details the troops were employing.

Deserving of first mention is the Central Command, the headquarters for the Iraq campaign — www.centcom.mil. The range of information it gave was staggering. Right from their numerous press releases and press briefings, there were links to photos from the battle frontlines, video clips and copies of the millions of leaflets that were air-dropped over Iraq either asking Saddam Hussein's officers to surrender or assuring the Iraqis that the American attack was not meant to harm them.

The American Army put up a site dedicated to operations in Iraq — www.army.mil/operations/iraq/ — with links to the Army's home page and links to all Army units. If this was not enough, there was yet another site about the Third Infantry Division that was leading the coalition charge on Baghdad and the Fourth Infantry Division that dropped its plans to make invasions from Turkey.

To cut a long story short, there were websites on the US Air Force with their own site on Operation Iraqi Freedom. There were sites on the US Marine Corps, the US Navy, including sites on its leading carriers, *USS Abraham Lincoln*, *USS Kitty Hawk*, *USS Theodore Roosevelt* and *USS Harry Truman*. The British and Australian Armies put up their own websites. Though they were not as comprehensive as their American counterparts, the extent of information they put online was certainly unprecedented. Poland's Army put up its own site after joining the coalition. This would not be complete without mentioning the full fledged website of British Gurkha troops — www.army.mod.uk/brigade_of_gurkhas/index.htm. This legendary unit of Nepalese fighters dating back to the 18th century was on duty guarding an Iraqi airbase inside the war theatre.

Clearly this is the digital watershed of the Internet. The Internet allowed people and institutions to make history online and in the process made its own history. Generations later these months would find key mention in history pages — about how the Internet changed the face of war and the outlook of people.

Now for CDs with greater storage



GREAT WORK: Stuart Solin

information per square inch, against 15 GB per square inch in present-day drives.

The existing generation of read heads for magnetic disk drives rely on a phenomenon called Giant

Chandril Chakraborty lauds a physics professor's attempt to achieve this goal

Magneto-resistance (GMR), which refers to the much greater than normal change in resistance certain multi-layered magnetic materials exhibit when subjected to a magnetic field. The read head is a critical component that limits the information capacity of a computer's disk drive. In a GMR read head, like the one unveiled by IBM Corp, the head sits at the end of the actuator arm that moves across the diameter of the disk from track to track. One

side of the GMR has a fixed magnetic field, while magnetisation of the other free layer can be perturbed by any bit passing under it. In GMR, resistance changes vastly with changes in the orientation of the external field relative to the free layer. Its advantage lies in its susceptibility to magnetic noise, which limits how small it can be made — the smaller the sensor, the more the noise. That puts a theoretical limit on how much information can be stored by means of GMR, which Solin estimates at 100 GB per square inch.

EMR read heads, being non-magnetic, escape that limit. The new EMR read heads synthesise their magneto resistive properties by influencing the electron clouds (orbitals) in some semiconductor-metal hybrids. This manipulation is done by embedding a metallic inhomogeneity, known as a shunt, into the composite material.

In other words, while GMR basi-

cally is a byproduct of the electron's quantum property called spin, EMR is associated with the orbital motion of the electrons. Orbitals describe the region in which the electron is most likely to be found; inside an atom, instead of clearly defined orbits, electrons exist as fuzzy clouds.

Besides allowing for greater data density, EMR read heads can operate at much higher speeds than materials used in conventional read heads, since EMR materials have much faster response times. So it is with considerable anticipation that the scientific community is awaiting details about the read head prototype that is almost five times faster.

A single 3.5-inch disk can hold a personal library of 1,000 films if the computer storage industry achieves terabit-per-square-inch densities. Solin hopes EMR can contribute to realise this goal.

(The author is a freelance writer.)

Pneumonia virus identified

Straits Times/ ANN

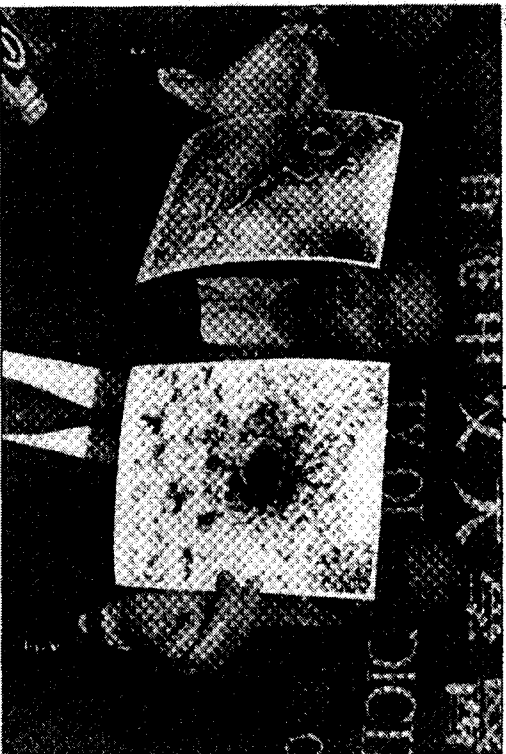
HONG KONG, March 19. — Researchers here have made a breakthrough in their battle to identify a mystery respiratory illness which has killed at least 10 people and caused a global health scare, reports said today.

The illness, known as Severe Acute Respiratory Syndrome (Sars), has been identified as a virus from the paramyxoviridae family by researchers from Hong Kong's Prince of Wales Hospital and Chinese University.

"It is an important finding showing the anti-viral treatment is the right choice," the dean of Chinese University's faculty of medicine, Ms Sydney Chung Sheung-chee, was quoted as saying by the *South China Morning Post*.

But doctors said the paramyxoviridae family incorporated different viruses that could affect humans and that further studies were needed to establish whether the Sars was a new virus and whether it was curable.

At least four deaths — two in



Officials from the Chinese University of Medicine display illustrations of atypical pneumonia in Hong Kong on Tuesday. — AFP

Canada, one in Hongkong and one in Vietnam — have been attributed to the disease, which has been described as an atypical pneumonia or influenza-like illness.

Besides the four confirmed deaths, health officials also strongly suspect Sars was behind five deaths last month in China's southern Guangdong province,

where the disease may have originated in November and peaked in February.

In a further sign that the illness originated in Guangdong, reports today confirmed that the patient believed to have triggered the outbreak in Hongkong had visited the southern Chinese province before falling ill.

'No need to panic'

China Daily/ ANN

BEIJING, March 19. — Medical experts here have assured that the flu-like illness "should not create panic" because the spread is not as aggressive as most forms of influenza.

Officials yesterday confirmed that the recent cases of Severe Acute Respiratory Syndrome in Guangdong province were under control. "The patients have recovered gradually and are resuming their normal lives," an official said.

More deaths reported: The flu-like illness killed a second victim in Hanoi today, according to Agency reports. In Hong Kong, a man died yesterday after being treated in a hospital ward where many health workers were suffering from the disease.

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THE STATESMAN

THE STATESMAN

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No more jabs, now inhale insulin

Science & Tech

RAJA GHOSHAL

New Delhi, March 4: Diabetics who have walked around with sore arms from jabbing insulin injections can finally breathe a sigh of relief — literally.

The world's leading pharmaceutical giants are working on a new drug delivery system for diabetics that will allow them to inhale insulin.

Inhalers have worked well for asthmatics but this is the first time that the pharmaceutical companies are beginning to work on a non-invasive method to administer insulin.

US-based multinational Eli Lilly has started Phase II studies on the inhalable insulin.

Phase II is the testing phase when the efficacy of a drug is

tested on human beings. Insulin has always been injected with the drug going into the system through the bloodstream. Eli Lilly is planning to use the pulmonary route to administer insulin.

Insulin cannot be administered in tablet form because acids in the stomach can destroy the efficacy of the drug. Until now, pharmaceutical companies have worked on a variety of injectables — vials and syringes, and cartridges in a pen format — to take the sting out of repeated insulin usage.

The lungs, on account of their large surface area, are an ideal target for drug delivery and inhaled insulin (pulmonary insulin) represents one of the promising alternatives to injection.

This method delivers insulin to millions of alveoli in the lungs where it can be readily absorbed into the bloodstream. The alveoli are small pouches with a combined surface area as large as half a tennis court.

Within the alveoli, the inhaled insulin is separated from the bloodstream by only a thin single-cell layer and rapidly passes into the blood. The success of pulmonary insulin therapy largely depends on the development of inhalation devices, which are able to deliver the insulin efficiently and reproducibly to the lungs.

Eli Lilly has put up a plant in the US at a cost of about a billion dollars to make insulin crystals as the inhaler NDDS requires five times the number of

crystals than through injections. Only one fifth of the inhaled units has the reach, unlike injectables where it is cent per cent," says Rajiv Gulati, managing director, of Eli Lilly and Company (India) Pvt Ltd.

Pfizer has tied up with Aventis to outsource the crystals to work on a similar project. According to industry sources, it will take about four years before inhaler insulin is in the market.

Globally, Eli Lilly and Novo Nordisk are the two leading players in the human insulin business followed by Aventis. Novo Nordisk is also working with Aradigm Corporation of the US to develop inhalable insulin.

"Inhaler insulin on which some companies are working has a good potential since a num-

ber of patients want to avoid injections," said Ambrish Mittal, who is a specialist on the subject working as an endocrinologist with Apollo Hospital in Delhi. However, Mittal adds a few caveats.

"Insulin users take both short-acting and long-acting doses. The inhalers are likely to replace the short-acting insulin, meaning it may not totally eliminate the need of the injections even though it may reduce it substantially," he said.

Secondly, the inhalers are expected to cost at least four to five times more, given the fact that they require that much more insulin crystals.

In India, the total insulin market is estimated at Rs 300 crore.

Genetics has scaled great heights ever since Watson and Crick defined DNA's structure 50 years ago

Change comes calling, through the helical ladder

SOME experts say that change, for good and ill, will most likely be swift and significant. Others say that maybe it is time for a reality check. The genome is not a simple system, and there may be a limit to what humans can figure out about how it operates. One of the people who see change coming fast is Dr. Gregory Stock, director of the Program on Medicine, Technology and Society at the University of California at Los Angeles. "I believe that within a decade," Stock said, "we will have done broad population studies associating certain genetic patterns with attributes related to health, to longevity. People will look at IQ. They will look at everything." And, he said, they will act.

If a genetic pattern for general intelligence is ever established, and many wonder if it ever will be, it will obviously be much in demand. Next would come the ability not only to pick genetic patterns but to alter them. Parents might eliminate one that predisposed to breast cancer and enhance the activity of one for height.

The effect will go beyond new and improved babies. "A lot of the differences between people have biologic underpin-

nings," Stock said. "Now, we have a dogma of egalitarianism. Everyone's the same." But, he said, we know that is not really true, and there will be genetic evidence spelling out why. Genetic tests will disclose significant differences between individuals and between groups, he said, and he foresees political consequences, as individuals argue that their genes determined their behaviour.

"The same people who today are trying to make claims that they are not responsible for a crime they committed because they heard a song on TV or that they are not responsible for their obesity because they ate at McDonald's will be making genetic arguments," Stock said. Dr. Todd Golub, director of cancer genetics at the Whitehead Institute Center for Genome Research in Cambridge, Mass., predicts fundamental change in a different arena, the pharmaceutical industry. Today, for example, doctors treat cancer patients without knowing, in most cases, whether a person's tumour can respond or resist. Some tumours shrivel and die. Others are impervious to drugs. With genetic insights, scientists will be able to predict which drugs will destroy a

particular tumour. Researchers will be able to design a variety of drugs, each tailored to particular genetic patterns.

But what happens when diseases like breast cancer, heart disease or Alzheimer's, all in some sense blanket diagnoses

the potential for multibillion-dollar drugs and a huge market opportunity. You treat lots of patients, knowing that not everyone will respond. "But what will happen when we refine this technology based on the genome?"

"We will take a disease like

cell than just a collection of individual genes. For now, even with all that is known about genes and cells, deep mysteries remain.

"Our whole gestalt is that there are only 30,000 genes, and when we work out this network we are going to understand cells," said Dr. Leland H. Hartwell, president and director of the Fred Hutchinson Cancer Research Center in Seattle and the winner of the Nobel Prize in Physiology or Medicine in 2001. But, Hartwell said, no cell ever grows from scratch from DNA in a test tube.

Another mystery is genetic variation. "We need to realise that all of our biology, all of our understanding, comes from studying inbred populations" like mice that are bred to be genetically identical, Hartwell said. But, he added, "We know we are missing a good part of what is going on."

It may be better for scientists to back away a bit from the promises of genetics, said Dr. Kenneth M. Weiss, a professor of anthropology and genetics at Pennsylvania State University. "I think we should really temper making genetics the established religion of our country."



cancer, which used to be a single disease and chop it up into a million little bits, none of which is big enough to make it attractive" to the big companies to develop a medication, Golub said. Not all scientists expect to see change come quickly, and many note that there is more to making a

that cover similar effects from different causes, are subdivided into more narrowly described ailments based on highly specific and varying genetic patterns?

"At the present time," Golub said, "where we have only a crude molecular understanding and classification of disease, there is

(The New York Times Science)

Columbia astronauts were unaware of the looming disaster

HD-9 2/3

WASHINGTON, MARCH 1. The U.S. space agency, National Aeronautics and Space Administration (NASA), has released a videotape recorded on board the space shuttle, Columbia,

minutes before it disintegrated on February 1, killing all seven astronauts aboard.

The tape showed four of the seven crew preparing for landing and doing routine work on

the shuttle. It ends 11 minutes before communication between Mission Control in Houston, Texas, and the crew broke off.

The astronauts appear relaxed in the video, talking and

joking and unaware of the looming disaster.

At times, the video camera was directed toward the shuttle windows, outside of which could be seen the orange glow of extremely hot gases, called plasma, that build up on the outside of the shuttle as it enters Earth's atmosphere.

The tape contains footage of commander Rick Husband, pilot Willie McCool, flight engineer Kalpana Chawla and medical expert Laurel Clark on the flight deck. The other three astronauts were on the lower deck while the video was shot.

The 13-minute tape was recovered among shuttle debris near the town of Palestine in Texas on February 6. It did not appear to offer any clues on what caused the accident. Husband can be seen putting on gloves and going through a checklist.

He and his colleagues talk and joke while the crew readied the shuttle for landing.

Columbia disintegrated 16 minutes before its scheduled landing in Florida.

The cause of the disaster is being investigated. The tape was only one of 250 that were shot on the shuttle. Heat damaged the tape, which ends when the shuttle was still west of San Francisco. — DPA



Kalpana Chawla waving at the camera as Columbia passed over the central Pacific Ocean on February 1. — AP

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THE MIND

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2/2

THE DEATH OF DOLLY

Science & Technology

WHAT KILLED DOLLY? It is known that the world's first cloned mammal, which had attained an iconic status during her six-year lifetime, succumbed to progressive lung disease. But the question that scientists need to determine is whether her premature death — well short of the normal dozen-year life span for sheep — was directly related to her cloning. Brought to life from a cell of her mother, Dolly's creation was attended by hopes of medical miracles, on the one hand, and fears about the possible abnormalities in cloned animals. Hundreds of animals have been cloned since Dolly's 'birth', a list that includes cows, goats, pigs and rabbits. The result of such experiments has been mixed and over the years public attention has been drawn to a host of problems, including unexplained deaths, excessive obesity, abnormal immune systems and premature ageing.

Dolly herself had her share of problems. She suffered from arthritis, which was unusual for a sheep of her age. She was also obese. But easily her most perplexing trait was the genetic signals of premature ageing that were reflected in structures at the end of chromosomes believed to play an important role in the very process of ageing. However, she reproduced normally, giving birth to four lambs and disproving suggestions that cloned mammals would be unable to breed. The virus-induced lung cancer that finally persuaded scientists to put her down was caught from other sheep housed with her. There is no firm evidence it was connected to Dolly's status as a clone and knee-jerk conclusions in this regard must be resisted. If the results of her post-mortem even hint at the possibility of such a link, her death is likely to be regarded as evidence of the inherent dangers of reproductive cloning.

Even otherwise, for those ethically opposed to cloning, Dolly's health when alive and her premature death will be regarded as a warning against 'rewriting' the laws of biology. It will be

used particularly to discourage the application of the technology to cloning human beings, a prospect that generates widespread unease and is fraught with great moral complexity. A couple of fringe organisations have already claimed that they have produced cloned human babies. For instance, a few weeks ago, a group called Clonaid claimed to have produced the first such baby girl, whom they nicknamed Eve. However, no proper evidence was furnished to support the claim, leading to scepticism about it within the scientific community. Nevertheless, there is little doubt that scientists are closer to cloning humans than ever before. What Dolly's death has done is to serve as a stark reminder that we do not know everything we need to about cloning and its impact on health and ageing. And that in the face of such ignorance, it would be foolish to extend the technology to produce human beings.

Given that most Governments are opposed to human reproductive cloning, it seems unlikely that it would be a part of officially sanctioned science's near future. A Bill to ban it lies before the U.S. Senate and many other countries have sworn not to permit it. However, a distinction needs to be made between human reproductive cloning and cloning for the purposes of stem cell research, which is for medical purposes and holds out tremendous promise. Many scientists believe it is only a matter of time before organs and tissues grown from stem cells may be used to fight a range of diseases, from diabetes to cancer. Ethical questions have been raised about stem cell research too but the ones that pertain to the creation of entire new human beings are much more basic and unsettling. Dolly's birth in a research compound of a scientific institute in 1996 signalled the promise that such technology held. The death of the world's most famous sheep in 2003 signals the dangers of extending it into areas such as human cloning, particularly at a time when it is pretty clear that man has far from mastered it.

PH. HINDU

20 FEB 2003

TRAGEDY ON RE-ENTRY; KALPANA CHAWLA AMONG ASTRONAUTS KILLED

Columbia burns up over Texas

By Sridhar Krishnaswami

WASHINGTON, FEB. 1. The space shuttle Columbia disintegrated over the state of Texas today, minutes before its scheduled landing in Florida, killing all seven astronauts on board. Six of them were Americans, including the Indian American, Kalpana Chawla and one Israeli air force officer. Calling it as indeed a "tragic day" for the NASA family, the top administrator of the agency, Sean O'Keefe, told a press briefing that the terrible tragedy was not caused "from the ground". A full investigative process has been initiated, including the setting up of a Mishap Investigation Board.

The last communication from the shuttle was "garbled". First efforts are on to study the circumstances leading to the disaster. Soon after the accident, Mr. O'Keefe said that he got in touch with the President, George W. Bush, who immediately offered full and immediate support. The President is said to have spoken to the family members of the astronauts.

NASA is cautioning people against going near or touching debris from the shuttle that is believed to be spread over an area of about 120 miles and perhaps across several states. At the speed and height of the disintegration, no one held out any hope of survivors on board the shuttle. In its final stages it was at a height of 207,000 feet and travelling at a speed of 12,500 miles per hour. Senior officials of the Bush administration said that there was no immediate information that could suggest



The space shuttle Columbia streaks across the Texas skies on Saturday. — Reuters

that terrorism was a factor in the tragedy that hit Columbia. "There is no information at this time that this was a terrorist incident. Obviously the investigation is just beginning, but this is

the information we have now", said a spokesman for the newly-created Homeland Security Department.

Unnamed senior law enforcement officials have also

been quoted as saying that there was nothing "troubling" by way of intelligence about this particular flight, which included an Israeli astronaut. That being the case terrorism was being ruled out. The Federal Bureau of Investigation is yet to be formally brought into the picture.

Security was extraordinarily tight because of the presence of the Israeli astronaut, Ilan Ramon, the first person from the Jewish state to fly into space. Some feared that the presence of Mr. Ramon would make the shuttle a terrorist target. Apart from Ms. Chawla, the only other person in the shuttle who had been in space before was the commander, Rick Husband — the rest of the five were first-timers.

Mr. Bush, who was first informed of the tragedy by his Chief of Staff, Andrew Card, returned to the White House early afternoon to keep track of the developments. The President is expected to talk to the Prime Minister of Israel, Ariel Sharon, to express condolences for the loss of Mr. Ramon.

Senior officials of the administration, including the Vice President, the Secretaries of State and Defence, the National Security Adviser and the Chairmen of the Joint Chiefs of Staff were also immediately notified of the accident.

The President is expected to address the nation later. The nation is already in a state of mourning. Flags are flying at half-staff at the White House, the Capitol Hill and the Kennedy Space Center. The 16-day shuttle flight was due to end in

Florida at 9:16 a.m. Eastern Time. But some 16 minutes before this was to happen Mission Control lost contact with the spacecraft and soon thereafter television footage showed signs of the craft disintegrating.

The speed and distance from the ground are two major things that are being taken into account by experts as they have initially ruled out terrorism — the shuttle was out of range for a surface-to-air missile, a senior official has been quoted as saying. But what is being paid close attention to in the initial hours of the tragedy is what took place when the shuttle lifted off on January 16 — a piece of insulating foam on the external fuel tank came off and is said to have hit the left wing of the craft.

At the time engineers felt that this was of minor consequence and posed no danger to the mission. Also under scrutiny is the age of the shuttle.

The Columbia is NASA's oldest shuttle and the last flight was the 28th for the craft. But what has to be kept in mind is that in the four decades-plus of human space flight, there has not been an accident during descent or landing. In 1986 the space shuttle Challenger exploded barely one minute into lift-off.

Ironically only this past week NASA observed the anniversary of the earlier twin tragedies — the Challenger explosion of January 28, 1986 that killed seven astronauts and the fire aboard an Apollo spacecraft on January 27, 1967 that killed three.

More reports, photos on Page 14

A bolt from the blue

By Our Staff Reporter

NEW DELHI, FEB. 1. For Sanjay Chawla, elder brother of astronaut Kalpana Chawla who is feared killed in the ill-fated space shuttle Columbia, the news came as a big shock. And unfortunately he had to bear it in loneliness in Delhi as the rest of the family was at Florida in the United States.

According to a family friend and neighbour, Sanjay's wife rang up from Florida informing him of the loss of contact with the shuttle. The news came as a shattering blow to Sanjay

and his friends as they were expecting to hear about the successful landing of the shuttle on earth after 16 days in space.

However, with television channels relaying the news minute-to-minute, the impending tragedy became clear. The overwhelming grief made it too difficult for Sanjay to react. His brother-in-law Anil Nagpal told waiting mediapersons outside their home at Asiad Village in South Delhi tonight that Sanjay was not in a position to talk to them. The Prime Minister's Office had also reportedly called to

express condolences, but Sanjay was not able to even take the call.

Sanjay, who runs a tyre business based in their native town Karnal in Haryana, is the only member of the family present in the Capital. His parents, who live with him at his Asiad Village house, are now in Florida. Sanjay's three children — Megha, Uday and Cherry — and his two sisters, Deepa and Sunita Chowdhary, had left for Florida on January 13 to witness the launch of Columbia.

She did India proud: Page 8



Astronaut Kalpana Chawla waving during a photo opportunity before the launch at the Kennedy Space Center with her husband, Jean Pierre Harrison. — AFP

Promise to dismantle bureaucracy

Science brain drain pains PM

OUR SPECIAL
CORRESPONDENT

Bangalore, Jan. 3: Prime Minister Atal Bihari Vajpayee today promised to free science and technology institutions from the clutches of the bureaucracy and expressed concern over what he called "internal brain drain".

Unveiling the national science policy, Vajpayee said: "We have to ensure our scientific institutions do not become afflicted by the culture of our government agencies."

The Prime Minister explained what he meant by internal brain drain. "We need to examine why a career in science is not considered worthwhile by so many of our talented younger scientists."

Vajpayee expressed anguish over diversion of talent from research careers to non-scientific

fields in government and the private sector.

Opening the 90th session of the Indian Science Congress, he said the government would formulate "pragmatic and flexible schemes" to enable expatriates to "come and work in our science and technology institutions".

In his address to over 3,000 scientists, Vajpayee promised simplification of administrative and financial procedures to allow efficient operation of research programmes, a quality that is tied up with any possible return of scientists and technologists of Indian origin.

The Science and Technology Policy 2003, coming after a gap of two decades, committed the government to spending at least 2 per cent of the GDP on science and technology within the next five years.

It lays out a roadmap for policymakers and scientists to fight

poverty, ensure food and energy security, foster scientific research and establish an intellectual property rights regime.

Vajpayee warned the scientific community that the gains of the past half-a-century cannot be consolidated if internal brain drain did not stop. "Talent should not be suppressed and individualism should not replace teamwork... Inadequate attention to these aspects sometimes results in our talented younger scientists getting frustrated. Closely linked to the bureaucratic culture in our science and technology establishments is the disturbing phenomenon of internal brain drain," he said.

Vajpayee announced the institution of an annual Rs 25 lakh India Science Award.

President A.P.J. Abdul Kalam will attend tomorrow's sessions, essentially in his capacity as a scientist.

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S&T policy seeks to give greater autonomy to R&D institutions

By P. Sunderarajan

BANGALORE, JAN. 3. The new national Science and Technology Policy unveiled today by the Prime Minister, Atal Behari Vajpayee, seeks to address the various challenges facing the sector because of the on-going globalisation process and, at the same time, help it meet the growing economic and social needs of the country.

A main highlight is that the policy aims at using the full potential of modern tools of science and technology to protect, update and add value to the traditional knowledge available, strengthen the mechanism for quicker commercialisation of indigenously developed technologies and establish an intellectual property rights (IPR) regime that would maximise the incentives for the generation and protection of intellectual property. It also seeks to provide greater autonomy to research and development institutions to create an ambience for truly creative work, even while ensuring that the science and technology enterprise is fully committed to its social responsibilities.

A detailed implementation strategy for identification of specific plans, programmes and projects, with clearly defined tasks, estimates of necessary resources and time targets has been spelt out. The road map, among other things, envisages a major initiative to modernise the infrastructure for science and engineering in aca-

ademic institutions.

Education to get support

While all middle and high schools, vocational and other colleges would have "appropriately" sized science laboratories, science, medical and engineering departments in academic institutions, and universities and colleges would be selected for special support to raise their standards of teaching and research. To begin with, some academic institutions, especially universities and engineering and medical institutions would be selected for the support to make an impact.

Another important feature is setting up of new funding mechanisms for basic research with special focus on simplification of the administrative and financial procedures and creation of world class facilities in carefully selected and nationally relevant fields to enhance the country's competitiveness in areas where it had strength, opportunities or natural advantages.

The policy envisages provision of new procedures such as flexibility in rules and regulations to meet the special needs of women scientists and provisions to encourage mobility of scientists and technologists between industry, academic institutions and research laboratories.

Besides, it seeks to squarely face the problem of inadequate contribution of

technology to the economy, by laying as much emphasis on social, institutional and market factors needed for adoption, diffusion, and transfer of innovation to the productive sector as the R&D and technological factors of innovation.

The focus would be especially with regard to the export sector, which at present, by and large, derives its competitive edge because of cheap labour, and the traditional industry, considering that it provides employment at lower per capita investments, and involves low energy inputs and carries with it unique civilisational traditions and culture.

Also envisaged is the creation of autonomous technology transfer organisations as associate agencies of universities and national laboratories to facilitate transfer of the know how developed by them to the industry and seeks to encourage the industry to adopt or support educational and research institutions by various means such as funding of courses of interest to them.

Among other things, a programme to enhance India's share in global herbal market, develop special IPR systems to protect scientific discoveries and technological innovations arising out of traditional knowledge, and formulate a series of tax and non-tax fiscal instruments to attract higher levels of public and private investments in S&T is also planned.

THE HINDU

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