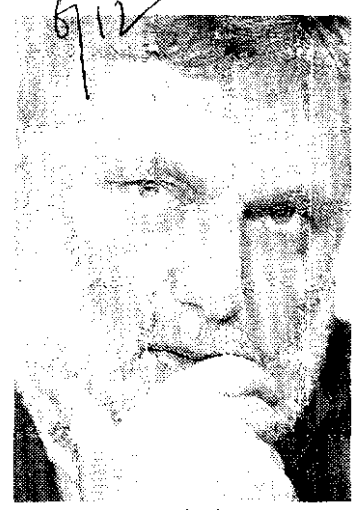
BSE can strike anywhere: E.U. Minister

By Vaiju Naravane

PARIS, DEC. 5. Dr. Franz Fischler, the European Commissioner (Minister) for Agriculture, today said that "spontaneous mutation" of prions leading to Bovine Spongiform Encephalopathy (BSE) could occur anywhere in the world, not just in Europe. He also admitted that the highly resistant prions could enter the water tables and cause contamination through soil and earth.

Citing a new scientific report just released in London, Dr Fischler said: "The widespread nature of the disease in countries like the U.K. was mainly because of the use of meat and bone meal.

But the disease can also be caused by a spontaneous mutation and if it is a spontaneous mutation, it can appear anywhere in the world. This is the last position of the scientists. So, therefore, if you don't detect a BSE case in a country, it does not automatically mean that that country is BSE- free forever."



Franz Fischler

This was why, he explained, the E.U. had decided to conduct systematic testing of animals of over 30 months in all member states whether they had reported BSE cases or not. Describing the BSE prion as "very resistant", Dr. Fischler said: "If an animal is fed with infected feed, then the disease can go from one animal to another via the water table.

One cannot exclude that. And this is an additional argument to ban the use of Meat and Bone Meal (MBM). If MBM is excluded from their diet, then this danger would not exist any more.

It would mean a cleaning up of the water table and the infection would not remain in the water table any more."

Asked whether the E.U. Commission had decided to alert other nations about the latest findings concerning the BSE prion's possible "spontaneous mutation", the Commissioner said: "It is clear that this new hypothesis turned up by the scientists will be a matter of discussion in the International Veterinary Organisation and they will also consider what should be done on an international level."

From July next year, the E.U. will carry out 6-7 million BSE tests. The entire operation of destroying those animals which test positive, of destroying the meat and bone meal, buying up animals for destruction so as not to penalise farmers and the import of some three million tonnes of soybean to replace MBM will cost the E.U. an estimated 1.23 euros, he said.

THE HINDU

-6 DEC 2001

DUTCH COURAGE

The Netherlands legalises euthanasia

THE Netherlands has been at the forefront of the ongoing moral revolution. It is the first country to legalise soft drugs like cannabis and marijuana and now becomes the first to have a mercy-killing legislation that gives terminally ill patients the right to die with medical assistance after due procedures. It is very difficult to say anything against this, although the idea continues to shock those who hold to the religious prohibition against assisted deaths in any form. Questions of faith are deeply implicated in this new attitude towards death. The point behind the Dutch legislation is a very simple one: what can one say to a person who is going to suffer excruciating pain, spend a lot of money to keep the inevitable at bay and be a burden on his loved ones for the remainder of his days? Christianity, on the other hand, has a simple explanation for human suffering — the original sin — that imposes it upon the faithful as a redemptory exercise. Trying to wriggle out of it would defeat, in some way, the grand scheme for human existence whose real meaning is revealed only in the afterlife. This is the kind of reasoning that the pro-euthanasia lobby will have to deal with. Other religions, such as Buddhism, with a more pessimistic view of life and death, may adopt a more liberal attitude.

Once the cultural and religious resistance is got out of the way, the argument ends. The Dutch law hands over the supervision of the entire process to the specialist doctor or the family physician. His condition has to be certified as beyond remedy by more than one doctor and he has to repeat his request for assisted suicide at regular intervals so that the final decision is taken after due deliberation on his part. The scope for abuse is minimal. Of course, such legislation can only work in societies where respect for the rule of law is part of the overall cultural ethos. One cannot possibly take such a risk in India.

Punching holes in a gen

ON 27 June, newspapers in Britain were suddenly filled with articles hailing what they described as one of the greatest scientific breakthroughs of all time: the success of the Human Genome Project. Strings of nucleotides that make up the genes strung together make up a molecule of DNA. Two copies of these are contained in every cell of a human body. These strings are on the verge of being mapped completely by a scientists' team based mainly in the USA and the UK, we were told.

The scale of the operation was hard to grasp, for with four possible nucleotides at each position on the string, and with a typical gene consisting of 10,000 basic units, and with human DNA containing maybe 150,000 genes, the map would have to be so vast that no human brain would be able to read it.

Yet its mapping would amount to "the book of life", would revolutionise our understanding and treatment of disease, and open the way to the manipulation by human beings of their own genetic material.

There was a lot about this strident announcement, and the statements that politicians from Bill Clinton to Tony Blair felt obliged to make about the project, that made me suspicious. Why had that particular day been chosen for the trumpeting of the breakthrough, when the project was apparently not yet complete? Could the unravelling of the human genetic code really hold the key to the conquest of disease, when diseases were caused by so many factors?

And what was the human genome, when surely the whole point about genes was that they were the basis of different individuals? I'm no scientist, so I couldn't answer these questions; but I was sufficiently sceptical about the whole thing not even to bother to keep a news-cutting, though the event was described as historic as the landing on the moon.

Because of my scepticism, I was immediately intrigued when – a few weeks later – I noticed a review of a book by the American geneticist Richard Lewontin, called *It Ain't Necessarily So: The Dream of the Human Genome and Other Illusions* (Granta Books, London, 2000). I ordered it from the library, and have now read it; and I'm relieved to find that my intuitive scepticism was not entirely ill-founded.

The book is a collection of reviews and essays that first appeared in the *New York Review of Books*; and though it is aimed at the lay – non-scientific – reader, it is by no means as folksy or popular as its title might suggest.

But it's a good title, for Lewontin repeatedly makes the point that people today can be as credulous and trusting about the claims of science (or the claims made by the popularisers of science) as they have often been about the claims of religion: *"It ain't necessarily so / It ain't necessarily so, / De tings dat yo' li'ble / To read in de Bible, / It ain't necessarily so."*

The book has taken me back to that splendid old song by Ira and George Gershwin,and I look forward to playing it on the piano and singing it as soon as I've finished this article.

The essays cover several different topics, all of them interesting: intelligence testing, Darwin and Mendel, the mental differences (or not) between men and women, the unre-liability of sur-veys on human sexual beha-viour, and the controversy about cloning.

But the central essay on the *Dream of the Human Genome* is what attracted me to the book, and is what I shall focus on here.

Lewontin has a dry and scathing way of writing, and delights in taking sidesweeps at popularisers such as Richard Dawkins, whom he (unfairly) ridicules for saying that DNA "creates" the human being, "body and mind". But his standpoint is not at all anti-scientific: he is a distinguished scientistand it is on strictly scientific grounds that he parts company with those who have adopted the Human Genome Project as a biological holy grail.

The metaphor of the Grail is not his own. According to a quotation he triumphantly gives us from one of the books that he discusses in his article (*The Code of Codes: Scientific and Social Issues in the Human Genome Project*, ed. Daniel J Kevles and Leroy Hood, Har-vard, 1992), the metaphor has been adopted without irony by proponents of the project.

The editors of this book write in their preface: "Unquestionably the connotations of power and fear associated with the holy grail accompany the genome project...Undoubtedly it will affect the way much of biology is pursued in the twenty-first century. Whatever the shape of that effect, the quest for the biological grail will, sooner or later, achieve its end, and we believe that it is not too early to begin thinking about how to control the power so as to diminish – better yet, abolish – the legitimate social and scientific fears."

Grail-metaphors apart, Lewontin is sceptical about the genome project on several counts. First, he doubts that it can ever arrive at a reliably "normal" version of the genome, for it has to be taken from individuals and who is to say that a bit of the genetic string that has been taken from such an individual may not be defective or abnormal in some respect?

Second, he says some of the more ardent champions of the Project have implanted in popular perception an entirely false "biological determinism": the idea that everything we are, both physically and mentally, and many of the diseases we might eventually suffer from, are somehow "programmed by the genes". Indeed hardly a day goes by without some report appearing in the paper of a genetic basis for something or other, be it homosexuality, breast cancer or a talent for chess.

Third, the hope that the mapping of the genome will make it possible to prevent or cure diseases by tinkering with the genome, either pre-natally or in the adult organism, seems to him wildly exaggerated. Diseases such as cystic fibrosis or Huntington's chorea that are known to derive from a genetic defect are very rare, and the mapping of the genome has not added radically to what we knew about them already.

They occur "irrespective of diet, occupation, social class or education"; but the trouble with most, more common diseases is that those other factors play a major part – and how is the genome project going to help us there?

To get some scientifically-informed views on Lewontin's arguments, I rang up two old school friends, one now a professor of neuroscience, the other one of Britain's leading neurosurgeons. Clive Coen and Henry Marsh have not only achieved eminence in their fields; they are also unusual in not having started out as scientists.

At school, Clive was known as an outstanding violinist, groomed, so it seemed, by his parents for a professional musical career. Henry was the school's most formidable all-round intellectual but seemed to be firmly located in the humanities and social sciences, doing history mainly at school, and politics, philosophy and econo-mics at Oxford.

Clive also went to Oxford, but when he arrived, having won a scholarship in Music, he told his college that he wanted to change to biochemistry. As he had no background in science, they wouldn't let him do that, but they did let him start a new course that had been set up in "human sciencesâ. Genetics, if I remember rightly, was one of its main components.

Henry did two years of PPE, then had a sort of brainstorm, disappeared for a year, and got a job as an operating theatre assistant in a hospital in the mining town of Ashington, in

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north-east England. He returned to Oxford, and got a First, but by then had decided to become a doctor.

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I talked to Clive first. He agreed that the genome itself gave no grounds for "biological determinism". As Lewontin puts it, "First, DNA is not self-reproducing; second it makes nothing; and third, organisms are not determined by it." What it does is provide the sequence of nucleotides that is used "by the machinery of the cell to determine what sequence of amino acids is built into a protein".

It's the proteins that make cells and determine the special functions of cells. They wouldn't be able to do that without the genes; but the genes would do nothing without "a complete apparatus of production" that is present in a human egg even before it is fertilised.

But Clive was more hopeful than Lewontin about potential medical applications. He explained to me that intervention would be possible not only at the early, pre-natal stage, but with an adult too: for new genes could be introduced into the organism by using a specially designed virus as a "vector". So it might be possible to treat cancer by changing the genetic predisposition that made someone susceptible to cancer — and he could imagine this as a therapy, not just a preventive measure.

Henry, like Clive, agreed with Lewontin's rejection of biological determinism and emphasised the scale and complexity of the protein activity that was the driving force behind the splitting and specialisation of cells.

But as regards medical applications, Henry — as a practising doctor — was more doubtful than Clive.

He could see that the genome project might make it possible to design therapeutic drugs that are tailormade for an individual — but could we, on a worldwide scale, afford such a luxury? How far should we go with expensive treatment of diseases that may be largely a consequence of ageing?

Better, surely, to get on with trying to alleviate bad sanitation, infectious disease, malnutrition and all the other ills of the world that we are well equipped to address, with the scientific and practical knowledge that we already have. Like Lewontin, Henry regarded many of the claims of the genome project as "hype".

Clive admitted that it was mostly "stamp-collecting", but that such a phase was necessary to move forward later to a more advanced understanding of the functions of proteins and cells.

Maybe the debate here is between a research scientist and a practising doctor. Ican appreciate both the enthusiasm of the one and the realism of the other. Butmy overriding hunch is that, despite what genetics may allow us to do with crops or livestock, when it comes to ourselves, we shall always — for better or worse — elude the science we have made.

The most exciting discovery is a gas giant orbiting Epsilon Eridani, which bears strong similarities to Jupiter

Astronomers discover 10 new planets outside solar system

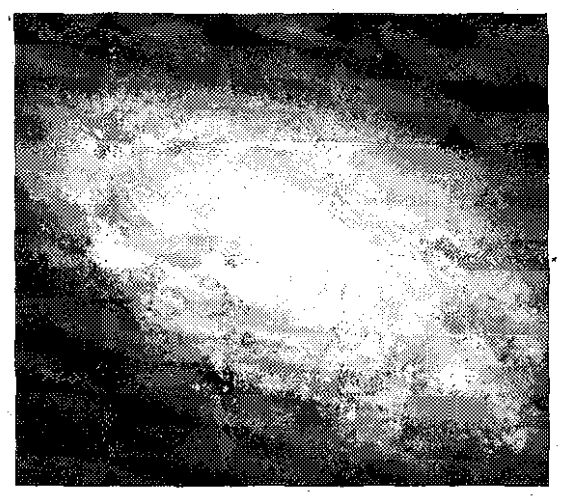
AGENCE FRANCE PRESSE
PARIS, AUG 7

ASTRONOMERS announced Monday they had detected 10 new planets outside our Solar System, including a tantalising Jupiter-sized giant found almost in the Earth's "backyard." The discoveries add enormously to the tally of around 40 extra-solar planets, existence of which was first uncovered only five years ago and which has sparked fevered speculation about the prospects for life elsewhere in the universe.

The most exciting finding is a gas giant about the size of Jupiter which orbits Epsilon Eridani, the fifth brightest star in the constellation Eridanus and one that is closely similar to the Sun. Epsilon Eridani is 10.49 light years from Earth, a tiny distance in galactic terms, which opens up the possibility that its planet could be directly photographed by one of the Earth's big orbiting telescopes, such as the Hubble.

William Cochran, an astronomer at the University of Texas' McDonald Observatory, which worked with renowned planet-hunters in California and Europe, said the discovery "is like finding a planet in our own backyard, relatively speaking."

"Not only is this planet nearby, it lies 478 million kilometers (297 million miles) from its central star — roughly the distance from the Sun to the asteroid belt in our-own solar system," Cochran said. The astronomers were to present their findings Monday at the general Assembly of the International Astronomical Union (IAU).



Things big and small in the Earth's backyard

The Assembly, meeting in Manchester, northern England, from Monday until August 18, gathers only every three years.

The apparent similarity between Jupiter and the planet spotted at Epsilon Eridani is of major interest, Cochran said in a press statement issued by the IAU. Jupiter is thought by some astronomers to have played a vital role in nurturing life on Earth.

This is because its huge gravitational pull acts as a protective barrier that attracts dangerous asteroids and comets, preventing them from smashing into our planet. "Having a large planet orbiting fairly out from Epsilon Eridani means there could be room for Earth-like planets in a reasonably stable orbit closer into the star," Cochran said. "All the planets found so far that are the size of Jupiter are much closer to the parent star. "It means there could be room for an Earth-like planet closer to Epsilon Eridani and — perhaps — in a habitable zone," he said.

If the new planet can be photographed directly, that too would be a breakthrough for space imaging. Extra-solar planets are usually detected by computer, thanks to the "wobble" their gravitational pull exerts on a star. The magnitude and nature of the "wobble" can be used to calculate the position, orbit and size of the planet.

Genetic testing fear: Will we lose our insurance?

BY MEERA SOMASUNDARAM

Chicago, July 11: As scientists celebrate the completion of a working draft of the human genome, the health insurance industry is seeking to calm consumer fears that insurers will not pay for genetic testing and that screening results might be used to deny future coverage.

Amid fanfare, government scientists and researchers from Maryland-based Celera Genomics Inc. said last month they had taken the first big step toward mapping the genetic blueprint of a human being, finishing a rough draft of the 3 billion letters of genetic instructions that make up the human body.

The milestone is expected eventually to transform medicine, allowing doctors to tailor drugs for each individual and predict through genetic testing who is at risk for certain diseases. Genome mapping is just a start and major medical discoveries using the information are still a long way off. But consumer advocates say the findings are generating fear of discrimination by insurers, employers, schools, adoption agencies and others seeking to use the genetic information to their advantage. "There is concern among women who say, 'If I'm screened for breast cancer and I find I have it I could be denied coverage,'" said Jeremy Rifkin, president of the Foundation on Economic Trends, a Washington-based group that focuses on biotechnology.

SPOTLIGHT

"A lot of women are not taking the test because once they find out it's in the family tree they're afraid their daughters and sisters will be denied insurance," he told. Mr Rifkin says some women already are shying away from getting tested for mutations of the BRCA1 and BRCA2 genes that have been linked to increased risks of breast and ovarian cancer. Dutch researchers said this month that women with genetic mutations are choosing to have the organs surgically removed to prevent getting cancer. Insurance industry officials say laws already prohibit them from denying coverage based on a pre-existing health condition. "This is a big breakthrough and there are logically going to be concerns and questions people have," said Susan Pisano, a spokeswoman for the American Association of Health Plans.

"If you're 20 years old and you know you're at risk for some major chronic condition, people are asking the question, 'Rather than using (the information) to help me, will that information haunt me?' What I'm saying is that, by and large, we're prevented from using that information to discriminate."

In fact, Aetna Inc., the largest US health insurer, said it already has an extensive policy on genetic testing and that it posts the criteria for coverage on its Web site. It said it has provided confidential coverage of the Myriad Genetics BRAC Analysis genetic test since 1998.

Aetna said those test results go directly to the requesting physician. *(Reuters)*

Infosys, Microsoft announce global strategic alliance

BROTHERS IN ARMS: Gates meets Infosys chief Narayana Murthy [illegible] alliance in New Delhi — AP

Team ET

NEW DELHI 14 SEPTEMBER

MICROSOFT, ON Thursday, announced the formation of a worldwide strategic alliance with Infosys. The tie-up marks the first time that Microsoft has formed a strategic alliance with an Indian software company which will supply business solutions to companies all over the world. The strategic alliance will develop business solutions based on the Windows 2000 platform and Microsoft's .NET enter server platform in areas such as e-commerce, financial services, insurance, retail and customer relationship management.

"The future direction of the two companies have a lot in common. Infosys is taking on increasingly complex and large scale e-commerce and CRM projects. Microsoft is taking its platform to a new level. We now have a platform that can be used for a large number of applications. We will find projects where Infosys can use its skill in large scale projects," Microsoft CEO and chief software architect Bill Gates said at a press conference here. Infosys chairman and CEO N.R. Narayana Murthy said Infosys had already developed solutions based on Microsoft's platforms. "We have 1,200 people who are already trained in using Microsoft's technology platforms," Mr Narayana Murthy said at the press conference. Infosys has 7,500 employees.

The strategic alliance will devise business solutions for corporates located in the US and India in its first year of operation. "In its second year, we will explore markets elsewhere," said Mr Sanjeev Mirchandani, managing director, Microsoft India.

"There will be constant technological exchange between the two companies. We will find projects where Infosys can use its skill in the months and years ahead," Mr Gates said at the press conference.

Infosys will also create a Microsoft competency centre in Bangalore which will showcase the solutions and prototypes using Microsoft technology which Infosys has developed.

The Economic Time[illegible]

Human genome mapping may revolutionise medicine

WASHINGTON, JUNE 24. Monday's expected announcement that two separate teams have put together a rough map of the human genome is just the start of a long road that will transform medicine, scientists say.

Both the Human Genome Project, a publicly funded international effort, and Celera Genomics, are expected to announce they have completed the first big step toward unravelling the human genetic code by sequencing and assembling the DNA that makes up the genes.

The announcement, to be made on Monday at a Washington D.C hotel, sounds like a huge accomplishment. "This is it. This is the book of life," Dr. Francis Collins, head of the National Human Genome Research Institute (NHGRI), said. Banks of machines at Rockville, Maryland-based Celera, at the nearby Institute of Genomic Research, at the Whitehead Institute at the Massachusetts Institute of Technology, and at the Sanger Centre in Cambridge, England, have been working 24 hours a day, 7 days a week to crank out the series of A, T, C and G that spell out the human genetic code. As quickly as this sequence is spilled out, it is fed into computers that have them assembled in the correct order.

It could have taken years, but in the end it took months. Celera started in September and has just finished. The slower, more painstaking work being done by the Human Genome Project got a shot in the arm from the huge publicity Celera has garnered, and raced to finish its rough draft at the same time. But scientists stress that having this code is only a beginning. "This is a race to the starting line," said Mr. Craig Venter, co-founder and president of Celera. The real work will come in the next years and decades, as powerful computers labour to figure out where in the miles and miles of AS, CS, TS and GS the genes are.

Only about three per cent of these base pairs, repeated over and over in different order, represent genes that code for the proteins that make up everything in the body. The rest is "junk DNA," which is perhaps misnamed, as much of it may control the functions of the genes.

"One analogy we use is the dictionary analogy — what we are getting right now from the human genome project is a list of the words," Dr. Arthur Sands, president and chief executive officer of Lexicon Genetics Inc., one of many companies whose goal is to exploit genetic information, said in a telephone interview. "Imagine a dictionary with 100,000 words and 95 percent of it is blank where the definitions should be. Only it's worse than that because the words are scrambled." The next task will be to first unscramble those words, and then find their definitions. This has already been done with many genes, but most of the genes in the human body remain a mystery.

Estimates range from 40,000 to 100,000. "The real money in the genome is in the drugs that will be discovered using this information," Mr. Sands said. — Reuters

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NOTICES

In the Court of the Pr

Science learns human alphabet in book of life

FROM PATRICIA REANEY

London, June 26 (Reuters): Scientists today confirmed that a working draft of the human genetic code has been completed, marking a scientific milestone that will transform the understanding, treatment and prevention of disease.

British researchers working on the publicly-funded Human Genome Project announced the achievement at a news conference in London. Across the Atlantic, Celera Genomics, a Maryland-based company funded with the specific purpose of being the first to map the human genome, also announced it had finished the sequence and assembled the genetic code.

Ending months of acrimony, the two groups agreed to share information after President Bill Clinton stepped in and brokered a truce. While the Human Genome Project has been publishing the information as it progresses, Celera wanted to protect corporate rights to the information.

"We have discovered the human alphabet — what we now have to do is put the letters in the right order and make a sentence. Only when all that is done shall we have the book of life to read," said John Toy, medical director of the Imperial Cancer Research Fund in Britain.

Today's announcement marks the end of the endeavour by scientists in the United States, Britain, France, Germany, Japan and China to decipher the three billion letters of genetic instructions that make us who we are and the beginning of the quest to understand what it all means. The letter code is carried on all the 23 human chromosomes that carry the DNA blueprint for human life.

"Mapping the human genome has been compared with putting a man on the moon but I believe it is more than that," said Michael Dexter, director of the Wellcome Trust which funded the British part of the project.

"This is the outstanding achievement not only of our lifetime but in terms of human history."

The working draft will allow scientists to delve deeper into the causes of disease and allow them to develop better treatments and preventive measures.

Scientists believe that eventually medicine will be able to identify from birth the disease that a person may develop and to provide treatment to extend life and health beyond what was never possible before.

But the scientists emphasised that the announcement was the beginning and not the end. Now that they have mapped 97 per cent of the genome, 85 per cent of it accurately, they will have to learn to read it and apply what it says to medicine.

"It is a milestone in the very longest sense of human understanding of the universe and now of itself," said John Sulston, who led the research team in Britain.

The director of the Sanger Centre, where British scientists have deciphered one-third of the genome, emphasised that the Human Genome Project will allow scientists to use the information to transform medical care in the 21st century.

The mapping is expected to have a profound impact on the battle against cancer and allow scientists to pinpoint the causes and best treatment of the disease. "It would seem to me inconceivable that within 20 to 30 years the treatment of cancer has not been transformed on the basis of the discovery of the human genome," said Mike Stratton, the head of Britain's Cancer Genome Project.

The project's working draft is a mosaic of DNA from several unidentified people which makes a sort of baseline or reference sequence. The key to understanding disease, why people are tall or thin or blonde or have brown eyes is knowing the differences between human beings.

DNA — the famous "double helix" — is a recipe for life, written in an alphabet of four letters A, T, G and C, standing for the chemical bases adenine, thymine, guanine and cytosine. The code for a gene could be as short as 1,000 letters or run to hundreds of thousands and there could be as many as 100,000 genes, containing the manufacturing instructions for the 200,000 proteins of which humans are made.

"With the human genome nearly mapped, one of the next major genetic advances will be the discovery of how genetic variation affects health," James Watson, who helped discover the double-helix structure of DNA, said in a recent statement.

Drug companies already look for genes that affect disease, but having a full map of the genome will help scientists locate disease-linked genes they would never have found, will help identify who is at risk of certain diseases, and will aid in tailoring drugs, because genes can help determine how a person will respond to a drug.

Researchers, who are against the data being "fenced off", received a shot in the arm with Clinton announcing that the two groups who mapped the genes will cooperate in publishing that knowledge.

"The public and private research teams are committed to publishing their scientific data together later this year," Clinton said in Washington.

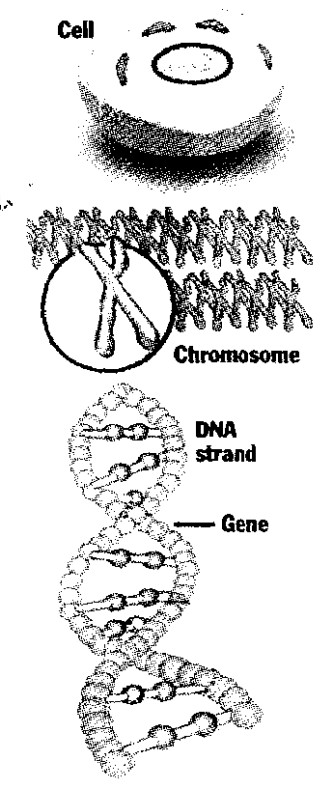
As the scientists heralded a brave new world, sceptics said a genetic breakthrough could usher in a sinister era of perfect people and death to the disabled.

"The further science goes, the further the worst case scenario goes," Steve Jenkins, a spokesman for the Church of England, said. "I'm not anti-science but there is no way that God is now out of a job."

"The idea of designing humans from scratch along with the prospect of an enormous increase in abortion is not the world we want," he added.

■ More reports on Page 4

CLUES TO THE HUMAN BLUEPRINT



Visual: AFP

What is DNA?

- An adult human being is made of 100 trillion cells. Inside the nucleus of each cell, there are 46 chromosomes, each one of them made of DNAs. DNAs are unimaginably long chains of molecules like adenosine (A), thymine (T), guanine (G) and cytosine (C). If all of the DNA were put end to end, it would reach the sun and back more than 600 times.
- Genes are fragments of DNA that orchestrates the synthesis of proteins—an activity that is most essential for life. Most of the diseases are caused by malfunctions of many of those genes.

What have the scientists done?

- They have finished the task of preparing a rough draft of the genetic constitution of a human body, essentially figuring out the locations of As, Ts, Gs, and Cs in most of the genes.

Why is it so exciting?

- The success in mapping genes will facilitate identification of their malfunctions, and, hence, the impending diseases much before they strike. Once you know who's prone to which ailment, you can treat him or her with appropriate drugs. Even more exciting — and far into the future — parents can go for designer babies.

Medical applications

Physical mapping has allowed scientists to identify about 100 disease-causing genes and hold the promise of finding cures for:

- Breast cancer
- Lung cancer
- Asthma
- Alzheimer's
- Epilepsy

What's next?

- The scientists will now have to identify which of the genes are straightaway linked to diseases and which aren't. Also, they have to identify the genes hiding in the 'junk' portions of DNAs that haven't been examined so far.

IBM supercomputer will be used to simulate N-tests

WASHINGTON: IBM has announced it has built the most powerful supercomputer in the world, able to perform 12.3 trillion operations per second, three times faster than the next-fastest computer.

An earlier version proved capable of defeating the world's greatest chess player in a 1997 tournament. The latest machine is intended to continue the advance toward matching and eventually surpassing the computing capacity of the human brain. The computer, called Advanced Strategic Computing Initiative White, or ASCI White, covers 9,920 square feet of floor space and weighs 106 tons.

IBM, making the announcement on Wednesday, said it will deliver ASCI White to the U.S. energy department's Lawrence Livermore National Laboratory this summer.

Under the ASCI contracts, the department pays a company—in this case, $110 million—to build a computer that can simulate the testing of nuclear weapons.

In time, said IBM and Livermore officials, this computer could lead to the end of nuclear testing.

Last year, when the senate rejected a treaty to ban nuclear testing worldwide, the administration of U.S. President Bill Clinton argued that using computer simulation instead of actual nuclear explosions was a reliable way of appraising the American weapons stockpile. *(AP)*

LAUNCHING OF INSAT-3B

THE SUCCESSFUL LAUNCHING of Insat-3B from Kourou in French Guyana at dawn on March 22 is another big leap into space and it will further enhance the capabilities already built up by India for instant communication, broadcasting and weather forecasting. The augmentation of the capacity for Very Small Aperture Terminals (VSATs) also offers prospects for global linkages for business houses. The very fact that there could be a live transmission of the launch from Kourou to the drawing rooms of millions of viewers around the world is itself a demonstration of the spectacular headway made in space science and technology. If India has now kept pace with the progress which the developed countries have achieved in the launching of orbiting satellites, it has been made possible by the unflinching devotion to this exacting task by the scientists, technicians and professionals right from Dr. K. Kasturirangan, Chairman of the ISRO, to the other institutions spread all over the country.

There should, however, be no complacency over the launching of Insat-3B having gone off smoothly. Dr. Kasturirangan has made it clear at Kourou that while the hurling of the satellite into orbit had completed the assignment the ISRO had given to the Ariane 5 launch vehicle of the U.S.-based WorldSpace Corporation, the more demanding jobs, which include the third firing of the liquid engine on March 26, still remain. Apart from this, it could hardly be taken for granted that the successful earlier launching of the satellites by the ISRO would have rendered the latest launch a routine one. The disturbing indications of the possibility of a hitch in the launching of Insat-3B could be clearly seen from the nail-biting tension which gripped those watching the progress of the multiple stages of its take-off from their computer terminals at Kourou. When the countdown stopped to switch over from rolling, cheery green to halting, disquieting red just a few seconds before reaching seven minutes, hope was turning into uncertainty because of an electrical storm which could have thrown a spanner in the works. The countdown was, however, happily resumed much to the relief of everyone in the space centre.

While the launching of Insat-3B further brightens the record of the Indian space scientists, engineers and technologists, it should not be forgotten that India has still to seek the support of foreign agencies for taking its satellites to space. Insat-3B is just one of the satellites put into space along with the AsiaStar of the U.S.-based WorldSpace Corporation. Such dependence should hopefully end when its the Geo-Stationary Launch Vehicle (GSLV) project is completed. The progress which had already been made with this project had been delayed because of the cantankerous U.S. blocking of the supply of cryogenic engines to India by Russia. The efforts which India has made to build these engines indigenously should have put the GSLV project well on course again.

The huge gains for India from its GSLV project can be seen from what Mr. Noah Samara, CEO of WorldSpace, had indicated about the plans of the space centre to place as many as ten satellites into orbit in the immediate future. He said that the space satellites in orbit were "creating information affluence" with high communication potential by the sending of signals "to wherever you are" and ushering in a revolution in digital radio. India's orbiting satellites should strengthen the adult education programme for eradicating illiteracy and spreading awareness of health care. This should help narrow the gap between the India that uses space-age technology and the other India chained to poverty, illiteracy and disease.

THE HINDU
24 MAR 2000

First artificial DNA can create new forms of life

By ROGER DOBSON

SCIENTISTS HAVE made the world's first synthetic DNA - the molecules that form the blueprint for life.

The breakthrough means that the first artificial organisms could be "born" within two years and raises the prospect of humans redesigning whole species, including themselves.

The DNA was created at the University of Texas where researchers have mapped out the exact way it will be configured to create synthetic organism one (SO1), the microbe destined to be the world's first man-made creature. "We are synthesising DNA to create the first synthetic organism," said Professor Glen Evans, director of the university's genome science and technology centre. "SO1 will have no specific function but once it is alive we can customise it. We can go back to the computer and change a gene and create other new life forms by pressing a button."

The researchers are planning to create a series of designer bugs, with super-efficient mechanisms for infecting target tissues such as cancer tumours - and then killing them. Some would infect the human gut to produce vitamin C. Critics, however, have warned that the scientists risk unleashing a microbe master race with increased powers to infect humans and wildlife.

The researchers' success lies in having found a way to create long chains of DNA. Such chains are made up of four types of molecule which join up in twosomes known as "base pairs". The base pairs then link to form a ladder that twists into the famous DNA double helix. In nature, one chain of DNA can contain hundreds of thousands of base pairs. Until now, however, scientists have found it impossible to join together more than 100.

Evans's team has broken this barrier with a technique that first creates short chains of DNA and then joins them together in a controllable way.

The scientists are close to achieving chains that contain 100,000 base pairs - enough to form the basis for simple life forms.

The design for SO1 is based on analyses of the genes of other small bacteria. Genes are the functional units of DNA, each one being responsible for creating a protein essential to processes such as respiration.

Evans plans to copy the vital genes from each bacterium, select the best and join them together. In nature all DNA also contains "junk genes" with no function but Evans plans to omit these - possibly making SO1 the most efficient organism that has lived.

The work to create SO1 is complex but the test of success will be simple. Can SO1 feed and reproduce? If so, then Evans will indeed be celebrating new life. Opponents might regard such an event differently.

Tony Juniper, policy and campaigns director of Friends of the Earth, said the bugs could present a serious threat to human health and the environment. He said: "Scientists have already unleashed genetically modified organisms and we are now seeing the damage they can do. Playing God by creating entirely new life forms could have very serious consequences which should be publicly and fully debated."

Evans believes that man will one day be able to create complex life forms. For now, however, the first benefit could be simpler - the end of the vitamin pill. "Humans need but cannot make vitamin C because we lack one particular enzyme," he said. "If we put that enzyme into one of our artificial organisms and drink it, the bug will live in our guts making vitmin C for ever." *(The Sunday Times)*

THE TELEGRAPH
15 JAN 2001

Born on nature's law of division

Scientists in Oregon have divided an eight-cell monkey embryo into quarters, creating identical quadruplet embryos. One of them survived and resulted in the birth of a baby monkey.

In their report, published on Friday in the journal *Science*, Dr Gerald P. Schatten of the Oregon Regional Primate Research Centre in Beaverton and his colleagues say this is the first time that embryos of primates were deliberately subdivided, resulting in the birth of a live offspring.

Scientists hope this first non-human primate to be cloned will result in squads of genetically identical lab animals perfect for use in testing.

"Tetra", the bright-eyed rhesus Macaque, was not made by the same method that made the world agog over Dolly the sheep. While Dolly was cloned using nuclear transfer — taking the nucleus out of an adult cell and using it to reprogram an unfertilised egg — Tetra was made by splitting a very early embryo into four pieces.

The method is commonly used in animals such as cattle but had never before been used to create a monkey. The splitting of embryos can occur naturally when an early embryo spontaneously divides in half, producing identical twins, or thirds or quarters early in development. Each piece can then develop as an independent embryo.

For more than two decades, scientists have mimicked this process by dividing early embryos from other animals in the laboratory and then implanting them in females, where they develop normally.

The new study involved 107 rhesus monkey embryos divided into anywhere from two to nine pieces to form 368 embryos. In addition to Tetra, researchers say they also have four pregnancies under way with embryos that had been split in half. Two of those split embryos will be identical twins if they survive until birth, which is expected in May.

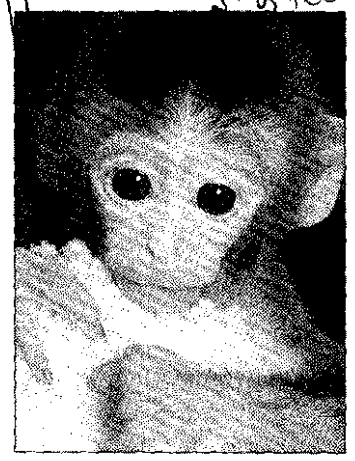
Schatten's group did not achieve nearly the success that was accomplished with other animals. The first successful embryo splitting was in 1978, when Dr Steen Willadsen divided sheep embryos in two. Sixty per cent to 80 per cent of the split embryos survived, resulting in the birth of live lambs. When he divided the embryos in quarters, half survived; when he divided them in eighths, 5 per cent to 10 per cent went on to become lambs.

Willadsen repeated the work, with the same success rate, in cows, goats, horses and pigs.

Schatten said while the success rate with monkey embryos had not been as great as with other species, the importance of his work was that he had established that embryos could be divided. He said the technique copied what nature does. "This I just artificial twinning. In order to move discoveries from the laboratory bench to a patient's bedside, we need to have genetically identical animals that would provide the information needed before these new therapies are tested on people."

"Our contribution is to help provide the genetically identical models in which lifesaving cures can be perfected."

NEW YORK TIMES NEWS SERVICE AND REUTERS



Tetra and one of its creators Gerald Schatten. (AFP)

THE HINDU
17 JAN 2000

Genetically-modified food

By Suman Sahai

WHATEVER MAY have happened in *Seattle, it would be* unwise to think that the WTO agenda has been derailed. The next round of negotiations are starting now in Geneva. On the agenda are discussions on agriculture, services and implementation issues arising from the Uruguay Round. In addition to these subjects, contentious issues such as labour and environment will remain on the agenda, so will market access and biotechnology.

Biotechnology is a subject which has not attracted much attention in the WTO context in India or in other developing countries. Specifically, this relates to trade in genetically-modified crops. Genetically-modified (GM) or genetically-engineered crops are those which contain a foreign gene. Geneticists today can cut out a gene from anywhere, not even necessarily another plant, and put it into any crop. This way traits that are not present in the particular crop can be brought in from anywhere: another plant, an animal or even a bacteria. In the case of transgenic Bt cotton, the gene that can provide protection against the dreaded cotton pest bollworm is brought in from a bacterium found in the soil. Transgenic or GM plants are being made in both food and cash crops. The most prominent are corn, soyabean, cotton, rape-seed, tomato and tobacco. The U.S. is the main producer of transgenic or GM crops followed by Canada, Australia and Argentina and to a smaller extent, Japan.

There are a lot of fears about GM foods chiefly relating to the safety aspects, both for the environment and for human health. It is feared that novel genes and genetic constructs could escape into the environment and create monster plants such as weeds that cannot be destroyed or new, recombinant pathogens such as bacteria and viruses for which there are no cures. There are fears that antibiotic genes used as markers in GM crops could have adverse effects on human health. Scientific evidence at present is thin that such side effects have actually happened or are likely to happen. However, there is a consensus in the scientific community and the informed public that the precautionary principle must be applied. It is felt that the technology itself needs improvement and that the safety aspect will have to be tested far more rigorously before it can be declared that GM crops are indeed a safe source of food.

The push to include GM food trade in the WTO comes from the so-called Life Science corporations such as Monsanto and Novartis who have made very large investments in this sector. Money has been spent on buying up smaller competing firms, on field testing, on obtaining licenses and clearances and on promotions and sales pitches for farmers. Farmers for their part have planted huge areas with GM crops. If they cannot sell their produce because of consumer aversion, they will vent their spleen on their Government. No wonder then that the American Government, pushed by the Life Science industry, needs to find markets for these controversial, frightening foods that no one seems to want.

At the WTO, India should make the case that a lot more work needs to be done on the safety and public interest concerns relating to genetically-modified crops.

It is in this context that the Americans are attempting to force open markets for their GM foods using the WTO as a platform. In a speech before Seattle, the American President, Mr. Bill Clinton, himself took a stand on biotechnology products and lobbied for the U.S. position. "America leads the world in agricultural products developed with biotechnology," he pronounced and added "We are committed to ensuring the safety of our food and environment through strong and transparent, science- based domestic (not international!) regulatory systems.... In Seattle we will continue to insist that market access for agricultural biotechnology products be based on strong science."

At present there are four major players in the WTO on the biotechnology issue, each of whom has taken divergent approaches. The European Union favors a clarification of the Agreement on Sanitary on Phytosanitary Measures (SPS Agreement); Canada has proposed the establishment of a working group "with a fact-finding mission to consider the adequacy and effectiveness of existing rules as well as the capacity of WTO members to implement these rules effectively"; Japan seeks "an appropriate forum to address new issues, including GM organisms as a sub-group of an independent negotiating group on agriculture"; and the United States wants "transparent, predictable, timely and science-based" approval systems for genetically-modified crop varieties to be among the objectives of the agricultural negotiations.

Both Japan and the E.U. support the "precautionary principle" and take a cautious approach to genetically engineered products. The U.S. and Canada are aggressive about opening markets for their genetically-modified crops because both are large producers and are having difficulties getting buyers. Both favour a less stringent approach to GM foods and are keen to see it in the WTO without further delay.

The U.S. is against setting up a Working Group on Biotechnology because it finds the proposed mandate too broad, and fears that the deliberations could slow down market opening for GM products. Instead, it has proposed that trade in agricultural biotechnology products should be made part of the negotiations on agriculture. As a matter of fact, the majority of WTO members are against creating a Working Group on Biotechnology but for different reasons. Most developing countries feel that GM organisms should be discussed under the Convention on Biological Diversity and not in the WTO. During discussions in the WTO, developing countries have not yet made any proposals on biotechnology. Most of them are in favour of stringent rules for trans-boundary movements of GM organisms in the Biosafety Protocol talks that are slated to resume this month. Developing countries are seeking provisions that would protect their regulations on GM imports, from WTO challenges.

India has nothing to gain from becoming a dumping ground for unwanted GM foods. Therefore it should strongly oppose the setting up of a Working Group on Biotechnology or allowing it to be included in the Agreement on Agriculture. On the basis of good science from the best laboratories and quoting the evidence of some of the top scientists in the field, India should make the case that a lot more work needs to be done on the safety and public interest concerns related to GM crops. That there are still credible concerns on the safety of the technology *per se* and that efforts must be made to clean up the technology. That today it would be irresponsible to engage in the international trade of GM products about which there are such grave public concerns.

India itself will also have to do a lot of homework on this new and controversial area. At first it needs to draw up a clear-cut domestic policy. It should decide its priority areas for research and place emphasis on crops relevant to India. It must flesh out a strong Biosafety Protocol and push for international acceptance for this and for compulsory labelling of GM foods. In addition, it should craft sensitive and just Intellectual Property legislation, which will protect our scientists and our consumers. We should satisfy ourselves on the basis of scientific evidence about the long-term safety of these crops for human health and for the environment. And, most of all, we should carry out an awareness generation programme and gain public acceptance for this technology and these foods in our country. Finally, we should propose that discussions related to the international trade of GM foods should be under the aegis of a somewhat more competent authority, for example the Science and Technology Commission of the U.N. The WTO has neither the skill nor the competence to evaluate the safety aspects of biotechnology products.

Insat-3B satellite ready for launch on March 14

HT Correspondent
Bangalore, January 24

ISRO'S FIRST in the Insat-3 series, the Insat-3B, will be launched on March 14 from Kourou in French Guyana aboard Ariane, the European launch vehicle. Announcing this here, Indian Space Research Organisation (ISRO) Chairman K. Kasturirangan said the launch window was between March 14 to 21. The satellite costs Rs 500 crore (including launch cost) and would make up for the sudden shortage of extended C-band transponder due to the failure of Insat-2D in space three years back.

Insat-3B was speeded up as a fast-track following the failure of Insat-2D. In April 1998, provisions were made in it to cater to mobile communication. The mobile satellite service (MSS) on board can support portable terminals and carry voice, fax or data. This would be Ariane's 128th launch and the satellite would be placed in geostationary orbit alongside Insat 2E at 83 degrees east longitude.

The satellite's communication payload provided 12 extended C-band channels. The KU-band payload provided three channels. The MSS transponders aboard the Insat-3B operated in the c/s band frequencies. Compared to earlier satellites, the power of extended C-band transponder on board the Insat-3B has been increased from 10 watt to 15 watt and that of KU-band from 20 watt to 55 watt.

It would be used to provide the first set of transponders for the Vidya Vahini programme announced by Prime Minister Atal Behari Vajpayee on August 15, 1998. These transponders would be extensively used for interactive training and developmental communication.

Tele-medicine is also expected to be introduced to help in remote diagnostics and extension of super-special hospital treatment to rural population.

Dr Kasturirangan, during a press conference, revealed that a cost-benefit study was being done on ISRO's space endeavour and was expected to finish in six months. Already the cost-benefit study of the remote-sensing satellite programme had been completed and the results were extremely revealing, he pointed out. The findings would be made public at a later date, he said.

On the demand and supply positions of transponders, the ISRO chairman said the original target was to have 130 transponders by 2002. However, the surge in liberalisation and the increase in demand by private corporates to have a transponder had pushed up demand by a further 40 transponders or so. This effectively means we have to consider launching two extra satellites to cater to the demand, he said.

As of now, ISRO's satellites had leased out 70 transponders.

THE HINDUSTAN TIMES
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