

'Missing link' in evolution

Perfectly preserved fossil Ida is unveiled

Scientists have discovered an exquisitely preserved ancient primate fossil that they believe forms a crucial "missing link" between our own evolutionary branch of life and the rest of the animal kingdom.

The 47m-year-old primate – named Ida – has been hailed as the fossil equivalent of a "Rosetta Stone" for understanding the critical early stages of primate evolution.

The international research team, who have studied her in secret for the past two years, believe she is the most complete primate fossil ever uncovered. The skeleton is 95 per cent complete and thanks to the unique location where she died, it is possible to see individual hairs covering her body and even the make-up of her final meal – a last vegetarian snack.

"This little creature is going to show us our connection with the rest of all the mammals; with cows and sheep, and elephants and anteaters," said Sir David Attenborough who is narrating a BBC documentary on the find. "The more you look at Ida, the more you can see, as it were, the primate in embryo."

"It tells a part of our evolution that has been hidden so far," said Dr. Jorn Hurum, the palaeontologist from Oslo University's Natural History Museum who assembled the scientific team to study the fossil. "It has been hidden because the only [other] specimens are so incomplete and so broken there's nothing almost to study."

-Guardian News Service

Source: Hindustan Times, 21.05.2009

Entrepreneur hoping idea of air-powered vehicles will fly

Most car companies are racing to bring electric vehicles to the market. But one start-up is skipping the high-tech electronics, making cars whose energy source is pulled literally out of thin air.

Zero Pollution Motors (ZPM) is trying to bring a car to US roads by early 2011 that's powered by a combination of compressed air and a small conventional engine. ZPM Chief Executive Shiva Vencat said the ultimate goal is a price tag between \$18,000 and \$20,000, fuel economy equivalent to 100 miles per gallon and a tailpipe that emits nothing but air at low enough speeds.

Elsewhere in the world, the technology is already gaining speed. The French start-up Motor Development International, which licensed the technology to ZPM, unveiled a new air-powered car at the Geneva Auto Show in March 2009. Airlines KLM and Air

France are starting to test the bubble-shaped AirPod this month for use as transportation around airports.

As Vencat says, the “air cars” plug into a wall outlet, allowing an on-board compressor to pressurize the car’s air tank to 4,500 pounds per sq inch. It takes about four hours to get the tank to full pressure, then the air is then released gradually to power the car’s pistons.

Source: The Times of India, 28.05.2009

Flying car a reality by 2011?

The Flying car is on its way. An US company Terrafugia Transition is set to unveil the dual-purpose car-cum-plane vehicle called “The Flying Car” as early as 2011. The two-seater vehicle can let you fly if you wish to avoid the congested city traffic.

If you want to drive on the road, just touch the road. The vehicle will fold up its wings in 30 seconds and transform itself into a car. “The Flying Car” can travel up to 725 kilometres in the air at a speed of more than 115 kilometres per hour. Fuelled by gasoline, it has front wheel drive on the road and a propeller for flight. With its wings folded, it can be parked in your ordinary car garage.

Its initial cost is expected to be around \$200,000 (nearly Rs.1 crore), says the company which has already orders for 60 vehicles. The CEO of the company told Canadian TV (CTV) network here that they have successfully test-flown “The Flying Car” as many as 28 times. The tests have shown that the vehicle can drive, fly and switch from being a plane to a car in just 30 seconds.

“It (testing) has been very successful,” Carl Dietrich, co-founder and CEO of Terrafugia, told the television network. “We have got a very good handling vehicle and our test pilot said that the flights were just remarkably unremarkable – it just flies like really nice, little airplane.” He said this miracle vehicle will ease problems for pilots who currently face problems like weather which sometimes doesn’t allow them to take off or land.

Source: Hindustan Times, 25.06.2009

Soon, paper battery could run your car

Ordinary paper could one day be used as a lightweight battery to power the devices that are now enabling the printed word to be eclipsed by email, ebooks and online news.

Scientists at Stanford University in California reported on Monday that they have successfully turned paper coated with ink made of silver and carbon nanomaterials into a “paper battery” that holds promise for new types of lightweight, high-performance energy storage. The same feature that helps ink adhere to paper allows it to hold onto the single-walled carbon nanotubes and silver nanowire films. Earlier research found

that silicon nanowires could be used to make batteries 10 times as powerful as lithium-ion batteries now used to power devices such as laptops.

“Taking advantage of the mature paper technology, low cost, light and high-performance energy-storage are realized by using conductive paper as current collectors and electrodes,” the scientists said in research published in the Proceedings of the National Academy of Sciences.

This type of battery could be useful in powering electric or hybrid vehicles, would make electronics lighter weight and longer lasting, and might even lead someday to paper electronics, the scientists said. Battery weight and life have been an obstacle to commercial viability of electric-powered cars and trucks. “Society really needs a low-cost, high-performance energy storage device, such as batteries and simple supercapacitors,” Stanford assistant professor of materials science and engineering and paper co-author Yi Cui said. Cui said in an email that in addition to being useful for portable electronics and wearable electronics, “Our paper supercapacitors can be used for all kinds of applications that require instant high power.”

Source: The Times of India, 9.12.2009

India’s longest sea bridge

- Conceived in 1963, but plan kept in cold storage because of the cost
- 5.6 km bridge (Bandra-Worli sea link), comprises two parts: 4.7 km Bandra-Worli stretch and 0.9 km Worli-Haji Ali stretch
- 424 stay cables hold the bridge together. Length of these wires is equal to the earth’s circumference. They can take a load of 900 tonnes
- Bridge weighs 270,000 tones, equal to the weight of 50,000 African elephants
- At its highest point, the bridge is 126 m tall, equal to a 43 storey building
- It took 2,983 days to complete
- 3,000 men from countries like China, Egypt, Canada, Switzerland, Britain, Serbia, Singapore, Thailand, Hong Kong, Indonesia and the Philippines spent 25.7 million man hours to complete the bridge
- 40,000 tonnes of steel, 90,000 tonnes of concrete used
- Foundation goes 34 m below the seabed
- Sealink expected to last over 100 years
- One of the world’s costliest lifts, ‘Asian Hercules’, was hired from a Singapore firm at a cost of Rs.10 million a day to build the bridge
- Speed limit on sealink is 50 kmph; 12 security cameras will monitor motorists

Source: Hindustan Times, 01.07.2009

Can volcanic eruptions counter global warming?

Recent massive volcanic eruptions like those at El Chicon, in Mexico in 1982, and Mount Pinatubo, in the Philippines in 1991, undoubtedly caused at least short-term

global cooling, said Nadine Unger, a research scientist at the Centre for Climate Systems Research at Columbia University.

The reason, she said, is not a cloud of dust but the fact that sulfur dioxide gas released in the explosions forms sulfate aerosol particulates that are injected high up into the atmosphere, where they act as a shiny shield and reflect solar radiation back to space. This mechanism, she said, “is the exact basis of the geo-engineering proposal as a solution to global warming in which President Obama has expressed interest.”

After the Pinatubo eruption, the Earth’s global average surface temperature dropped by 0.9°Fahrenheit, Unger said.

Sulfate aerosol has a fairly short lifetime in the atmosphere, so the Earth system recovers in one to two years, Unger said, concluding that based on observations, the cooling effects of sulfate particulates outweigh any potential warming effects of carbon dioxide released in the explosion. Still, she added, the carbon dioxide released from volcanoes is dwarfed by the annual emissions from the burning of fossil fuels by humans.

Source: Indian Express, 12.07.2009

Kashmir goes to record (Tunnel) length for its train track

An ear-splitting blast rips through the darkness, echoing many times over. And then a loud applause – Kashmir is eight kilometers closer to a rail connection with the rest of the country.

The 11 km tunnel will be the longest transport tunnel in the country and will link Banihal, 190 km from Jammu, with Qazigund. Eight kilometers of it are now ready and rest will be completed by 2010. Named T-80 for now, the tunnel runs for 11 km into the Pir Panjal range of the inner Himalayas and is one of the last engineering hurdles the railways are up against in the tough terrain of the Valley. The tunnel shoulders a heavy burden. The mountains on top are 1100 meters high – tallest for any tunnel in the country.

“This tunnel is the toughest job we’re doing here,” said Rakesh Chopra, member-engineering, Railway Board.

The “day break” – the ceremonious razing of the last wall between two ends of a tunnel – came at around 3.45 pm. Two bulldozers from opposite came face to face, clearing debris on the way.

Built at Rs. 6470 million, the tunnel will have a single track. Moving at 50-80 kilometres per hour speed, a train will take 12-15 minutes to cross the tunnel. A direct rail link with the rest of the country is expected to boost the economy of the turbulent Valley.

Source: Hindustan Times, 14.07.2009

White roofs for a green planet

Painting a roof white is a simple but big energy saver. Relying on the centuries old principle that white objects absorb less heat than dark ones, US homeowners are embracing “cool roofs” as one of the most affordable weapons against climate change.

- Studies show white roofs reduce air-conditioning costs by 20 percent or more in hot, sunny weather.
- Energy Secretary Steven Chu, a Nobel laureate in Physics, has proselytized for cool roofs at home and abroad. “Make it white,” he regularly says on television shows.
- From Dubai to Osaka reflective roofs have been embraced by local officials seeking to rein in energy costs. However, light roofs may have the opposite effect in cooler climates by driving up AC bills.
- Scientists at the US’s Lawrence Berkeley Laboratory have provided roof makers with a rainbow of colors showing the amount of light that each hue reflects and the amount of heat it re-emits.
- 24 billion metric tons is the amount of carbon dioxide emissions that would be saved over 20 years if all the world’s roofs were made “light.”
- Out of 4268 outlets Walmart in the US, 3201 outlets have reflective roofs.

Source: Hindustan Times, 08.08.2009

Half million villages on world wide web

Imagine a farmer in the field, talking on a videophone. The government of India plans to wire up 500,000 villages with broadband connectivity, of at least 512 kbps always on, with capability to deliver data, voice and video.

Funding the surge

The government will invite bids from telecom service providers to rollout the wireless network. Successful bidders will be given subsidy to finance the plan.

USOF? What’s that?

USOF is raised through a 5% levy imposed on telecom operators’ revenues. It is used to support rural telecom services. At present, Rs. 181,920 million is lying with the USOF.

Cheap, on state orders

The tariffs would be subsidized.

Proposed plan	Minimum speed	Free download	Monthly charges
1	512 kbps	400 MB	Rs. 99
2	512 kbps	1 GB	Rs. 150

Who buys the computer?

The government plans to provide a Rs. 4500 frontloaded subsidy and an optional Rs. 500 more for a few years.

Source: Hindustan Times, 15.07.2009

Israeli rush hour now generates power

In a unique development, an Israeli company has developed a method to generate electricity from road traffic with the government mulling to implement the system on the nation's high ways. The system works by using generators implanted in the asphalt that create energy when cars drive over them, daily Ha'aretz reported. Each generator produces 2,000 watts per hour, which is stored in batteries along the side of the road. The innovative technology is the brainchild of Israeli firm, Innowattech, in collaboration with the Technion University.

A trial performed on the system on a Highway along a 10 metre stretch was viewed as a success with passing cars providing the power for street lights set up next to the 10 meter strip, the report said.

The manager of the project, Dr. Lucy Edri-Azoulay, said the generators on Highway No.4 were planted 2 inches below the top level of asphalt and they used the weight of cars driving on top of them to generate electricity. The technology driving the system is based on Piezoelectric materials, which generate electricity in response to applied mechanical stress, Edri-Azoulay explained.

Source: The Times of India, 08.10.2009

Lecture by: Dr. Rajbal Singh, Joint Director, CSMRS, New Delhi

Topic: Tunnelling in extremely weak rock mass conditions at Tala hydroelectric project, Bhutan

Date: 19.06.09

Venue: Deptt. of Civil Engineering, IIT Roorkee

There is good friendship between Bhutan and India. The hydroelectric project was financed by the government of India. The total cost of project is Rs. 43210 million. The cost of electricity is Rs. 1.80 per unit for India and Rs. 0.30 per unit for Bhutan. We are earning Rs. 30-40 million per day. Indian expertise and technology was used in the project. Fourteen families were displaced and new houses were given to them.

Entire contract for in-situ instrumentation was given to two firms who were giving monthly reports regularly. The cost of instrumentation was about 3% of total cost of project. The time of completion of project is 8 years after preparation of detailed project report (DPR). The features of the project are as follows:

- Height of concrete dam made of high performance concrete = 92m with 130m length
- Diversion dam = made of concrete with grouting of rock mass
- Diversion tunnel = 6.8 m finished diameter and length of 23 km with 5 adits and 11 tunnel faces. Heavily reinforced concrete

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| | lining was used |
| • Tail race tunnel | = 7.75 m diameter of 3.7 km length |
| • Desilting chamber | = 250m x 13.9m x 18.5 m |
| • Powerhouse cavern | = 206m x 20.4m x 44.5m (1020 MW) |
| • Cost of tunnel | = Rs. 210 million per km in good rocks |
| | = Rs. 400 million per km in adverse geological conditions (AGC) |
| • Horizontal in-situ stress | = 15 MPa |
| • Vertical in-situ stress | = 11 MPa |
| • Rebound of SFRS | = 4 – 9 % in tunnels |
| • Measured core strength of SFRS | = 39 – 40 MPa |
| • Survival rate of instruments | = very high |

The surge shaft was supported by circular steel ribs and empty space between rock and ribs was filled with self-compacting concrete. But concrete lining was conventional R.C.C. with heavy reinforcement.

The head race tunnel (HRT) passed through quartzite and biotite schist and was along foliation in class I, II and III rock masses. SFRS and rock bolts were used successfully. At one location adverse geological condition (AGC) was met and rock mass had UCS less than 1 MPa. The tunnel alignment was diverted locally across AGC along HRT by a bypass tunnel. Slightly better rock conditions was encountered. Consolidation grouting and grouting by polyurethane was tried in the original tunnel, yet the tunnel supports collapsed. So it was decided to divert the tunnel. Thick shear zone was again met and squeezing ground condition (Class V) was again faced due to high in-situ stresses. Heavy steel ribs (250 T capacity at spacing less than 60 cm) embedded in thick SFRS were used in AGC and invert struts were welded to steel ribs to increase the lateral capacity of the ribs. Reinforcement by fore-polling umbrella of 21 rock anchors of 9m length was provided. The tunnel face was supported by SFRS and sometimes steel wire-mesh and a drainage drill hole was made to release seepage pressures. Monitoring of AGC was done well. The load on steel ribs with load cells was measured as high as 173 tonnes. The convergence was observed to be 170 mm. The upheaval of tunnel bottom due to squeezing was recorded as 48-53 mm. Inverts were cracked actually due to high heaving. Instruments were checked and were working well. Support was strengthened with more bolts and SFRS to check the high convergence. No blasting was used for excavation and weak rock mass was excavated by scooping. There was no casualty. Work was stuck for 3 years at AGC.

The length of rock bolts was 12 m in powerhouse cavern. Upheaval was also observed in this cavern. The wall convergence was recorded as 450mm which is the highest recorded convergence. The software 3 DEC predicted a wall convergence of 170 mm. Pre-tensioned bolts were essential to control high wall convergence.

Dr. Rajbal Singh delivered spell binding lecture. He emphasized a strong need of in-situ instrumentation and quality control of concrete, sand, aggregates, steel ribs, rock bolts

and SFRS. Q-system is the best for tunnels except in adverse geological conditions compared to RMR etc.

-Editors, JRMTT

You may escape the law, but not your karma (deeds)

We reap what we sow. If things do not catch up with us in this lifetime, rest assured they would do so, in another. Karma has become a well-used word these days, but how many people take time to understand and remember it? The first step to change is to understand karma. Any good you do in this lifetime will come back to you. If you are spiritually attuned, the good will return to you in this life. If not, then you will experience good in the next life.

Thought is also energy – be very careful about negative thoughts and whom you project them onto! Think before you do something mean to someone else, even when they have done something mean to you! It could become a continual circle that you and the other person get stuck in, for many lifetimes. The saying ‘turn the other cheek’ begins to have a real energetic meaning. So, in fact, if someone does something negative to you, do not react but let it go...so that it remains their karma and does not become part of yours.

Cause and Effect is related to karma as it means the consequences of our actions. We all want positive karma, not negative, and the same rules apply – so it is essential that we think and act in a good way. All actions and thoughts create energy, and energy fields surround all things including our selves. Another name of our energy field is the aura. Both positive and negative energy stays in our auras and travels with us from one life to another. If you think you have got away with something bad, say a murder or hurting some one – wait! It will come back to you and the same will be done to you! Ah! You cannot get away from karma; you may escape the law of the land, yes, but not your karma.

We all have choices, deciding which path to follow and the lessons we wish to learn. No one is squeaky clean. Negative energy is something we all try to avoid, and we certainly don't want it lingering in our auras, lifetime after lifetime.

There is a saying: “What angers you, controls you”...Anger is a dark red colour in the aura, and can make the aura feel heavy and dull, but at the same time very spiky. Anger causes many dramas and can stop you from moving forward.

Another big negative energy is fear. It is like a heavy grey cloud that sits in the aura and can manifest at many levels. Some people live in constant fear, which prevents them from enjoying life. Fear can hold you back from all you ever want, and prevent you from finding true happiness.

Our worst fear has been that of death and dying, but we never die, we just move on to other lives, perhaps repeating lessons we got wrong or never finished. Some people touch on their past lives by accident or experience them on a regular basis. Letting go of

fear can change your whole outlook on life, and the nature of your relationships. To not forgive is another big negative energy. A good place to start is to start forgiving others.

Just imagine negative energies as dark, heavy colours, and positive energies as light, bright colours in our auras – which would you prefer? We all display our karma in our auras, and hopefully we get it cleared by making the right choices.

- Casey Costello

Extract from New Chakra System Handbook

Source: The Times of India, 15.9.2009

Humour

- Yoga teacher to a woman: Has yoga any effect over your husband's drinking habit? Woman: Yes, An Amazing Funny Effect!! Now he drinks the whole bottle standing upside down over his head.
- A French husband was returning home after cremating his wife. He sees heavy lightning and thunderstorm in the sky. Husband thinks: She must have reached there.
- Mortal: What is a million years like to you? God: Like one minute. Mortal: What is a million dollars like to you? God: Like one penny. Mortal: Can I have a penny? God: just a minute.