New Device to Make Coma Victims Walk

There is good news for coma victims and their families. According to one of Britain’s top neuroscientists, coma victims would be able to talk and walk may be within the span of next ten years.

In fact, situated in the cerebral cortex there is a special centre in the brain that keeps the entire cortex in the awakened or conscious state. If this centre starts malfunctioning or gets damaged somehow, the person may slip into the coma state. This usually happens with victims of car accidents.

Adrian Owen of Cambridge University, who has claimed that coma victims some day will be able to walk and talk, had earlier demonstrated that using functional magnetic resonance imaging (f-MRI) some coma victims, who show no outward signs of awareness, can not only comprehend what people are saying but also answer simple questions.

Owen’s team, collaborating with Steven Laureys of University of Liege, has now discovered that it is possible to talk to a coma victim by using a device that resembles an Electroencephalography (EEG) machine. Looking like a swimming cap studded with electrodes, an EEG machine records the electrical activity produced by the firing of neurons within the brain.

Owen studied a 29-year-old man brain-damaged in a car crash in 2003. The victim was in a coma for two years before slipping into a persistent vegetative state known as “deep coma.” He was seemingly awake, occasionally blinked but showed no other signs of being aware of the outside world.

Owen believes that using the EEG-like device, which is much cheaper and shorter than the EEG machine, it would some day be possible “Waking the dead.” The new device could be available within ten years.

Male or Female—Different Points of View?

Neuroscientists at MIT and Harvard have made the surprising discovery that the brain sees some faces as male when they appear in one area of a person’s field of view, but female when they appear in a different location.

The findings challenge a longstanding tenet of neuroscience — that how the brain sees an object should not depend on where the object is located relative to the observer, says Arash Afraz, a postdoctoral associate at MIT’s McGovern Institute for Brain Research and lead author of a new paper on the work. He and two colleagues from Harvard, Patrick Cavanagh and Maryam Vaziri Pashkam, described their findings in the Nov. 24 online edition of the journal Current Biology.

In the real world, the brain’s inconsistency in assigning gender to faces isn’t noticeable, because there are so many other clues: hair and clothing, for example. But when people view computer-generated faces, stripped of all other gender-identifying features, a pattern of biases, based on location of the face, emerges.

The researchers showed subjects a random series of faces, ranging along a spectrum of very male to very female, and asked them to classify the faces by gender. For the more androgynous faces, subjects rated the same faces as male or female, depending on where they appeared.

Study participants were told to fix their gaze at the center of the screen, as faces were flashed elsewhere on the screen for 50 milliseconds each. Assuming that the subjects sat about 22 inches from the monitor, the faces appeared to be about three-quarters of an inch tall.

The patterns of male and female biases were different for different regions of Uttaranchal and Jammu region of Jammu & Kashmir.

According to Dr M.C. Varshney, Vice Chancellor, AAU, the new variety of aromatic rice, called GAR-I, has shorter maturity period of 125-130 days and has double the yield as compared to the national average of 2.5 tonnes per hectare.

Basmati is one of the long grain varieties of rice grown mainly in India and Pakistan. In India it is grown in Karnal, Panipat, Kaithal, Kurukshetra and Ambala districts of Haryana. It is also grown in Punjab, Dehradun, New High-Yielding & Aromatic Variety Of Rice

Agriculture scientists working at the Anand Agriculture University (AAU), Anand, Gujarat have developed a new variety of rice that is similar to ‘Basmati’ in aroma, and has double the yield compared to the national average of 2.5 tonnes per hectare.

Basmati is one of the long grain varieties of rice grown mainly in India and Pakistan. In India it is grown in Karnal, Panipat, Kaithal, Kurukshetra and Ambala districts of Haryana. It is also grown in Punjab, Dehradun and other regions of Uttaranchal and Jammu region of Jammu & Kashmir.

According to Dr M.C. Varshney, Vice Chancellor, AAU, the new variety of aromatic rice, called GAR-I, has shorter maturity period of 125-130 days and has double the yield as compared to the national average of 2.5 tonnes per hectare. GAR-I is the only variety that has aroma similar to Basmati and superior grain quality. The commercial seed production of GAR-I has begun and its
Superconducting Carbon Nanotube

When electrical sparks are passed between two graphite rods, it results in soot, which consists of many layers of tiny carbon tubes stacked one upon the other. These are called multiwalled carbon nanotubes. Carbon nanotubes are very thin and light tubes made up of carbon and are invisible to the naked eye. They offer great strength and are even much harder than diamond and steel.

Due to its typical structure and physical properties, it can be used in low-energy computer display terminal, flat panel industry, super compact fuel cell batteries, as sensors, and catalyst as well. Also, owing to its light weight and high strength, layers of carbon nanotubes can be used as electrodes to power a compact fuel cell for use in mobile devices enabling our cell phones and laptops to work for days without recharging.

Ping Sheng and his coworkers at the Institute of Nanoscience & Technology, Hong Kong, China have observed superconductivity in 4A single-walled carbon nanotubes (SWCN). These nanotubes have been observed directly by transmission electron microscopy as well as indirectly by diffuse X-ray scattering and micro Raman measurements of the nanotube-breathing mode. These tubes manifest superconductivity at 15k. These can be used as powerful yet tiny logic chips in computers and have high potency as compared to conventional silicon chips.

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Bigger Brains for Sociable Dogs

Over millions of years dogs have developed bigger brains than cats because highly social species of mammals need more brain power than solitary animals, according to a study by Oxford University. For the first time researchers have attempted to chart the evolutionary history of the brain across different groups of mammals over 60 million years. They have discovered that there are huge variations in how the brains of different groups of mammals have evolved over that time. They also suggest that there is a link between the sociality of mammals and the size of their brains relative to body size, according to a study published in the PNAS journal.

The research team analysed available data on the brain size and body size of more than 500 species of living and fossilised mammals. It found that the brains of monkeys grew the most over time, followed by horses, dolphins, camels and dogs. The study shows that groups of mammals with relatively bigger brains tend to live in stable social groups. The brains of more solitary mammals, such as cats, deer and rhino, grew much more slowly during the same period.

Previous research which has looked at why certain groups of living mammals have bigger brains has relied on studies of distantly-related living mammals. It was widely believed that the growth rate of the brain relative to body size followed a general trend across all groups of mammals. However, this study by Dr Susanne Shultz and Professor Robin Dunbar, from Oxford University’s Institute of Cognitive and Evolutionary Anthropology (ICEA), overturns this view. They find that there is wide variation in patterns of brain growth across different groups of mammals and they have discovered that not all mammal groups have larger brains, suggesting that social animals needed to think more.

Lead author Dr Susanne Shultz, a Royal Society Dorothy Hodgkin Fellow at ICEA, said: ‘This study overturns the long-held belief that brain size has increased across all mammals. Instead, groups of highly social species have undergone much more rapid increases than more solitary species. This suggests that the cooperation and coordination needed for group living can be challenging and over time some mammals have evolved larger brains to be able to cope with the demands of socialising.’

News Briefs

- The mechanics of cellular growth and division are important not only for basic biology, but also for diagnostics, drug development, tissue engineering and understanding cancer. Biologists have long questioned whether cells grow at a fixed rate or whether growth accelerates as mass increases. Now, researchers are able to track that the cells grow faster as they grew heavier, rather than growing at the same rate throughout the cell cycle.

- Scientists have developed a way of smuggling an anti-cancer drug past the protective blood-brain barrier and into brain tumours and metastases using a nanocarrier – a tiny capsule specially designed to pass through cell membranes and deliver its anti-cancer drug to the cancer cell. The blood-brain barrier expresses a high level of proteins that pump foreign molecules away from the brain, while allowing others (such as glucose and insulin) that are necessary to the functioning of the brain cells to cross the barrier.

- The overall warming of Earth’s northern half could result in cold winters, new research shows. The shrinking of sea-ice in the eastern Arctic causes some regional heating of the lower levels of air, which may lead to strong anomalies in atmospheric airstreams, triggering an overall cooling of the northern continents. The researchers base their assumptions on simulations with an elaborate computer model of general circulation.

- The language we speak may influence not only our thoughts, but our implicit preferences as well. The psychologists at Harvard University found that bilingual individuals’ opinions of different ethnic groups were affected by the language. This study suggests that language is much more than a medium for expressing thoughts and feelings. Language creates and shapes our thoughts and feelings as well.

- Bioengineers have created an artificial environment for stem cells that simultaneously provides the chemical, mechanical and electrical cues necessary for stem cell growth and differentiation. Building better microenvironments for nurturing stem cells is critical for stem-cell-based regenerative medicine, including cartilage for joint repair, cardiac cells for damaged hearts, healthy skeletal myoblasts for muscular dystrophy patients and better model systems for fundamental stem cell research.

- A new image from NASA’s Wide-field Infrared Survey Explorer shows what looks like a glowing jellyfish floating at the bottom of a dark, speckled sea. In reality, this critter belongs to the cosmos – it’s a dying star surrounded by fluorescing gas and two very unusual rings. Planetary nebulae with asymmetrical wings of nebulosity are common. But nothing like the newfound rings around NGC 1514 had been seen before. Astronomers say the rings are made of dust ejected by the dying pair of stars at the center of NGC 1514.