



## GM maize gets EU's nod



One of Monsanto's genetically-modified maize cobs

EUROPEAN regulators authorised on the import of six types of genetically-modified maize for use in animal feed after governments were deadlocked over whether to ban or approve them.

The European Union has been divided for years over genetically-modified foods and the European Commission has proposed new rules aiming to break an impasse that has severely limited the cultivation of such crops.

Agriculture ministers meeting last month in Luxembourg were unable to reach a qualified majority on maize from US biotech firms Monsanto and Pioneer, and Swiss company Syngenta to be used for feeding animals, not cultivation.

Under European Union rules, the decision was passed on to the European Commission, which gave the six maize types the green light because they were scientifically sound, a commission spokesman said.

Recently, the EU's executive arm proposed new rules that would give individual EU states the ultimate power to ban or grow genetically-modified crops.

Source: AFP

## VANISHING PLANKTONS

# Oceanic food chain threatened

DESPITE their tiny size, plant plankton found in the world's oceans are crucial to much of life on Earth. They are the foundation of the bountiful marine food web, produce half the world's oxygen and suck up harmful carbon dioxide.

And they are declining sharply.

Worldwide phytoplankton levels are down 40 percent since the 1950s, according to a study published Wednesday in the journal *Nature*. The likely cause is global warming, which makes it hard for the plant plankton to get vital nutrients, researchers say.

The numbers are both staggering and disturbing, say the Canadian scientists who did the study and a top U.S. government scientist.

"It's concerning because phytoplankton is the basic currency for everything going on in the ocean," said Dalhousie University biology professor Boris Worm, a study co-author. "It's almost like a recession... that has been going on for decades."

Half a million datapoints dating to 1899 show that plant plankton levels in nearly all of the world's oceans started to drop in the 1950s. The biggest changes are in the Arctic, southern and equatorial Atlantic and equatorial Pacific oceans. Only the Indian Ocean is not showing a decline. The study's authors said it's too early to say that plant plankton is on the verge of vanishing.

Virginia Burkett, the chief climate change scientist for U.S. Geological Survey, said the plankton numbers are worrisome and show problems that can't be seen just by watching bigger more charismatic species like dolphins or whales.

"These tiny species are indicating that large-scale changes in the ocean are affecting the primary productivity of the planet," said Burkett, who wasn't involved in the study.

When plant plankton plummet like they do during El Niño climate cycles, sea birds and marine mammals starve and die in huge numbers, experts said.

"Phytoplankton ultimately affects all of us in our daily lives," said lead author Daniel Boyce, also of Dalhousie University in Halifax, Nova Scotia. "Much of the oxygen in our atmosphere today was produced by phytoplankton or phytoplankton precursors over the past 2 billion years."

Plant plankton some of it visible, some microscopic help keep

Earth cool. They take carbon dioxide the key greenhouse gas out of the air to keep the world from getting even warmer, Boyce said.

Worm said when the surface of the ocean gets warmer, the warm water at the top doesn't mix as easily with the cooler water below. That makes it tougher for the plant plankton which are light and often live near the ocean surface to get nutrients in deeper, cooler water. It also matches other global warming trends, with the biggest effects at the poles and around the equator.

Previous plankton research has mostly relied on satellite data that only goes back to 1978. But Worm and colleagues used a low-tech technology disks devised by Vatican scientist Pietro Angelo Secchi, in the 19th century. These disks measure the murkiness of the ocean. The murkier the waters, the more plankton.

It's a proxy the scientific community has long accepted as legitimate, said Paul Falkowski of Rutgers University, who has used Secchi disk data for his work.

He and other independent scientists said the methods and conclusions of the new study made sense.



Oceanic plankton have largely disappeared from the waters off Northern California, Oregon and Washington, mystifying scientists

Source: Live Science



## Two's the magic number

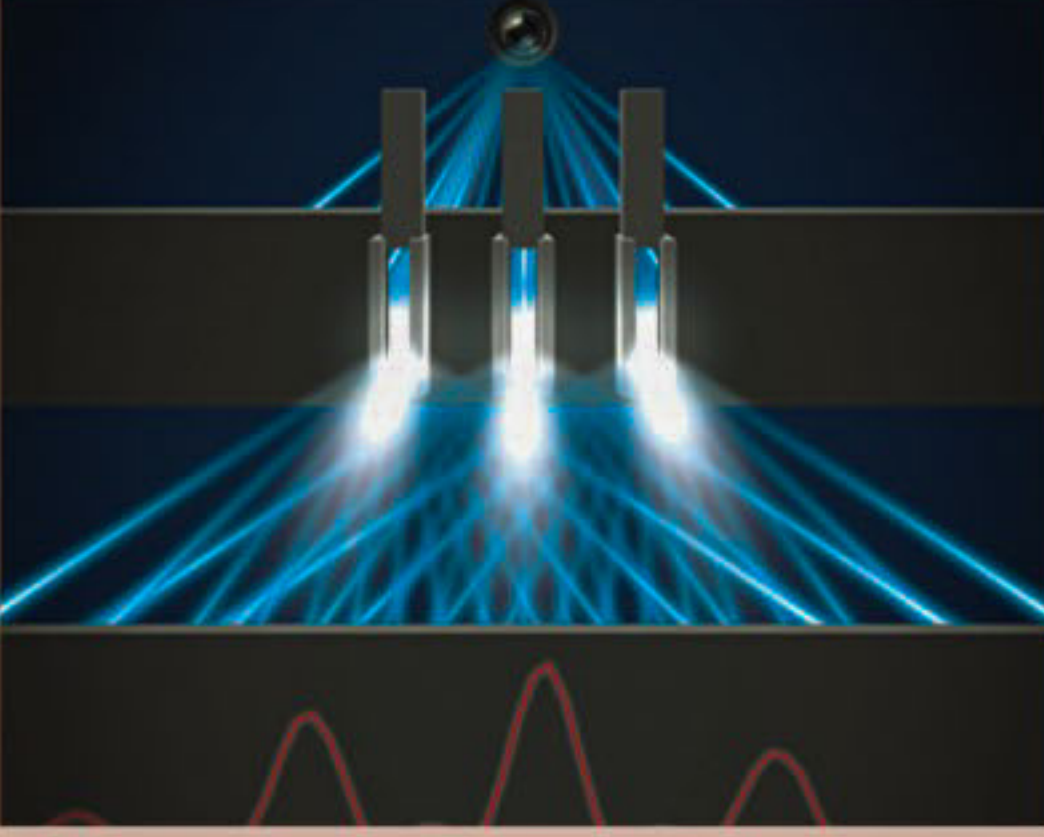
EXTENDING an experiment at the foundation of quantum physics confirms that two is company and three is a crowd. In a new twist on the famous double-slit experiment, researchers have verified a basic tenet of quantum mechanics by showing that adding a third slit doesn't create additional interference between packets of light.

The double-slit experiment embodies the mystery at the heart of quantum mechanics, the famous physicist Richard Feynman observed in his *Lectures on Physics*. The experiment illustrates some of the strangest predictions of quantum mechanics, including the dual particle-wave nature of tiny objects.

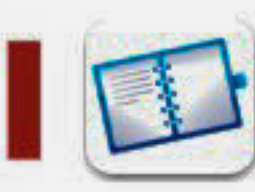
In the 1920s, German physicist Max Born proposed that particle pairs and not triplets, quadruplets or more can interfere, causing their wavelike forms to boost and diminish one another. Born's math puts the interference contribution of the third slit (and any additional slits) at exactly zero. Although the reason why quantum interference stops at two isn't clear, Born's postulate has been widely accepted and used by physicists, yet until now it hadn't been explicitly tested in experiments.

"It's important that you test all the postulates of quantum mechanics," says study coauthor Urbasi Sinha of the Institute for Quantum Computing at the University of Waterloo in Canada. "What is the point of just advancing a theory in its theoretical form if you don't have experiments backing things up?"

Source: Science News



The interference pattern (bottom) of a stream of photons (blue) traveling through three slits



## RENEWABLE ENERGY OPTION Mindset is the barrier

The following is the first instalment of the interview of Dr. Saiful Haque, Secretary, Bangladesh Solar Energy Society. Abu Raihan Rume and Dewan Mowdud Rahman took the interview for The Daily Star. They are both students of the Military Institute of Science and Technology (MIST).



DR. SAIFUL HAQUE

**Daily Star (DS):** What is the present status of Renewable Energy use in Bangladesh?

**Saiful Haque (SH):** In Bangladesh, we are using mainly Solar, Hydro, Biogas and Biomass. Up until now, 30,000 biogas plants have been installed. Out of those, 25,000 plants are running efficiently. Others are suffering due to lack of proper maintenance. Except Dhaka, use of biogas is spreading fast all over the country. That is because it is cost-effective. Solar PV (photo-voltaic) is also becoming popular, especially in the rural households where there is no grid connection.

**DS:** Why have we to go for renewable source of energy? Is it not costlier than the conventional sources?

**S.H.:** Though in some cases it is costlier, yet if we consider the overall impact of its negative sides, then it becomes evident that use of renewable energy is more economical and environment-friendly than the conventionally produced variety as it emits minimum amount of carbon. Extraction of renewable energy involves less complexity. Proper energy conservation is another key issue.

Another flip side of conventional sources is that we have to spend a large chunk of our hard currency to import it every year. Moreover, the global reserve of fossil fuel is depleting fast.

In the circumstances, as a third world country we have little option but to go for alternative source of energy, which, in other words, are the renewable sources, in the future.

**DS:** What do you think should be the steps to popularise it?

**S.H.:** First of all, we have to change our mindset. Otherwise, popularisation of

direction towards promoting renewable energy option?

**S.H.:** In 2009, the government framed a policy to promote renewable energy option all over the country. But the task involves a number of steps and a strong monitoring mechanism. In India there is a ministry for non-conventional energy. We urged the government to create a similar ministry in Bangladesh. The government, too, has agreed to develop an authority, the Sustainable Energy Development Authority (SEDA).

The renewable energy sector should be provided with government subsidy, as it is the case with Agriculture and Education. For Renewable Energy-based power system, the battery involves 40% of the cost. So, the government should reduce the import tax on battery. The business people, on the other hand, need to refrain from creating a syndicate with the motive of making a windfall gain out of it. The government needs to monitor all these issues in earnest.

TO BE CONTINUED



10 kilowatt solar power plant at Barkal, Rangamati



## Noisy bacteria

USING new technology to peer inside single cells and count individual molecules, researchers have found that there's a lot of variability among these biochemical factories even when they're working from the same set of plans.

In the past, scientists have studied what goes on in cells by looking at them en masse and have assumed that all of them are pretty much the same. But a study in the July 30 *Science* finds substantial differences from one *E. coli* bacterium to the next in the relative abundance of cellular proteins and the RNA molecules that encode them.

The "central dogma" in molecular biology is that DNA is copied into messenger RNA, which is the blueprint for proteins. Scientists have long assumed that the amount of mRNA in a cell is proportional to the amount of its associated protein. But now researchers are checking to see if that's the case for individual cells.

"We know the central dogma, but we want to understand it at the quantitative level," says biophysical chemist Sunney Xie of Harvard University, who led the study.

Xie and his team looked inside cells of the gut microbe *Escherichia coli* and did the first broad analysis of the exact protein and mRNA numbers in single cells. A special microscope technique allowed the researchers to simultaneously count individual mRNAs and proteins associated with 1,018 genes, about a quarter of the microbe's genome. They found that the number of proteins in a single cell wasn't at all related to the number of associated mRNAs.

"That sounds absurd on first examination," says cell biologist Sanjay Tyagi from the University of Medicine and Dentistry of New Jersey in Newark. "You expect that there should be direct correspondence between the number of molecules of RNA the cell has and the number of proteins it has."

But when you consider how mRNA and proteins work, he says, the result makes sense.

Protein and mRNA molecules exist on two different time scales, Xie explains. Messenger RNA molecules are short lived; they degrade just a minute or two after forming. That means their number varies depending exactly when the count is taken.

Proteins, on the other hand, stick around for hours after they're made. They often last until the cell divides, so their numbers are more constant over time.

The results provide a "cautionary note" to researchers when they measure mRNA levels in single cells, Xie says: They need to take into account that the mRNA level in a cell does not reflect the level of its associated protein. Xie and his team next will study how this "noise" might contribute to antibiotic resistance in bacteria.

Source: Science News

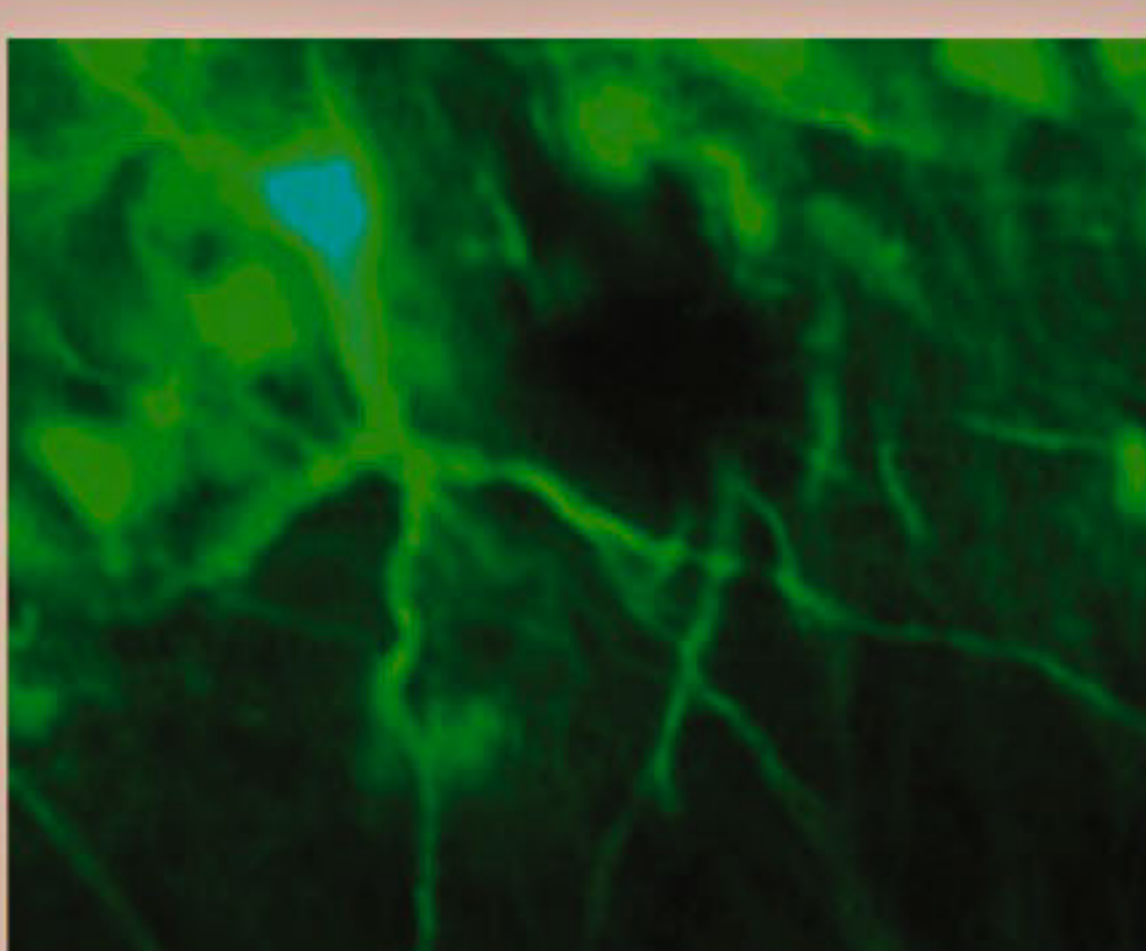


## Chemistry of fear

Kerry Ressler wants to understand the molecular biology of fear.

"We're studying how the biology of the brain is changed by the environment, and how these changes underlie memories and experiences," said Ressler, an associate professor in the department of psychiatry and behavioral sciences at Emory University School of Medicine and Yerkes National Primate Center. "I think it's the key to understanding lots of big picture questions about the brain and the mind."

Source: Live Science



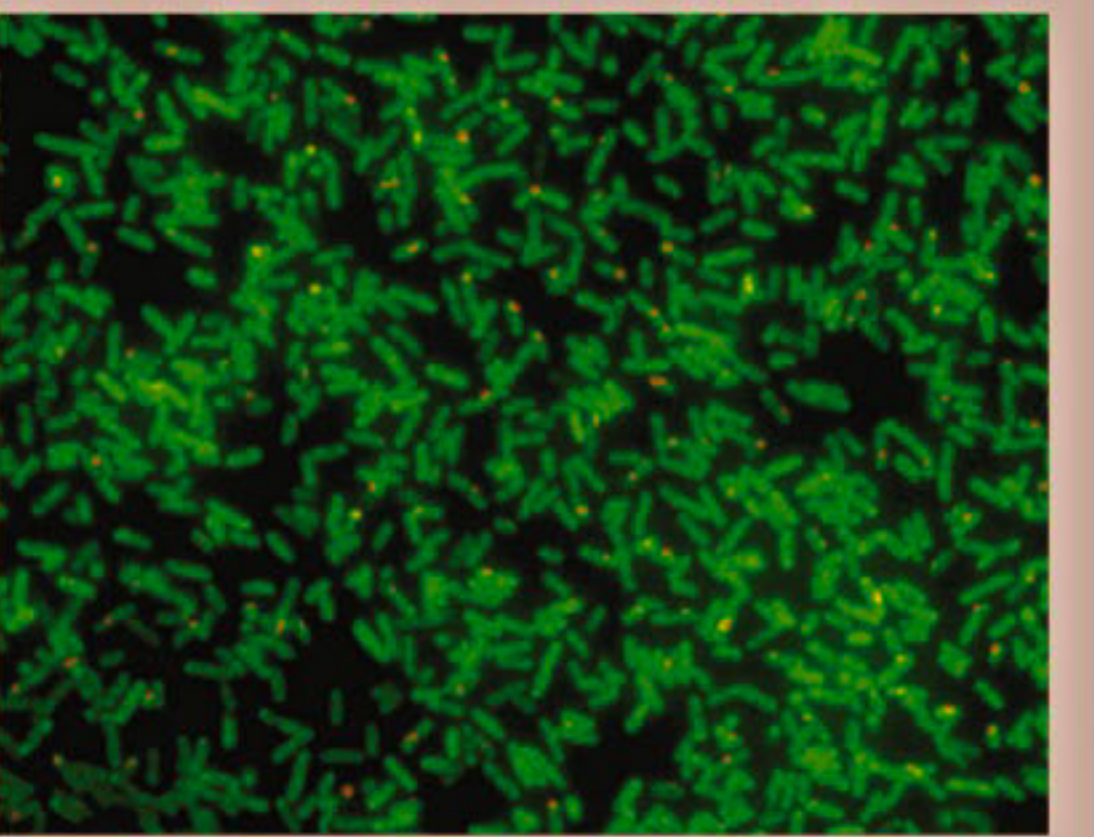
Green fluorescence labels neurons within a rodent amygdala. The Ressler lab examine the role of specific genes in the neural circuitry which underlies fear-memory formation



## Who invented kite and when?



No one knows exactly how or who invented the first kite. It is thought that the earliest use of kites was among the Chinese, approximately 2,800 years ago. The kite was said to be the invention of the famous 5th century BC Chinese philosophers Mozi and Lu Ban. By 549 AD, paper kites were being flown - in that year a paper kite was used as a message for a rescue mission. Ancient and medieval Chinese sources list other uses of kites for measuring distances, testing the wind, lifting men, signaling, and military communication.



A new study finds that amounts of protein (green) and mRNA (red) vary from cell to cell