

MANKIND'S OLDEST ANCESTOR

Fossil shatters myth of missing link

THE discovery of a 4.4-million-year-old skeleton, humankind's oldest known ancestor, was the greatest scientific breakthrough of 2009, the prestigious journal Science said on December 17.

The fossil, known as Ardi, topped a list of the 10 greatest scientific advances for the year, which also featured the discovery of water on the moon and the use of ultra-thin carbon atom sheets in experimental electronic devices.

Ardi, or *Ardipithecus ramidus*, was the subject of 15 years of painstaking examination by anthropologists who said the find, in what is now Ethiopia, provided untold insights into human evolution.

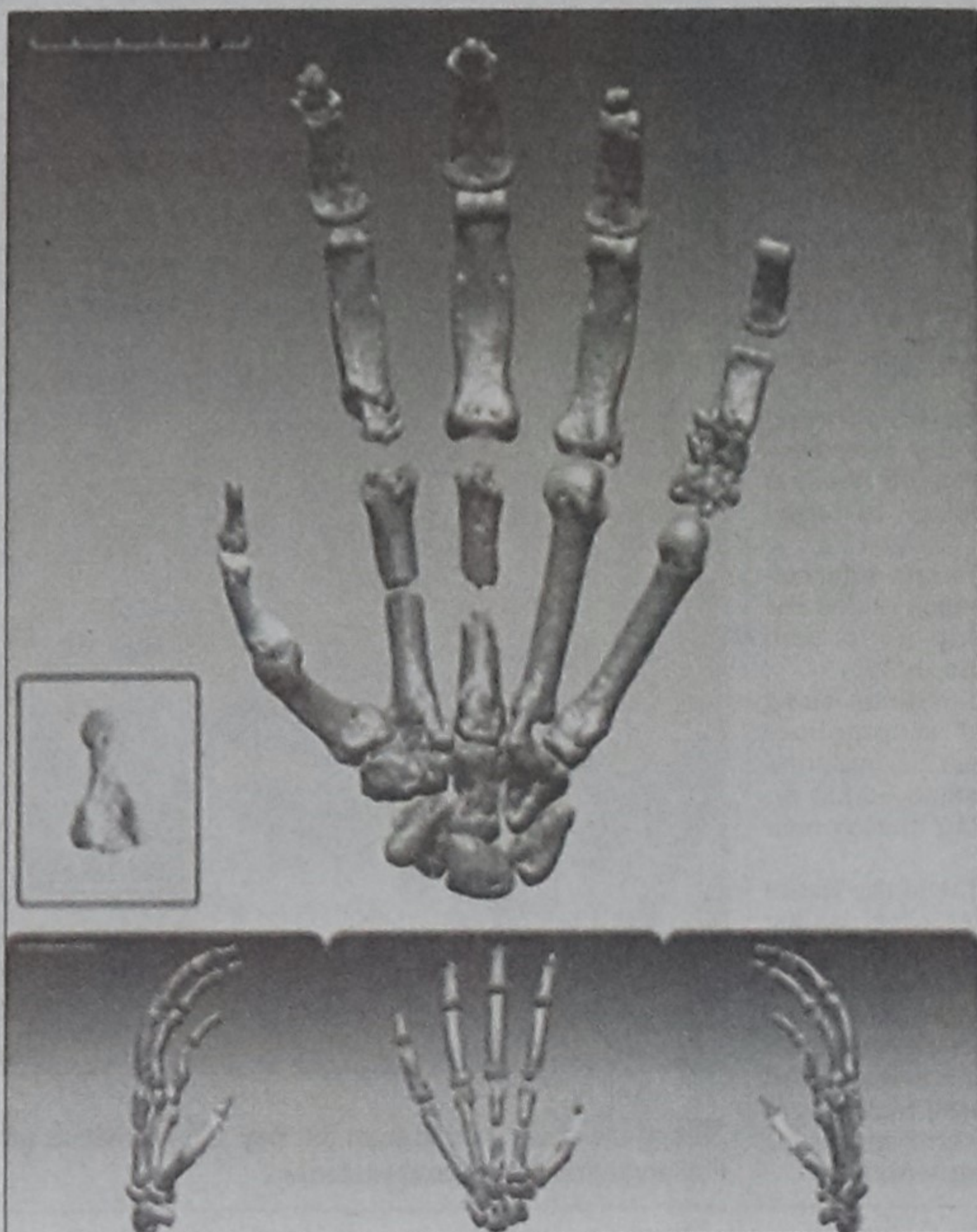
At 1.2 million years older than "Lucy", previously the oldest known human ancestor, Ardi helped shatter popular myths about the direct similarity between humans and modern apes.

Many of the traits found in Ardi's skull, teeth, pelvis, hands and feet, showed that African apes have evolved extensively since sharing a common ancestor with humans.

It also quelled hopes of finding a missing link between humans and modern apes.

"(Ardi) changes the way we think about early human evolution," said Bruce Alberts, Science's editor.

Among the other developments listed by the journal was the discovery of previously unknown pulsars by NASA's Fermi telescope,



Digitally rendered composite hand of the "Ardi" partial skeleton. The discovery of a 4.4-million-year-old skeleton, human-kind's oldest known ancestor, was the greatest scientific breakthrough of 2009.

including one located 4,600 light-years from Earth.

The observations helped

explain how a pulsar -- the rapidly-spinning and highly-magnetized core of a exploded star -- works,

and how they contribute to electromagnetic radiation in the universe.

Astrophysics provided two more of the top 10 advances of the year, including NASA's discovery of ice water on the moon.

In October the US space agency slammed a missile into the permanently shadowed Cabeus crater, near the moon's southern pole, at around 5,600 miles (9,000 kilometers) per hour.

It was followed four minutes later by a spacecraft equipped with instruments that detected significant amounts of ice water.

NASA was also praised by Science for astronauts' repairs of the Hubble space telescope, providing unprecedented images of our universe.

Meanwhile physicists working on Earth with bizarre crystalline materials managed to create magnetic ripples that could help confirm the existence of monopoles, a theoretical particle with only one magnetic pole.

And physicists operating an X-ray laser at Stanford University got fresh snap-shots of chemical reactions in progress and molecules 10,000 times smaller than a human hair.

The year also saw the advances in the way we use materials, including graphene -- highly conductive sheets of carbon atoms.

Scientists examining the ultra-thin structures were able for the first time to manipulate them into nano-scale electronic devices, raising hopes that the advance

could spark an entire industry.

In the biological sciences breakthroughs were made in gene therapy and signal pathways, which offer the hope of extending human life.

While gene therapists developed new ways to treat brain disease, hereditary blindness and some immune disorders, those working on signal pathways worked on a drug that extended the life-span of mice by around 10 percent.

It was the first time the immune-suppressing drug, rapamycin, had been proven to work on mammals.

As climate change topped the political agenda, scientists grasped a clearer picture of plant molecules that could allow them to develop new ways to protect crops against drought.

They isolated the abscisic acid hormone, finding that it triggered when plants detect drought conditions. Thought the creation of hormone variations scientist hope they will be able to boost plants' protection.

In the coming year Science's editors said they expect breakthroughs in stem cell research, cancer cell metabolism and the mapping of the human genome.

With the White House set to decide on funding, the future of human space flight and NASA's quest to return man to the moon by 2020 and establish lunar bases for further exploration to Mars, may also be decided.

Source: AFP



PEOPLE'S SCIENCE

Self-taught inventors display their exhibits



Inventions of local talents at the exhibition.

SOME 20 self-taught scientists gathered on December 11 and 12 at the Udvabon Mela (Invention Fair) on the premises of Bangladesh Council of Scientific and Industrial Research (BCSIR), also known as Science Laboratory in Dhaka. Jonobigga (People's Science) Foundation organized the event. Technologist came from far-flung places of the country along with their inventions for display and demonstration. Most of the participants were engaged in agriculture, so were their inventions. The various devices they developed are made of locally available materials.

The motto of the fair has been to free society from its bondage of tradition into an innovative, creative and productive one. To this end, such fairs would be held and books would be published from time to time through similar 'Udvabon Mela' (Invention Fair). This time Jonobigga Foundation also observed the '200 years of the Theory of Evolution'.

The fair was part of Jonobigga Foundation's effort to let people know about the basic concepts of science and dispel misconceptions through writings in publications like Jonobigga.

Zahid Hossain, Jonobigga writer.

NEW FINDINGS

Cancer's gene code cracked



Illustration shows the DNA double helix.

TWO common forms of cancer have been genetically mapped for the first time British scientists announced, in a major breakthrough in understanding the diseases.

The maps have exposed the DNA mutations that lead to skin and lung cancers, in a discovery scientists said could transform the way these diseases are diagnosed and treated in coming years.

All cancers are caused by damage to genes -- mutations in DNA -- that can be triggered by environmental factors such as tobacco smoke, harmful chemicals or ultraviolet radiation, and causes cells to grow out of control.

Scientists from Britain's Wellcome Trust Sanger Institute and their collaborators have mapped this genetic damage from the tumours of two patients suffering from lung cancer and malignant melanoma, a deadly skin cancer.

"This is a fundamental moment in cancer research. From here on in we will think about cancers in a very different way," said Professor Mike Stratton who led the institute's cancer genome project.

"Today for the first time, in two individual cancers, a melanoma and a lung cancer, we have provided the complete list of abnormalities in DNA in each of those two cancers," he told the BBC.

"We now see uncovered all the forces that have generated that cancer and we now see all the genes that are responsible for driving those two cancers."

The scientists' research, published in the journal Nature, also gained deeper insights into the way the body tries to repair the damage caused by the cancers and stop the disease spreading.

Stratton said the research could in future change the way cancers are treated -- by using genetic maps to find the defects that caused them.

"Now that we have these comprehensive complete catalogues of mutations on individual cancers, we will be able to see how each cancer developed, what were the exposures, what were the environmental factors and that's going to be key for our understanding generally of how cancers develop," he said.

Source: AFP

FROM THE BACKYARD

Secrets of honey

MALIHA AFRIN

HONEYBEES are the main collector of honey. The most accurate architecture of Nature can be seen in a beehive. The wax in hives is produced by the glands on the underside of a bee's body. They use the hive as their abode and most of the compartments are stocked with honey. In each hive there is only one queen-bee and she can lay as many as thousand eggs in one day.

There are several drones or male bees in each hive. Their only function is to serve as mates for queens. The drones usually die soon after mating. The female worker bees keep the hive clean, nurse the newly hatched eggs and collect nectar and pollen from flowers. The interesting thing is that the bees have two stomachs, one is for collecting honey and the other is for digestion. After collecting the nectar the worker-bee passes the nectar from its honey-stomach to another worker's honey-stomach. This act is repeated several times. It helps to the change of nectar into honey. Nectar is a sweet juice of flower that bees change into honey. The



honey so produced is then placed in the compartments of the beehive.

Honey is collected by rural people (locally known as Bawaly) from the Sundarbans forest area. But freshly collected honey remains contaminated

with various filthy matters like dirt, wax and excess of water content, which dilute the quality of honey. Scientists of the 'Carbohydrate Section' of the Bangladesh Council of Scientific and Industrial Research (BCSIR) laboratories have developed a process to store and preserve the honey collected from the Sundarbans for at least one year and a half without affecting its quality.

Honey is a highly nutritive and energetic substance. It is considered to be the precious gift of nature. Different kinds of sugar such as glucose and fructose as well as a small amount of sucrose constitute the main nutrients of honey. Scientists observed that in addition to these nutrients various types of enzymes, vitamins, minerals, proteins and amino acids are also present in the honey. Scientists also observed that storing honey for a long-time might lead to the formation of some toxic materials such as Hydroxy methyl furfural (H.M.F) etc., which may be fatal for health.

The writer is a B. SC (Hons) student at the Home Economics College, Dhaka.

QUEST FOR EL DORADO



An 1898 painting by Frederic Remington portrays Spanish explorer Francisco Vazquez de Coronado on his ill-fated quest in 1541 to find the fabled Seven Cities of Cibola. The expedition, which included hundreds of soldiers and Native American guides, lasted two years and traversed some 4,000 miles of the American West.

- Collected



SCIENCE QUIZ

Quiz 1

The inspiration for this invention occurred after a hunting trip.

Question. What was the invention?

- Paper Clip.
- Velcro.
- Zipper.

Quiz 2

This invention caused a great debate over the meaning of words.

Question. What was the invention?

- Scrabble.
- Airplane.
- Toilet.

Ans to previous quiz

Quiz -1

c. 3

Quiz -2

a. Automobile

- Collected



FIGHTING EXTINCTION

Endangered sturgeon

The U.S. Fish and Wildlife Service on Thursday, December 17, declared that attempts over the past two years to save the endangered Kootenai River white sturgeon had failed.

The prehistoric sturgeon, characterized by its large head and armor-like scales, can reach 19 feet long and top 1,000 pounds.

An isolated population of the species lives along a stretch of the Kootenai that passes through Montana, northern Idaho and southern British Columbia. Fewer than 500 of the bottom-feeding behemoths survive and it's been 35 years since they successfully spawned.

The problem is Libby Dam, a hydroelectric facility in Montana run by the Army Corps of Engineers that serves power markets in the Pacific Northwest. When the dam went up in 1974, it stopped periodic flooding of Bonners Ferry, Idaho but also high water flows that triggered the sturgeon to move upriver and spawn.

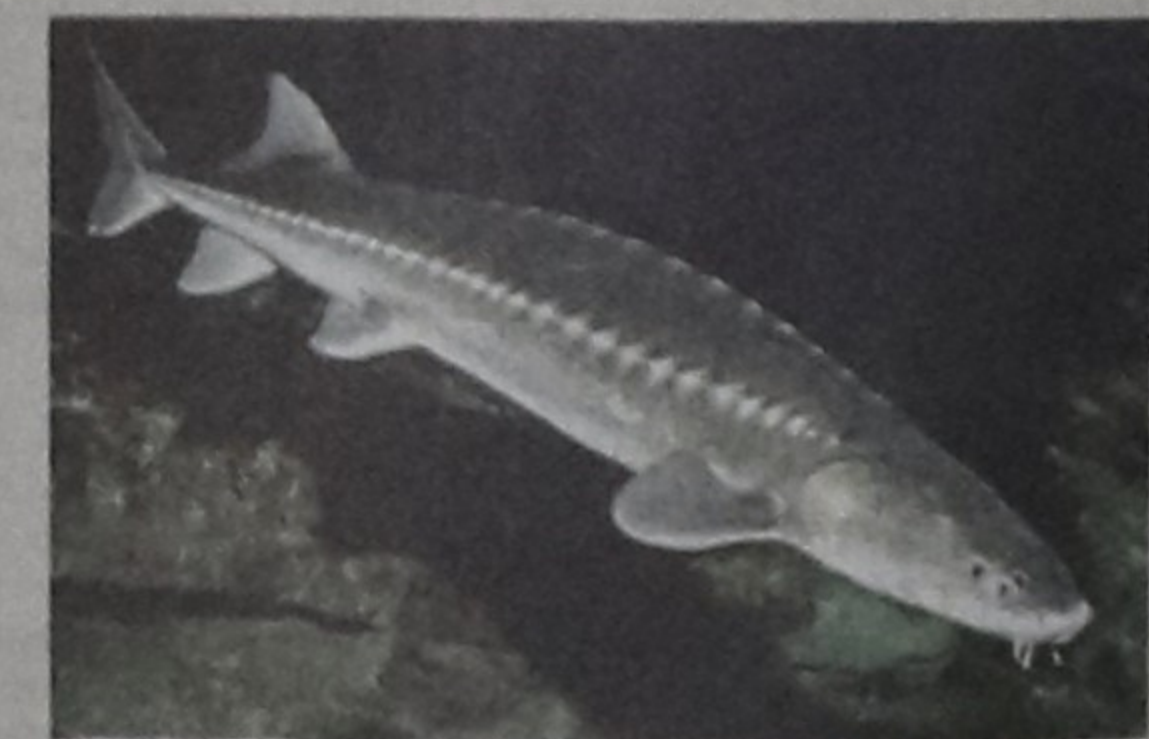
After years of litigation, the federal government agreed to alter how it runs the dam and more closely mimic historical water flows. That hasn't worked, and fisheries officials and the Corps now say they plan to spill more water over the dam next spring.

It could be one of the last chances to stave off disaster for the massive fish: Biologists say it could be on track for extinction within the next decade unless a fix is found.

Even with the increased spillover from the dam, the Kootenai River would rise to less than half its historical levels.

"We're still kind of tinkering around at the bottom end of what historically used to occur," said Jason Flory, a biologist with the U.S. Fish and Wildlife Service. "But the spring flows that were pre-Libby Dam were what flooded Bonners Ferry. You just don't do that, you don't flood towns."

Source: AP



The endangered Kootenai River white sturgeon. As efforts falter to save this largest freshwater fish a toothless beast left over from the days of dinosaurs officials hope to stave off extinction by sending more water hurtling down a river so the fish can spawn in the wild.