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General Assembly Hall at the United Nations (U.N.) headquarters building, in New York City, in the U.S.

U.N.'s 70th GENERAL ASSEMBLY

Many world leaders took part in a four-day summit in New York City, in the U.S. The meeting, which began on September 25, was called the U.N. Sustainable Development Summit. It was held at the headquarters of the United Nations (U.N.). The summit was followed by the U.N.'s General Assembly. This is an annual event that lasts for one or two weeks.

The General Assembly is the start of a new 12-month period, or session. This meeting marked the beginning of the seventieth session of the United Nations General Assembly. So it is the 70th Assembly since the U.N. was founded in 1945. Today, the U.N. has 193 member countries. The leaders of each are invited to take part in the Assembly's General Debate.

The U.N. was formed just after the Second World War ended in 1945. It replaced the League of Nations. This organization was set up after the end of the

First World War (1914 – 1918). The main purpose of the League was to stop wars breaking out. It was not successful. The League of Nations failed to prevent the Second World War, which began in 1939. Towards the end of the war a decision was made to disband, or close, the League. A new organization, called the United Nations, would then take its place.

A secretary-general leads the U.N. Its current leader is Ban Ki-moon. He is a former diplomat. Mr. Ban, who is from South Korea, became the U.N.'s secretary-general in 2007. He took over from Kofi Annan, who is from Ghana. Each General Assembly has a president. This person is in charge of U.N. meetings for the next 12 months. He or she then hands over to a new president at the beginning of the next General Assembly.

U.N. member countries are divided into five geographical groups: African,

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Asian, Latin American and Caribbean, Western European and other States, and Eastern European. The five groups take turns to choose who is going to be the next General Assembly's president. This year it was the turn of the Western European and other States group. The 28 member states within this group chose Mogens Lykketoft. He is a politician from Denmark. The president for the previous, or sixty-ninth, session was from Uganda.

The General Debate is one of the main parts of the General Assembly. During the debate the leader, or a representative, from each member country can make a speech. These happen one after the other. The leaders do not have to talk about the same subject. They can say whatever they want to about international matters, or affairs. Each speech is not supposed to last longer than 15 minutes. These speeches are often reported in the news. This is because they are a chance, or opportunity, for leaders to complain about, or criticize, what other countries are doing.

The General Debate began on September 28. It ended on October 1. The debate takes place in the General Assembly Hall. With seats for 1,800 people, this is the largest room in the U.N.'s headquarters building, or complex. The hall is the only conference room in the U.N. complex that displays the U.N.'s emblem, or logo. This is a globe, or map of the world as seen from above the North Pole. On either side of the globe are olive wreaths. These are a symbol of peace.

Mr. Ban made the opening speech. Mr. Lykketoft, the Assembly's president, followed him. Dilma Rousseff, the president of Brazil, was the first member country leader to speak. The American president, Barack Obama,



was next. The last person to speak in the debate was from Honduras. The leaders of several of the world's most powerful countries spoke on the first day. As well as Mr. Obama, they included Xi Jinping, the president of China, Russia's president Vladimir Putin, and France's leader, President François Hollande.

Those who speak at the debate are not always their country's leaders. It is not unusual for one of their senior ministers to take their place. Normally, Sergey Lavrov speaks for Russia. He is the country's foreign minister. This year Mr. Putin decided to take part. This is the first time that he has spoken at the General Debate for several years. David Cameron, the prime minister of Britain, was another elected leader who did not take part. Philip Hammond, Britain's foreign minister, took his place. King Willem-Alexander also spoke. The king is the Netherlands' head of state, but his prime minister, Mark Rutte, runs the country.

During the two weeks of the General Assembly special rooms are set up in the U.N. building. Member countries use these to hold their own bilateral talks. These are discussions between just two countries. For example, on the first day of the Assembly, Mr. Obama and Mr. Putin met. They discussed Ukraine and Syria.

The two men disagree about what has recently happened in these countries.

Fifteen years ago the U.N. set eight goals, or targets. These are called the Millennium Development Goals (MDGs). All were to be completed by 2015. Aimed at less wealthy nations, they included reducing poverty, giving every child an education, improving health, preventing diseases such as HIV/AIDS and malaria, and making sure that men and women are treated equally.

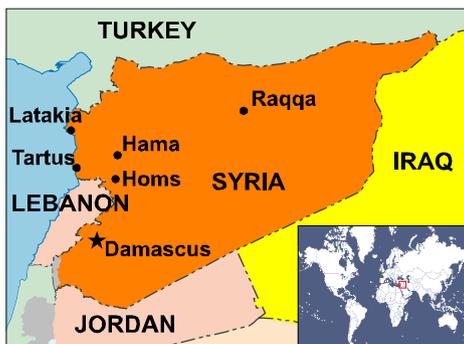
The four-day meeting before the General Assembly was held to discuss a new set of goals. They are called the Sustainable Development Goals (SDGs). Unlike the MDGs, the 17 new SDGs are supposed to be achieved by every country. All U.N. member countries agreed to meet these goals within the next 15 years. Some of the SDGs are: [eradicating](#) poverty and hunger, promoting peace, boosting [prosperity](#), improving health and education, and fixing the causes of climate change.

This year the leaders of 150 countries attended the Assembly. This was a record. As it is the one time of the year when nearly all the world's leaders are in the same building at the same time, security is very strict. During the Assembly hundreds of police officers surrounded the U.N. headquarters building. ■

RUSSIAN AIR STRIKES IN SYRIA

On September 30, an important vote was held in Russia's parliament. It passed. The vote was to agree that Russia could use military force against terrorist groups in Syria. It meant that Russian military commanders could order air strikes if Bashar al-Assad, the president of Syria, asks for help.

Later the same day, Russian SU-24 warplanes took off from an airbase in Syria. They attacked several places in northwest Syria. Some air strikes were close to the cities of Homs and Hama. This was the first time Russia had used military force, outside the borders of the old Russian-led Soviet Union, for 25 years. Currently, warplanes from the U.S. have been flying over northern Syria. A Russian official warned the U.S. that the air strikes would happen one hour before the planes took off.



The war in Syria began four years ago. It started after protests were held in several towns and cities. The protesters wanted Mr. al-Assad and his government to resign. He and his family have controlled Syria for over 45 years. The protesters said that they wanted free and fair elections in the country. The Syrian army was ordered to stop the demonstrations. Soldiers shot and killed many protesters. An opposition group was set up. It became known as the Free Syrian Army (FSA). Some Syrian

soldiers were unhappy about what was happening. They **deserted** and joined the FSA.

Other countries have agreed to support the FSA. They include: the U.S., Britain, France, and several Arab nations. The leaders of these countries insist that Mr. al-Assad must leave the country. They say that the war in Syria is unlikely to end if he remains in charge. In recent years, several other opposition groups have been set up in Syria. One is called the al-Nusra Front. It is also fighting against the Syrian army. Al-Nusra is an Islamic militant organization. It wants to take over Syria and govern the country using strict religious laws.

Two years ago, the Islamic State (IS) set up its headquarters in Raqqa. This city is in northeast Syria. (The IS is also known as ISIL and ISIS.) The IS now controls large areas of northeast Syria and western Iraq. The IS has between 20,000 and 30,000 gunmen. Many people say that its supporters are fanatics who are prepared to commit mass murder. They wear black clothing and treat Shia Muslims, Christians and people of other religions very harshly. Its leaders want to set up a new Islamic country, or state. Everyone living within it would have to obey severe rules.

The U.S. has organized an anti-IS coalition. Over 40 countries have joined. Most are in Europe and the Middle East. However, Australia is also a member. All these countries want to defeat the IS and end the war in Syria. So far, about 250,000 people have died in the war. Hundreds of thousands of people have been forced to leave their homes. Many Syrians are now living in refugee camps in Lebanon, Turkey and Jordan.

Traditionally, Russia has supported the al-Assad family. Syria buys many things from Russia including weapons. Its government allows Russian navy ships to use Tartus. This is one of Syria's ports on the Mediterranean Sea. Until now, Russia has not been involved in the Syrian war. Recently, it began to send military equipment, such as planes and helicopters, to the country. Hundreds of Russian soldiers have also arrived in Syria.



Russian SU-24 warplanes

Russia's president, Vladimir Putin, insists that Mr. al-Assad is the lawful leader of Syria. The Syrian president says that all groups fighting against his army are terrorists. Mr. Putin agrees. However, the U.S. and other countries support what they call "the more **moderate** rebel groups". The FSA is one of these.

The leaders of the anti-IS coalition say that they would welcome Russian air attacks on IS targets. However, an argument began soon after Russia's first air strikes. Russia insisted that their warplanes had hit IS targets. Yet other countries disagreed. They claim that some moderate rebel groups were attacked.

After the Russian attacks, senior officials from the U.S. and Russia made an announcement. They said that they would work together to try to co-ordinate what they are doing in Syria. ■

ARCTIC MOSQUITOES

Researchers from the U.S. have completed a study on Arctic mosquitoes. Their work suggests that many more mosquitoes will become adults if temperatures get warmer. These “extra” mosquitoes, the researchers say, could reduce the size of caribou and reindeer herds in Arctic regions.

There are more than 3,500 types of mosquito. The name comes from two Spanish words. They mean “little fly”. These insects live in all parts of the world except for Antarctica. In warmer climates, mosquitoes are active all year. In colder places, like the Arctic, they appear only in the summer months.

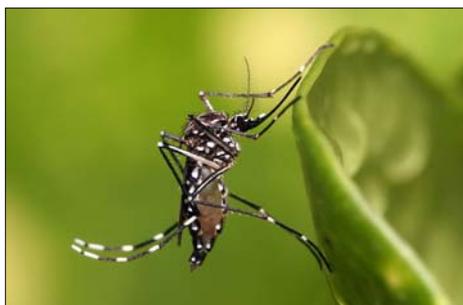


Mosquitoes in the Arctic

Mosquitoes are best known for their bites. However, not all types bite humans. The insects feed on nectar and plant juices. Only females suck blood. It helps them to produce eggs. In warmer parts of the world, some mosquitoes can spread diseases among humans. A mosquito might become infected if it bites a person who has a virus in their blood. If this mosquito then bites another person it may pass on the virus. Diseases spread in this way include malaria, dengue fever (pronounced den-gee) and West Nile virus.

Female mosquitoes lay eggs in stagnant, or still, water. Arctic mosquitoes lay them in ponds. The eggs

hatch around May the following year. This is when the ice melts. Female mosquitoes produce between ten and 200 eggs. When the larvae hatch, they stay just under the water’s surface. After a time, the larvae develop an outer layer or casing called a pupa. The winged mosquito forms inside it. Eventually, the insect breaks out of the casing and flies away.



Mosquito (Muhammad Mahdi Karim)

Records show that temperatures in the Arctic have warmed over the last hundred years. Scientists believe that the Arctic is warming faster than any other parts of the world. The researchers studied mosquitoes in western Greenland. They collected water samples from ponds. These contained mosquito eggs. The researchers kept the samples at different temperatures. The number of eggs that hatch and larvae that become mosquitoes increases in warmer water. This increase, the researchers estimate, could be as much as 50% if temperatures rise by 3.6°F (2°C).

In the Arctic, a type of diving beetle eats mosquito eggs and larvae. Yet if the eggs hatch earlier these beetles will eat fewer of them. Some birds migrate to the Arctic. Several feed mosquito larvae to their chicks. Yet, if the larvae have turned into adults by the time they arrive, the birds will not help control the numbers. What’s more, their chicks may go hungry.

Female Arctic mosquitoes suck the blood of caribou and reindeer. There aren’t many other warm-blooded creatures that they can feed on. These animals try to get away from clouds of biting mosquitoes by running as fast as they can. Another way is to go to a snowy place where the wind is very strong. Unfortunately, the more the animals try to avoid being bitten, the less time they spend grazing, or eating. So they become weaker and less healthy.

Normally, caribou and reindeer give birth when there aren’t many mosquitoes. However, if they hatch earlier, mosquitoes will attack the calves. The young animals are unable to protect themselves. If they are bitten by thousands of mosquitoes they are likely to die.

Many local or **indigenous** people in the Arctic rely on caribou and reindeer. They make clothes from the skins, tools from the bones and eat the meat. If increasing numbers of mosquitoes reduce the size of caribou and reindeer herds, the lifestyle of these people may have to change. ■

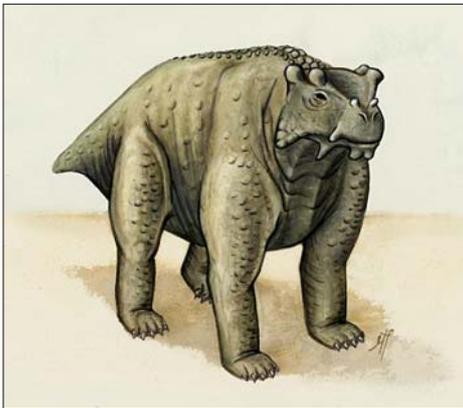
FIRST UPRIGHT CREATURE?

Nowadays, most people believe that life on the Earth evolved over many hundreds of millions of years. It began in the seas and oceans. Fossils of the first tetrapods, or land animals, are about 370 million years old. Scientists sometimes describe the first land animals as “sprawlers”. Their stomachs, or bellies, were close to the ground. Their legs stuck outwards like some modern-day lizards.

Over millions of years some four-legged creatures evolved to stand upright. Their legs were below their bodies like a dog or a horse.

Researchers from Canada and the U.S. now believe that they have discovered the earliest known upright-standing creature. Its name is *Bunostegos akokanensis*. Many animals living around this time stood “semi-upright”. Their stomachs were off the ground, but their legs were bent, or bowed. A recent study of *Bunostegos*’ bones suggests that its legs were straight.

Bunostegos was a type of pareiasaur. These creatures were roughly the same size as a modern-day cow. They were herbivores, or plant eaters. Pareiasaurs lived between 266 million and 252 million years ago. This was around the middle and end of a period of the Earth’s history known as the Permian.

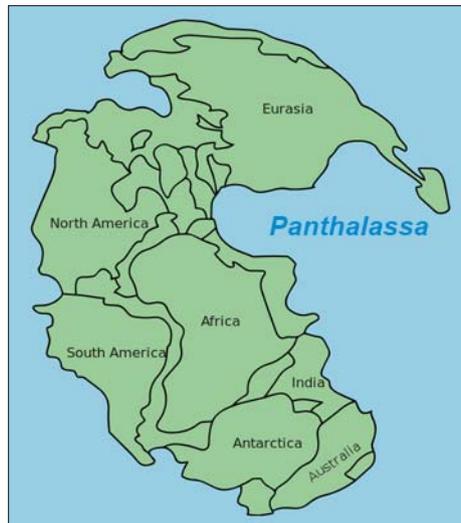


Artist's impression of *Bunostegos* (M. Turner)

Many millions of years ago the landmasses, or continents, that we know today were in different places. Over very long periods of time they “drifted” apart from one another, or joined together. It’s thought that at several times in the Earth’s history all the continents were one large landmass. One of these “supercontinents” is believed to have existed between 1.1 billion and 750 million years ago. Scientists call this huge landmass Rodinia.

Rodinia eventually broke up. Yet by the time of the Permian the landmasses are thought to have drifted

back together again to form another supercontinent. This huge landmass has been given the name Pangea. The ocean that surrounded it is known as Panthalassa. Both names come from Ancient Greek. Pangea means “all” and “Earth”. Panthalassa means “all” and “ocean”.



How Pangea and Panthalassa may have looked

Niger, where the *Bunostegos* fossil was found, is a modern-day country in Africa. Yet when these creatures lived, this part of Africa was in the middle of Pangea. Scientists believe that there was a large desert in the central part of this landmass. It seems to have acted as a barrier. Few creatures moved into the desert and those that lived there did not move out. This meant that animals like *Bunostegos* evolved in different ways to those that lived in the wetter parts of Pangea.

All pareiasaurs had bone-like armour on their backs. They also had bulbous growths on their skulls. However, of all the pareiasaurs discovered so far, *Bunostegos* seemed to have had the most and biggest “bony knobs” on its head. This is why it has been called *Bunostegos*. This word means “knobby roof”. The scientists say that these growths were probably covered in skin. They

may therefore have been similar to the horns of modern day giraffes.

The researchers do not know why *Bunostegos* began to walk upright. It may have meant that the creature could walk quicker. If areas of plants it fed on were far apart, walking quicker may have helped *Bunostegos* to survive.

During the Earth’s long history there have been a number of mass extinctions. Perhaps the best known was 66 million years ago. This was when the dinosaurs died out. However, the worst mass extinction in the Earth’s history was at the end of the Permian, or around 252 million years ago. Then, nearly 90% of the creatures living in the sea and 70% of those on land became extinct. They included *Bunostegos*. ■

TALIBAN CAPTURE AFGHAN CITY

Kunduz is one of the largest cities in Afghanistan. It is in the north of the country. On September 28, the Taliban attacked the city. By the end of the day Taliban leaders claimed to have captured Kunduz. Soldiers from the Afghan army withdrew to the airport. It is several miles from the city center.

The population of Kunduz is about 300,000. Its capture is probably the Taliban’s biggest success since the U.S. led an invasion of Afghanistan 14 years ago. Ashraf Ghani is the president of Afghanistan. He has just marked his first anniversary as the country’s leader.

The war against the Taliban in Afghanistan began in 2001. It had ruled Afghanistan under very strict Islamic laws. In 2001 an Islamic militant group called al-Qaeda attacked the U.S. Members of al-Qaeda [hijacked](#) four passenger planes.

Two were deliberately flown into tall buildings in New York City. Another crashed into the Pentagon. This large building, near Washington DC, is the U.S.'s military headquarters. The fourth plane crashed into a field. Around 3,000 people were killed in these attacks.



Ashraf Ghani, the president of Afghanistan

Then, the Taliban allowed al-Qaeda to operate its training camps in Afghanistan. The U.S. demanded that the Taliban hand over the al-Qaeda leaders who were in Afghanistan. When the Taliban leaders refused an American force invaded.

However, the Taliban was not defeated. Many of its supporters moved to the southern mountainous areas close to the border with Pakistan. So fighting against the Taliban and al-Qaeda continued. A few years after the U.S.'s invasion, many NATO (North Atlantic Treaty Organization) member countries sent troops to Afghanistan to help the American forces. These countries included: Britain, France, Germany, Italy, and the Netherlands.

The U.S. helped to organize elections for a president and a new parliament. During the time that foreign troops were in Afghanistan they helped train a new Afghan army and police force. Now the country has 350,000 soldiers and police.

Several years ago, Barack Obama, the president of the U.S., declared that all American troops

would leave Afghanistan at the beginning of 2015. By then, the security for parts of Afghanistan controlled by foreign soldiers had been handed over to the Afghan army. Today, there are 13,000 foreign troops in the country. Most are from the U.S. Their job is to continue to train the Afghan army and police force. Some American warplanes and helicopters are still in the country. These can be used to help Afghan forces if requested.

Many people suspected that the Taliban leaders were waiting for the foreign troops to leave. Once this happened the Taliban would try to take over again. However, the leaders of the U.S. and Britain said that the new Afghan army would be able to stop this from happening.



After capturing Kunduz, the Taliban released the prisoners in the city's jail. The Taliban commanders took all the money kept in the banks. Many military vehicles and weapons were captured. American warplanes launched air strikes after Taliban gunmen tried to attack the airport. More Afghan soldiers have been sent to the area to try to retake the city. Even if the Taliban gunmen were forced to leave the city, their attack would have been a success.

The Taliban's capture of Kunduz is embarrassing for Mr. Ghani and his government. Reports say that only a few hundred Taliban gunmen attacked the city. They managed to

force thousands of Afghan soldiers and police officers to leave. Some members of Afghanistan's parliament in Kabul, the capital city, criticized the president. They said that he must resign because of what happened in Kunduz. ■

HELPING NORTHERN BALD IBISES

Four northern bald ibis chicks recently hatched in a zoo, in Britain. Soon they will be sent to Spain. These birds used to be a common sight in southern and Central Europe, North Africa and the Middle East. Now, they are in danger of dying out. The chicks hatched at the zoo are part of a project to make sure that these birds do not become extinct. The northern bald ibis is also known as the waldrapp or the [hermit](#) ibis.

There are nearly 30 species of ibis. These birds live in many different parts of the world. Two species have already died out. In Ancient Egypt the ibis was believed to be a sacred, or holy, bird.

Most ibises walk around, or wade, in mud and shallow water. There, they look for food like shrimp and small fish. The northern bald ibis is not a wading bird. It prefers to live in rocky and near desert-like areas. These ibises make their nests on cliff ledges. They eat lizards and insects. Like vultures, the northern bald ibis doesn't have any feathers on its head. The feathers that cover its body are black. The birds have long legs. Fully-grown adults are about 30 inches (75 centimeters) in length.

Wild northern bald ibises have not been seen in Europe for over 300 years. Today, most are found in Morocco, in North Africa. A few live in Turkey and Syria. However,

the population in Turkey has been declining. For the last four years there has been a war in Syria. The birds live in a place where there has been recent fighting. None have been seen for nearly two years. Wildlife officials believe that only 500 northern bald ibises are now living in the wild.

The International Union for the Conservation of Nature (IUCN) collects information about animals and plants all over the world. It is based in Switzerland. The IUCN works out if any of these are endangered. It puts each species into one of eight classes. These range from “least concern” (not at risk) to “extinct” (no individuals left). The IUCN has put the northern bald ibis on its Red List. This means that it is “critically endangered”.



Bald ibises (BirdLife International)

More than 98% of the world’s northern bald ibis population disappeared between 1900 and 2002. Scientists are not sure why. Habitat loss, or the destruction of where the birds live, may be a reason. Building work, firewood collection and animal grazing can all destroy habitat. Chemicals, or pesticides, used to kill insects might have poisoned the birds.

Several zoos in Europe have been working together to breed northern bald ibises. The British zoo currently has 28. The oldest is 22 years old. The youngest ones hatched six months ago. This zoo has been

protecting and breeding these birds for over 25 years.

The chicks from Britain are being sent to a zoo in Southwest Spain. Currently, this zoo has 100 northern bald ibises. These birds are not kept in cages. They are free to fly around a large area. Chicks from European zoos have been gradually introduced to this group. The Spanish zookeepers plan to release the whole group into the wild before the end of the year. Then, it’s hoped that birds will start breeding in the wild. ■

STATE VISITS TO THE U.S.

Two world leaders traveled to Washington DC, the capital of the U.S., at the end of September. Both were invited for state visits. Pope Francis, the leader of the Roman Catholic Church, arrived for a six-day visit on September 22. Xi Jinping, the president of China, arrived on the same day. During their trips both men spoke at the United Nations (U.N.) headquarters, in New York City.

Presidents and prime ministers frequently travel to other countries. However, a state visit is different. State visits are formal events. For example, there will be a special welcoming ceremony. Often there is a military parade and the two countries’ national anthems are played. In the U.S., welcoming ceremonies are held at the White House, in Washington DC. This is the home and offices of the American president. During a state visit a formal dinner is usually held at the White House.

Jorge Mario Bergoglio was chosen to be the Roman Catholic Church’s leader, or pope, two years ago. He chose the name Francis. The pope comes from Argentina.

Before his visit, Pope Francis had never been to the U.S. His plane arrived at an air force base close to Washington DC. Unusually, Barack Obama, the American president, his wife and two daughters, were waiting to greet him.



Pope Francis and Barack Obama the president of the U.S., at the White House

Pope Francis then traveled to the White House. This was the third time that a pope had been to the American president’s home. The following day he went to the United States Capitol. This famous building is where the House of Representatives and the Senate meet. It is also known as Capitol Hill. While there, Pope Francis made a speech to the United States Congress. This is the elected members of the two “houses” (the House of Representatives and the Senate). Pope Francis is the first pope to address both houses (this is called a joint session).

In New York City, Pope Francis led several religious services. One was in New York’s Catholic cathedral. Then, after visiting and speaking at the U.N., he traveled to Philadelphia. The population of the U.S. is about 320 million. About 64 million or one-fifth of all Americans follow the Roman Catholic faith. In Philadelphia, Pope Francis took part in the World Meeting of Families. This is a large Roman Catholic gathering that takes place every three years. It is held in different countries. Wherever Pope Francis

went large crowds lined the streets to see him.

Mr. Xi arrived in the city of Seattle. He was appointed as China's president three years ago. In Seattle, Mr. Xi visited the Boeing Company's headquarters. Boeing is one of the world's largest aircraft makers. Mr. Xi went to the Microsoft Company's headquarters, which is also in Seattle. He made a speech to the bosses of some of the U.S.'s biggest companies. They included: the bosses of Apple, Amazon, IBM, Facebook, and Starbucks. The heads of several large Chinese companies such as Baidu, Alibaba and Lenovo also attended this event.

On September 24, Mr. Xi flew to Washington DC. As part of his welcoming ceremony there was a 21-gun salute. The firing of a gun salute is a way of marking or celebrating an important event. Mr. Xi had a three-hour long meeting with Mr. Obama. The Chinese president and his wife were guests of honor at a formal White House dinner.

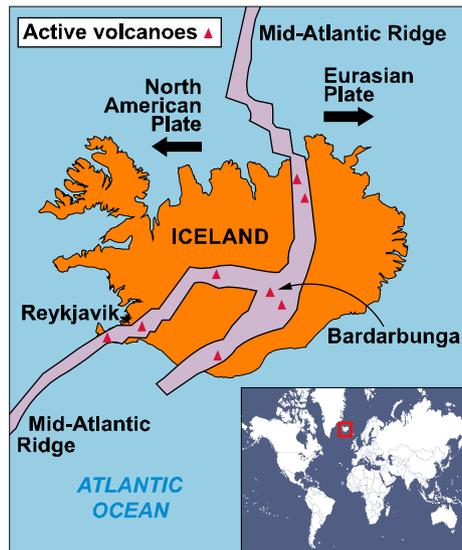


Mr. Xi, China's president, and Mr. Obama, the president of the U.S., at the White House

While in Washington DC, Mr. Xi met with the leaders of Congress. He also attended a lunch that was hosted by Joe Biden, the U.S.'s vice president. Before leaving for New York City, Mr. Xi said that he looked forward to the U.S. and China working more closely together in the future. Mr. Xi returned to China on September 28. ■

BARDARBUNGA VOLCANO

The Bardarbunga volcano is in Iceland. Last year it began to erupt. The eruption lasted for six months. Scientists from Britain have recently completed a report on what happened during this time. It says that the volcano produced a huge amount of sulfur dioxide. This gas can cause acid rain and breathing problems.



Some factories produce sulfur dioxide (SO₂). The scientists calculated that the volcano **expelled** three times the amount of SO₂ that all the factories in Europe produce in six months. When SO₂ comes into contact with moisture in the air it can form tiny droplets of sulfuric acid. These combine with other water droplets and fall as acid rain. This type of rain can affect creatures that live in oceans, lakes and rivers. It also has harmful effects on plants and stone buildings.

Lava discharged by the volcano created an enormous lava field. This covered an area of about 35 square miles (90 square kilometers). This is roughly the same size as Manhattan. This island forms much of the central part of New York City, in the U.S. The scientists say

that it was Iceland's biggest eruption for 200 years.

Iceland is home to 330,000 people. Reykjavik, the country's capital city, is home to about one-third of them. Scandinavians (people from Denmark, Norway and Sweden) first settled in Iceland over 1,100 years ago. During its history, Iceland has been ruled by Denmark and Norway. It became a separate kingdom about 100 years ago. The country has been a republic, with an elected president and prime minister, since 1944.

The higher parts of Iceland are covered by ice. The country has at least 20 active volcanoes. These have all erupted in the recent past. There is a lot of volcanic activity in Iceland. This explains why it is often called the "land of ice and fire". As well as volcanoes, the country has hot springs, geysers and bubbling mud pools. Geysers are a type of hot spring that can erupt. When this happens, water and steam are ejected high into the air.

Iceland is on the Mid-Atlantic Ridge. It is one of the few places where one of these mid-ocean ridges rises above the sea's surface. The Mid-Atlantic Ridge marks the line, or boundary, where two of the Earth's tectonic plates are moving apart.

There is a layer of very hot liquid rock deep below the surface, or crust, of the Earth. It's called the mantle. The Earth's crust is made up of huge pieces called tectonic plates. Usually called plates, they "float" on the mantle. Where these plates meet (known as plate boundaries) the edge of one can slide over or under another. The edges can also move apart or push into each other. Earthquakes are not unusual where plates meet. This is also where most of the world's active volcanoes are.

Iceland is split between two plates, the North American Plate and the Eurasian Plate. These are slowly moving apart, so Iceland is getting bigger. Plates move at about 2.3 inches (59 millimeters) each year. (A human fingernail grows at about the same speed.) Where this happens, magma comes up to the surface. It creates new land by “filling the gap between the plates”. Magma is **molten** or semi-molten rock. When it reaches the surface it is called lava.



Bardarbunga volcanic eruption (Peter Hartree)

The Bardarbunga volcano is covered in thick ice. Eruptions occur along deep cracks, or fissures. The recent eruption produced a huge amount of SO₂, but not much volcanic ash. Five years ago another volcano in Iceland erupted. It ejected a huge volume of ash. This ash formed a cloud (also known as a plume) that was blown towards Europe. Officials in most European countries decided it was too dangerous for planes to fly through it. Thousands of passenger flights had to be canceled. ■

ROMANOVS EXHUMED

The remains of Nicholas the Second of Russia and his wife, Empress Alexandra, were **exhumed** on September 23. Seventeen years ago, their bones were put inside a tomb in the Peter and Paul

Cathedral, in St Petersburg. This is Russia’s second largest city. Officials exhumed the bones to take DNA samples. In 2007 some charred, or burned, remains were dug up. The officials will use the DNA samples to confirm that these are the remains of two of Nicholas and Alexandra’s five children.

Nicholas the Second (1868 – 1918) was the last tsar (or king) of Russia. Nicholas’s family name was Romanov. The Romanovs ruled Russia from the early 1600s until Nicholas abdicated, or gave up the throne, in 1917. Nicholas became tsar after his father, Alexander the Third, died in 1894. He had married Alexandra Feodorovna two years earlier. She was a princess from the Grand Duchy of Hesse and by Rhine. Soon after Alexandra was born, this duchy became a part of Germany. She and Nicholas had five children. The four oldest were girls.

During Nicholas’s lifetime Russia had a prime minister and a parliament. However, the tsar made all the important decisions. This system of government is known as an absolute monarchy. During the First World War (1914 – 1918), Russia fought alongside France and Britain against Germany and the Austro-Hungarian Empire. Russia lost several large battles. Support for the tsar declined. Factory and farm workers were unhappy. Few had enough to eat.

There were many large demonstrations against the tsar. In 1917, protest leaders imprisoned Nicholas and his family in one of their royal palaces. Nicholas agreed to abdicate. The demonstrations eventually led to the Russian Revolution. Russia then became a communist country with Vladimir Lenin (1870 – 1924) as its leader.

In 1918 the communist leaders thought it too dangerous to keep the royal family alive. They were worried that the tsar’s supporters might try to rescue them. On July 17, 1918, communist officials went to the house where Nicholas and his family were being held prisoner. The family were told to go to a room in the basement. There, they were shot and killed. Their bodies were buried in secret graves.

In 1991 Russia ceased to be a communist state. Soon afterwards an investigation to find out what happened to the Romanovs was carried out. The bones of two adults and three younger people were discovered in 1991. In 1998 scientists said that DNA tests showed that these were the remains of Nicholas and Alexandra and three of their daughters.



Family photograph of Nicholas the Second with his wife and five children taken in 1913

The bones were reburied in the cathedral, exactly 80 years after the family were murdered. Yet no bones belonging to the two other children, Alexei, the tsar’s 13-year-old son, and one of the daughters were found. This led to rumours that they had survived the massacre. Then, in 2007, the bones of two other people were dug up. They had been buried close to where the remains of Nicholas, his wife and three daughters were discovered.

Fifteen years ago the Russian Orthodox Church declared that it had canonized Nicholas and his family. This meant that they had become saints. Under Orthodox Church laws, the remains of saints are holy **relics**. Church leaders therefore want to be sure that all the remains belong to the Romanov family.

In recent years DNA tests have become more accurate. Also, DNA samples from other known close relatives can now be used. They include DNA samples from Alexander the Second (Nicholas's grandfather) and Grand Duchess Elisabeth of Russia. She was Alexandra's older sister.

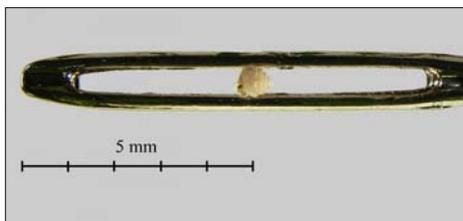
Alexander the Second was assassinated. A bomb killed him in 1881. The DNA sample will be taken from the blood stained uniform he wore at the time of his death. Communist supporters murdered Grand Duchess Elisabeth and her husband in 1918. However, their remains were taken out of Russia. They were eventually reburied in a Russian Orthodox church, in Jerusalem. ■

WORLD'S SMALLEST LAND SNAIL?

Researchers working in China have discovered seven new species of tiny land snails. Very small snails are called "microsnails". The snails' shells were found in soil samples collected at the bottom of some limestone rocks. The light gray shells were empty. The researchers are therefore yet to find any of these new microsnails alive.

Snails and slugs are known as gastropods. They belong to a larger group (or phylum) called mollusks. Other mollusks include clams, oysters and mussels. The name gastropods come from two words in Ancient Greek. They mean "stomach"

and "foot". There are land snails, freshwater snails and snails that live in the seas and oceans. Land snails have lungs. Most of those that live in water breathe through gills. However, some water snails have lungs. They have to come to the surface to breathe.



Newly discovered microsnail in the eye of a sewing needle (Dr. Barna Páll-Gergely and Nikolett Szpisjak)

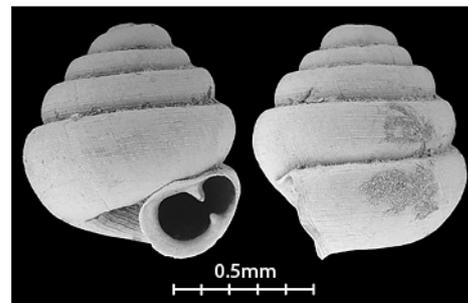
Unlike slugs, snails have shells. These are mainly a round spiral shape. Some snails have longer cone shaped spiral shells. Snails withdraw into their shells if they sense danger. Some snails hibernate. When they do this they remain inside their shells. Land snails may also stay in their shells if the weather is very dry.

Land snails are nocturnal, so they are more active at night. They do not like bright sunshine. These snails can be seen moving during the day if it is cloudy. Snails have two pairs of tentacles on their heads. One pair is longer than the other. The snail's eyes are at the end of the longer tentacles. It uses the shorter ones to smell. Land snails cover their bodies with a thin layer of mucus. This stops them from drying out. When they move, a trail of this mucus is left behind. The mucus protects the snail's body when it moves over sharp objects.

Each snail is a male and a female. These types of creatures are called hermaphrodites. However, they have to find another snail to mate with. After mating both snails are able to lay eggs. Land snails make

a small hollow in the soil for their eggs. Once laid, the eggs are covered over. They can take between two and four weeks to hatch. Some kinds of snail give birth to live young.

Most snails eat living plants. They have a narrow, or ribbon-like, tongue. This is called a radula. It has rows of very tiny teeth. Snails use their radula to cut up bits of plant that are then swallowed. The world's largest snail is found in Africa. Called the giant African snail, it can be 12 inches (30.5 centimeters) in length. In some countries, these large snails have become an invasive species.



The empty shells of two of the newly discovered microsnails (Dr. Barna Páll-Gergely)

Microsnails are snails whose shells have a diameter of less than 0.12 inches (five millimeters). The smallest ones are a type of sea snail. These snails are about 0.015 inches (0.4 millimeters) long. The shells of the smallest of the seven new land snail species have a height of 0.03 inches (0.86 millimeters). Ten could fit in the eye of a sewing needle. The researchers say that these tiny snails probably live in cracks in the limestone. There, they eat the algae that grow on the rocks. ■

ROBOT-COCKROACH

Scientists in Russia have designed and built a robot-cockroach. They decided to make a robot that looked like one of these insects. The

scientists wanted it to move like a cockroach and to be about the same size. It took them seven months to create their first [prototype](#).

There are around 4,000 different types of cockroach. Most live in rainforests and wooded areas. About 30 species can be found in people's homes and other buildings. Here, the cockroaches like the warmer temperatures. Normally, there is also plenty of food. These cockroaches can survive without eating or drinking for several weeks. Cockroaches that live in outdoor places feed on rotting plants.



Real cockroach with robot-cockroach (BFU)

Cockroaches have been on the Earth for millions of years. Fossils show that the cockroaches we see today are similar to those that lived 200 million years ago. So these insects existed at the same time as the dinosaurs.

The Russian scientists wanted to copy a cockroach species called *Blaberus giganteus*. It is also known as the Central American giant cave cockroach. This cockroach is found in Colombia, Venezuela and several Central American countries. It is one of the world's largest. Females are about four inches (ten centimeters) long. The males are smaller. These cockroaches like places that are moist, or damp, and dark. They are found in caves, hollow trees and cracks in rocks.

However, the Russian scientists were not able to get any of

these cockroaches. They therefore decided to use the *Blaberus craniifer*. These cockroaches are very similar to *B. giganteus*, but about half the size. They are also called the death's head cockroach. This name comes from a mark on the back of their heads. It looks a bit like a human skull. Death's head cockroaches cannot climb up glass walls. This is one reason why some people keep them as pets. If these cockroaches are put in an empty tank, or aquarium, they cannot climb out.

The scientists spent two months studying the cockroaches and how they moved before making the robot. It has two sensors. One detects light. The other is used to stop the robot-cockroach from bumping into things. It can travel at a speed of 12 inches (30 centimeters) per second. The robot can be controlled with a smartphone app. Its battery has enough power for about 20 minutes running time.

Now that the scientists have made a successful prototype, they are working to improve it. They want to increase its battery life. The scientists also plan to attach a small camera. The prototype was designed so that it can carry something that weighs up to ten grams (0.35 ounces).

The scientists say that the Russian army is interested in their robot. They could be used for "search and rescue" operations. For example, when a powerful earthquake strikes it is not unusual for people to be trapped under collapsed buildings. It can be difficult to rescue them. A small robot that can move through tiny spaces could help find people who are trapped and still alive. ■

WILDEBEEST MIGRATION

Every year over two million animals move between Tanzania's Serengeti National Park and the Maasai Mara National Game Reserve, in Kenya. Some people describe this twice-yearly migration as "the Greatest Show on Earth". On September 29, wildlife officials in Kenya began broadcasting film of the migration on the internet. At this time of year, the animals are beginning their southward journey from the Maasai Mara to the Serengeti.

About 1.5 million of the migrating animals are wildebeest. These animals are also called gnus. In the Dutch language wildebeest means "wild beast" or "wild cattle". An adult wildebeest is about 4.5 feet (1.4 meters) tall at the shoulder. They can weigh as much as 600 pounds (272 kilograms). The animals have short, sharp curved horns.



Wildebeest (Muhammad Mahdi Karim)

Wildebeest are only found in the southern and eastern parts of Africa. Their habitats, or places where they live, are grassy plains and areas of open woodland. The animals live in large herds. Wildebeest are active during the day and night. They spend much of the time eating grass.

In Tanzania and Kenya the animals are famous for their migration. Each year, wildebeest move northwards from the Serengeti National Park to the Maasai Mara Game

Reserve. This migration normally happens in May or June. Then, at the end of September or in October, the wildebeest begin to return.

The migration route is like a long thin oval path. The wildebeest travel around the route in a clockwise direction. Each circuit is about 700 miles (1,125 kilometers) long. Many visitors travel to this part of Africa to watch the migrating animals.

Around 400,000 zebras and 200,000 gazelles travel alongside the wildebeest. Other animals hunt and kill, or prey on, the migrating animals. These include: lions, cheetahs, hyenas, and wild dogs. This is probably why wildebeest travel in such big herds. Animals that feed on them find it easier to catch and kill wildebeest if they are not part of a big herd. During their migration, wildebeest have to cross the Mara River. This river is home to many crocodiles. They too prey on wildebeest. Vultures follow the migrating animals. These large birds are [scavengers](#). They feed on [carcasses](#) of animals that have died or been killed.



Wildebeest crossing the Mara River during their twice-yearly migration (Christopher Michel)

It's thought that the weather is the reason for the migration. The Serengeti and Maasai Mara have different amounts of rain. It also rains at different times of the year. When the rains arrive, the grass grows quickly and it is much greener. The animals therefore move from one place to the other for the better grass.

During their southward migration, female wildebeest give birth to about 300,000 calves. The calves only take a few minutes to learn to walk. After several days they can run with the herd.

The officials in Kenya announced that the daily broadcast would be between ten and 20 minutes long. The last one is to be shown on October 5. ■

BURKINA FASO UPRISING ENDS

Michel Kafando, the interim, or temporary, president of Burkina Faso, spoke on September 23. His speech marked his return to power and the end of several uprisings by the presidential guard. Mr. Kafando declared that he would continue to lead the country until new elections are held.

For many years Burkina Faso was a colony of France. Then, it was known as Upper Volta. It became an independent nation in 1960. The country's name was changed to Burkina Faso in 1984. In the local language, Burkina Faso means "the land of the upright (or honest) men". People who come from Burkina Faso are called Burkinabé.

Burkina Faso is a member of the African Union (AU). This organization has 54 member countries. It is also part of a regional organization called the Economic Community of West African States (ECOWAS).

Problems began in Burkina Faso at the end of last year. Blaise Compaoré had been the country's president of 27 years. Before he seized power in 1987, Mr. Compaoré was a soldier. In later years, Mr. Compaoré won four elections. The last was in 2010. However, many people disputed these election results.

They claimed that there had been cheating and many votes were counted incorrectly.

Mr. Compaoré set up a presidential guard. It was made up of 1,300 well-trained soldiers. Their job was to protect the president. The presidential guard was separate from the rest of the country's army.



The next elections in Burkina Faso are supposed to take place this year. The rules by which the country is governed, or its constitution, say that Mr. Compaoré could not stand again. However, about ten months ago, the political party that Mr. Compaoré led arranged a special debate in Burkina Faso's parliament. It planned to change the constitution. This would mean that Mr. Compaoré could take part in the next election.



Michel Kafando, Burkina Faso's temporary president

A few days before the debate, crowds gathered in the center of Ouagadougou (pronounced gua-ga-do-gu), Burkina Faso's capital city. Tens of thousands of people took part in large demonstrations.

All said that Mr. Compaoré should not stand again. Police used tear gas to try to control the protests. On the day of the debate, protesters set fire to a part of the parliament building.

As the protests continued, Mr. Compaoré fled. He is now in Ivory Coast (Côte d'Ivoire), a nearby country. After the president left, a senior officer from the presidential guard announced that he was in charge of the country. Later, leaders from the AU traveled to Burkina Faso. They persuaded the presidential guard leader to hand over power to Mr. Kafando. Mr. Kafando, the AU leaders said, would act as a temporary leader until new elections were organized. Mr. Kafando used to be one of Mr. Compaoré's government ministers.

Ten months later, on September 16, members of the presidential

guard went to Mr. Kafando's office and arrested him. The orders to do this were given by a different senior presidential guard officer. He feared that Mr. Kafando was planning to disband the guard. This officer then announced that he would run the country. He expected army leaders to support him. They refused. About one week later, they sent soldiers to the capital city to attack the presidential guard.

The heads of Nigeria, Ghana, Benin, and Niger traveled to Ouagadougou on September 23. These are all ECOWAS member countries. After they arrived, army leaders said that they would not attack the presidential guard. Senior officers of the guard then agreed that Mr. Kafando should be restored to power. Two days later, Mr. Kafando disbanded the presidential guard. ■

ELECTION IN CATALONIA

An election was held for the parliament of Catalonia on September 27. Catalonia is a part of Spain. The country is divided into 17 regions. Catalonia is one of them.

Spain is a constitutional monarchy. Its monarch (currently King Felipe the Sixth) is the head of state. The country is run by an elected prime minister and his or her government. These people are elected in national elections. These are votes in which all adults in the country can take part. The national parliament is in Madrid, Spain's capital city. It makes decisions that affect the whole country.

Spain's system of government is decentralized. This means that its 17 regions make many of their own local decisions. Each region holds its own elections. These are



This map shows countries to which news stories refer in this issue. Visit www.newsademic.com for more detailed world maps.

for a president and a parliament. Artur Mas has been Catalonia's president since 2010. He is also the leader of a political party called the Democratic [Convergence](#) of Catalonia (CDC). Mr. Mas and CDC supporters believe that Catalonia should be an independent or separate country.

Catalonia is in the northeast of Spain. Around 300 years ago it was a separate nation. Catalans (or the people who come from Catalonia) have their own language, traditions and flag. Barcelona is Catalonia's biggest city. It is the second largest city in Spain. Spain's population is about 47 million. Of these roughly 7.6 million live in Catalonia.



Catalonia is one of the wealthiest regions of Spain. However, many Catalans complain that the Spanish government takes too much money made by Catalonia. This, they claim, is then used to help Spain's less wealthy regions. About 16% of Spain's population live in Catalonia. Yet around 30% of all Spain's exports come from the region. Exports are items that are sold to other countries.

Last year Mr. Mas said that a referendum about independence would be held in Catalonia. People in the region would be able to vote "yes" or "no" to being a separate country. The Spanish government in Madrid insists that current laws mean that

independence for any of Spain's 17 regions is not possible. The most senior Spanish court declared that a referendum vote on independence in Catalonia would be unlawful.



Independence supporters with Catalanian flags

Mr. Mas then decided to hold an unofficial referendum. No government workers or money was involved. The vote, or ballot, was organized by [volunteers](#). About 2.2 million people voted. This was about half of those [eligible](#) to vote in Catalonia. Roughly 80% of those who took part voted "yes".

Before the recent election for Catalonia's parliament, Mr. Mas said that this "official" ballot would also be a vote on independence. Catalonia's parliament has 135 seats. To have a majority a party, or group of parties working together, must get at least 68 seats. Mr. Mas declared that if pro-independence parties won a majority it would be an official "yes" for independence.

Before the election the CDC helped set up an organization called "Together for Yes". Other parties that also want independence were invited to join. After all the votes were counted, it was announced that "Together for Yes" had won 62 seats. However, a party called the Popular Unity Candidacy (C.U.P.) got ten seats. Its supporters also want independence. Yet

the C.U.P. was not part of the "Together for Yes" campaign.

The CDC and C.U.P. have very different political views. The C.U.P. wants independence for different reasons. It is a socialist, or left wing, party. The CDC is a conservative, or more right wing, party. However, Mr. Mas and the leader of the C.U.P. have agreed to talks. If they can work together, they would have a majority in the parliament.

Many people think that the election result means that Catalonia will not become independent. Of the total number of people who took part, 48% voted for pro-independence parties. Therefore 52% voted for parties that don't want Catalonia to be a separate country. ■

HAJJ STAMPEDE

On September 24, several streets in Mina became overcrowded. A [stampede](#) began. At least 800 people were crushed to death. Hundreds of others were badly hurt. Mina is a small town near Mecca, in Saudi Arabia. All of those killed or injured had traveled to Mecca to take part in the Hajj.

The Hajj is a pilgrimage to the city of Mecca. It takes place every year. All Muslims believe that Muhammad was God's messenger and a prophet. He was born in Mecca about 1,400 years ago. A pilgrimage to Mecca is meant to help people devote themselves to their religion. There are about 1.6 billion Muslims in the world. All are expected to undertake the Hajj at least once during their lifetimes.

The Hajj lasts for about seven days. During it Muslims perform several rituals, or ceremonies. These represent important ideas in

the Islamic faith. One ceremony takes place at Mina. This town is about three miles (five kilometers) from Mecca. Nowadays, an electric train runs between Mecca and Mina. Thousands of buses also travel between the two places. However, many pilgrims still prefer to walk from Mecca to Mina.



Tent city at Mina (Al Jazeera)

Around two million people travel to Mecca for the Hajj. Because of the numbers, a huge tent city was built close to Mina. This is where most pilgrims stay. The tents are made of a special material that cannot catch fire. At Mina, the pilgrims perform a special ritual. They throw small stones, or pebbles, at three walls. These walls, which used to be pillars, represent the Devil.

Many years ago a bridge was built around the old pillars. Pilgrims could then throw stones at two levels. This construction is called the Jamaraat Bridge. It was rebuilt in 2006. The pillars were replaced with three bigger walls and more levels added. Mina's tent city is close to the Jamaraat Bridge.

People staying in the tent city are told the times at which they can go to the Jamaraat Bridge. These times are spread out between sunrise and sunset. This is to stop the bridge from getting too crowded. The stampede happened when many people were walking along a tent city street towards the Jamaraat Bridge. They met a big crowd coming the other

way. These people were returning from the stoning ritual. Other pilgrims arrived from a side street. As the crowd grew, some people fell to the ground. They were trampled on and caused others to fall.

This was not the first accident to happen during the Hajj. In 1990 over 1,000 pilgrims died in a stampede inside a [pedestrian](#) tunnel. In 2006, 346 people died in another crush. This year there was another accident. A tall crane fell, or toppled, over during a storm on September 11. It crashed into part of the Grand Mosque in Mecca. This accident killed over 100 people.



The Jamaraat Bridge at Mina (Al Jazeera)

The people who died in the stampede came from many different countries. Over 400 were Iranians. After the accident, Iran's leaders claimed that Saudi Arabia was unable to manage the Hajj safely. They said that other Muslim countries should be allowed to organize the annual pilgrimage in the future. ■

STARFISH SOLUTION?

Researchers from a university in Australia have made a surprising discovery. They say that a crown-of-thorns starfish will die if it is injected with vinegar. In recent years huge populations of these starfish have damaged the Great Barrier Reef. The researchers say that vinegar could be an easy and inexpensive

way of controlling crown-of-thorns starfish numbers.

The Great Barrier Reef is the largest coral reef in the world. It is over 1,250 miles (2,000 kilometers) long. The reef is off the northeast coast of Australia. It is a specially protected area. The Great Barrier Reef is an important ecological site. It is home to thousands of marine species. Many of them are endangered.

Adult crown-of-thorns starfish are about 18 inches (46 centimeters) in diameter. They are covered in long sharp spines from which the starfish gets its name. The starfish feed on coral. Adults can eat around 65 square feet (six square meters) of living coral every 12 months. Crown-of-thorns starfish have lived on the Great Barrier Reef for thousands of years. However, over the last 20 years their numbers have greatly increased.

Crown-of-thorns starfish breed for about two months every year. Females can produce 65 million eggs in one breeding season. The eggs become larvae. Starfish larvae feed on tiny organisms called phytoplankton. Most phytoplankton have only one cell. Some are bacteria, but many are algae, or very tiny plants. Normally, most starfish larvae would not reach adulthood. Many marine creatures feed on them. Others die because they cannot find enough to eat.

For many years fertilizers have been used on farmland in Australia. Some of these get washed into rivers and then out to sea. Phytoplankton algae feed on the fertilizer chemicals. So the amount of these algae has greatly increased. More tiny algae around the Great Barrier Reef means that there is much more food for the starfish larvae. Thus, in recent years, many more have

survived and grown into adults. Nowadays, there are thought to be at least 12 million crown-of-thorns starfish on the Great Barrier Reef.



Crown-of-thorns starfish on coral

A few years ago a system was set up to try to control the starfish. Divers working from two boats inject the starfish with a chemical. Last year the divers killed about 350,000 starfish. However, this chemical is expensive. It also has to be mixed correctly. If this is not done the starfish will survive. It would be much simpler to use vinegar. It could even be bought from a shop or supermarket.

Researchers at another Australian university have been working on a device that may help the divers. It looks like a small submarine. The device has a camera and can be remotely controlled. It has an extendable arm that is designed to inject the starfish. If several of these devices were in use many more starfish could be culled, or killed.

However, some people think that the injections are unlikely to solve the problem. They say that the best way to control starfish numbers on the Great Barrier Reef is to stop using fertilizers on the land. ■

VW'S EMISSIONS SOFTWARE

In the U.S. there is an organization called the Environmental Protection Agency (EPA). Its job is to make sure that laws past in the

U.S. about the environment are obeyed. On September 18, officials from the EPA sent a legal letter, or notice, to the Volkswagen Company. It accused the company of cheating when its diesel cars were tested in the U.S. These tests are done to make sure that a car's **emissions** do not contain high amounts of harmful gases.

Two days later, bosses at the German company admitted that many Volkswagen diesel cars were fitted with special software. This software was designed to "switch on" when Volkswagen cars were being tested. The software makes the engine operate differently. By doing this, harmful emissions that the car produces are greatly reduced. Because their emissions were low, the cars passed the EPA tests. Yet, when driven on the road their emissions were at a much higher level.

Today, Volkswagen is one of the most successful car making companies in the world. Volkswagen is German for "people's car". In the 1930s Adolf Hitler became the German leader. Then, as they were very expensive, only a few people owned cars. Hitler wanted to build a simple car, which ordinary Germans could afford to buy. This was what Volkswagen called its "Type 1". After the end of the Second World War (1939 – 1945) the Type 1 became the famous Volkswagen Beetle.

Volkswagen's headquarters is in Wolfsburg, in northern Germany. Its factory is the biggest car plant in the world. The company has nearly 600,000 workers. Last year it made a profit of €10.8 billion (\$12 billion). Over the years Volkswagen has bought, or acquired,

many other well-known carmakers. These include: Audi, Bentley, Bugatti, Lamborghini, Porsche, SEAT, and Skoda.

Volkswagen is a European carmaker. Some time ago most governments in Europe decided that diesel cars were "cleaner" than cars with gasoline engines. Diesel cars produced less carbon dioxide. Some governments lowered taxes on diesel cars. This was done to encourage people to buy them. Today, about 50% of cars sold in Europe have diesel engines. However, diesel cars produce gases that are a mixture of nitrogen and oxygen. These are called NOx. It's now known that breathing in large amounts of these gases can damage a person's health.

The Volkswagen bosses wanted to sell more of their cars in the U.S. Not many diesel cars are sold in America. One reason is that emissions tests in the U.S. are stricter than European tests. Volkswagen wanted to persuade Americans to buy their diesel cars. The engines could be designed to pass the EPA emissions tests.

Yet this would mean that the cars would be slower and use more fuel. The "cheat software" solved the company's problem. Its diesel cars would pass the tests but still drive just as fast and use less fuel. This made them easier to sell.

Volkswagen declared that about 11 million of its cars are fitted with the "cheat software". They are in many different countries. All these cars will have to be recalled and the software removed. However, many people who bought Volkswagen diesel cars are unhappy. They believed that they bought a car with "low" emissions. This was untrue.



Many customers are expected to demand **compensation** payments. What's more, because of the news about the emissions tests, few people are now buying Volkswagen diesel cars. The emissions test **scandal** is expected to cost the company a lot of money. Some people say that this sum will be €18 billion (\$20 billion). Yet others expect it to be much higher.

On September 23, Volkswagen's boss, Martin Winterkorn, announced that he would resign. He insisted that he knew nothing about the "cheating software". ■

FLOWING WATER ON MARS

Scientists working at NASA (The National Aeronautics and Space Administration) made an important announcement on September 28. They said that they had discovered liquid water on Mars. The discovery of flowing water means that the chances of finding life on Mars are much greater. However, if life forms do exist they are likely to be tiny microbes.

The discovery was made using special cameras and other instruments on an unmanned spacecraft called the *Mars Reconnaissance Orbiter* (MRO). This NASA spacecraft began circling, or orbiting, Mars in 2006. Currently, including the MRO, five spacecraft are orbiting Mars. Two rovers, or remotely controlled vehicles, are on the planet's surface. NASA controls both of them.

Mars is named after the Roman god of war. It is often called the "Red Planet". In the night sky the planet looks a brownish-red color. A rust colored dust covers most of its rocky surface. Together with Mercury, Venus and the Earth, Mars is one of the Solar System's four rocky

planets. (The other planets are mostly made of gases.) Mars is much smaller than the Earth. However, the size of its landmass is similar. This is because about 70% of the Earth's surface is covered by water.

Mars' gravity is much weaker than the Earth's. If you could stand on the planet's surface you would be able to jump about three times higher than you can on the Earth. From Mars, the Sun would look about half the size.

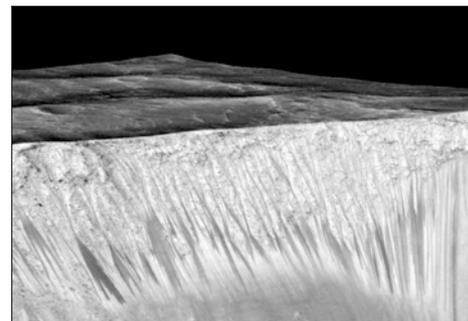


Mars (NASA)

It's known that Mars was very different about four billion years ago. Then, it had a large ocean, thick clouds and an atmosphere with big amounts of carbon dioxide (CO₂). The ocean covered about 20% of Mars' surface. Unlike the Earth, Mars has a very weak magnetic field. The Earth's magnetic field acts as a shield. It protects our atmosphere from solar winds. Huge explosions on the surface of the Sun create these winds. They contain millions of tons of magnetically charged particles, or atoms. Many scientists think that Mars' atmosphere was gradually "stripped away" by these solar winds.

Over time, the atmosphere got thinner and thinner. The drop in pressure meant that much of the water disappeared into space. With its thinner atmosphere, Mars became

much colder. What liquid water remained turned to ice. Scientists think that some of Mars' old ocean is now frozen at the planet's polar caps.



Recurring slope lineae on Mars (NASA)

Like the Earth, Mars is tilted on its axis. This means that it also has seasons. A few years ago the MRO registered something unusual. During Mars' summer months, it recorded dark marks, or streaks, on the sides of some craters and valleys. These were in the middle of the planet, or the warmest part. The dark streaks look like small streams that slowly get longer. In the colder winter months, they disappear. NASA scientists called them "recurring slope lineae" (RSL).

Making use of its other equipment, the MRO discovered that the dark marks or flows contained salts. These salts disappeared when the flows stopped. The scientists are sure that the salts are contained within very salty, or briny, water. The scientists do not know where this water comes from. It's likely to be ten times saltier than the seas on the Earth. Water freezes at 0°C (32°F). Yet salty water remains liquid at much lower temperatures.

Very salty water (far saltier than seawater) exists on the Earth. Certain types of microbe are able to live within it. Scientists say that it's therefore possible that similar microbes might be found in or next to the RSLs on Mars. ■

WORLD RHINO DAY

Many zoos around the world organized special events on September 22. Since 2010 this date has been designated as World Rhino Day. The purpose of the day is to make people aware that not many rhinoceroses (or rhinos) are left in the world. Nowadays, all rhinos living in the wild are protected. It is unlawful to harm or hunt them.

The rhinoceros is what's known as a mega-vertebrate. It is one of the world's largest mammals. The biggest rhinos are 13 feet (four meters) long. They weigh over 7,940 pounds (3,600 kilograms). Rhinos are easily recognized by their horns. These stick up from the front of their snouts, or noses. The animals are herbivores, or plant eaters. They mainly eat grass.

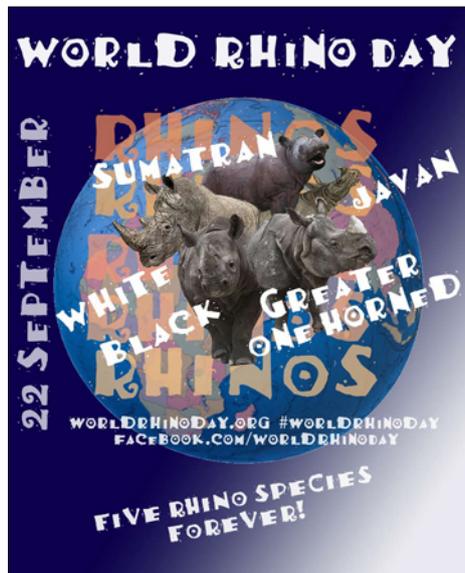
There are five species of rhinoceros: black, white, Sumatran, Javan, and Indian. The Indian rhino is also known as the greater one-horned rhinoceros. White rhinos and the black rhinoceros are found in Africa. The Sumatran and Javan rhinoceros live in Indonesia.



Sumatran rhino at Cincinnati Zoo (Trisha Shears)

Of all rhinos, the white rhinoceros is the largest. There are two sub species of white rhino. They are known as the northern white rhinoceros and the southern white rhinoceros. The names of African

rhinos are confusing. Both white and black rhinoceros are a gray color. The black rhinoceros was given the name “black” to distinguish it from the white rhino.



Many northern white rhinos used to live in Central and East Africa. Now only four remain. Three are in Kenya and one is in a zoo in the U.S. The ones in Kenya are guarded day and night. Southern white rhinos live farther south, in countries such as Namibia, Botswana and Zimbabwe. At least 16,000 southern white rhinos live in the wild. There are more southern white rhinos than any other type of rhinoceros.

The Indian rhinoceros used to be found all over India and parts of Pakistan and Nepal. After the white rhinoceros, it is the second largest rhino. Wildlife officials now believe that there are about 3,500 Indian rhinos living in the wild. Most are in northern India and parts of southern Nepal. Both the Javan and Sumatran rhinos are in danger of dying out. They live in different parts of Indonesia. Only 57 Javan rhinos remain. All are in one of Indonesia's national parks. None of these animals are kept in zoos. In the past many Javan rhinos

were illegally killed for their horns. These were then used in traditional Chinese medicines.

The Sumatran rhinoceros has two horns. It is also known as the hairy rhinoceros. Of the five rhino species, it is the smallest. These rhinos used to live in the forests in India, Bangladesh, Myanmar (also known as Burma), Laos, Thailand, Malaysia, Indonesia, and south west China. They too were hunted for their horns. About 200 Sumatran rhinos survive. Half of them live in a special sanctuary in Indonesia.

On World Rhino Day people working at the sanctuary had something to celebrate. One of their females is pregnant. The father was brought to Indonesia from a zoo in Cincinnati, in the U.S., several years ago. Another male Sumatran rhino is kept at this zoo. This one will also be sent to the Indonesian sanctuary before the end of the year.

A rhino's gestation, or pregnancy, is 16 months long. Of all the world's land animals, the rhino has the second-longest gestation period. Elephants have the longest. Female elephants are pregnant for nearly two years. ■

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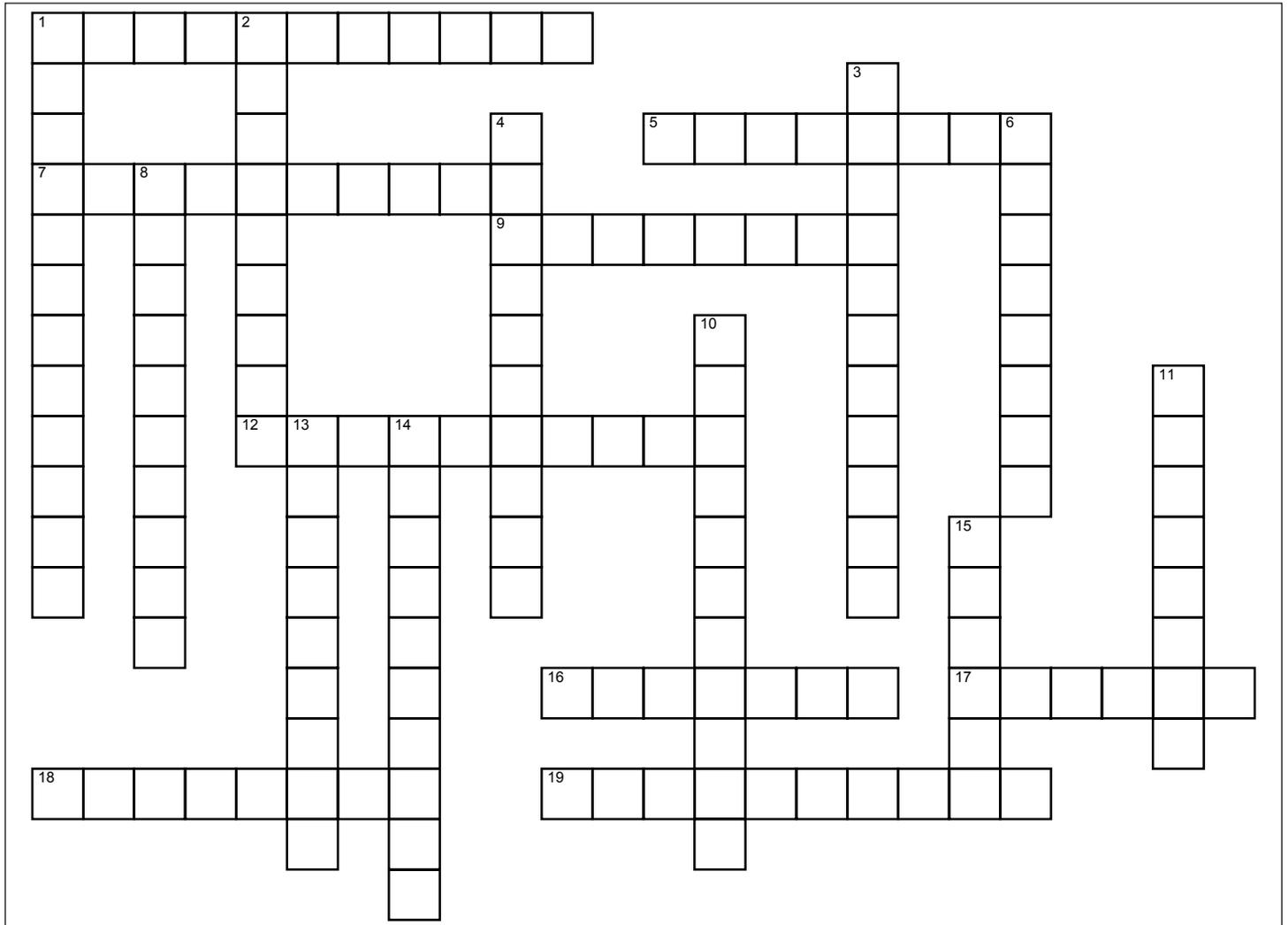
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ISSUE 259

GLOSSARY PUZZLE

INSTRUCTIONS: ① Complete the crossword. The answers are highlighted in orange in the news stories. There are 25 words highlighted and you need 20 of them to complete the crossword. ② Once you have solved the crossword go to the word search on the next page ➡



Across

- 1 *Noun* Coming together
- 5 *Adjective* Describes a person or organization that does not have extreme political views
- 7 *Adjective* Describes a place where people can walk
- 9 *Verb* Left an organization because you no longer wished to be part of it; usually used for people who leave the military
- 12 *Noun Plural* Animals or insects that eat decaying organic matter, including dead animals that have already been killed
- 16 *Verb* Dug up a dead body for an investigation or for reburial
- 17 *Adjective* Describes something that has been turned to a liquid by heat; especially metal, glass and rock
- 18 *Noun* A sudden, rushed movement of a large number of people or animals, usually in panic
- 19 *Noun* Having wealth and success

Down

- 1 *Noun* Something, usually money, given to make up for loss, suffering, or injury
- 2 *Noun Plural* Man-made gases that cause air pollution
- 3 *Verb* Getting rid of completely
- 4 *Adjective* Originating in or native to a particular country
- 6 *Adjective* Entitled or fit to be chosen
- 8 *Verb* Given an official name, title or purpose
- 10 *Verb* Given an official name, title or purpose
- 11 *Verb* Violently took control of an aircraft, ship or other vehicle while it was traveling
- 13 *Noun Plural* Dead bodies of animals
- 14 *Noun Plural* People who do things without being asked or paid
- 15 *Noun* A person who chooses to live alone and rarely speaks to others

ISSUE 259

GLOSSARY PUZZLE *CONTINUED*

INSTRUCTIONS: ③ Find 19 of the 20 crossword answers in the word search. Words can go vertically, horizontally, diagonally and back to front. ④ After finding the 19 words write down the 20th (or missing) word under the puzzle.

N A I R T S E D E P S M G U U B S D
 O B G N I V I J G U D W M Z W P U I
 I O P C M M S R E E T N U L O V O S
 T H O M R L L E S T A M P E D E N T
 A I J J E P D E S R O K R P D D E I
 S J D E H Q R Q L S E Q A K F W G N
 N A W L B T U Z T I A G M O S Z I G
 E C Q F E X X A S U G C N E N N D U
 P K P D Y F J Q H N J I R E A L N I
 M E E P E T Q R I U O I B A V H I S
 O D B O Y T I T C E T I E L C A G H
 C K B X J G A R J N A L S V E V C U
 F R P H K C U N E G P E P S B X W S
 U M M C I E D T G P U T S G I G L R
 R Z T D E D L P V I S C D A Q M U P
 L O A M N O U U T B S O D P P K E Q
 S R L L M F X W M O D E R A T E U P
 E C N E G R E V N O C G D P K E R O

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MISSING WORD ANSWER =

ISSUE 258 ANSWERS

CHALLENGE