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Street memorial to the November 2015 Paris attacks (Jean-François Gornet)

## HOLLANDE - 'WE ARE AT WAR'

On November 20, the United Nations (UN) Security Council voted on a new [resolution](#), or formal proposal. A majority of the 15-member Council voted for the proposal. It authorized the use of military force against the Islamic State (IS). This militant Islamic organization operates in parts of Syria and Iraq. It is also known as ISIS, ISIL and Daesh.

The French government requested the U.N. resolution. One week before the U.N. vote, several small groups of men attacked a sports stadium, restaurants and concert hall in Paris, the French capital city. The men were armed with automatic weapons and grenades. IS leaders declared that they planned and organized these attacks.

François Hollande, the president of France, was at the sports stadium. He was part of a large crowd watching a football match between France and Germany.

During the game there were three large explosions outside the stadium. Later, it was discovered that three suicide bombers had blown themselves up. One had planned to do this inside the stadium, but the officials checking tickets stopped him. Soon after the explosions, Mr. Hollande's security team took him away.

At the same time, other gunmen fired at people in several restaurants near the centre of Paris. Another three-man group entered a theater, or concert hall. An American group was performing. The building was full. The men fired their machine guns into the crowd. Specially trained police arrived and surrounded the theater. As they entered the building, two gunmen blew themselves up. A third was shot dead.

After the attacks were over, Mr Hollande spoke on live television. He declared that 'we are at war'. He added that

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‘terrorism will not destroy France, because France will destroy it’. The French president also announced a state of emergency. This gives the police and army special powers to arrest people. Later, it was confirmed that 130 people had died. Hundreds were badly injured. Most of the deaths occurred in the concert hall.

French police tracked some of the gunmen to an apartment in a building not far from the stadium a few days later. A gun battle followed. Several people were arrested. Three were killed. One is believed to have been the leader of the group. Another gunman managed to cross the border into Belgium. There, Belgian police began a manhunt to find him. French police confirmed that several of the attackers had recently traveled from Syria to Brussels, the capital of Belgium. Three cars used in the attacks were hired in Belgium. Some of the gunmen who blew themselves up were French citizens.

People set up street memorials outside the theater and restaurants in Paris. Many left flowers and candles. One symbol became popular. It is based on the well-known ‘peace sign’. The lines in the middle of the circle were redrawn to look like the Eiffel Tower. This world famous building is a symbol of Paris.

The Paris attacks shocked many people. Leaders of other European countries and the U.S., Canada and Australia quickly declared their support for France. As a sign of solidarity, many well-known buildings in these nations were lit up at night in red, white and blue. These are the colours of the “Le Tricolore” or the French flag.

The IS was set up in northeast Syria a few years ago. Its capital is

the Syrian city of Raqqa. Abu Bakr al-Baghdadi leads the group. He is rarely seen in public. Everyone who lives in IS controlled areas must follow very strict religious laws. The IS is now believed to have about 30,000 fighters, or gunmen. Last year it took control of a large area of western Iraq. This includes Mosul, Iraq’s second largest city.

IS leaders say they do not recognize countries like Iraq and Syria. Nor do they believe in democracy. The IS, they say, will eventually include all the Middle East and even parts of Europe. They have declared a caliphate. In the past a caliphate was a large Muslim area ruled by one person. This person, who was known as the caliph, was a religious and political leader.

IS gunmen wear black clothing. Many describe them as fanatics who are prepared to commit executions and mass murder. Over the last 18 months, hundreds of Muslims from countries such as Britain, France, Belgium, Germany, and Australia have traveled to Syria to join the IS. Most are young men. Thousands of others have gone to Raqqa from Arab countries such as Tunisia and Libya.

In Islam there is a divide. It is between Sunni and Shia Muslims. This divide, or split, began about 1,400 years ago. Of all the Muslims in the world about 85% are Sunnis. The IS is a Sunni group. It treats Shia Muslims, Christians, Kurds, and people of all other religions very harshly. However, an overwhelming majority of people who follow the Islamic faith dislike the IS. Many are angry. They say that what the IS does goes against their religion.

Last year the U.S. set up an anti-IS coalition. Many countries joined. However, all are reluctant to send soldiers to places that IS

controls. Instead several anti-IS countries have been attacking IS targets from the air. They have also been sending weapons to local groups that are fighting against the IS. The most successful of these are Kurdish fighters in northern Iraq and northern Syria. Nowadays, American and French planes carry out most of the air strikes. This is why the IS chose to attack Paris.

After the Paris attacks, Mr. Hollande ordered the Charles de Gaulle to sail to the Syrian coast in the eastern Mediterranean. This large navy ship is a nuclear-powered aircraft carrier. As soon as it arrived, the ship’s planes began to attack IS targets. The carrier is named after a famous former French general and president.



Charles de Gaulle aircraft carrier

David Cameron, the British prime minister, visited Mr. Hollande in Paris. The French president traveled to the U.S. to speak with Barack Obama, the American president. He also flew to Russia. There he met with the country’s president, Vladimir Putin. Mr. Hollande wants all these countries to work together to defeat the IS.

Military commanders all agree that IS will not be beaten by air power alone. Many politicians and people in the U.S. and Europe don’t want to become involved in a ground war in Syria and Iraq. They argue that forces from Middle Eastern countries must confront and defeat the IS. ■

## PYGMY HIPPO BABY

Zookeepers in Britain have announced the birth of a baby pygmy hippopotamus. This is a rare event. These animals are endangered. Wildlife officials believe that only 2,000 pygmy hippos now live in the wild.



Pygmy hippos

Pygmy hippos are much smaller than the better-known common hippopotamus. The hippopotamus' name comes from two Ancient Greek words. They mean "river horse". The common hippopotamus is one of the world's largest land animals. Only elephants and rhinoceroses, or rhinos, are bigger. Common hippos can weigh as much as 3,300 pounds (1,500 kilograms). They used to live in most of Africa. Yet today they are found only in certain areas. Even though they look similar to pigs, hippos are more closely related to whales and dolphins.

Hippos are semi-aquatic mammals. They are stout, or fat, with thick skin, large mouths and four toes on each foot. Hippos spend much of the time in rivers, lakes and swamps. The water and mud stops their skin from drying out. The animals are herbivores. They eat plants and not meat. Common hippos live in large groups, or pods. They can be very aggressive. Many people in Africa say that hippos are more dangerous than lions or crocodiles. This is because they are known to attack animals and people. Hippos are

nocturnal, or more active at night. During the day, they usually stay in the water with only their eyes and ears above the surface.

Pygmy hippos are different. They look like common hippos, but are far smaller. Adults are only 2.6 feet (0.8 meters) tall. They weigh about 606 pounds (275 kilograms). The behavior of pygmy hippos also differs. They live alone or in pairs and are not aggressive. Pygmy hippos spend less time in the water. At night, pygmy hippos go into the forest to look for food. They eat several types of plant and fruit. Pygmy hippos are found only in a few places in West Africa. Most live in Sierra Leone, Liberia and Côte d'Ivoire (Ivory Coast).

Ancient bones show that other large hippo species lived in Europe and Asia many thousands of years ago. Scientists suspect that a changing climate caused these hippos to gradually move to warmer parts of the world. They also shrank in size.



Common hippopotamus pod (Paul Maritz)

Wildlife experts warn that pygmy hippos are in danger of dying out. They are threatened by deforestation and hunting. Several zoos, such as the one in Britain, try to encourage their pygmy hippos to breed to increase their numbers.

The zookeepers in Britain say that the baby pygmy hippo is doing well. It weighs about 3.6 kilograms (eight pounds). They have not been able to have a close look at the baby. Its

mother is being very protective. The keepers are yet to find out if the baby is a male or female. However, they have watched it feeding and swimming. Currently, the place where the hippos live is closed to all visitors.

Not all baby pygmy hippos survive in zoos. Just after the birth in Britain, a baby pygmy hippo in an American zoo died. It was one week old. The zookeepers thought that the mother was looking after its baby. Yet, later, they discovered that the baby had not been able to get enough food, or milk, from its mother. It was the first baby pygmy hippo to be born in this zoo for more than ten years. ■

## YOUNG AL FAILS TO SELL

An unusual auction took place in Britain on November 25. Valuable paintings, ceramics or jewelry are often sold at auctions. Yet this one was held to sell a 9.3 feet (2.8 meter) long fossilized dinosaur skeleton.

The fossilized bones are from a young, or juvenile, *Allosaurus*. Unusually, almost all of this dinosaur's bones were found. In Ancient Greek *Allosaurus* means "different lizard". The average length of a fully-grown, or adult, *Allosaurus* was 28 feet (8.5 meters).

*Allosaurus* looked similar to the more-famous *Tyrannosaurus rex*. *Tyrannosaurus* is Greek for "tyrant lizard" and *rex* is Latin for "king". The two dinosaurs lived at different times. *Allosaurus* walked on the Earth about 150 million years ago. *T. rex*, which was several feet longer than *Allosaurus*, lived around 66 million years ago. This was the time when the dinosaurs became extinct. Scientists are not sure why this happened. Some believe that

they died out when a large asteroid hit the Earth. Others think that huge volcanic eruptions poisoned the air and blocked out the Sun.

*Allosaurus* was a carnivore, or meat eater. It walked on two legs and had an oversized skull and big, sharp, saw-like teeth. The dinosaur's long, powerful tail balanced its large head. The front arms, or limbs, were very short. Each ended in three fingers with sharp curved claws. *Allosaurus* are believed to have hunted in packs. They probably preyed on other larger plant-eating dinosaurs.



*Allosaurus skeleton*

A German palaeontologist, or scientist who studies fossils, dug up the *Allosaurus* skeleton. He found it in the state of Wyoming, in the U.S. Only one other young *Allosaurus* has ever been found. Most of this one's bones were missing. The bones in Wyoming were scattered over a wide area. They were mixed up with the bones of a sauropod. These dinosaurs had very long necks and tails. They walked on four thick legs. Sauropods ate vegetation such as grasses, and the leaves and smaller branches of trees. Some grew to an enormous size.

The excavation of the *Allosaurus*' bones took three years. The skeleton is the most complete juvenile *Allosaurus* skeleton ever found. It has been nicknamed "Young Al". Even though fossils are usually called bones, they have really turned into stone.

Two years ago the German scientists managed to sell another dinosaur skeleton. It was found in the same area of Wyoming. This dinosaur was a type of sauropod called diplodocus. It also lived about 150 million years ago. The scientist was allowed to take the bones out of the U.S. This was because they were found on private land. He and the landowner agreed to share the money from the auction. The diplodocus sold for £400,000 (\$601,500). It was bought by a museum in Denmark.

The company arranging the auction expected Young Al to sell for between £300,000 and £500,000 (\$451,000 and \$752,000). However, the offers, or bids, received were all below the reserved price. This is the minimum amount that an owner has decided to sell something for. The auction company now expects other possible buyers, who did not take part in the auction, to make higher bids. ■

## SPY RELEASED

Jonathan Pollard was released from prison in the U.S. on November 20. He had been behind bars for 30 years, less one day. Mr. Pollard was arrested in 1985. A court ruled that he was guilty of spying for Israel. Mr. Pollard was given a life sentence. Then, in the U.S., a life sentence was equal to 45 years in prison.

In 1948 the U.S. and the United Nations (U.N.) helped to set up a new Jewish state. Called Israel, the country was to be in an area of the Middle East known as Palestine. Thousands of Jewish people from Europe and other parts of the world moved there.

At that time, many Palestinians who lived in the area that became Israel were forced to leave their land and homes. Most had to move to refugee camps in nearby countries. After the set up of Israel, Jewish people had their own country. Yet many Palestinians were left without one.



*Jonathan Pollard around the time of his arrest*

Nearby Arab countries were angry about what had happened. The set up of a new Jewish state led to several wars between Israel and the surrounding Arab nations. Israel, with the backing of the U.S., won them easily. The U.S. is Israel's main supporter. Yet many American presidents have been disappointed that Israeli leaders have not agreed to make peace with the Palestinians. Israel's leaders blame the Palestinians for the violence. Several Palestinian groups refuse to recognize Israel's right to exist.

Many Jewish people in America hold senior positions in government and business. These people have been nicknamed the "Jewish **Lobby**". Most political experts agree that the Jewish Lobby's **influence** is powerful. It means that an anti-Israel politician is unlikely to ever be elected as the president of the U.S. This is why the U.S. has been involved in all peace talks between the Palestinians and Israel.

Mr. Pollard was born into a Jewish family. He traveled to Israel as part of a student science program in

1970. After university, he applied to join the CIA (Central [Intelligence Agency](#)). The CIA is a secret American organization. One of its jobs is to spy on what's happening in other countries. The CIA turned Mr. Pollard down. However, he did manage to get a job with the American navy's intelligence unit.

Soon after starting his new job, Mr. Pollard began passing copies of hundreds of secret, or classified, documents to Israeli agents. Much of this information was collected by American spy satellites. It included the movements of French and Russian navy ships, where Libya's anti-aircraft weapons were, and details of chemical weapons factories in Syria and Iraq. In return, the Israelis paid Mr. Pollard \$2,500 each month.

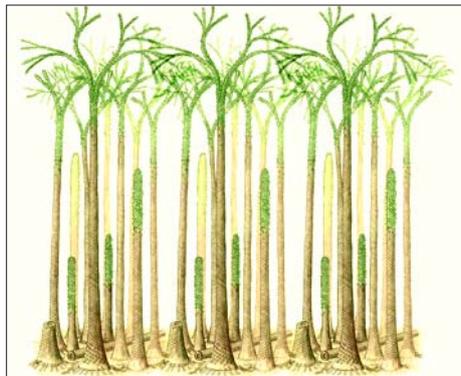
Mr. Pollard was not a good spy. He was caught within 12 months. Mr. Pollard [confessed](#). The U.S. and Israel are allies. Mr. Pollard claimed that his country should have shared the secret information with its ally. He said that he wanted to protect Israel and not harm his own country. At first, Israeli officials denied that Mr. Pollard gave secret information to them. Yet, later, they admitted what had happened and apologized.

In Israel many people think that Mr. Pollard is a hero. He is now 61 years old. In recent years, Israeli leaders have frequently asked American presidents to release him. Bill Clinton, George W. Bush and Barack Obama (at first) all refused. In 1995 Mr. Pollard was given Israeli citizenship. However, as part of the terms of his release, Mr. Pollard must stay in the U.S. for five years. Why Mr. Obama has now agreed to release him is not known. ■

## TROPICAL FOSSIL FOREST

Researchers from Britain have discovered numerous tree fossils. They were found on Svalbard. This archipelago, or group of islands, is part of Norway. The islands, which are in the Arctic Ocean, are roughly halfway between Norway's northern coastline and the North Pole. The researchers say that the trees were part of an ancient tropical forest.

From scientific tests, the researchers worked out that the ancient forest is 380 million years old. Scientists believe that the first large plants and trees started to spread across the land during a period called the Devonian. This was between 420 and 360 million years ago. Therefore, the ancient Svalbard forest contains some of the oldest tree fossils ever found.



*Drawing of what the ancient Svalbard forest may have looked like (M. Berry / J. Marshall)*

The researchers say that the forest grew near the Equator. A process known as continental drift explains why its fossilized remains are now in the Arctic Ocean. As long as 400 years ago some people suspected that the world's continents must have moved or "drifted" apart. They noticed that the outlines of the east coast of South America and west coast of Africa look like pieces of a puzzle, which fit together.

In 1912, Alfred Wegener, a German scientist, came up with the idea

of continental drift. He believed that the continents were slowly moving around the Earth. In the 1950s a new theory, called plate tectonics, meant that the movement of the continents was better understood.



*Forest fossils from Svalbard, in Norway, the blue bar is two inches long (M. Berry / J. Marshall)*

Plate tectonics explain why, and how, huge pieces of the Earth's outer layer, or crust, move. The Earth's crust is like an enormous jigsaw. It is made up of huge pieces called (tectonic) plates. These plates float on the very hot liquid rock deep below the surface. They move slowly at a speed of around 0.8 inches (two centimeters) per year.

Svalbard's fossil forest was mainly made up of lycopod trees. The forest's trees were about 13 feet (four meters) high. They had diamond patterns on their trunks. The trees' leaves were needle-like. They grew directly out of their trunks and branches. The forest was very dense, as the trees grew close together. These early trees were slightly similar to modern-day palm trees and tree ferns.

In later years, large numbers of lycopod trees grew in swampy areas of the Earth. Other layers of sand and rock eventually covered the places where these huge forests grew. Then, over many millions of years, the remains of the trees and other vegetation turned to coal.

Scientists believe that early trees, like those found on Svalbard, helped to change the Earth's climate.

During the Devonian there was far more carbon dioxide (CO<sub>2</sub>) in the atmosphere. Scientists believe it was about 15 times today's levels. Like plants, trees take in, or absorb, CO<sub>2</sub> from the air. By a process called photosynthesis, they use sunlight to turn CO<sub>2</sub> and water into starches and sugars. This is how trees grow, or build up their tissues.

In the Devonian the Earth was much warmer. This was probably because of the extra CO<sub>2</sub> in the atmosphere. Scientists suspect that trees, like those growing in the Svalbard forest, changed the climate. After these trees and forests began to expand, more and more CO<sub>2</sub> was taken out of the air. This continued over hundreds of thousands of years. The Earth started to cool. By the end of the Devonian, the amount of CO<sub>2</sub> in the atmosphere was about the same as it is today. ■

## ARGENTINA'S NEW PRESIDENT

An election for the president of Argentina took place on November 22. The following day the country's electoral commission, or the organization in charge of the vote counting, announced the results. It declared that, with just over 51.4% of the votes, Mauricio Macri was the winner.

Argentina is the second-largest country in South America. (Brazil is the biggest.) For many years this part of South America was controlled by Spain. Independence from Spain was declared in 1816. In the late 1800s thousands of people from European countries went to live in Argentina. Most traveled from Spain and Italy. Today, Argentina is home to 43 million people. The country's official language is Spanish.

Argentina is well known for its productive farmland. It is one of the biggest growers of wheat and maize in the world. The country also has large herds of beef cattle. Much of the food that Argentina produces is sold, or exported, to other countries. In recent years many farmers have decided to grow soybeans. Now, the country is one of the world's biggest soy producers. Most is exported to China where soybeans are very popular.



*Mauricio Macri, Argentina's new president*

Even though Argentina exports large amounts of food, the country still has financial problems. In the past, governments have borrowed large amounts of money from foreign banks and financial organizations. There have been times when Argentina has defaulted on its debts. This means that it has been unable to repay the money. Today, inflation in Argentina is believed to be about 20%. Inflation is when a currency loses value and the cost of most things goes up.

Mr. Macri's victory brings an end to 12 years of the "de Kirchner" presidency. Elections for Argentina's president are held every four years. Cristina Fernández de Kirchner won the 2007 and 2011 elections. Before 2007 her husband, Néstor Kirchner, was the country's president. He died of a heart attack in 2010, aged 60.

Ms. Fernández de Kirchner was not allowed to stand again. This is because presidents in Argentina can

serve for only two successive four-year terms. She and members of her political party wanted Daniel Scioli to win. He was Argentina's vice president when Ms. Fernández de Kirchner's husband led the country. Since then, Mr. Scioli has been the governor of Buenos Aires Province. Argentina is divided into 23 provinces. The Province of Buenos Aires is the largest. It includes the city of Buenos Aires, which is Argentina's capital.

The election on November 22, was a run-off. Argentina has a rule that says a person must get over 45% of the votes, or be ten percent in front of their nearest rival, to win a presidential election. If this does not happen, a second round, or run-off, must be held. Then, the two candidates who got the highest number of votes take part in this second election.

The first election was held on October 25. Mr. Scioli got 36.7% of the votes and Mr. Macri 34.5%. The third-placed candidate got 21%. So a second round had to be arranged. This was Argentina's first ever run-off election. Mr. Scioli said that he would govern the country in the same way as Ms. Fernández de Kirchner. Mr. Macri declared that he would change many of her policies. News reporters described Mr. Macri as the "business-friendly candidate".

As Mr. Scioli won the first round, many people were surprised by the final result. Mr. Macri will officially take over from Cristina Fernández de Kirchner on December 10. ■

## PENGUIN NUMBERS

Researchers from Australia have been studying Adélie penguins in Antarctica. They believe that the number of these penguins in East

Antarctica has increased 135-fold over the last 14,000 years. Their study suggests that warming temperatures are the reason for this big increase in numbers.



*Adélie penguins in Antarctica (Jason Auch)*

The last Ice Age (or glacial period) ended around 11,500 years ago. Most scientists now believe that human activity over the last 150 years is causing average world temperatures to rise. This warming, they say, is causing the climate to change in some parts of the world. The human activity is mainly burning fossil fuels, or oil, natural gas and coal. This creates carbon dioxide (CO<sub>2</sub>). The scientists say that this extra CO<sub>2</sub> in the atmosphere is trapping more of the Sun's heat.

Antarctica is almost twice as big as Australia. It is often divided into East Antarctica and West Antarctica. They are separated by a mountain range called the Transantarctic Mountains. East Antarctica is about two-thirds of the continent. The researchers say that this part of Antarctica is now home to around 1.14 million breeding pairs of Adélie penguins. This is about 30% of their total population.

There are many different penguin species. Even though they cannot fly, penguins are birds. Apart from those kept in zoos, all penguins live in the southern hemisphere. Yet only Adélie and Emperor penguins breed in Antarctica. Emperors are the largest penguins. They grow to a

height of 48 inches (122 centimeters). Adélie penguins are about 27.5 inches (70 centimeters) tall.

Adélie penguins get their name from a French sea captain and explorer called Jules Dumont d'Urville (1790 – 1842). He landed on the coast of Antarctica in 1840. The captain named this part of the continent Adélie Land (*Terre Adélie*). Adélie was his wife's name. Later, the penguins were named after Adélie Land.

Adélie penguins live in large groups called colonies. They make their nests on the land. (Emperor penguins nest on sea ice.) Adélie penguin nests are made from pebbles, or small stones. The birds usually return to the same place each summer to breed. Their nesting grounds are known as rookeries. Some rookeries have been used for thousands of years. To get to the land, the penguins must cross any sea ice that blocks the way. On ice and snow, Adélie penguins can move quickly by sliding, or tobogganing, on their stomachs.

The females lay two eggs. Both have normally hatched after 40 days. The male and female look after the chicks. They take turns to go back to the sea. There, they catch and swallow tiny shrimp-like creatures called krill. Back at the nest, the krill are regurgitated, or brought back up to the mouth, and fed to the chicks.

If there is not much sea ice, the penguins can get to the sea easily, catch some krill and return. Sometimes the sea ice around the coast can stretch for 12.5 miles or more. This means that the adult penguins have a long way to travel. If this journey takes too long, the chicks can die from a lack of food.

Warming temperatures mean that some Antarctic sea ice is shrinking.

However, the researchers say that this is not the main reason for the increase in Adélie penguin numbers. Most of Antarctica is covered in a thick ice sheet. Since the end of the last Ice Age, this ice sheet has been slowly shrinking. As more land around the coast is exposed, there are more nesting sites. The researchers believe that more nesting sites are the reason for the penguins' population growth.



*Adélie penguin colony at a rookery in Antarctica*

The researchers say that as long as the ice continues to shrink (and there are plenty of krill), the number of Adélie penguins is likely to keep rising. ■

## TAX INVERSION DEAL

The merger of two large drug, or pharmaceutical, companies was announced on November 23. Pfizer and Allergan have agreed to join together to form one much larger company.

Pfizer is based in the U.S. Allergan has its headquarters in the Republic of Ireland. The merger announcement is likely to cause arguments. This is because it is what's known as a "tax inversion" deal. These arrangements are controversial. The deal is expected to cost Pfizer \$155 billion. If it happens, the merger will create one of the world's biggest drug-making companies.

Normally, pharmaceutical companies make most of their money from [prescription](#) drugs. Yet new prescription drugs can take many years of research and development (R&D). Also, before a new drug can be given to people it has to be tested. These tests can last for several years. This can make the new drugs that these companies develop very expensive to buy.

Pharmaceutical companies apply for patents on their new drugs. A patent is a way of protecting something that a person or company has designed or invented. It means that others cannot copy it.



In many countries pharmaceutical companies can patent their drugs for 20 years. When a pharmaceutical company manages to develop a very popular drug it is known as a “blockbuster”. These drugs make a lot of money for the company. This usually continues until the drug’s patent runs out, or expires.

Once a drug’s patent expires other companies can legally make copies. These medicines are often described as generic, or copy-cat, drugs. Many companies who make generic drugs are in India. Generic drugs are much cheaper to buy. Therefore, after a drug’s patent expires it usually becomes far less expensive.

It is not unusual for one company to buy another. This is called a takeover. A merger is different. When a merger happens it often means that two companies of equal size are joining together. However, Pfizer is much bigger than Allergan. For example,

Pfizer has 78,000 employees; Allergan’s workers number 30,000.

Experts say that the deal has been arranged in a special way. Allergan will take over Pfizer. A smaller company taking over a larger one is often called a “reverse takeover”. Allergan will then change its name to Pfizer. This means that Pfizer’s legal registration will move from the U.S. to Ireland.

The boss of Pfizer will be the new company’s CEO (chief executive officer) or managing director (MD). Allergan’s boss is to be the COO (chief operating officer). The COO is responsible for the day-to-day operation of the company.

In most countries companies pay tax on the money they make. This is known as [corporation](#) tax. Usually, this tax is a percentage of the company’s profits. Different countries have different corporation tax rates. In the U.S. it is around 35%. This is one of the highest corporation tax rates in the world. What’s more, American companies have to pay 35% tax on the profits that they make in all other countries.

Ireland’s corporation tax is 12.5%. (In Britain it is 20%). Therefore, if it is registered or [domiciled](#) in Ireland, Pfizer will pay far less tax. The new company will still have to pay 35% on any profits it makes in America. Yet the tax Pfizer pays in other parts of the world would be much lower. These taxes are paid to the government of countries in which Pfizer operates.

In recent years, several other American companies have arranged similar tax inversion deals. Burger King took over a company in Canada. Now it is a Canadian-domiciled company. Chiquita is a well-known banana company. It merged with another fruit company in Ireland.

Many American politicians are angry about these deals. This is because the country receives less money in company taxes. Barack Obama, the president of the U.S., has said that tax inversions are [un-patriotic](#). However, these arrangements are not unlawful. Many politicians say that new laws are now needed to make them illegal. ■

## WHEEL OF GIANTS

Archaeologists have dated an ancient circular structure in the Middle East. They believe that it was built about 5,500 years ago. However, what it was used for is still a mystery. There are several ideas, or theories. Some think that it was the burial site of an important person. Others believe it was constructed for burials. Another idea is that it was a type of sky calendar.



Wheel of giants from the air (israeltourism)

In Arabic the structure is known as *Rujm el-Hiri*. This means “stone heap of the wild cat”. In the Hebrew language it is called *Gilgal Refaim*, or “wheel of giants”. This name may refer to a race of legendary giants that is mentioned in the Hebrew Bible. The site is in a place called the Golan Heights. Originally, this was a part of Syria. Israeli forces now occupy the area. They captured the Golan Heights during an Arab-Israeli war in 1967.

The wheel of giants is about 520 feet (160 meters) across. It was made from hundreds of thousands of stones. The walls form several **concentric** circles. The outer wall, or ring, was about eight feet (2.4 meters) high. The inner walls gradually get lower and narrower the closer they are to the middle of the wheel.



Entrance to the tomb or burial cave (Ani Nimi)

At the center there is a large tomb-like structure or cave. This was broken into long ago. Nothing has been found inside it. Some people believe that the whole structure was part of the tomb. Others are not so sure. They suspect that the central tomb was added to the structure about 2,000 years after the circles were built.

One idea is that the wheel was used for what's known as "sky burials". The bodies of people who had died were left in the center of the wheel. Vultures would then arrive and eat them. The concentric walls were built for the vultures to sit, or perch, on. After the vultures had finished only the bones were left. These were collected and placed inside a special box, or container, called an ossuary. The boxes of bones were then buried or placed elsewhere.

Zoroastrianism is an ancient religion. It's known that people who followed this religion in places that are now parts of Iran and India used sky burials. They put the dead on raised platforms called sky towers for vultures to eat. Today, some monks in Tibet (a part of China) do something similar. However, archaeologists have not found any human bones within the wheel. So some people think it's unlikely that it was built for any type of burial.

Other ancient circular stone structures seem to have been used to track the Sun. Stonehenge in Britain is the best-known example. It was probably used as a "calendar". Some of its large stones line up with the places on the **horizon** where the Sun rises on Midsummer's Day and sets at midwinter. Another theory is that the wheel of giants served a similar purpose. If so, it was used to track how the Sun appears to travel across the sky during the different seasons.

Nowadays, it is possible to visit the wheel of giants on holidays and weekends. On other days the Israeli army uses the area for training. ■

## G20 MEETS IN TURKEY

The leaders of the G20 group of countries attended a two-day summit on November 15 and 16. The meeting was held in a large hotel complex in Antalya. This city is on Turkey's Southwest coast. Turkey's president, Recep Tayyip Erdoğan, hosted the summit.

The G20 is a group of wealthy nations. Its members have the 19 most successful economies in the world. The European Union (EU) is the G20's 20th member. The EU is made up of 28 European nations. Britain, Germany, France, and Italy

are G20 countries. These countries are also members of the EU.

Currently the world's population is about 7.3 billion. Around two-thirds live in G20 countries. The two nations with the world's largest populations, China (1.3 billion) and India (1.2 billion), are members. The next three, the U.S. (319 million), Indonesia (252 million) and Brazil (201 million), are all G20 countries.

In total, G20 members represent about 85% of the world's economy. This group first met in 1999 in Berlin, the capital of Germany. For a few years the G20 organized summits every six months. Nowadays, these meetings are held annually.



G20 leaders in Turkey

This was the first time that Malcolm Turnbull and Justin Trudeau have attended a G20 meeting. Mr. Turnbull took over as Australia's prime minister several months ago. Mr. Trudeau is the prime minister of Canada. He was elected about four weeks before the summit. Cristina Fernández de Kirchner, the president of Argentina, was unable to attend. An election for a new president in her country was being held the following week. Argentina's economy minister took her place at the summit.

France's president, François Hollande, did not travel to Turkey. Two days before the meeting, there were a number of attacks in Paris, France's capital city. Many people were killed. Several small groups of armed men fired their weapons at restaurants and inside a concert hall.

**G20 MEMBERS**

Argentina	Mexico
Australia	Russia
Brazil	Saudi Arabia
Canada	South Africa
China	South Korea
France	Turkey
Germany	UK
India	U.S.
Indonesia	European
Italy	Union (EU)
Japan	

The Islamic State (IS) claimed that it organized the attacks. This militant Islamic group currently controls large parts of Syria and Iraq. Whilst he stayed in Paris, Mr. Hollande sent his foreign minister and finance minister to the summit.

Normally, several subjects are discussed at G20 meetings. Often these are about economic issues. G20 members usually talk about creating more jobs and how member countries can trade with each other more easily. Yet this year most talks were about what happened in Paris and the ongoing war in Syria. The need to solve the migrant crisis and how to prevent terrorist attacks were also discussed.

People from other important international organizations also attend G20 meetings. For example, the heads of the United Nations (U.N.), the International Monetary Fund (IMF) and the World Trade Organization (WTO) take part in G20 meetings. A number of non-G20 countries are also invited to take part in the meetings. This year the leaders of Spain, Azerbaijan, Malaysia, Senegal, Singapore, and Zimbabwe all received invitations to the summit.

Usually, the host country arranges some entertainment in the evenings. Often traditional music is played while the leaders eat dinner. However, this year, because of what happened in Paris, President Erdoğan decided to cancel all these performances. Next year's G20 meeting will be in China. ■

**BLUE DRAGON**

An unusual marine creature was recently photographed in Australia. It washed up on a beach. The small creature is a type of sea slug. Its scientific name is *Glaucus atlanticus*. Yet it is also known by many other names. These include: blue dragon, blue angel, blue sea slug, blue ocean slug, and sea swallow.

Blue dragons are normally found floating far out at sea. They are pelagic creatures. This means that they live in the open sea and are rarely seen close to coastlines or beaches. Blue dragons seem to prefer warmer tropical waters. There are many types of sea slug. Like "land" slugs, sea slugs are invertebrates. They do not have a backbone, or spine.



Blue dragon in water (Sylke Rohrlach)

Blue dragons are about 1.2 inches (three centimeters) in length. They have an unusual appearance. Their bodies are flat. On each side there are three **appendages**. These fan out into many feather-like fingers called cerata.

The creatures float upside-down. Their underside, or the one facing the sky, is a blue color. This means that they are camouflaged against the blue of the sea. Their top, or underwater, side is a silver-gray. So from below sea dragons are difficult to see against the sea's silvery surface. Blue dragons have a gas-filled sac inside their bodies. This helps them to float upside-down.

Blue dragons are unable to swim. They are blown along by the wind and drift with the currents. However, when near their prey or another sea dragon, they can get closer by moving their cerata. Each blue dragon is both a male and female. These types of creatures are called hermaphrodites. However, they have to find another blue dragon to mate with. After mating both blue dragons produce a string of eggs.

Unusually, blue dragons are known to attack much bigger marine creatures. These include poisonous jellyfish. The jellyfish's poison, or venom, does not affect the blue dragons. After swallowing the cells of venom, blue dragons store them at the tips of their cerata. Here, the poison becomes **concentrated**. It is therefore far more venomous than the jellyfish's poison. Blue dragons use this concentrated poison to sting their prey.

A blue dragon's sting can kill much bigger creatures such as a Portuguese man-o-war. Also known as a bluebottle, this is a large jellyfish that floats on the sea's surface. Its 30 feet (nine meter) long tentacles hang below. These jellyfish can give swimmers a powerful sting. The Portuguese man-o-war's name comes from a type of armed wooden sailing ship from 250 years ago. The part of the jellyfish that floats above the sea looks like the sails of these old ships.

Marine experts warn that a blue dragon found on a beach should not be touched. This is because its sting can be very dangerous. ▣



The five new flag designs

## FLAG CHOICE

A referendum, or vote in which all adults can take part, began in New Zealand on November 20. People have been asked to vote for one of five new flag designs. They must do this by December 11. Then, in March next year, there will be another vote. This one will decide if New Zealand's (traditional) flag is kept or if it is to be replaced by the most popular new flag design.

The first European explorers arrived in New Zealand in 1642. Yet it was not until the early 1800s that large numbers of them began to live there. Most came from Britain. The Maori are the native people of New Zealand. In 1840 Maori leaders and officials from Britain signed an agreement. This is known as the Treaty of Waitangi. The treaty officially made New Zealand part of the British Empire. In return, the government of Britain said that it would protect the Maori people's rights to their lands.

New Zealand has been an independent country for many years. However, like several other nations that were part of the British Empire New Zealand is what's known as a Commonwealth realm. This means that the British king or queen is the country's head of state. Other Commonwealth realms include: Australia, Canada, Jamaica, and Papua New Guinea (PNG).

New Zealand's flag is blue with a Union Jack in the top left corner. It has four red stars with white outlines. They represent the brightest stars of the Southern Cross.

The Union Jack is the flag of the United Kingdom (UK). The Southern Cross is in the Crux [constellation](#), or group of stars. This star grouping can be seen in the night sky, at any time of the year, in the southern hemisphere.



New Zealand flag (Tākuta/Edward Hyde)

Some people think that New Zealand's flag is too similar to Australia's. The Australian flag also has a blue background and Union Jack. It too has stars of the Southern Cross. However, these are white and there are five stars not four. Others say the Union Jack makes it look as if New Zealand is not an independent nation. John Key is New Zealand's prime minister. He arranged the "flag referendum". Mr. Key thinks the flag should change. He believes that its design suggests that New Zealand is still [dominated](#) by Britain.

Canada used to have a Union Jack on its flag. It decided to change the design in 1965. Now, the Canadian flag is red and white with a large red maple leaf in the center. Canada is famous for its maple syrup. It's made from the sap of the maple tree. The country produces about 70% of the world's pure maple syrup. The tree's leaf is Canada's national symbol.

Three of the five new designs feature a stylized silver fern. This type of fern, which is also called ponga, grows only in New Zealand. It has a special importance for the Maoris. New Zealand has a world-famous rugby team, which is often called the "All Blacks". The team wears black shirts, shorts and socks. The black shirts have a silver fern on the left breast. Over the last 100 years many Maoris have played for the All Blacks.

Many people in New Zealand disagree with their prime minister. They say that they are proud of the country's connections with Britain. Thousands of soldiers from New Zealand died in the First World War (1914 – 1918) and the Second World War (1939 – 1945). These people argue that these men fought for the country and its flag. It would therefore be wrong to change it. ▣

## APEC SUMMIT

The APEC (Asia-Pacific Economic Cooperation) leaders' summit, or annual meeting, took place on November 18 and 19. It was held in Manila, the capital of the Philippines. APEC is an economic and political organization. Benigno Aquino, the president of the Philippines, hosted the summit.

APEC has 20 member countries. It prefers to call them "member economies". Hong Kong, which became a part of China 18 years ago, also takes part. Most members are countries that have coastlines around the Pacific Ocean.

Today, about 40% of all the people in the world live in APEC member economies. Roughly 44% of the world's trade (items made in one country and then sold to another) comes from APEC members.

APEC countries include large nations such as Canada, Russia and Australia. Others like Brunei and Singapore are very small. The countries with the three largest economies in the world, the U.S., China and Japan, are members of APEC.



APEC 2015, group photograph

The first APEC meeting took place in Australia in 1989. The organization was set up to try to make it easier for member countries to trade with each other. Decisions at APEC summits are made by consensus. This means disagreements rarely happen at these meetings.

APEC is an economic forum. Usually, there are no political discussions. Currently, the Philippines and some other APEC members, such as Vietnam and Malaysia, are angry with China. There are many small, uninhabited islands in the South China Sea. Several countries claim to own them. Chinese leaders insist that nearly all the islands in the South China Sea are part of China. Chinese people, they argue, have fished in the seas around these tiny islands for hundreds of years.

Over the last 18 months, China has used **dredging** ships to increase the size of some islands. Several buildings, harbors and landing

#### APEC MEMBER ECONOMIES

Australia	Japan	Russia
Brunei	Malaysia	Singapore
Canada	Mexico	South Korea
Chile	New Zealand	Taiwan (Chinese Taipei)
China	Papua New Guinea	Thailand
Hong Kong, China	Peru	U.S.
Indonesia	Philippines	Vietnam

strips for aircraft have been built on them. The government of the Philippines has complained about what China is doing. Recently, American navy ships sailed close to some of the enlarged islands. Air force planes flew overhead. This annoyed China's leaders. However, before the APEC summit, Mr. Aquino said that Xi Jinping, the president of China, would be welcomed in Manila. The disagreement about the islands, he added, would not be discussed.

Most of the talks and discussions during the summit were about trade. Barack Obama, the president of the U.S., has set up a new trade arrangement. Called the Trans-Pacific Partnership (TPP), 12 APEC members have recently agreed to join. (China and Russia are not part of this partnership.) The TPP should make it much easier for its members to trade with each other. The Manila summit was the first time the leaders of all these countries have met since joining the TPP.

Before and during the summit the leaders arranged many bilateral meetings. These are discussions, or talks, between the leaders of two countries. For example, Mr. Obama had private talks with Mr. Aquino and Japan's prime minister. Mr. Aquino held separate meetings with the presidents of Chile and Mexico.

One tradition of APEC summits is to arrange for all the leaders to wear the host country's national dress for one evening. Last year's APEC meeting took place in Beijing, the capital of China. There, the leaders wore traditional Chinese outfits. These are single colored plain suits with high collars.



Barack Obama, the president of the U.S., and the Sultan of Brunei, wearing Barong Tagalog shirts

In Manila, the leaders were given a traditional shirt to wear. It's called a "Barong Tagalog". These shirts are made from lightweight material and decorated with embroidery, or sewing patterns. They are worn over a white undershirt and not tucked into the top of the trousers. ■

#### GM SALMON

Salmon are a popular type of food. The fish are believed to be good for people's health. They contain important vitamins and proteins. In recent years many salmon farms have been set up.

On November 19, the Food and Drug Administration (FDA) made an important announcement. The FDA's job is to make sure that all food and (medical) drugs sold in the U.S. do not have any harmful effects. In its statement the FDA approved the sale of genetically modified (GM) salmon. It says that "food from the fish is safe to eat". This is the first time that official approval has been given to eat a GM animal.

There are many types of salmon. Canada's Pacific Ocean coast, Ireland, Scotland in the UK, and Norway are well known for their wild salmon. Salmon are anadromous. This means that they are born in fresh water and then migrate to the salty water of the oceans. Later, they return to fresh water to reproduce. Many swim hundreds of miles up fast flowing rivers to find the right place to lay their eggs, or spawn.

A legend says that each wild salmon returns to its exact birthplace to spawn. Tests seem to show that 90% do. Nobody understands how the fish know where to go. Yet they are known to have a very good sense of smell.



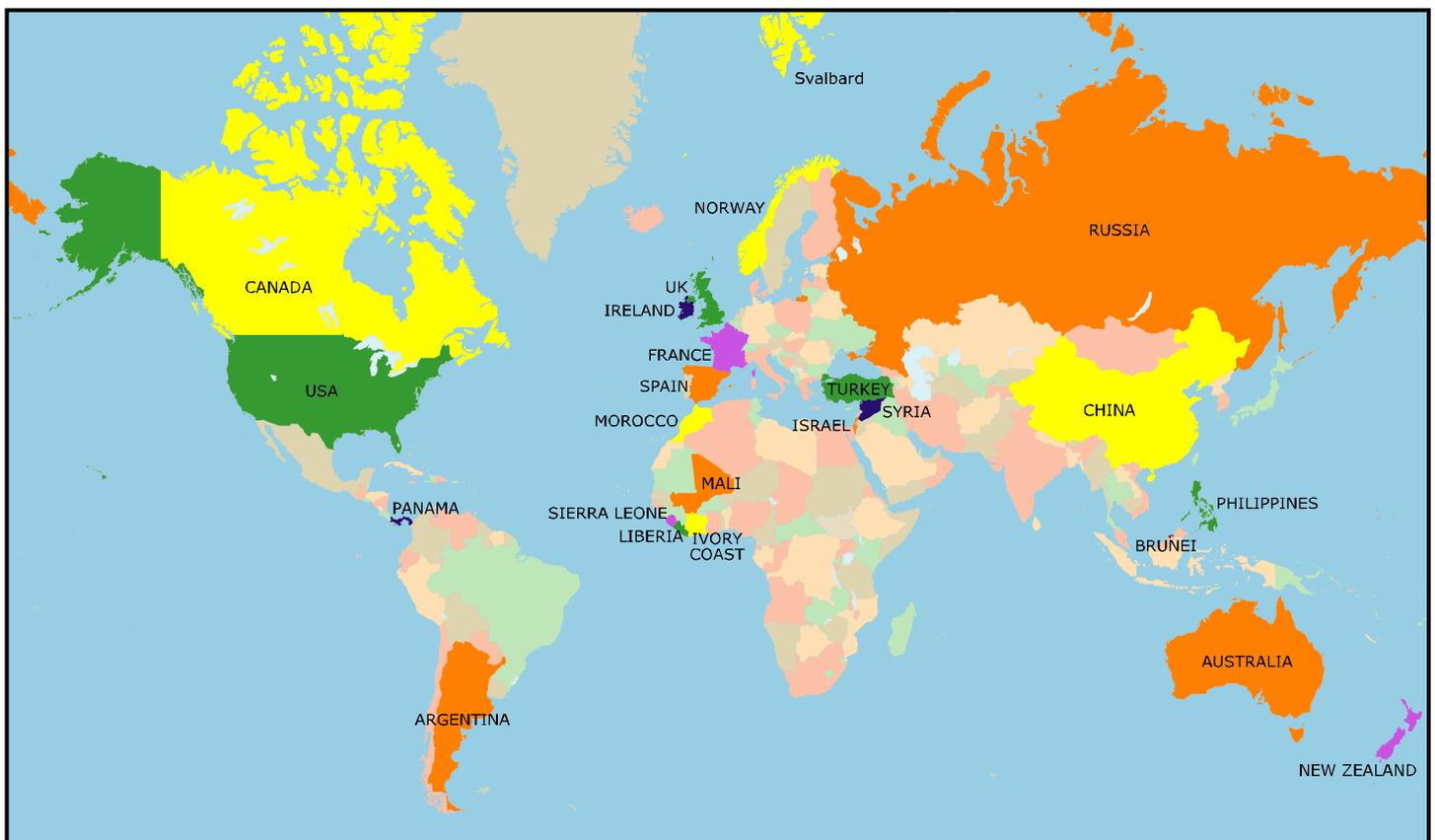
*A genetically modified (GM) salmon (top) and an Atlantic salmon (bottom), both are aged 18 months*

Scientists have been modifying, or changing, the genes of some plants for many years. Nowadays, GM plants, or crops, can be made to produce more food or grow with less water. It is also possible to

increase their resistance to certain diseases and insects. GM food crops have been grown in North America and parts of Asia for many years.

Not everyone agrees that GM crops are a good idea. Some distrust them. These people claim that not enough is done to make sure that GM crops do not affect other wild plants. They worry that GM crops might damage other wildlife. Many European countries have banned GM food. Yet supporters of GM food plants insist that there is nothing wrong with them. They argue that many millions of people already eat food made from GM crops.

The company that has genetically modified the salmon is called AquaBounty. It is based in the U.S. Researchers working for the company managed to "alter" a species called the Atlantic salmon. They put some "growth" genes into



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the fish. These were taken from Pacific Chinook salmon. They also added DNA from a protein found in ocean pout. These are an eel-like fish. This DNA means that the GM salmon grows throughout the year.

The company calls the GM fish AquAdvantage salmon. Normally Atlantic salmon take three years to reach full size. The GM salmon grow to the same size in half the time. This much quicker growth means that the GM fish can be kept in enclosed tanks. The company has set up two of these tanks. One is in Canada and the other in Panama.

Some people worry about what might happen if GM salmon managed to get into the sea. There, they could spread their genes to other salmon species. However, the company says that this will not happen. The GM fish, it explains, will not be able to escape from the tanks, which are far from the sea. What's more, only sterile female GM salmon will be produced. These fish cannot reproduce, or have their own offspring.

The world's population is growing. So extra food will be needed. Many people therefore think that more GM "food" animals will have to be produced in the future. GM animals are also known as genetically modified organisms (GMOs). Not everyone agrees with GMOs. Several large food stores in the U.S. have already said that they will not sell GM salmon. ■

## BIRTH OF NEW PLANET

Two American astronomers, or researchers who study the stars and planets, have recorded an unusual sight. Using a very powerful tele-

scope, they have observed a new planet taking shape, or being born. This has never been seen before. The newly forming planet is going around, or orbiting, a young star.



Artist's impression of a young star, new planets and material left over from the star-formation process (NASA)

Scientists have often wondered how the planets in our Solar System first formed. This happened over four billion years ago. Then, an enormous cloud of dust and gas surrounded a protostar. (New or "very young" suns are known as protostars.) The material in this cloud was left over from the formation of the Sun. As the cloud span around the Sun, it gradually flattened into a disc-like shape.

Small pieces of material in the cloud then began to stick together. As these larger clumps orbited the Sun, they got bigger and bigger. Gradually, the growing clumps cleared all the dust and gases in their paths. Then, they became big enough to attract other nearby material with their own gravity. Larger clumps attracted smaller clumps and formed very small planets. Eventually, they grew in size to become the planets that we know today.

It is not known how long this planet formation took. Some scientists think it was between one and 10,000 years. Others believe that it was far longer. Collecting extra material like this is known as accretion. The idea that the Solar System's planets

formed in this way is described as the "accretion disk model".

In our Solar System the four inner planets, Mercury, Venus, the Earth, and Mars, are all rocky. The outer, or more distant planets, Jupiter, Saturn, Uranus, and Neptune, are made mainly of gases. This probably happened because of the makeup of the disc-like cloud that was around the younger Sun. Rocky dust debris in the cloud was closer to the Sun and the gases farther away.

The first exoplanet was discovered in 1995. These are planets that orbit stars (or suns) beyond our Solar System. As telescopes became more powerful, more and more exoplanets have been observed. So far, about 1,900 exoplanets have been recorded. They all orbit older stars. Therefore all of these exoplanets have already formed.

The star observed by the two astronomers is called LkCa 15. It is only two million years old. The very young star is 450 light years from the Earth. A light year is the distance light travels in one year. (The speed of light is roughly 186,400 miles (300,000 kilometers) per second.)

The astronomers spotted a planet orbiting LkCa 15 (there might be one or two others as well). Because of the star's young age, this must be a newly formed planet. What's more, there is a large ring, or cloud, of cosmic dust and gas, beyond the planet. It looks as if this part of the sun's disc-like cloud is yet to form any planets. The whole system looks like a doughnut. The cloud is the doughnut and the sun and its new planet (or planets) are within the hole in the middle.

By studying this new star system, scientists hope to find out if the accretion disk model is correct. ■

## FRANCO ANNIVERSARY

Francisco Franco died on November 20, 1975 aged 82. Therefore, November 20, this year was the 40th anniversary of his death. General Franco ruled Spain for many years. Before the anniversary, several churches declared that they planned to hold special services on November 20. This angered many Spanish people. They believe that what Franco did and the events of his life should not be officially remembered or celebrated.

Today, Spain is what's known as a constitutional monarchy. Its monarch is head of state. Yet the Spanish king has few powers. The country's prime minister and his elected government make all the important decisions. Other nations have similar constitutional monarchies. These include: the Netherlands, Belgium, Thailand, Britain, and Japan.



General Franco

Felipe the Sixth is Spain's king. He took over after his father, Juan Carlos the First, decided to step down, or abdicate, last year. Juan Carlos officially became the king of Spain in 1975. Before this, Spain had been a republic and run as a dictatorship. Juan Carlos's grandfather, Alfonso the Thirteenth, fled his

country when it was declared to be a republic in 1931. Five years later the Spanish Civil War broke out.

The war was between the Nationalists and those who believed that Spain should be a republic. General Franco led the Nationalists. Many people who fought on the Republican side wanted Spain to become a communist country. The war lasted for three years. The Nationalists won.

The Spanish Civil War ended just before the Second World War began in 1939. During the war in Spain, Franco was helped by Adolf Hitler, the leader of Germany, and Italy's dictator, Benito Mussolini. Russia, which was a communist country at that time, supported the Republicans. Both Germany and Italy sent soldiers to Spain to help the Nationalists.

Around 500,000 people died in the Spanish Civil War. Both sides committed atrocities, or serious war crimes. However, those carried out by the Nationalists were far worse. Hundreds of the people they killed, or executed, were buried in unmarked graves.

Most Nationalist followers wanted a return of the monarchy. However, after the war ended, Franco decided to take charge of the country. Ruling as a dictator, he controlled Spain for the next 36 years. When the Second World War began, many people thought that Franco's Spain would join Germany and Italy. Yet throughout the conflict, Spain stayed neutral, or did not support one side or the other.

Franco wanted to make arrangements about how Spain should be led after he died. He was happy for a king to return. Franco decided to appoint Alfonso the Thirteenth's grandson, Juan Carlos, as his

successor. Then, the future king was living in Italy. Juan Carlos returned to Spain in 1969. He was given the title Prince of Spain. After Franco died in 1975, the new king surprised many people. He announced that he wanted Spain to be a constitutional monarchy. So, for the first time in many years, the Spanish people were able to elect their own leaders.



Monument of the Valley of the Fallen

Franco was buried at the Valley of the Fallen (*Valle de los Caídos*). This national monument is near Madrid, the country's capital city. Franco organized its construction. The monument was built as a burial place for all those who died in the civil war. Some Spanish people want Franco's remains to be removed from the Valley of the Fallen. They argue that his tomb should not be a part of the monument. ■

## BAMAKO ATTACK

On November 20, several armed men ran into a large hotel in Bamako, the capital city of Mali. They fired their weapons and took over 100 people as **hostages**. Specially trained Malian troops then surrounded the hotel. After entering the building, they shot and killed two armed men. Some French and American soldiers who were in Bamako at

the time helped the Malian troops. Twenty people staying or working at the hotel died in the attack.

Trouble in Mali began in 2012. Then, a small group of army officers forced Mali's president to leave the country. They took control of Bamako. For several years the Malian army had been fighting against Tuareg rebels in the north of the country. The Tuareg is a nomadic tribe. Its members mainly live in northern Mali and in parts of Niger, Algeria, and Libya. The Tuareg rebels wanted the northern part of Mali, which they call Azawad, to be a separate country.



The Tuareg took advantage of what the army officers were doing in Bamako. It managed to force all the Malian soldiers to leave the northern part of the country. Several militant Islamic groups assisted them.

Mali is a member of a group called ECOWAS (the Economic Community of West African States). This organization has 15 member countries. Leaders of ECOWAS became alarmed at what was happening in Mali. They feared that the militant Islamic groups might take over the whole of Mali. If that happened, similar problems might spread to their own countries.

At first, ECOWAS insisted that the army officers hand power back to a new president. After this was

done, ECOWAS began discussing ways of defeating the Islamic militants. Yet, then, to many people's surprise, the militants attacked a town near Bamako. Mali's president asked François Hollande, the president of France, for help.

Like many other countries in North and West Africa, Mali used to be a colony of France. These countries became independent nations in the early 1960s. Yet France has continued to keep military bases in some of them. Mr. Hollande immediately sent several thousand specially trained French troops to Mali. Most were based in Chad, another North African country.

Working with soldiers from the Malian army, the French forces soon defeated the Islamic militant groups. Several ECOWAS countries also sent troops to help. However, many militants escaped to the huge areas of remote desert in the north of Mali.

The United Nations (U.N.) helped to organize new elections. It also sent a large peacekeeping force to Mali. This force then took over from the French and ECOWAS troops. Ibrahim Boubacar Keita won the presidential election.

Many foreign business people use the Bamako hotel that was attacked. Those who died in the hotel included six Russians and three people from China. This was the second deadly attack in the capital city. Eight months ago, gunmen killed five people in one of the Bamako's most popular restaurants. People from France and Belgium died in this incident.

Mali's president insisted that all the Islamic militant groups in Mali would be defeated. Several of these groups are known to be operating in the country. It is not known which one planned the attack on the hotel. ■

## ANIMAL COMPASSES

Some birds are known to migrate for very long distances. Several whale, fish and turtle species swim thousands of miles to the places where they give birth to their young or lay their eggs. How these animals know which way to travel is a mystery.



*Magnified fruit fly*

Many scientists suspect that migrating animals use the Earth's magnetic field to work out their direction of travel. Others may use the position of the Sun. The Earth is similar to a huge magnet. It's the planet's magnetic field that makes a compass needle point towards the north. Magnetic north and south are near to the North and South Poles.

Researchers in China now believe that they have discovered a biological "compass" in fruit flies. They call it a biocompass. Fruit flies seem to know in which direction they need to travel. The Chinese researchers' work suggests that many animals have their own internal biocompass. This compass, they say, is how the animals know where they are and where they are going.

Other scientific work in the past seemed to show that some animals could sense magnetic fields in certain circumstances. It happened when electrons fell on a protein found in the eye. These proteins can detect

light. Therefore they could be a connection between sunlight and the magnetic field. Some molecules in the body contain iron. Another idea was that this iron acts like a magnet when exposed to a magnetic field.

The Chinese researchers did not think these explanations solved the mystery. However, they thought that the answer might be a combination of both. The researchers studied genes from fruit flies. They found several proteins that contain iron. The researchers then performed several tests on these proteins. These showed that the iron-based protein would bind, or attach, to the light-detecting proteins.

Proteins are a type of molecule. In living organisms they perform different roles, or do certain jobs. For example, proteins carry out instructions that are “given out” by genes. The protein with the iron formed a rod-like shape amongst the light detecting proteins. The researchers called this iron-based protein a magnetoreceptor, or MagR. Further tests showed that MagR lines up with the Earth’s magnetic field. The researchers believe that this protein is the fruit fly’s biocompass.



Migrating geese (USFWS)

The Earth’s magnetic field is not the same strength all around the globe. It is weaker over South America, yet stronger over Canada, Siberia, in northern Russia, and parts of Antarctica’s coastline. What’s more, the field’s direction and angle

changes. It goes straight down at the North Pole, is horizontal, or flat, at the Equator, and points straight up at the South Pole. The researchers think that a biocompass can detect all these differences.

The researchers say that they have found MagR in pigeons’ eyes. It is also in butterflies, rats, whales, and, in very small amounts, humans. They now suspect that all animals have some type of biocompass. More work is needed to find out if this is true. The researchers say that they also want to discover how biocompasses send “signals” to the brain. ■

## RUSSIAN PLANE SHOOTDOWN

Three months ago Russia sent planes, attack helicopters and soldiers to Syria. Vladimir Putin, Russia’s president, declared that these forces would support Syria’s president, Bashar al-Assad, and his country’s army. Currently, the Syrian army is fighting against several opposition groups as well as the Islamic State (IS).

On November 24, two Russian Su-24 bomber planes were attacking an opposition group in northwest Syria. The planes were flying very close to the Syrian-Turkish border. Two Turkish fighter jet aircraft were close by. A missile fired by a Turkish plane hit one of the Russian bombers. It burst into flames. The Russian pilot and his navigator ejected from the plane. Their parachutes opened and they began to float down to the ground. Soon afterwards the damaged Russian plane crashed inside Syria and exploded.

The Russian airmen landed in different places. Fighters from the opposition group shot and killed the pilot before he reached the ground. Russian rescue helicopters took off from

a military base in Syria. They set out to search for the Russian airmen. The gunmen from the opposition group fired at one helicopter and killed a soldier on board. This helicopter was forced to make an emergency landing. Later, soldiers from the Syrian army managed to find the surviving Russian airman and rescue him.



Russian Su-24 bomber warplane, similar to the one shot down by Turkish fighter jet aircraft

The shooting down of the Russian plane has caused a big argument between Russia and Turkey. Soon after the incident Mr. Putin spoke on Russian television. He was very angry. Mr. Putin accused Turkey of “committing a crime”. Turkish officials insisted that the Russian planes crossed the Syrian-Turkish border into Turkish airspace. The Turkish pilots said that they had warned the Russian planes to change course ten times. However, they also admitted that the Russian bomber had flown inside Turkish airspace for only 17 seconds.

Russian air force officials insisted that their planes were at least 0.6 miles (one kilometer) from the border. The airman who survived the attack was navigating the plane. He claimed that he and the pilot had not received any warnings from the Turkish jet planes. He also insisted that his plane had not crossed the border.

Turkey is also involved in the Syrian War. Like Russia, it opposes the IS. However, it refuses to support Syria’s president. It also backs some of the opposition groups

fighting against the Syrian army. One is the armed group that shot and killed the Russian pilot.

Turkey is a member of NATO (North Atlantic Treaty Organization). NATO is a military alliance. It was set up by the U.S. soon after the end of the Second World War in 1945. At first, NATO had seven member nations. Apart from the U.S. and Canada, all were in Europe. Now, 28 countries are members of NATO. Turkey joined the alliance in 1952. NATO countries agree to send military forces to help if other NATO members are attacked, or threatened with attack. After the Russian plane was shot down, NATO held an emergency meeting. Its leader said that the alliance agreed with Turkey's explanation.



Some people suspect that the Turkish pilots made a mistake. They think that the pilots thought it was a Syrian air force plane. This might explain why they fired at it. The Syrian air force uses the same Russian-made warplanes. If the Turkish pilots knew it was a Russian plane, these people say, they would not have fired at it.

Many world leaders asked Mr. Putin and Turkey's president, Recep Tayyip Erdoğan, to de-escalate their argument. This means to make it "less serious" or "less intense". However, a few days after the shutdown, Russian leaders announced that they intended to punish Turkey economically for what had happened. ■

## SOLAR POWER PLANT TO OPEN

The first part, or phase, of a huge solar power complex is about to open in Morocco. It is one of the largest solar power projects in the world. Work on the complex began two years ago. When complete, the solar plant will cover an area of desert the same size as Rabat, Morocco's capital city. It will produce enough electric power for one million homes.

The complex is what's known as a concentrated solar power (CSP) plant. The first phase is called Noor 1. It has 500,000 crescent-shaped mirrors. These are set out in 800 long lines, or rows. The mirrors move. They are designed to follow the Sun as it appears to move across the sky. Morocco is one of the best places in the world for large solar power plants. This is because it is a hot sunny country with mostly cloudless skies throughout the year.

Each mirror is 39 feet (12 meters) high. The power plant does not work in the same way as solar panels. The mirrors reflect sunlight onto a long steel pipeline. This pipe is full of a type of oil, which is known as a heat transfer solution (HTS). The HTS heats up to 739°F (393°C). The pipes carry the HTS to a large circular tank, or heat engine, in the center of the complex. There, it mixes with water. The water immediately boils and turns to steam. The steam is then used to turn large turbines. It is the rotating of these turbines that generates the electric power.

The heat energy is then stored in heat tanks. These contain a form of liquid sand. This sand can store heat for up to three hours after the Sun has set. The stored heat is also used to make steam. So, unusually for a solar power plant, Noor 1 can produce electricity after the Sun has set.

The Moroccan government plans to complete Noor 2 and Noor 3 by the end of 2017. When they are working, the after darkness energy production will increase to eight hours.

Morocco is not an oil-producing country. Currently, about 94% of its energy comes from fossil fuels, or oil and gas. These are bought or imported from other countries. Morocco is also planning to generate electricity from wind and hydroelectric power.



Concentrated solar power plant in Morocco

After the solar power complex is completed in five years' time, Morocco hopes that nearly all of its power will be clean energy. This is electric power that has not been made by burning fossil fuels. The country also has plans to export clean electric power to several European countries. ■

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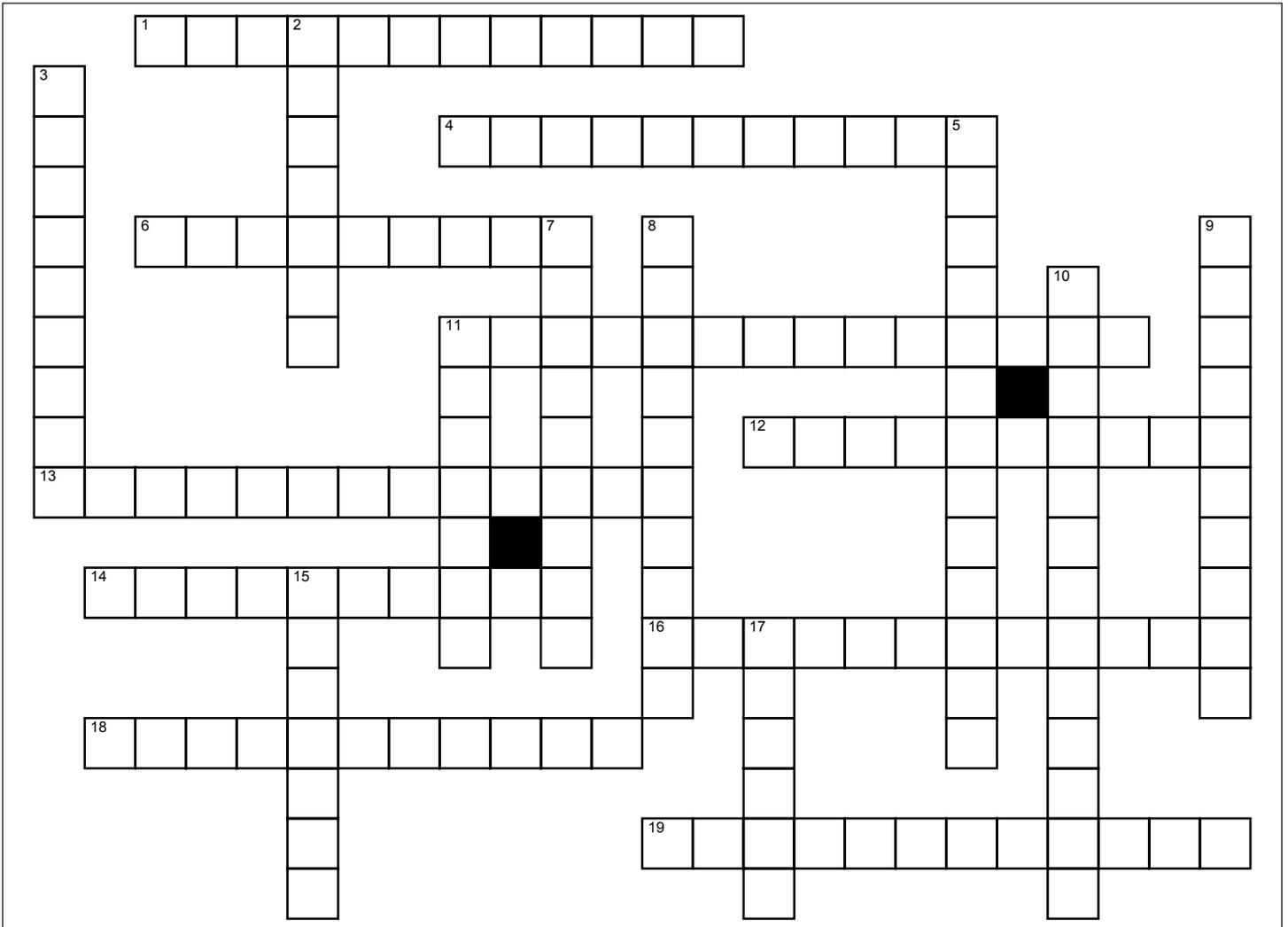
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# ISSUE 263

## 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 *Adjective* Describes medicines that a doctor has told someone to take to treat an illness
- 4 *Adjective* Not supporting or liking your country
- 6 *Verb* To be in control of or more powerful than others
- 11 *Noun* The management of the day-to-day running of a business or organization
- 12 *Noun* An official decision to do something
- 13 *Noun* The removal or cutting down of trees
- 14 *Adjective* Displaying forceful, attacking behaviour
- 16 *Noun* Useful information that has been gathered about an enemy
- 18 *Noun* A group of companies or group of people that can legally act as a single organization
- 19 *Adjective* Large number of items, or particles of a substance, together in one area

**Down**

- 2 *Adjective* Unable to breed
- 3 *Verb* Admitted doing something wrong
- 5 *Noun* A group of stars in the night sky that appears to form a pattern and has been given a name
- 7 *Verb* Residing or living (in a place, normally for tax reasons)
- 8 *Adjective* Describes circles and rings that have the same center
- 9 *Noun Plural* Parts of a body that project, or stick out, from the rest of the body
- 10 *Adjective* Likely to cause arguments
- 11 *Adjective* Describes something that grows, lives or is found in water
- 15 *Verb* Made visible or uncovered
- 17 *Noun* A person who rules in a cruel or unjust manner

# ISSUE 263

## 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.

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

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**MISSING WORD ANSWER =**

PHENOMENON  
 AQUEDUCT  
 TURBINES  
 DIAGNOSED  
 DESTINATIONS  
 CARCASSES  
 BARRENS  
 FRAGRANCES

**ISSUE 262 ANSWERS**

T U R B I N E S