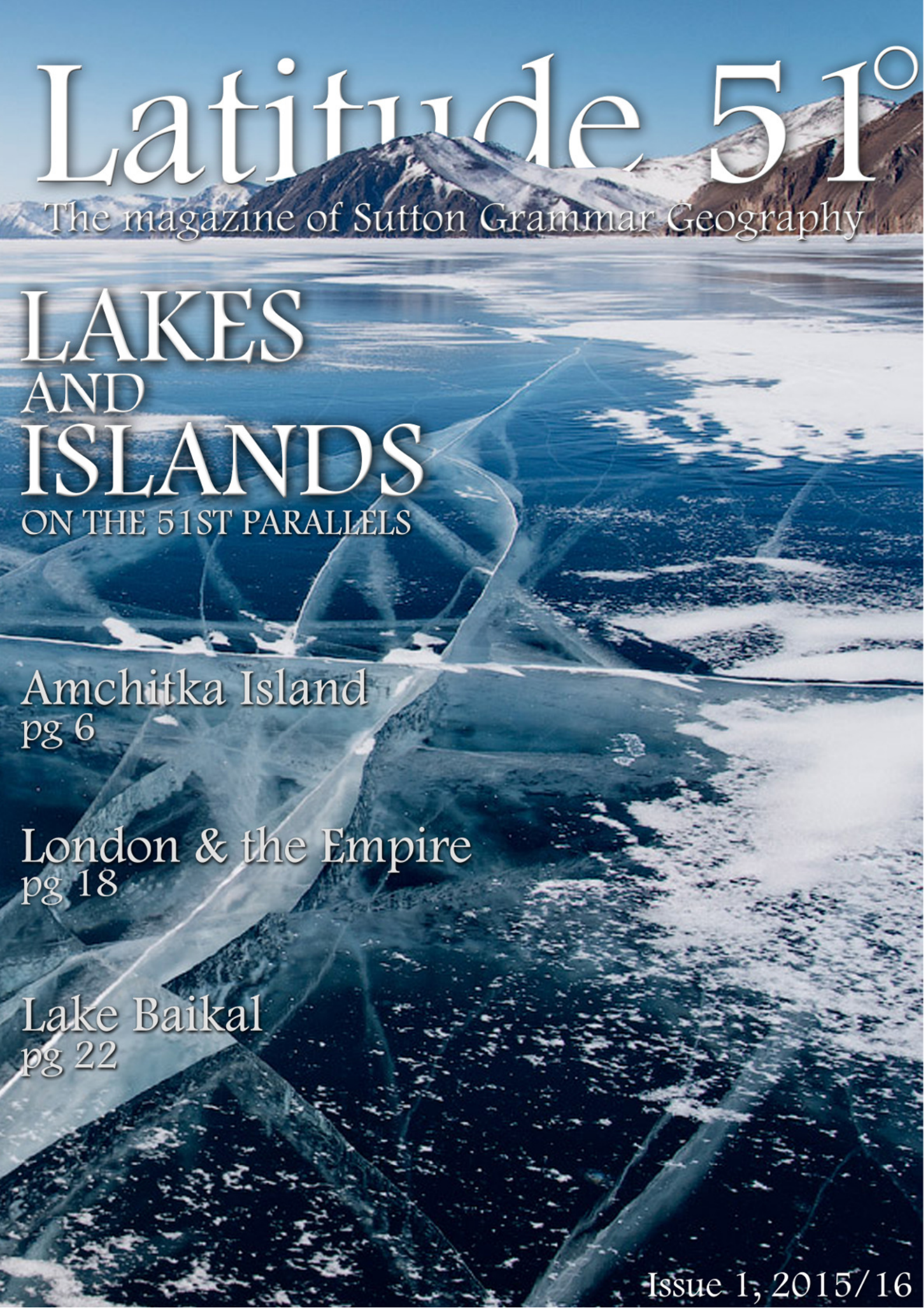
Latitude 51°

The magazine of Sutton Grammar Geography



LAKES AND ISLANDS

ON THE 51ST PARALLELS

Issue 1, 2015/16

Japanese macaque monkeys, known as “snow monkeys,” take an open-air hot spring bath while snowflakes fall at the Jigokudani (hell valley) Monkey Park in the town of Yamanouchi, Nagano prefecture on January 19, 2014. Some 160 of the monkeys inhabit the area and are a popular tourist draw.

Contents

Editorial

As the first edition of Latitude 51 is ready to go to press, it falls to me to write the Editorial. This first issue looks at the remarkable world of our latitude, the 51st Parallels North and South, and it has become clear to us that it is a fascinating place indeed. Our hope is that we can both inform you of the world that is out there, and also showcase some of the geographical issues affecting our planet today. There are a whole range of articles in this magazine, on subjects ranging from islands you may never have heard of, to countries we should perhaps all know more about, written by pupils from most year groups, and they should all be very proud of their work - editing it has been pleasantly easy. This accolade, however, cannot go to myself alone. I would like to offer my sincere thanks to my editing team, and to Mr Pletts and Miss Bartlett, for all they have done to make the magazine what it is. All that remains for me to say is I hope you enjoy reading Latitude 51°, and that it demonstrates the knowledge of and passion for geography at Sutton Grammar. Keep an eye out for the second issue, to be published in Spring 2016.

Callum Jack 13GR

Jason Islands

George Ayers 12RE

The Jason Islands is the collective term given to describe the archipelago in the Falkland Islands, which consists of five main islands; namely Steeple Island, Elephant Island, Flat Island, South Island and Grand Island, with the latter being the largest of the group. The physical
geography of all of the islands is relatively similar, though the individual characteristics of each are detailed within their names. Grand Island, the largest of the group has a varied terrain. Despite this, the main feature of the island's geography is a high plateaux with gullies, where steep cliffs can also be seen. The area is barren and sparsely covered in grass and plants, though a native plant called Tussac grass is present on some of the island's slopes.

Unlike Grand Island, Steeple Island, the second largest of the archipelago, is covered almost fully in dense Tussac Grass. Steeple Island is low-lying and slopes towards a rocky point, which gives the island its name.

Elephant Island has a long ridge that reaches a peak of 208 metres, though the landscape varies across the island. There are cliffs on the western side of the island and on the northern and eastern coasts a plateau is covered with dense tussac, which extends around most of the island. Little is known about the geography of South Island except from the fact that South Island slopes to a central peak of 300 metres. Because the islands have never been inhabited, there is no evidence that explains the landscape of Flat Island either. All that is known about the island is that it is distinctly flat in comparison with the other Jasons.

In terms of human geography, even though animals have thrived on the Jasons, humans have never inhabited the islands, though one or two farming buildings remain. Today, the islands remain as nature reserves that aim to protect the natural animal species that live there, which are, for the most part, penguins, sheep and black-browed albatrosses. The Jason Islands are also home to the Striated Caracara, Antarctic Skuas and Fur Seals. The Jason Islands have also been recently identified by BirdLife International as an Important Bird Area.

Unbeknownst to most, the Jasons take their name from a British Navy Vessel, HMS Jason, which was dispatched to survey the islands. From the early 1800s until 1970, the islands were used for grazing sheep, as the relatively flat landscape and Tussac Grass provided the perfect environment for the sheep to live. Despite the success of sheep grazing on the island, the few farmers exploited the other species native to the island to increase their profits. Hence, between 1864 and 1866, two million Rockhopper and Gentoo penguins were killed by the farmers between said years, as they extracted their oil for sale.

Over 100 years later, the Jason Islands were bought by the conservationist Len Hill, who paid £5,500 for the islands in 1970. Len Hill attempted to raise funds for the islands by printing new banknotes as he wanted to raise awareness of the islands' species and help to conserve them.

In 1982, a Royal Air Force airplane crashed into South Jason Island, causing some damage to the landscape, during the Falklands War.

In the 1990s, two of the islands were purchased by a New York philanthropist who donated them to the Wildlife Conservation Society along with US$ 425,000 to build a conservation station and since then the islands have been conserved through conservation projects.

Although the main aim of the nature reserves is to prevent the extinction or endangerment of the islands' native animals there is also a focus on restoring the landscape due to erosion as a result of overgrazing.

In summation, the Jason Islands are, for the most part, reasonably flat islands, covered in Tussac Grass. Though plant life can be found on the islands, the conditions are not the optimum for humans to live in. Besides this, the islands have been used for animal grazing and have since been converted into nature reserves through the work of philanthropists. Despite a poorly documented history, the islands have experienced changes in human geography in the last few decades and will hopefully continue to be conserved for many years to come. As one of the few places located on the latitude of 51° South, the Jasons are an interesting and unknown archipelago.

The Falkland Islands

Jed Heffernan and Tom Perkins 8BL

The Falkland Islands, largely known for the controversy of the Falkland's War (also known as the Falklands Crisis), are a small group of 778 islands just off the coast of Argentina. Located in the South Atlantic, the Falklands Islands lie on latitude 51 degrees south and have a vast range of geographical landforms. With rugged terrain and cliff-lined coasts, these islands have interesting geological features. The capital, Stanley, on the east island, houses 2,121 people, a mere fraction compared to that of London's. Likewise, the entire population of the islands is 2,932. This population is largely made up of farmers and abundance of wildlife. The islands are of British ownership due to the fact of the 10 week war with Argentina beginning in April of 1982.

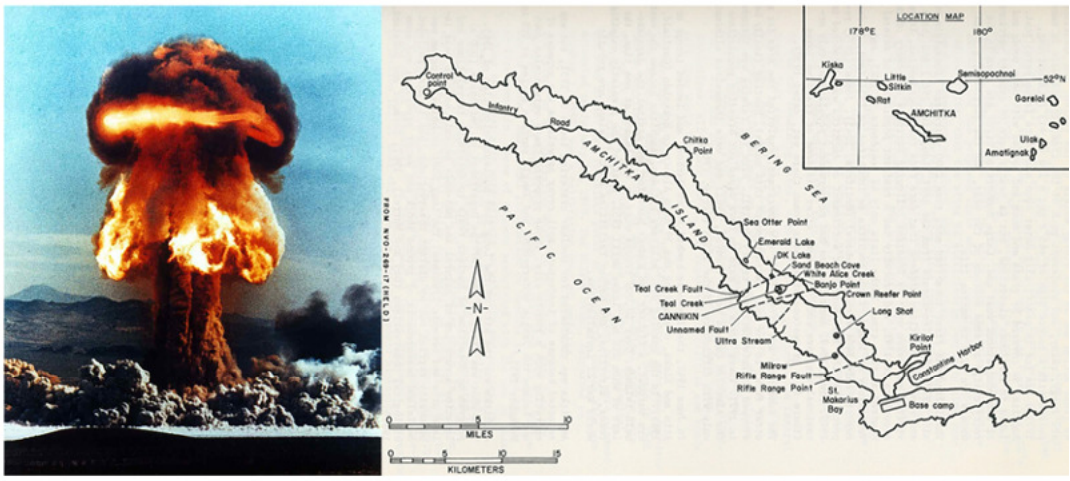
Despite the fact that the Falkland Islands have no volcanoes, there are many interesting and exciting aspects to its nature, culture and climate. As previously mentioned, there are lots of farmers on the Falkland Islands as a consequence of the maritime subarctic climate. This means that there is a lot of rain in the country as well as strong westerly winds constantly hammering on the shores allowing plants to grow plentifully. However, the plants sometimes die from being overfed which causes the farmers a great predicament. In spite of this, the rain helps more than not. As well as this, the Falkland Islands are located in the South Atlantic Ocean. Resulting from this is an abundance of fishermen; consequently there is never a shortage in food and produce. Although the Falkland Islands are a beautiful place, large companies are likely to gradually start moving in, to promote tourism etc. which may damage the landscape as well as the society there. Due to the fact that during most of the year the Falkland Islands experience rain, there is lots of moisture collected in the ground leading to some of the islands become very marshy, some dangerously so. Even though there are 778 islands making up the Falklands, only the two largest are somewhat densely inhabited. These two islands, East and West Island, are where you are most likely to find shops and corporations.

The Falklands War has been disputed many times over the years following on from the tragic events that concerned Argentina and the Britian during the conflict. As mentioned before, the conflict was a ten week struggle that scarred the British and Argentines. It began in April 1982, when the Argentines invaded the occupied islands and on the following continued by the taking South Georgia. The motive for the attacks was because the Argentineans believed the islands to be theirs, but in 1766 the British had settled there and laid claim to the land, until the time came when they were forced to leave because of the American Revolution. The British left a plaque saying that the Falklands were their territory. After World War II the issue was active once more and fighting broke out again and again until the problem had turned into a full out civil war. The battle waged on for 74 days after which the Argentines surrendered on the 14 June 1982, returning the islands back into British hands. The fight had had massive consequences and, in total, 907 people were killed. With 649 Argentine military personnel dead they had suffered a large amount more compared to the 255 British soldiers killed. Although the military services had endured much pain the locals of the islands were wise to not join the conflict, leaving only 3 dead by the end of the war.

Amchitka Island

Joseph Hearn 11GR

Many people have seen video clips of fantastic, awe-inspiring nuclear explosions, with their trademark mushroom cloud and piercing white light. These hellish weapons, whether quietly slipping under the oceans in submarines, floating on clouds in strategic bombers or trundling over grass-covered steppes, are an omnipresent, omnipotent reminder of mankind's ability to wage Armageddon-like warfare. However, most of society fails to realise that these munitions have been tested numerous times, often with scant regard for the unfortunate flora and fauna surrounding the test site.



In 1965, the United States Atomic Energy Commission staged the first of three nuclear tests on Amchitka Island, a landmass in the Rat Islands group of the Aleutian Islands in southwest Alaska. The Long Shot test involved a nuclear device being buried underground and exploded, with the resulting seismic and environmental effects recorded. This first test passed with little fanfare, however krypton and tritium were both found on the surface of the island, foreshadowing the hefty ecological toll that this atomic-battering would render upon the ecosystem. The two later tests – Milrow in 1969 and Cannikin in 1971 gained much greater media attention and even led to the founding of Greenpeace in 1969. Moreover, the environmental impact of these two detonations would prove to be extreme: Greenpeace recorded in an official document that the blast "turned the surrounding sea to froth" and "forced geysers of mud and water from local streams and lakes 50 feet (15 m) into the air".

The Cannikin test, which was four hundred times more powerful than Hiroshima, led to huge land subsidence, rock falls and the formation of a mile-wide new lake. The most direct and initial impact of the tests was the fauna and flora that was cooked the second the bombs exploded. Wildlife surveys revealed that between 700 to 2,000 sea otters were killed in the Bering Sea, their organs pulverised by the sheer force of the blast. Furthermore, huge facilities, including airstrips and housing, were built all over the island to aid the setting up and recording of the tests (see figure 2). This displaced much of the native fauna, with habitats being bulldozed to make way for concrete and steel.

The waters surrounding Amchitka support a vast array of animals, from pollock and crab to whales and seabirds. In recent years, concerns have been raised by the Aleut locals about the possibility of plutonium and other radioactive substances leaking into the water, but their concerns have been muffled by the media power of the Department of Energy. Stephen Jewett, a research professor of fisheries ecology who led a diving trip to survey the island's environmental wellbeing in 2006, said that "The Aleutians are just a spectacular environment. Of all the places I have dived, I have not found any place quite as unique. It has incredible visibility because there's virtually no sediment in the water column. We had visibility approaching 100 feet, which is uncharacteristic in most waters of the state. And the diversity of plant and animal life out there is incredible.

> "The diversity of plant and animal life out there is incredible"

We saw sponges, softcorals and hydroids. Just unbelievable." This endorsement from a respected researchersuggests how vital it is to ensure Amchitka recovers from its scarred past and continues to foster diversity.

What the long term effects of the nuclear tests on Amchitka Island are has yet to be seen however, it is safe to say that the island was devastated in the original blasts and will continue to hold the risk of radiation outflow for many hundreds, if not thousands, of years. Whilst it may never be safe for the Aleut people to return to their homes, we must hope that the lessons learnt from these and numerous other similar programs are never forgotten.

Adak Island

Sam Cheng 12BR

The city of Adak is the westernmost civilised municipality of the United States and is the furthest southerly city in Alaska. It lies 1,930km southwest of Anchorage and 724 km west of Dutch Harbour at 51.872° North, 176.636° West near the Russian end of the arc that makes up this volcanic island chain. Flight time to Anchorage is a minimum of three hours, or longer depending on weather. The Island's one airport is served by Alaskan Airlines. Adak is the southern-most community in Alaska and on the same latitude as Vancouver Island in Canada, and Brussels, Belgium. This Aleutian island is 1,200 miles from Anchorage, but seems as though it is a different country. There's more than enough to explore in the island's abandoned military infrastructure which once housed 6,000 troops and thousands of acres of tundra to intrigue visitors.

The Island was fairly heavily populated up to the end of the 18th century by the Unanga tribe; until the turn of the 19th century as the Aleutian Island hunters followed the Russian fur trade eastward, and famine set in on the Andrean of Island group. However they returned to continue to hunt and fish actively around the island over the years, until World War II broke out. The US army installations which are still present today facilitated the US offensive on the Japanese islands of Kiska and Attu. At its peak, the station housed over 6,000 Naval and Coast Guard personnel and their families. In 1994, the base was downsized, and both family housing and schools were closed before completely shutting down in 1997. Post-war, the Island played a pivotal role during the Cold war with the establishment of a Naval air station which acted as an early missile detection system and submarine surveillance centre. The U.S. Navy and Coast Guard also developed facilities and recreation opportunities at Adak with use of the already present infrastructure. At its peak, Adak had a college, a McDonald's restaurant, movie theatre, roller skating rink, swimming pool, ski lodge, bowling alleys, skeet range, auto hobby shop, photo lab, and racquetball and tennis courts. A new $18-million hospital was built in 1990, just seven years prior to the closure of the station. By March 2003, six years after the closure of the station, most of these facilities had closed.

As of 2013, Adak had a population of 326 and an average age of 44 compared to an average age of 33 for the rest of Alaska. The city's residents surprisingly have a very high median income of just over $90,000 when the US median income per household is $51,000.

Land use permits are required for all non-residents visiting Aleut Corporation land and can be obtained from Anchorage or the harbourmaster at Adak's port. The Aleutian Housing Authority is the only provider of lodging on Adak, and offers both long-term and short-term accommodations in former Naval officer housing. Housing units are heated, furnished, and include local telephone and cable TV service.

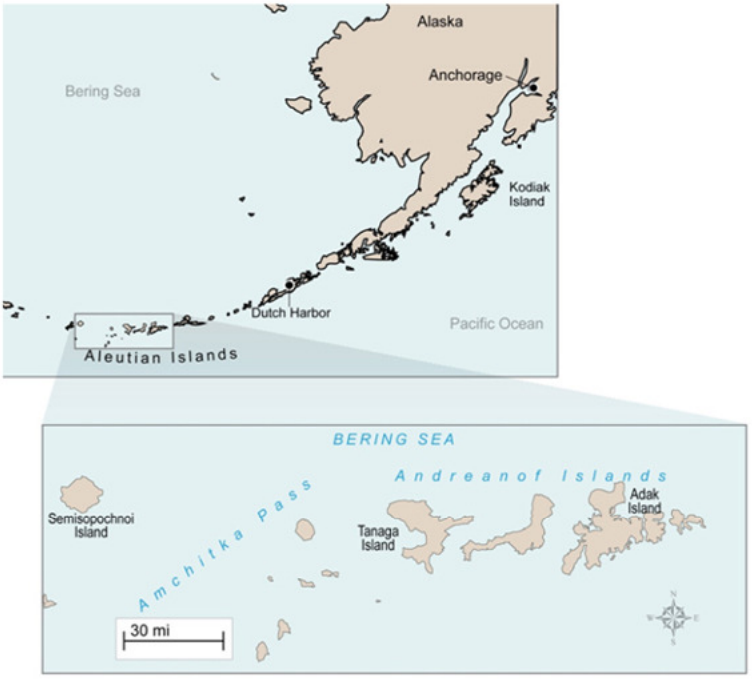
Camping is possible without a permit on Alaska Maritime National Wildlife Refuge lands, but is generally not recommended due to the harsh climate. The wind on Adak is highly variable and often unpredictable. Gusts can exceed 190 km/h, however during the calmer summer months, sustained wind speeds average 93 km/h.

> "The Island played a pivotal role during the Cold war"

The city's water is derived from Lake Bonnie Rose, Lake De Marie, and Nurses Creek, stored in seven water tanks throughout the community, and piped to facilities and housing units. The wastewater treatment system discharges through a marine outflow line to Kuluk Bay. Energy costs are exorbitantly high at around $2-$3 per kilowatt hour and the city is currently exploring renewable sources, specifically hydro-electric power which is suited to the geography of the area.

In a far-flung corner of isolated interest, Semisopochnoi stands among its volcanic brothers and sisters, biding its time. Straddling the Aleutian Trench on the Pacific Ring of Fire, the island marks the (disputed) most easterly point of the United States of America. Its calm and resolute appearance belies the volcanically-active destructive plate boundary which lies beneath.

Few will have heard of such a place outside of volcanologist circles. There are fewer still that have ever set foot on such remarkable ground. Yet those who have had the privilege of venturing to this dot on the edge of the Bering Sea will have been privy to its importance and great beauty. To charter a flight to this desolate place is not a possibility. Those who wish to visit must fly to Anchorage in Alaska and charter a boat for the remaining 1283 miles of the journey. As such, this 20km² igneous jewel isn't somewhere you just happen to stumble upon. Despite being the furthest point West as you look at the map, the island is located in the Eastern Hemisphere on the opposite side of the International Date Line, obtaining the title of both most westerly and most easterly point in the United States of America.



Semisopochnoi

Miss Bartlett

Semisopochnoi (Unyak in Russian) claims to be the most active volcano in the Western Aleutian archipelago. Proudly situated on the 51st parallel north it draws little comparison with other, perhaps more famous, locations on the same line. There are those who argue that people should know more about the island and its fellow Rats (locally these islands are known as the Rat Islands). However, what contributes to Semisopochnoi's worth is it's uninhabited, uncompromised and untampered-with scene. Footfall on the island is limited to a few hardy ornithologists who venture there during the breeding season to take stock of great auklet (Athea cristatella) colonies who make the island their home for the summer. For the most part the island is left alone to fend for itself.

Its neighbours have not had such luck. Kiska Island to the west of Semisopochnoi was used during the Second World War as a base for attacking North America. In 1965, 1969 and 1971 Amchitka Island to the west was used for extensive nuclear testing by the U.S. Department of Defense and Atomic Energy Committee (see pg6 for further details). During a short period of its history, it was surrounded by destruction and aggression. A calm spot in the middle of the storm.

The island itself cannot claim to have always been the unruffled sentinel on this western outpost. Eruptions may have been few and far between in recent history, but its explosive past is etched into the very landscape. Semisopochnoi is an andesitic stratovolcano. Its tapered flanks are the consequence of lava flows emanating from previous eruptions covering the upper sections in cracked shades of obsidian. The island boasts the largest and most active volcano of all the Aleutian Islands, Mount Cerberus, which towers above the surrounding landscape with perfect conical presence. Despite recent signs of activity between May and June 2015, the last-recorded dated eruption was in April 1987 in which Mount Cerberus spewed andesitic ash into the air, covering the entirety of the island. The most recent lava flows date to well over 100 years old, suggesting that our dear Semisopochnoi is, indeed, a sleeping giant.

The volcanology of the region isn't the only characteristic that renders this island inhospitable and dangerous. Its situation in the Bering Strait, surround by the cold waters of the Northern Pacific and Alaskan Sea, influences the island's climate and environment. The island is classified as tundra biome and, thus, a particularly fragile and somewhat unappealing environment. With a slow growing season, little sunlight and exceptionally cold temperatures, Semisopochnoi appears to have stopped still in time, resistant to change. Unfortunately its future cannot be so certain.

Introduction to the island of the Arctic Fox by humans, led to the extirpation of the rock ptarmigans (Lagopus muta), tufted puffins (Fratercula cirrhata) and many other ground nesting birds which had evolved in the absence of predators. Semisopochnoi lends its name to a growing group of islands whose native species have been wiped out by human intervention. The Dodo (Mauritius), the Stephens Island Wren (single-handedly wiped out by one New Zealand lighthouse keeper's cat) and the Elephant Bird (Madagascar) all lend their names to this 'not so elite' group. Each example highlights the impacts of humans on these quiet and fragile places on earth.

Recent history has shown that Semisopochnoi should still be regarded with reverence, regardless of its present dormancy. Hurricane force storms and dangerous seas are the setting for the breeding grounds of a profitable commodity. The U.S. states of Washington, Oregon and Alaska take advantage of the nutrient rich oceans surrounding the Alaskan peninsula, with hundreds of thousands of people relying solely on the fishing industry as a means for survival. With persistent churning up of nutrients within the lower layers of the ocean, this provides a profligate feeding ground for a complex and biodiverse food ecosystem. As such, fishermen frequently traverse these oceans looking for profits. In October 2008 fishermen on board the Katmai Fishing Vessel placed their lives in the hands of the oceans surrounding Semisopochnoi. Five men died as a result of the sinking of their fishing vessel and two are still unaccounted for, considered lost at sea. The oceans surrounding the island are a force to be reckoned with and only the most able seamen should venture this close.

The future of the island depends on people's lack of interest in inhabiting the area. Climate change has increased the speed of the sea ice melt north of the Arctic Circle. Consequently, resources can now be transported from Western Europe via the infamous Northwest Passage through the Bering Strait and into the Pacific. Semisopochnoi has the potential to once again be a stopping place for those who require shelter. Shelter, however, they may not find. With cold temperatures (mean annual temperature is 3°C) and a windswept landscape, Semisopochnoi is no more inviting than the desolate black beaches of South Georgia or treeless landscape of St Kilda, where the winds are so forceful that no plant life taller than one metre can survive.

Aeopyomis titan
Pleistocene to recent
Madagascar

Why, then, should we glorify a seemingly barren and desolate rock in the middle of nowhere and of which no one has any inclination of visiting? Firstly, because of its significance in the evolution of the earth as an anthropocentric system. Humans evolved and emerged from Africa, following Homo erectus and Homo habilis across Africa, through the Fertile Crescent (present day Jordan and the Middle East) and across Beringia into the Americas. Those first humans potentially could have set foot on Semisopochnoi on their way to world domination.

Secondly, because of its untouched nature. When Mungo Park first followed the Niger River into the depths of Africa, he was among those fabled explorers who were, indeed, the first to see, hear and experience the wild places of Africa. 150 years later and we take package holidays to The Gambia, Namibia and other places previously considered to have been inhospitable and 'backward'. With globalisation and a greater disposable income, so little 'terra incognita' still remains for those explorers still amongst us, that places like Semisopochnoi should be valued for their wildness and their mystery.

Lastly, because of its vulnerability and, therefore, geographical significance. Too many examples exist in present history of the impacts and irreversible changes that humans have imposed upon the earth. Semisopochnoi is part of a fast decreasing group of locations that can have any kind of claim to being natural. It may be the last of a particular environment that can teach us so much, yet asks for nothing in return.

Semisopochnoi has seen its share of trials and tribulations throughout its physical and human history. One thing is consistent when it comes to the island. It stands resolute and proud in its small spot on the surface of the earth. Little-known to many but much-loved to some. Value the places which we don't know much about and try to keep them that way. The less we know, the less likely we are to alter these little rarities of wilderness.

Joshua Hanson 8GR

Segula Island

Segula Island is situated in the Aleutian Island archipelago, around 1,200 miles off of the Alaskan peninsula. The island consists of a Holocene stratovolcano that is largely inactive. It is a relatively small island of only three to four miles in diameter which would account for it being one of the least populated places on latitude 51°N north. What is interesting about this island is that it lies directly on the parallel separating latitude 51°N and latitude 52°N. Consequently half of the island is on a different parallel to the other.

Read the rest of this article at: http://www.suttongrammar.sutton.sch.uk/Geography-Enrichment

Hokkaido Island

Adam Khan 12BR

Hokkaido is the northernmost of Japan's main islands and is situated close to Russia. As Japan's second largest island it borders the Sea of Japan, Sea of Okhotsk and the Pacific Ocean.

Hokkaido lies on the Okhotsk tectonic plate, to the east of the Pacific plate which is moving North West at a rate of approximately 9cm per year. This forms a convergent boundary as both plates collide, with the Pacific plate 'sliding' underneath the Okhotsk plate. When this occurs it is known as subduction, with the whole area being called the 'subduction zone'. The subduction creates and oceanic trench along the plate boundary (Kuril Plate), as the Pacific plate moves underneath the crust. This type of plate boundary causes significant volcanic and seismic activity found all around the Pacific Basin, known as the 'Ring of Fire'. This area is not only responsible for Japan's volcanic and seismic activity but also the West coast of North and South America including Los Angeles.

This plate boundary make Hokkaido famous for its volcanoes and mountains; one of the most famous being Hokkaido Komagatake volcano. Mt. Komagatake is a 1,131 metre tall stratovolcano. This type of volcano is common along subduction zones in volcanic chains such as those found in Japan. It is formed by magma rising through the crust and pooling near the surface, forming a magma chamber. Once gas and magma accumulate in this chamber, pressure increases, until it is discharged in an eruption. This last occurred for Komagatake in 2000.

Hokkaido is also well known for its hot springs which are a cultural symbol of the area and Japan as a whole. These thermal springs are formed by convection currents in magma over a kilometer under the surface. This heats up pools of water, causing them to be used locally as spas. These waters often contain different chemicals including sulfur, sodium chloride and hydrogen carbonate. This is what many attribute the water's "healing properties".

Germany By Numbers

Shayaan Satwani 8RE

81,000,000

Germany has the largest population in Europe of 81 million. Germany is one of the few countries in stage 5 with a birth rate of 8.47 per 1000 people and a death rate of 11.42 per 1000 people

'Time' Person of the Year

Angela Dorothea Merkel is a German politician and former research scientist who has been the Chancellor of Germany since 2005

1,500,000

Due to Germany having a higher death rate than birth rate, Germany was willfully took in migrants fleeing from Syria and Iraq

Germany is part of west-central Europe. It is bordered by two seas: the North Sea and the Baltic Sea. A host of countries border Germany such as Denmark, Netherlands, France, Poland and Switzerland. Germany starts from just north of the Italian Alps and stretches all the way North to the North Sea. Germany covers 357,021 km² of Europe and this figure puts Germany as the 7th largest country in Europe.

Brandenburg Gate

-The gate was constructed in the later part of the 18th century
-The gate signifies reunification of West and East Germany
-Some call the gate the 'regal symbol of Berlin'
-The gate has survived many wars for many centuries including both World Wars
-These days, a lot of festivals take place under the gate

Cologne Cathedral

-This is the most-visited landmark in Germany
-First built in the Roman times
-Rebuilt many times because of WWII and events such as this
-It is known as 'a masterpiece of Gothic architecture'
-It is in (yep, you've guessed it…) Cologne!

Neuschwanstein Castle

-This castle was built for King Ludwig II
-This castle inspired Disney in the 'Sleeping Beauty' movie
-The castle is located on a hill in southwest Bavaria
-It is the most-photographed site in Germany
-The castle was opened to tourists in 1886

Berlin Wall

-Separated East and West Germany for more than 30 years
-Built in 1961
-Demolished in 1989

Hesse, Germany

Samuel Groves 8GR

Hesse, or Hessen, is a federal state located in the west of Germany. Hesse is surrounded by the states of Lower Saxony to the north, Thuringia to the east, Bavaria to the southeast, Baden-Württemberg to the south, Rhineland-Palatinate to the west, and North Rhine–Westphalia to the northwest. Its capital, Wiesbaden, has an area of 8,152 square miles. Small-scale farming is quite widespread across the state. Wheat is the most widely grown crop, followed by sugar beets and potatoes. Poultry, pigs and cattle are the chief livestock. Southwestern Hessen is primarily industrial, but it is also an area of intensive agriculture. The plains along the Rhine and Main rivers are a mosaic of vineyards, orchards and fields of grain, potatoes and tobacco. The surrounding hills have a three-year rotation of rye, oats and potatoes and livestock farms focus on the production of butter and cheese. Market gardening is especially important near the cities.

The most important cities in Hesse are Frankfurt am Main, Darmstadt, Kassel, Offenbach am Main and of course Wiesbaden. Most of the population of Hesse (5.994 million people) can be located around the Rhine Main Area in the south of Hesse. The Rhine acts as a border for the southwest of Hesse as it runs around the state without passing through it.

The state's industries depend on the Rhine waterway and its extensions up the Main and Neckar. The Rhine-Main area, centred on Frankfurt am Main and Wiesbaden, is one of the important business regions of Germany. Kassel, Offenbach, Wiesbaden and Darmstadt are other large manufacturing centres. Quality steel is produced in Wetzlar. Vehicles, machinery, chemicals, electrical goods, scientific instruments and textiles are among the products of these and other towns. New industries have developed since World War II, stimulated by the arrival of German refugees from eastern Europe. These enterprises include the making of glass, musical instruments and toys. Book publishing is a prominent economic activity as well. Frankfurt am Main is an important financial centre, home to the European Union's central bank and Germany's major stock market.

Although the industrial side of Hesse is striking, the state is considered one of the greenest in Germany. Covering 42% of the state, forests consist of Fasanerie Gross-Gerau, National Park Zentrum Kellerwald, Barenfichtenweiher and more.

Whilst containing mostly wooded areas, Hesse also has the massive volcanic Vogels Mountains (Vogelsberg), which are the largest constant basalt area in Europe. The Vogels Mountains are separated from the Rhön Mountains (a mountainous mass rising to Wasser Peak) by the Fulda River and its valley. The main peaks of the Vogelsberg are Taufstein, 2,536 ft, and Hoherodskopf, 2,503 ft, both now enclosed in a nature park, the Hoher Vogelsberg Nature Park. In this area there is a broad population of wildlife, including the Eurasian lynx and wild boar, whilst wolves are said to be spotted in the region. The mountain range between the Main and the Neckar river is called the Odenwald. The plain in between the rivers Main, Rhine and Neckar, and the Odenwald mountains is called the Ried.

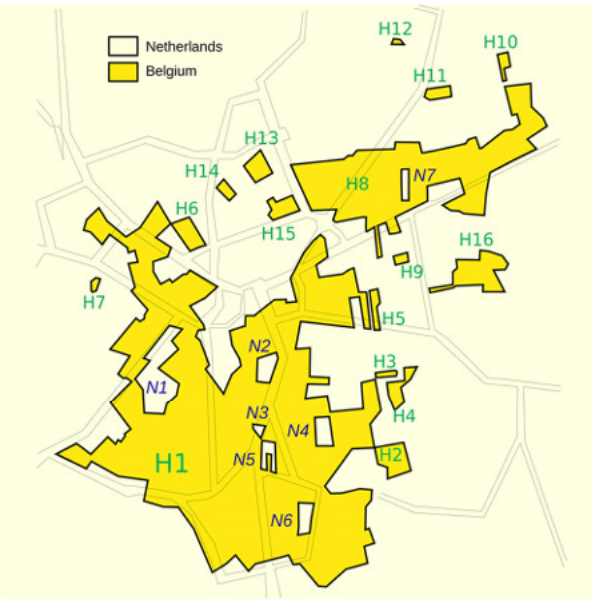
Borders of Baarle-Nassau & Baarle-Hertog

Hamish Macrae 9RE

Baarle-Nassau and Baarle-Hertog are two small scenic towns, the former located in the southern Netherlands and the latter a municipality of Belgium. They are considered by many to be great tourist attractions, with a combined population of around nine thousand people they are ideal places to visit if one wishes to get away from the hustle and bustle of everyday life. Moreover, the way of life in Baarle-Nassau and Baarle-Hertog is simple. Both visitors and inhabitants of the areas seem to do no more than visit the museums that the region has to offer and drink coffee whilst watching the world go by.

The laid back atmosphere of the towns is not what makes them unique. Nor is it the fact that their names start with the same word, or indeed that they are both on latitude 51° North. No, it is because they exist within each other (separated by a complex system of borders) that in some cases run across streets, that they are so fascinating. This leaves no doubt in your mind as to which country you are in. The complexity and nature in which the two countries are divided into enclaves is very difficult to describe with words. The map and image provide some clarification of how the enclaves exist within and next to each other in this complex system. The international border does not run straight through this settlement, dividing it up into multiple parts on its way through and consequently the towns are made up of 26 separate parcels of land.

As can be presumed, this mind bending network of borders is sure to result in some disagreements and confusion among its residents and landowners, and as such, there have been many different treaties and agreements made during medieval times among rich people to clearly clarify what they did and did not own. These treaties were made between the Lords of Breda and the Dukes of Brabant who were the stakeholders that owned the two pieces of land at the time. The treaties were changed, clarified and then again verified until the final decision who owned what was finally agreed on in the Treaty of Maastricht in 1843.



As a result of this treaty life in the 'Baarle' has never been the same. Homes are split in two, the bathroom in The Netherlands the kitchen in Belgium. The amount of tax paid in shops that operated adjacent to each other differed highly making the price of the product you were buying uncertain. Restaurants which straddled the border had to shut down half of their service at midnight because The Netherlands licensing hours stopped short of midnight. Customers would drag their chairs across the room to continue drinking in the Belgian side for another hour.

An additional weird peculiarity, borne out of an already odd situation, is that the architecture within the two separations is completely different. This makes it feel so strange because by simply walking through the two towns it feels like you are walking into a whole other country whilst crossing the street. In reality this is literally true, but the fact that you can walk a very short distance to achieve this effect is something completely odd.

Baarle-Nassau and Baarle-Hertog are not actually the only countries in the world to have such complex border systems. One such border is between America and Mexico, although this is not complicated in the same way. Instead of having many enclaves the clear division between the American-Mexican border is that the land is higher in Mexico than it is in America.

Ultimately the example of Baarle-Nassau and Baarle-Hertog is a representation of some of the most fascinating human political geography. This creation, along with others, date back to significant periods in our past and show the significance of the impacts that our ancestors have had on present day Geography. Rather interesting wouldn't you say?

Netherlands Delta Works

William Frost 11GR

The severe floods in the North West of England in the last few weeks are fresh in our minds; however, the impacts of these were tiny compared to the huge floods that The Netherlands have experienced in the past, since most of the country is below sea level. Over the years many floods have occurred, most remarkably the North Sea flood of 1953. After a colossal storm out at sea on the last day of January, a huge flood drenched the low-lying Netherlands, most severely affecting Zeeland. Over 1,830 people were killed in The Netherlands alone, not to mention parts of the UK and Belgium. This flood resulted in millions of pounds worth of damage and stunned the Dutch government into action.

Henceforth, in the view of the American Society of Civil Engineers (who classed it as such in 1994), one of the seven wonders of the modern world was created. The whole project was based on old plans from before the Second World War, that had not yet been put into action because of the slight distraction that the war caused.

From 1958 to 1997, a monumental fourteen different projects took place to create the Delta Works system that is in place today. The south western area of The Netherlands, namely Zeeland, the furthest west province of The Netherlands, Noord-Brabant and Zuid-Holland are all on a huge delta system which forms the mouth of the rivers Scheld, Rhine and Meuse. This project is essentially an array of dams, locks, dykes, sluices and floodgates. Both sluices and floodgates limit the amount of water that enters a water channel.

Together, all of these different man-made features control the amount of seawater that is let inland and effectively shortens the coastline of the south-western part of The Netherlands by over 400 miles. However, this project was even less straightforward than it might seem, because at the same time as limiting water entering the delta, there needed to be enough space to allow enormous ships into the country. Most importantly, a prodigious number of ships, both cargo and transport, needed to be able to make their way past the Hook of Holland, into Rotterdam, to feed the lively industry. This same principle also applied to Antwerp, in northern Belgium, which houses none other than the third biggest port in Europe.

The planning for the Delta Works was very mathematical, comparing the potential damage to property and loss of human life to the cost of the construction and the likelihood that a dangerous storm or flood would strike the coast. This process became so calculated that a human life was judged to be worth 2.2million euros. Even the likelihood that the dykes might fail was taken into consideration, and all the details were set in a piece of legislation that outlined the requirements for any form of delta project.

The very first construction in the Delta Works project was a storm barrier in the Hollandse Ijssel, a branch of the Rhine delta. This was an immensely important barrier because it protected the densely populated western part of The Netherlands. After the construction of this first storm barrier in 1958, two more barriers were erected on the Veerse Gat and the Zandkreek, which has resulted in the water in this area, the Veerse Meer, becoming much less salty and effectively forming a vast lake.

The Delta Works system has not only prevented flooding, as the project has increased the amount of freshwater in the Netherlands and also has made it far easier to let polluted water out. Furthermore, this project has facilitated the infrastructure in southern Holland, as the increased control of the water has allowed both a bridge and a tunnel to be built to the fairly isolated province of Zeeland.

With an artificial structure on a scale as huge as the Delta Works system, unsurprisingly some natural spaces have been damaged. To combat this, work has been done to preserve plant and animal life, such as strengthening the river bed at specific points. Furthermore, preventing flooding does also protect plants, animals and the well-renowned magnificent scenery of The Netherlands.

Nature is undoubtedly a fearful opponent and for this reason work is constantly being done to identify weak points in the Delta Works, so that it can be frequently repaired and the ever-present force of the ocean can be combatted.

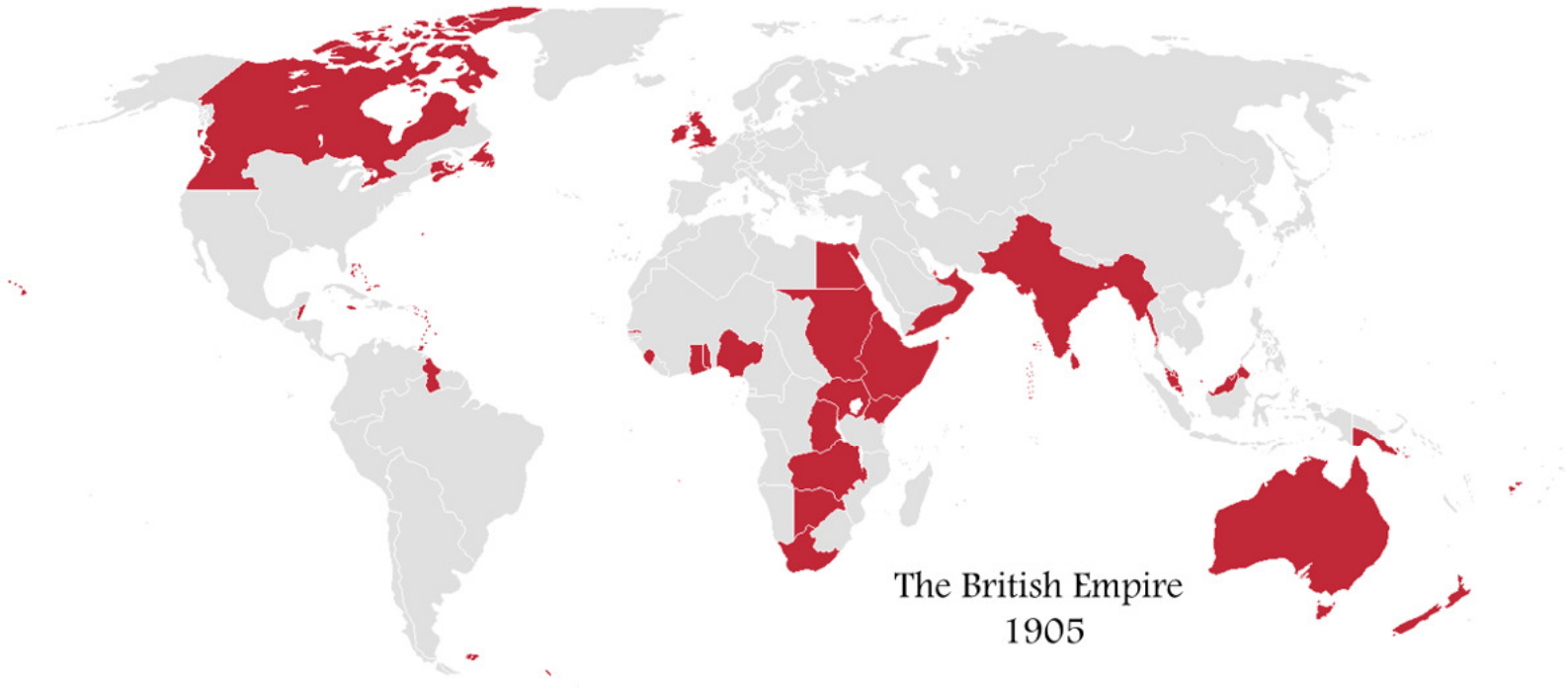
LONDON & The Empire

In the last few centuries, London, like the world's population, has grown at an exponential rate. From the city's creation by the Romans in 43AD, when it was called 'Londinium' and occupied a mere 0.5 miles squared, to the 17th century, where the majority of the city was still packed into a single square mile, very minimal growth had occurred within the city. However, in the past few hundred years, the size of the city has soared to 607 square miles, and, at the same time, the population of the city rocketed upwards, from housing 200,000 inhabitants in the Tudor era, to now, in the present day, having a population of 8.6 million. However, it is not just the size of London that has soared, but also its status and power in the world as a whole.

From the moment that London started to form, it has always been very significant, with its site on the bank of the River Thames providing the city with an ideal location for transport and trade, which helped to build the city and its economy. From London's beginning under the Romans, there is evidence to support the fact that London was a cosmopolitan hub of trade and culture, as archaeologists have discovered many items imported from all over the Roman Empire.

However, there was little major development in London, or across the world, until almost the 17th century, when Britain began to build its empire. From 1600, London has advanced from being the capital city of a relatively small island off the coast of mainland Europe, to being the vast hub of a massive, profitable empire spanning the world, leading to the development of the phrase, 'the empire on which the sun never sets', which accentuates the magnitude of this mighty empire. An immense operation, consisting of large numbers of imports and exports founded on the new 'contacts' established by the empire's development was concentrated on the City of London and its port.

This network produced the wealth and raw materials required for the industrialisation of Britain, which firmly set London as the economic, political and cultural capital of not just Britain, but the world. With the invaluable imports to Britain that the trade provided, such as grain and raw wood from the 13 Colonies in America in the 17th and 18th centuries, Britain was able to become the first nation ever to industrialise and receive the many benefits which accompanied it.



The British Empire
1905

With industrialisation, came mechanisation, technological advances and an overall much-improved standard of living in general. The mechanisation of the agricultural industry meant that significantly higher yields of crops could be cultivated, leading to a wider availability of food for all people. Moreover, it signalled the expiration of the physically draining and back breaking work in the fields, which often led to illness and disability in the workforce. Additionally, urbanisation followed mechanisation, bringing people into the cities so that they could become a commercial hive of activity, boosting the economic power of cities, such as London. This urban growth ensured that a far greater proportion of the population was in closer proximity to medical facilities, improving the health of the people. Specifically, the year 1798 saw Edward Jenner's momentous creation of the smallpox vaccine, the first in history, and a prime example of superb medical advancement. Until the industrial revolution in Britain, the population growth was at replacement rate, causing the population to remain fairly constant, but with the technological advancements and developments, the death rate plummeted, from about 35 per 1,000 in 1,740 to around 15 per 1,000 in 1900. This led to Britain becoming the first nation to experience the natural increase associated with stages two and three of the demographic transition model.

Undeniably, London was the centre of this hugely prosperous empire and therefore soon became the richest city in the world and a major hub. It had become the 'Rome of the British Empire', but on an even greater scale, as London was the capital of nearly a quarter of the world and the British Empire's territories stretched far beyond the boundaries of Europe. During the course of the 19th century, London was the predominant marketplace of the world. With the rich rewards being reaped from the developing colonies, the railway, a prize of industrialisation, could deliver a variety of produce (fruit, vegetables, fish and meat) to the markets at Covent Garden, Billingsgate and Smithfield. Ships from across the Empire (and thus the globe) discharged containers and goods at the numerous wharves along the River Thames. This trade provided about one million Londoners with their income.

Additionally, prosperity and development in London can be evidenced by the opening of the first ever underground train line, called the 'Metropolitan Railway', in January 1863. This line operated between Paddington and Farringdon and the carriages were pulled by the famous steam locomotives that came from industrialisation and revolutionised Britain and its economy. Moreover, even in the later years of the empire, the influence and cultural significance of London is realised by the city being awarded the 1908 Summer Olympics Games, only the fourth of the modern era.

Yet, the military prowess of the empire was also crucial in London's prominence on the world stage. The safety of London and indeed the whole British Empire was definitively secured (for the next 100 years until WWI) following the Battles of Trafalgar and Waterloo, in 1805 and 1815 respectively, which were decisive battles in warding off and ending the threat posed by Spain and France, both on land and crucially for ongoing trading success, on water. This allowed the empire and its capital city, London, to continually flourish.

The British Empire would eventually become the largest and richest in history, paving the way for Britain to drive the world and be the principal global power. London was to become the heart of this empire, and it soon speedily developed into the economic centre and powerhouse who it is still is today. Even in 1922 (when the empire was declining in the aftermath of World War I), the British Empire commanded authority over roughly 458 million people, a staggering one-fifth of the global population at the time. Moreover, the territories spanned nearly a quarter of the Earth's entire surface area.

To conclude, the might and scale of the British Empire seems to be the direct cause for the growth of London, by any measure, be it population or economy. The resources gained from the colonisation of overseas lands undoubtedly provided London with the required goods, skills and labour to industrialise and develop into the thriving capital of the greatest Empire in history. This led to the great demographic changes in London and Britain as a whole, which enabled the massive economic advances to occur. The standing given to London by the Empire is still clearly evident today, for London is still one of the World's greatest cities (in 2008, London had the highest GDP in Europe of $565 billion) and this serves as tremendous testament to the strength of the British Empire.

James Hudson 12GR

Mongolia

Max Sinclair-Johnson 11GR

You may not know much about it, but Mongolia is the 19th largest country in the world, and the 2nd largest of all landlocked countries. Founded by Genghis Khan during the 12th and 13th centuries, the Mongol Empire included Mongolia and also at its peak stretched over all of East Asia, most of the Middle East and even into Eastern Europe. The nomadic roots pre-dating Genghis Khan are still ever present in today's Mongolian society, with over 30% of the population being nomadic or semi-nomadic. With a population of around 3 million people and consisting of a land area of 603,900 square miles, 6.5 times bigger than the United Kingdom, Mongolia remains one of the world's least densely populated countries.

As Mongolia has one of the world's highest average altitudes, it is little surprise that Mongolia's capital city, which is called 'Ulaanbaatar', is the world's coldest with an average annual temperature of -1.3C. With this bitter cold and relatively industry-free environment especially in rural areas, snow leopards thrive and over one quarter of the snow leopard's global numbers live in Mongolia. At least 35% of Mongolia's land is desert, with the Gobi Desert, the 4th largest worldwide, covering
approximately 250,000 square miles of Mongolia's surface and in most years there is no annual rainfall across the Gobi. However, the Gobi Desert was in fact once a sea, which explains why many tourists find marine dinosaur fossils when walking in the Gobi Desert. The Bactrian Camel, a critically endangered species with approximately only 1,000 left in the wild, roam throughout the Gobi Desert and around Mongolia. However, nomads in Mongolia seldom use camels any more, whereas horses are much preferred - to such an extent that horses outnumber humans 13 to 1! Eagles are also commonly used by nomadic Mongol tribesman to hunt, as they help to seek out prey easier.

Due to the freezing temperatures, the ground in Mongolia is typically permafrost, meaning the ground is frozen for long periods each year which makes development, both commercial and residential, very difficult – for instance, it is too cold in winter to pour concrete therefore restricting the time when development can take place. However, even though the average temperature is below freezing, Mongolia has an unusually high 260 sunny days in an average year. Despite this, Mongolian people require heating for 8 months to survive the freezing temperatures and, therefore, many different materials are burned to obtain this heat.

Wood, coal, refuse and old tyres are just a few of the materials burned regularly by Mongolians and they all release harmful gases into the atmosphere, such as carbon dioxide, sulphur dioxide and carbon monoxide. With air pollution in the capital city, Ulaanbaatar, 14 times higher than the World Health Organization's threat level, it is considered to be one of the world's most polluted cities. There is no surprise therefore that the rate of premature deaths, cases of chronic bronchitis, and respiratory related hospital admissions is increasing rapidly.

Natural disasters are rife in Mongolia, especially dust storms (called 'zud' in Mongolian dialect), which happens when loose particles and dirt from a dry surface rise due to heavy gusts of wind- 'zuds' tend to occur in arid or semi-arid regions like Mongolia. The phenomenon of 'Asian Dust' is common throughout Mongolia and with the seriously high levels of pollutant gases; these dry particles (such as sulfur) that are carried by the gusts of winds can severely damage inhabitant's lungs and increase number of asthma sufferers and cases of emphysema too. Although much of Mongolia is arid or semi-arid, there are three mountainous ranges: The Altai Mountains, the Khangai Mountains and the Khentii Mountains. 'Tavan Bogd' is a mountain massif; (a section of the Earth's crust that has been limited by faults), and it is found in the Altai range on the borders of Russia and China. It contains the 'Khüiten' peak which is Mongolia's highest peak reaching 4,374m skywards. These mountains can frequently produce dangerous blizzards in Mongolia, and the snow melt flow from the mountains, coupled with occasional high levels of precipitation can sometimes result in flooding - a flood on 11th July 1966 affected over 270,000 of the population.

There is no doubting the fact that Mongolia is slowly increasing in wealth and global status. Particularly in rural areas, Mongolia is rich in its biodiversity, culture and history, as well as boasting plentiful supplies of fossil fuels, especially reserves of natural gas. With a growing tourist industry and many natural and historical sites to entice visitors, there is no denying that Mongolia will rise in fame and stature, yet this potential economic growth is dependant, among other things, on how Mongolia is governed. The perilous levels of pollution, increasing wealth gap between nomadic and non-nomadic
communities and extreme poverty are problems that must surely be dealt with effectively, at least before Mongolia can truly start to grow and become a nation as economically and technologically advanced as its neighbour China. Advances in the industrial and commercial sectors along with fast-improving technology will surely pave the way for more efficient economic development both in the urban and rural areas within Mongolia. The potential for success is substantial, but can Mongolia manage its environmental, economic and social problems before they damage it irreversibly? Only time shall tell.

Lake Baikal

Salih Halil 12BR

"Lake Baikal is rich in biodiversity. It hosts more than 1,000 species of plants and 2,500 species of animals"

Lake Baikal is an ancient, massive lake in the mountainous region of Siberia, located just north of the Mongolian border. With a maximum depth of 1,642 m (5,387 ft.) it is considered the deepest lake in the world. Not only that; it is also considered among the world's clearest and oldest lakes at an approximated age of at least 25 million years. Lake Baikal is the seventh largest lake in the world by surface area, and with a volume of over 23,500 km^3 of fresh water it contains more fresh water than all of the North American Great Lakes combined.

With an estimated age of 25-30 million years, it is one of the most ancient lakes in geological history. The lake is unique among high latitude lakes, in that its sediments have not been scoured by ice sheets that have passed over it in the past. Cooperative studies of deep drilling core sediments carried out by Russia, U.S., and Japan in the 1990s give a detailed record of climatic variation over the past 6.7 million years. There are plans to drill deeper into the sediment cores to gather more data from the lake.

The lake is completely surrounded by mountains; the Baikal Mountains on the north shore and the taiga are technically supported as a national park. It contains 27 islands, the largest of the islands being Olkhon which is 72km long and is the third largest lake bound island in the world. The lake is fed by as many as 330 in flowing rivers and is drained through a single outlet: the Angara River.

Lake Baikal was formed as an ancient rift valley, between several highlands or mountain ranges, giving it its typical long crescent. At 636km long and 79km wide Lake Baikal has the largest surface area of any freshwater lake in Asia, at 31,722 km^2. Due to the thousands of species of plants and animals that call Baikal their home and that may exist nowhere else in the world, UNESCO declared it a World Heritage Site in 1996, which means that no one is allowed to destroy the natural habitat of the flora and fauna that call it home.

A rift valley has created by a divergent plate boundary beneath the lake which has been named 'The Baikal Rift Zone'. In geology a rift is where the Earth's crust is being pulled apart and is an example of the tectonic plates below the surface extending. The bottom of Lake Baikal is 1,865 m below sea level, but below it lies 7km of sediment, this places the rift floor 9km below the surface making it the deepest continental rift on Earth. In geological terms, the rift where Baikal is situated is young and active, widening at a rate of 2cm per year.

The Buryat tribe live on the Eastern Side of Lake Baikal and consist of 500,000 people making them the largest indigenous group in Siberia; they mainly rear goats, camels, cattle and sheep. As the Lake that the tribe call home is a world heritage site it is illegal to commit any acts of hostility towards the spiritual heritage of the Buryat tribe. The Buryat national tradition is one which has been based on the challenges that nature throws at them, having to live in conditions where in the winter the mean minimum temperature is -19 °C and the mean maximum temperature in the summer is 14 °C. These harsh climatic conditions of the region have created a 'fragile' balance between humans, society and the environment itself.

Lake Baikal is rich in biodiversity. It hosts more than 1,000 species of plants and 2,500 species of animals based on current knowledge, but the actual figures for both groups are believed to be significantly higher. More than 80% of the animals are endemic (can only be found at Lake Baikal). The Baikal seal (nerpa) is found throughout Lake Baikal and is one of only three entirely freshwater seal populations in the world, the other two being subspecies of ringed seals.

In total, there are fewer than 60 native fish species in the lake, but more than half of these are endemic including two species of Baikal Oil Fish. These long-finned, translucent fish typically live in open water in depths of 100–500m, but occur both shallower and much deeper. They are the primary prey of the Baikal seal and represent the largest fish biomass in the lake. Baikal is also home to a variety of fish that belong to the superfamily Cottoidea; this superfamily of fish contains 11 families, 149 genera, and 756 species. Apart from these there are few endemic fish species in the lake. The most important species of fish for the fisheries and the Buryat Tribesmen is the omul, a whitefish species of the salmon family that is also endemic to the lake. The fish is caught, smoked and then sold widely in markets around the lake. The Baikal Black Grayling, the Baikal White Grayling and the Baikal Sturgeon are other important species with commercial value.

There are several organisations that are carrying out natural research projects on Lake Baikal; most of them are governmental or associated with governmental organizations. The Baikal Research Centre is an independent research organization carrying out environmental research projects at Lake Baikal. In July, 2008, Russia sent two small submersibles, Mir 1 and Mir 2, to descend to the bottom of the lake to conduct geological and biological tests on its unique ecosystem. Russian scientist and federal politician Artur Chilingarov, the leader of the mission, took part in the Mir dives as did Russian leader Vladimir Putin. The dive was meant to also set a world record for the deepest freshwater dive, but they were just 37m short of the record which was set in 1990 by Anatoly Sagalevich who also did his dive in Lake Baikal reaching a depth of 1637m.

Recently a scientific expedition in Lake Baikal has discovered that 160 tonnes of liquid waste are being produced in Baikal's Chivyrkui Bay; this information comes from the head of the Baikal Enviromental Wave. Ecologists have said that if the contamination of the lake does not stop, this lake, that has been around since the dinosaurs, can be turned into a swamp.

SIA (Security Industry Agency) have reported locals have also complained to ecologists that waste easily drains into the lake. The large tourist attraction of Lake Baikal is creating larger tourist camps each year which are unwillingly contributing to the pollution. The report from the head of Baikal Environmental Wave also elaborates that the camps pass waste to special organizations, but the disposal vehicles often don't reach the facilities and instead end up dumping the waste into Baikal or rivers that flow into the lake.

It's not only the dumping of waste from transport vehicles that contribute to the contamination of the lake; another large contributing factor is water transport. Ships, boats, yachts and other vessels produce 25,0000 thousand tonnes of liquid waste annually, but only 1,600 of the waste produced by these vessels actually end up at the proper disposal

Continued on next page

facilities; the rest, as you have probably guessed by now, is presumed to end up in the lake. The contamination of the lake is already having visible effects to the lake, with invasive species of plants that have never grown at the lake spreading all over the Lake. This includes plants such as Spirogyra and Elodea Canadensis that tend to only grow around swampy regions.

Researchers found a significant accumulation of water plants and dead lake molluscs on the northern coast of Lake Baikal, according to the report. They monitored the coastline from the mouth of the River Tia to Senogda Bay, finding rotting water plants down the coast. An increased level of pollution was also discovered in Listvenichesky Bay.

Local ecologists have suggested that to prevent the waterlogging they should equip vehicles with GPS to track exactly where the waste is delivered. In addition they think that new technology and educational programs should be introduced to help preserve the lake. Ecologists have also offered to support initiatives of the residents as well as local environmental projects.

In December 2013, after almost a two decade battle to close a major polluter of the lake – Baikal Pulp and Paper Mill was finally shut down after 47 years of dumping waste into the lake. The closure of the mill took a toll on the region's economy, with almost 2,000 people left jobless, the minister of natural resources and ecology of the Irkutsk region said that the mill was the town's only major employer and accounted for 80% of its income. Local residents have been staging protests in an effort to bring attention to the town's economic problems.

In response to their calls, the minister proposed to create environmentally friendly enterprises. Now there are several small plants being constructed which will bottle water and process vegetables and fruit. These plants have been planned out so that close to zero waste will be dumped into the lake with efficient disposal systems being set in place, but due to the history of these disposal systems, until the legalisation of tracking on these vehicles passes we cannot say that the lake will not suffer from these plants.

in response to the pollution caused by water transport vehicles, the government is planning on building the first eco-friendly vessel which will battle waterlogging; it will reportedly be equipped with devices to recycle sewage water into fuel. The ship will also be equipped with solar panels and a wind generator. The cost of the project has been estimated at £211,000 per vessel.

In conclusion, Lake Baikal is one of the world's most geologically and ecologically important lakes, however it is under constant threat of irreparable damage from pollution. Therefore to preserve this pivotal natural feature, not just for the flora and fauna, but for the local community, policies must be put in place that will have a lasting benefit on the area.

Strait of Tartary

Jack Saunders 12RE

The Strait of Tartary is a naturally formed, narrow, and navigable waterway in the Pacific Ocean, dividing the Russian island of Sakhalin from mainland Asia (South-East Russia), connecting the Sea of Okhotsk on the north with the Sea of Japan on the south. It is 900 km long, 4–20m deep and 7.3 km wide at the narrowest point.

The name Tartars had long been used by Europeans for various peoples of Inner Asia and North Asia. Since the Manchus' rise to prominence in 1644, the name "Tartars" became applied to them as well, and Manchuria became known to the Europeans as the "Chinese Tartary". Rather appropriately, when La Pérouse charted nearly the entire strait between Sakhalin and the mainland "Chinese Tartary" in 1787, the body of water between the mainland and island received the name of the Strait of Tartary.

On Russian maps, the shortest and narrowest section of the strait (south of the Amur) is called Nevelskoy Strait, named after Admiral Gennady Nevelskoy, who explored the area in 1848; the body of water north of there, into which the Amur River flows, is the Amur Liman; and the name of Strait of Tartary is reserved for the largest section of the body of water, south of Nevelskoy Strait. When approached from the south, it becomes increasingly shallow and looks like the head of a bay; therefore Tartar Strait has puzzled European explorers ever since. In 1787 La Perouse decided not to risk it and turned south even though locals had told him that Sakhalin was an island. In 1797, William Broughton also decided that the Strait of Tartary was a bay and turned south. In 1805, Adam Johann von Krusenstern failed to penetrate the strait from the north. Mamiya Rinzō's journey of 1808 was little-known to Europeans. Gennady Nevelskoy passed the strait from the north in 1848. The Russians kept this a secret and used it to evade a British fleet during the Crimean War; a clever tactic.

There have been various disappearances involving this Strait (the Bermuda Triangle is not the only mysterious patch of sea in the world!). The S-117 was a Soviet Shchuka class submarine that was lost on the 15 December, 1952, due to unknown causes. The boat may have collided with another ship or struck a mine. Forty-seven crew were killed in the incident; only their body remains, along with a few parts of the ship, were salvaged.

The south-eastern part of the Strait of Tartary was also the site of one of the most tense moments of the Cold War. At the start of September, 1983, Korean Air Flight 007, strayed into the Soviet air space and was attacked by a Soviet Su-15 interceptor just west of Sakhalin Island. The plane had 269 passengers onboard including a sitting U.S. congressman, Larry McDonald. The stricken plane came down in the waters off the strait's only land mass, Moneron Island.

Since 1973, a rail ferry operates across the strait, connecting the port of Vanino, Khabarovsk Krai on the mainland with Kholmsk on Sakhalin Island. However, in its first year of operation there were meant to be seven available ferries for the Russians to use. Surprisingly, after the first trip only two of these ferries returned. The rest have been forever missing with no traces of their whereabouts. To make things simple, Josef Stalin attempted to create an underground tunnel going across the strait this abandoned after his death.

Overall, the Strait of Tartary leaves you in awe. Being very shallow it's possibly not too surprising that ships and submarines often go missing or crash. It is a small, but formidable, strait.

Lake Kurile

Lucas Heys Herrera 8BR

Kurile lake is a crater lake formed by a volcanic eruption. located in a far eastern peninsula of Russia, more specifically Kamchatka Peninsula in the Kronotsky reserve. The coordinates of the lake are 51.45°N, 157.12°E.

The lake measures 77 square kilometres and is fed by both snowmelt and rain. The maximum depth of the lake is 306 m and the average depth of the lake is 195 m. To put that into perspective the average depth of the lake is 44 and a half double decker busses!

The lake is so massive that it would take 18 years to completely replace itself if emptied! The magnitude of fluctuation in the water level is 1-3m. The average temperature of the lake is a bone chilling 6-7° Celsius all year round.
Kurile Lake is surrounded by volcanoes. The main volcano is the Ilynski volcano, which is a stratovolcano - built up of alternate layers of lava and ash. The Ilynski volcano has an elevation of 1578m. The summers around the area of the lake are cool and rainy whereas the winters are snowy and cold.
The lake has a couple of islands in it, one of which is Serdse Alaida (Alaid's heart).The rocky island is in the southern part of the lake has the shape of a heart. The island is a rhylotic lava dome. This means the rock is a result of the lava from a volcanic eruption.

If you are thinking of going there as a holiday you might have to think again, as to get to the lake you have to first take a big plane then a small plane then an armoured truck and then a long walk.

Kurile Lake has a wide range of wildlife. There are many different types of salmon in Kurile Lake, with the Sockeye salmon proliferating. When the salmon die they become food for the fry (the baby fish). The Lake is a huge spawning ground for Sockeye salmon infact it is the biggest spawning ground in Asia. Usually there are about 1.5-3.5 million Sockeye salmon that spawn every year in the lake. The maximum Sockeye salmon population for a year ever recorded was unbelievable 6 million in 1990. The salmon spawn in between July and March which creates a huge feeding opportunity for foxes, otters and bears of which there are 200 around the lake. Lots of birds nest in the surrounding sanctuary which is also a stopover for migrating birds heading North over the Kuril Islands.

Kurile Lake was formed by two large volcanic eruptions, the first 45,000 years ago and the other around 6440 BC. The explosion around 6440 BC is given a VEI (volcanic explosivity index) rating of 7 making it comparable to some of the largest eruptions in recorded history. The lake was first formed about 8000 years ago, just after the second major eruption and was first discovered by humans in 1739.

BORAT

Can negative misrepresentation be a blessing in disguise?

Kazakhstan

Mr Pletts

In 2006, Sacha Baron Cohen, the Cambridge-educated British comedian (responsible for bringing Ali-G to our television screens) released his second feature film, 'Borat: Cultural Learnings of America for Make Benefit Glorious Nation of Kazakhstan'. The film was based around the title character, who had featured hilariously in 'Da Ali-G Show' where he poked fun at the little-known post-Soviet state (which lies on the 51st parallel north). In this film, he ventured to the United States to feign awe and wonder at the developed nation and its "superiority" in many facets of daily life over poor, rural, less-developed Kazakhstan. Baron Cohen also uses Borat's rather controversial views to satirise the cultures of the USA and Kazakhstan. The film was very popular at the box office and many critics described it as "hilarious", but there were also many, including the Kazakh and Russian governments who were offended; indeed, these two nations promptly banned the film for its misrepresentation of Kazakhstan. However, regardless of whether you find it funny or not, does the film misrepresent Kazakhstan, or is it simply highlighting and satirising controversial or unusual aspects of Kazakh life which exist? And secondly, does it matter to Kazakhstan that it is misrepresented?

Kazakhstan is a vast country, ten times the size of the United Kingdom, at 2.7 million km². It is sandwiched between Russia and Uzbekistan to the north and south respectively, and between the Caspian Sea to the west and China to the east. This places Kazakhstan at the crossroads between Europe and Asia and this can be seen in its culture and political stance.

As a former Soviet state; it was the last to declare independence in 1991, it has strong links to Moscow and approximately a quarter of the population are ethnic Russians. Nevertheless, two thirds of the population are Kazakh (a Turkic group) and this combination might, in the context of the Balkan and Kosovan regions, be expected to lead to ethnic tension and civil unrest; however, there has been little evidence of this due to the tight political and military control exercised by the dictatorial President Nursultan Nazarbayev.
Kazakhstan is criticised by various groups for its restrictions on human rights but the trade-off is perhaps that Kazakhstan ranks highly (32nd out of 102) for 'Order and Security' according to the World Justice Project. The tensions that have spilled over in other Eurasian zones have thus-far not afflicted Kazakhstan. Examples of government policies that are in contrast to other parts of the region are Kazakhstan's insistence on religious freedoms and its dual languages - the state language is (Turkic) Kazakh and the 'official' tongue is Russian. There appears to be a tolerance of Russian and Turkic peoples and their customs and beliefs. Yet despite effective policies maintaining peace and unity in the country, Kazakhstan lies 84th for 'Fundamental Rights' and 85th (out of 102) for 'Open Government' including such failings as a lack of open elections. These poor records on issues that humans consider critical may not sound like a great subject matter for comedy; however it the satirisation of the life that these restrictions can create that Borat draws upon.

In the film, Borat visits his village Glod, Romania) and returns to see his family who are depicted as very poor, rural people living in squalor. In terms of the reality of this, just 46% of the population are living in rural areas and the capital city of Astana (800,000 people) is the second largest behind Almaty (1.5 million). Although the majority of people live in cities, the large minority suggests that there is a sizeable rural population in Kazakhstan and evidence suggests that they are amongst the poorest people in Europe. The average annual salary in the capital is 1.4 million Tenge or just £3,000. This drops to just £1,060 in the Northern Kazakhstan region. Even taking into account the lower cost of living, if the average salary in this region is equivalent to $4.37 per day, then many of the poorest people are certainly living within the $2.50 per day bracket of poverty, as classified by the World Bank. The life expectancy also differs dramatically between the rural North of Kazakhstan where it is just 66.5, compared with over 73 in Astana. The jokes used by Sacha Baron Cohen to poke fun at rural poverty, such as broken down cars converted into horse carts, may be considered by some to be in poor taste, but do highlight the lack of technology and reliance on subsistence farming in some regions.

Another controversial issue presented satirically as though it is the norm in Kazakhstan, is Borat's polygamy. He introduces us to the women of his family unit; firstly his mother and then moves on to his wife: "This is my wife," he says standing next to a woman in a field. The camera cuts to him stood next to a woman in the city, "This is my other wife".

He continues: "This is my missus. This is my girlfriend." The issue of polygamy or multiple wives has been debated numerous times in Kazakhstan and was decriminalized in 1998, although not legalized (there is a subtle difference). Whether to allow men to have multiple partners has been debated both from a demographic viewpoint and a religious one, and there is evidence to suggest that polygamy was not unusual historically in Kazakhstan. It was on the political agenda during the last prime ministerial elections. It is estimated through recent polls that up to 40% of Kazakh men support polygamy. Once again, Baron Cohen has taken a concept that is alien to much of his Western European and American audience and presented it in a way that suggests it is more common in Kazakhstan than it really is.

To return to my title; is Borat's Kazakhstan, if not entirely accurate, good for Kazakhstan? Well there is little doubt that what is presented by the film is exaggerated and even offensive in places. The rural Kazakhs would certainly not recognise or approve of the portrayal of "modern" Kazakhstan. There was such anger in 2006 that the foreign minister banned the film upon release, although there is little likelihood that those people represented by the village scene would have been able to attend a cinema to see it regardless. Russia followed suit in banning the film and many campaigners argued that it could have a detrimental effect on the reputation of the '-stans' such as Kazakhstan and neighbouring Azerbaijan, Kyrgyzstan, Afghanistan and Turkmenistan. Therefore, it would be logical to assume that any further negative publicity caused by the British comedian would have been received extremely badly by the Kazakh government; however fast forward to 2012 and the Asian Shooting championships where a spoof version of the national anthem by Sacha Baron Cohen was played instead of the real Kazakh national anthem. The incident angered the shooting team but was instead met with a relaxed response by the very same foreign minister who had banned the film's release six years earlier. Yerzhan Kazykhanov said, "I salute 'Borat' for helping attract tourists to Kazakhstan. With the release of this film, the number of [tourist] visas issued by Kazakhstan grew tenfold."

This example represents a recent phenomenon in tourism to explore evermore-remote and adventurous locations off the beaten track. It is perhaps best characterised by the increasing tourist numbers to locations such as Antarctica and the Arctic Circle; people are keen to explore and experience places for themselves. In 2014, the capital city Astana pledged to invest $10bn to increase tourism in the city from 0.3% of GDP to 3%. Almaty recently lost out to Beijing in the bidding to host the 2022 Winter Olympics. However, there are many challenges to Kazakhstan's desire to increase tourism. Borat may have exaggerated the primitive nature of rural life, but there is no disguising the poor quality or limited extent of much of Kazakhstan's infrastructure. Prices are also extremely high due to the fact that most products have to be imported; a consequence of its recent independence and low percentage of people employed in manufacturing. This cost of living further exacerbates the effects of poverty amongst the Kazakhs. In recent years there has been rapid economic growth associated with oil in the region. Between 2000 and 2005, the gross domestic product (GDP) of Kazakhstan grew by 10% per annum. A minority of people have grown rich. This in turn raises prices, especially in the cities, and drives consumer spending. It might be expected that this
national wealth will gradually filter down to the general public; however the slow technical progress in Kazakhstan and the relatively small workforce associated with extractive industries mean that it is critical for Kazakhstan to have some GDP generated by non-oil activities.

For this reason, tourism could be their best bet and the old adage that any publicity is good publicity may ring true. The beautiful and varied landscapes including mountains for skiing, Caspian Sea shoreline and unique climate (Astana is the coldest capital in the World after Ulan Bator, Mongolia, with an average temperature of 2.5°C) give it the sort of tourist potential of the biggest earners like the USA and Italy. Kazakhstan might well be very "nice" in Borat's words but has a long way to go to match the tourist industries of some of its neighbours. The foreign minister's change of tone may just be enough to convince Sacha Baron Cohen to make another 'mockumentary' and, next time, the Kazakhs may just appreciate it more.

Lake Winnipeg

Nathan Livingstone 9BR

Lake Winnipeg is a Canadian lake that spans 4 lines of latitude including this issue's focus, Latitude 51°N. The lake is the 10th largest freshwater lake in the world and is located in Manitoba, Canada on the boundary between the Interior Plains and the South-Western Canadian Shield . Lake Winnipeg is formed of the last remains of the glacial lake Agassiz and is approximately 436 kilometres long and is, at its widest, 111 kilometres across. Described as a shallow lake, Lake Winnipeg has an average depth of 9 metres and at its 36 metres deep at its deepest point.

In terms of area, the lake's total surface area is 23,750km^3 and it has a drainage basin that is around 1,000,000km^3. Contributing to the lake's volume are a number of tributaries that include some major rivers. These rivers are namely: Winnipeg, Red, Poplar and Saskatchewan. However the lake drains northward into only one river and that is the Nelson River. The shoreline of Lake Winnipeg is 1,750km long, with many harbours, bays and beaches around it. The climate is cold continental with an average rainfall of 400-600mm, of which 15-40% falls as snow.

The lake comprises a larger, deeper north basin, which is joined by The Narrows to the smaller, shallower South Basin. Not only is Lake Winnipeg impressive in terms of size but also indirectly for inspiring Winnie the Pooh. A WW1 Winnipeg Captain, Harry Colebourn, took a black bear cub to England as his Regiment's mascot, which he donated to London Zoo. A.A.Milne and his son Christopher Robin loved the Bear, called "Winnie" who later became famous in his books. Over 7 million people live within the Lake Winnipeg basin. The lake is at the heart of the community providing hydroelectric power (the 3rd largest hydroelectric reservoir in the world), tourism, fisheries (both commercial and sport) and recreation. Approximately 800 commercial fisheries operate on the lake and catch a vast array of fish including Walli, Sauger, Trout Perch and Yellow Perch. The largest fish caught in the lake was a 1.2metre musky landed by 81 year old John Selkirk in 2014. Water based tourist attractions include swimming, sailing and windsurfing in the summer. In the winter, ice sports dominate with Winnipeg having one of the longest skating trails in the world. Skaters can travel down the Red and Assiniboine Rivers for distances up to 9km. In addition giant iced toboggan slides enable crossing from the Red River from Fort Gibraltar to Alexander Avenue.

Historically the lake was a lifeline for development in the region. Because of its length, the water system, the rivers and the lake itself were important transportation routes into the area, enabling trade to flourish within the region. The Government of Canada is investing in the future of Lake Winnipeg and other Canadian lakes and launched the Lake Winnipeg Basin Initiative. This is currently in its second phase (2012-2017) and is focusing on restoring the ecological health of the lake and reducing pollution.

Ball Lightning

Kazim Nizam 9 BR

Ball lightning is a weather phenomenon that has puzzled scientists for centuries. Early scholars viewed the concept as one of a more fictitious and mythical nature, as initial reports suggested that ball lightning was characterised by having the ability to go through walls and hover above the ground. There have been alleged sightings of ball lightning explosions which have led to disputes over the following questions: What is ball lightning? And is it real?

Ball lightning is an unexplainable atmospheric phenomenon that is usually associated with thunderstorms. Despite this, ball lightning is thought to linger in the sky for a considerably longer amount of time than usual lightning, before it explodes. Unfortunately, there have been no confirmed sightings of the phenomenon, but there have been photos of what has been presumed to be ball lightning, the pictures on the right is what we currently belive ball lightning to look like. At the moment, geographers' hypotheses are the only possible explanations for ball lightning.

Although there is no proof of ball lightning ever existing, many sightings have been recorded. Importantly, one of these took place on latitude 51° north at Widecombe-in-the-Moor, Devon, England, on 21st October 1638. Though an individual is not credited for the report, most of the records would have been influenced by monks of the era, as they were the most literate people in the seventeenth century. Ball lightning likely occurs during thunderstorms and, uncoincidentally, the chosen sighting was during an event known simply as "The Great Thunderstorm".

Proof that the feature is fictitious is impossible to come by but the idea of its mythological nature is clear from the article. According to the report, the ball lightning divided into two segments - one of which smashed through a window and the other dissipated into the church.

Not only were buildings damaged, but people were injured too. The ball, apparently 8 feet (2.4m) in height, killed four people and injured sixty more. The ball lightning though was not the only thing that posed a threat, as the thick sulphurous smoke produced by the lightning could have contributed to onlookers' deaths too.

This 8 foot "ball of lightning" was said to have been hurled through the window, breaking through the structural beams of the church, causing a plume of sulphurous smoke. This could have been the sole cause of the deaths so in actuality, ball lightning itself may not have been the direct cause of the four deaths.

Though the tale of the "The Great Thunderstorm" shows the phenomenon's existence is spurious (if we are to believe that the lightning hurled itself into the building, directly killing the people), the idea that the sulphur caused the deaths makes the reality of ball lightning more likely. Like earthquakes, hurricanes and ordinary lightning, most people experience greater suffering from secondary effects such as suffocation.

Popular belief in the 1600s was that ball lightning was the work of the devil, likening the fire and sulphur to the "flames of hell". Others believed that it was God's wrath as a method of punishing the people, blaming it on two peasants who were playing cards during a sermon!

In conclusion, ball lightning is an unexplainable phenomenon which has been experienced by people on latitude 51° north during the last five hundred years. Although it is similar to ordinary lightning, there is some dispute as to whether ball lightning is real or whether it is merely urban myth.

Do you think that ball lightning exists?

(Responses to the above question can be sent to latitude51magazine@gmail.com)

Geo Grad

Allan Macleod

In Geo Grad, we look at what our former students have been working on in their courses at university and what they are planning on doing as a graduate of Geography in their lives afterwards. This issue features 2012 leaver Allan Macleod. Allan Macleod is currently studying at Bristol University for his Geography BSc, having spent a year of his studies in Grenoble. We managed to get in touch with him and asked him to share one of his university assignments with us, as well as telling us a bit about studing geography at uni.

"Something I've found about geography while at university is the overarching nature of the subject. Even while at SGS I remember trying to begin to come to grips with the links and connections that geography had with so many subjects and it has become even more apparent at university. Whether that has been through studying environmental and climate law, economic policy and political theory, or the biogeochemical interactions in glacial and riverine landscapes. It brings together such a wide range of people under the same banner and it is this diversity that makes geography departments and students some of the most interesting in the university. Add to that the various opportunities to study abroad and there is no way I would want to have taken a different degree at university.

As a subject its range of topics can lead you into almost anything you want, I have friends who work in commodity management in Africa to journalism and documentary making. Most courses will give you lots of skills, but fundamentally the view it gives you of the world is really a selling point for the subject. Alexander von Humbolt once said, "The most dangerous worldview is the worldview of those who have not viewed the world", and with a subject like geography you have no choice but to view the world and engage with ideas and theories you might not have otherwise. I myself haven't decided where I want to end up, I've applied for various jobs in investment management, social inequality alleviation and the cooperate world, all I do know is that wherever I do end up my outlook on life would be markedly different had I not chosen geography at university."

Digging Our Own Grave?

Mankind has always been intrinsically linked to the soil. In recent times our impacts have increased greatly, with some even suggesting we are the primary geomorphic agents on the planet. Human interactions can either be intentional (mining and construction) or unintentional (agriculture). This briefing note will focus on the unintentional implications of our agriculture. These consequences are often more dangerous as often they are unplanned and unrestricted. Natural land use trends have been shown to follow patterns towards intensive farming and land-use changes (Figure 1) and it is the combination of these two processes along with increasing demands on the land that could have serious ramifications for our society and civilisation in the coming decades.

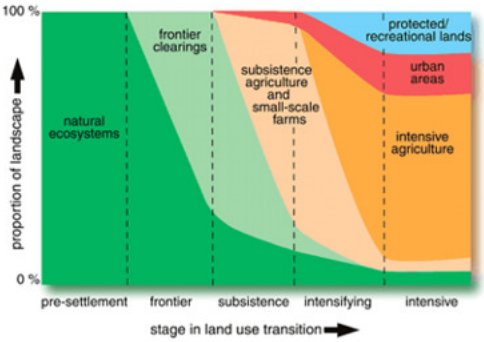


Figure 1: The changes in land use transition

This briefing note will focus on the potential implications of agricultural erosion on climate change, flood risk and food production, which if combined could have lasting impacts on our society.

Figure 3: Deforestation in Cameron

Deforestation & erosion

With the need for greater food & fuel production, pressure has been put on governments to free up land for food & biofuel purposes. The resulting deforestation accounts for approximately 20% of the global greenhouse gas emissions10 as well as huge increases in soil erosion on the new agricultural land created (fig 3). The bare soil and reduced foliage lead to a reduction in interception, in turn decreasing the amount of infiltration and increasing runoff. The high runoff often creates gullies (figure 2) and leads to the leaching of nutrients from the soil further reducing soil productivity. Work on the Loess Plateau of China found that seven years after deforestation caused organic matter, nitrogen and phosphorus levels to half12. Additionally it has been postulated that the impact of over farming and human induced deforestation was what caused the collapse of many ancient civilisations such as the Mayans in Mexico and the Polynesian people on Easter Island.

Climate

Carbon cycle

Our climate system is known to be changing drastically and these changes will have huge implications for society. It is often difficult to quantify exactly what the direct causes and consequences of climate perturbations are. Agriculture is one such topic where soil erosion has been found to both be a source and a sink of atmospheric carbon. Modelled evidence for both shows varying sources of 0.8-1.2PgC/yr to carbon burial rates of 1PgC/yr. This highlights the need for further research into the topic to tdevelop our understanding and better inform policy and environmental planning.

Figure 2: Soil erosion in agricultural fields

The climatic consequences of this agriculturally induced land use change and erosion, show the potential implications for us and the need to fully understand agricultural erosion.

Fluvial management

Flood risk

Changes in land use from natural land to cultivated land, cause increases in runoff. Rainwater reaches river channels faster leading to shorter lag times for flood events.. However it is not only the peak discharge of a flood event that causes damage but also the sediment carried by the flood wave.

Sediment has been shown to increase with lower levels of vegetation cover and the damages from this can have global scale impacts especially in large catchments, such as the Amazon, Ganges and Yellow rivers.

River and Soil Chemistry

Poor soil cover influences the runoff chemistry. Less vegetation leads to higher levels of nutrient leaching which alters not only the fertility of the soil but the downstream processes, especially in areas where fertilisation is higher. Globally soil phosphorous levels have been found to be 75% higher than preindustrial levels, indicating the impact intense agriculture has. Furthermore with higher levels of erosion on agricultural land, the increased levels of nitrogen and phosphorous, as well as other chemicals and elements, enter rivers and have downstream consequences for river ecology through eutrophication. These consequences can be seen the world over, showing the global extent of the problem.

Food Security

Soil erosion damages crop productivity through the thinning of topsoil which restricts root depth. This reduces the nutrients, water and organic material available to the plants.
Different crops, continents and soil types show variations in the impact of agricultural erosion on productivity, however all show decreases. In addition the management practices used on cultivated land have been shown to have different impacts on the level of soil erosion, and consequently productivity. The current level of erosion from farmlands is on a scale far greater than any seen previously (figure 4). Figure 4 shows sediment yield from farmland degradation is nearly 3 times the sediment produced by rivers. Soil erosion however, is not a new feature of our lifestyle. Vast and powerful empires such as the Babylonians have failed because of soil erosion (fig 5), showing it is something that needs addressing now.

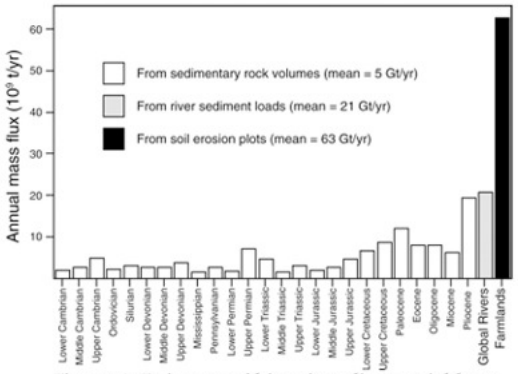


Figure 4: Estimates of historic sediment yields vs farmland yields

Conclusion

It is clear that agricultural erosion has far reaching and global implications. Further studies are needed in: whether soil erosion is a net source or sink for atmospheric CO2, agriculture management strategies to reduce the impacts of eutrophication and river sediments, and how to sustainably supply food for a global population that is predicted to reach 10 billion. Agricultural soil erosion is a complex global problem and we must act to save our soils.

Allan Macleod (SGS 2005-2012)

Figure 5: The Hanging Gardens of Babylon

Best of @SGSgeography on Twitter

https://twitter.com/SGSgeography

These are just a selection of interesting tweets from our Twitter feed in the past few weeks. Follow us for the latest geographical news and department information. To see the following posts, go to Twitter and scroll down to the date shown below.

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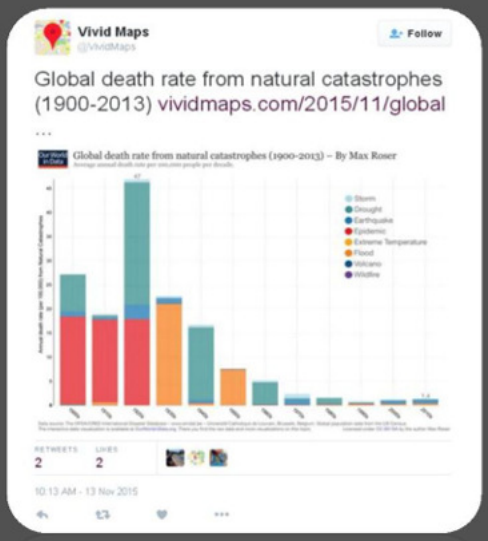
3rd December



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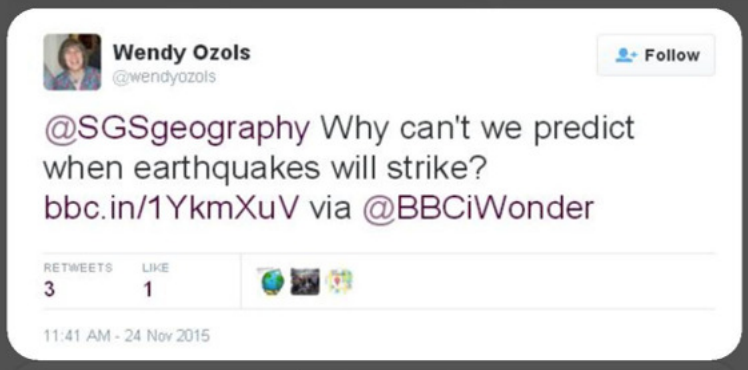

24th November

12th November

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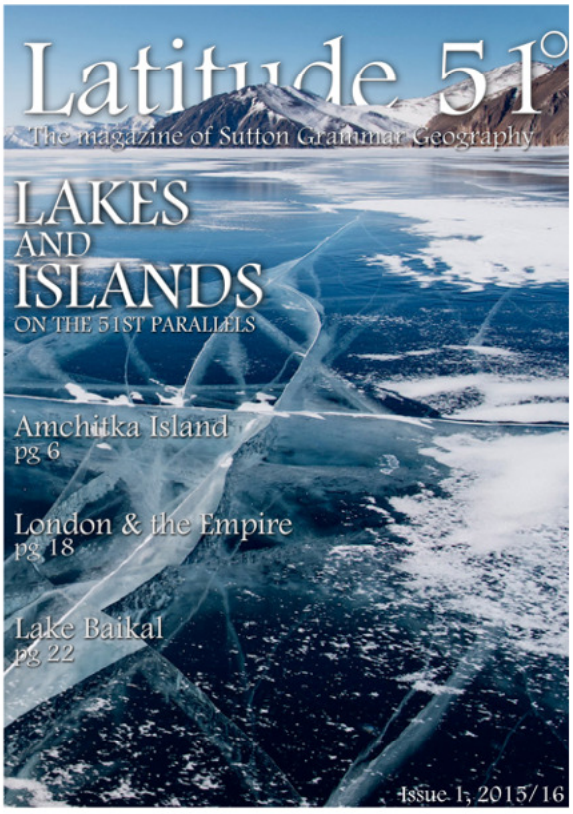

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