

SATURDAY 03 DECEMBER 2016

SAT 19:00 A Timewatch Guide (b052vcbg)
Series 1

Roman Britain

Using years of BBC history archive film, Dr Alice Roberts explores how our views and understanding of Roman Britain have changed and evolved over the decades.

Along the way she investigates a diverse range of subjects from the Roman invasion, through Hadrian's Wall, the Vindolanda tablets and the eventual collapse of Roman rule. Drawing on the work of archaeologists and historians throughout the decades, Alice uncovers how and why our views of this much-loved period of our history have forever been in flux.

SAT 20:00 Egypt's Lost Queens (b04gnhv5)

Professor Joann Fletcher explores what it was like to be a woman of power in ancient Egypt. Through a wealth of spectacular buildings, personal artefacts and amazing tombs, Joann brings to life four of ancient Egypt's most powerful female rulers and discovers the remarkable influence wielded by women, whose power and freedom was unique in the ancient world.

Throughout Egypt's history, women held the title of pharaoh no fewer than 15 times, and many other women played key roles in running the state and shaping every aspect of life. Joann Fletcher puts these influential women back at the heart of our understanding, revealing the other half of ancient Egypt.

SAT 21:00 Modus (b066bx9h)

Series 1

Episode 3

The police have finally discovered the body of murdered TV chef Isabella Levin, while the killer continues in his pursuit of young witness Stina Vik. Stina's mother Inger Johanne joins the investigation. Meanwhile, the widowed husband of Bishop Elisabeth Lindgren is acting strangely, while Rolf Ljungberg starts to doubt the fidelity of his husband, successful businessman Marcus Stahl. As police struggle to make sense of the Christmas murders, is another terrible event about to unfold?

In Swedish and English, with English subtitles.

SAT 21:45 Modus (b067dgvj)

Series 1

Episode 4

The police hear the results of the autopsy on the body of artist Niclas Rosen. The investigation now involves three seemingly unfathomable murders, but a link slowly starts to emerge. Lennart Carlsson is taken in for questioning, and Inger Johanne is more than a little unsettled when she realises that she has seen him before. Meanwhile, a series of vicious homophobic attacks is taking place around Stockholm.

In Swedish with English subtitles.

SAT 22:30 Top of the Pops (b0844w9t)

John Peel presents the pop chart show, first broadcast on 23 September 1982. Includes appearances from David Christie, Culture Club, Fat Larry's Band, Depeche Mode, Musical Youth, Survivor and Evelyn King. Also includes a dance performance from Zoo.

SAT 23:10 Top of the Pops (b0844wjb)

John Peel presents the chart show, first broadcast on 14 October 1982. Includes appearances from Mari Wilson, Tears for Fears, Pinkees, Barry Manilow, Melba Moore, Ultravox, The Beatles and Musical Youth. Also includes a dance performance from Zoo.

SAT 23:45 Reggae at the BBC (b00ymjld)

An archive celebration of great reggae performances filmed in the BBC Studios, drawn from programmes such as The Old Grey Whistle Test, Top of the Pops and Later... with Jools Holland, and featuring the likes of Bob Marley and The Wailers, Gregory Isaacs, Desmond Dekker, Burning Spear, Althea and Donna, Dennis Brown, Buju Banton and many more.

SAT 01:15 The Old Grey Whistle Test (b00y1487)

Reggae Concert from the Edinburgh Festival

Live performance specially recorded for Whistle Test from the Reggae Concert at the Edinburgh Festival in 1973, featuring

The Cimarons, Winston Groovy, Dennis Alcapone, The Marvels, Nicky Thomas and The Pioneers.

SAT 02:00 Sounds of the 70s 2 (b01gymg9)

Reggae - Stir it Up

By the start of the 70s, the Windrush generation of immigrants who came to the UK from the Caribbean and West Indies were an established part of the British population and their influence and culture permeated UK society.

This second programme rejoices and revels in the reggae music exported from Jamaica and the home-grown reggae-influenced sounds that sprouted from the cities of England. Reggae's dominance of the UK charts is celebrated with performances from Ken Boothe, Dave and Ansel Collins, Steel Pulse, Althea and Donna, Bob Marley and the Wailers, Janet Kay, Susan Cadogan and The Specials.

SAT 02:30 How Quizzing Got Cool: TV's Brains of Britain (b084fs6s)

We all love a good quiz. So here's a question - when did ordinary contestants turn into the pro-quizzers of today? Giving the answers are Victoria Coren Mitchell, Judith Keppel, Chris Tarrant, Mark Labbett, Nicholas Parsons and many more. Narrated by Ben Miller.

SUNDAY 04 DECEMBER 2016

SUN 19:00 The Flying Archaeologist (b01s1ll4)

Stonehenge

Archaeologist Ben Robinson flies over Wiltshire to uncover new discoveries in the Stone Age landscape. Sites found from the air have led to exciting new evidence about Stonehenge. The discoveries help to explain why the monument is where it is, and reveal how long ago it was occupied by people.

SUN 19:30 Britten's Endgame (b03hj038)

Writer and film-maker John Bridcut presents a documentary for the centenary anniversary of the birth of composer Benjamin Britten which explores Britten's creativity in the face of death. Those closest to him watched anxiously as he raced to complete his final opera Death in Venice, tackling an edgy subject which resonated with his own life. Britten's eventual heart operation after years of stress and illness left him incapacitated and prematurely old and frail, yet somehow he rediscovered his creative urge to produce two late masterpieces.

Nine years after Bridcut made his award-winning Britten's Children, this is a rich and poignant film about the final years of a surprisingly insecure composer and the impact of what Britten's partner Peter Pears called 'an evil opera'.

The film features specially filmed performances of Britten's music by Sarah Connolly (mezzo-soprano), John Graham-Hall and Allan Clayton (tenors), Xavier Phillips (cello), the BBC Concert Orchestra conducted by Paul Kildea, Schola Cantorum of Oxford conducted by James Burton, and the Fitzwilliam String Quartet.

SUN 21:30 Turner Prize (b0850cp3)

2016

The Nominees

Morgan Quaintance assesses the four nominees for this year's Turner Prize at Tate Britain. With the help of the curator of this year's prize, Linsey Young, Morgan explores the work of each of the artists and the themes that preoccupy them. To mark the first time that public photography is allowed in the gallery, Morgan looks at the impact of social networks on contemporary art and speculates as to whether some of this year's Turner Prize nominees might have been selected to be 'insta' friendly.

He'll join a Facebook live streaming event to find out if social networking can provide new ways for audiences to engage with art and we'll hear from the public too, through the frank and often highly entertaining text cards written by visitors to the gallery.

SUN 22:00 Storyville (b084xppx)

Forever Pure - Football and Racism in Jerusalem

Documentary which follows events at Israel's most notorious football club. Beitar Jerusalem FC is the most popular team in Israel and the only club in the Premier League never to sign an Arab player. Midway through a season the club's owner, Russian-Israeli oligarch Arcadi Gaydamak, brought in two Muslim players from Chechnya in a secretive transfer deal that triggered the most racist campaign in Israeli sport and sent the club spiralling out of control.

Forever Pure follows the famous football club through the tumultuous season, as power, money and politics fuel a crisis and shows how racism is destroying both the team and society from within.

SUN 23:25 Cosmonauts: How Russia Won the Space Race (b04lcxms)

When Neil Armstrong stepped onto the moon in 1969, America went down in popular history as the winner of the space race. However, the real pioneers of space exploration were the Soviet cosmonauts.

This remarkable feature-length documentary combines rare and unseen archive footage with interviews with the surviving cosmonauts to tell the fascinating and at times terrifying story of how the Russians led us into the space age. A particular highlight is Alexei Leonov, the man who performed the first spacewalk, explaining how he found himself trapped outside his spacecraft 500 miles above the Earth. Scary stuff.

SUN 00:55 Monkey Planet (p01s0z7y)

Family Matters

The key to primate success is that, like us, most species live in close-knit family groups. How do you choose your friends, learn from those around you and know who to trust? We explore the complex world of primate social lifestyles.

In Peru, emperor tamarin males are conned into childcare, while vervet monkeys in South Africa have a sophisticated alarm system to warn for predators. Elsewhere, George has a very close encounter with some hunting chimpanzees.

But living in families is not always easy. In Gibraltar, barbary macaques steal babies to impress their boss. Hamadryas baboon males in Ethiopia rule with an iron fist, and in matriarchal ring-tailed lemur societies, the girls have to fight pitched battles with babies in tow.

SUN 01:55 Blink: A Horizon Guide to the Senses (b01kptcr)

Touch, sight, smell, hearing and taste - our senses link us to the outside world. Dr Kevin Fong looks back through 40 years of Horizon archives to find out what science has taught us about our tools of perception - why babies use touch more than any other sense, why our eyes are so easily tricked and how pioneering technology is edging closer to the dream of replacing our human senses if they fail.

SUN 02:55 Egypt's Lost Queens (b04gnhv5)

[Repeat of broadcast at 20:00 on Saturday]

MONDAY 05 DECEMBER 2016

MON 19:00 World News Today (b084jzy3)

The latest national and international news, exploring the day's events from a global perspective.

MON 19:30 Railway Walks with Julia Bradbury (b00f80z6)

Harbouring History

The backstreets of Weymouth seem an unlikely spot to explore railway history, but Julia discovers there was once a short railway that ran south from Weymouth and across the unique coastal features of Chesil Beach and Portland. The walk is the ideal platform for learning about the history of Portland Harbour and the tied isle's most famous export, Portland stone.

MON 20:00 Insect Dissection: How Insects Work (p00zt23)

Insects outnumber us by 200 million to one. They thrive in environments where humans wouldn't last minutes. We mostly perceive them as pests - yet without bugs, entire ecosystems would collapse, crops would disappear and waste would pile high.

The secret of their success? Their incredible alien anatomy.

To reveal this extraordinary hidden world, entomologists Dr James Logan and Brendan Dunphy carry out a complete insect dissection. Cutting-edge imaging technology shows us the beauty and precision of the natural engineering inside even the simplest insects.

Stripping back the layers, they uncover ingenious body systems and finely tuned senses - a bug body plan that is the hidden blueprint behind insects' 'global domination'. They also discover how science is now using the secrets of insect anatomy to inspire technology that could save human lives.

MON 21:00 Monkey Planet (p01s0zg9)

Master Minds

There's one thing that sets us primates apart from most other families on the planet, and that's a flexible mind. Our primate cousins are much smarter than you might imagine. Just like us they use tools, solve problems and even have emotions. Monkey Planet discovers how these animals are individuals with a sense of self and why brainpower is essential to primate survival.

In Thailand, long-tailed macaques floss their teeth with human hair and use tools to open oysters on the beach. In Uganda, chimps pass on cultures and customs through generations. George McGavin goes to orangutan school in Sumatra and meets a bonobo in the States who can order his own picnic on a smart phone and toast marshmallows in a fire he makes himself.

MON 22:00 Timeshift (b00nm7k)

Series 9

The Men Who Built the Liners

Many of the most famous passenger liners in history were built in the British Isles, several in the shipyards along the banks of the Clyde. Timeshift combines personal accounts and archive footage to evoke a vivid picture of the unique culture that grew up in the Clyde shipyards. Despite some of the harshest working conditions in industrial history and dire industrial relations, it was here that the Queen Mary, the Queen Elizabeth and the QE2 were built. Such was the Clyde shipbuilders' pride in their work, and the strength of public support, that in 1971 they were able to defy a government attempt to close them down and win the right to carry on shipbuilding.

MON 23:00 The First World War (b01rp9y7)

War without End

The war's last months were more destructive than trench warfare had been. Germany remained on French soil, believing herself unbeatable. The armistice was the Allies' bid to obtain - on paper - Germany's unconditional surrender. At Versailles she was made to shoulder the blame for the war so she was forced to pay for it. The war, with losses of over 20 million, was later deemed as a senseless waste, but at the time it was seen in positive terms - for defence against aggression and for glory. It curbed militarism, for a while, but was not the war to end all wars. Its terrible message to the century it shaped was that war can fulfil ambitions and that war can work.

MON 23:50 Dan Cruickshank's Adventures in Architecture (b00bbsrc)

Dreams

Architecture is the stuff of dreams. Since building began, architects have tried to build the future, tried to build fantasy worlds, tried even to change humanity by dreams of new inventions in bricks and mortar. Dan continues his travels around some of the world's greatest buildings.

In Yemen he reveals an ancient city of skyscrapers made of mud - Shibam. Originally named after its ruler King Shibam, the city is now nicknamed 'the Manhattan of the desert' due to its astonishing skyline. And in the Dominican Republic, Dan visits Santo Domingo where Spanish invaders dreamed of creating the first grid-style city on the American continent - a model for every modern American city that would follow.

In the hidden kingdom of Bhutan in the Himalayas, Dan experiences the dream of a king to live in the past - so that modern buildings are indistinguishable from those built 500 years before. And he explores how dreams can turn to nightmare in Eastern State Penitentiary in Philadelphia, where society dreamt of reforming criminals into decent men, only to find their techniques made them mad.

MON 00:50 Egypt's Lost Queens (b04gnhv5)

[Repeat of broadcast at 20:00 on Saturday]

MON 01:50 Timeshift (b00nm7k)

[Repeat of broadcast at 22:00 today]

MON 02:50 Insect Dissection: How Insects Work (p00zst23)

[Repeat of broadcast at 20:00 today]

TUESDAY 06 DECEMBER 2016

TUE 19:00 World News Today (b084jzvh)

The latest national and international news, exploring the day's events from a global perspective.

TUE 19:30 Railway Walks with Julia Bradbury (b00fd1dd)

Gateway to the Highlands

Julia Bradbury faces an epic walk in more ways than one. Not only is this the longest and arguably most dramatic walk yet, but it passes through the unruly territory of Scottish clans and Rob Roy. The Highlands were a place to be wary of, until the railway arrived.

TUE 20:00 Ian Hislop Goes off the Rails (b00drtpj)

Ian Hislop brings his customary humour, analysis and wit to the notorious Beeching Report of 1963, which led to the closure of a third of the nation's railway lines and stations and forced tens of thousands of people into the car and onto the road.

Was author Dr Richard Beeching little more than Genghis Khan with a slide rule, ruthlessly hacking away at Britain's rail network in a misguided quest for profitability, or was he the fall guy for short-sighted government policies that favoured the car over the train?

Ian also investigates the fallout of Beeching's plan, discovering what was lost to the British landscape, communities and ways of life when the railway map shrank, and recalls the halcyon days of train travel, celebrated by John Betjeman.

Ian travels from Cornwall to the Scottish borders, meeting those responsible and those affected and questioning whether such brutal measures could be justified. Knowing what we know now, with trains far more energy efficient and environmentally sound than cars, perhaps Beeching's plan was the biggest folly of the 1960s?

TUE 21:00 Digging for Britain (b084xym3)

Series 5

West

Professor Alice Roberts presents the very best in British archaeology 2016 - filmed by the archaeologists themselves, straight from the trenches, so you can see each exciting discovery as it happens. The teams then bring their best finds - from skeletons to treasure - back to the Digging for Britain lab, to examine them with Alice and reveal how they are changing the story of Britain.

This episode looks at the west of Britain, and archaeologists are in the lab to look at the new finds and what they mean.

Findings include the lost World War I training trenches on Salisbury Plain, Britain's first 'double hedge' - discovered just down the road from Stonehenge, where the evidence suggests our ancestors feasted and made sacred offerings as part of a visit to the ritualistic Stonehenge landscape, and luxury foreign goods discovered at Tintagel, the legendary childhood home of King Arthur.

TUE 22:00 The Secret History of Our Streets (b01kvkw6)

Series 1

Arnold Circus

In 1886 Charles Booth embarked on an ambitious plan to visit every one of London's streets to record the social conditions of residents. His project took him 17 years.

Once he had finished he had constructed a groundbreaking series of maps which recorded the social class and standing of inhabitants. These maps transformed the way Victorians felt about their capital city.

This series takes six archetypal London streets as they are now, discovering how they have fared since Booth's day.

Booth colour coded each street, from yellow for the 'servant-keeping classes' down to black for the 'vicious and semi-criminal'. With the aid of maps, the series explores why certain streets have been transformed from desperate slums to become some of the most desirable and valuable property in the UK, whilst others have barely changed.

This landmark series features residents past and present, exploring how what happened on the street in the last 125 years continues to shape the lives of those who live there now.

Charles Booth's vast 1886 Survey of London ranks each one of London streets according to the class

The sixth episode features Arnold Circus in the East End and the story of a Victorian social experiment that changed Britain. Arnold Circus is home to the first council estate, which opened in 1896. The planning of the estate, from its lack of pubs to the pattern of the brickwork, was deliberate in order to make its residents respectable, as previously the land had played host to a notorious crime-ridden slum.

Featuring compelling accounts from residents both past and present, this is the story of how Arnold Circus made the difficult journey from feared underclass to a self-respecting

community; of how it became and still is a haven in heart of the City.

TUE 23:00 Treasures of Ancient Greece (b05rj5xj)

The Long Shadow

Alastair Sooke explores the extraordinary afterlife of the Greek masterpieces that changed the course of western culture. Succeeding centuries have found in ancient Greek art inspiration for their own ideals and ambitions. Filming in Italy, Germany, France and Britain, Alastair's investigation includes The Venus of Knidos, the first naked woman in western art, the bronze horses of St Mark's in Venice which became a pawn in an imperial game and the naked discus thrower, the Discobolus, personally bought by Adolf Hitler and used by him as a symbol of Aryan supremacy.

TUE 00:00 A Timewatch Guide (b052vcbg)

[Repeat of broadcast at 19:00 on Saturday]

TUE 01:00 Nigel Slater's Icing on the Cake (b04pl14k)

Nigel Slater takes us on a nostalgic, funny and heartwarming journey back in time exploring the earliest origins of cake in Britain, charting the ways in which Neolithic man used to munch on flat compacted handfuls of grain, through to the ways in which Elizabethan cooks discovered the magical raising agent that is the egg white and the impact of developments in kitchen technology on our cake consumption.

Cake has come a long way from its earliest manifestations and Nigel brings this tastiest of culinary histories to life. He finds out about the ancient rituals surrounding the baking and eating of cake and the ways in which buns were once considered too risqué for us common folk and so were banned.

He goes back to school to learn about the science behind a successful bake, explores whether our desire to eat cake really is just a question of mind over matter, examines the rise and popularity of the cupcake and comes face to face with some grisly cakes created by bakers hoping to revolutionise what we mean when we refer to a cake.

Reflecting on the cakes of his youth and childhood, Nigel examines the mass appeal of a culinary creation that can be defined by that most appropriate of phrases 'naughty but nice'. Whether it be homemade cakes courtesy of Auntie Marjorie or a battenberg bought from the corner shop, for Nigel a cake is all about sharing and so here he shares the story of British cake.

TUE 02:00 Ian Hislop Goes off the Rails (b00drtpj)

[Repeat of broadcast at 20:00 today]

TUE 03:00 Digging for Britain (b084xym3)

[Repeat of broadcast at 21:00 today]

WEDNESDAY 07 DECEMBER 2016

WED 19:00 World News Today (b084jzys)

The latest national and international news, exploring the day's events from a global perspective.

WED 19:30 The River Taff with Will Millard (b06zyl2v)

Series 1

Episode 1

Writer and fisherman Will Millard tells the extraordinary story of how the River Taff came back from the dead. This river, once so polluted by heavy industry that no fish could live there, has now become one of the best salmon and trout rivers in Wales. Will travels from the source high in the stunning Brecon Beacons National Park to Merthyr Tydfil where he discovers that the town's ironworks were once vital to the British Empire. Along the way he trains with a mountain rescue team facing a unique set of challenges, meets a group of conservationists working to protect a magical, hidden valley and fishes for wild brown trout in the most unlikely location.

WED 20:00 Britain's Treasure Islands (b077rl5m)

Ocean Odyssey

Naturalist Stewart McPherson's exploration of the British Overseas Territories begins in Bermuda in the North Atlantic, where he finds ancient castles and a bird that had been thought extinct for more than 300 years.

Stewart then travels to the British Indian Ocean Territory, which lies halfway between Tanzania and Indonesia, where he comes across the world's biggest land invertebrate. He eventually reaches Pitcairn Island in the South Pacific, where he

meets the descendants of the mutineers of the Bounty.

WED 21:00 The Ipcress File (b0074sv0)

Spy thriller in which intelligence agent Harry Palmer is plunged into the shabby and treacherous world of counter-espionage as he uncovers a bizarre brain drain among scientists. Based on the novel by Len Deighton.

WED 22:45 The Highest Court in the Land: Justice Makers (b00xz0s5)

They are the UK's most powerful arbiters of justice and now, for the first time, four of the Justices of the Supreme Court talk frankly and openly about the nature of justice and how they make their decisions. The film offers a revealing glimpse of the human characters behind the judgments and explores why the Supreme Court and its members are fundamental to our democracy.

The 11 men and one woman who make up the UK Supreme Court have the last say on the most controversial and difficult cases in the land. What they decide binds every citizen. But are their rulings always fair, do their feelings ever get in the way of their judgments and are they always right?

In the first 14 months of the court they have ruled on MPs' expenses, which led to David Chaytor's prosecution, changed the status of pre-nuptial agreements and battled with the government over control orders and the Human Rights Act.

They explain what happens when they cannot agree and there is a divided judgment, and how they avoid letting their personal feelings effect their interpretation of the law. And they face up to the difficult issue of diversity; there is only one woman on the court, and she is the only Justice who went to a non-fee-paying school.

WED 23:45 Britain's Treasure Islands (b077rl5m)
[Repeat of broadcast at 20:00 today]

WED 00:45 The Secret History of Our Streets (b01kvw6)
[Repeat of broadcast at 22:00 on Tuesday]

WED 01:45 How to Build a Dinosaur (b014vy5y)

Dinosaurs died out 65 million years ago and we have hardly ever found a complete skeleton. So how do we turn a pile of broken bones into a dinosaur exhibit? Dr Alice Roberts finds out how the experts put skeletons back together, with muscles, accurate postures and even, in some cases, the correct skin colour.

WED 02:45 The Highest Court in the Land: Justice Makers (b00xz0s5)
[Repeat of broadcast at 22:45 today]

THURSDAY 08 DECEMBER 2016

THU 19:00 World News Today (b084jzyy)

The latest national and international news, exploring the day's events from a global perspective.

THU 19:30 Top of the Pops (b084zy8n)

Peter Powell presents the weekly pop chart show, first broadcast on 21 December 1982. Includes appearances from The Piranhas, Toyah, The Kids from Fame, Imagination, Kool and the Gang, Bauhaus, Spandau Ballet, Culture Club, Sharon Redd and Shakin' Stevens.

THU 20:00 Dangerous Earth (b084n7z1)

Tornado

Dr Helen Czerski peers into the heart of the storm to find out how advances in technology are giving new insight into tornadoes - the fastest winds on the planet. From the breathtaking footage that capture the extreme weather events that produce them, to the latest experiments investigating their incredible destructive power, Helen discovers how our increasing understanding of the subtle changes deep within a storm is improving our ability to predict when and where these devastating beasts will strike.

THU 20:30 Dangerous Earth (b084n7z1)

Iceberg

Dr Helen Czerski reveals the latest scientific insights into icebergs. From side-scanning sonar that scrutinises the edge of glaciers where icebergs are born, to satellite images that show how icebergs create hotspots for life and eyewitness pictures that give us a unique glimpse of how they transform over time,

we can now capture on camera the mysteries of icebergs - and how their lifecycle is intricately linked to our changing planet.

THU 21:00 Vienna: Empire, Dynasty and Dream (p046dxfw)
Episode 1

Vienna was the capital of the Habsburg dynasty and home to the Holy Roman Emperors. From here, they dominated middle Europe for nearly 1,000 years. In this series, historian Simon Sebag Montefiore describes how the Habsburgs transformed Vienna into a multinational city of music, culture and ideas. Napoleon, Hitler, Mozart, Strauss, Freud, Stalin and Klimt all played their part.

In this first episode, we follow the Habsburgs' rise to power and discover how Vienna marked Europe's front line in the struggle to defend both Christendom from the Ottomans and the Catholic Church from the Protestant revolutionaries that plotted to destroy it.

THU 22:00 Horizon (b02xcvhw)
2012-2013

The Secret Life of the Cat

Horizon discovers what your cat really gets up to when it leaves the cat flap.

In a groundbreaking experiment, 50 cats from a village in Surrey are tagged with GPS collars and their every movement is recorded, day and night, as they hunt in our backyards and patrol the garden fences and hedgerows.

The cats are also fitted with specially developed cat-cams which reveal their unique view of our world.

You may think you understand your pet, but their secret life is more surprising than we thought.

THU 23:00 Colour: The Spectrum of Science (b06nxwld)
Colours of Life

We live in a world ablaze with colour. Rainbows and rainforests, oceans and humanity, earth is the most colourful place we know of. But the colours we see are far more complex and fascinating than they appear. In this series, Dr Helen Czerski uncovers what colour is, how it works, and how it has written the story of our planet - from the colours that transformed a dull ball of rock into a vivid jewel to the colours that life has used to survive and thrive. But the story doesn't end there - there are also the colours that we can't see, the ones that lie beyond the rainbow. Each one has a fascinating story to tell.

The raw, early Earth had plenty of colour, but that was nothing compared with what was going to come next. That canvas was about to be painted with a vast new palette - and the source of those colours was life. Green is the colour of the natural world and yet it's the one colour that plants have evolved not to use.

The huge diversity of human skin tones tells the story of how humanity spread and ultimately conquered the planet. But the true masters of colour turn out to be some of the smallest and most elusive. Helen travels to the Great Smokey Mountains of Tennessee during the one week in the year when fireflies light up the night sky with their colourful mating display. And she reveals the marine animals that hide from the world by changing the colour of their skin.

THU 00:00 Deep Down & Dirty: The Science of Soil (b040y925)

For billions of years our planet was devoid of life, but something transformed it into a vibrant, living planet. That something was soil.

It's a much-misunderstood substance, often dismissed as 'dirt', something to be avoided. Yet the crops we eat, the animals we rely on, the very oxygen we breathe, all depend on the existence of the plant life that bursts from the soil every year.

In this film, gardening expert Chris Beardshaw explores where soil comes from, what it's made of and what makes it so essential to life. Using specialist microphotography, he reveals it as we've never seen it before - an intricate microscopic landscape, teeming with strange and wonderful life forms.

It's a world where the chaos of life meets the permanence of rock, the two interacting with each other to make a living system of staggering complexity that sustains all life on Earth.

Chris explores how man is challenging this most precious resource on our planet and how new science is seeking to preserve it.

THU 01:00 Top of the Pops (b084zy8n)
[Repeat of broadcast at 19:30 today]

THU 01:40 Cosmonauts: How Russia Won the Space Race (b04lxcms)
[Repeat of broadcast at 23:25 on Sunday]

THU 02:40 Vienna: Empire, Dynasty and Dream (p046dxfw)
[Repeat of broadcast at 21:00 today]

FRIDAY 09 DECEMBER 2016

FRI 19:00 World News Today (b084jzz3)

The latest national and international news, exploring the day's events from a global perspective.

FRI 19:30 Top of the Pops (b084zy9d)

Simon Bates presents the weekly chart show, first broadcast on 28 October 1982. Includes appearances from Raw Silk, Blue Zoo, Culture Club, Dionne Warwick, Melba Moore, The Beatles, Tears for Fears and Eddy Grant.

FRI 20:00 Classic Cellists at the BBC (b084nsed)

Julian Lloyd Webber takes an extraordinary musical journey through the BBC archives from the 1950s to the present to celebrate the world of the cello through some of its greatest interpreters. From dazzling performances by legendary masters such as Paul Tortelier, Jacqueline du Pre and Mstislav Rostropovich to some of today's leading interpreters including Yo Yo Ma, Steven Isserlis and Mischa Maisky, Julian gives us a cellist's perspective on an extraordinary virtuoso tradition.

FRI 21:00 Arena (b0074sgb)

Bob Dylan: No Direction Home

Part 1

A story told in flashbacks, Martin Scorsese's documentary intertwines the immediacy of Bob Dylan's controversial 1966 tour of the British Isles with his remarkable personal and musical journey. Drawing from hundreds of hours of unseen footage and rare recordings, in-depth interviews and revealing photographs, the film strikes a remarkable balance - telling the story of one man's journey and at the same time placing that story within the greater canvas of human events.

This opening part traces his journey from a rock 'n' roll loving kid in the Midwest to his arrival as a major force in the world of folk music. In his own words, Dylan tells viewers how he became smitten with folk music as the story shifts scenes from the iron range in Minnesota to Greenwich Village in New York City.

An amazing cast of characters includes Dave Van Ronk, the king of Greenwich village folk clubs, Joan Baez, queen of the folk music world and Allen Ginsburg, America's beat poet laureate. And, most importantly, the wide range of music that influenced the young Bob Dylan is explored.

As Dylan's fame and notoriety grows, his skill as a performer matures rapidly and the songs begin to pour out - Blowing in the Wind, A Hard Rain's A-Gonna Fall, Masters of War, Don't Think Twice It's Alright and many more.

Part one ends with what seems to be the dawn of a new generation - Dylan, hands intertwined with musician Pete Seeger, the Freedom Singers and Odetta singing Blowin' in the Wind at the closing night of the Newport Folk Festival in 1963.

FRI 22:55 Arena (b0074sgc)

Bob Dylan: No Direction Home

Part 2

Martin Scorsese continues to explore the emotional, musical and intellectual journey of Bob Dylan's early career. The story turns dark. At 23, Dylan is already a newsworthy phenomenon and with that success comes expectations - from the old left to become a political activist, and from the media to articulate the concerns of America's youth. It's a role in which Dylan is completely uninterested. He is already on the move, finding a new musical vocabulary to capture the complexity of a seismic cultural shift. He injects a heightened sense of poetry into his writing and adds electricity to his music, electricity that now seems inevitable but at the time saw him labelled a sell-out and a traitor.

Scorsese delicately balances Dylan's internal world with signpost images from the external world. Dylan's music is the backdrop as the war in Vietnam escalates and the nightly news

brings home images people would never have dreamed of seeing on their television sets. Scorsese takes the time to let viewers really see the music unfold in revelatory concert performances.

By 1966 Dylan's personal world has become one of constant touring and press conferences. By the end of the film it is plainly obvious that for Dylan there are some journeys from which there is No Direction Home.

FRI 00:25 Top of the Pops (b084zy9d)

[Repeat of broadcast at 19:30 today]

FRI 01:00 Singer-Songwriters at the BBC (b00vfhy7)

Series 1

Episode 4

Compilation which unlocks the BBC vaults to explore the burgeoning singer-songwriter genre that exploded at the dawn of the 1970s and became one of the defining styles of that decade.

Featuring songs from Donovan, Gerry Rafferty, James Taylor, Elton John, Mickey Newbury, Tom Paxton, John Prine, Melanie, Jesse Winchester, Steve Forbert, Chris Rea, Carole King and others.

Programme sources include The Old Grey Whistle Test, In Concert, Top of the Pops, One in Ten and Cilla!

FRI 02:00 Troubadours: The Rise of the Singer-Songwriter (b012cr37)

Morgan Neville's full-length documentary is James Taylor and Carole King's first-hand account of the genesis and blossoming of the 1970s singer-songwriter culture in LA, focusing on the backgrounds and emerging collaboration between Taylor, King and the Troubadour, the famed West Hollywood club that nurtured a community of gifted young artists and singer-songwriters.

Taylor and King first performed together at the Troubadour in November 1970, and the film explores their coming together and the growth of a new, personal voice in songwriting pioneered by a small group of fledgling artists around the club. Contributors include Taylor, King, David Crosby, Roger McGuinn, Jackson Browne, Bonnie Raitt, Kris Kristofferson, JD Souther, Peter Asher, Cheech & Chong, Steve Martin and Elton John.