

SCIENCE
TECHNOLOGY
MEDICINE

DOCUMENTARY
30 MIN.

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The Quest for Knowledge

Man has always had a thirst for knowledge – whether it be to improve his life and circumstances or out of sheer curiosity and the urge to get to the bottom of things. Without scientific discoveries, humanity would not have evolved at such a rapid pace. Life as we know it today would be unthinkable without the knowledge we gain through science and scholarship. Innovations and new insights are integrated into our lives in ever quicker succession. We watch scientists, technicians and inventors as they look for ways to increase human knowledge. These fascinating films accompany them in their **Quest for Knowledge**.

01 The Earth – Are We Alone in Space?

A recurring theme in science fiction, the idea that other solar systems may harbour some kind of life is currently THE hottest topic in the field of astronomy. Researchers at the La Silla mountain observatory in the Atacama desert in Chile, working at an altitude of 2,400 metres, are looking for nothing less than an answer to the question: are we alone in space? Or is there life out there somewhere? Maybe even intelligent life? Their aim is to find extrasolar planets, those that orbit unknown stars far beyond our own solar system.

02 Survival Strategies – Who's the Cleverest of Them All?

Dogs, chimpanzees, marmosets, or the cleaner wrasse – which is the most intelligent member of the animal kingdom? An apparently simple question, but one that's actually difficult to answer: chimpanzees can make intelligent use of tools and are actually pretty good at cheating, dogs have an unrivalled capacity for empathy, and are masters at interpreting human emotions, the cleaner wrasse is expert at fooling other reef residents, and marmosets are brilliant social learners.

03 Survival Strategies – Honesty is not the Best Policy

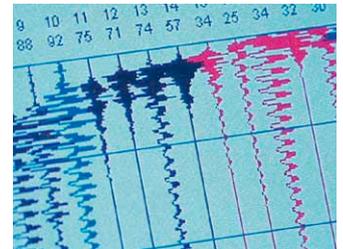
Lies are an everyday fact of life, and scientists have come to recognise their merits, as telling a person the naked truth often results in social isolation. Evolutionary biologists now think they've identified the lie as the key motor driving the development of human intelligence.

04 The Secret Lives of Bugs and Mites

We share our homes with billions of other life forms. Dust mites, spider beetles, house spiders, flour moths, pirate bugs, book scorpions, to name but a few. Not to mention the innumerable creatures that are invisible to the naked eye and whose home is the human body – hair follicle mites, for example. What do they look like? How and where and for how long do they live? What do they eat? Are they harmful, or just annoying, or maybe even useful?

05 Trees – Facing an Uncertain Future

Trees have stood their ground for hundreds of millions of years. But botanists in Europe have recently established that the gentle giants are dying out in huge numbers. Conditions for trees are apparently worsening. Following decades of work, researchers are now able to prove that Europe's forests are under serious threat. They say mankind now faces an enormous challenge if the trees are to be saved.



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**06 Making Artificial Blood –
The Race is On**

Scientists, research labs and pharmaceutical companies are currently vying with one another to become the first to create the first fully synthetic blood. The need is immense: this film relates the background to the pursuit of “tailor-made blood”, detailing both the positive and negative aspects of the process, the complexity and potential of blood, and the consequences of blood manipulation for the human body.

07 Ice Recession in the Alps

Global warming is not only affecting expanses of ice that are clearly visible, like the glaciers. The invisible ice of the mountains – the permafrost on peaks and in rock faces – is also receding, with dramatic consequences. This documentary accompanies researchers as they penetrate the interior of mountains to find out more about permafrost. A race against time has begun.

08 Is Wind Energy Still Viable?

Advocates and opponents are quite vocal about this regenerative form of energy. But that is not surprising, because wind energy has a lot to offer: for engineers, architects, and biologists.

**09 The Cyberhand – Giving Amputees
a Sense of Touch**

In this film a patient tests the cyberhand, as it is known, for the first time. Unlike other artificial limbs, this neuroprosthesis is controlled not by electrical impulses from the muscles but directly by the nerves which control muscular contraction. The cyberhand is designed not only to serve the wearer as a gripping tool but also to impart a sense of touch.

10 Does Water Live?

Water is the element of life. Without H₂O there would be no plants, no animals, and no micro-organisms. But could the elixir of life itself be alive? Can water store information? It is not only esoteric thinkers who believe that there is far more to water than has been thought.

**11 Surviving in the Mountains –
Altitude Sickness**

Climbers, skiers, and hikers are often plagued by the symptoms of altitude sickness which can result in fatal highaltitude cerebral or pulmonary oedema. Professor Peter Bärtsch from Heidelberg University is an internationally renowned expert on acute mountain sickness. His aim is to identify the exact causes of the condition and the best way of treating it.

**12 Israel’s Water Shortage – The Dead Sea
Is Dying**

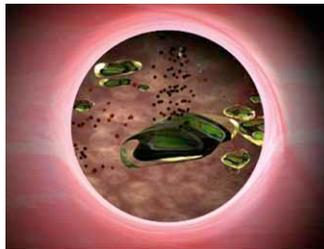
The Promised Land is also an arid land. The shortage of fresh water has been a problem in Israel now for several decades. Modern-day Israel consumes some two billion cubic metres of water every year. Roughly two-thirds of this volume are pumped into agriculture. Water is a precious resource and, to a certain extent, lies at the heart of Israel’s conflict with its neighbouring states and with the Palestinians. Desalination plants and droplet irrigation will, it is hoped, provide a solution to the problem.

13 The Hunt for Our Thoughts

Our thoughts are free and, above all, private. At least that has been the belief up to now. But the time, it seems, has come to revise that belief, because brain researchers can now read our thoughts and identify our intentions, and even manipulate them. This new science can be helpful. But it also involves certain risks.

14 The Enigma of the Lightning Strike

Millions of lightning bolts hit the Earth every day. But we know very little about them. At temperatures of up to 30,000 °C nothing can match them for heat; they pack millions of volts and can carry thousands of amps of direct current. Scientists in the US and Germany are attempting to cast new light on the process that creates lightning.



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15 Expedition to the Bleeding Lake

Lake Alat in southern Germany may not appear to be anything special – but descend 16 meters below the surface and you will see a deadly purple-colored cloud. This is a layer of sulphur-processing bacteria. There is no oxygen below this layer, and the water is extremely acidic. An expedition takes a closer look at the causes of this unique natural phenomenon.

16 The Secret Reserves of Top Athletes

“Faster, higher, further” is the motto of world-class sport. But in many disciplines, the unremitting drive to break records appears to be exceeding the limits of human capacity. The last reserves of sportsmen and women are mobilized by the latest high-tech methods of performance appraisal and optimization – but also by gene doping and other illegal practices.

17 The History of the Climate

A lot of research is going on into the history of the climate – to understand the past and even to try to predict the future. Researchers are analyzing samples taken from the heart of Greenland’s glaciers, ice that serves as an environmental archive stretching back more than 100,000 years. Scientists are also looking for records in libraries and archives – and scouting some of the oldest cities in Europe for telling clues.

18 The End of the Line for the Fishing Industry?

The global demand for fish has doubled since 1980. Now half of the world’s stocks have been fished to their limits, while a quarter is thought to have been over-fished. If things carry on like this, commercial fishing could grind to a halt by 2050. Scientists are looking for ways to avert such a scenario – but policy makers rarely heed their advice.

19 Light at the Speed Limit

Light is crucial for life on Earth, yet it remains very hard to understand. Exhibiting properties of both waves and particles, it travels at 300,000 kilometers per second. It provides us with energy, allows us to observe the world around us, and is set to be the basis for devices and computers of the future.

20 Radiation from Space

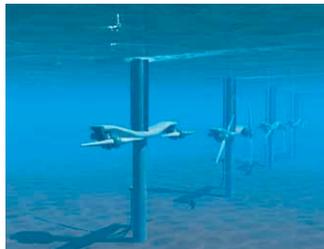
The Earth is under incessant fire from cosmic radiation, which consists of all manner of particles. Scientists from around the world are working on solving its mysteries. They pool their knowledge, piecing it together like a puzzle, and keep a close eye on outer space in a bid to fathom the origins of our existence: What effect does this tide of cosmic particles have on us? Where does life come from? How did the Universe come about?

21 Energy from the Oceans

Two-thirds of the Earth’s surface is covered by ocean. The seas represent gigantic sources of energy, which scientists aim to harness to produce electricity. Their work focuses primarily on tides and currents, waves and the salt contained in seawater. The sea could meet the growing human demand for energy, without destroying the Earth.

22 Death from the Laboratory?

Rice farmers in Thailand are at high risk of contracting melioidosis. The disease is caused by bacteria that are found mostly in tropical and sub-tropical regions. Some progress has been made in efforts to combat the disease. But there are fears that the pathogen could also be used by terrorists planning a biological attack.



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23 How Food Shapes Our Bodies

How does a newborn baby develop its immune system? Is there a link between experiences of smell in early childhood and later eating habits? How does diet influence the ageing process? These are some of the questions being investigated by scientists wanting to know how the human body responds to food. Their goal is to find the formula for a long and healthy life.

24 The Weather Makers – Can We Control the Climate?

It's currently common practice to influence local weather systems in more than 30 countries. Techniques are used to generate rainfall or sunshine, or to prevent dangerous hailstorms. But not enough research has been conducted into the consequences of such intervention in the climate. Despite the potential risks, weather manipulation is occurring with greater frequency throughout the world.

25 Dangerous Debris in Space

Since the beginnings of space travel, man has left a trail of debris behind him: burned out rocket stages, and disused and damaged satellites, for example. Hundreds of thousands of pieces of space debris are orbiting the Earth. Some scientists say the danger of collision is now so great that the era of space travel may already be nearing its end.

26 The World's Highest Clinical Laboratory

There can be few places on earth as hostile to life as Mount Everest. The human body is simply not made for the icy, thin air found at such altitudes, air that makes blood more viscous and alters brain and lung functions. But by studying the changes in the body caused by conditions on the world's tallest mountain, a European team of doctors is convinced it can develop new treatments for the critically ill.

27 Hidden Poison

You can't see, smell or taste them, but they can have a serious impact on your health: toxins in food and everyday objects from clothing to toys. Harmful substances lurk at every turn, and primarily pose a threat to children. In a bid to protect consumers, scientists have been working for years on enhanced toxin detection methods.

28 Research in the Rain Forest – Are Lianas Taking Over?

As lianas continue their apparently inexorable advance, the equilibrium of the rain forests of Guyana is under threat. As they strive to reach light, the vines suppress everything in their path. Scientists take to the skies in a hot air balloon to investigate the causes and the consequences of this large-scale growth.

29 Climate Change – A Threat for Historic Buildings

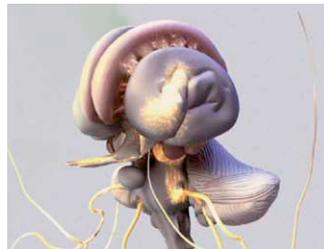
Climate change is a threat not only to people, animals and plants, but also to monuments. By conducting a series of complex experiments, scientists hope to discover more about the effects of extreme temperature fluctuations and to find new ways to protect murals, valuable furniture and other historical objects.

30 Mars Mission – Inside the Isolation Pod

Not to see the sun, not to feel the wind, and to have no contact with their families for 105 days: That is part of the challenge facing six test astronauts in the service of science. An experiment at the Moscow Institute of Biomedical Problems simulates a flight to Mars in order to study the psychological and physical effects of such a long period of isolation.

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31 Communication Without Words – The Language of Facial Expressions

A furrowed brow, a beaming smile, a twitch of the nose – our face is talking every second, even if we're not saying anything. It can produce more than 10,000 different expressions – with just eight facial muscles.

32 The Wonderful World of Mushrooms

Mushrooms are masters of chemistry and cooperation. They cooperate with microscopic algae to become robust hybrids, lichens, which can withstand both Arctic cold and blistering heat. Some of the substances they produce are poisonous to humans, some have a healing or hallucinogenic effect, and others are a source of flavor and aroma.

33 Don't Panic! – How to Control Crowds of People

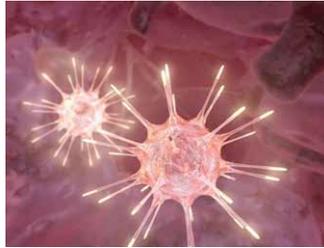
If crowds of people start to panic, this can quickly become dangerous. Scientists, engineers and rescue services are teaming up to find ways to evacuate public places as swiftly as possible in the event of an emergency.

34 Stradivari's Legacy **HD**

Stradivari violins are famous for their incomparable tone. Scientists, violin makers and musicians have long been trying to discover the secret of this very special sound. It would appear that Stradivari selected wood of a particular density to make his violins. And this density, it turns out, can be influenced with the help of a fungus.

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35 Intelligent Creatures

Until recently, behavioral research deemed an animal to be intelligent if it is aware of itself. But intelligence manifests itself in many different ways, and recent studies identify intelligent behavior in all kinds of creatures. Is it time to revise our understanding of animals?

36 Europe's Giant Elephants – Exploring a Lost Biotope **HD**

120,000 years ago, giant elephants roamed the plains of Europe. A spectacular archaeological find in Germany reveals a great deal about the fauna and climate of that era, during which early humans tried to assert themselves over the animal kingdom.

37 The Earth's Sensitive Surface **HD**

Biological crusts of mosses, lichens and cyanobacteria cover vast areas of the Earth's surface like a skin. They protect against erosion and destruction – and act as a brake on global warming to a much greater extent than previously thought. But much too little is known about these sensitive layers.

38 Bionics – Is Nature the Better Architect?

Scientists are increasingly examining how complex technical problems are solved in the natural world. Their field of research is known as bionics. Looking at nature's solutions is especially worthwhile when exploring durability and load-bearing structures. How, for example, can sensitive electronic products be transported to customers in a secure and environmentally-friendly way?

39 Barriers to Knowledge

Scientific progress has made the world more fathomable. But in many cases, researchers find themselves up against fundamental limitations on their knowledge. The transition between life and death, for example, or the question of human consciousness. The concept of time also presents science with puzzles it has so far been unable to solve.

40 The Numbers Game

Mathematics enables us to make complex forecasts and calculations that are of great use in our everyday lives. But maths has a hard time getting a handle on certain complex natural phenomena. What is the relationship between physical reality and the laws of mathematics?

41 The Essential Conundrum

Is a vacuum really empty? What are Black Holes? Einstein's theory of relativity and quantum mechanics provide precise answers, but they contradict each other. Physicists are searching for the formula that unites both theories.

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42 The Neanderthal in Us **HD**

We are more closely related to Neanderthal Man than previously thought. This is the astonishing conclusion of scientists working on a project to decode the Neanderthal genome. Their research, carried out over a number of years, has revolutionized our understanding of prehistoric man and his evolution.

43 Water – The Emergent Energy Source

Hydropower is the most reliable form of regenerative energy. Engineers are currently testing completely new concepts for its use. For example, they are designing power stations that harness mountain streams or that run effectively on small amounts of water falling from low drop heights.

44 The Silent Demise of a Species **HD**

Around a third of the world's 5,000 species of amphibian are endangered. Scientists only have a limited understanding of why this might be the case. In Cameroon, two German tropical marine ecologists have spent years conducting research into around 100 indigenous species of frog.

45 Southern Italy – Understanding Volcanoes **HD**

Vesuvius, Etna and Stromboli are among the most intensively explored and monitored volcanoes in the world. Researchers want to be able to predict eruptions more precisely, but this is proving to be difficult. Nevertheless, their work on the volcanoes of southern Italy is helping colleagues in other regions.

46 Swarm Intelligence – Mysteries of Natural Collectives

Whether birds, fish or insects – when animals pool their resources as a group, their problem-solving capabilities far exceed those of any one single creature. This is why engineers and cyberneticists are so interested in swarms and are trying to transfer their collective approach to robots.

47 Tree Protection – Finding Ways of “Fingerprinting” Wood **HD**

Illegal logging and the illegal trade in timber are destroying many of the world's forests. Scientists are trying to develop ways of identifying wood according to its type and origin. They hope that this will help to crack down on the destructive activities of crooks and smugglers.

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