EDGE MEDIA
CONTROVERSIAL TV
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Programme Two: Our Island Earth

The following transcript contains all to-camera presentation, narration and interviews from the programme first broadcast on Edge Media TV's Controversial TV (Sky channel 200) on 2nd May 2009. To ease readability as a transcript, most other parts of the script have been removed.

TITLE SEQUENCE

ATTENBOROUGH NATURE RESERVE: DAY

CHRISTOPHER BARNATT (CB) TO CAMERA:

Welcome to Challenging Reality. I'm Chris Barnatt, and in this series we're taking a journey across time — across reality itself — on a quest to explore the greatest challenges and opportunities of the future. Last time, we looked at the changing nature of human achievement, and charted a progression from awe-inspiring ancient monuments, to the ingenuity of the 20th century, and on to potential future wonders limited only by our ethics and imagination.

This time, we're going to look at the history and future of travel and communications. However, before that, we should remind ourselves that many of the boundaries that constrain us are mental rather than physical. For example, whilst most people would see this stream as a barrier to reaching the far bank, others would challenge that reality and refuse to accept it as a barrier at all.

CB WADES INTO AND ACROSS STREAM TO FAR BANK. DISSOLVE TO:

TOY RABBIT AND PLASTIC BOX ON GROUND. CB WALKS IN AND PICKS THEM UP.

This is a rabbit. And this is a plastic box. If I take this rabbit and put it in the box and put on the lid [PAUSE AS DOES THIS], it will be perfectly OK because this particular rabbit is not actually alive. However, if I took a real rabbit and sealed it in a plastic box — something of course you should never, ever do — then it would very rapidly expire. Indeed, even if the box let in some air, the rabbit would soon die from a lack of food and water. I could of course get a bigger box and put in the rabbit with lots of carrots. However, this would only postpone the inevitable. For the rabbit to survive it would have to be caged in an open box to which food and water were regularly delivered.

The rabbit-in-a-box scenario demonstrates the implication of what physicists call the Second Law of Thermodynamics. This states that all closed systems — such as our poor rabbit in a box — are doomed to stagnate and decay. Indeed, as time progresses, the fate of anything that's not open to the wider world has to be extinction.

Recognising the fate of closed systems is critical in understanding the continual geographic expansion of the human race. Indeed, I would argue that all human communities — from early tribal settlements to entire nations — are best regarded as closed systems. They are therefore subject to the Second Law of Thermodynamics, and will stagnate and decay unless they constantly seek wider and wider resources.

GENERIC VISUALS

Until around 10,000 years ago, human beings were nomadic and hence avoided the problems of living in a closed system. Early settlements then grew up in parts of the world with plentiful natural resources. For example in Ancient Egypt soft metals were fairly widely available. These and other resources therefore enabled early civilizations to rise and prosper before the stagnation of living in a closed system took hold.

BANK OF RIVER TRENT

CB TO CAMERA:

All ancient civilizations were also founded on the banks of great rivers. These watered and fertilized their lands, as well as facilitating transportation and trade. Hence, whilst rivers and indeed oceans may have divided humanity into regions and nations, they also offered early empires their essential opportunity for geographic expansion.

MONTAGE OF DEVELOPMENT OF TRANSPORTATION

By 2500 BC, Egyptian merchants were raiding the coast of Africa in wooden vessels up to 70 feet in length. These were then used to transport cargoes including elephant tusks, copper ingots, and monkeys. Alongside the Ancient Egyptians, the Mesopotamians, Greeks, Romans, Aegeans, Vikings and Chinese also came to dominate early maritime trade and exploration.

The Persians and then the Romans improved transportation by building their famous roads. However, it was not until the construction of canals and further road networks in the 17th and 18th centuries that inland communications significantly advanced. This said, even two hundred years ago, few people had access to transport. Canals and roads therefore remained trading pathways between largely isolated geographic regions. Indeed, it remains difficult for us today to imagine the immobility of most people before the advent of modern transportation technologies.

Mass personal travel only became a reality in the early-19th century with the construction of the railways. Steam power then also came to dominate the oceans, with oil-driven motor transport rapidly on its heels. The entire 20th century was then shaped by exceptionally rapid developments in transportation technology. Indeed, in only a handful of decades we progressed from horse-drawn carriages and steam power, to motor cars, aeroplanes, and space craft capable of landing us on the Moon.

In the early years of the 21st century, humanity now mass-populates all habitable areas of the planet. Personal transportation and global trade have also risen to a level that cannot be sustainable long-term. The Earth itself is therefore now the closed system that needs to be opened up to ensure our survival. Or to put it another way, with pollution rising and natural resources starting to run out, the human race is now the rabbit within the sealed plastic box of our first planet.

SPACE SHUTTLE LAUNCH

America's space shuttles were humanity's first attempt to make access to space more routine, and have played a significant role in constructing the International Space Station. Since the first shuttle flight in 1981, commercial interest in space travel has also risen significantly. In 2004, SpaceShipOne won the coveted X Prize by becoming the first private, piloted spacecraft to journey into space twice in two weeks. The world's first commercial space line — Virgin Galactic — has subsequently begun construction of the larger SpaceShipTwo to offer journeys into space for future space tourists.

NASA AND OTHER SPACE EXPLORATION FOOTAGE

Virgin Galactic is also far from alone in developing future space transportation. NASA, for example, is working on programme called Constellation. This has the goal of furthering human experience in space, and involves building new launch rockets called Ares, and a new space capsule called Orion. There's also a new lunar lander called Altair. Indeed, at the core of the Constellation Programme is a return to the Moon, where NASA is planning a sustainable, long-term human presence.

The Constellation Programme is currently intended to transport Americans to the Moon by 2019, and may even take us on to Mars. In parallel, other countries are ramping-up their space programmes, with both China and Russia potentially on target to return human beings to the Moon before America.

Whilst the last space race was fuelled by Cold War politics, this time around there are serious economic imperatives to obtain valuable natural resources. For example, both Russia and China have stated that they will prospect on the Moon for a rare gas called helium-3, with Russia having already announced plans to extract helium-3 from the lunar soil on an industrial scale.

Helium-3 is important because it could fuel the next generation of nuclear fusion power plants. These would not produce the radiation and waste made by our

current, uranium-fuelled nuclear fission power stations. It is therefore unfortunate that there is extremely little helium-3 on planet Earth. Helium-3 is, however, emitted by the Sun, and whilst this cannot penetrate the Earth's magnetic field, the Moon has been absorbing helium-3 for billions of years. There are therefore estimated to be over one million tonnes of helium-3 on the surface of the Moon.

Around 25 tonnes of helium-3 — or enough to fill one space shuttle cargo bay — could fuel the United States for a year. Helium-3 is therefore potentially worth billions of dollars a tonne. Even with current space technology, extracting helium-3 from the Moon could therefore be cost effective. Indeed, in a few decades time the dominant superpower could well be the nation that controls the supply of lunar helium-3. It is therefore perhaps not surprising that NASA is planning its permanent Moon base on one of the lunar poles where helium-3 is known to be concentrated.

ATTENBOROUGH NATURE RESERVE

CB TO CAMERA:

Russian rocket pioneer Konstantin Tsiolkovsky once said that the Earth is the cradle of the mind, but one cannot live in the cradle forever. Indeed, with dwindling natural resources, it seems inevitable that at some point we will have to venture forth from our first planet.

Whilst this idea may be both logical and inescapable, at present the practicalities are not that simple. For a start, the required space transportation technology does not yet exist. As we'll explore in Part II, in the short-term we therefore need to use digital media to help us communicate more and travel less . . .

END OF PART ONE

PART TWO

ATTENBOROUGH NATURE RESERVE

CB TO CAMERA:

Welcome back to Challenging Reality. In Part I, we saw how developments in transportation have enabled the human race to seek wider and wider resources. However, with the limits of the Earth now being reached, we also need to find alternatives to physical travel.

MONTAGE OF EARLY MEDIA

For thousands of years, human beings have been developing media to allow their ideas to journey across both time and space. The first written language was developed by the Sumerians around 5000 years ago. This was based on pictograms

baked into clay tablets, and evolved into a script known as cuneiform. The Ancient Egyptians then developed their famous hieroglyphics.

Paper and printing were first developed by the Chinese around 200 AD. However, it was not until the arrival of the Guttenberg printing press in 1450 that books started to become widely available in the West.

By the 19th century, books and newspapers became the world's first mass produced products. The late 1800s then saw a rapid development of photographic and electronic media, including the phonograph, radio and cinema. These allowed human experiences to be communicated as never before, and soon had a significant influence on the general population.

ROBERTA PEARSON INTERVIEW

Well film starts, roughly 1895. Uhm, circa. 1906,7,8 a new form of exhibition springs up, and these are the famous nickelodeons where you pay a nickel, five cents, to get in. And they're often located in large urban centres, and on the one hand you have fears about people gathering in these rather insalubrious places and watching films that might have, you know, sexuality or criminality. And there are others who are saying, "well this is great, this is a democratising influence" — that people who can't read can watch silent films, that they can see things from all over the world. And by the late teens, early twenties you get the establishment of the large picture palaces. And this is where a shop girl can sit to a millionaire. This is a levelling of the classes — they're all going to these lovely places. And the programme's quite different from when we think about going to the cinema today. We maybe think about seeing some adverts and a feature film. But what they got was a mixed bag, of a feature film, maybe a comedy short, some travelogues, so in fact is was an educational influence for many people.

MONTAGE OF EARLY TV AND THEN DIGITAL MEDIA

With silent films having already made a significant impact, taking pictures arrived in the late 1920s. By this time the first experiments in early television were also underway. Television then seriously took hold, with half a billion people watching the moonlandings in 1969. Around this time the Internet was also taking its first steps, with the global telephone network also growing substantially.

Personal video recording and digital media were introduced in the 1970s and 1980s. Then, in the late 1990s, the Internet slowly began to integrate broadcast and personal media. Indeed, it now looks certain that the Internet will continue to transform not just personal communications, but also how we access and interact with television and other entertainment content.

ELIZABETH EVANS INTERVIEW

One of the key things that's changing about television is being able to watch content when you want to watch it, as opposed to when broadcasters tell you you

should. So whereas with television broadcasting you had to be in front of your television set, in your lounge, at a particular time on a particular day to be able to watch a particular programme, increasingly the industry are offering services where you don't have to do that — where you can do to BBC iPlayer or Channel 4's 4OD whenever you want and watch whatever you want.

In some respects the Internet can just be another place for more traditional media forms, its just another way of access. But at the same time there's also the potential for much greater experimentation, and the mixing of this one-to-many medium of broadcasting with the more kind of one-to-one, or mass-to-mass, many-to-many capabilities some something like the Internet. So its interesting to see what's happening, it's hard to kind of predict where people will take it, but there's lots of quite exciting things going on that point ways to which the Internet might be changing both how media is created, but also how people respond to it and engage with it.

MONTAGE OF ONLINE MEDIA, PHONES & PDA DEVICES

The domination of most media by the Internet could be a cause for concern. However, it will not result in people spending more and more time sitting at a personal computer. Instead, a greater variety of computing devices are likely to be used to link us to both media content and each other in a development known as ubiquitous computing.

CHRIS GREENHALGH INTERVIEW

Ubiquitous computing, one way of defining it, is that its not like the computing we used to know – it's definitely not about the PC on the desktop. And in some ways it's about everything else. I mean, more positively, the vision of ubiquitous computing is seeing technology and computers becoming part of our everyday lives and part of the everyday world. So part of it is the incredible growth of pocket devices, handheld devices, but also computer-type systems embedded in our homes, in the buildings that we walk through. Also devices embedded in what might be everyday artefacts — mugs, pictures, pieces of furniture, and the idea that all of these elements are working together behind the scenes. So that as we just go about our everyday life, the computer in my pocket is talking to the computer in my room, and the other ones around about and giving me, for example, the information that I want when I want it. And the sort of environment to work in that I need at the time and — it just works. Or at least that's the vision.

FURTHER ONLINE TECHNOLOGY MONTAGE

In tandem with the continued growth of the Internet, the arrival of ubiquitous computing may help humanity to communicate more and travel less. Already, many people are working from home using the Internet. A significant proportion of social communication has also already also moved online, with social networking now also entering the business domain.

The Internet is rapidly developing into a truly integrated audio-visual media with few boundaries between personal and mass communication. Anybody with a broadband connection and a webcam can now make video calls or broadcast on the web. Millions of people are also starting to meet and explore in 3D worlds that in future could further reduce the need for personal or business travel. In short, humanity is now expanding its horizons and seeking wider resources online.

ATTENBOROUGH NATURE RESERVE

CB TO CAMERA:

The global interconnectedness of humanity potentially has implications well beyond the Internet. For example, in his 1993 book "Metaman", Gregory Stock suggests that all human beings should now all be thought of as the interconnected cells of a single, planetary life form.

TRANSITION FROM BOOK COVER TO THE EARTH AS SEEN FROM THE MOON, TO:

THE EARTH AT NIGHT – A NETWORK OF ILLUMINATED CITIES.

In his book, Stock asks us to consider looking down from the Moon at the dark side of the Earth, pitch dark except for the luminous network of cities and highways. He then points out that over the decades this shimmering lacework has evolved and extended in pattern that indicates how all of the people and technology on the Earth have merged into one a gigantic living being. Stock then names this new life form "Metaman".

As it consumes its first planet, Metaman is increasingly fighting the constraints of living in a closed system. Given its scale, Metaman is also reacting extremely quickly to threats including global warming, over population and dwindling natural resources. As a single entity, Metaman is therefore very likely to survive. However, just what kind of being Metaman will be in one hundred or one thousand years time is far from clear, with the fate of any individual part of Metaman even less certain. What's more, quite where Metaman will live in the distant future is very much open to debate.

TRANSITION FROM THE LIGHTS OF CITIES FROM SPACE TO THE LIGHTS OF:

TRAFFIC AT NIGHT IN THE POURING RAIN

The human species now faces a very difficult paradox. On the one hand, thermodynamic theory teaches us that current and increasing levels of travel and trade are absolutely essential for the survival of the closed systems of humanity. However, on the other hand, such levels of travel and trade are entirely unsustainable and will lead to our demise. Becoming increasingly global by travelling and trading electronically rather than physically is definitely a credible option that will buy us more time. However, we need to be careful to use that time

to invest our imagination, skills and remaining resources in taking far more leaps forward in our conquest of space.

Given the mess we are currently making of our first planet, some may question our right to rape the broader resources of the solar system. However, on a purely practical level, we cannot escape the physical certainty that life only ever survives by consuming a wider and wider environment.

ATTENBOROUGH NATURE RESERVE

CB TO CAMERA:

In this programme we've used thermodynamic theory to explain the geographic expansion of the human race. Few people may currently accept the resultant implication that in future we will have to seek wider resources beyond planet Earth. However, challenging reality is what this series is all about.

Next time we're going to look at the role and power of the individual at times of fundamental change. But now that's it for this programme. And remember, the future . . . is in your hands.

END CREDITS

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CHRISTOPHER BARNATT is an lecturer and futurist currently working in Nottingham University Business School in the United Kingdom. He is the author of five books and the websites ExplainingTheFuture.com and ExplainingComputers.com.

For more information, please see www.ExplainingTheFuture.com/reality