



**open
skies**

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Emirates

**WHAT WILL THE
WORLD LOOK
LIKE IN 2054?**

SCIENTIST JAMES BURKE,
NAMED ONE OF THE MOST INTRIGUING
MINDS IN THE WESTERN WORLD,
IS GOING TO TELL YOU





THIS MAN IS
JAMES BURKE
HE IS A SCIENTIST.
WAY BACK IN
THE 1970S HE
PREDICTED
THE RISE OF
THE PERSONAL
COMPUTER. NOW
HE HAS A VISION
FOR WHAT THE
WORLD WILL LOOK
LIKE IN 2054





It is already dark on a cold autumn afternoon. The lights from street lamps and passing traffic reflect off the rain-drenched streets. People file out of Barnes Bridge Station, scurrying home from work. Barnes is 9km southwest of London, a historical district tucked in a cul-de-sac of the river Thames. The Terrace is a strip of 18th century terraces looking out over the river as it meanders its way south. It is here that I am meeting James Burke, a pre-eminent scientific thinker and television presenter whose career spans almost 50 years.

In the lead up to our meeting no email was left unanswered. His detailed directions covered everything, right down to the old 1980s beige BMW that sits in front of his house. Punctuality is very important to Burke. There is still 10 minutes before our meeting, but I decide to knock anyway. He promptly answers through the closed door, "You're early, how did you know I'd be in?"

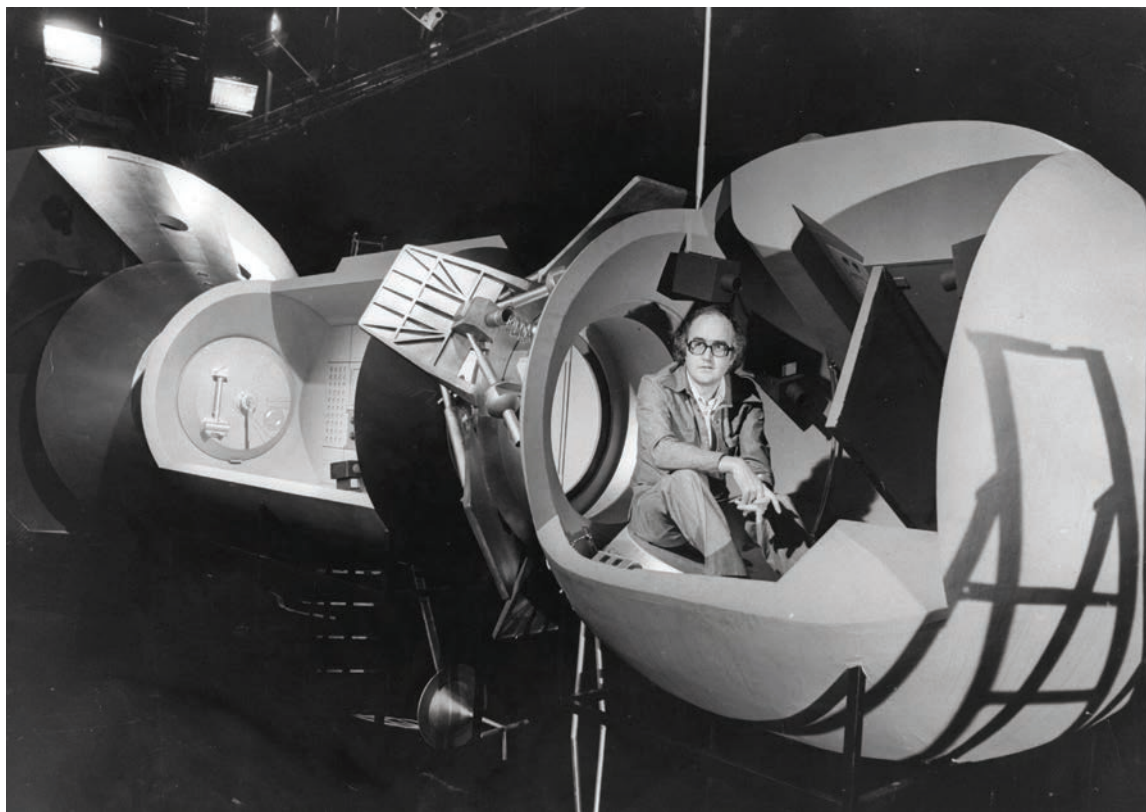
He is wearing a grey woollen jumper with his shirt collar neatly tucked out. On the side table near the door is a copy of *New Scientist* magazine, still in its plastic wrapper. "That's where I get all my ideas from," Burke jokes.

Now 76, Burke is full of life; he speaks with the speed of an auctioneer and is as captivating and animated as a tribal storyteller. He has just come back from a public speaking engagement in the US, and tomorrow he will fly to the south of France where he has a second home near Nice.

We walk up an old wooden staircase, to the dining room. The house is traditionally furnished, with parquet floors and walls adorned with numerous paintings. "This one," he says, pointing to a painterly winter scene of a fox in the snow, "is covering a hole in the wall." One minute with Burke and you realise that a dry humorous wit and self-deprecation are trusted conversational devices. He prepares a cup of tea and puts the cup directly on the ornate coffee table; he is not the sort to bother with coasters.

International audiences grew up with Burke's sharp delivery and imaginative mind. He shot to fame when the BBC appointed him lead anchor for their coverage of the 1969 Apollo 11 moon landing. In 1978 he went on to host his own series, *Connections*, an innovative programme that explored the origins of our modern world by showing how everything was connected to everything else. He is also a best-selling author, currently working on his 13th book, and a keynote speaker on technology and social change to audiences at institutions such as NASA, IBM and Microsoft.

The Washington Post has called him "one of the most intriguing minds in the Western world". When asked about the approbation, he shrugged it off in typical joking fashion, "I think they were intrigued by my general connectivist approach, or perhaps they were just easily impressed."





In 1969, as NASA's Apollo mission approached the moon, Burke was on every TV in the UK. "The BBC went into the moon landing thing a bit slowly," Burke recalls, shifting back on his couch. "I'm not sure they thought it was really going to happen."

Nevertheless, Burke was in front of an entire population, commenting on one of the most significant events of the 20th century. "All I really cared about was doing my job, I wasn't thinking, 'This is history,'" he announces, raising his voice and forming a fist to imitate a loud speaker. "You think, 'What am I going to say next?' or 'Where the hell is that pointer?' But mainly it was just making sure you kept your mouth shut, because the air-to-ground was open all the time, and the worst thing in the world was to talk when the astronauts were talking, the audience would really get annoyed."

"Here in the UK it was lunacy, the country went crazy. The nation stayed up all night, because it landed in the middle of the night here. Taxi drivers were talking about 'mid-course corrections' and I'd think, 'What! You're not supposed to know that.'"

For more than 40 years there have been moon landing conspiracy theorists claiming that NASA staged a

hoax, but Burke is unconvinced. At least he thinks he's unconvinced. "I remember looking up at the sky and thinking, 'No, I don't believe this, they're not really up there, it's all video.' Did they really go?" He pauses

for effect. "Yes, they went, you can tell from the signal, how long it took. You can't avoid that; the signal took so many seconds. If it was coming from Phoenix it wouldn't have taken that long." He raises his voice for emphasis, "Well I think they went.

I don't care, it made my career." Burke can't hide his grin.

Born in Londonderry, Northern Ireland, in 1936, his family moved to England after the war in search of work. He went to Jesus College,

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MODEL PRESENTER / Burke was lead anchor for the BBC's coverage of the Apollo 11 moon landing in 1969. Lifesize models of the manned sections of the spacecraft (left) were built for the show

SPACE MEN / Burke chats with astronomer Patrick Moore at the Kennedy Space Center in Florida in 1973 (above)



Oxford, between 1957 and 1961, where he earned an MA in Medieval English. In 1962 he moved to Italy, where he worked as a lecturer and was involved in a three-year project creating an English-Italian dictionary. He met his wife-to-be, a young woman from New Zealand teaching at an international school named Madeline, at a party in Rome. The couple moved back to England in 1966, where they married and Burke began working on a popular BBC magazine-style gadget programme called *Tomorrow's World*.

Burke's television career was a big success. His science programmes sold internationally and, aside from the BBC, he worked regularly with Discovery Channel and PBS (Public Broadcasting Service) in America.

In 1973 *Radio Times* asked Burke to predict what the future would hold for us in 20 years. It has taken something closer to 40 years for Burke's predictions to come true, but most of them have, including the importance of the personal computer.

"In 1973 computers filled an entire floor of a building," he says. "The predominant view at the time was

Nineteen Eighty-Four, George Orwell, Big Brother, all of that stuff. I didn't see it that way. I didn't know that the PC was coming [exactly], nobody did – I don't even think Steve Jobs knew. Now we have something in our lap that could land 10 Apollos, do your tax returns and then go into sleep mode."

"It seemed obvious that certain things were going to happen; a computer makes you do things faster than you would do normally, so the chance is that it's going to accelerate the process by which we solve all our problems – in medicine, in education – so that's the approach I took. Some of it was right, most of it was right. I was horrendously wrong in one aspect. I said there would be something like 300,000 computers, and there were something like 146 million. So, oops. Slightly wrong. But then nobody foresaw the speed with which it would happen. Because even then it was kind of NSA (National Security Agency) stuff – white coats, silent rooms, air conditioning and people muttering."

Burke foresaw a more relaxed view of privacy – that we would need to give more information in order to benefit from the advances in technology.

"I think at the time a fuss was made. They said, 'He thinks we're going to have no privacy,'" he recalls. "I didn't mean that at all. I meant that we would give a certain amount of data freely in order to run the place better, have a better life, be healthier, be educated."

BURKE'S TELEVISION CAREER WAS A BIG SUCCESS



TECHNIQUES ARE NOW
AVAILABLE TO MANIPULATE
SINGLE ATOMS. YOU CAN
REACH DOWN AND PICK UP
A SINGLE ATOM AND PUT
IT WITH ANOTHER SINGLE
ATOM AND THEN ANOTHER
SINGLE ATOM AND BINGO!
YOU'VE MADE A MOLECULE

"It's difficult to realise that back then people did not give information about themselves, they weren't asked to give information. When you went to the bank you would show a letter with your name on it, which was proof that you were who you say. I mean, hello! No photographic ID. A driver's licence was a little red book with scribble in it, no picture. People took your word for it. That whole data-driven society was really what I was going on about. And most of it came true."

Since the 1970s, Burke's agent, Royce Carlton, has played a major role in his longevity, and he has become an important figure in educating institutions on alternative views of change and technology. As Burke says, "Together almost 30 years, it's a marriage made in heaven."

The strangest meeting Carlton has ever arranged for Burke was just last year, with a mysterious party in the USA. Carlton refused to tell him who he was meeting with, sparking his curiosity. So Burke boarded a flight to Maryland, where he was met at the airport by a driver, also sworn to secrecy, who drove him to a cottage in the woods.

"We are out the front of this ordinary looking cottage," recalls Burke. "And I said, 'Are you coming?' and he says, 'I can't go in.' So I go in alone and these two really nice people say, 'Hello, welcome to the NSA.'"

Burke, shocked, responded with an obscenity. "Everybody says that, they say." Burke bursts into laughter.

The National Security Agency policy doesn't permit Burke to speak about the details of his mysterious visit. "I'm not allowed to put it on my CV. I'm not allowed to say the name of anyone I met. I'm only allowed to tell you that I went there. And they said, 'We're serious about this,' so that's all I'm going to tell you. But it was the high point of my career."

If working with the NSA was a highlight, the lowest moment in Burke's life came just five years ago. Seven years earlier, in 2002, Burke had stopped working to spend more time with his wife. "My wife, Madeline, who lived in France, said, 'Wouldn't it be nice if we actually lived together? After all we're supposed to be married.'" Burke would spend months at a time either travelling on film trips or editing in London. "I'd been doing this for years and years, and she was right, it was her turn. We only got seven years, so just as well."

Any future plans the couple had were shattered by the news in

2009 that Madeline had cancer. She died that same year. "Deeply distressed, I went into a cave for four years and never came out," says Burke. "I stayed in France and researched my next book, because it was something to do. But I didn't go out and see anybody. I think maybe I saw four or five people in four years. Bad things happen to everybody. But it's the single most devastating thing that can happen to anyone."

In September last year Burke came out of his cave. He was approached by the BBC to once again do a segment on what the future holds for us in another 40 years. When I ask if he would share his new predictions in detail Burke looked down at the floor and said, "This will take a moment." There is silence for the first time. Then he looks up and says seriously, "I think there are three things coming, and it may take all of the 40 years."

"One is nanotechnology," he begins. "Nanotechnology is already happening in more than 14,000 laboratories around the UK. Nanotechnology deals with materials at the nanometric level, a nanometre is 1/70,000 the width of a human hair. So it's tiny. Techniques are now available to manipulate single atoms. You can reach down and pick up a single atom and put it with another single atom and then another single atom and bingo! You've made a molecule. Want to make water? You get one atom of oxygen and two atoms of hydrogen and you get water. They are able to do that now."

Burke continues in the same excited manner, explaining that the ability to create our own molecules will have a positive effect on the environment, decreasing our reliance on raw materials.

"For example, there is already a process by which you can put one end of a tube into the filthiest water you could possibly think of and using a nanoscale filter you can pump the dirty water through and you can drink the water coming



BOOKWORM / Burke relaxes with a pile of books in his garden in Barnes, London, in the 1980s





out of the other side immediately. It is the purest water you'll ever drink. Think about what that's going to do for the third world."

Burke believes that these developments are going to radically change the way we live over the next 40 years.

"Everybody's going on and on about starvation, no water, pollution and the ozone layer, it will all be gone. We'll mend the Earth," he says. "The second thing nanotechnology is going to make possible is computers the size of a dust mote, and that's going to happen in 10 to 15 years. They've already got one in a lab that you need a microscope to look at – it's so small."

"There will be trillions and trillions of these embedded absolutely everywhere. Every object – maybe even your head – will have these things attached and they will create a gigantic network that makes the internet look like, 'We'll chip this out of stone guys let's call it the internet.' The motes, as they will become known, will run the world."

"A network of motes would be able to handle everything, the whole of human knowledge in about 0.00001 per cent of the capacity of the network. If anything needs fixing, they'll fix it. If anything needs inventing, they'll invent it."

In Burke's future we will essentially be able to perform a real life Google search. If you have lost your car, as long as it has a mote connected to it, your search would reveal its whereabouts. All of our consumer patterns, life choices and daily habits will be recorded as data. The motes will therefore know what we need, when we need it and how to improve our lives effectively.

"The third big thing is a real killer," Burke continues. "A nanofabricator. You'll have one of these in your house, your shed, back garden, I don't know where you'll put it. It will make anything you want and you'll only need to shove in dirt, air and water and a little bit of acetylene gas, which contains a lot of carbon, because almost everything contains carbon."

"Everyone on the planet will have one. And you don't [physically] send it anywhere, you [send] instruction software and at the other end it makes itself. So [you could be] at Ayers Rock or Ouagadougou, anywhere. They are going to destroy absolutely everything, I mean destroy in the sense that society as we know it, every single institution will be obsolete."

IN BURKE'S FUTURE
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Burke sees the role of governments throughout history as handling scarcity, sharing out what resources there are, because there isn't enough to go around.

"Scarcity rules and that's why we have values," he says. "The value system is all about scarcity. Valuables are scarce – PhDs, diamonds, good looks, wealth, a yacht, it's all to do with scarcity – and the fabricator will cause totally sustainable abundance."

"So that's what I think is coming, abundance. And it's very scary, because we've spent 40,000 years caring only about scarcity. We have no idea how to handle abundance."

"How will we interact with each other? This is very interesting. First of all, I think if you want to go out to dinner with your grandmother you go out holographically. A hologram of her arrives and sits at your table, and unless you put your arm through her she is real. The interesting thing is, is she somewhere else? Is she having dinner with nine other people, because it's just as easy? It's going to be a very interesting problem to have dinner with nine people at once."

"You sit in your house and you think, 'The Globe Theatre. Why not?' Your house becomes the Globe Theatre, and you see the greatest Shakespeare play you've ever seen, all done by holograms."

Burke also sees an end to private property and a reversal of the trend for city living.

"We will probably opt for small communities rather than living alone and the likelihood is that we will probably head back to where we were before the industrial revolution. Not packed like sardines in stinking cities. We will spread out," he says. "Private property, why would it be private? Private property is only there to make you money, and if there is no money, why do you need private property?"

"I can imagine Earth like a giant, untouched jungle dotted with gardens, which people would tend for the good of their souls, not because they need anything to eat."

Burke's world is free from the mundane daily needs of survival, but is it naïve to view the future with such optimism when we are surrounded by so many negative views of the future, especially in the media?

"Never mind telling me what's wrong, tell me how to solve it," demands Burke. "I don't see why one has to be pessimistic, there's no value in pessimisms. It's retrogressive. It says stop. Life doesn't stop. You have to handle what's going on whether you like it or not, life will roll over you if you don't."

Burke sits back confidently in his chair, basking in the silence. His certainty is infectious. Looking around the room, I notice the wintery scene of the fox in the stairwell. Burke's vision paints a utopian picture that may not simply be covering over a hole in the wall. He has laid out a blueprint that would allow us to redesign the entire structure of the planet and, if he's right, we won't have to wait too long for his predictions to come true.