Johnny Ball
Wobbling on the shoulders of giants
December 17, 2007

Stand-up on the shoulders of giants

Johnny Ball started his public career as a stand-up comedian and went on to become one of Britain's best-known TV presenters, making science fun for children. The title of his RSE Christmas Lecture, supported by the University of Edinburgh, was "Wobbling on the shoulders of giants," arguing that too many people today focus on "worry science" rather than "wow science" – blaming science for creating problems rather than solving them... Many in the audience had grown up watching Johnny Ball on children's television, and had been inspired by him to study science. And after igniting a lively debate on global warming, Johnny came under "friendly fire" from some of his audience who had clearly been doing their homework.

Ball is an evangelist for science, who declared at the start of his lecture that the most important subject you can learn at school is maths, and that maths will open doors to any future career. By the end of his talk, he had also declared that the "greens" have "demonised" carbon dioxide, that Al Gore has exaggerated rising sea levels and that politicians should get out of science. He also argued strongly for nuclear power and asserted that wind power will not come close to the targets the government recently set, describing the UK's energy policy over the last few years as "a farce."

Ball kicked off the evening by describing how most major breakthroughs in science are not achieved by individual geniuses, but by successive generations who stand on the shoulders of others. To illustrate this, Ball used Newton as the primary example – building on the theories of Galileo and Kepler to reach his own conclusions on gravitational motion.

The use of props and volunteers to illustrate Newton's achievement made the lecture seem more like a game show at times, and that is what gets Ball excited: "Science is supposed to be difficult," he said, "but it's so easy and so beautiful."

Science also has the potential to transform our everyday lives, Ball suggested, but sometimes more effort goes into Formula 1 than chemical formulae. "There is not enough application of science in areas that matter, like medicine," he said.

Ball is also concerned about the way that science is depicted in the media and has been "hijacked" by politicians. While "radiation has been our salvation," according to Ball, providing energy and helping in medical treatment, the media portray it as a danger and the green lobby flatly rejects it. He also said that nuclear waste is a much smaller problem than critics suggest, and lamented that France now provides us with as much as 10 per cent of our power, most of it from nuclear reactors.

More controversially, Ball also talked about climate change, claiming that the merchants of "doom and gloom" were harming the image of science. "Greenpeace have demonised carbon dioxide," he said, adding that CO_2 is only one 3,000th of the atmosphere and is a temperature retardant, not a warmer.

He also questioned how we measure temperature changes to start with, pointing out that cities are hot spots which may distort readings. Then he claimed that recent floods in Bangladesh were probably caused by geographical factors, rather than by rising sea levels as a result of global warming, as some people claim.

Al Gore's film *An Inconvenient Truth* predicted an imminent 20-feet rise in sea levels, but does this take account of plate tectonics, Ball asked, adding that London has been sinking at a rate of 3mm per year since the time of the Romans – or about 20 feet.

Wind power has been held up as the answer to most of our energy problems, said Ball. But according to recent research, no wind farm has ever produced energy at even 25 per cent of its potential, which means that Britain's target of 50 per cent may end up more like 10 per cent of total requirements.

The new generation of nuclear reactors, said Ball, is eight times more efficient than the first generation, producing 10 per cent of the waste that it used to produce. The reactors are also four times smaller than they used to be and quicker to build. "So why wind not nuclear?" Ball asked.

Scotland also came under attack, with Ball suggesting that over the last year, instead of providing the south with five per cent of its power requirements, we now import power from England.

The efficiency of power stations using fossil fuels has improved by over 60 per cent over the last 12 years, claimed Ball, adding that providing cheap electricity to developing countries would lift them out of poverty faster than financial aid.

"If we use technology, and turn one child in 20 into a scientist, then we would achieve much more than energy cuts," Ball continued, saying that seven out of ten experiments in classrooms today are "worry science, not wow science."

"Climate change has been outrageously overstated, especially by politicians," Ball concluded. "But the future is brilliant!"

Even though he may have ruffled a few people's feathers, no-one could accuse Ball of dodging his critics, however. At the end of his lecture, he patiently debated the issues with a number of people who had stayed behind to comment – both for and against.

Several audience members were concerned that Ball was advocating points of view based on "bad science," while others said that he was right to criticise the bad science used by the greens, and raise important questions that are sometimes ignored in the frenzy for "end is nigh" headlines.

– Peter Barr