What we'll look like in the future

Commentary

The main idea here is that it is always necessary to look for the underlying scientific concepts in a news story and whether the ideas match up with evidence. The story studied here suggested that humans would, in the future, all end up with similar skin colourations and may split into two separate species. In both cases easily accessible evidence would indicate that neither of these is likely. Speciation needs much more extreme conditions; groups separated for tens of thousands of years can still interbreed.

Science stories can come from a number of different places. They may be driven by a team of researchers reporting on a scientific finding, but they may also be part of PR activity for a company's brand.

Prior to this lesson, students should know that characteristics such as skin colour are genetically determined and therefore inherited.

One way of introducing this lesson is to show a clip from The Time Machine*. The 1960 MGM production is on YouTube and part seven shows both Eloi and Morlocks. These were the two 'species' featured in the H.G.Wells novel and a key idea in this lesson.*

This lesson could lead into (or follow on from) lessons on evolution and the basis for changes that take place. More specifically it leads into speciation.

Resources

The Time Machine video clip (search for 'time machine 1960' on YouTube) • bs_evolve_worksheet 'The future ascent (and descent) of man'

Learning objectives

- To analyse a piece of text about an aspect of science and identify the key features
- To set these features against a background of accepted scientific evidence
- To consider why some stories about science get written

Learning outcomes

By the end of the lesson students will have:

- analysed the story about the likely future evolutionary trends of humans
- identified the key ideas and compared them with accepted ideas about evolution
- suggested why some such stories get written and published

Key vocabulary

evolution • species • speciation

Obstacles to learning

Students may hold misconceptions relating to:

- Timescale of evolutionary change
- Factors affecting evolutionary change

Starter

Ask students to work in small groups to explore the following questions:

- How have humans evolved over the last few millions of years – what changes have taken place in the way we look and move?
- How might evolution over the next few million years affect us?
- Do you think it's possible that humans might split into two species?
- What would have to happen for this to occur?

Get groups to share ideas and draw out the following points:

- What we would recognise as human life forms appeared two to three million years ago. They walked upright but earlier forms (such as 'Lucy') may have walked with legs bent. They had smaller brains and long arms.
- Evolution arises from random changes that may happen to confer an advantage. If, for example, temperatures rise, organisms that can cope with that will survive.
- Dividing into species usually means separation for long periods of time and for the groups to have evolved in different ways.

Main activity

Formally introduce objectives and outcomes, relating back to the starter (although they will have been on display since start of lesson).

Circulate copies of *The future ascent (and descent) of man* (ideally enlarged to A3) and ask students to work in pairs to identify key predictions being made. Provide each pair with a highlighter to mark the points. Then ask pairs to pair up and compare findings. Say that you want a clear list of the specific predictions being made.

Take feedback and draw out the following predictions:

- Division into attractive and ugly sub-species
- Uniform racial characteristics
- Reduction in social skills
- Reduction in physical robustness

Explain that scientists then look to see if such things have occurred in the past.

Speciation (the formation of new species) occurs in a number of ways, but usually because of geographical isolation (such as the finches Darwin found on the Galapagos Islands) or small populations that are unable to exchange genes (drosophila sometimes experiences this). Without these occurrences it is highly unlikely that sub species will form. Tasmanian aborigines lived separately from other humans for over 10,000 years but can still interbreed. (As an aside, sympatric speciation was until recently a contested theory; one species that may experience it is the Tennessee cave salamander. This is a good example not only of evolution in action, but of theories changing as new evidence comes to light. Nevertheless it is thought to be a rare occurrence).

The uniformity of racial characteristics also seems not to happen in this way. In Brazil, for example, interbreeding between black Africans, white Europeans and native Americans over many centuries has not resulted in blending and evening out of skin colour.

Plenary

Ask students:

- how they think stories about scientific issues get into the press and how PR companies try to influence editors.
- to go back to the story and find out who it was commissioned by; see if they know anything about Bravo (a "bikini and fast cars men's TV channel").
- if they have suggestions as to why Bravo commissioned such a piece (it ran on the BBC, Daily Telegraph, Sun, Scotsman, Metro and many others).
- Whether they think such stories have any scientific basis.

What we'll look like in the future

The future ascent (and descent) of man

Within 100,000 years the divide between rich and poor could lead to two human sub-species

By Mark Henderson, Science Editor, *The Times*, October 17, 2006

The mating preferences of the rich, highly educated and well-nourished could ultimately drive their separation into a genetically distinct group that no longer interbreeds with less fortunate human beings, according to Oliver Curry.

Dr Curry, a research associate in the Centre for Philosophy of Natural and Social Science of the London School of Economics, speculated that privileged humans might over tens of thousands of years evolve into a 'gracile' subspecies, tall, thin, symmetrical, intelligent and creative. The rest would be shorter and stockier, with asymmetric features and lower intelligence, he said.

Dr Curry's vision echoes that of H. G. Wells in The Time Machine. He envisaged a race of frail, privileged beings, the Eloi, living in a ruined city and coexisting uneasily with ape-like Morlocks who toil underground and are descended from the downtrodden workers of today.

Dr Curry also said that today's concept of race would be gone by the year 3000, relationships between people with different skin colours producing a 'coffee-colour' across all populations. With improvements in nutrition and medicine, people would routinely grow to 6ft 6in and live to the age of 120, he said.

Genetic modification, cosmetic surgery and sexual selection — whereby mate preferences drive evolution — meant that people would tend to be better-looking than today.

Otherwise, humans will look much as they do now, with one exception: Dr Curry also suggested that increased reliance on processed food would make chewing less important, possibly resulting in less developed jaws and shorter chins. Ten thousand years from today this effect could be compounded as human faces grow more juvenile in appearance. This effect — neotony — is known from domestic animals: dogs resemble young versions of wild relatives such as wolves.

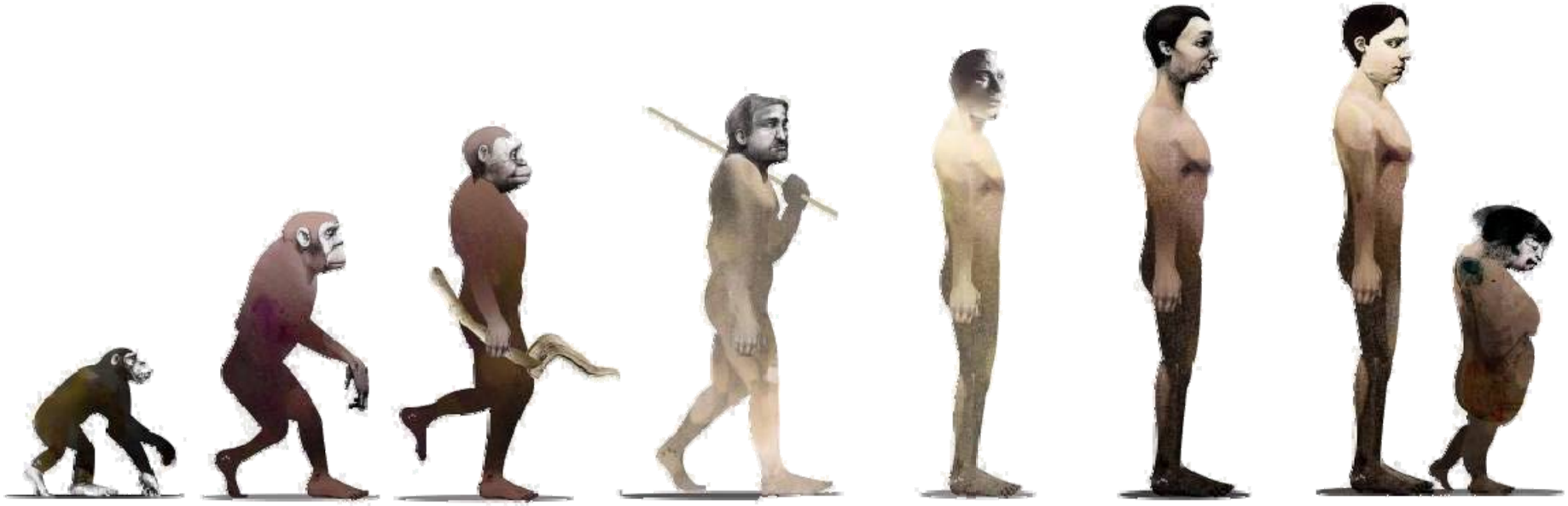
Dr Curry raised the worrying possibility that reliance on technology could erode social skills and even health. As deaths from genetic diseases such as cancer are prevented, the genes themselves might become more common, no longer being 'weeded out' of the gene pool. Increased use of medicine as a means of treating disease could lead to the deterioration of the body's immune system.

Dr Curry's predictions were commissioned by the television channel Bravo to celebrate its 21st anniversary on air.

"The Bravo Evolution Report suggests that the future of man will be a story of the good, the bad and the ugly," he said. "While science and technology have the potential to create an ideal habitat for humanity over the next millennium, there is the possibility of a genetic hangover due to an over-reliance on technology reducing our natural capacity to resist disease or get along with each other.

"After that, things could get ugly, with the possible emergence of genetic 'haves' and 'have-nots'."

THE BRAVO EVOLUTION REPORT



1,000 YEARS A
The peak of human enhancement – average height of 6.5 feet, life expectancy of 120 years, coffee coloured, symmetrical facial features, athleticism. Huge clear eyes and smooth hairless skin. Humans will have less developed jaws and shorter shins.

100,000 YEARS A
Mankind will be divided into two distinct sub-species – The genetic 'haves' and the genetic 'have nots.' The 'haves' will be tall, thin, symmetrical, clean, healthy, intelligent and creative. The 'have nots' will be short, stocky, asymmetrical, grubby, unhealthy and less intelligent.