

Discoveries and breakthroughs

discover
discoverer
discovery
make a discovery

The **discoverer** of something is the person who finds it or becomes aware of it for the first time by **discovering** it or by **making a discovery**.

Wallace was the co-discoverer with Darwin of the process of evolution by natural selection.

evolution 118 ↓

Neuroscience stands today roughly where atomic physics was in 1919, when Ernest Rutherford discovered the nucleus, or where molecular biology stood in 1944 when Oswald Avery proved that genetic material was made of DNA.

physics 129 ↓

nucleus 140 ↓

DNA 111 ↓

An ink pen running at regular intervals over a paper chart was the hint that led Jocelyn Bell Burnell to make an astonishing discovery about the universe. Nobody yelled 'eureka'. At the time, she was a 24-year-old PhD student at Cambridge, doing a routine monitoring job. But she rapidly acquired an international reputation for her discovery of the pulsar, a new type of star.

universe 153 ↓

pulsar 177 ↓

star 175 ↓

breakthrough
break new ground
ground-breaking
pioneer
pioneering work

A discovery may be described as a **breakthrough**. People may say that it is **ground-breaking** or that it **breaks new ground**.

Scientists who are the first to do work in a particular area are **pioneers**. They are said to **pioneer** particular developments or do **pioneering work** in a particular area.

The sheet of material, about 5mm square, exhibits all the properties of a superconductor. However, Tomoji Kawai says that more tests are needed to confirm their findings. Japanese physicists hailed the discovery as a breakthrough.

superconductor

135 ↓

physicist 129 ↓

In the 1940s, Griffin made the ground-breaking discovery, with his colleague Robert Galambos, that bats use radar navigation.

Where their report breaks new ground is in demonstrating that the longer-term climate shifts seen in earlier records are themselves marked by strong variations of less than ten years' duration.

climate change

46 ↓

The team were well aware that the pioneers who studied nearby galaxies in the 1930s and 1940s mistook growing nebulae and star clusters for individual stars.

galaxy 177 ↓

nebula 175 ↓



"I CAN HELP YOU WITH TINY, LITTLE STEPS. AS FOR BREAKTHROUGHS, YOU'RE ON YOUR OWN."

Hodgkin pioneered the use of computers to handle the complex mathematics involved in determining crystal structures by X-ray crystallography.

crystal 135 ↓

The general theory of relativity predicts that for any given mass, there is a critical radius known as the Schwarzschild radius, named after the pioneering work of Karl Schwarzschild in 1916. Once any mass is squeezed within the confines of its Schwarzschild radius, space-time is curved so tightly around the mass by its own gravity that it is cut off from the gravity outside and becomes a black hole.

relativity 150 ↓

mass 137 ↓

space-time 150 ↓

gravity 148 ↓

black hole 177 ↓

- 16** **Legendary exploits.** Read this review from the *New Scientist* of a book called *British Medicine in an Age of Reform* and answer the questions.

Medical Mythology

One of the problems with science and medicine is still the extent to which they have a mythology instead of a history. It is full of stereotyped pioneers breaking new ground and noble images of heroes, even heroines.

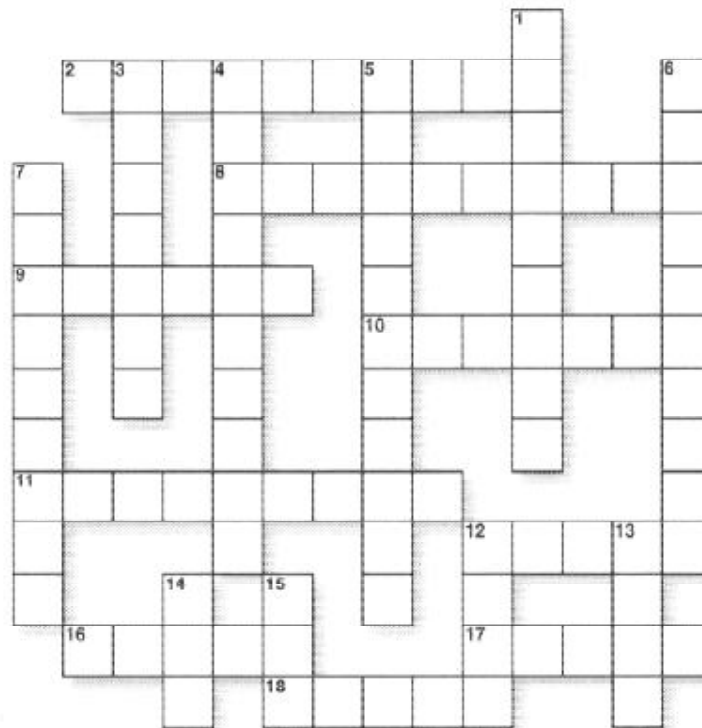
The purpose of this mythology is not hard to find. It clearly attempts to buttress the mythology that emerging professions like to have of themselves. In an excellent essay, Perry Williams looks at the mythology of nursing and promptly demolishes it in favour of a straightforward account of how modern nursing developed.

Most telling is his entirely convincing account of how the Florence Nightingale myth has worked against the interests of nurses. He replaces the image of the selfless, caring woman on the Crimean wards with that of the ruthless, determined reformer of hospital building, administration and standards of hygiene. 'The lady with the lamp' becomes the woman holding the new broom and the bucket of disinfectant. ...

medicine 80 ↓

- 1 Is 'stereotyped' used showing approval?
- 2 If X buttresses Y, does it support Y?
- 3 Is an emerging profession one that has been recognized for a long time?
- 4 Which of these things can also be demolished? a) arguments, b) meals, c) houses.
- 5 Does 'straightforward' indicate approval?
- 6 If an account is telling, is it revealing?
- 7 Why does this myth work against the interests of nurses?
- 8 If someone reforms something they bring about c _____ s .
- 9 What do new brooms do, metaphorically speaking?

Crossword



Across

- 2 Relating to science (10)
- 8 Thing observed with an unusual plural (10)
- 9 Idea about why something is like it is (6)
- 10 Submit this to a journal (7)
- 11 Something that a technophile would like (9)
- 12 What a scientist does with a hypothesis: he or she _____ it (5)
- 16 Nothing is better than this: _____ of the art (5)
- 17 The problem is to get from the laboratory _____ to 'real' applications (5)
- 18 Stereotypical colour of scientific wear (5)

Down

- 1 A geologist is an earth _____ (9)
- 3 Scientists gather or _____ data (7)
- 4 Noun or verb for trying things out (10)
- 5 New products or ideas (11)
- 6 Scientific gatherings (10)
- 7 Not deductive, but useful even so (9)
- 12 Second half of experimental equipment (4)
- 13 This can be high or hi (4)
- 14 Scientific rule (3)
- 15 Ground-breaking adjective (3)