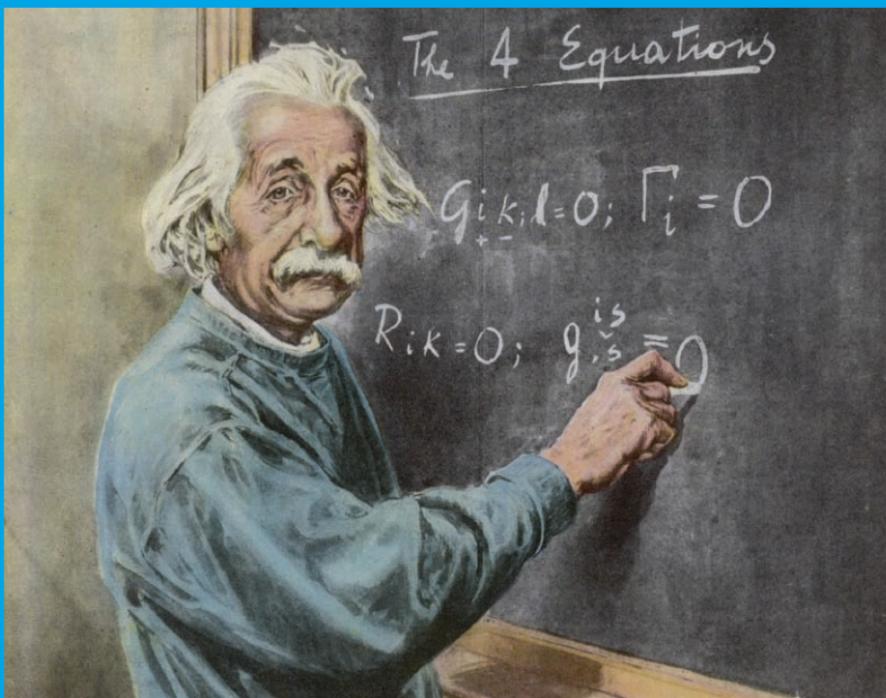


David Angus

GREAT SCIENTISTS AND THEIR DISCOVERIES

Galileo Galilei • Robert Boyle • Isaac Newton
Michael Faraday • Charles Darwin • Gregor Mendel
Albert Einstein • James Watson & Francis Crick

Read by **Clare Corbett** and **Benjamin Soames**



1	Introduction	3:14
2	Galileo Galilei 1564–1642	6:46
3	In 1591 Vincenzo Galilei died.	4:37
4	Galileo however, had quite another use for his telescope.	6:15
5	In 1623 a new pope, Urban VIII, was elected.	4:56
6	Robert Boyle 1627–1691	6:37
7	In 1662 Boyle published his work...	6:13
8	Isaac Newton 1643–1727	5:54
9	Newton was also keenly interested in light...	4:13
10	Michael Faraday 1791–1867	5:24
11	In his spare time, Michael started to attend...	5:06
12	From France they travelled to Italy...	5:13
13	By 1823 Faraday was beginning to be recognized...	6:24
14	Charles Darwin 1809–1882	5:56
15	When HMS Beagle arrived back in England in 1836...	4:29

16	There were huge rows and many public discussions.	3:26
17	Gregor Mendel 1822–1884	7:33
18	The first evolutionary theory to gain widespread interest...	5:11
19	For ten years Mendel patiently cultivated and tested...	4:29
20	Albert Einstein 1879–1955	5:22
21	At home he discovered another new area of learning...	5:08
22	He decided to write a doctoral thesis...	6:39
23	Einstein was famous.	4:11
24	Back in Berlin he continued his work...	4:20
25	James Watson 1928–, Francis Crick 1916–2004 and the hunt for DNA	5:10
26	James Watson decided to go to Copenhagen...	6:38
27	In November 1951 Wilkins went to Cambridge...	5:49

Total time: 2:25:29

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In 1675 the great English scientist Isaac Newton wrote in a letter to his colleague Robert Hooke, 'If I have seen further than certain other men it is by standing upon the shoulders of giants'. He was referring to the great thinkers who had come before him, without whose work he believed he would not have been able to make his own discoveries.

While this was undoubtedly true, it is also true to say that, as science has developed through the centuries, there have been certain people who, because of their amazingly original way of looking at things, have completely changed the way the rest of us think about the universe. Isaac Newton was certainly one of these men himself.

The word science comes from the Latin, 'scientia' which means 'knowledge', but to discover the origins

of science we have to look much further back than the Romans, to the very birth of human civilisation itself.

Since the earliest days of mankind, people have sought to understand the world around them. Over time, stories and legends developed which gave explanations for the creation of the earth, the movements of the stars and planets, the seas and winds, and for the lives of men, plants and animals. Some of these 'myths' became the basis for organised religions and many of them are still very important to the way people think today.

However, with the development of the first civilisations in the ancient cities of Egypt and Mesopotamia, new, more practical ways of describing things began to appear. 4,000 years ago the Babylonians had invented a system of

numbers based on 1–10, as well as measurements for lengths, weights, and volumes. They also created a calendar. They invented an alphabet and we know about their ideas because they wrote them on to clay tablets, which they then baked hard in ovens, so that thousands of them survive to this day.

With the development of these practical ways of describing the world came new technologies leading to the invention of new tools, agriculture, medicine, weapons, ships and buildings. It also began to lead to a new way of thinking: practical descriptions led to practical explanations.

It was in Ancient Greece that science, as we would understand it today, began to take shape. The great philosopher and teacher Aristotle invented a new way of describing things by putting them into groups which shared the same distinguishing traits, or characteristics. Today we call this 'classification'. Aristotle believed that by identifying each object, or living creature's, proper place in the world, we

could begin to understand the workings of the whole universe, for 'everything in nature', he wrote 'contains something of the marvellous'.

As well as separating objects into their own groups, he also began to separate the study of these groups into different subjects, such as physics, astronomy, botany and zoology. 'Science' was born.

When we study science today, it is easy to imagine that it has always been organised in this practical way and that the growth of our scientific knowledge must have developed smoothly to where it is now. In fact, it has been a pretty bumpy ride. Again and again, throughout history, original thinkers have emerged to challenge the ideas which have come to be accepted as 'the truth' by previous generations. These are the 'giants' that Newton wrote about and it is because of their brilliant, creative and original work that science has continued to make great leaps forward.

So, far from being a steady

accumulation of knowledge, science has really developed as a series of revolutions. By the time just about any idea in the history of science has become universally accepted as a 'truth', someone has appeared to prove that it is not so.

This has sometimes been a dangerous thing to do and often it has led to a great deal of trouble. When, for example, Galileo Galilei published his book in 1632, in which he explained that the earth was not the centre of the universe but in fact was in orbit around the sun, he was forced to publicly deny his own discoveries by the Inquisition of the Catholic Church. If he refused, they threatened to have him burnt at the stake.

Two hundred and fifty years later, when Charles Darwin published his great work 'The Descent of Man', in which he suggested that mankind was descended from a more primitive, ape-like creature, it created a huge storm of protest and indeed people are still arguing furiously about his ideas to this day.

At the beginning of the twentieth century, Albert Einstein's ideas about space and time were so astonishingly new and different that for a long time he was not taken seriously, mostly because no one else actually understood him. Eventually he was proved to be correct by other scientists who were trying to prove that he must surely have been mistaken! Funnily enough, when the mathematician, Herbert Minkowski discovered the mathematical proofs for Einstein's ideas, they were so complicated that Einstein declared, when he had read them, that he longer understood his own theories!

Recalling those famous words of Isaac Newton, each of these scientists can be properly described as 'giants' in their own field, as can all the other great names that feature in this recording. Who will tomorrow's giants be and what theories will they propose? It may be that the exploration of space will lead to amazing new discoveries. It may be that someone simply sitting and thinking at home will come up with an astonishing

new way of describing and explaining things that we already think we understand.

If there is one thing that history has taught us, it is that we should keep an open mind and not trust absolutely in what can seem to be obvious truths. For we can be sure that whatever direction science does take in the future, it will not be predictable.

Notes by David Angus

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NAXOS and MARCO POLO catalogues**

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DOWLAND LUTE MUSIC Nigel North, Lute	8.557586
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Clare Corbett was the Carleton Hobbs winner in 2000 and since then has been heard on BBC Radio Repertory and seen in regional theatres. She is a familiar face to television viewers having appeared in *The Bill*, *Fastnet*, *Spooks*, *Casualty* and *Final Demand*. She has also read *Venus and Adonis* for Naxos Audiobooks.



Benjamin Soames trained at LAMDA. Since then, he has been active on both stage and screen, appearing in the popular TV series *Sharpe* and touring worldwide in the acclaimed Cheek by Jowl production of Shakespeare's *Measure for Measure* directed by Declan Donnellan. He also reads *Tales from the Norse Legends*, *The Tale of Troy*, *The Adventures of Odysseus* and *More Tales from Greek Legends*, *Venus and Adonis* and *Great Inventors and their Inventions* for Naxos AudioBooks.

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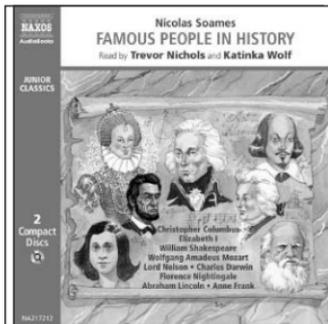
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How did the great scientists make their remarkable discoveries? And what kind of men were they? This companion volume to **Great Inventors and their Inventions** introduces the work of nine men to younger readers, and ranges from the world of Ancient Greece to the 20th century discovery of DNA. Included are the crucial discovery that the earth goes around the sun (Galileo), the principle of gravity (Newton), the evolution of the species (Darwin) and the principle of inherited characteristics or genetics (Mendel).

CD ISBN:

978-962-634-440-8

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Recorded at Motivation Sound Studios, London
Produced by Nicolas Soames
Edited by Rachel Smith & Sarah Butcher

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Total time
2:25:29