Robert Hooke

Robert Hooke

FRS

c. 1680 *Portrait of a Mathematician* by Mary Beale, conjectured to be of Hooke[1][2] but also conjectured to be of Isaac Barrow[3]

Born	18 July 1635 Freshwater, Isle of Wight, England
Died	3 March 1703 (aged 67)[a] London, England
Resting place	St Helen's Church, Bishopsgate
Alma mater	Christ Church, Oxford
Known for	Hooke's law Microscopy Coining the term 'cell'
Scientific career	
Fields	Physics and Biology
Institutions	University of Oxford
Academic advisors	John Wilkins, Robert Boyle
Signature	

Robert Hooke FRS (Isle of Wight, 18 July 1635 – London, 3 March 1703) was an English naturalist, architect and polymath. Hooke played an important role in the birth of science in the 17th century with both experimental and theoretical work. He was a colleague of Robert Boyle and Christopher Wren, and a rival to Isaac Newton. Hooke was a leader in the plans to rebuild after the Great Fire of London in 1666.

There is no surviving portrait of Hooke.[4]

Hooke's achievements

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Physics

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He discovered Hooke's Law of elasticity. He designed and ordered the making of telescopes and microscopes, and used both instruments. He reported on this work in a book called *Micrographia* in 1665. He was the first person to

Continuum mechanics

Laws

Conservations

Energy · Mass · Momentum

Inequalities

see biological cells. He made drawings of bodies in the Solar System, and made the first attempts to measure the distance of certain stars.[5]

Robert Hooke was appointed the Royal Society's first Curator of Experiments in 1662, and he rose to be Secretary of the Royal Society. He took responsibility for experiments performed at its weekly meetings. This was a position he held for over 40 years.

In 1664 Hooke also was appointed Professor of Geometry at Gresham College in London and Cutlerian Lecturer in Mechanics.[6]

On 8 July 1680, Hooke observed the nodal patterns associated with the mode of vibration of glass plates. He ran a bow along the edge of a glass plate covered with flour, and saw the nodal patterns emerge.[7][8]p101

Hooke did some fundamental work on gravitation and the motion of the planets. Forever after, he was convinced that Newton and the world had cheated him of the credit[5]p389

Natural history

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He was also known for his work in natural history (biology and geology).[9] He reported on his microsope use in a book called *Micrographica* in 1665. He was the first person to see biological cells, and was the first to use the word 'cell' to describe them.

In 1668, in a talk to the Royal Society, he recognised that fossil shells of unknown marine animals suggested that some species had become extinct.

Clausius–Duhem (entropy)

Solid mechanics

Stress · Deformation · Compatibility · Finite strain · Infinitesimal strain · Elasticity (linear) · Plasticity · Bending · Hooke's law · Material failure theory · Fracture mechanics
Contact mechanics (frictional)

Fluid mechanics

Fluids

Statics · Dynamics
Archimedes' principle · Bernoulli's principle
Navier–Stokes equations
Poiseuille equation · Pascal's law
Viscosity (Newtonian · non-Newtonian)
Buoyancy · Mixing · Pressure

Liquids

Surface tension · Capillary action

Gases

Atmosphere · Boyle's law · Charles's law · Gay-Lussac's law · Combined gas law

Plasma

Rheology

Viscoelasticity · Rheometry · Rheometer

Smart fluids

Magnetorheological · Electrorheological · Ferrofluids

Scientists

Bernoulli · Boyle · Cauchy · Charles · Euler · Gay-Lussac · Hooke · Pascal · Newton · Navier · Stokes

v · t · e

Architecture

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The church at Willen, Milton Keynes.

Hooke achieved fame in his day as Surveyor to the City of London and chief assistant of Christopher Wren. Hooke helped Wren rebuild London after the Great Fire in 1666.

He also worked on the Royal Greenwich Observatory, and the infamous Bethlem Royal Hospital (which became known as 'Bedlam'). Many other buildings were designed by Hooke, including the Royal College of Physicians (1679).

Hooke's collaboration with Christopher Wren included St Paul's Cathedral, whose dome uses a method of construction conceived by Hooke. Hooke also participated in the design of the Pepys Library, which held the manuscripts of Samuel Pepys's diaries, the most frequently cited eyewitness account of the Great Fire of London.[10]

In the reconstruction after the Great Fire, Hooke proposed redesigning London's streets on a grid pattern with wide boulevards. This pattern was used in the later renovation of Paris, Liverpool, and many American cities. The proposal was rejected. The opponents argued that in practice property owners were secretly shifting their boundaries. Hooke was in demand to settle many of these disputes, due to his skill as a surveyor and his tact as an arbitrator.[11]

Related pages

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- Physicist
- List of physicists

Notes

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a. ↑ Cite error: The named reference `dual dating` was used but no text was provided for refs named (see the help page).

References

[change | change source]

1. ↑ Griffing (2020).
2. ↑ Griffing (2021).
3. ↑ Whittaker (2021).
4. ↑ Portraits have been claimed, but not authenticated.

5. ↑ 5.0 5.1 Inwood, Stephen 2002. *The man who knew too much*. Macmillan, London. ISBN 0-330-48829-5. Published in the USA as *The forgotten genius*.
6. ↑ Espinasse, Margaret (1956). *Robert Hooke*. London: William Heinemann Ltd. p. 187.
7. ↑ Ernst Florens Friedrich Chladni Archived 2013-04-08 at the Wayback Machine, Institute for Learning Technologies Archived 2007-11-11 at the Wayback Machine, Columbia University
8. ↑ *Oxford Dictionary of Scientists*. Oxford University Press, 1999.
9. ↑ Hooke, Robert (1705) 1978. Lectures and discourses of eathquakes and subterranean eruptions. Explicating the causes of the rugged and uneven face of the Earth, and what reasons may be given for the frequent finding of shells and other sea and land petrified substances, scattered over the whole terrestrial superficies. In Waller R. (ed) *The posthumous works of Robert Hooke. Containing his Cutlerian lectures and other discourses, read at meetings of the illustrious Royal Society*. 2nd facsimile edition, with a new introduction by T.M. Brown of Princeton University. London: Frank Cass, Part V.
10. ↑ Hyam, R. (1982). *Magdalene Described*. Sawston, Cambridgeshire, U.K.: Crampton & Sons Ltd.
11. ↑ Cooper, Michael (2003). *A more beautiful City: Robert Hooke and the rebuilding of London after the Great Fire*. Sutton Publishing Ltd. ISBN 0-7509-2959-6.