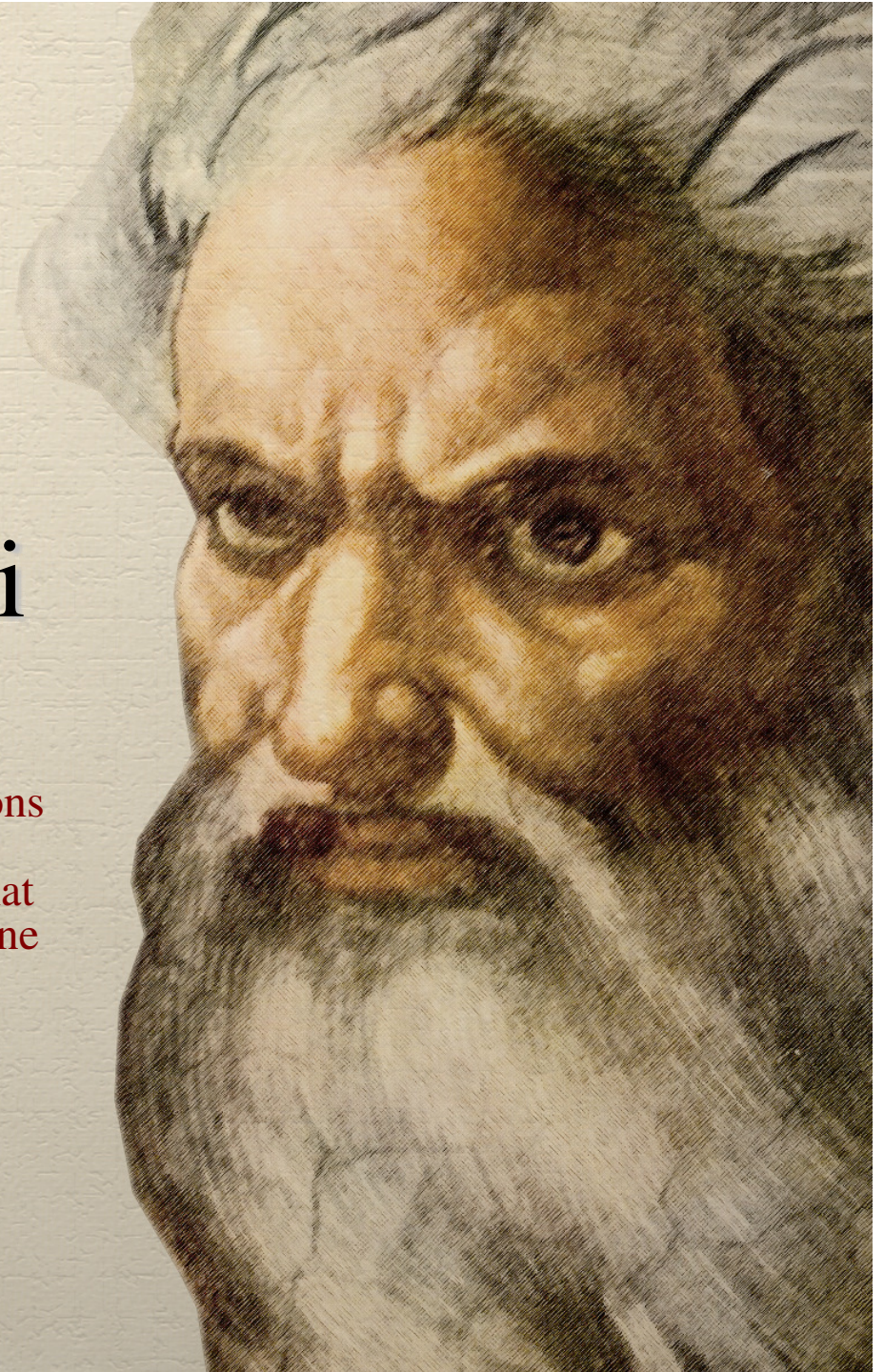


# Leonardo da Vinci

“The genius of Leonardo’s designs for his inventions so far outstripped both his contemporaries’ intellectual grasp and contemporary technology that they were rendered literally inconceivable to anyone but him.”

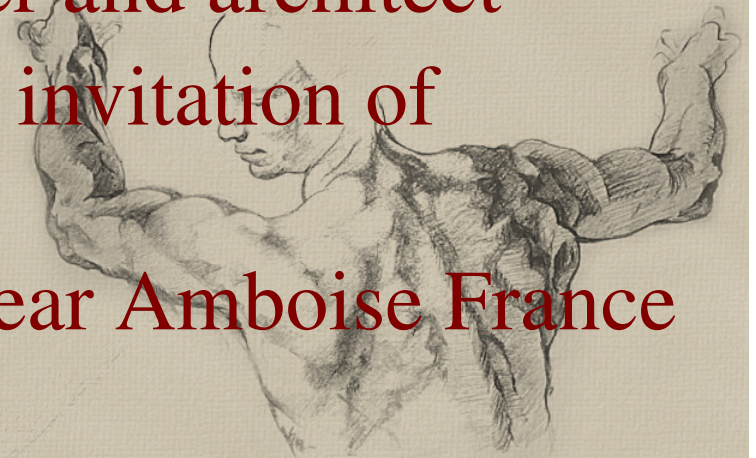
**John Balchin**





# Chronology

- 1449 - apprenticed in the studio of Verrocchio in Florence
- 1482 – Works for the Duke of Milan
- 1502 – Returns to Florence to work for Cesare Borgia as his military engineer and architect
- 1516 – Journeys to France on invitation of Francis I
- 1519 – Dies in Close-Luce, near Amboise France





# Unpublished

- **Most of his work remained unpublished**
- **Largely forgotten centuries after his death**
- **Undoubted one of the most brilliant scientific minds of all time**





# Renaissance Man

- Celebrated as Renaissance artist who created such masterpieces as the Last Supper and the Mona Lisa
- Spent much of his time on scientific enquiry
- Range of areas studied:
  - Astronomy
  - Geography
  - Palaeontology
  - Geology
  - Botany
  - Zoology
  - Hydrodynamics
  - Optics
  - Aerodynamics
  - Anatomy





# Realism

- **To study anatomy he undertook a number of human dissections**
- **Stole corpses for this purpose**
- **Made detail sketches of the body**





# Method of Enquiry

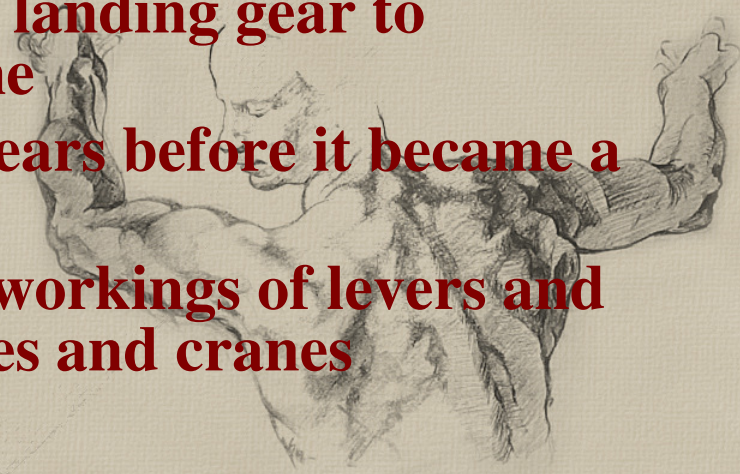
- **Most important contribution is method of enquiry**
- **Introduced a rational, systematic approach to study of nature after thousand years of superstition**
- **Ask a question – “How does a bird fly?”**
- **Observe in natural environment**
- **Make notes on its behaviour**
- **Repeat observation to ensure accuracy**
- **Make sketches and draw conclusions**





# Aerodynamics

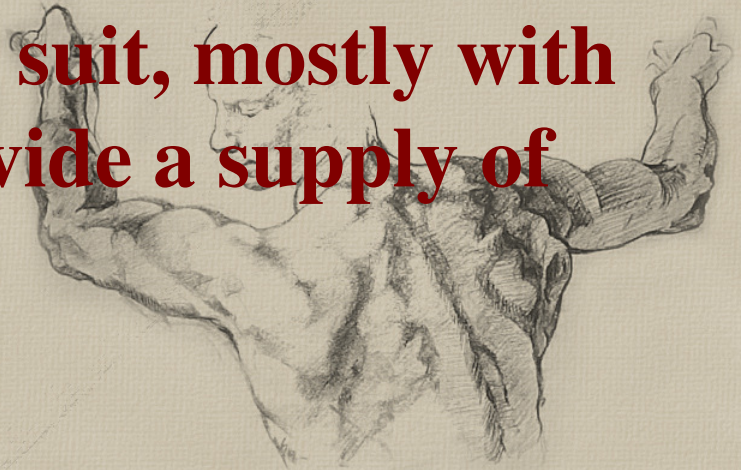
- Applied results of observation to designs for inventions for human use
- Made sketches for a number of flying machines which could potential fly.
- Sketched a primitive helicopter some 500 years before the invention became a reality
- Even envisaged need for retractable landing gear to improve aerodynamics once airborne
- In 1485 designed a parachute, 300 years before it became a reality
- Had excellent understanding of the workings of levers and gears, enabling him to design bicycles and cranes





# Hydrodynamics

- **Sketched designs for waterwheels and water-powered machines centuries before the industrial revolution**
- **Sketched humidity-measuring equipment, number of primitive diving suit, mostly with long snorkel devices to provide a supply of air**







# Military Inventions

- **Worked for the Duke of Milan between 1482 and 1499**
- **Prepared an array of designs for weaponry such as catapults and missiles**
- **Also prepared sketches of hand-grenades, mortars, machine-type guns, a primitive tank and even a submarine!**