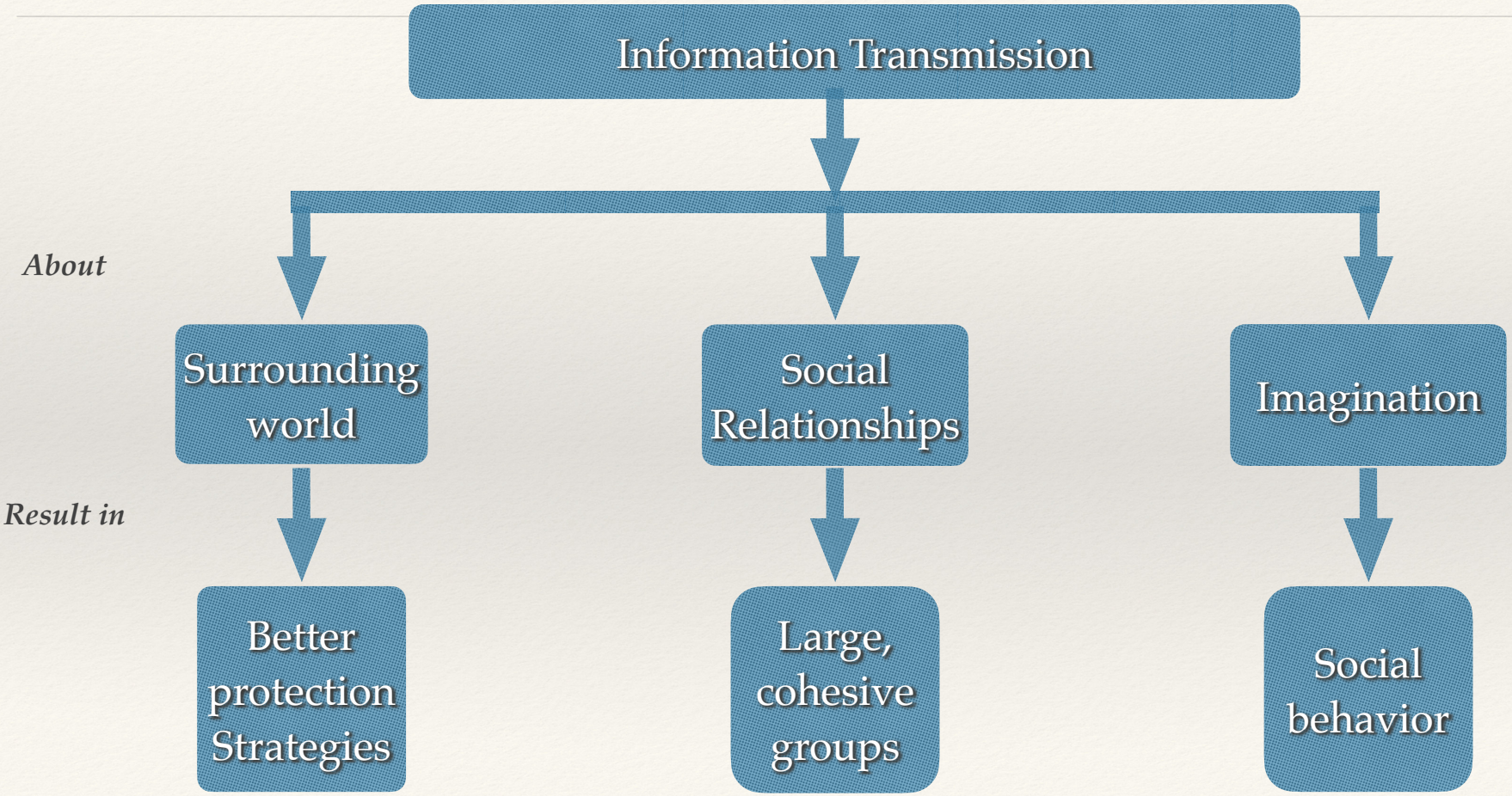
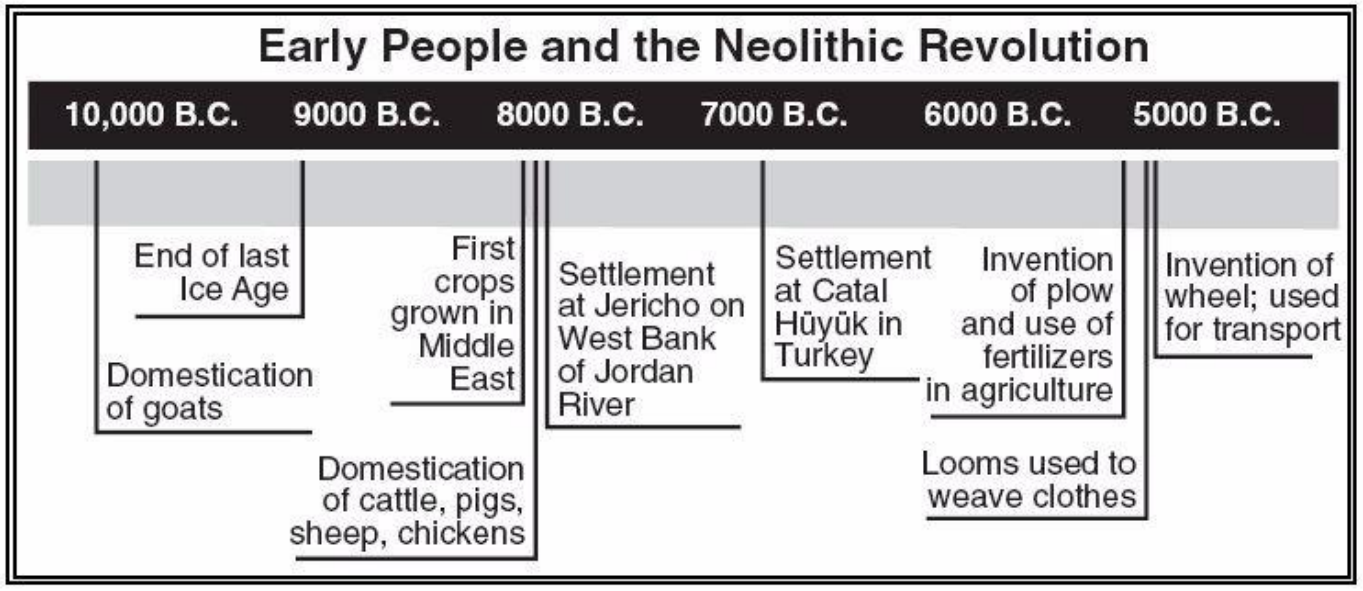
# (Bio)technology

# Cognitive Revolution



# Agricultural revolution

## Neolithic Timeline




Source: Vivienne Hodges, *New York State Global History Regents Coach*, Educational Design, Inc. (adapted)

WORLD HISTORY ENCYCLOPEDIA

# THE SCIENTIFIC REVOLUTION IN EUROPE c. 1500 - 1700

**1614** S. SANTORIO — METABOLISM, MEDICAL DEVICES

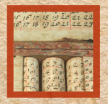
**1637** R. DESCARTES — "COGITO, ERGO SUM" DEDUCTIVE REASONING

**1673** A. VAN LEEUWENHOEK — MICROBIOLOGY

1558 Urdaneta discovers the sea route from Asia to the Americas

1618-1648 Thirty Years' War

**1556** G. AGRICOLA — MINERALOGY, MINING SCIENCES

**1594** J. NAPIER — LOGARITHMS 

**1630** G. GALILEI — REFUTES ARISTOTELIAN SYSTEM

**1660** M. MALPIGHI — MICROSCOPICAL ANATOMY

**1690** J. HEVELIUS — STARS CATALOGUE

1562-1598 French Wars of Religion

1604 union of the crowns of England and Scotland

1639-1651 Wars of the Three Kingdoms on the British Isles

**1530-1537** O. BRUNFELS — BOTANICAL WRITINGS ON OBSERVATIONS

1558 Elizabeth I is crowned

1557 Spain declares bankruptcy

**1600** W. GILBERT — MAGNETISM STATIC ELECTRICITY

**1620** F. BACON — SCIENTIFIC METHOD

**1647** J. HEVELIUS — MOON MAP

**1665** R. HOOKE — MICROBES

**1704** I. NEWTON — SPEED OF SOUND, INFINITESIMAL CALCULUS

1521 Edict of Worms

1547 Ivan the Terrible becomes the first Russian tsar

1600 British East India Company is founded

1633 tulip mania in Holand

1632 Galileo is convicted of heresy

1666 The Great Fire of London

1669 first steam engine by T. Savery

**1543** N. COPERNICUS — HELIOCENTRIC SOLAR SYSTEM

**1577** T. BRAHE — VS. ARISTOTELIAN COSMOLOGY

**1600** G. BRUNO — COSMIC PLURALISM INFINITE UNIVERSE

**1609-1619** J. KEPLER — LAWS OF PLANETARY MOTION

**1660** ROYAL SOCIETY

**1687** I. NEWTON — LAWS OF MOTION, UNIVERSAL GRAVITATION

1525 1550 1575 1600 1625 1650 1675 1700 1725

**1543** A. VESALIUS — BOOKS ON HUMAN ANATOMY

**1582** POPE GREGORY XIII — GREGORIAN CALENDAR

**1610** G. GALILEI — OBSERVATIONAL ASTRONOMY

**1628** W. HARVEY — BLOOD CIRCULATION

**1661** R. BOYLE — MODERN CHEMISTRY

**1677** E. HALLEY — SOUTHERN STARS MAPPED

1524-1525 German Peasants' War

Mercator 1569 world map

1580-1640 Spanish and Portuguese crowns are united

1689 Bill of Rights

**1542** L. FUCHS — PLANTS' USES AS MEDICINES

**1591** F. VIETA — ALGEBRA NOVA

**1608** H. LIPPERSHEY — REFRACTING OPTICAL TELESCOPE

**1657** C. HUYGENS — PENDULUM CLOCK

**1680** G. BORELLI — BIOMECHANICS

1520-1566 reign of Suleiman the Magnificent

1566–1648: Eighty Years' War between Spain and the Netherlands

**1585** A. PARÉ — FIELD SURGERY FORENSIC PATHOLOGY

**1619** C. DREBBEL — COMPOUND MICROSCOPE

**1653** B. PASCAL — TRANSMISSION OF FLUID-PRESSURE

**1657** O. VON GUERICKE — VACUUM PUMP

**1705** E. HALLEY — COMET PERIODICITY

1527 Rome sacked by mutinous troops of Charles V

1532 Church of England breaks away from the Catholic Church

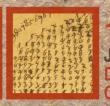
1597 Romeo and Juliet is published

1637 the first public opera opens in Venice

1683 the Ottomans are defeated in the siege of Vienna.

**1585** S. STEVIN — DECIMAL SYSTEM FRACTIONS

**1643** E. TORRICELLI — PRESSURE, BAROMETER

**1655** J. WALLIS — DIFFERENTIAL CALCULUS 

**1673** G. LEIBNIZ — MECHANICAL CALCULATOR, INFINITESIMAL CALCULUS

1550-1551 Valladolid debate on rights of the Indigenous people of the Americas

1621 the Mayflower reaches North America

CV ME GN

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# Ian Barbour's views of technology

| Liberator |
| --- |
| Higher living standards (*medicines, sanitation, nutrition, reduced manual labor*) |
| Opportunity for choice (*mobility, birth control,…*) |
| More leisure (*education, arts, entertainment, sport,…*) |
| Better communications (radio, TV, phone, email,…) |

# Ian Barbour's views of technology

| Liberator | Threat |
| --- | --- |
| Higher living standards (*medicines, sanitation, nutrition, reduced manual labor*) | Uniformity (*standardized products, lack of individuality*) |
| Opportunity for choice (*mobility, birth control,…*) | Narrow criteria of efficiency (*efficiency is defined in terms of quantity where human values are overlooked*) |
| More leisure (*education, arts, entertainment, sport,…*) | Alienation (*from the process of work, the product of work*) |
| Better communications (radio, TV, phone, email,…) | Uncontrollability (*technology takes on a life on its own; we lose control*) |

# Ian Barbour's views of technology

| Liberator | Threat | Instrument of Power |
|---|---|---|
| Higher living standards (*medicines, sanitation, nutrition, reduced manual labor*) | Uniformity (*standardized products, lack of individuality*) | Technology and power (*technology is neither good nor evil*) |
| Opportunity for choice (*mobility, birth control,…*) | Narrow criteria of efficiency (*efficiency is defined in terms of quantity where human values are overlooked*) | Redirection of technology (*political structures can redirect technology to do more good*) |
| More leisure (*education, arts, entertainment, sport,…*) | Alienation (*from the process of work, the product of work*) | Social construction of technology (*science, society, and technology are mutually reciprocal in influence*) |
| Better communications (radio, TV, phone, email,…) | Uncontrollability (*technology takes on a life on its own; we lose control*) | |

# Kranzberg's first law

- **Technology is neither good nor bad; nor is it neutral.**

A technology might not have an intention, but it has embedded assumptions and effects. Consider a few examples:

- **Social media algorithms** aren't "neutral"—they're designed to maximize engagement, which mathematically tends to amplify divisive content. The technology itself pushes society in particular directions.
- **Surveillance technology** isn't neutral—its very existence makes certain kinds of control possible that weren't before, which changes power dynamics regardless of whether it's used "for good" or "for bad."

# Kranzberg's second law

- **Invention is the mother of necessity**

**"Every technical innovation seems to require additional technical advances in order to make it fully effective.**