

RESEARCH METHODOLOGY

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Research

Investigation or experimentation aimed at discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new theories or laws

-Webster Dictionary

A careful, systematic, patient study and investigation in some field of knowledge, undertaken to establish facts or principles. It is a structured inquiry that utilizes acceptable scientific methodology to solve problems and relates new knowledge that is generally applicable.

-Grinnell

A systematic investigation to find answers to a problem.

- Burns

Scientific research is a systematic, controlled, empirical, and critical investigation of hypothetical propositions about the presumed relations among natural phenomena.

-Kerlinger

Research Method

- Technique of executing Research

Examples:

- Analysis
- Observations
- Questionnaire
- Interview
- Case Study

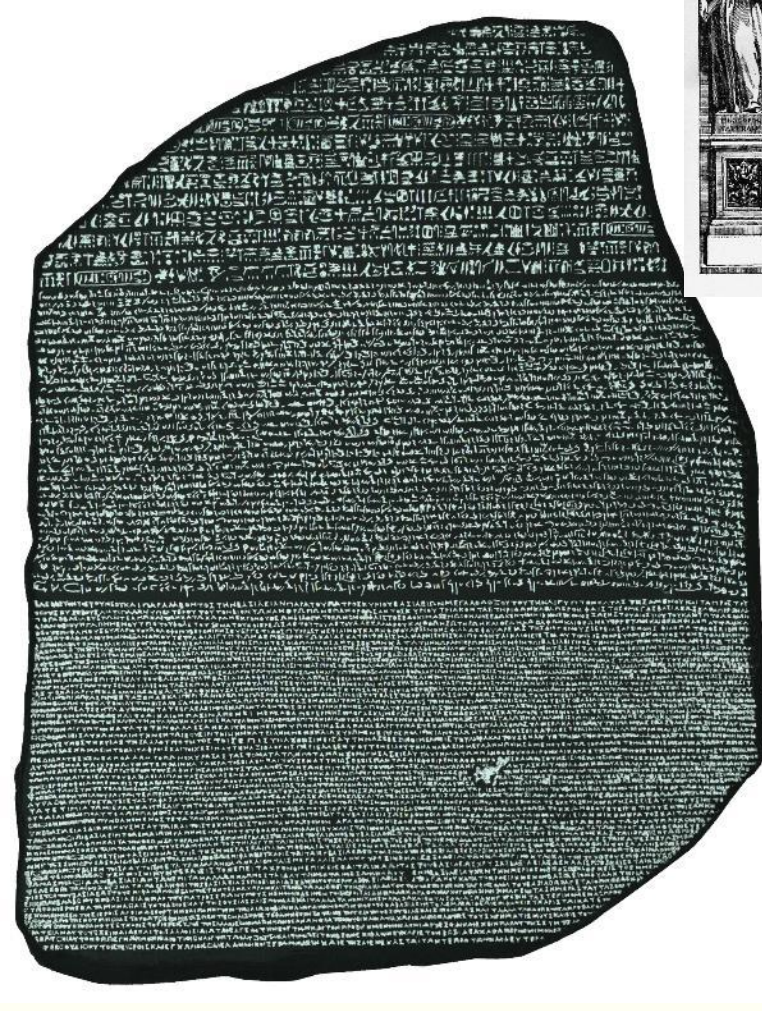
Research Methodology

- Study of Process of Research



Fragments of Euclid's
elements

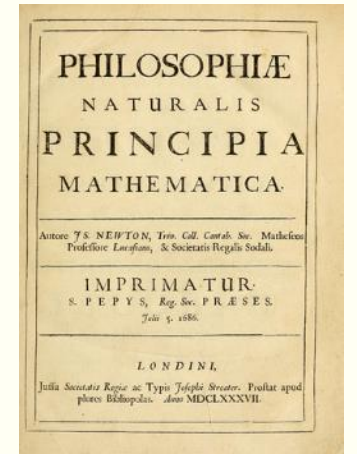
300 BC



196 BC
Rosetta Stone — to Britain 1801, deciphered 1822



1623 — Galileo, Il
Saggiatore



1687 — Newton,
Principia



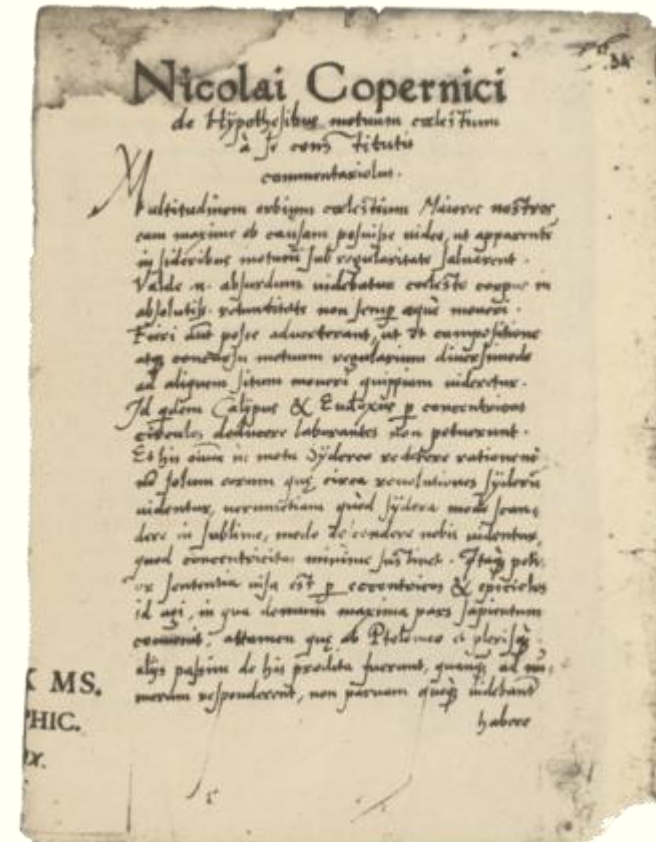
Thomas Young (1773–1829), whose
work helped decipher the stone

Ptolemy (100–170 AD) to Nicolaus Copernicus (1473–1543)

Almagest



Commentariolus



The first research Journal

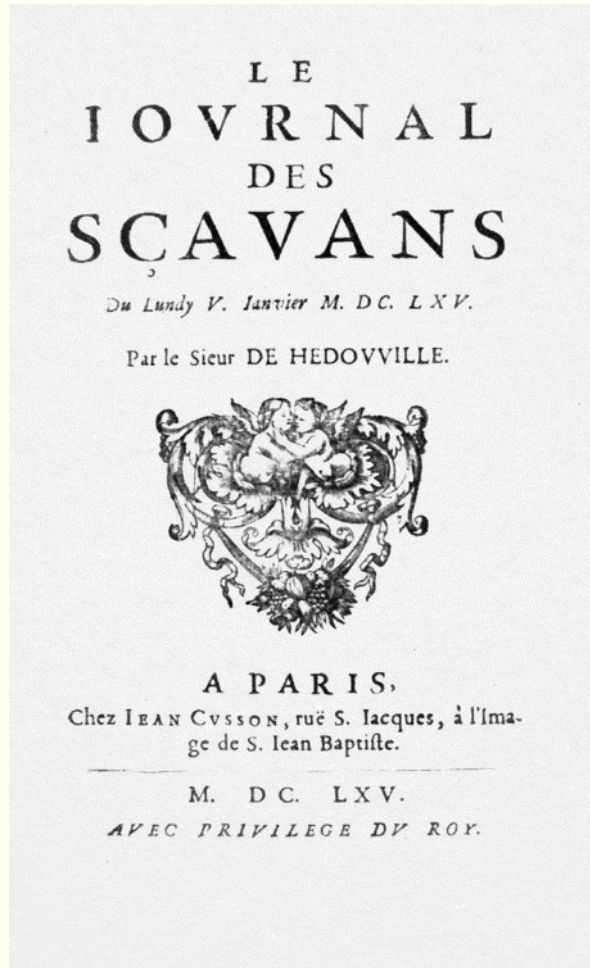
Royal privilege from King Louis XIV, 1664, to establish the

Journal des sçavans

first issue 1665.

Objectives:

- review newly published major European books,
- publish the obituaries of famous people,
- report on discoveries in arts and science
- report on the proceedings and censures of courts



Journals

- The Royal Society

- Timeline

- Philosophical Transactions(1665-1775)
 - Philosophical Transactions of Royal Society of London(1776- 1886)
 - 1887 (Split)
 - Philosophical Transactions of Royal Society of London A
 - Philosophical Transactions of Royal Society of London B

A- Maths and Physics

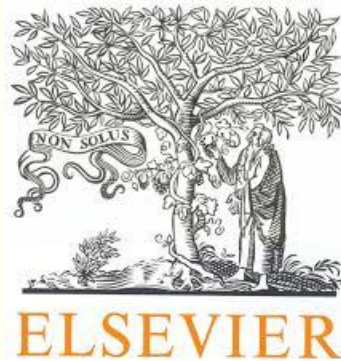
B-Biological Characters

Present Day: A-Mathematical , Physical and Engineering Sciences

- B- Biological Sciences
 - 1869 Nature
 - 1880 Science

Publishers

- Elsevier
- Springer Nature
- Wiley, Taylor & Francis
- IEEE
- Open access: MDPI, PLOS, Frontiers, ...

The Nature logo is a solid dark red square with the word "nature" written in a white, lowercase, serif font.

Magazines



Journal or magazine?

- Journals: peer-reviewed, primary literature — written by researchers, for researchers, and citable.
- Magazines: editor-selected, secondary reporting — they popularize research for a wide audience.
- On this slide, only Science is a peer-reviewed journal; Scientific American, Popular Science, New Scientist and The Economist are magazines.
- Magazines are a fine place to find ideas — but cite the original papers.



Here we are in the year 2026

- ~50,000 active journals
- 200+ million papers ever published
- 3+ million new papers every year

