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THE CELL
(Introductory)

Latin word - Cellula - a small compartment

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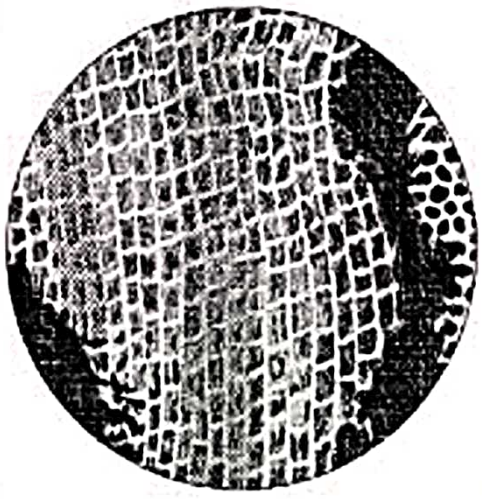
The cell was first discovered by Robert Hooke (1665). He described several observations in detail of various objects under a coarse compound microscope.

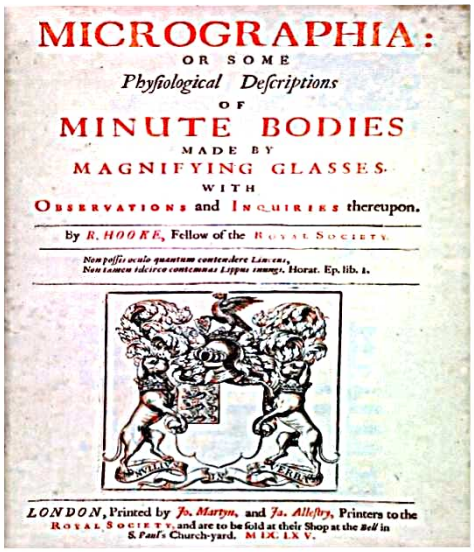
One observation was from a thin slices of bottle cork (Quercus suber).

All these findings were published in a book entitled "Micrographia"

- What Robert Hooke saw was infact the cell wall that surrounded the cavities and gave the term cellula or 'cell' for these little boxes or compartments into which the thin slices of the cork was regularly partitioned.



ROBERT HOOKE'S CELL


MICROGRAPHIA:
OR SOME
Physiological Descriptions
OF
MINUTE BODIES
MADE BY
MAGNIFYING GLASSES.
WITH
OBSERVATIONS and INQUIRIES thereupon.
By R. HOOKE, Fellow of the ROYAL SOCIETY.
Non possis oculo quantum contendere Lynceus,
Non tamen idcirco contemnas Lippus inungi. Horat. Ep. lib. 1.
LONDON, Printed by Jo. Martyn, and Ja. Allestry, Printers to the ROYAL SOCIETY, and are to be sold at their Shop at the Bell in S. Paul's Church-yard. MDCLXV.

- Antony Van Leeuwenhoek (1674), a Dutch dry-goods merchant, was the first person to see a living cell. He observed bacteria, yeast, protozoa, RBC, Spermatozoa etc. with his simple microscope - a magnifying lens, he was able to magnify the objects almost 300-folds.

He named these objects "animalcules" — meaning little animals. He observed many motile objects and reported the same to "The Royal Society", formally "The Royal Society of London".

- Advancement in the field of biology

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The formulation of cell theory

- Foundation of the cell theory:
  H.J. Dutrochet (1824), French scientist, boiled the tissue in acid and separated the cells. On this basis he thought that all animals and plants are made of cells.

- Promulgation of cell theory:
  M.J. Schleiden (1838), a German botanist
  Theodor Schwann (1839), a German Zoologist
  by their independent works, they found essential similarities in the structure of plant and animal cells. From their findings two of the three tenets of the cell theory were postulated. These were-

(i) All living organisms are composed of one or more cells.
(ii) The cells are the basic unit of life.

The third part, which asserts that cells come from preexisting cells that have multiplied, was described by Rudolf Virchow in 1858, when he stated Omnis Cellula e Cellula (meaning every cell from a cell). Thus he refuted Schleiden's assumption of cell formation through crystallisation.

The three tenets of the cell theory are as follows —

(i) All organisms are composed of one or more cells
(ii) The cell is the basic unit of structure and organisation in organisms.
(iii) All cells arise from the preexisting cells of the similar kinds. Thus the continuity of life from one generation to another is through living cells.

Although Rudolf Virchow, also a German scientist, made important contribution towards the promulgation of cell theory, the credit for the theory was given to Schleiden and Schwann, because of their basic work which attracted the attention of biologists of their time.

- **Modern Cell theory**

Since the promulgation of classical cell theory, technology has improved, allowing for more detailed observations that have led to new discoveries about cells. These findings led to the formation of the modern cell theory, which has three main additions

- first, that DNA is passed between cells during cell division,
- second, that the cells of all organisms within a similar species are mostly the same, both structurally and chemically,
- third, that energy flow occurs within cells.

- Cell as "highly organised molecular factory"

It is because of the contributions of cell biologists and biochemists.

Cell biologists - working with electron microscope, found that the cytoplasm is differentiated into a large number of organelles adapted to carry on the diverse processes of life.

Biochemists - they traced the pathways by which the cell carries out biochemical reactions required for continuity of life.