➢ **The G_1 phase:**

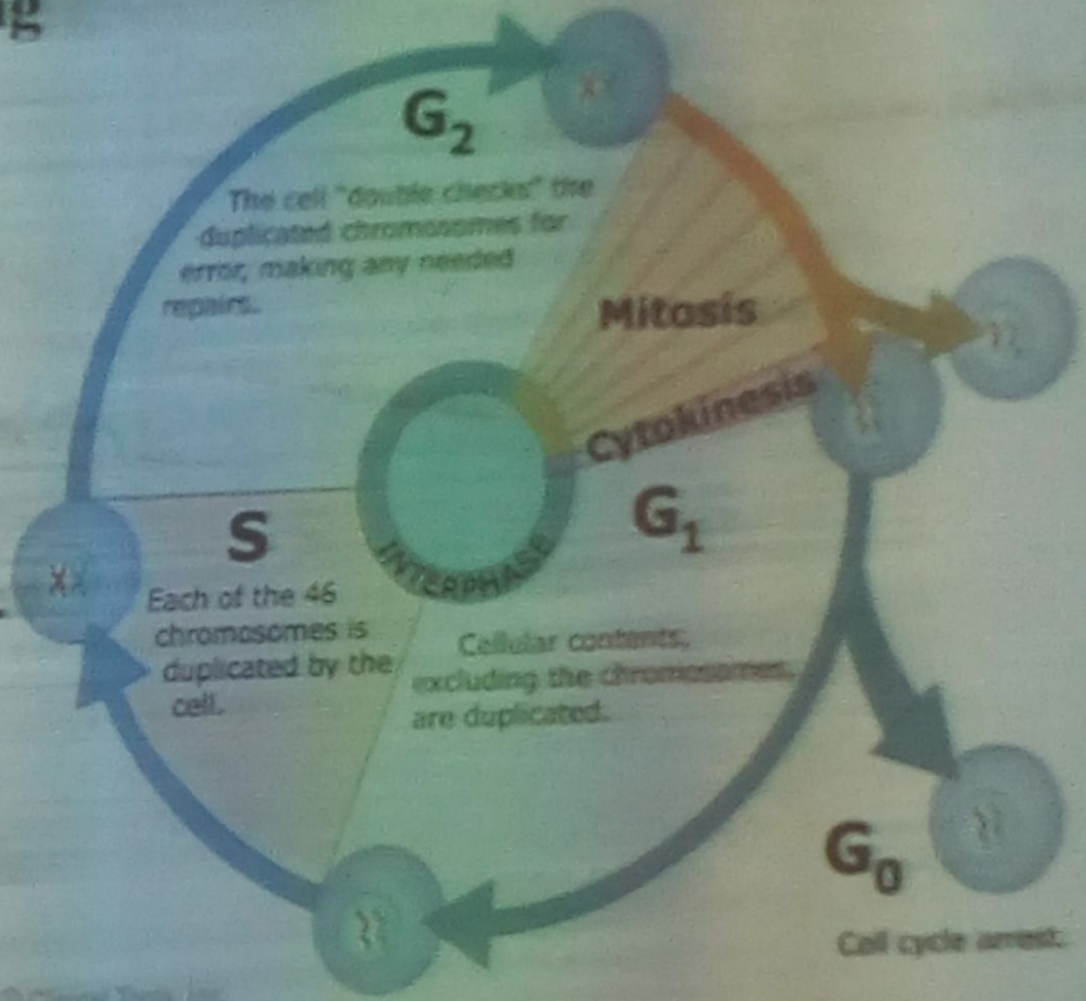
It is a period of growth involving the synthesis of proteins and other macromolecules.

➢ **The S phase:**

It is a period of DNA synthesis during which there is an exact replication of each chromosome.

➢ **The G_2 phase:**

is a brief phase during which here is an increase in protein nthesis and final preparation r cell division.



The cell cycle

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TYPES OF CELL DIVISION

1. Mitosis
2. Meiosis

MITOSIS

Cells divide mitotically during:

a) Asexual reproduction

b) Cell replacement

c) Cell regeneration

d) Embryonic development

e) Growth

f) Cancer or tumor formation.

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Mitosis is divided into the following phases:

1. Prophase

- A major event is the duplication, formation and migration of centrioles to opposite poles of the cells.

- At the end of the process, there are two pairs of centrioles and each pair is made up of one parent centriole and one daughter centriole.

- A large array of microtubules now develops from each centrosome called the mitotic spindle.

A protein body called the kinetochore appears at the centromere of each chromatid.

For each chromosome, one of the kinetochore is attached to one pole, the second to the opposite pole.

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2. Pro-metaphase

- The chromosome tend to aggregate in a central position in the cell as soon as the nuclear membrane breaks down.

- In both plant and animal cells, this time corresponds to the first appearance of an organized spindle.

3. Metaphase

- Coiling or condensation of chromosome continues.

- The main feature of metaphase is that all the chromosomes come to rest in a plane midway between the poles.

- This plane is called the equatorial plane or metaphase plate.

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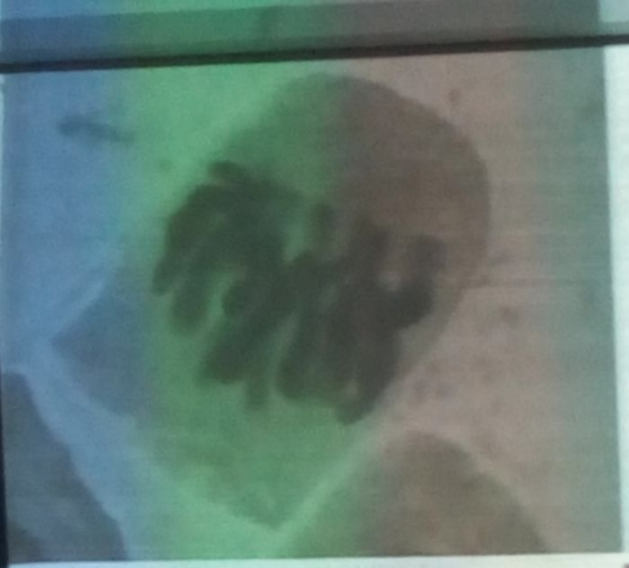

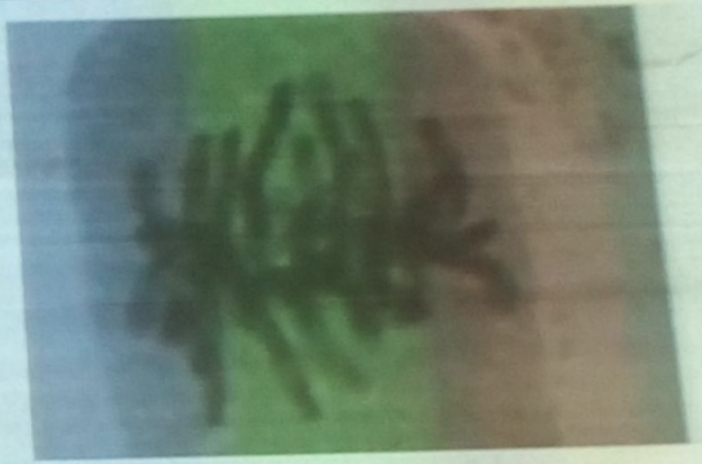

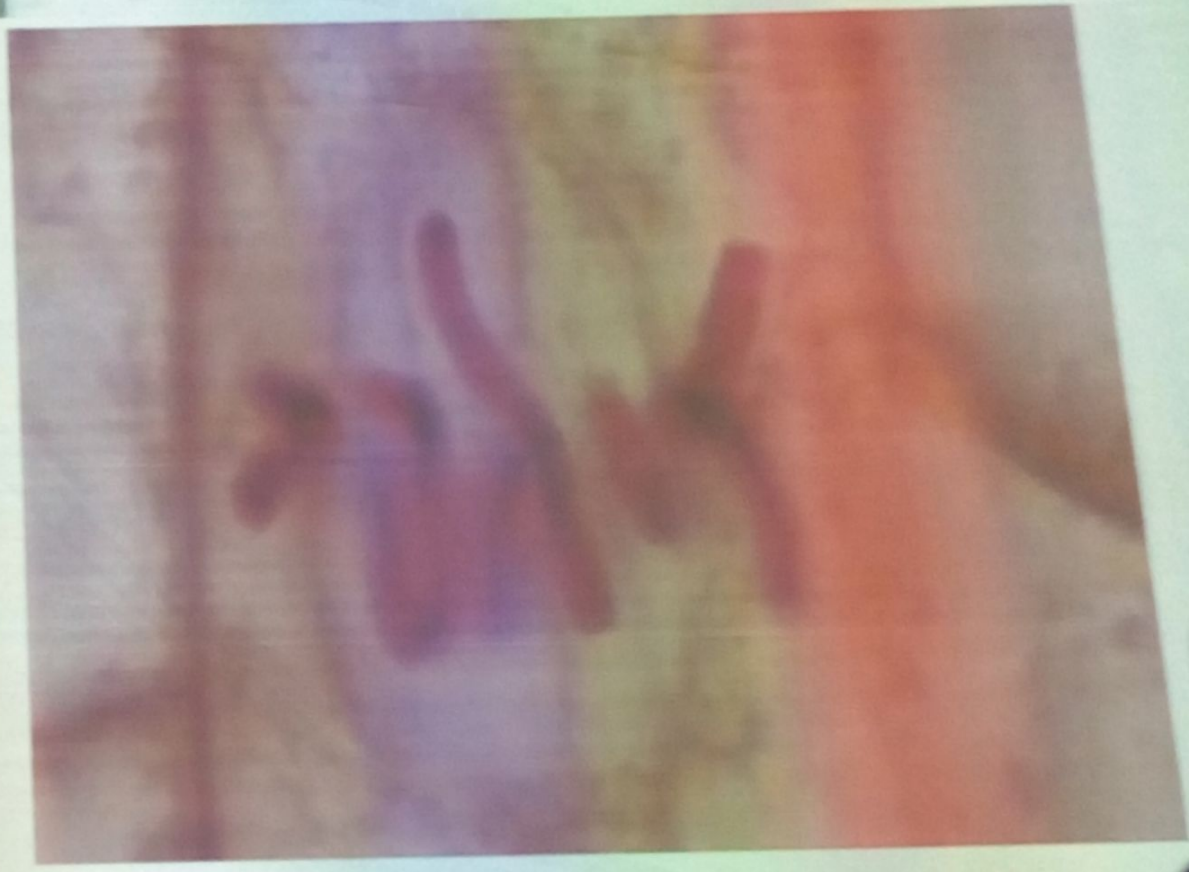

PHASE STAGE OF MITOSIS

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4. Anaphase

- Begins with the rapid separation of the sister kinetochores or centromere.
- The sister chromatids are separated at their centromeres.

5. Telophase

- The chromosomes have reached their respective poles.
- The spindle fibers disintegrate and a new nuclear membrane is reconstructed around each set of chromosome.

The nucleolus also reappears and immediately the chromosome begins to uncoil and assume the form characteristic of interphase.

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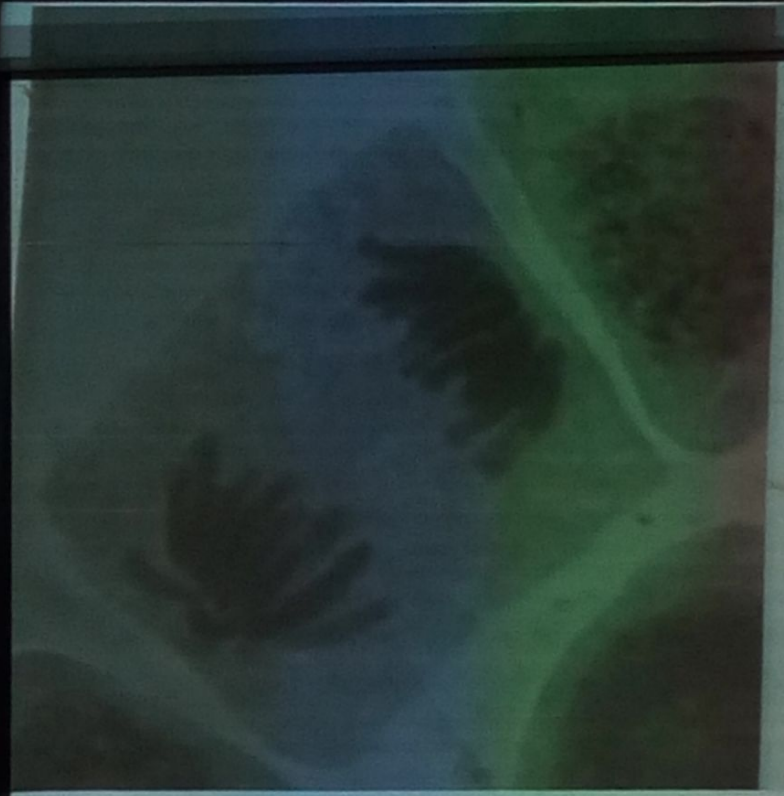

NAPHASE STAGE OF MITOSIS

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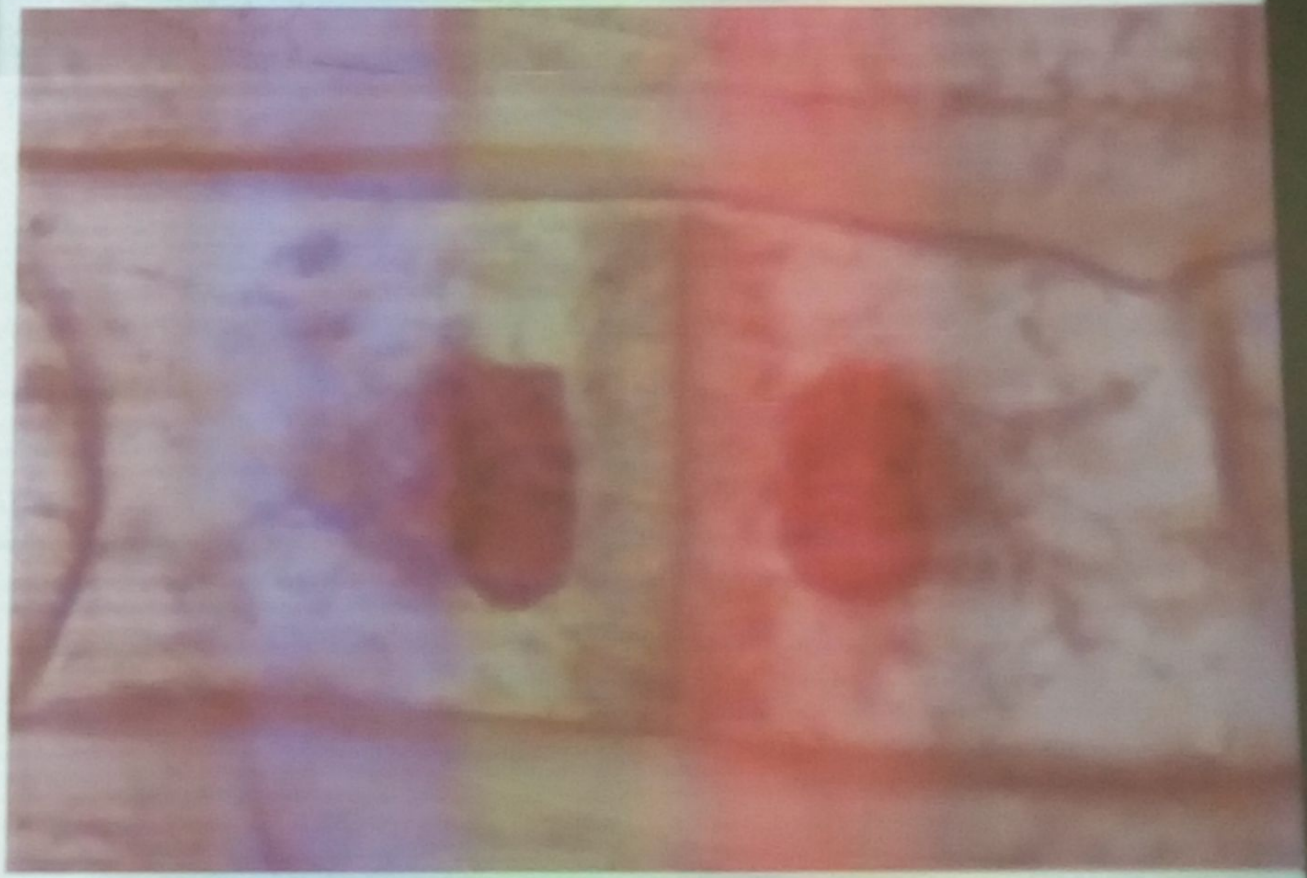

LOPHASE STAGE OF MITOSIS

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6. Cytokinesis

- It means division of the cell into two.
- In animal, it is done by the furrowing of the parent cells.
- In plant cells, cell split is first formed around the plate (middle of the cell) and the plasma membrane subsequently formed around the place.

Revision questions

1. Enumerate the differences and similarities between cytokinesis in plants and animal cells.
2. What is/are the significance of mitosis?
3. Compare and contrast mitosis and meiosis.

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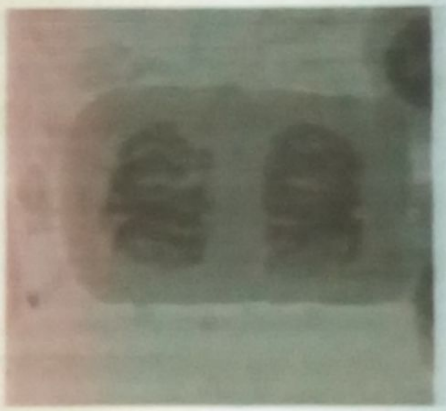

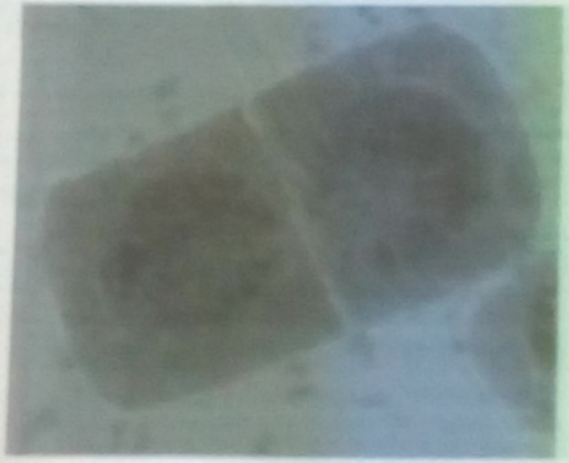

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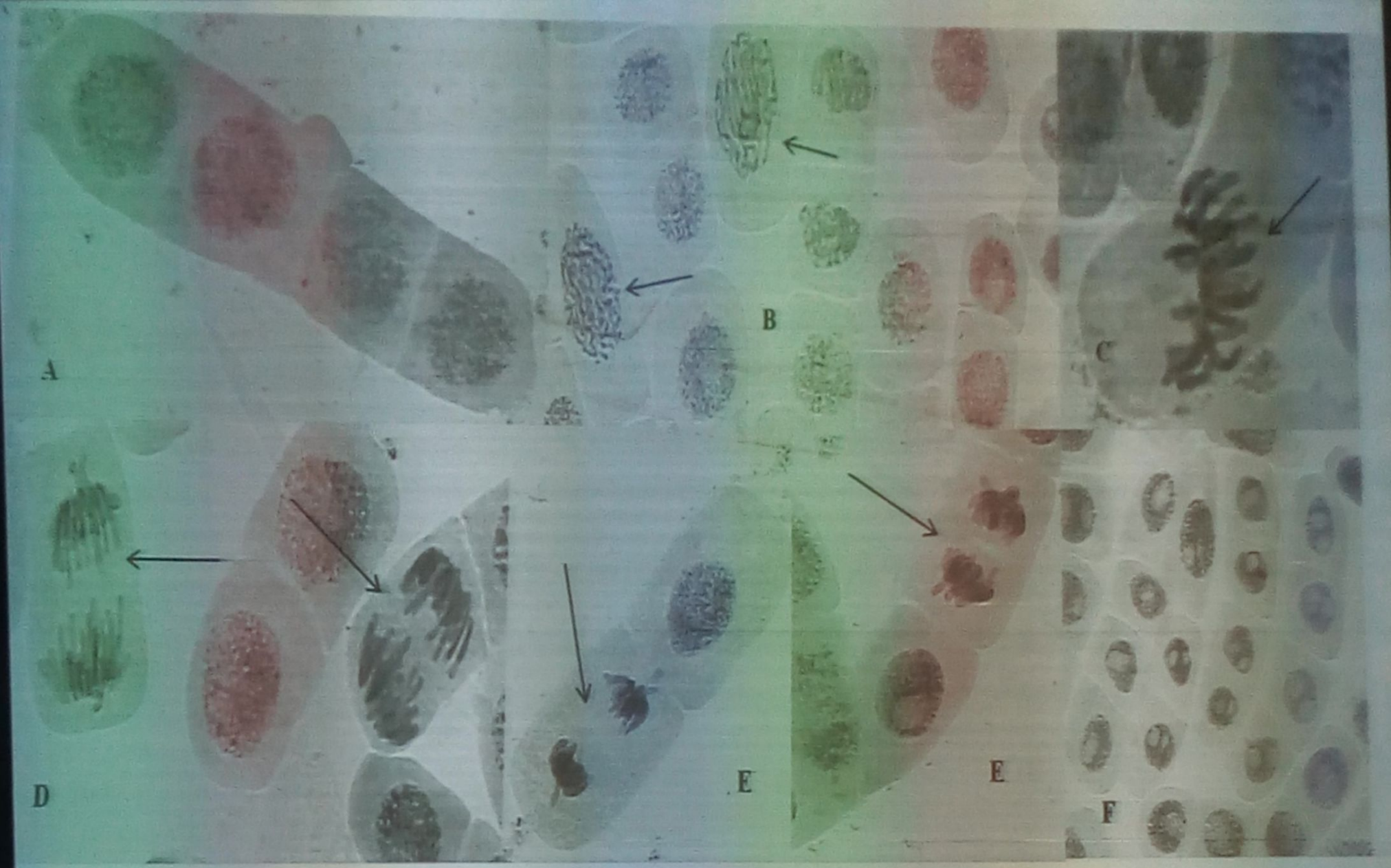

itosis in *Allium cepa* (2n=16, Family *Amaryllidaceae*); A=
erphase, B=prophase, C=metaphase, D=anaphase, E=telophase,
cyto

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