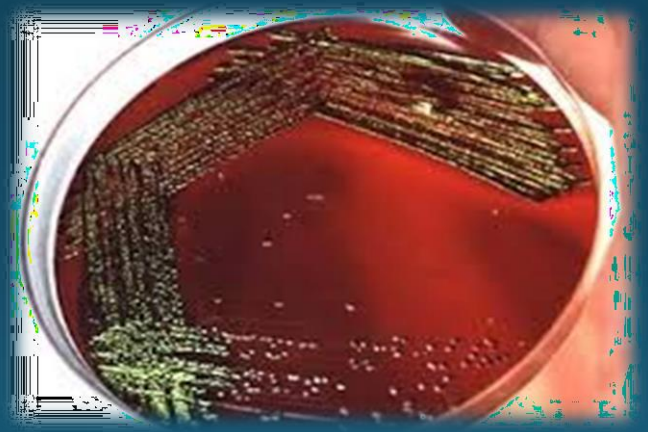
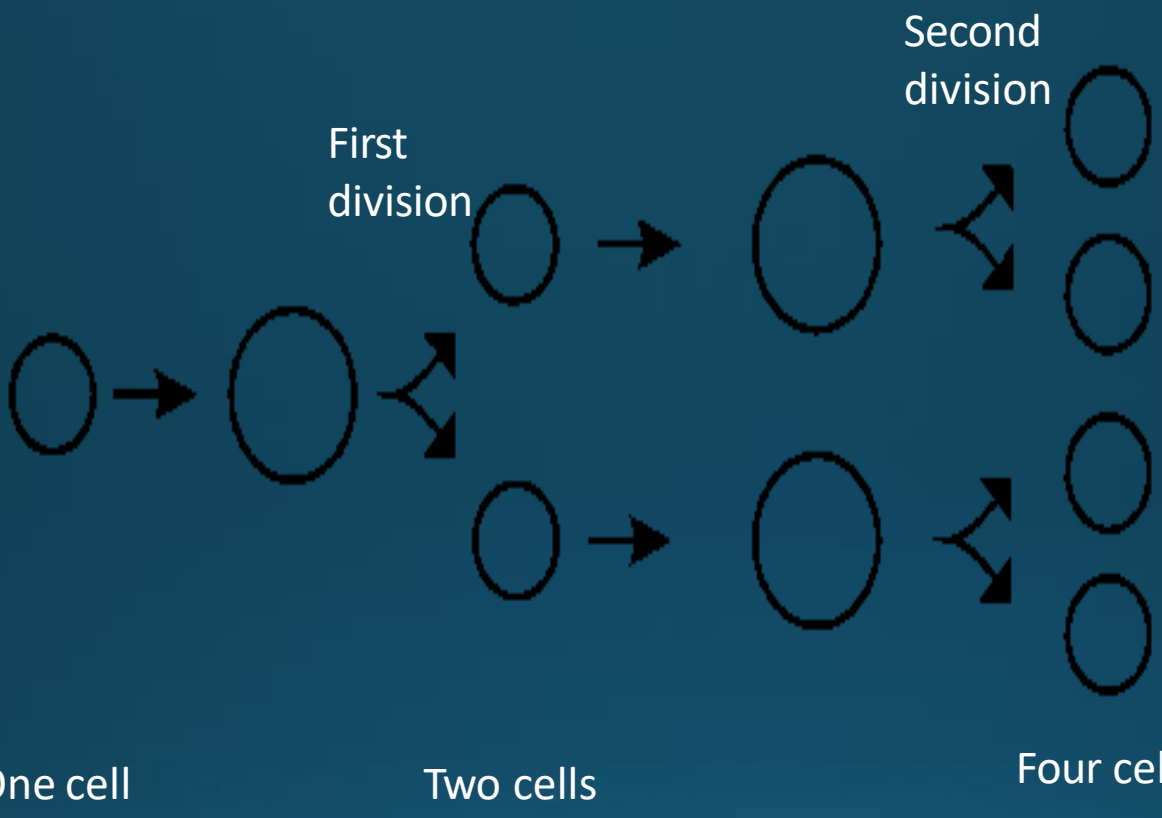
PURE CULTURE TECHNIQUE OF MICROORGANISMS





Division of a single bacterial cell results in the formation of a pure colony

Culture

The microorganisms that are cultivated is known as culture

Mixed culture

(more than one microorganism)

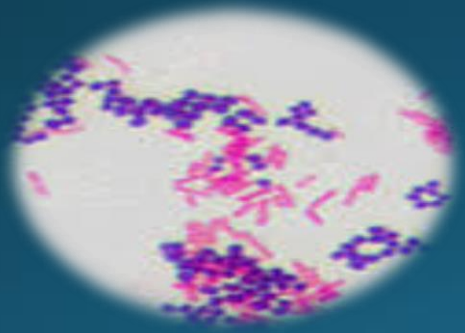
Pure culture

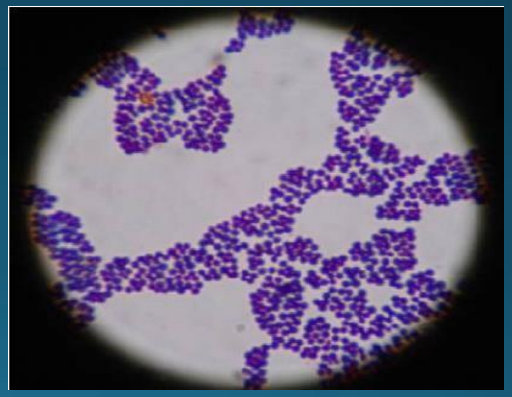
(containing single species)

ASSESSMENT OF PURITY OF CULTURE

- Several isolated colonies of a pure culture show the **same cultural characteristic** on a particular media.
- When stained and observed under the microscope they look alike i.e **same stain and Morphology .**
- Several isolated colonies perform identically, as in the case of similar biochemical results

CULTURAL AND MORPHOLOGICAL
RACTERI





Mixed culture

Pure culture

BIOCHEMICAL CHARACTERISTICS

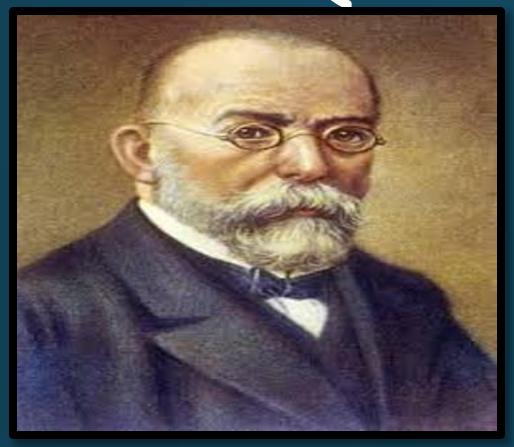
Mixed culture showing different results

Pure culture showing similar results

IMPORTANCE OF PURE CULTURE

- A pure culture can be grown, identified, characterized and tested.
- The physiology and the clinical aspects can be studied.
- Same results are obtained for a particular culture irrespective of the number of times the test has been done.
- The rate of spontaneous mutation is low and the clone of a pure colony is identical in all aspects.

HISTORY OF PURE CULTURE TECHNIQUE



Robert Koch's

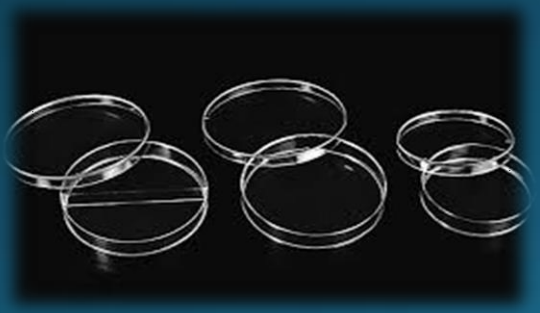
Robert Koch was the first to perfect the technique of isolating bacteria in pure culture.
He also isolated *Bacillus anthracis*,
the cause of Anthrax

Agar was first used in microbiology in 1882 by a German microbiologist Walther Hesse working in Koch's Laboratory

Fanny Hesse & Walther Hesse

- Julius Richard Petri

Koch's assistant, Julius Richard Petri, in 1887 developed the Petri plate (Dish), a container used for solid culture media.



Petri dish

Petri Plate (with media)

TECHNIQUES INVOLVED

- **Sterilization** of media and glassware
- **Dispersing the individual cells** across the medium
- **Thinning the samples** many times before inoculating the fresh media

STERILIZATION TECHNIQUES

- **Moist heat sterilization**
- **Dry heat sterilization**
- **Filtration**
- **Flame sterilization**
- **Bio Safety Cabinets** (LAMINAR AIR FLOW)

Autoclave

Hot air oven

Seitz filter

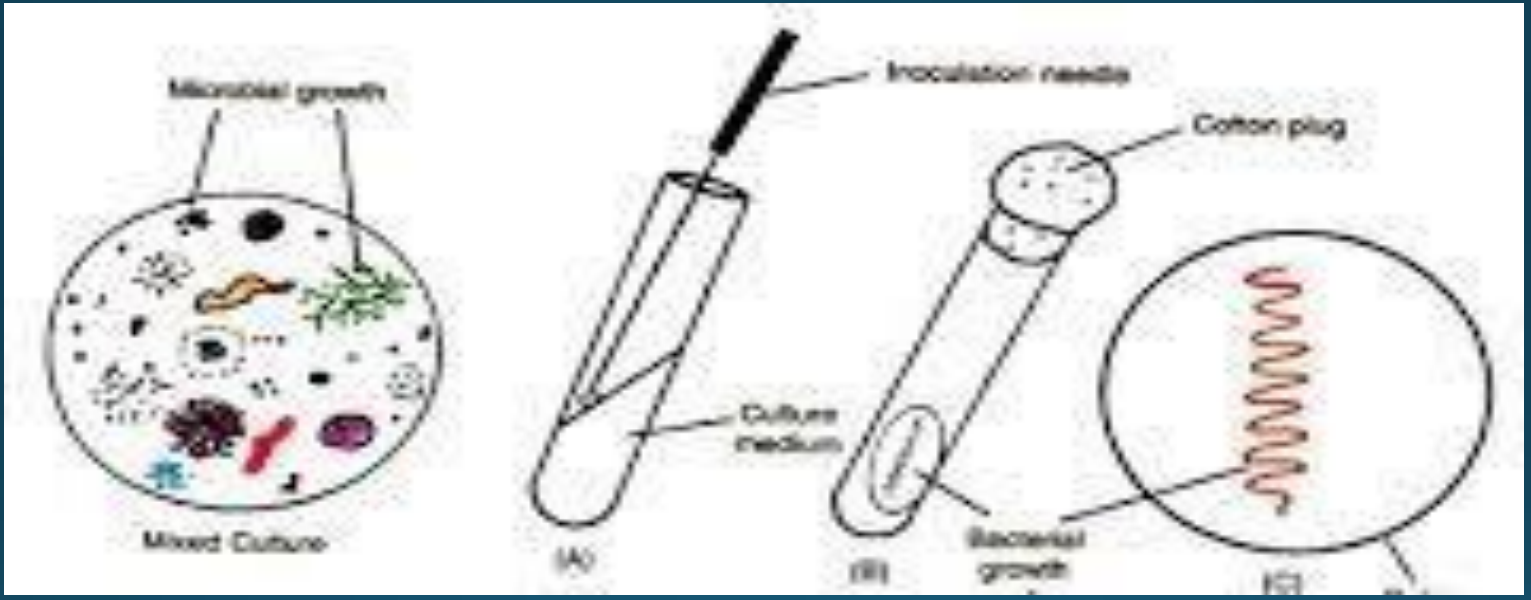
Flame

Laminar Air Flow

ISOLATION OF PURE CULTURE

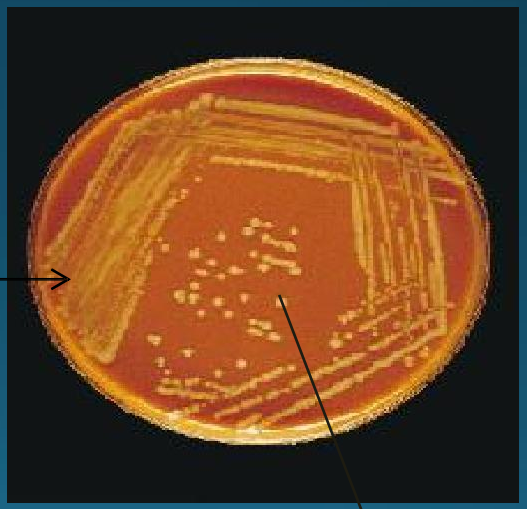
- **STREAK PLATE TECHNIQUE**
- **POUR PLATE TECHNIQUE**
- **SERIAL DILUTION TECHNIQUE**
- **SPREAD PLATE TECHNIQUE**
- **ENRICHMENT METHOD**

STREAK PLATE TECHNIQUE



STREAK PATTERN

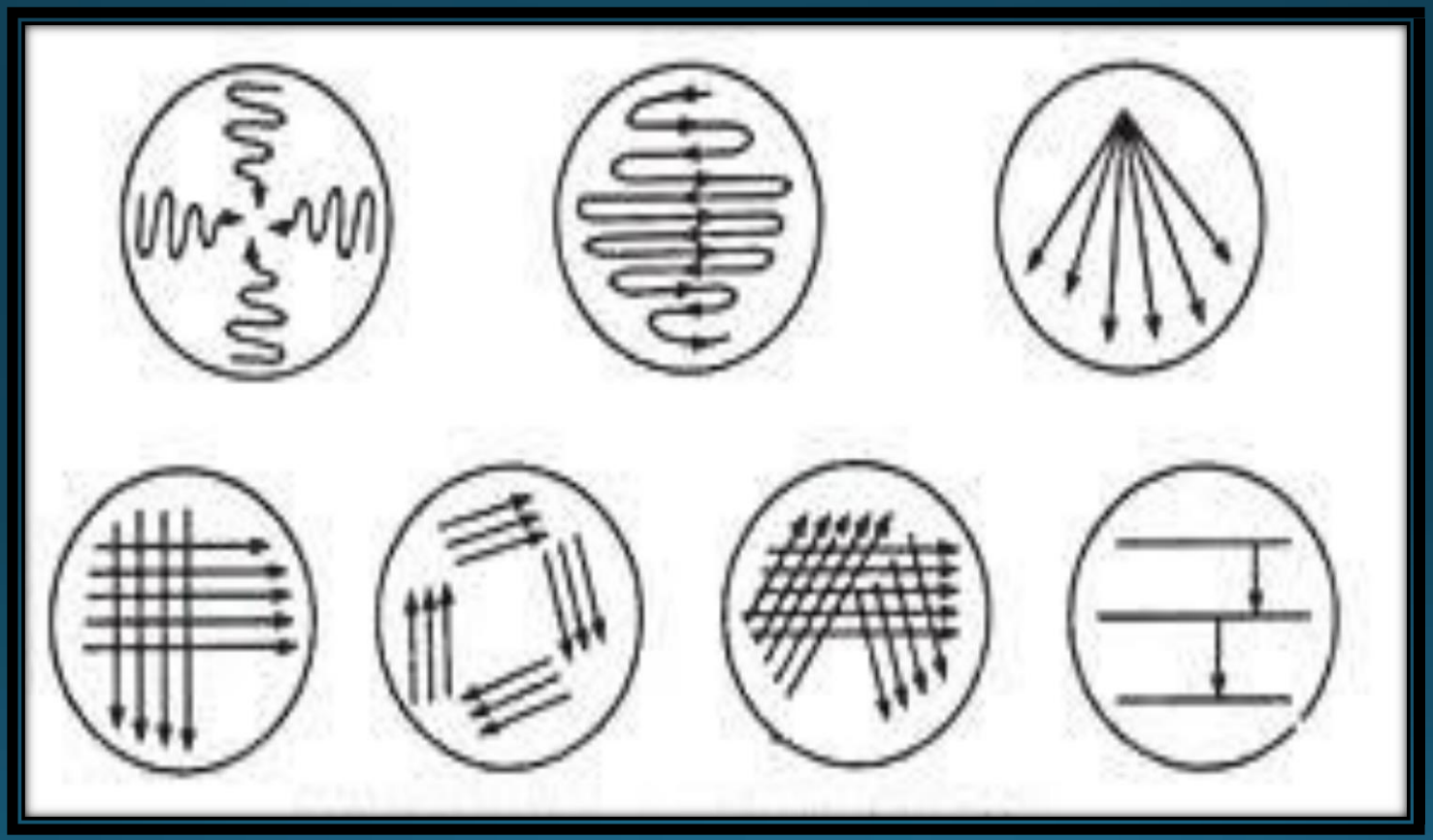
Observation of streaking after incubation



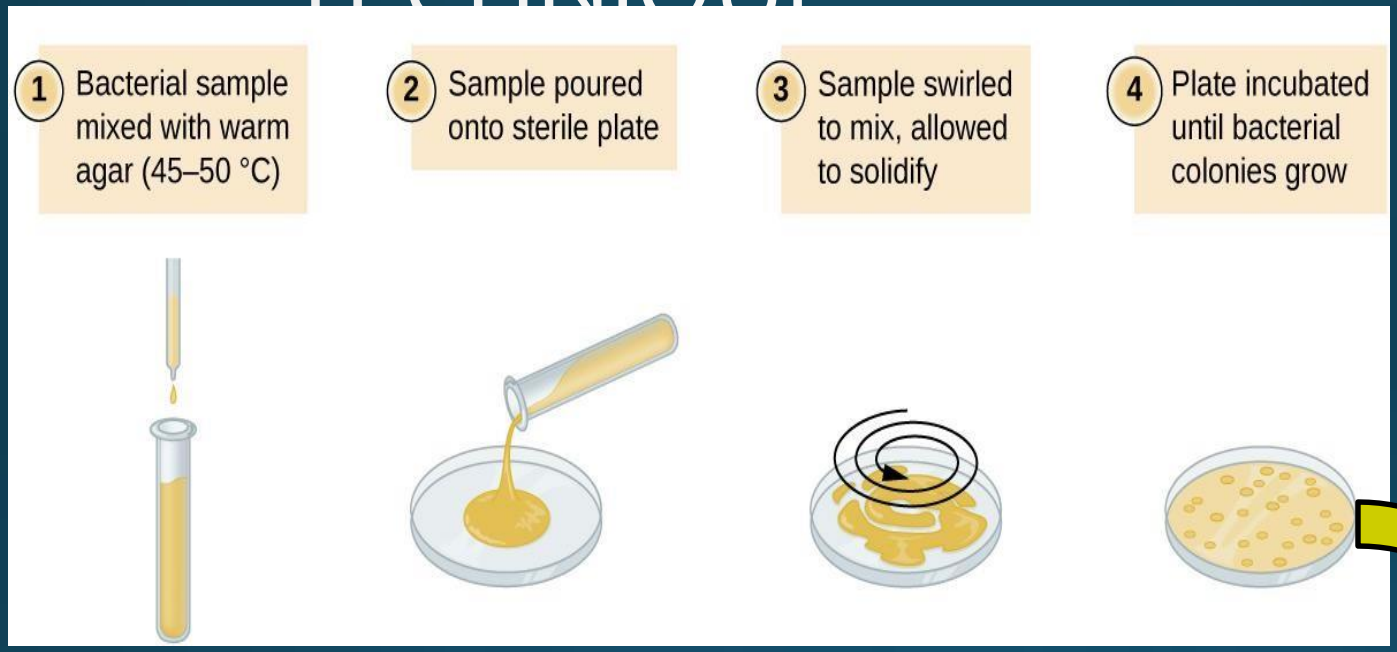
More inoculum

Pure isolated colony

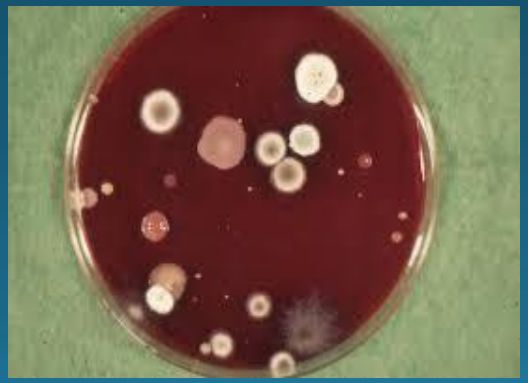
VARIOUS STREAKING METHODS



POUR PLATE TECHNIQUE

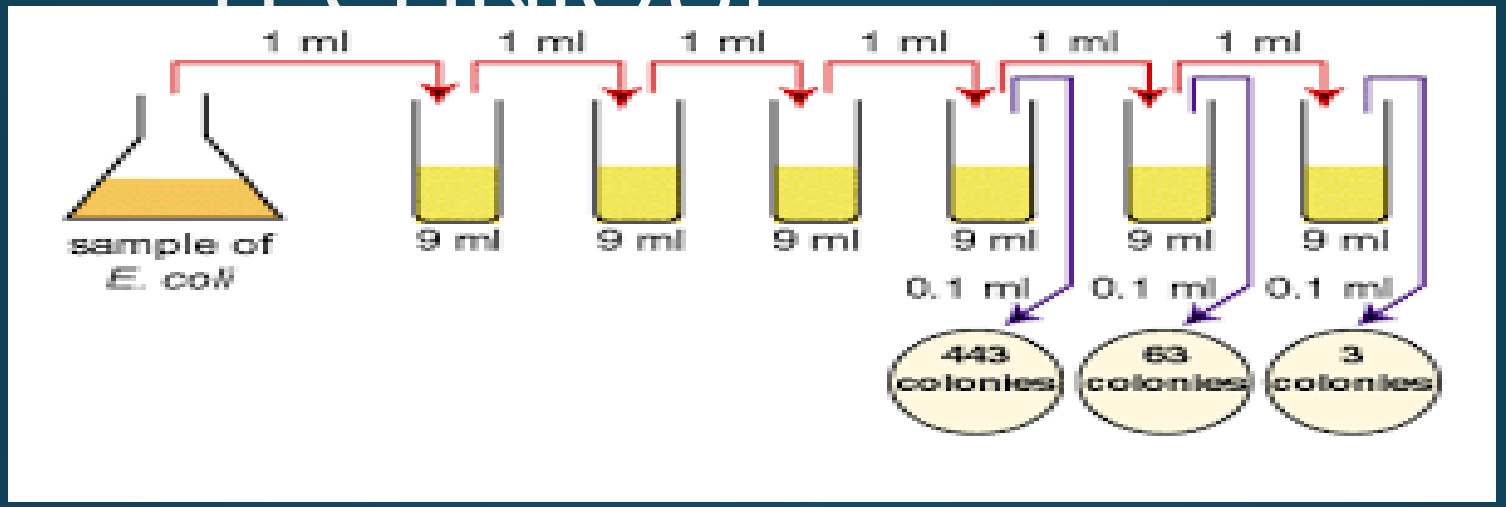


TECHNIQUE

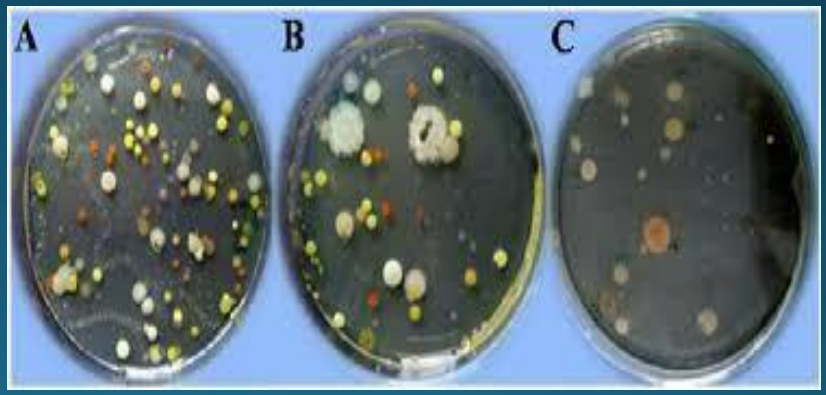


OBSERVATION AFTER INCUBATION

SERIAL DILUTION TECHNIQUE

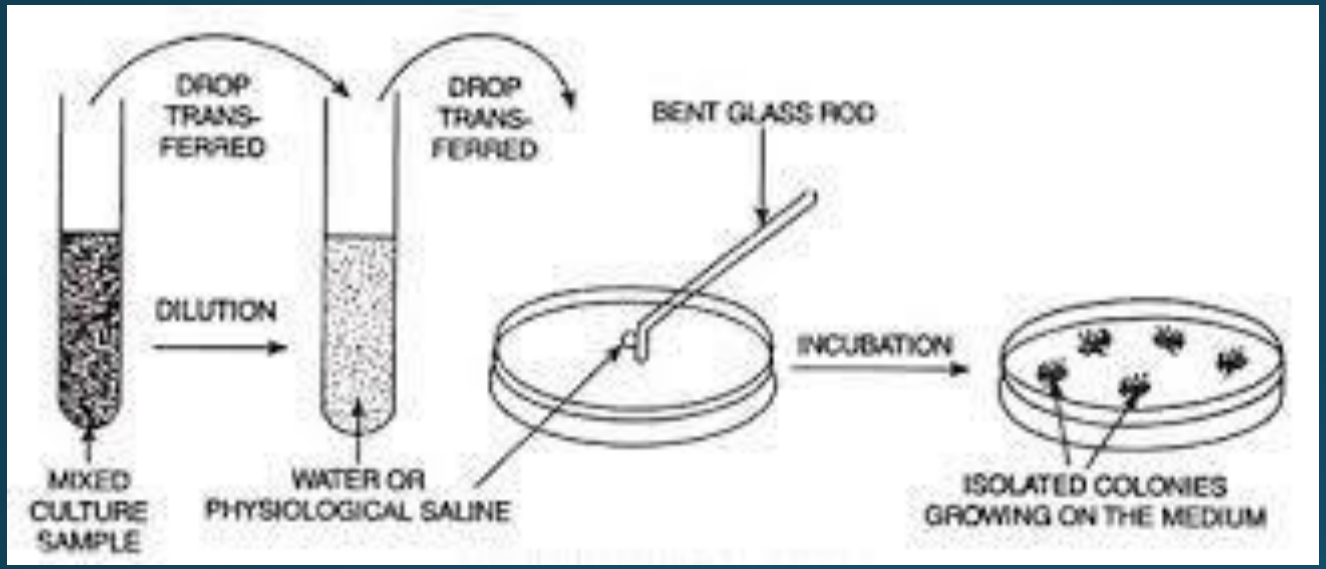


PLATING WITH DIFFERENT DILUTION OF SOIL SAMPLE

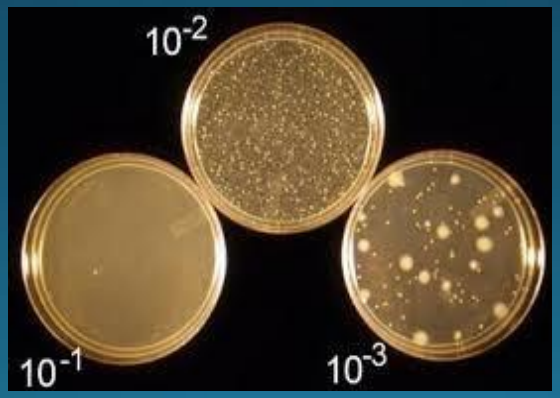


MORE DILUTION ….. LESSER COLONIES

SPREAD PLATE TECHNIQUE



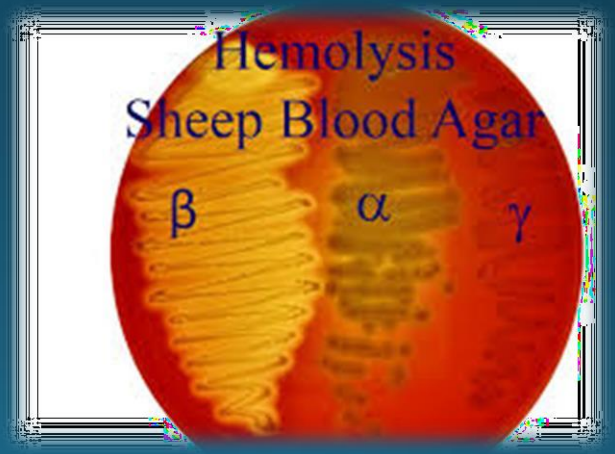
TECHNIQUE



OBSERVATION AFTER INCUBATION

ENRICHMENT METHOD

- Basal medium is incorporated with **blood, antibiotics, growth supplement** to enhance the growth of the desired culture.



MAINTENANCE OF PURE CULTURE

Once the pure culture is isolated maintenance and preservation is necessary for further study and application of the culture.

THANKYOU