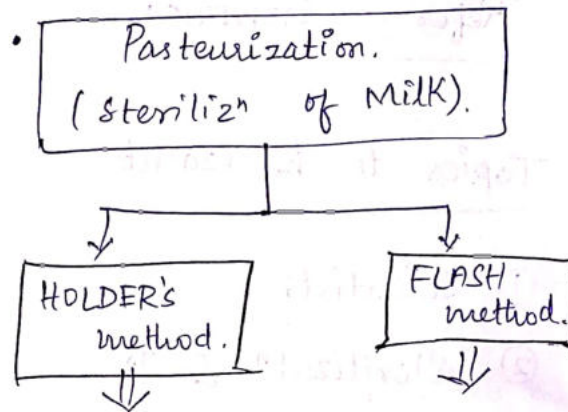


- 1) Antonie Von Leewenhoek.
- 2) Louis Pasteur.
- 3) Robert Koch
- 4) Paul Ehrlich.
- 5) Joseph Lister
- 6) Ignaz Semmelweis.

## ii) Sterilization



Hold the milk @ 63°C for 30 mins  
(all bacteria killed except *Coxiella burnetii*)

72°C for 20 sec.

1) Antonie. Von Leewenhoek

(Father of microscopy).

\* simple microscope  
(only 1 lens).

\* microbes - little animalcules.

2) Louis. Pasteur

\* Father of Microbiology

i) vaccination:

• coined "vaccine".

• vaccines:

C - Cholera

A - Anthrax

R - Rabies.

• Hot air oven

160°C → 2 hrs.

• Autoclave

121°C → 15 mins.

(pressure - 15 pounds psi pressure)

iii) Fermentation: (ID of Bacteria).

\* Utilization of Carbohydrate (sugar)

by the organism in the absence of O<sub>2</sub>.

(if presence of O<sub>2</sub> - OXIDATION)

but Bacteria always prefer

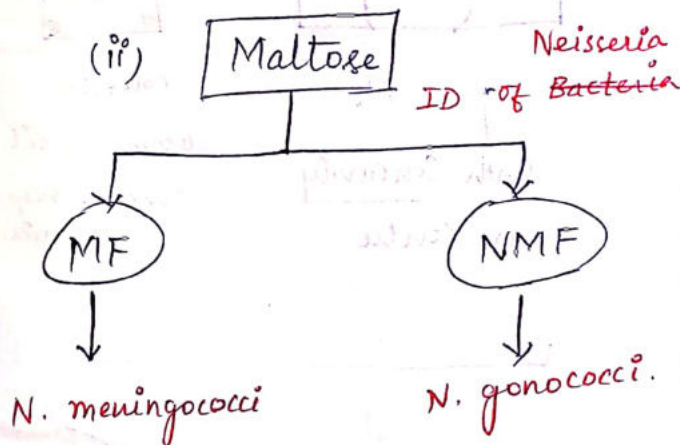
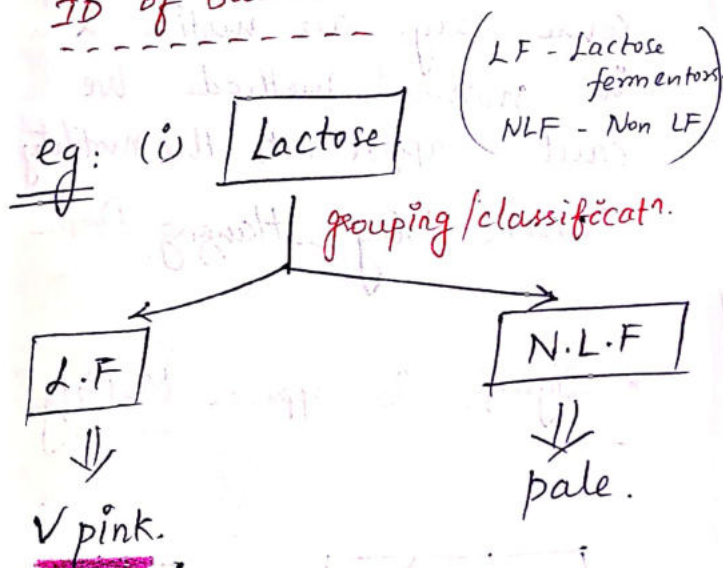
FERMENTATION. (except

Non Fermentors).

Byproducts

- \* acid. (all bacteria). → detected by pH indicator
- \* gas. (few). → Durham's Tube (Bubble produced)

### ID of Bacteria



Note: Both *N. meningococci* & *gonococci* grows on clear medium but *meningococci* is a MF whereas -----

### iv) Germ theory of diseases.

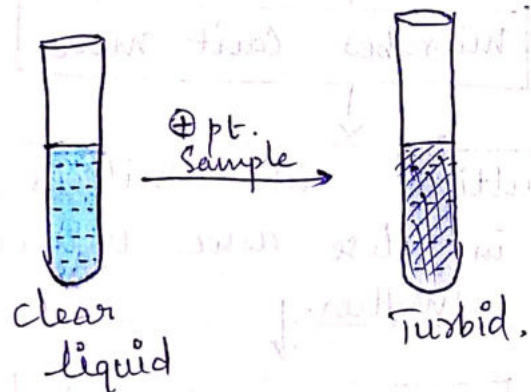
Earlier, people believed diseases are due to

- sins
- ancestors...
- Bad air...

He tried to convince the people that diseases are caused due to Microbes/germs.

### v) Liquid Culture Media

↓  
Nutrition for the Bacteria



\* Bacteria utilize the liquid culture & convert it to turbid liquid.

### Disadvantage:

\* We can't see the organism. We can just see turbidity.

\* We can't differentiate which organism is causing the disease.



3) Robert Koch: Bacteriology

www.FirstRanker.com

www.FirstRanker.com

i) Solid Culture Media:

↓  
He discovered Bacteria

A - Anthrax

T - TB bacilli (MTB).

\* He discovered "Agar"

Agar - Non Nutritive & added to the liquid culture media to solidify it.

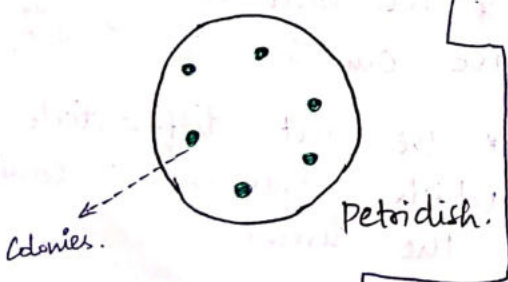
\* In Solid culture.

↓  
microbes can't move.

↓  
multiply into millions & are in close assoc. with one another

↓  
Colonies are formed.

↓  
Thus we can see the microbes (Solved the disadv. of liq. culture..)

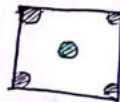
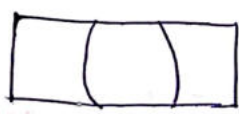


↓  
& also we can isolate the bacteria

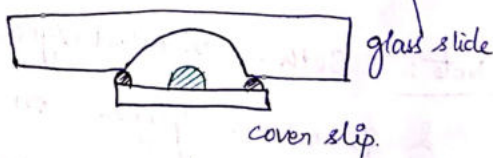
iii) Hanging Drop Method

\* Since org. are colourless we can't see it. Also some org. are motile. & in normal methods we can't appreciate the motility. THAT'S why... Hanging Drop--

\* Signif: To apprec Motility



4 corners - oil.  
Centre - susp. of microb



\* Now org. has enough space to move around. We can appreciate its motility better

Vibrio cholerae - Darting motility  
Salmonella - Serpentine motility

(iv) Culture Again

www.FirstRanker.com

www.FirstRanker.com

We should be able to isolate the same colony/org. in pure culture from the animal's sample.

#### (v) Staining Methods:

\* ↑ contrast & the visibility of organisms.

\* Dyes: **BASIC/Aniline** dyes

#### (v) Koch's Postulates:

\* Not all microbes are disease causing.

\* Only when all 4 postulates are fulfilled, the org. is said to be disease causing.

Microorg.  $\xrightarrow{\text{4 Postulates}}$  Disease.  
(Meningococcus) (Meningitis)

(i) Human: microorganism  
(constant association).  
↓  
Disease

(ii) Culture:  
isolate the colony of the org. in pure culture.

(iii) Lab Animal:   
introduce the org. & the animal should develop the same disease.

#### Summary of Postulate.

- (i) Const. Assoc<sup>n</sup>.
- (ii) Isolatr<sup>n</sup> of org. in pure culture
- (iii) Lab Animal - same disease.
- (iv) Re-isolate the same org. in pure culture

#### (vth) postulate Added :

(Based on **Immune Response**).

\* Demonstratr<sup>n</sup> of Antibodies against the organism in the pt.

#### Koch postulates

↓ modified into  
Molecular Koch postulates

\* Not the organism, It is the **Virulent gene** present inside the organism that is responsible for the Disease



So DON'T BLAME THE ORGANISM.



don't follow Koch's

postulates:

Bcoz they're Non cultivable.

eg: Treponema pallidum

M. leprae.

Rickettsia

Chlamydia.

4) Paul Ehrlich: [Father of Chemotherapy]

(i)

\* 1st Antibiotic "SALVARSAN"

↓#

Syphilis.  
(T. pallidus).

(ii)

Acid-fast staining:

\* Which is then modified

by Ziehl-Neelson as ZN staining

ZN stain = Mod. Acid fast stain

(iii) standardisation of Toxin &

AntiToxin

5) Joseph Lister.

[Father of Aseptic Surgery]

\* Ophthalmologist.

\* He observed that there are lot of deaths in post-oper.pts. due to poor Asepsis.

\* So He used,

DISINFECTANT: 5% Carbolic a (phenol).



Drastic Reducn. in deaths due to post-surg. Complications.

Disinfectants.

don't irritate the skin.

can irritate skin.

SKIN DISINFECTANT

SURFACE DISINFECTANT

5% Carbolic a (phenol).

6) Ignaz Semmelweis.

("saviour of mothers")

\* Surgical Handwashing Technique. in Obstetrics ....