SEP 12 1972

In Mud Micro course
notes. 1945

(First up to say 7/10/#5)
see last page. ±

viste juxtaposition of yeast life cycle
dissimilar .... Kahn + Harris

7/9 [1945]

Bacteriaceae

microsc. plant-like microorganisms Schizomycetes

Repr. by binary fission.

Morphological differences

cocci

~~bacilli~~
rods

spirilla.

Microscopic developments

Light

Electron

Dark field

Size variation considerable

Neither elution via cellulose.

Nucleus – debatable.

Some species show granules – volutin
metachromatic
polar etc.

" " " capsules. Usually assoc. ± high virulence.

are immune-specific. SSS.

Motility – flagella found on some rods + spirilla.

Spores – some rods. A 'resting' stage

Sex ?

Gram stain mechanism

1. Physical – critical region sp.
2. Phys-Chem. – Hans + Staus IEP
3. Chemical – spec. Dons zen.

Clones – descendants of single cells.

two types S, R

Pleimorphism – Löhnis –
Miller

Variation in Bacteria

Hadley. Mici. Dissociation.

q. life cycle - mid fetable phase.

Clinically important - S. e.g. Gring pathogen - virulent.

Exp. anthrax.

R-S transition Immunibility.

~~bacil~~ L. acidophilus. (R).

Agriculture, S may be obtained. Irreversible.

Transmutation, ex. Pneumococci.

cit. Twyndal., Dawson, etc.

Bacteria - chemistry. Escherichia coli. 7/10

1. Water
2. Ash 2-13% K = 13% Na = 2% Cl = 0.
3. Proteins - 8-15% Arginine, Hist, lysine, Tyrosine
   - Nucleoproteins enzymes proteins (apoenzymes).
4. Carbohydrate - cellulose?
   SSS
   ribose is complex

Growth cycle lag, log, late phases

Caries - space ??

(glucose? tetanus!

Autotrophs + heterotrophs -

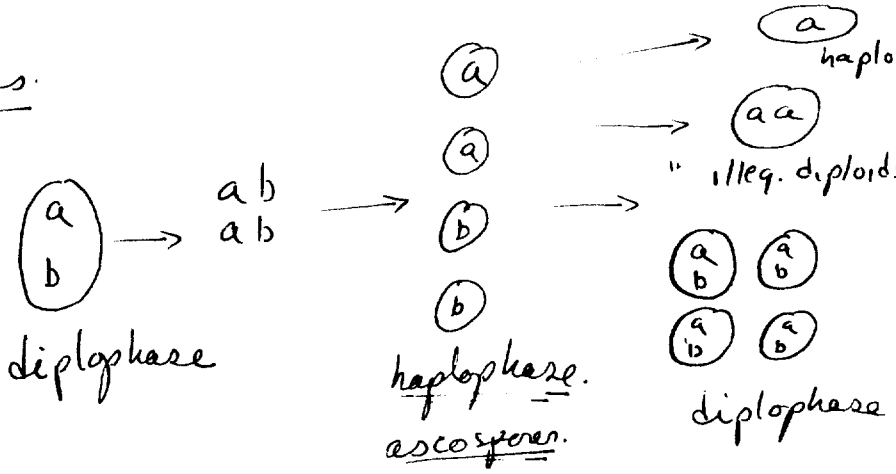
Final bacterium may contain more G. F. than is provided by medium ! [redacted] supplies "adaptation" regularly.

Extracellular reactions, — hydrolyses

Intracellular .....

Life cycle of yeasts.

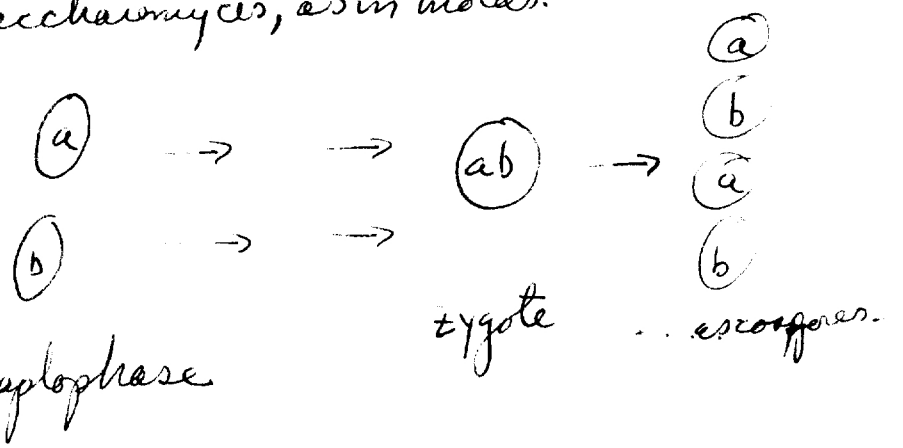
Saccharomyces.



Parthenogenetic formation of ascospores claimed by Guilliermond.
No essential sex differentiation.
Single ascospore isolations can yield normally sporulating cultures.

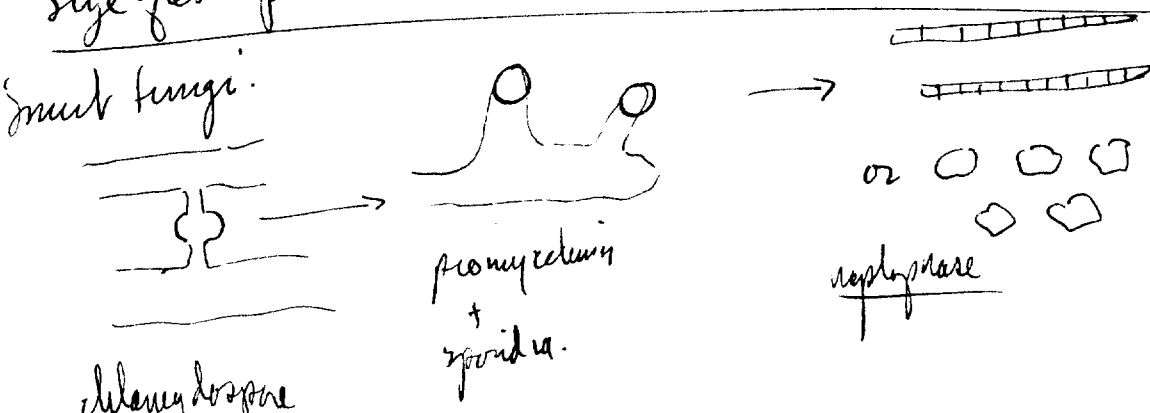
Winge — vs Lindegren on regularity of illeg. diploids (single ascospore cultures) and fertility of their ascospores.

By Schizosaccharomyces, as in molds.



Mating types?
Size of ascospores?

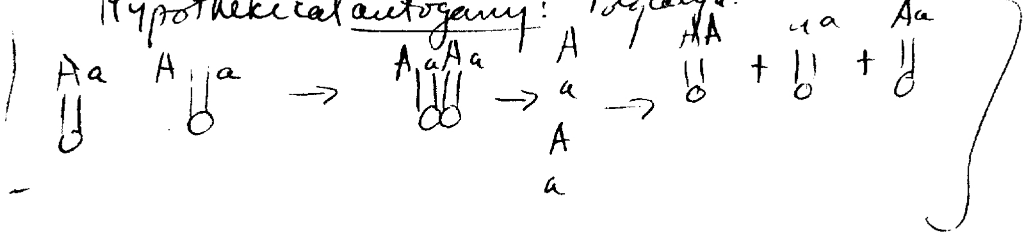
Smut fungi.



Variation.

"type" forms.
Isolated observations contemp. c̄ Koch. Koch maintained a strictly monomorphic

– Hypothetical autogamy: Polygamy.



Only reasonable classification is etiologic. Of recognized causes of death

Exogenous. { Animate 42.7% / Inanimate 22.3%

Endogenous. – unknown 38%.
(Idiopathic!)

Mechanisms of disease: Infection: Df. process by which (parasitic) organisms gain entrance to a susceptible host, causing injury + giving rise to a reaction. Saprophytes vs parasite:

a. Thermophilic – capable of growth at 37° as in T.B.

Pathogenicity is adaptation. Many lose "virulence" on artificial culture. Response mechanism? e.g. B. pestis. Some maintain virulence B. typhosus

b. ~~Hosp~~ Host specificity.

c. Growth rate. – incr. in virulence on serial transfer during log phase.

aggressin + organism → virulent organism?

Wash organism.

Dosage - variability.

General host reactions.

1. Incubation period - apparent even if toxin.
2. Fever
3.

Mechanisms of resistance.

Nutritional variation in E. coli.

1. Test strain – Inoculate a type strain into Basal medium.
   Carry through 5 transfers.

2. Isolate – Plate out from minimal. Select a small colony, cultivate in Basal
   on to basal agar.

3. Repeat isolation, select a colony, prepare agar slant for storage
   inoculate into basal. = T_0

4. Serial transfer through SA and dl-methionine, A, B, C, D, E. – varying proportions. Transfer every 48 hours, from lowest tube (X) showing visible turbidity to all + higher tubes, and to basal.
   When inocula do not grow in basal medium, variation has been achieved. Concurrently, transfer serially through methionine alone. (M)

5. After inoculation from a culture, store in victory. After variation is established, plate out numerous transfers to test their homogeneity.

6. Test variant for methionine requirement
   " adaptation
   " quantitative response to methionine
   " specificity of response.

Regeneration of Tissues

a. Skin. Edges of cut + epidermis elaborate outgrowths on surface of dermis, [illegible] later thickening, later [illegible] papillation. [illegible] [illegible] Regen. is rarely complete. Corium, C.T. irregular + densely bound c̄ adipose.

b. Sk Muscle – At cut end of fibre, cytoplasm exudes; nuclei accumulate in bud. Bud grows [illegible] [illegible] muscle cell). [illegible] [illegible] c̄ embryonic muscle cell [illegible] [illegible] eventually striae develop.... [illegible] [illegible] envelop the bud c̄ collagen.

c.) Card. Muscle – very slight ability for regeneration.

1.) Nerve – Glia very proliferative. Neurons do not [illegible] [illegible] functional substitution. "Associated c̄ structural complexity of cell" Cell cannot withdraw its processes. [illegible] of nerve processes. May be blocked (neuroma) [illegible]

2.) Kidney – If tubule is destroyed, no reformation. Glomeruli are not neo-formed. If a few cells are destroyed, rest of tubule can smooth [illegible] – flat, low cuboidal cells....

[illegible] Liver – Wax-plate reconstructions may indicate some budding off of new lobules – (though [illegible])

Central necrosis – replacement very rapid [illegible] [illegible] "new cells more resistant to CCl_4" – ascribed to "[illegible]" [illegible]?

Intestine. — as stomach, [illegible] [illegible], [illegible]
[illegible] [illegible]. [illegible]
lamina to muscularis; muscularis mucosa
does not invaginate.

Bone:

Problems:

1. Staph transformation, independence of a) pigment
   b) antigenic formula (ABC?)

2. Growth vs Differentiation - Growth "energy"

3. Is differentiation the acquirement of new forms or the [illegible] of most of [illegible] repertoire ± the exaggeration of some part. Is not the "primitive" cell a composite of all structures + functions of mature, differentiated cells.

4. Sex in bacteria: If stable mutants are available, for two deficiencies, incubate together in a) minimal b) partial c) complete media. Plate out old cultures on minimal agar. Compare frequency of survivors ± that of individual old cultures. (Compare Sherman + Wing) Test for transformation by broth filtrates or killed. Because of selectivity, this is a preferable method, if stability can be achieved.

[One can also perform the comparable test of antigenic inheritance, particularly ± independent alleles.

If the frequency of recovery of ++ is significantly greater than]

(1) / must be Bennett + McKinney

Brett is 1948

APR 17 1973

cc: Cooper