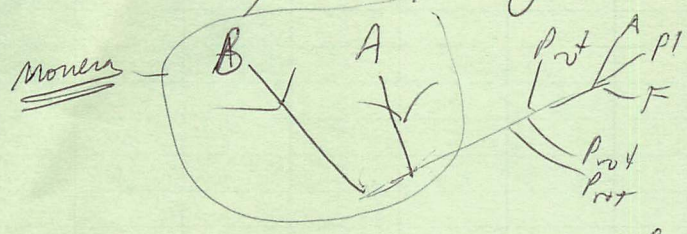


Carl Woese Revolution in Microb. Evolution: Microbial Taxonomy Comes into its own

- "Microbiology is dead. long live microbiology"
- "Microbiology should listen to trees"
- most people have learned about 5 Kingdoms
Animals, Plants, Fungi, Protista, Monera



- many people would speak to details

What is wrong w/ biology today?

① microbiology is dead "w/in departments of molecular and cellular whatever"

② microbiologists stunted dup
- always lacked history

③ molecular paradigm
- history in physics & chemistry
- ignores Darwinian basis

History of Microbial Phylogeny

- "paradigms are funny things - historical, arbitrary ..."
- Roger Steiner & C Van Niel

Classical Pd

- Hegal proposed protista
- Cohn, F - 1875 "bacteria characteristics more of a negative than positive nature"
- Kluyver & van Niel 1936

Kluyver & van Niel

iv.

v. few of the proposed higher taxa valid

① morphology¹⁰

② morphological simple thought to be most primitive

- why fail?

③ characters to simple of variable to be phylogenetically relevant

Van Niel, 1946

- cannot use physiolog./biochem characters to construct phylogeny

Van Niel, 1958

- probably never will find good characters

Stamer & van Niel 1952

- questioned value of doing so

So problem...

So leaned toward molecular paradigm

"Prokaryote" - lack of a nucleus is a negative character
and thus essentially useless as phylogenetic character

- defined prokaryotes in terms of E. coli

- everyone accepted "prokaryote" as model of all non-eukaryotes

- then Sanger, & Zuckerkandl & Pauling

- but no microbiologists used this data

- except ayt C in 1979 Nature

1977

1977 - Archaea

- why so surprising?

- nobody had recognized distinction
- even w/ strange lipids in these bacterial taxa
- even lack of peptidoglycan in halos.
- even weird coenzymes

- Response to Archaea

- Wolfe -- got call from Laureate

"Prok-Euk dichotomy
is a wall not a bridge"

- Why concerned w/ microbiology now?

- microbes do EVERYTHING

- cysts
- mito
- vents
- degradation
- weird environments
- ecology
- lack of cultivation

NORM PACE

- Archaea

How are they similar?

