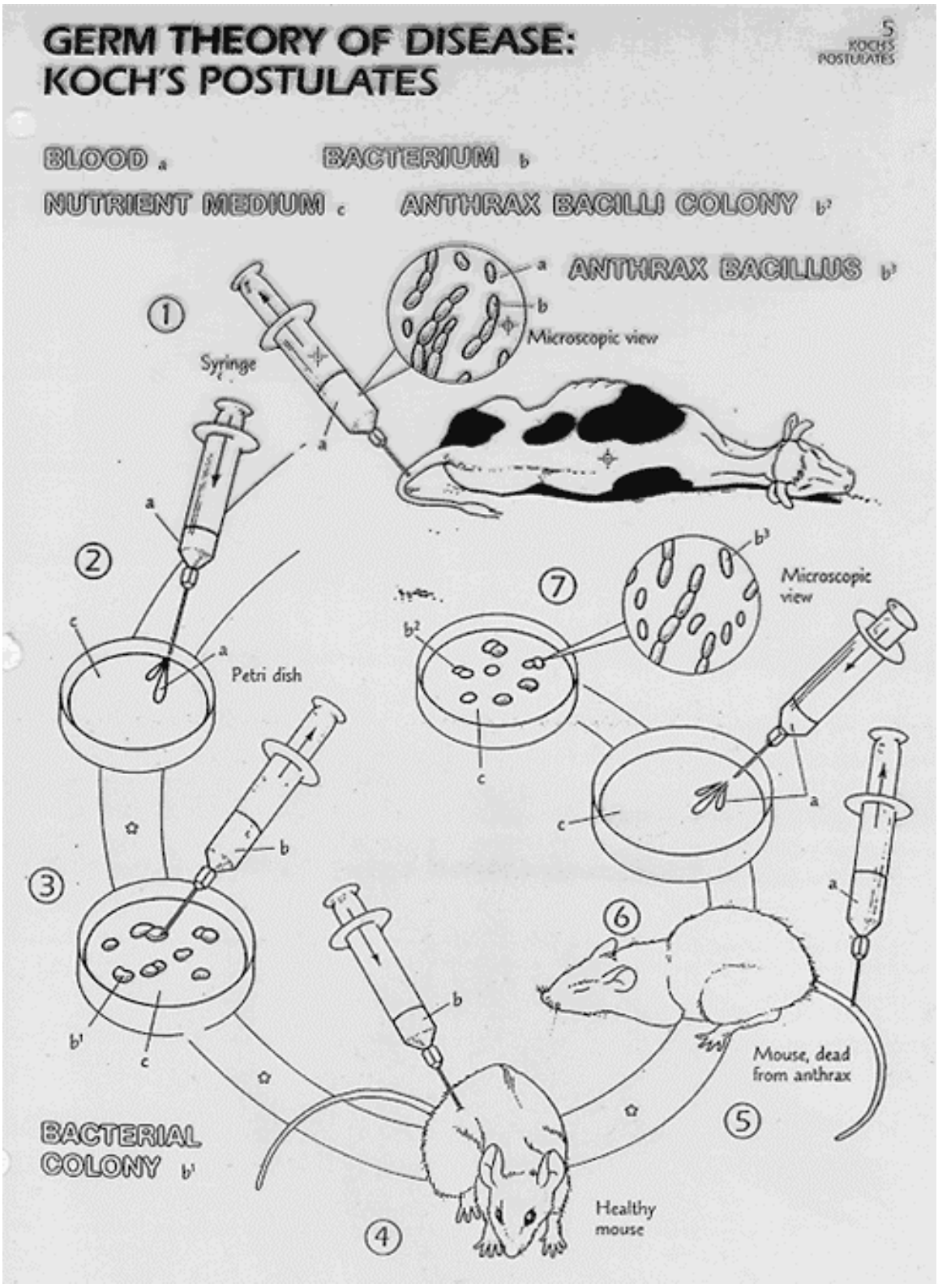
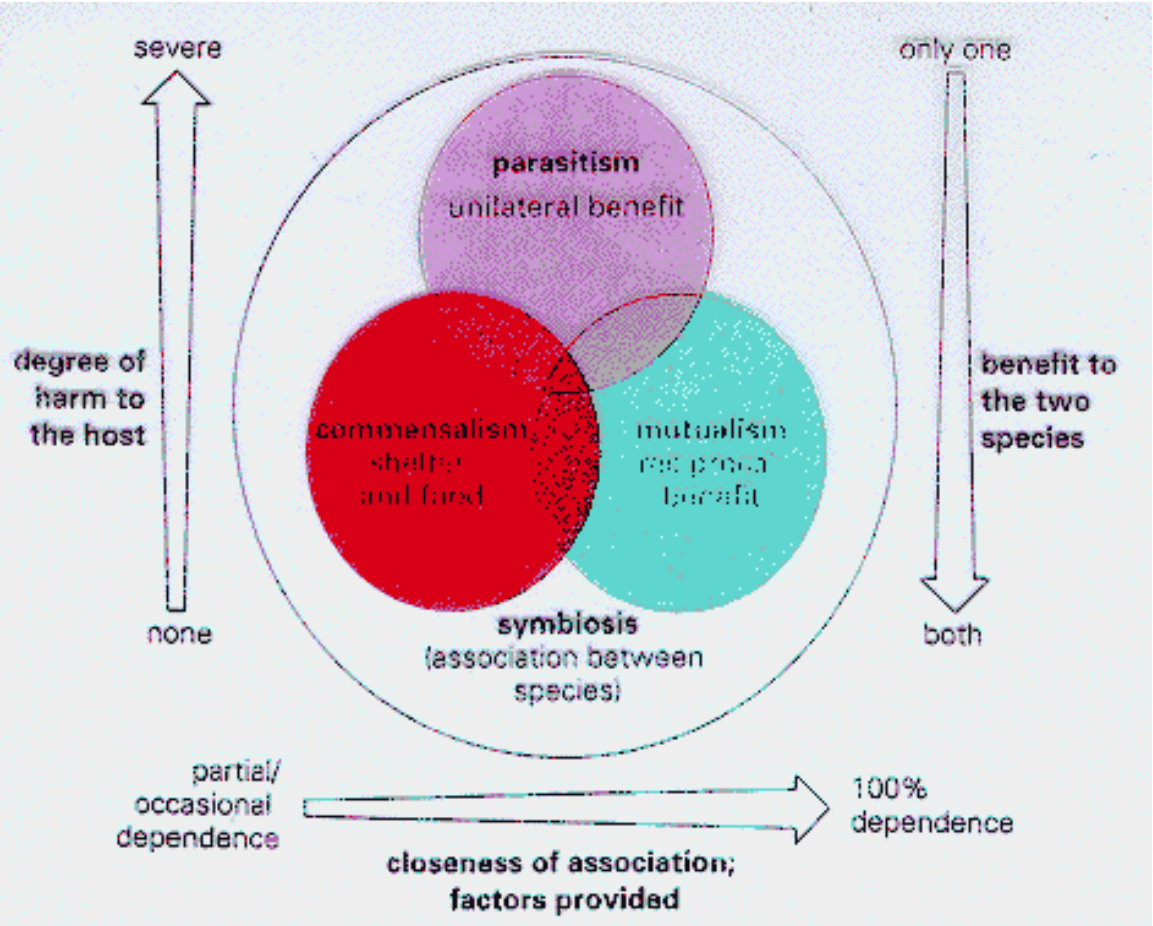
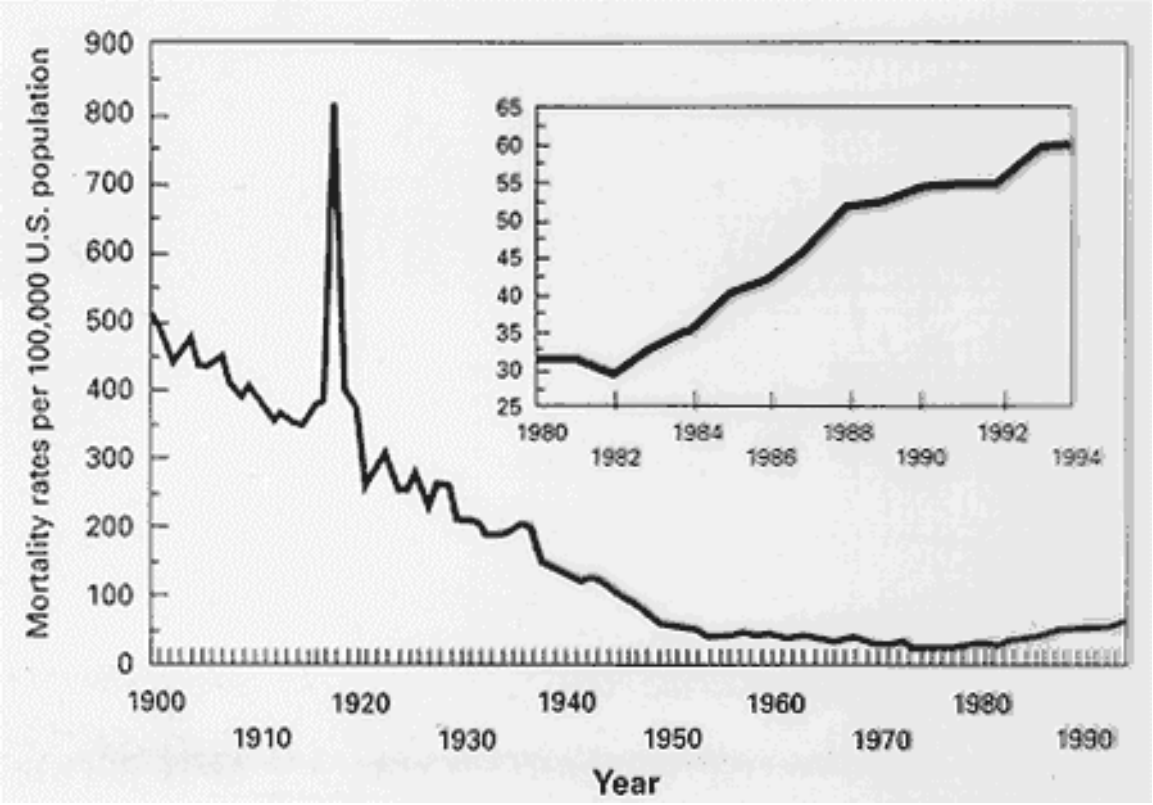

GERM THEORY OF DISEASE:
KOCH'S POSTULATES
5
KOCH'S POSTULATES
BLOOD a
BACTERIUM b
NUTRIENT MEDIUM c
ANTHRAX BACILLI COLONY b²
ANTHRAX BACILLUS b³
Microscopic view
Syringe
Petri dish
Microscopic view
Mouse, dead from anthrax
BACTERIAL COLONY b¹
Healthy mouse
1
2
3
4
5
6
7

1a


severe
none
degree of harm to the host
only one
both
benefit to the two species
parasitism
unilateral benefit
commensalism
shelter and food
mutualism
mutual benefit
symbiosis
(association between species)
partial/ occasional dependence
100% dependence
closeness of association; factors provided

1b


Mortality rates per 100,000 U.S. population
900
800
700
600
500
400
300
200
100
0
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
Year
65
60
55
50
45
40
35
30
25
1980
1982
1984
1986
1988
1990
1992
1994
1c

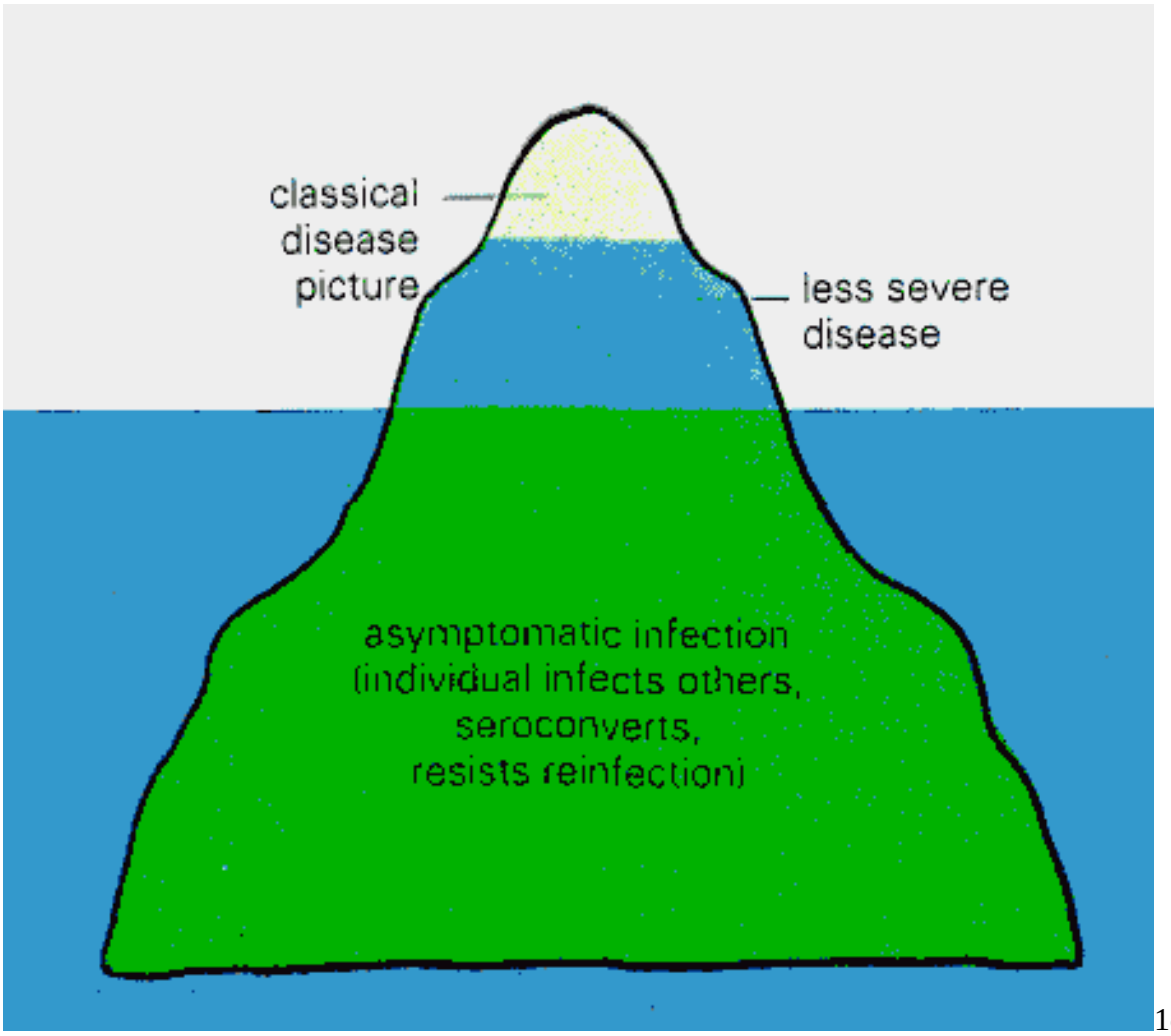

classical
disease
picture
less severe
disease
asymptomatic infection
(individual infects others,
seroconverts,
resists reinfection)
1d

Table 1.1. Obligatory steps for infectious microorganisms

Step	Phenomenon	Requirement
1. Attachment ± entry into body	Infection (entry)	Evade host's natural protective and cleansing mechanisms
2. Local or general spread in the body	Local events, spread	Evade immediate local defences, and the natural barriers to spread
3. Multiplication	Multiplication	Multiply; many offspring will die in host or *en route* to fresh host
4. Evasion of host defences	Microbial answer to host defences	Evade phagocytic and immune defences long enough for full cycle in host to be completed
5. Shedding (exit) from body	Transmission	Leave body at site and on a scale that ensures spread to fresh host
6. Cause damage in host	Pathology, disease	Not strictly necessary but often occurs[a]

[a] Some damage may be inevitable if efficient shedding is to occur (e.g. common cold, diarrhoea, skin vesicles).

1e