MEDICAL ACADEMY NAMED AFTER S.I.GEORGIEVSKY

Topic:theory of phylembryogenesis

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195A

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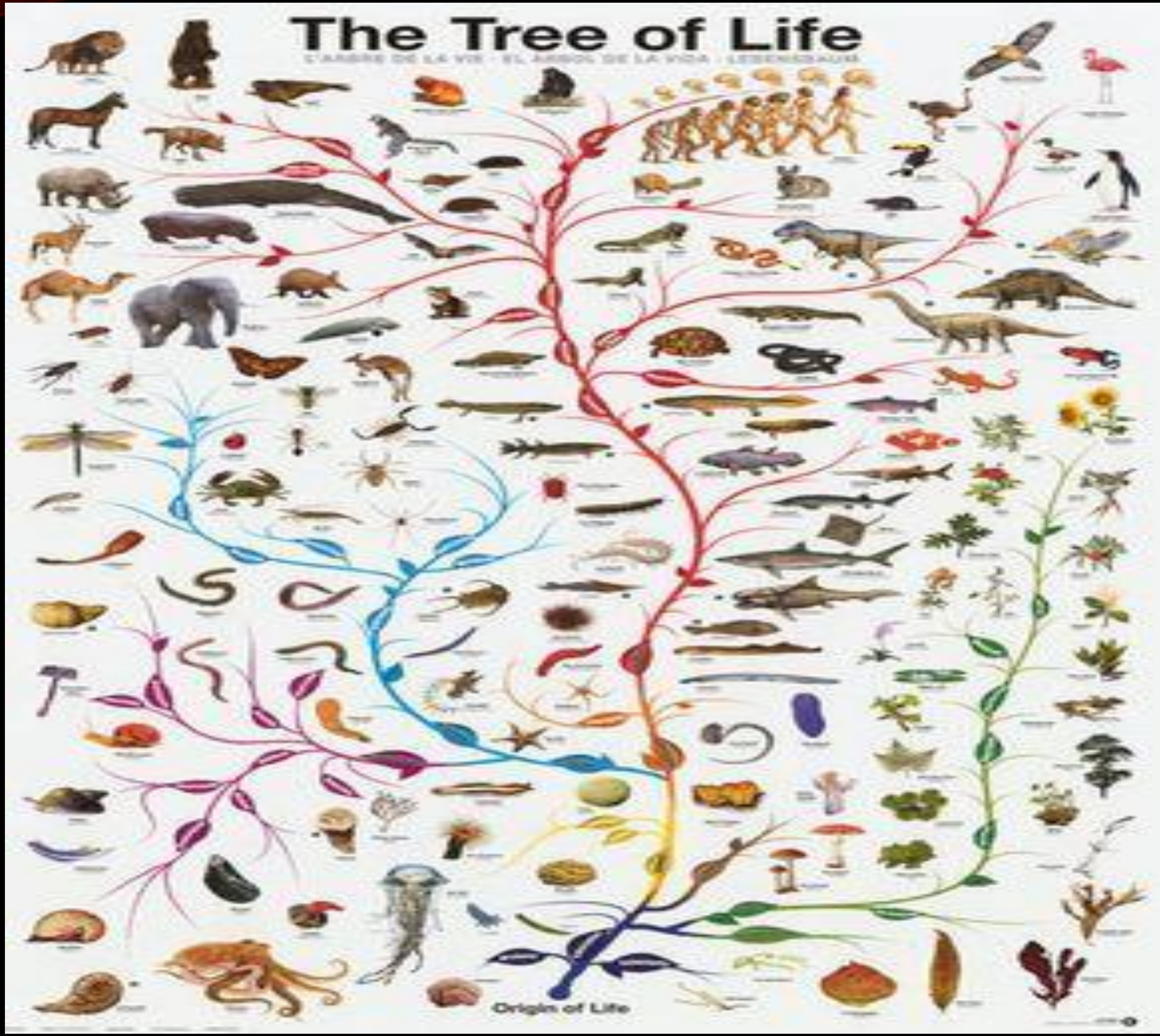
THEORY OF PHYLEMBRYOGENSIS

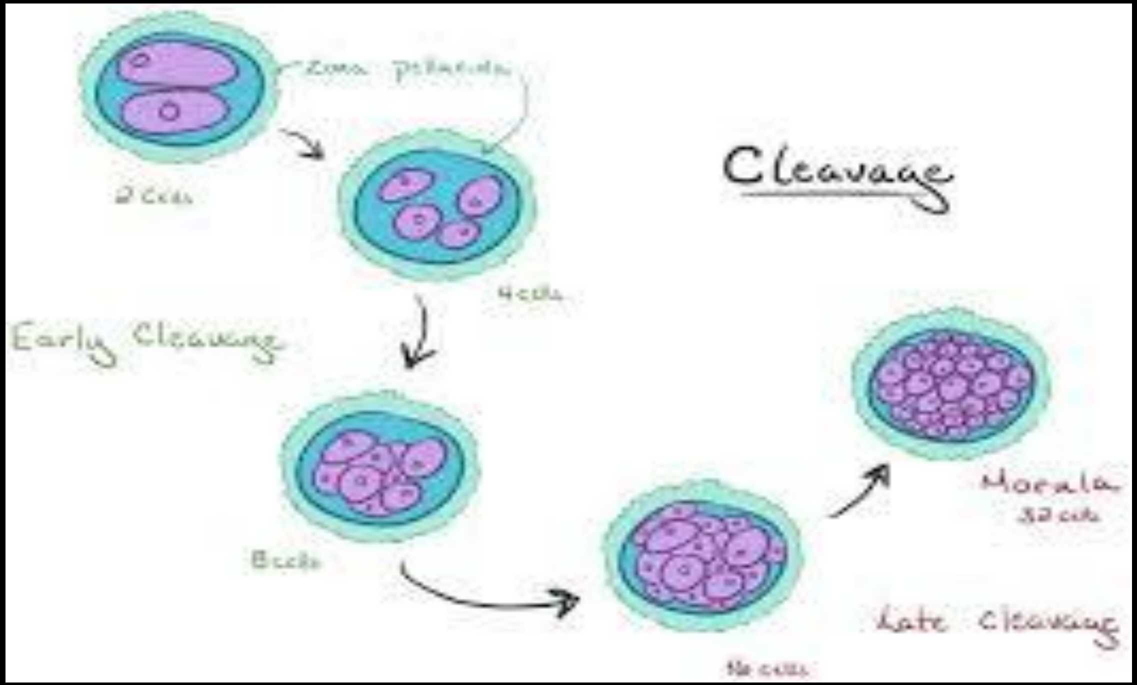
A **theory** put forth by Russian palaeontologist Severtsov, postulating that phylogenetic changes in organisms are conditioned by ontogenetic alterations, in that certain events are added, modified or deleted in the development of an embryo based on the events of ancestral development.



The Tree of Life
Origin of Life

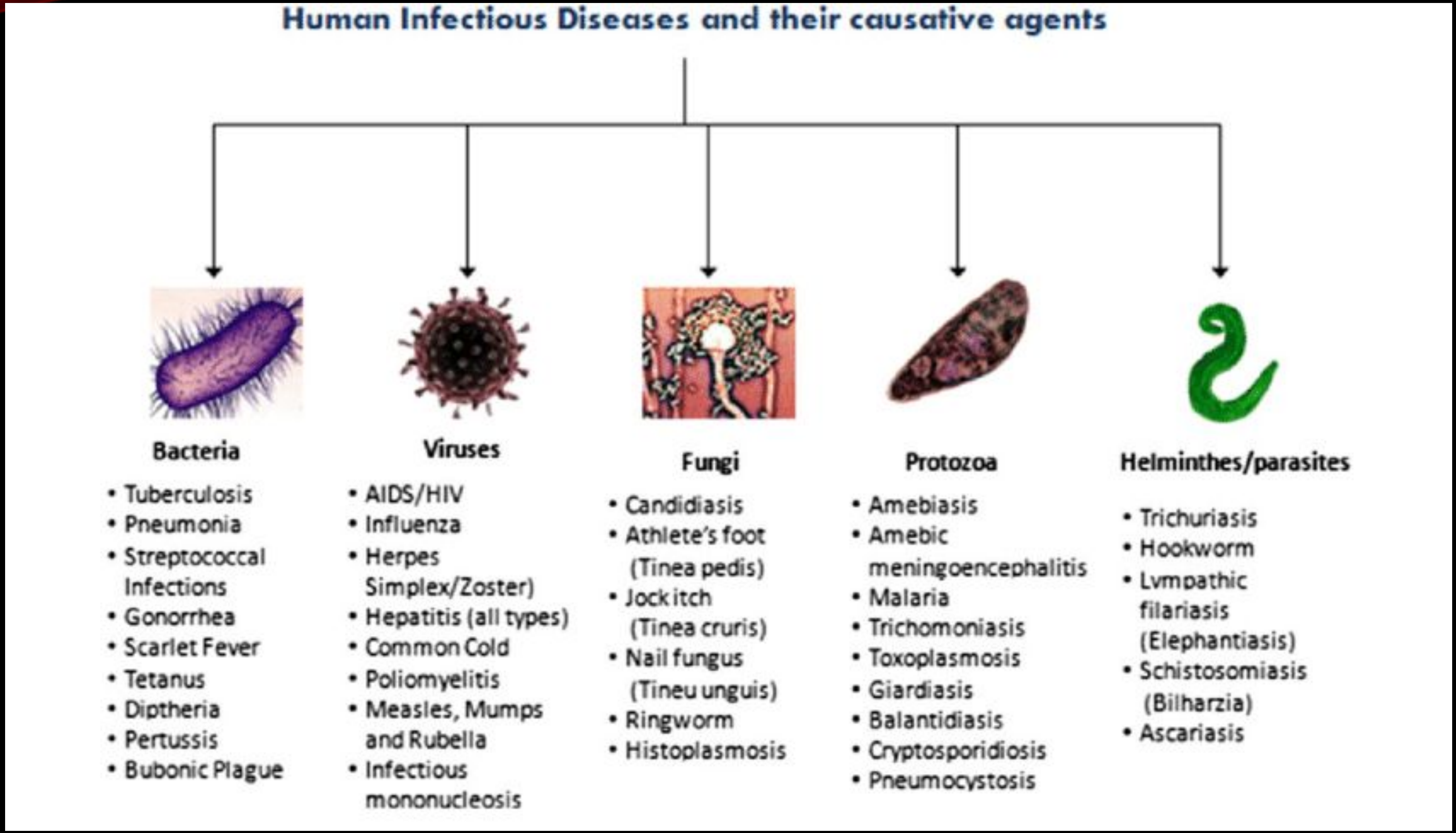
Influence of biological factor

in earlGrowth **factors** play key roles in influencing cell fate and behaviour during development. ... it its distinctive polarity has been a major focus in lens developmental **biology**. ... IGF, PDGF and EGF, also potentiated the **effects** of a low dose of FGF by ... new insights into cell determination y development.


Cleavage
Zona pellucida
2 cells
4 cells
Early Cleavage
8 cells
16 cells
Morula
32 cells
Late cleavage

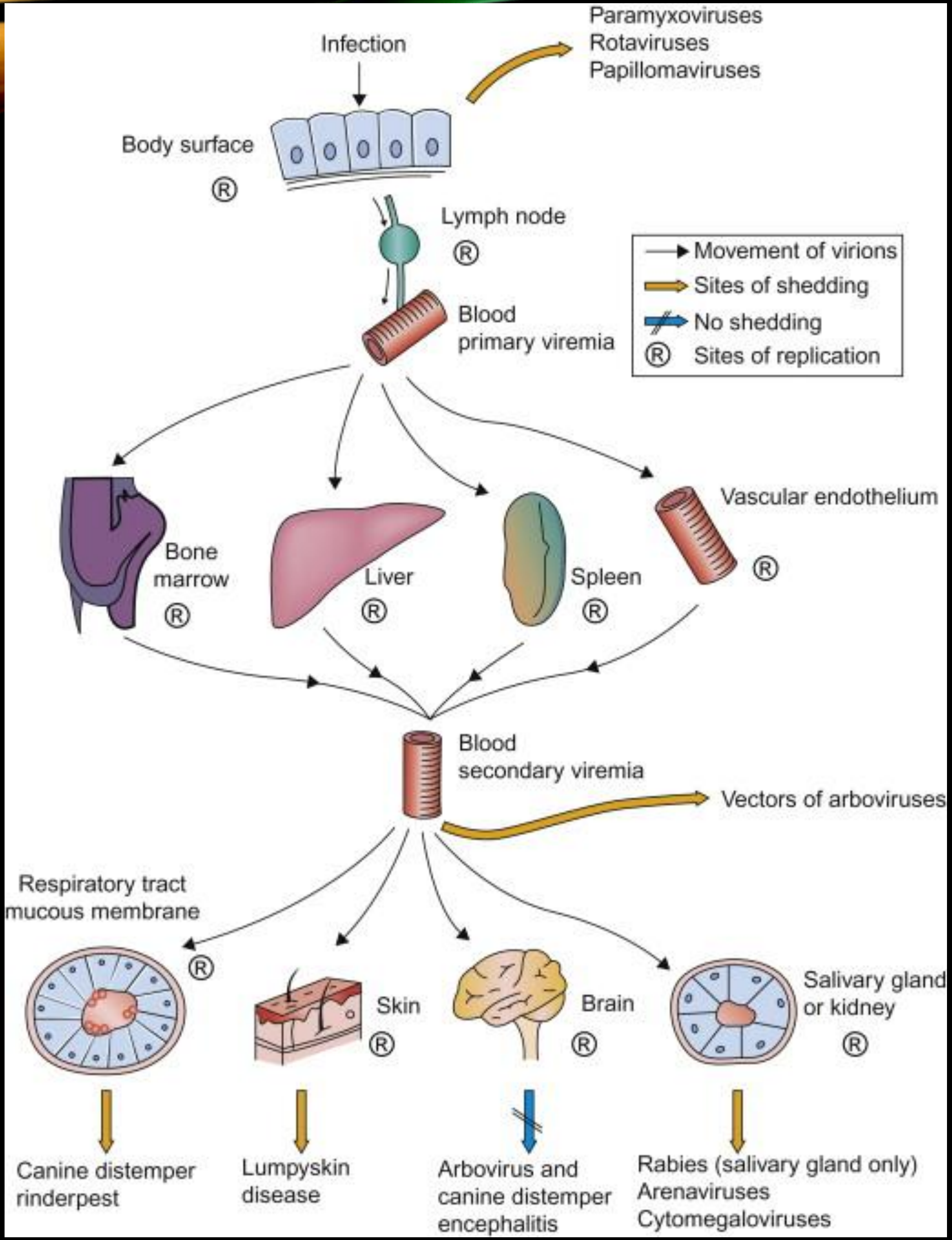
Classification of infective disease

The agents of **infection** can be divided into different groups on the basis of their size, biochemical characteristics, or manner in which they interact with the human host. The groups of organisms that cause **infectious diseases** are categorized as bacteria, viruses, fungi, and parasites.


Human Infectious Diseases and their causative agents
Bacteria
• Tuberculosis
• Pneumonia
• Streptococcal Infections
• Gonorrhea
• Scarlet Fever
• Tetanus
• Diptheria
• Pertussis
• Bubonic Plague
Viruses
• AIDS/HIV
• Influenza
• Herpes Simplex/Zoster)
• Hepatitis (all types)
• Common Cold
• Poliomyelitis
• Measles, Mumps and Rubella
• Infectious mononucleosis
Fungi
• Candidiasis
• Athlete's foot (Tinea pedis)
• Jock itch (Tinea cruris)
• Nail fungus (Tineu unguis)
• Ringworm
• Histoplasmosis
Protozoa
• Amebiasis
• Amebic meningoencephalitis
• Malaria
• Trichomoniasis
• Toxoplasmosis
• Giardiasis
• Balantidiasis
• Cryptosporidiosis
• Pneumocystosis
Helminthes/parasites
• Trichuriasis
• Hookworm
• Lympathic filariasis (Elephantiasis)
• Schistosomiasis (Bilharzia)
• Ascariasis

Pathway of penetration

The human body presents **three** large epithelial surfaces to the environment—the skin, the respiratory mucosa, and the alimentary tract, and two lesser surfaces—the genital tract and the conjunctiva


Infection
Paramyxoviruses
Rotaviruses
Papillomaviruses
Body surface
®
Lymph node
®
Blood
primary viremia
Movement of virions
Sites of shedding
No shedding
® Sites of replication
Bone
marrow
®
Liver
®
Spleen
®
Vascular endothelium
®
Blood
secondary viremia
Vectors of arboviruses
Respiratory tract
mucous membrane
®
Skin
®
Brain
®
Salivary gland
or kidney
®
Canine distemper
rinderpest
Lumpyskin
disease
Arbovirus and
canine distemper
encephalitis
Rabies (salivary gland only)
Arenaviruses
Cytomegaloviruses

E.N. Pavlovsky WORKS

HE Introduced the concept of natural nidality of human diseases, defined by the idea that microscale disease foci are determined by the entire ecosystem. This concept laid the foundation for the elaboration of a number of preventive measures and promoted the development of the environmental trend in parasitology (together with the works of parasitologist Valentin Dogel). Yevgeny Pavlovsky researched host organism as a habitat for parasites (parasitocenosis), numerous matters of regional and landscape parasitology, life cycles of a number of parasites, pathogenesis of helminth infection. Pavlovsky and his fellow scientists researched the fauna of flying blood-sucking insects (gnat) and methods of controlling them and venomous animals and characteristics of their venom.

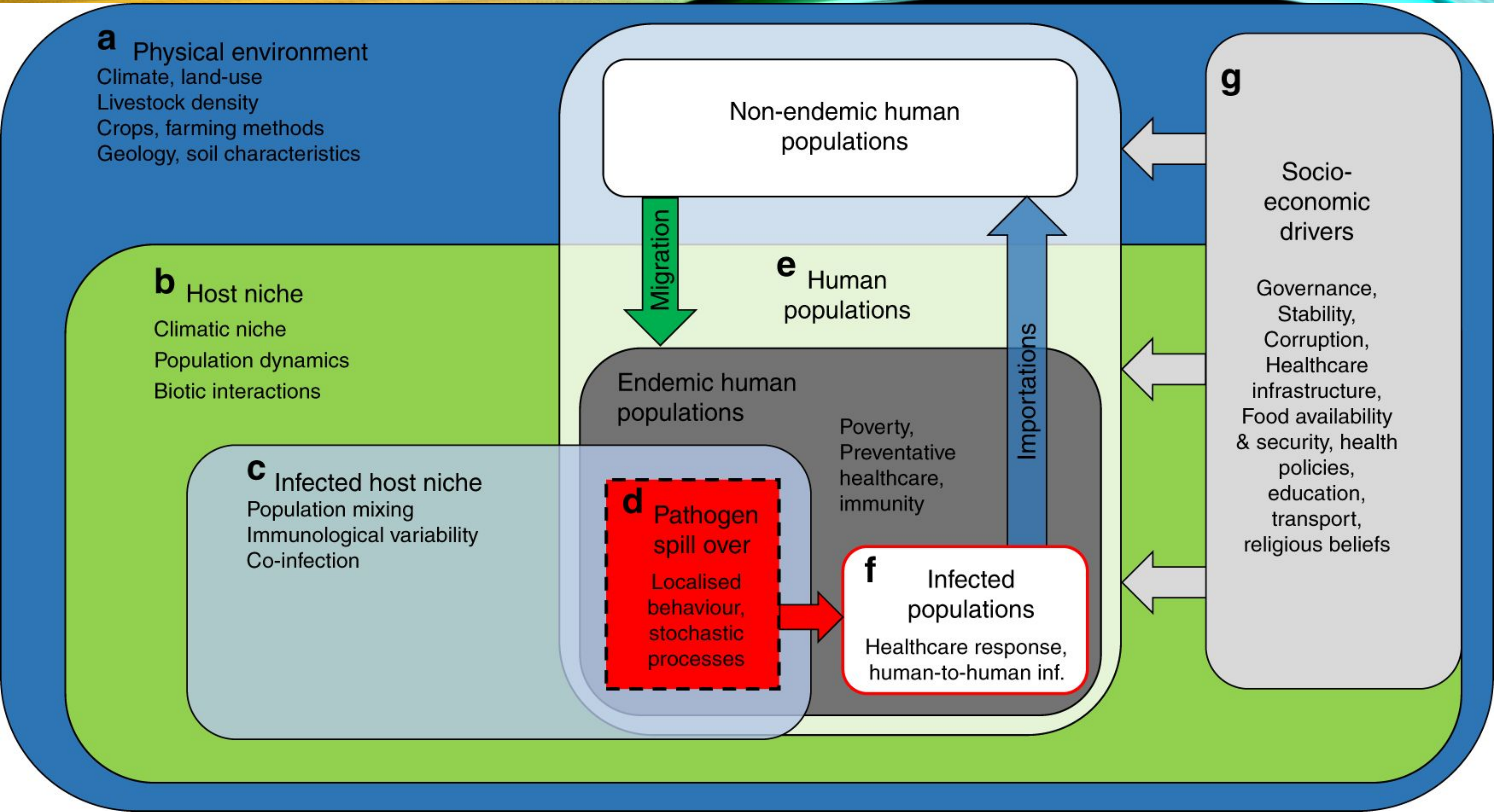
NATURAL FORCE DISEASEA

number of environmental factors influence the spread of communicable diseases that are prone to cause epidemics. The most important of these are:

- water supply
- sanitation facilities
- food
- climate.

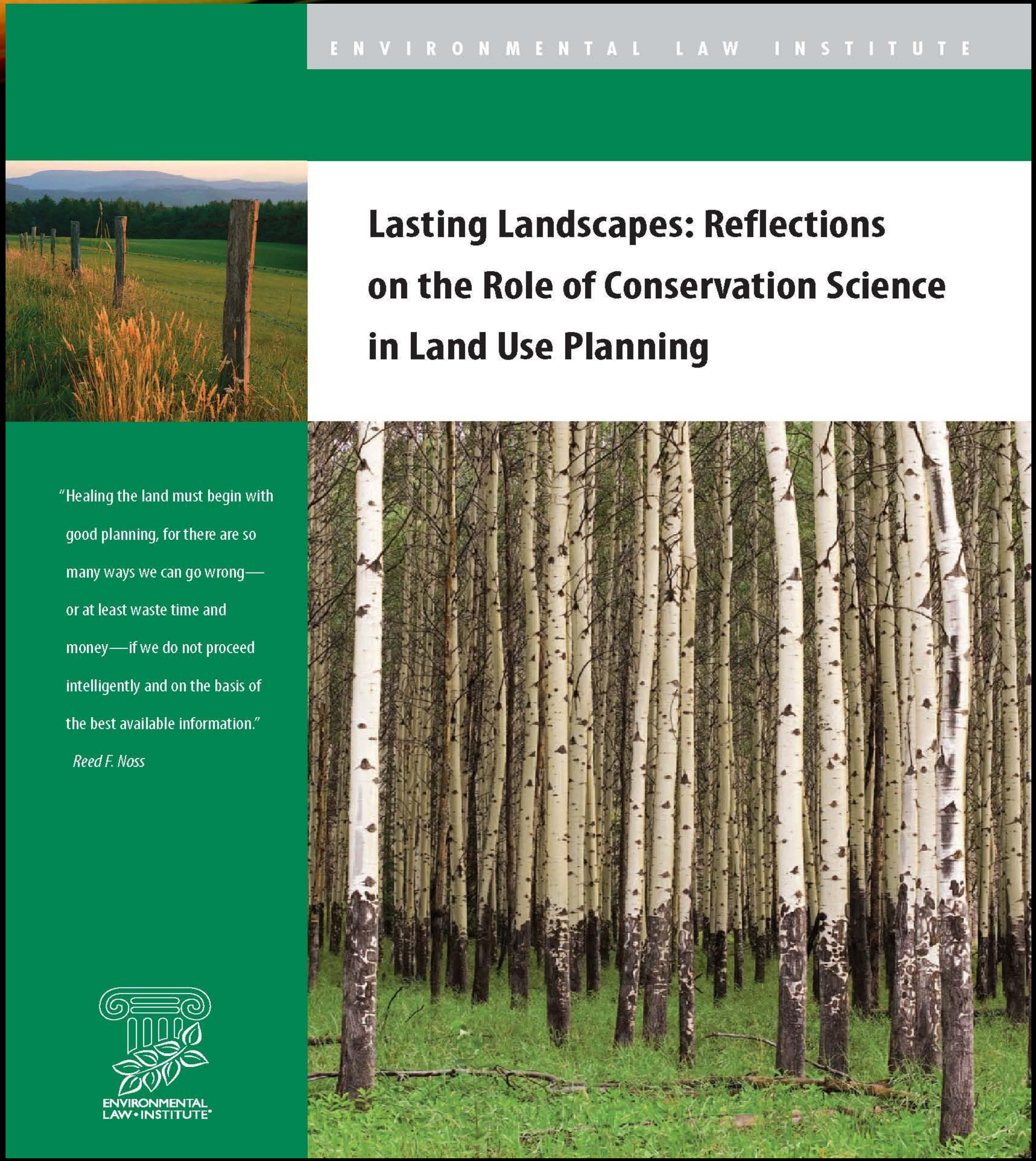
A lack of safe water, inadequate excreta disposal facilities, poor hygiene, poor living conditions and unsafe food can all cause diarrhoeal diseases. These diseases are a major cause of suffering and death in an emergency situation.

Climate can affect disease transmission in a variety of ways. The distribution and population size of disease vectors can be heavily affected by local climate. Flooding after heavy rains can result in sewage overflow and widespread water contamination. In addition, there is some evidence to suggest that pathogens can be spread from one region to another along air streams or by wind


a Physical environment
Climate, land-use
Livestock density
Crops, farming methods
Geology, soil characteristics
Non-endemic human populations
Migration
Importations
e Human populations
g
Socio-economic drivers
Governance, Stability, Corruption, Healthcare infrastructure, Food availability & security, health policies, education, transport, religious beliefs
b Host niche
Climatic niche
Population dynamics
Biotic interactions
Endemic human populations
Poverty, Preventative healthcare, immunity
c Infected host niche
Population mixing
Immunological variability
Co-infection
d Pathogen spill over
Localised behaviour, stochastic processes
f Infected populations
Healthcare response, human-to-human inf.

The basis of landscape science

it is the theory that the geographic **landscape** is the primary element in the physicogeo-graphical differentiation of the earth. ... Elementary geographic complexes are studied as parts of related, regularly structured territorial systems (**landscapes**).



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Lasting Landscapes: Reflections on the Role of Conservation Science in Land Use Planning

"Healing the land must begin with good planning, for there are so many ways we can go wrong—or at least waste time and money—if we do not proceed intelligently and on the basis of the best available information."

Reed F. Noss

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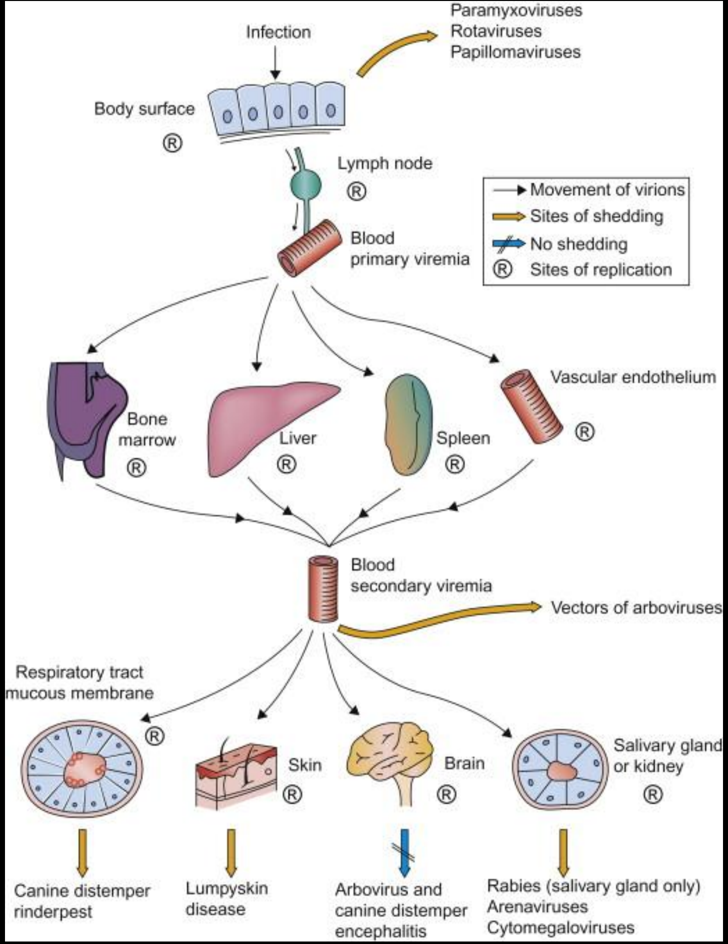
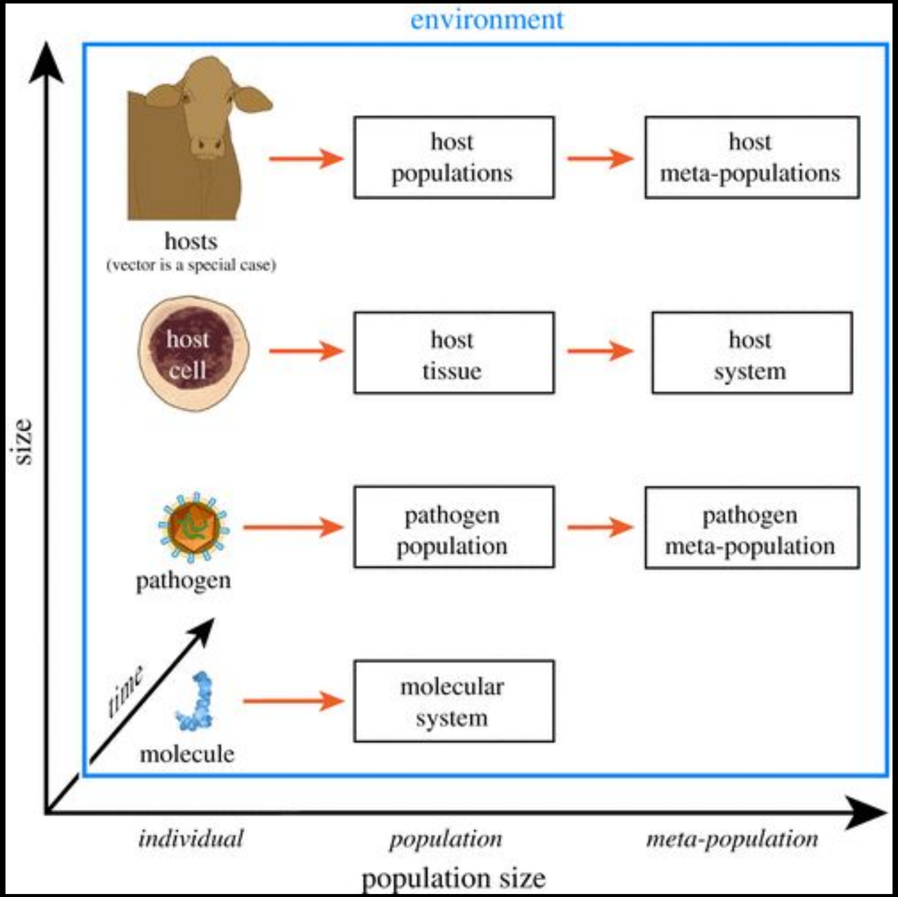
Dynamics of infectious and viral diseses

The dynamics of any infectious disease are heavily dependent on the rate of transmission from infectious to susceptible hosts. In many disease models, this rate is captured in a single compound parameter, the probability of transmission β. However, closer examination reveals how β can be further decomposed into a number of biologically relevant variables, including contact rates among individuals and the probability that contact events actually result in disease transmission. We start by introducing some of the basic concepts underlying the different approaches to modeling disease transmission and by laying out why a more detailed understanding of the variables involved is usually desirable. We then describe how parameter estimates of these variables can be derived from empirical data, drawing primarily from the existing literature on human diseases. Finally, we discuss how these concepts and approaches may be applied to the study of pathogen transmission in wildlife diseases. In particular, we highlight recent technical innovations that could help to overcome some the logistical challenges commonly associated with empirical disease research in wild populations.



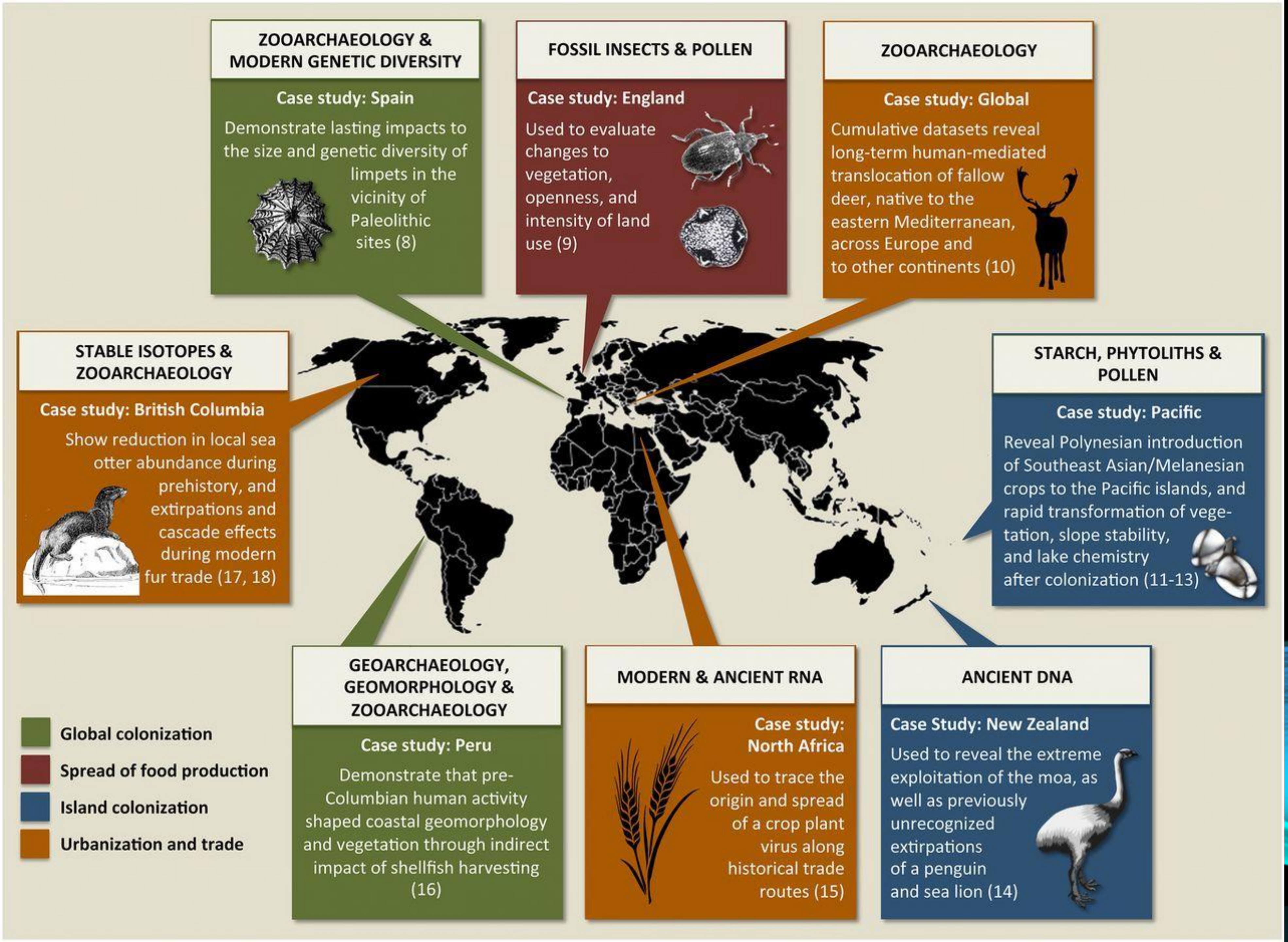
Infection
Paramyxoviruses
Rotaviruses
Papillomaviruses
Body surface
Lymph node
Movement of virions
Sites of shedding
No shedding
Sites of replication
Blood
primary viremia
Bone marrow
Liver
Spleen
Vascular endothelium
Blood
secondary viremia
Vectors of arboviruses
Respiratory tract
mucous membrane
Skin
Brain
Salivary gland
or kidney
Canine distemper
rinderpest
Lumpyskin
disease
Arbovirus and
canine distemper
encephalitis
Rabies (salivary gland only)
Arenaviruses
Cytomegaloviruses



environment
hosts
(vector is a special case)
host
populations
host
meta-populations
host
cell
host
tissue
host
system
pathogen
pathogen
population
pathogen
meta-population
molecule
molecular
system
size
time
individual
population
meta-population
population size

INVASIVE DISEASE RESULT OF ANTROPOGENESIS CHANGES

Invasive species are a major threat to the livelihoods of the people who live in the areas they colonize. Through disrupting ecosystems, **invasive** plants, insects and diseases impair many of the things **humans** need to sustain a good quality of life – including food and shelter, **health**, security and social interaction


ZOOARCHAEOLOGY & MODERN GENETIC DIVERSITY
Case study: Spain
Demonstrate lasting impacts to the size and genetic diversity of limpets in the vicinity of Paleolithic sites (8)
FOSSIL INSECTS & POLLEN
Case study: England
Used to evaluate changes to vegetation, openness, and intensity of land use (9)
ZOOARCHAEOLOGY
Case study: Global
Cumulative datasets reveal long-term human-mediated translocation of fallow deer, native to the eastern Mediterranean, across Europe and to other continents (10)
STABLE ISOTOPES & ZOOARCHAEOLOGY
Case study: British Columbia
Show reduction in local sea otter abundance during prehistory, and extirpations and cascade effects during modern fur trade (17, 18)
STARCH, PHYTOLITHS & POLLEN
Case study: Pacific
Reveal Polynesian introduction of Southeast Asian/Melanesian crops to the Pacific islands, and rapid transformation of vege-tation, slope stability, and lake chemistry after colonization (11-13)
GEOARCHAEOLOGY, GEOMORPHOLOGY & ZOOARCHAEOLOGY
Case study: Peru
Demonstrate that pre-Columbian human activity shaped coastal geomorphology and vegetation through indirect impact of shellfish harvesting (16)
MODERN & ANCIENT RNA
Case study: North Africa
Used to trace the origin and spread of a crop plant virus along historical trade routes (15)
ANCIENT DNA
Case Study: New Zealand
Used to reveal the extreme exploitation of the moa, as well as previously unrecognized extirpations of a penguin and sea lion (14)
Global colonization
Spread of food production
Island colonization
Urbanization and trade

POISON AND ALLERGEN OPF PLANT AND ANIML ORGIN AND THEIR EFFECT ON HUMAN BODY

The following classification, which is based on **their toxic effects**, has been ... photosensitization, and (4) **plants** that produce airborne **allergies** (see Table 6). ... death; responsible for many **human** fatalities; leaves most **toxic** when **plant** is flowering ... may also cause an eczematous dermatitis of **the** exposed parts of **the body** ...

Natural Toxins

- They are naturally present in plants & animals.
- The long term ingestion of natural toxins in commonly eaten foods → the risks to human health?
- Usually, natural toxins are not acutely toxic, except in a few cases in animals.
- Most of the natural toxins, particularly those occurring in plant-derived foods, induce adverse effects only after chronic ingestion or by allergic reactions.

THANK YOU MAM