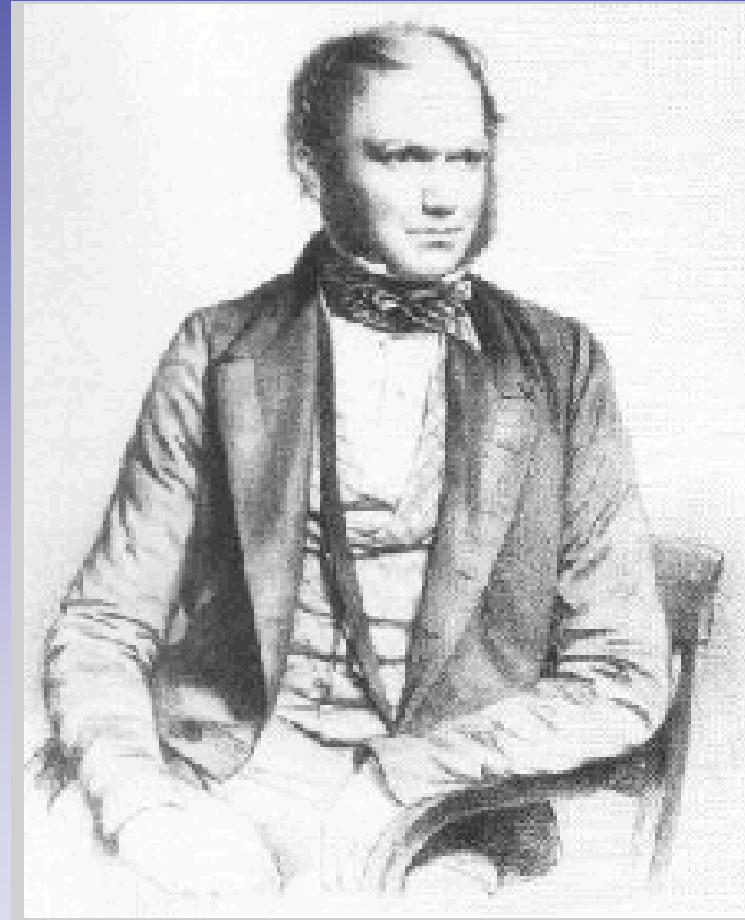


BIOLOGY



Maths in Biology

- Ecology
- Physiology & Ontology
- Genetics
- Evolution (phylogenetics)
- Bioinformatics
 - Genomics
 - Proteomics

John Trueman, Dept Botany and Zoology

John.Trueman@anu.edu.au

www.anu.edu.au/BoZo/trueman/labsite

Ecology

Interactions among species

- Species
- Environment
- Perturbations

Mathematical modelling

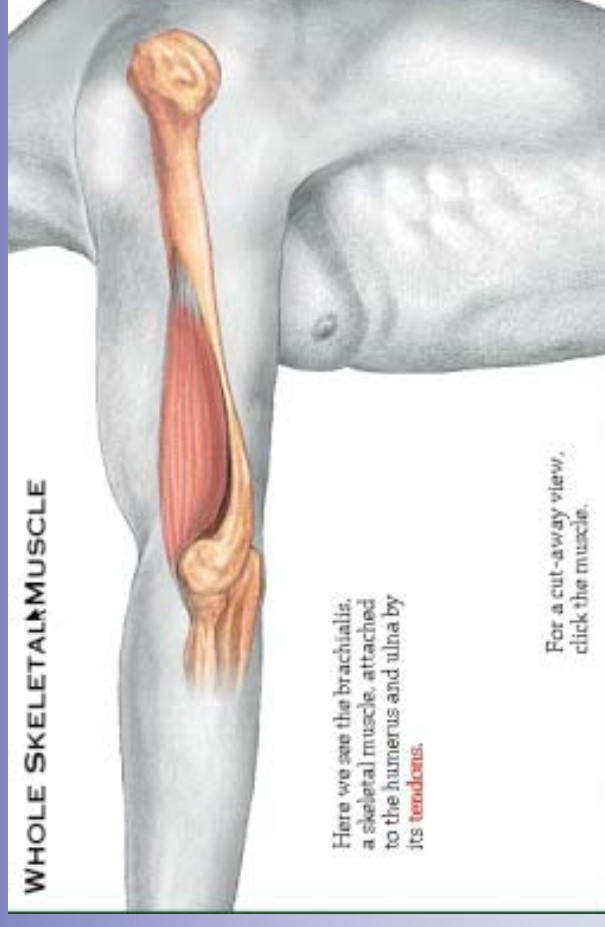


Physiology & Ontology

Energy - physical flows

- Functioning of tissues/organs
- Interactions of tissues/organs
- Patterns of growth & stasis

Mathematical modelling

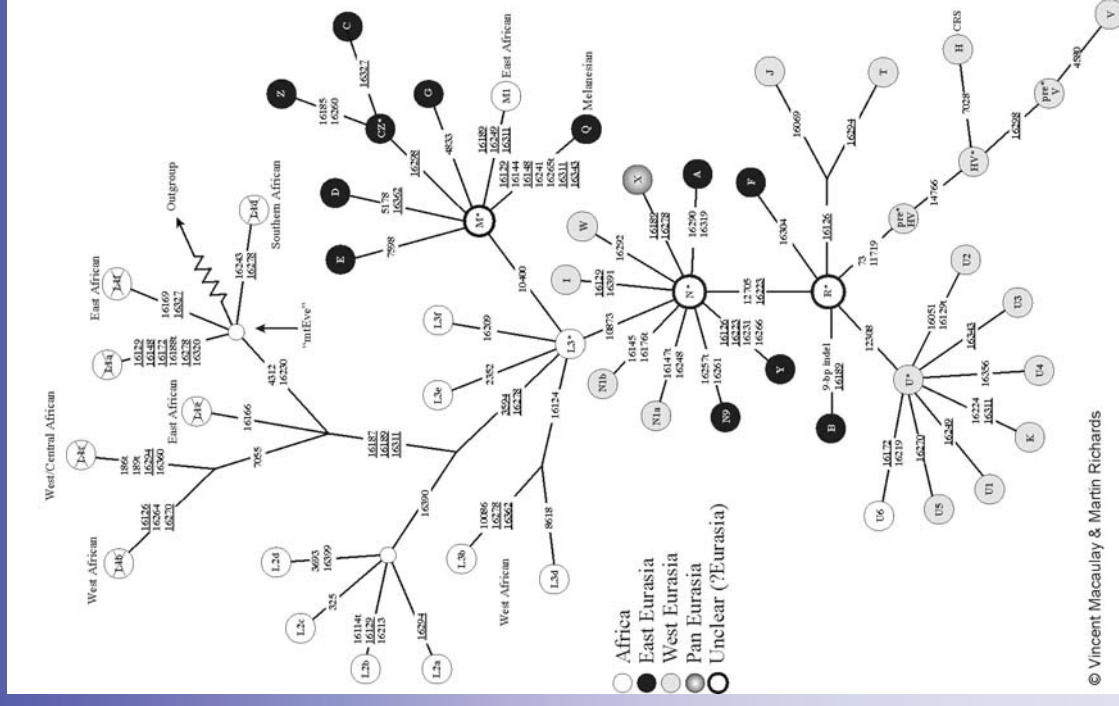


Genetics

Population genetics

- inheritance
- alleles
- selection
- disequilibrium

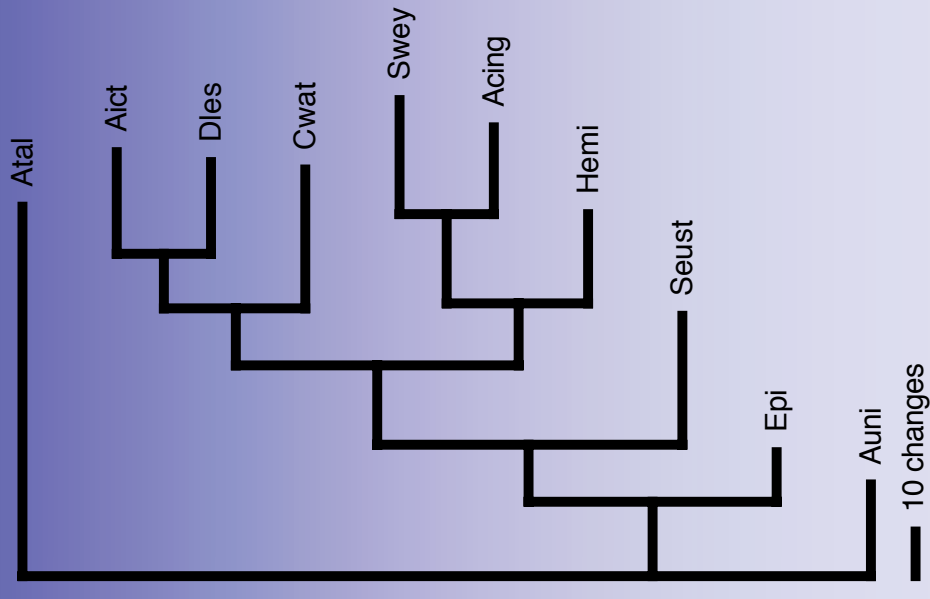
Mathematical modelling



Evolution (phylogenetics)

Evolutionary trees

- Acyclic digraphs
- NP-complete problems
- Statistics of tree-shaped hypotheses ...



Bioinformatics

Genomics -- molecular sequences

Proteomics -- what they code for

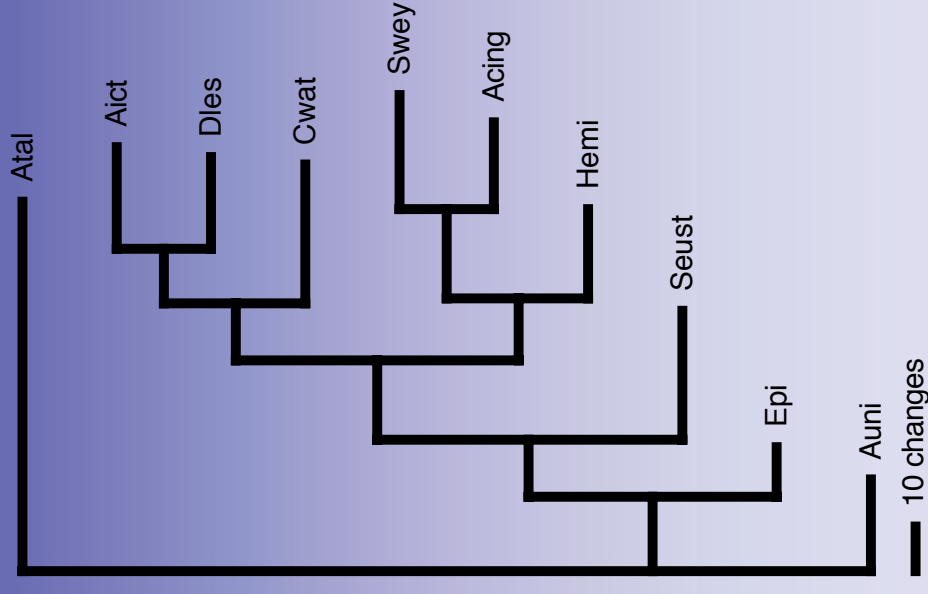
Whole field thoroughly mathematical

All downstream molecular biology

Human genome

Other genomes

Sequences and sequence products at
all levels of expression/ integration ...



Bioinformatics

Genomics -- molecular sequences

Proteomics -- what they code for

- Massive data flows
- Gene searching/identification
- Gene regulation
- Patterns of expression
- Medical and industrial ...

