

Time of Death

Skeletal remains

Fluorescence



Fresh bones



Fluoresce



Old bones



Do not fluoresce

Vampire skeleton

Time of Death

Elemental analysis

FUN analysis



Fluorine



Uranium



Nitrogen

Fingerprints

Fibre Analysis

Poison

Blood

FUN analysis

Fresh bones



Nitrogen



4% by weight

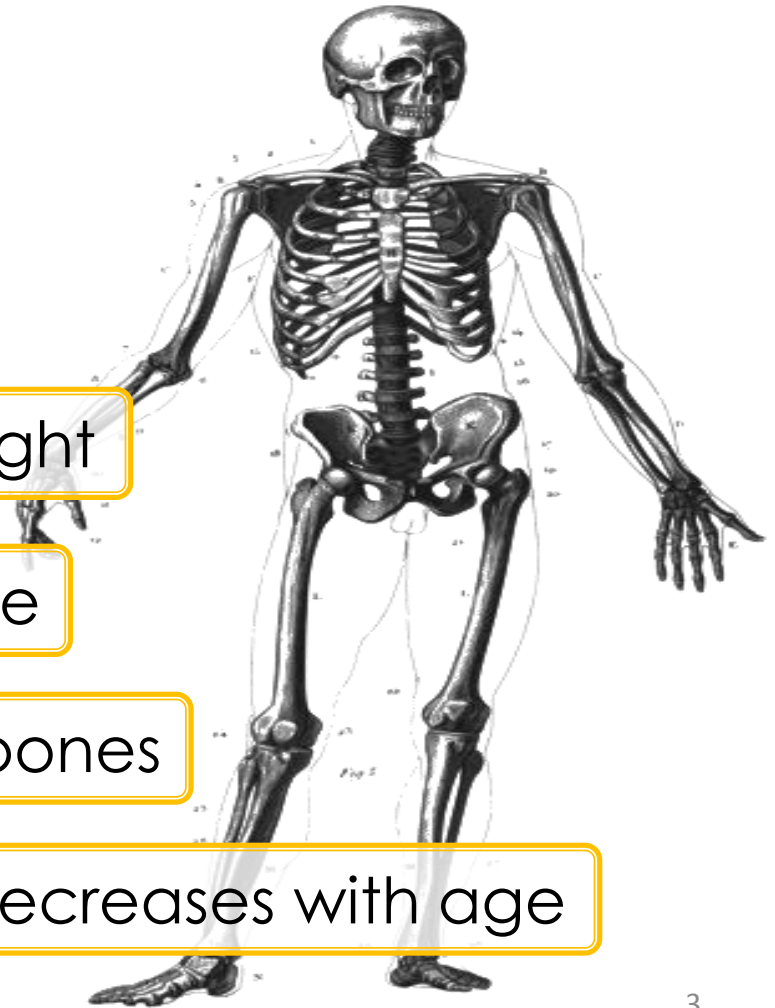
Proteins break down with time



Nitrogen diffuses out of bones



Bone nitrogen content decreases with age



FUN analysis

Fresh bones



Fluorine & Uranium



0% by weight

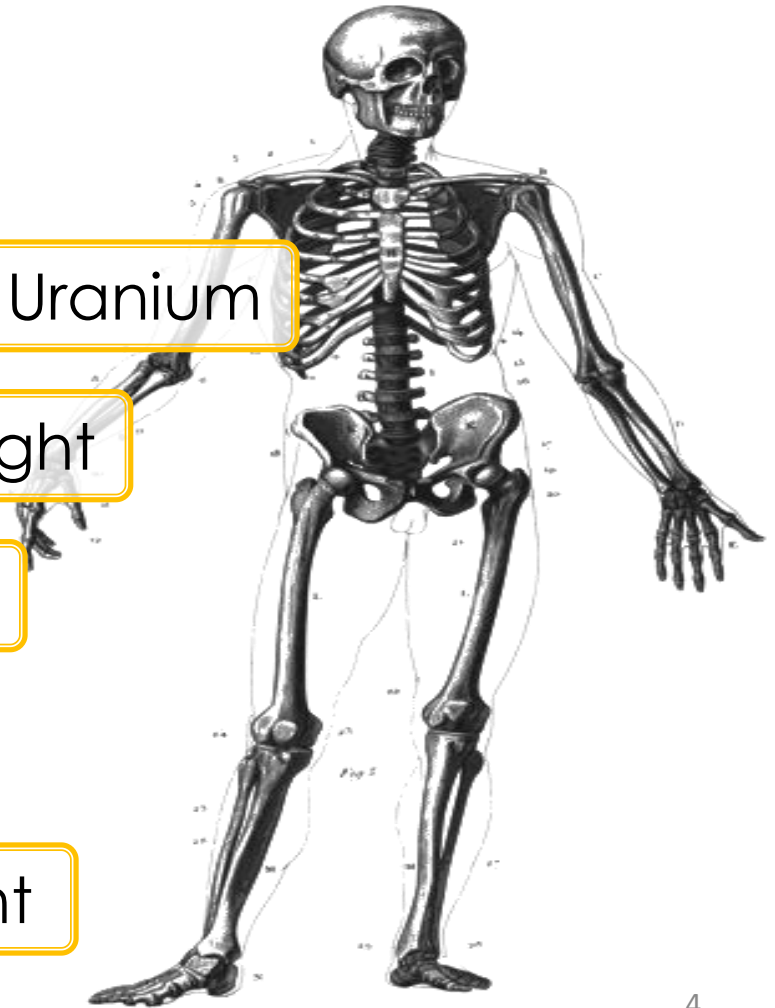
Absorbed from groundwater



Increases with age



Depends on environment



FUN analysis

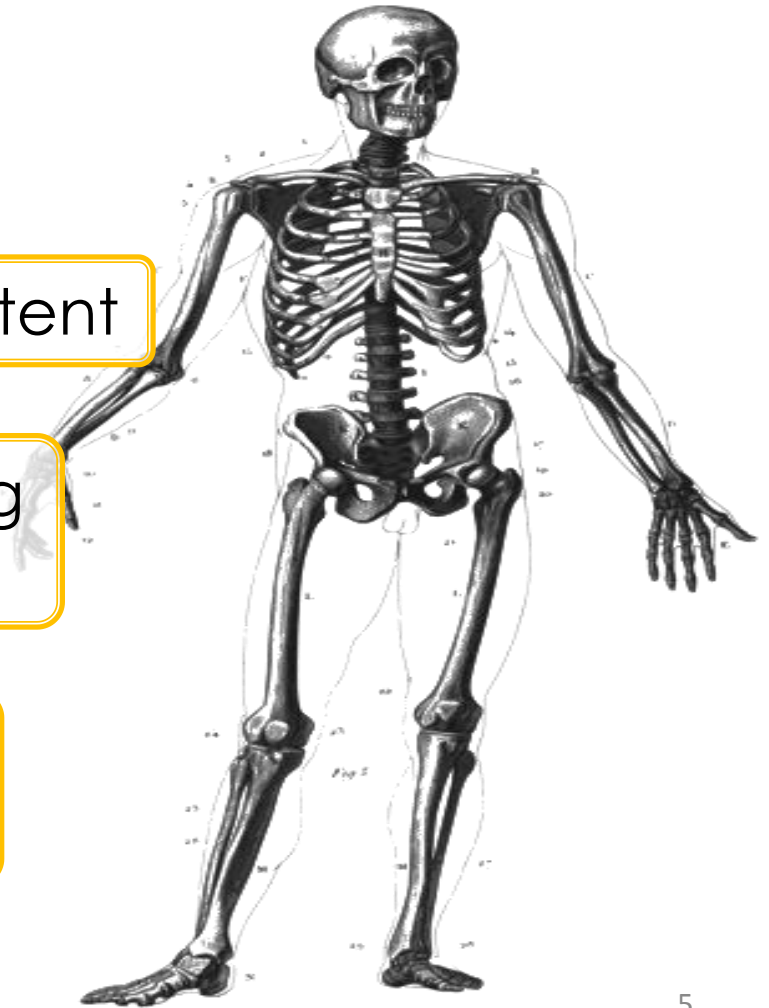
Bone Fluorine & Uranium content



Useful only for comparing samples from **same** site



F and U in groundwater or minerals is variable



Pittdown Man

Ancestors of *homosapiens*

Germany



Neanderthal man



Neanderthal Man

Piltdown Man

Ancestors of *homosapiens*

Germany

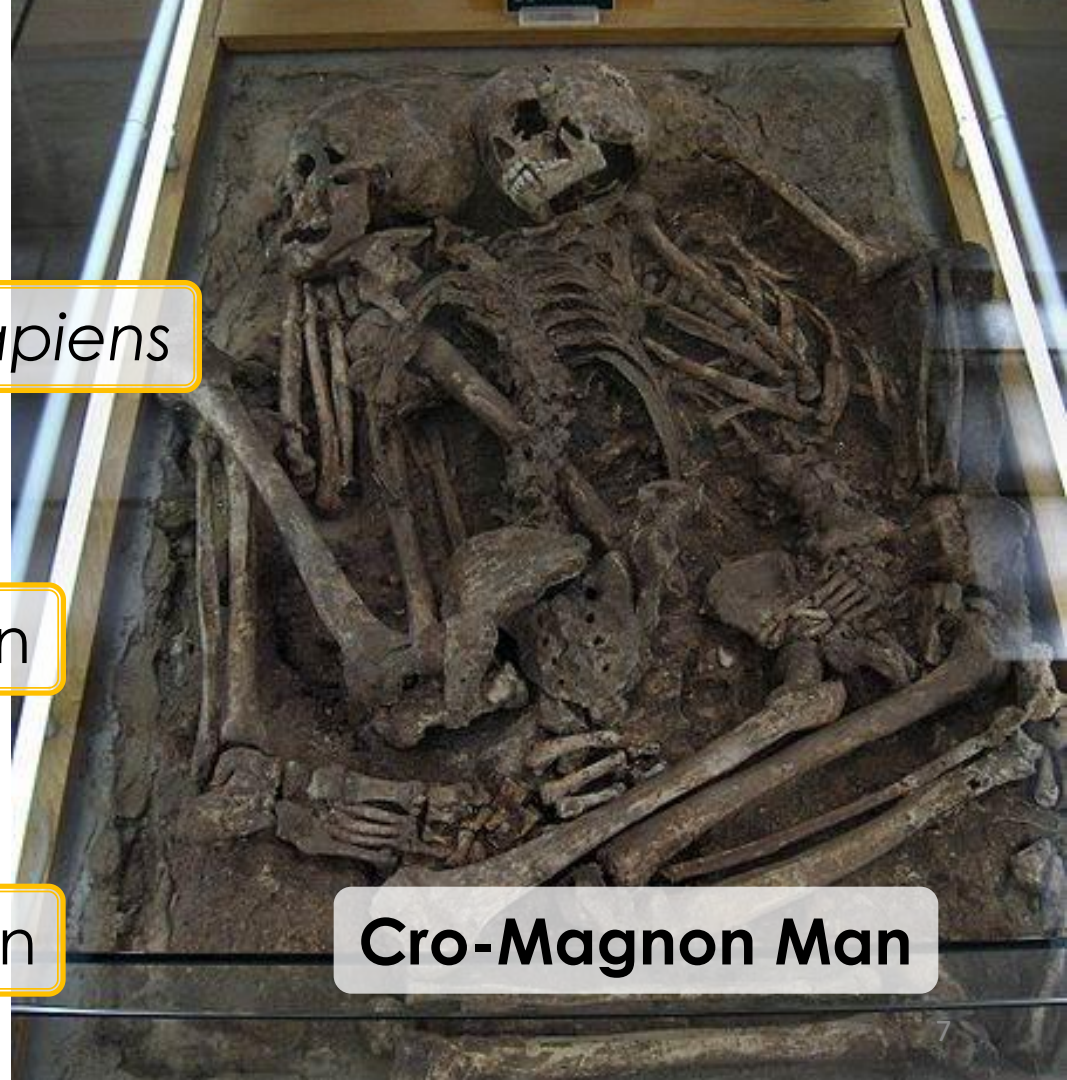


Neanderthal man

France



Cro-Magnon man



Cro-Magnon Man

Piltdown Man

Peking man



Peking Man

Pitldown Man

Peking man

Java man

Java Man

Piltdown Man

Britain?



1912 - 1915

2 humanoid fragments



Claimed to be
500 000 years old



Map of Piltdown

Piltdown Man

Skull fragment

Jaw fragment

Brain evolved
before jaw?



Piltdown Man

Pitdown Man

Late 1940s



Sent for fluorine & nitrogen analysis

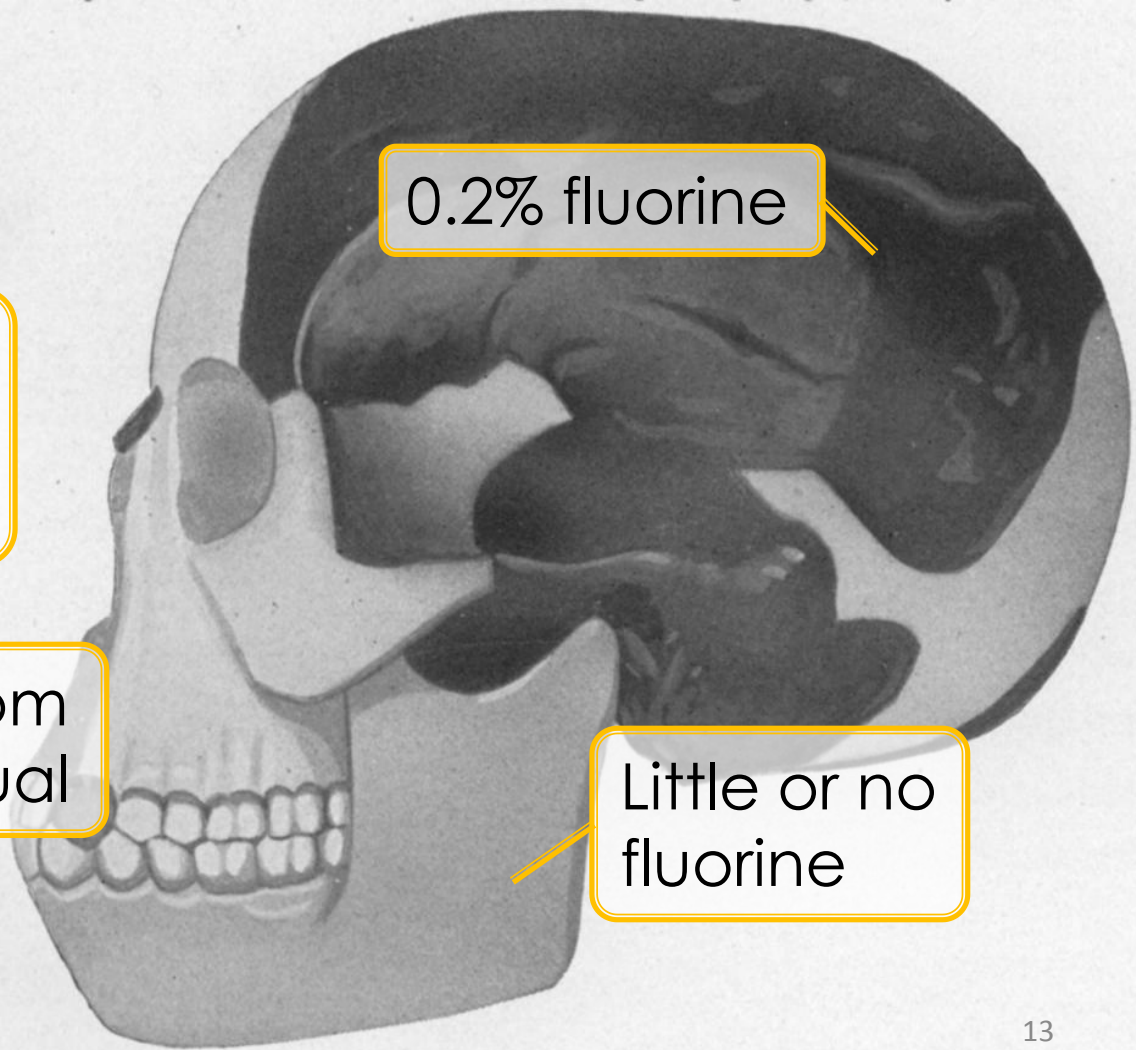
Piltdown Man

Bone pieces not
around for same
length of time

Fragments not from
the same individual

0.2% fluorine

Little or no
fluorine



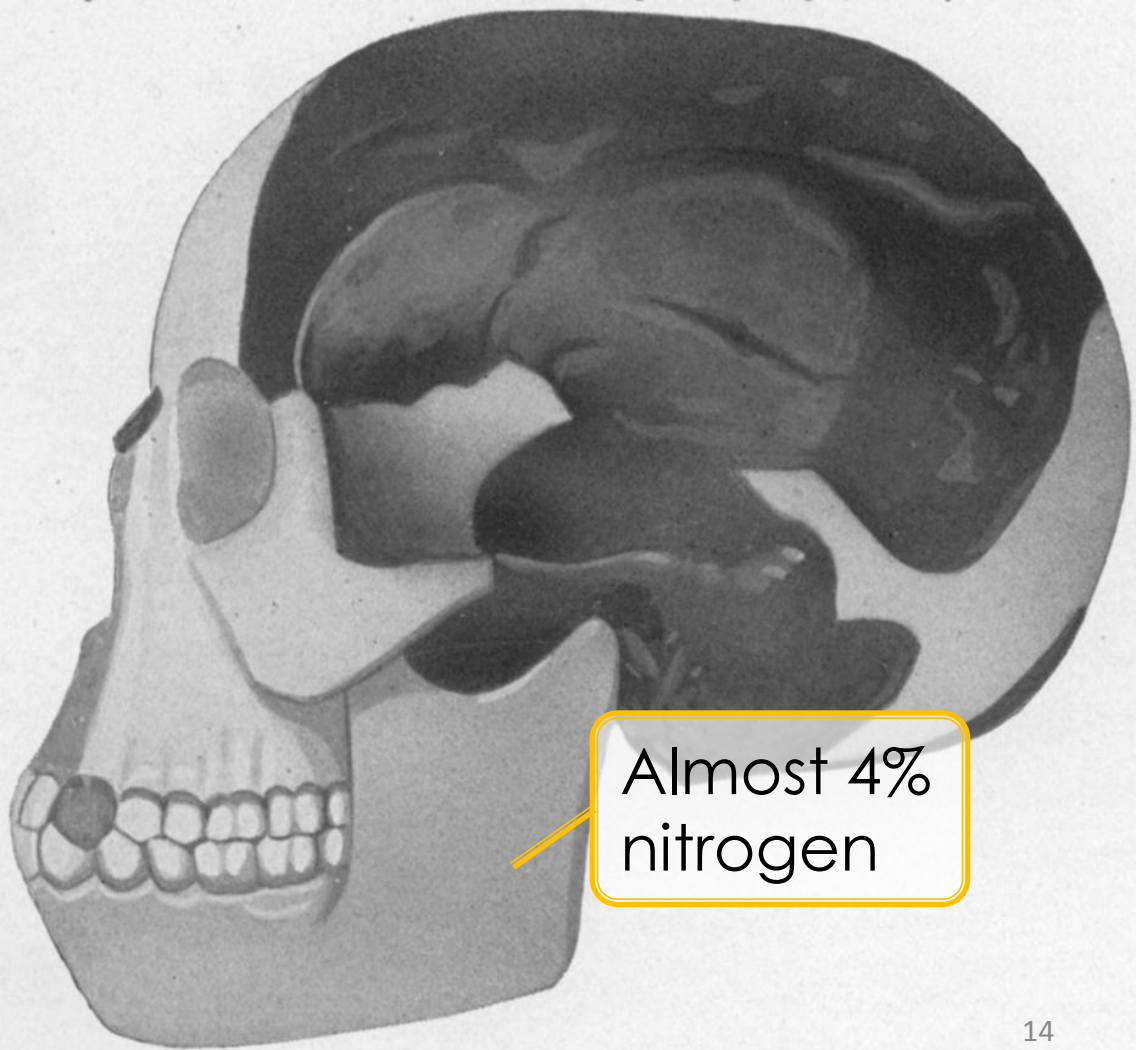
Pitldown Man

Jaw = modern
piece of bone



Modern
orang-utan

Skull = old
human bone



Almost 4%
nitrogen

Pitdown Man

One of most famous examples of scientific fraud



Exposed by chemical analysis