

# Evolution & Intelligent Design

## Session 4

### Morphology as Evidence of Evolution

Morphology has helped scientists discover evolutionary relationships back to very early versions of the horse, between the sabre tooth tiger and other members of the cats, etc.

Some pose an evolutionary relationship between certain reptiles and birds. Both have a lateral torso. Both have the same stance on articulated limbs. Both have a similar number of splayed toes. Both have a head protruding laterally from the horizontal body.

Ironically, this is where requests for proof become consistently disappointing.

### Whale Evolution

A striking case is the use of morphology for the ancestor of the whale. Scientists propose that the ancient evolutionary ancestor of the blue whale is a land mammal looking very similar to a fox – *pakicetus*.



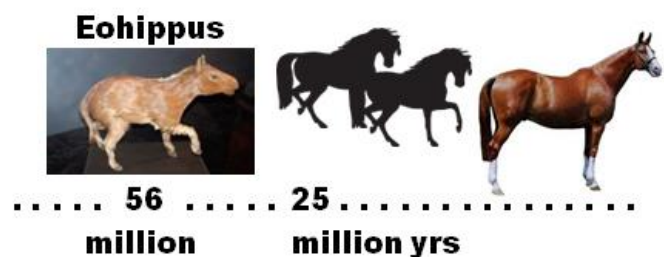
### Evolution of the Horse

Evolutionists claim that the horse serves as an iconic diagram of microevolution becoming macroevolution. For many others it remains just microevolution simply because one begins with what is a very horse-like animal and ends with a horse-like animal, i.e. we start and end with horse-like creatures.

A normal expectation is to get beyond the horse-like form into a period like the Jurassic - and see if there is an ancestor among the reptiles.

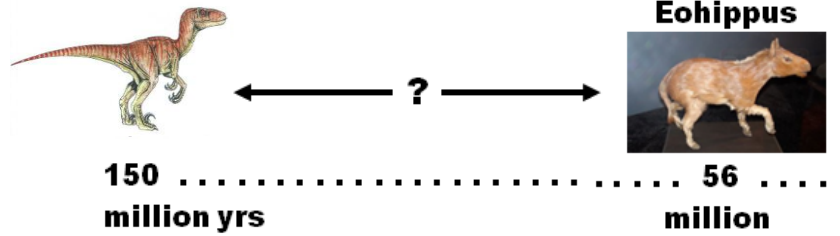
Here we see the modern horse going back in the fossil record as much as 25 million years, unchanged.

At 56 million years we find the most primitive form of horse and some transitional forms between Eohippus and the modern horse (not shown).



But how do we get back from Eohippus into the Jurassic?

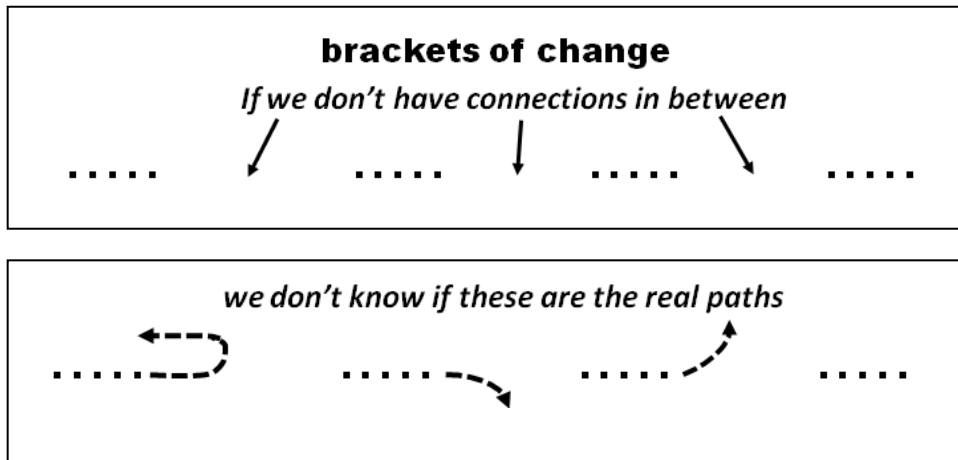
In this case, we have no universally agreed fossil forms to span this gap, meaning we have a case of bracketed evolution, where horse-like starter forms end up very horse-like at the end.



Evolutionists notoriously trot out examples like these as macroevolution at work, when to the average person they appear without the prejudice of evolution to be instances of microevolution.

When asked to fill in the gaps, many evolutionists smile, laugh or become sarcastic, as if to show that such requests are no longer needed, or are unnecessary if you are a scientist.

But without the connective lineage, we have the following:

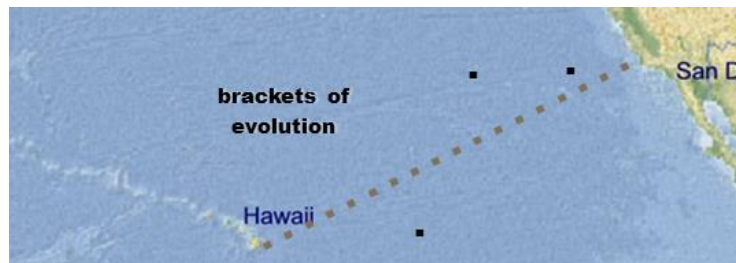


*Bracketed Development - The Only Proofs Offered*

**Stephen Meyer's example** (*Darwin's Doubt*, pg 93)

A swimmer makes the bold claim that it is possible to swim from California to Hawaii, taking weeks or even months if one stopped at way stations for rest and refreshment.

Instead of offering evidence of archipelagos arrayed across the Pacific at one day intervals, the swimmer instead offers but a couple barren atoll's, considerably off course.



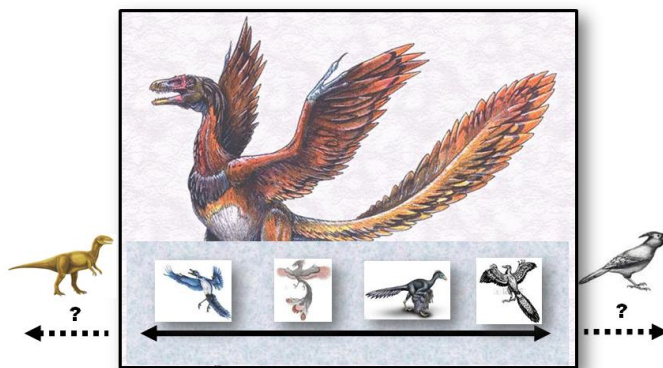
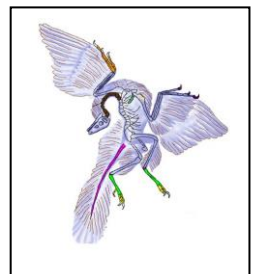
Because they believe that macroevolution is essentially microevolution occurring over longer periods of time, they consistently appeal to bracketed events of microevolution **and** the intervening assumptions needed to fill out the picture. The assumptions are not viewed as naked assumptions, but as proper because they exemplify a theory already accepted as fact.

Thus we get the example of eohippus developing into the modern horse, grizzly bears evolving into polar bears, the Galapagos finches, nothosaurs into plesiosaurs, etc. But visually we end up seeing animals whose beginning and end are remarkably horse-like, bear-like, finch-like, and plesiosaurish. All of which are great examples of microevolution or small-scale speciation, but hardly the kind of evidence that demands macroevolution has occurred.

### Reptile-to-Bird Evolution

Science now claims to have filled in many of the gaps with transitional fossils unknown in prior decades. But whether these are transitionals remains open to question. Evolutionists see them as unmistakably transitional. Creationists continue to see them as major leaps along an imaginary path between life forms.

Logical expectations of a transitional form would be visible vestiges of its predecessor along with hints of its successor. Archaeopteryx is one of the paradigms for transitional forms: it has vestiges of its supposed reptile predecessor and features of its successor – birds.



Here are the commonly stated transitional forms that tell the developmental story for Archaeopteryx – the transitional form between reptiles and birds.

Yet the forms are bracketed within the spectre of archaeopteryx-like creatures and lack transitional forms that get us anywhere near the reptile he came from or the bird he supposedly evolved to.

As such, the example of the horse and the reptile-to-bird transition don't meet the basic expectations of a transitional form, because where they need to prove their connection to either end, they lack the fossil evidence.

## Reptile-to-Mammal Transitional Forms - Supposedly Complete

Now take the evolution of reptiles to mammals, claimed to do the same thing. According to paleontologists like Carroll, "We also have an exquisitely complete series of fossils for the reptile-mammal intermediates, ranging from the pelycosauria, therapsida, cynodonts, up to primitive mammalia" Carroll, R. L. (1988) Vertebrate Paleontology and Evolution. New York: W. H. Freeman and Co.

Let's see how exquisitely complete this list is.

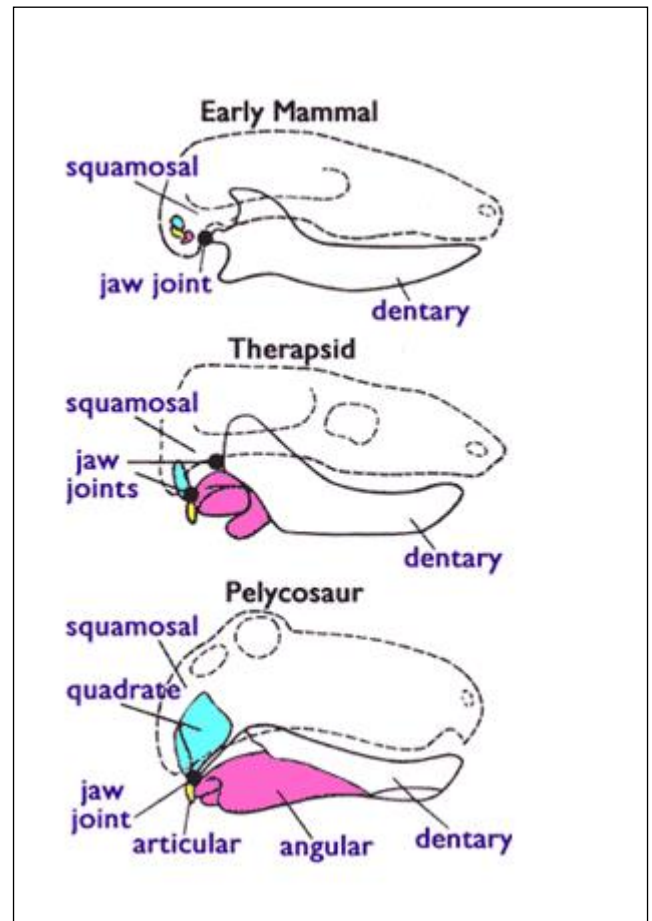
At the bottom we have a *pelycosaur*, then a *therapsid* thought to be at the mid-point between reptiles and mammals. Finally an early mammal (top).

Of note are the various arrangements and forms of the bones of the jaw and jaw joints.

The reptile has a lower jaw bone (dentary) that narrows and rises slightly toward the rear. The dentary bone doesn't have direct contact with the jaw joint but contacts via the other bones. The angular bone is fat and tapering.

The therapsid extends the dentary bone horizontally to the rear and rises high toward the squamosal. The angular bone (pink) has shrunk and appears folded back on itself in a circular form. There are also two jaw joints.

The mammal has reverted back to one jaw joint, the angular bone is all but gone, the dentary is a three-pronged form with one point attaching to the jaw joint.



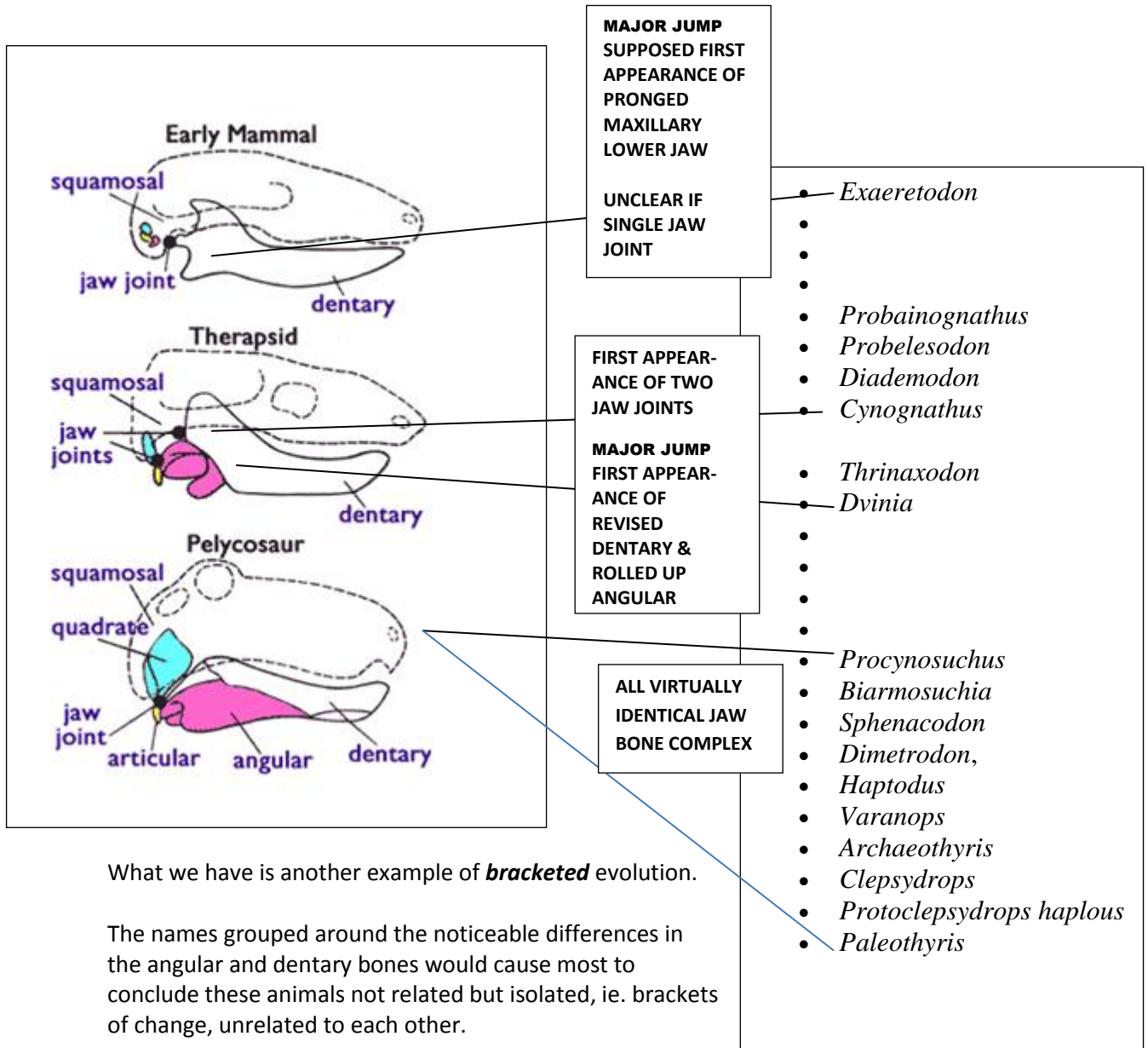
Since Carroll claims there is an *exquisitely complete* series from reptile to mammal, it's obvious the three examples are only stops along the way.

Here then is a more complete list of *unassailable* transitional animals spanning evolution across these three forms. As you can see, they are hardly gradual steps along the path

*Dvinia* (middle group) is the first form showing the change in the dentary and angular bones. Yet all the immediate forms leading up to it are not gradual transitions but have virtually

identical jaw structures to *pelycosaur*. Which means *Dvinia* makes a considerable leap from its predecessor *Procynosuchus* with no transitionals between.

The appearance of the mammalian three pronged lower jaw and a return to one joint is also a leap from the therapsids without transitionals between.



What we have is another example of **bracketed** evolution.

The names grouped around the noticeable differences in the angular and dentary bones would cause most to conclude these animals not related but isolated, ie. brackets of change, unrelated to each other.

## The Problems of Morphology (cont.)

Another difficulty morphology cannot overcome is that it is restricted to analysis of skeletal or hard part remains. Many claims of evolutionary ancestry involve development and mutations in the soft parts of organisms.

Take our friend Rocky J. Squirrel. His key divergence or adaptation is his extra folds of skin that give him aerodynamic back pressure to glide to safety. Were he extinct, we would have no way to tell that he ever existed.

## Problem B – Inadequacy of the Fossil Record - Contradictory Field Data from Predictions

The key predictions for future research and data collection were:

- **prediction of innumerable transitional forms in the fossil record**

The major criticism from scientists at the time was the notable lack of transitional forms, and instead the rather abrupt appearance of life forms full formed. This was countered with the precariousness of fossilization and the period of *stasis* would have more candidates than the brief time of transitional appearance.

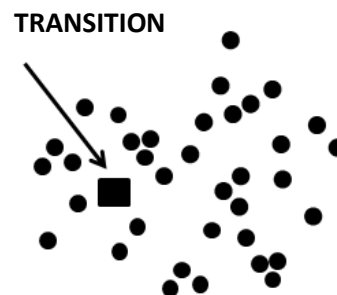
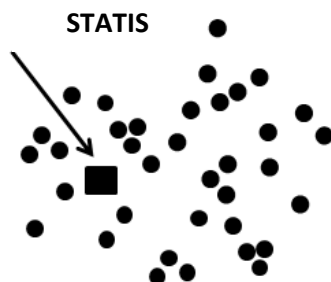
Question: if everything is a transitional then all transitionals move to stasis where the candidates have better chances to be fossilized. Why don't we see them?

The standard answer is that the transitional period is shorter therefore the chances of accidental fossilization are much rarer. In stasis, organisms are stable for long periods of time between transition periods, so fossilization events have more opportunities to occur then.

Take velociraptor who will develop his extra claw. He receives an early mutation at far right.

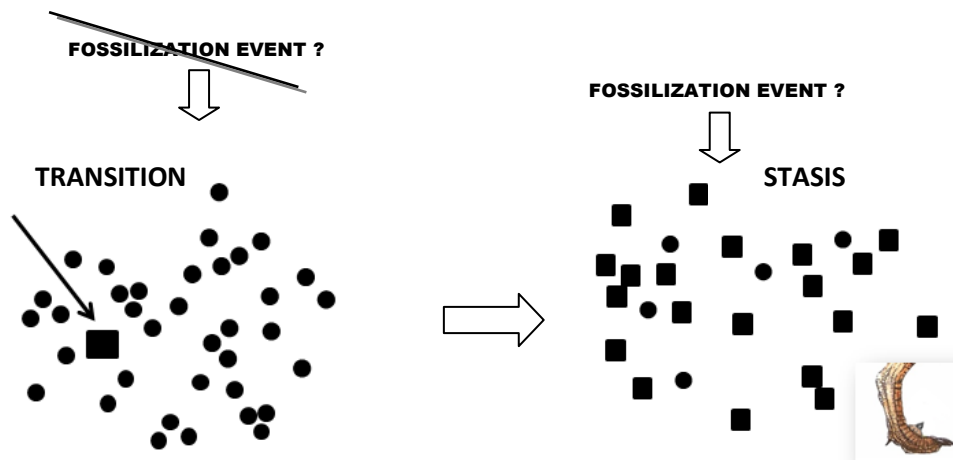
Our velociraptor is originally part of a herd that is in stasis – no mutations have been occurring.

Then the mutation for the claw occurs and we move to transition



Since fossilization is extremely rare and the period of transition is brief, evolutionists claim there is little expectation of finding transitional fossils.

But as velociraptor undergoes natural selection, his adaptation becomes dominant. He moves into a period of stasis. According to evolutionists, this period of dominance and stasis is where accidents of fossilization primarily occur. Therefore, the adaptation should be captured by a fossilization event because it is now plentiful in the population, i.e. every member has the new promontory point on their theropod foot.



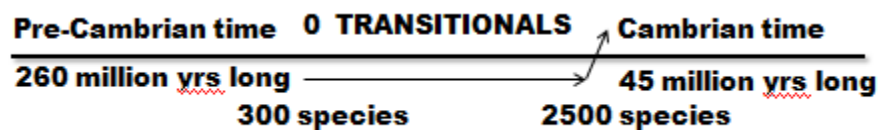
But we don't see the transitional form in the fossil record, which means the fossil record represents something else or the principle of evolution and transitional forms is mistaken.

- **the fossil record should only stop where the simplest ancestors would be least fossilized (soft-bodied organisms)**

Meaning, there is no expectation of abrupt termination during well-developed stages.

Organisms that are still quite developed therefore have an evolutionary expectation of predecessors, since it was never established that the simplest soft-bodied forms could be the immediate predecessors of well-developed hard-bodied forms.

In the transition between the Pre-Cambrian and Cambrian periods, we have just such a dilemma. As we go further back in time, well-developed life abruptly ends at the Cambrian, with no evidence of earlier predecessors expected by the theory. Called the Cambrian Explosion, even Darwin along with his critics agreed this was a major setback for the theory.



We have an explosion of life forms in the Cambrian for which there are no transitional adequate to be ancestral parent forms.

The richest treasure of fossils for the Cambrian is in the Burgess Shale in the Canadian Rockies.

What keeps a connection open between periods is that not enough time has been available thus far to discover more.

While it's true that more Pre-Cambrian fossils have been discovered since, they still remain poor in number and still do not fill in the types expected as ancestors of the Cambrian.

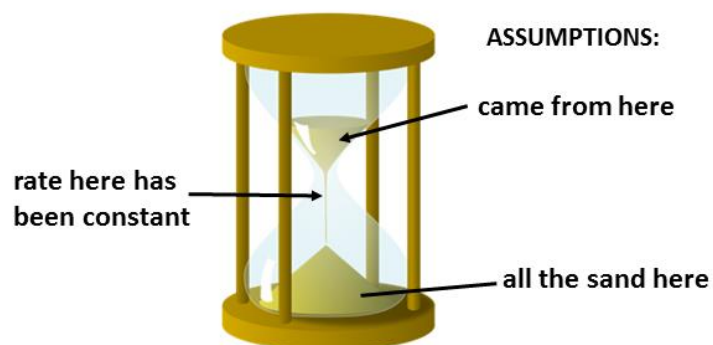
- **dating fossils in their sedimentary layers**

Folks assume that age-dating techniques date the fossils and establish the ages for the dinosaurs or the first appearance of birds, etc. But the clock in all organic life (carbon-14) does not extend back as far as the supposed age of the dinosaurs, so it would give a false age in accord with a younger earth – not because the fossil is that young but because the precision of the tool is useless were the sample to be older.

Scientists therefore try to measure the age of the fossil by measuring the age of the sediments in which the fossil is trapped. But this would be a mistake for two reasons: 1) the age of the rocks is not the age when the fossil was buried, and 2) - sedimentary rocks (where fossils are found) are not radioactive.

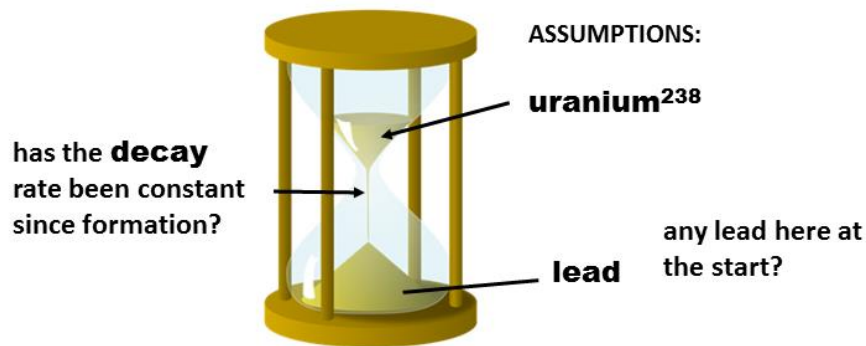
#### *How Age Dating Works*

A simple example is the hour glass helps. Here the sand in the bottom of the glass is assumed to have come from the upper chamber and the flow of sand has been at a constant rate, i.e. all the sand transferred in one hour's time at a constant rate.





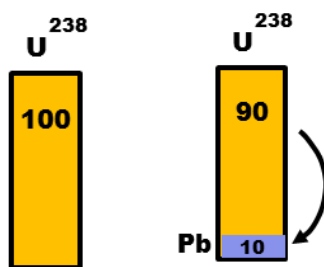
In the case of radiometric dating, scientists substitute radioactive minerals like Uranium<sup>238</sup> and lead. And the rate of the transfer is the half-life of the parent element – Uranium.



Here are the half-lives of the primary dating systems, which help determine how much time has passed, based on how much daughter material is present in the rock

Carbon 14	5,730 yrs 7 times – 40,000 yrs
Uranium-lead	4.5 billion yrs
Rubidium-Strontium	48 billion yrs
Potassium-argon	1.25 billion yrs

Rocks that are radioactive have materials that are slightly different from the stable materials they differ from. Radioactive rocks which contain lead also contain an isotope of lead called thorium or uranium (extra protons). Thorium and uranium decay into stable lead at a known rate and this can be used to calculate backwards to when the rock was originally formed.



But this would be the wrong date for the fossil, since the date we are looking for is when the fossil was trapped in the material that became rock under pressure.

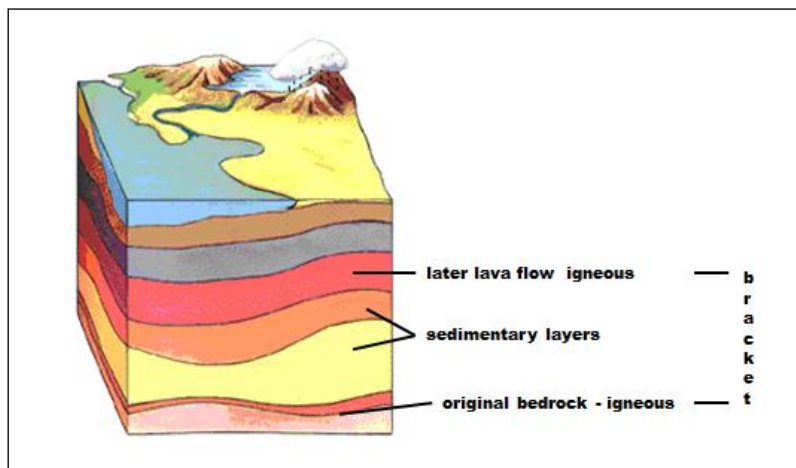
### *Sedimentary Rock Not Radioactive*

Processes that make originally radioactive rock become part of sedimentary rock almost always destroy the radioactive nature of the sediment – usually from long exposure to water which can leach out the radioactive elements.

But even if they retained their radioactive quality, sedimentary rock would be a mix of many rocks with different dates of original formation, preventing anything conclusive about its age.

### *Dating Sediments and Fossils in a Range of Radiometric Rock*

Geologists must resort to dating adjacent rock that is radiometric – above and below the sediments containing fossils. Since these contain radioactive clocks, their dates for formation above and below would form a bracket of time, in between which the sediments were laid down with their fossils. Scientists must extrapolate the age of a particular sediment by assuming the time it took to lay down sediments up to the level containing the fossil. Assisting this is knowing the types of sediment in the layers and what processes laid them down. Ex. Sandstone takes a different amount of time than sedimentation in water. Shale takes less time than limestone.



### *Use Carbon-dating to Establish Young Earth in Fossils*

If the creationist model proposes a young earth within 10-20,000 years, why couldn't carbon dating – good for <40,000 years - date the fossils and establish the young earth explanation?

Some tests on fossils millions of years old – therefore expecting zero levels – still contained amounts of carbon-14. (Paul Giam, "Carbon-14 Content of Fossil Carbon," *Origins* 51 (2001): 6-30.)

Likelihood and ease of contamination over time with this material (and during retrieval and preparation) complicate using this method for proving young earth that would avoid stiff criticism and rejection.

### Problem C – The Fine Grain of Gradualism

The problem with the expectation of gradualism is that the finer the granularity of smaller and slighter steps, the harder it is to demonstrate how such steps improve the organism's survivability, especially at the earliest steps.

Example: Flying Squirrel. If the earliest mutations of extra skin between arms and legs are very slight, the addition would be more a nuisance than an aid. No advantage, no superior survivability. What if only one-sided? If mutations must accumulate more and more to begin to be an advantage in escape or navigating the trees, how do they get there if the earliest mutations are not helpful?

But also, even though Rocky exists today, we have further problems seeing him develop by gradualism.

If he began as an un-adapted ground squirrel, he would get in perhaps his first mutation an extra flap of skin. Ever so slight, one then questions how this would give him an advantage?

First, he would be lop-sided if additional flaps of skin were not symmetrically adapted as well.

He gets a flap on his right side, but he gets no corresponding flaps equally around. Rocky's first attempt at gliding would be lop-sided perhaps even causing an accident or death.

While he is waiting for the other flaps to develop via gradualism, he is not benefited and has nothing to offer natural selection. Is so, he just a as open to the same mortality as un-adapted members, hence he leaves no greater number of offspring. (The individual Rocky really means all offspring going forward;)



It would not be until the many variations add up to a significant adaptation that improved survivability so as to enable natural selection to act. And one can't get to that build up point if the intermediate steps did not improve survivability along the way. With an immensely long evolutionary timescale predicted by Darwin, offspring of the organism must wait through many thousands of generations for the next improvement step, meaning a huge amount of time living with what amounts to nuisance variations for a very long time.

Some choose here to offer, *"Let's abandon gradualism for faster more abrupt evolution"* as in Punctuated Equilibrium (discussed later).

But modern spokesman for evolution, Richard Dawkins disagrees:

*"If you throw out gradualism you throw out the very thing that makes evolution more plausible than creation."* **Richard Dawkins (Nature)**