

Carbon - 14 Dating



By Doug Hove
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Periodic Table of the Elements

GROUP		PERIOD																VIII						
IA																		VIII						
1	H Hydrogen 1.00794																	2	He Helium 4.00260					
2	Li Lithium 6.941	Be Beryllium 9.01218																	B Boron 10.811	C Carbon 12.0107	N Nitrogen 14.00674	O Oxygen 15.9994	F Fluorine 18.99840	Ne Neon 20.1797
3	Na Sodium 22.98977	Mg Magnesium 24.3050	IIIA	IVA	VA	VIA	VIIA	VIII		IB	IIB	Al Aluminum 26.98154	Si Silicon 28.0855	P Phosphorus 30.97376	S Sulfur 32.066	Cl Chlorine 35.4527	Ar Argon 39.948							
4	K Potassium 39.0983	Ca Calcium 40.078	Sc Scandium 44.95591	Ti Titanium 47.867	V Vanadium 50.9415	Cr Chromium 51.9961	Mn Manganese 54.93805	Fe Iron 55.845	Co Cobalt 58.93320	Ni Nickel 58.6934	Cu Copper 63.546	Zn Zinc 65.39	Ga Gallium 69.723	Ge Germanium 72.61	As Arsenic 74.92160	Se Selenium 78.95	Br Bromine 79.904	Kr Krypton 83.80						
5	Rb Rubidium 85.4678	Sr Strontium 87.62	Y Yttrium 88.90585	Zr Zirconium 91.224	Nb Niobium 92.90638	Mo Molybdenum 95.94	Tc Technetium (98)	Ru Ruthenium 101.07	Rh Rhodium 102.90550	Pd Palladium 106.42	Ag Silver 107.8682	Cd Cadmium 112.411	In Indium 114.818	Sn Tin 118.710	Sb Antimony 121.760	Te Tellurium 127.60	I Iodine 126.90447	Xe Xenon 131.29						
6	Cs Cesium 132.90545	Ba Barium 137.327		Hf Hafnium 178.49	Ta Tantalum 180.9479	W Tungsten 183.84	Re Rhenium 186.207	Os Osmium 190.23	Ir Iridium 192.217	Pt Platinum 195.078	Au Gold 196.96655	Hg Mercury 200.59	Tl Thallium 204.3833	Pb Lead 207.2	Bi Bismuth 208.98038	Po Polonium (209)	At Astatine (210)	Rn Radon (222)						
7	Fr Francium (223)	Ra Radium (226)		Rf Rutherfordium (261)	Db Dubnium (262)	Sg Seaborgium (263)	Bh Bohrium (264)	Hs Hassium (265)	Mt Meitnerium (268)	Uun Ununium (269)	Uuu Unununium (272)	Uub Ununbium												
			La Lanthanum 138.9055	Ce Cerium 140.116	Pr Praseodymium 140.90765	Nd Neodymium 144.24	Pm Promethium (145)	Sm Samarium 150.36	Eu Europium 151.964	Gd Gadolinium 157.25	Tb Terbium 158.92534	Dy Dysprosium 162.50	Ho Holmium 164.93032	Er Erbium 167.26	Tm Thulium 168.93421	Yb Ytterbium 173.04	Lu Lutetium 174.967							
			Ac Actinium (227)	Th Thorium 232.0381	Pa Protactinium 231.03588	U Uranium 238.0289	Np Neptunium (237)	Pu Plutonium (244)	Am Americium (243)	Cm Curium (247)	Bk Berkelium (247)	Cf Californium (251)	Es Einsteinium (252)	Fm Fermium (257)	Md Mendelevium (258)	No Nobelium (259)	Lr Lawrencium (262)							

Solids
 Liquids
 Gases
 Artificially Prepared

Atomic Number: 26
 Symbol: Fe
 Name: Iron
 Atomic Weight: 55.845

All Carbon atoms have 6 Protons

6
C
Carbon
12.0107

Atomic Number = Number of Protons

Symbol

Name

Atomic Weight

The number of protons equals the number of electrons

The number of electrons determines how the element reacts chemically

Neutron

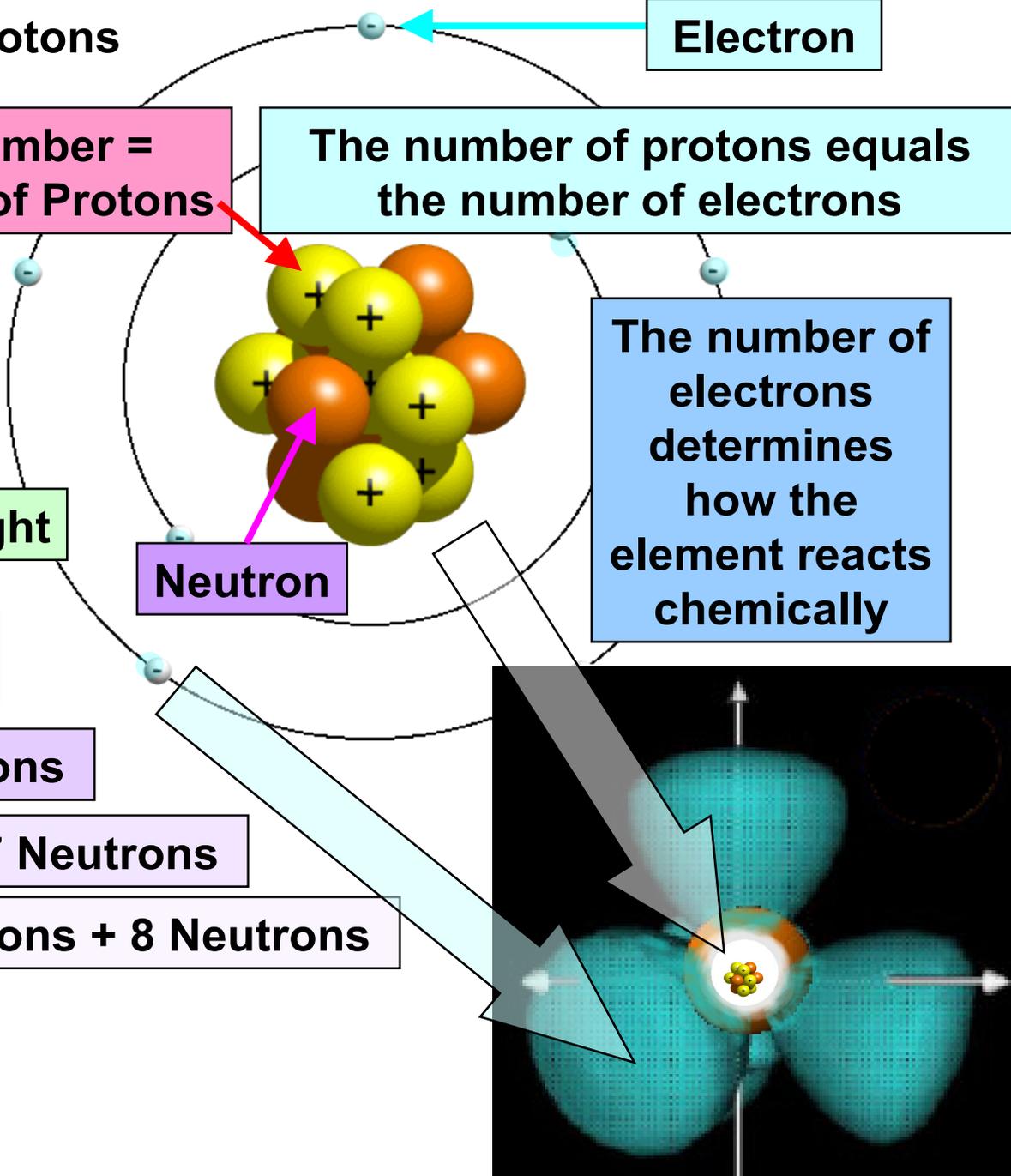
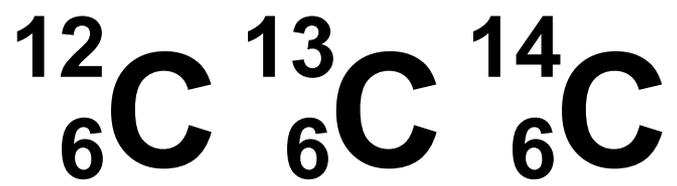
Electron

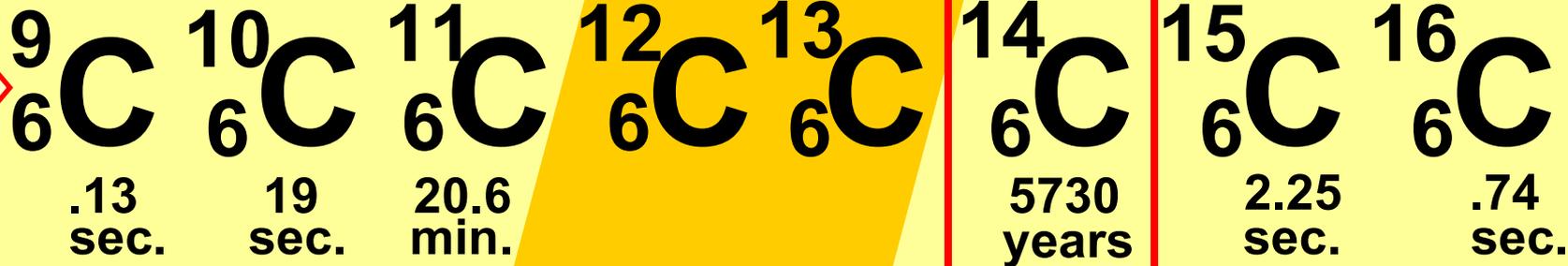
Isotopes of Carbon

C-12 = 6 Protons + 6 Neutrons

C-13 = 6 Protons + 7 Neutrons

C-14 = 6 Protons + 8 Neutrons





Positron Decay

Beta Decay

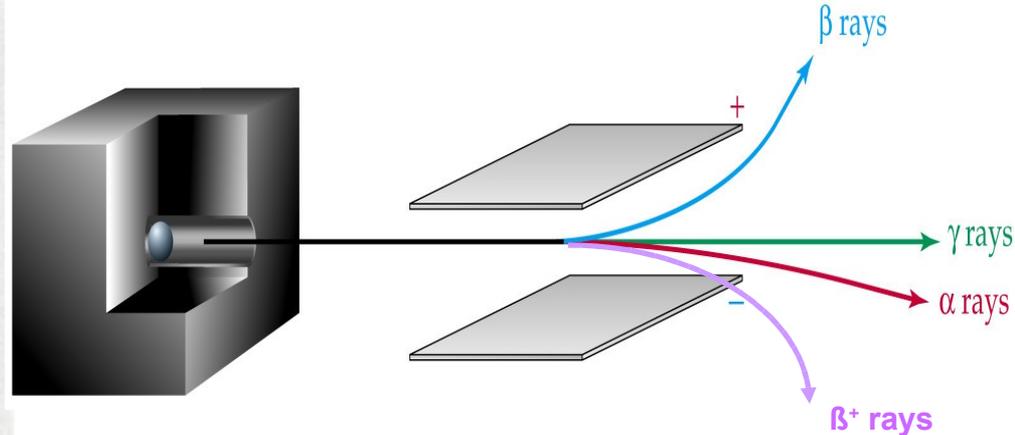
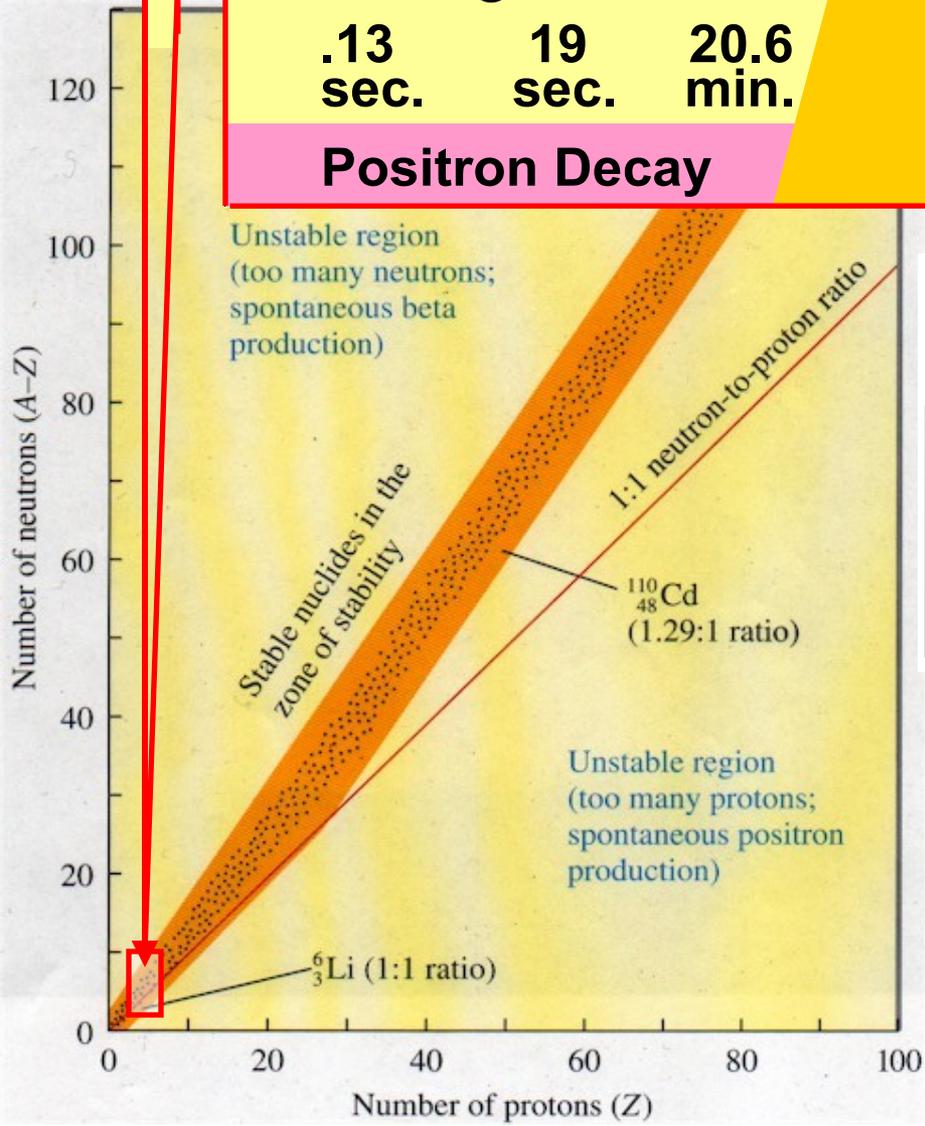


TABLE 22.1

A Summary of Radioactive Decay Processes

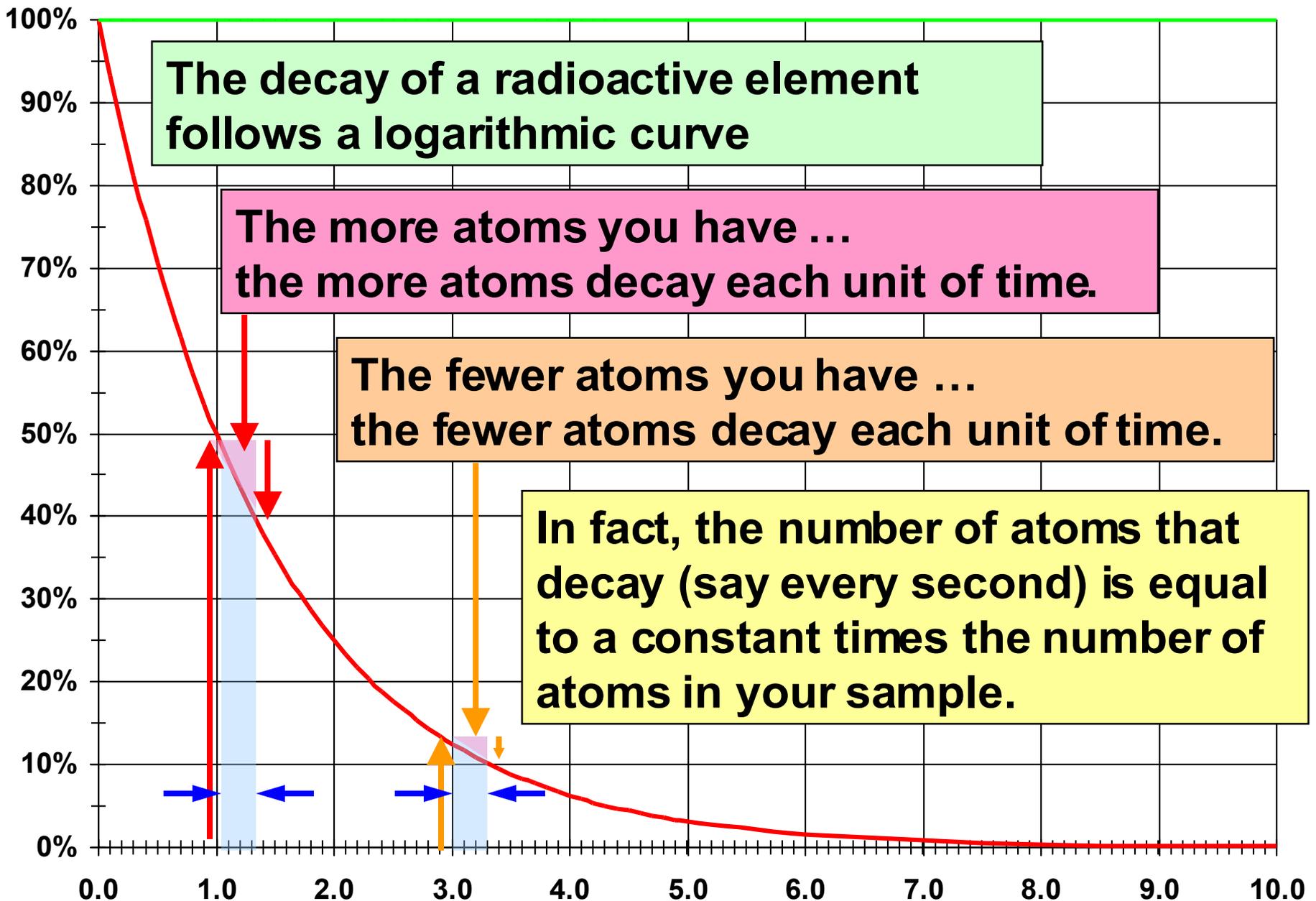
Process	Symbol	Change in Atomic Number	Change in Mass Number	Change in Neutron Number
Alpha emission	${}^4_2\text{He}$ or α	-2	-4	-2
Beta emission	${}^0_{-1}\text{e}$ or β^-	+1	0	-1
Gamma emission	${}^0_0\gamma$ or γ	0	0	0
Positron emission	${}^0_1\text{e}$ or β^+	-1	0	+1
Electron capture	E. C.	-1	0	+1

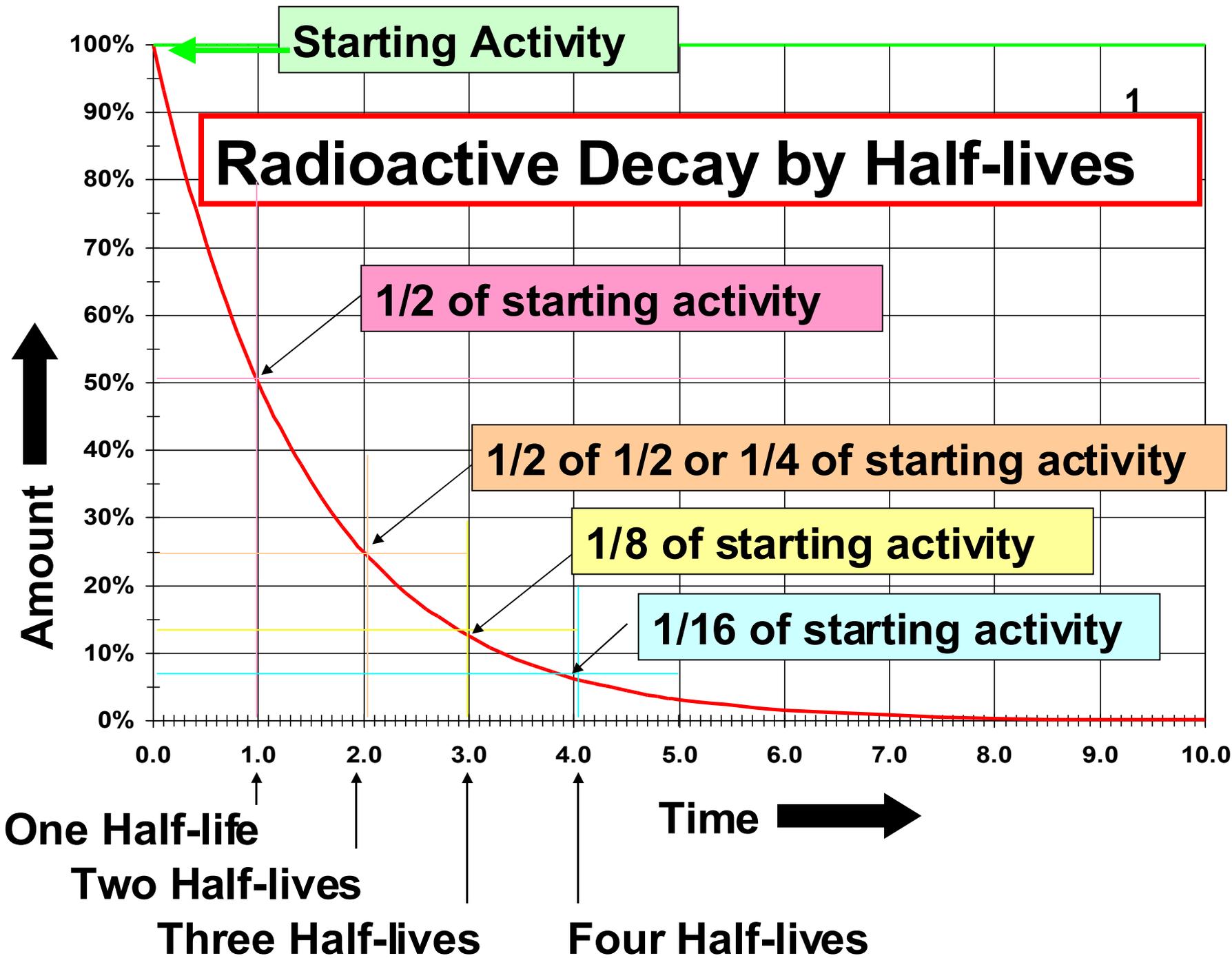
The decay of a radioactive element follows a logarithmic curve

The more atoms you have ... the more atoms decay each unit of time.

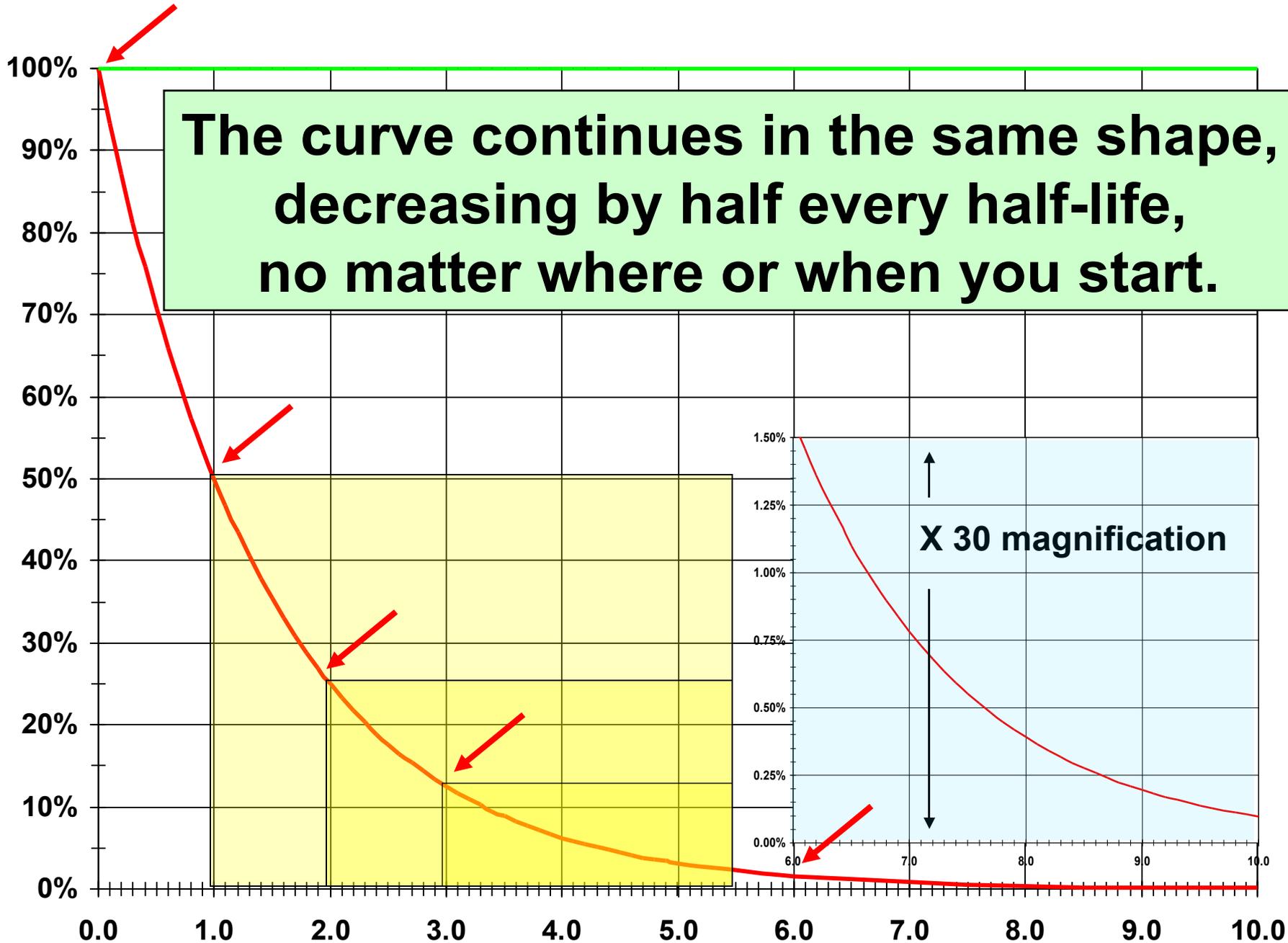
The fewer atoms you have ... the fewer atoms decay each unit of time.

In fact, the number of atoms that decay (say every second) is equal to a constant times the number of atoms in your sample.





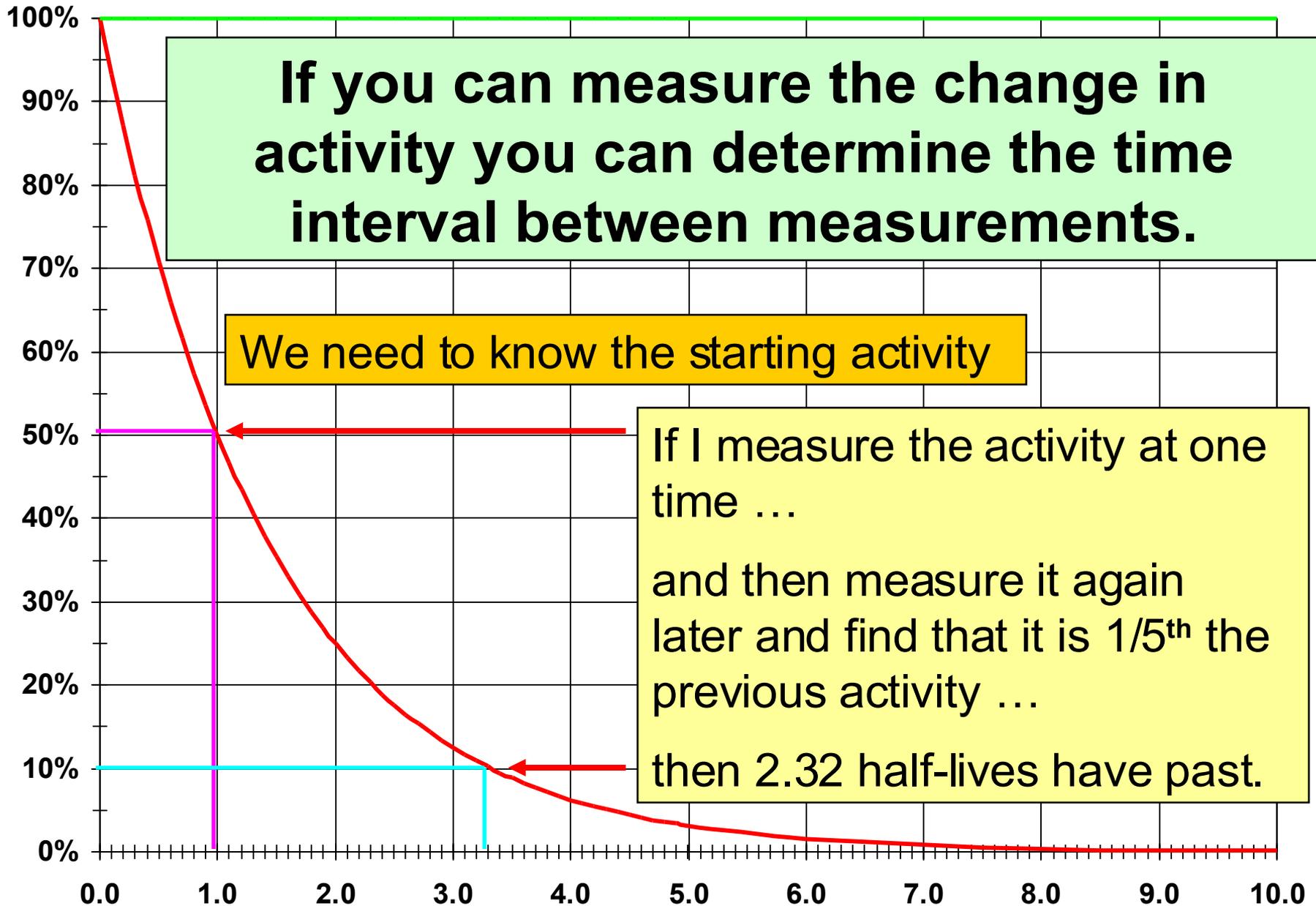
The curve continues in the same shape, decreasing by half every half-life, no matter where or when you start.

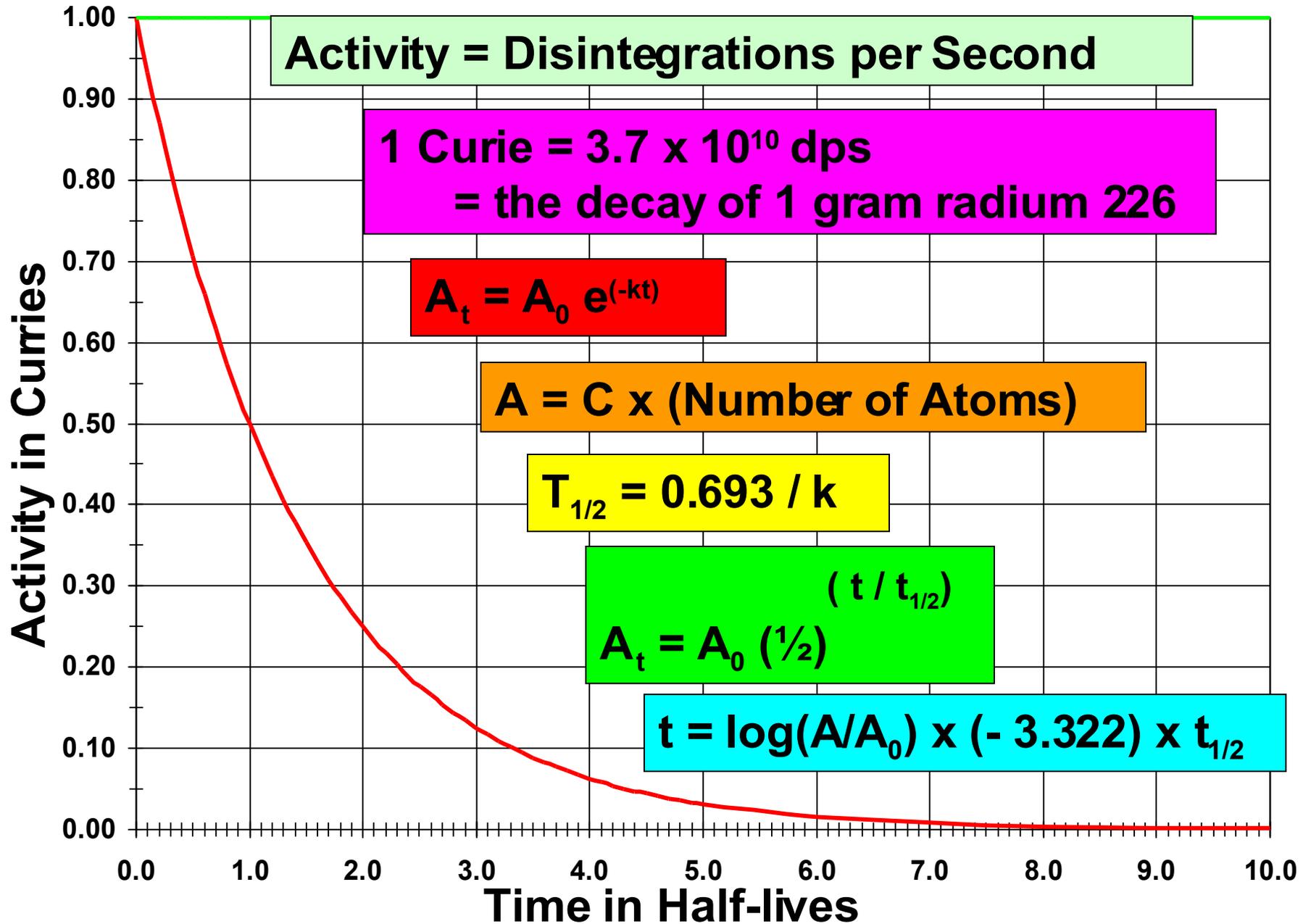


If you can measure the change in activity you can determine the time interval between measurements.

We need to know the starting activity

If I measure the activity at one time ...
and then measure it again later and find that it is 1/5th the previous activity ...
then 2.32 half-lives have past.





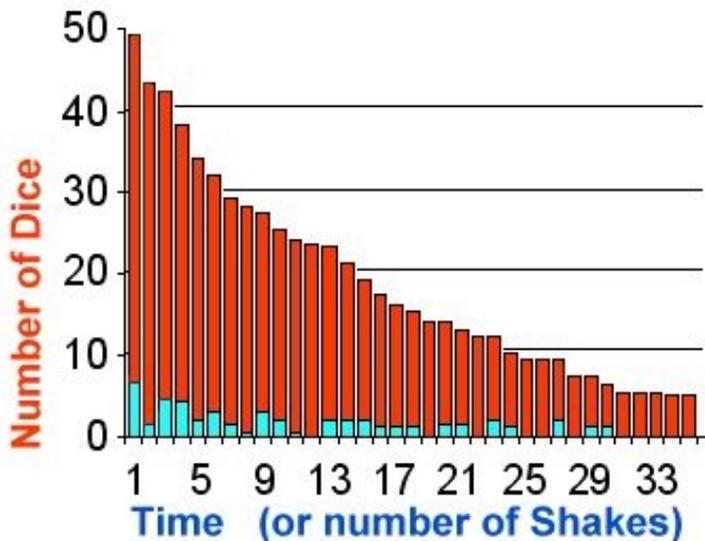
Place some dice on a shaker table and begin to shake them.

If a die rolls a 6 it explodes and becomes a blue cube.

As time goes on you have less and less dice and less and less explosions each second.

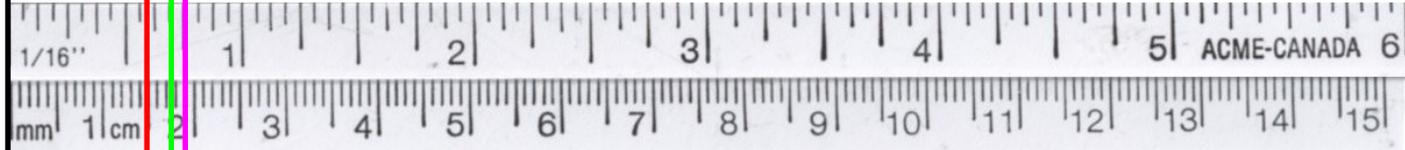
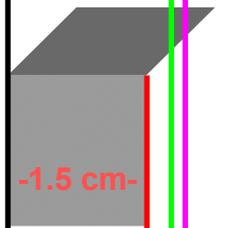
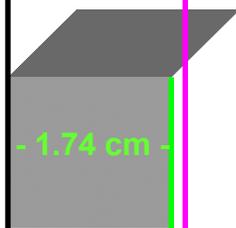
We can never tell when any one dice will explode but we can predict how many dice will be left after so many shakes.

The greater the number of dice we use in our experiment the closer our prediction will be to the actual number of dice left.



Many Atoms

6
C
Carbon
12.0107



Cube of
Solid Carbon

Sugar Cube

Each atom of carbon weighs
12.0107 Daltons or AMU's on
average.

12.0107 grams of solid carbon
would be a cube 1.74 cm across.

This would contain about
 6.022×10^{23} atoms
(Avogadro's number)

602,200,000,000,000,000,000,000 or 6.022×10^{23}

The Earth contains 3.821×10^{22} cubic feet

It would all decay
to Nitrogen – 14
in less than
1 million years

**So where does Carbon-14
come from ?**

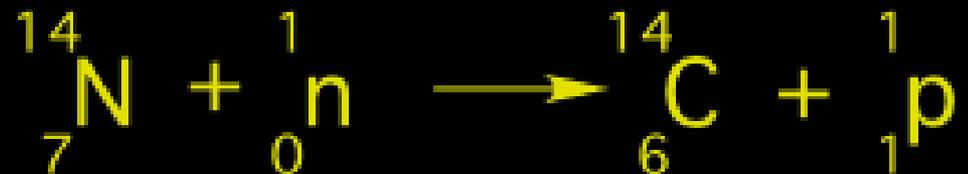
Cosmic Rays enter the Atmosphere causing molecules to fly apart.



The resulting Neutrons, collide into N 14 Atoms.



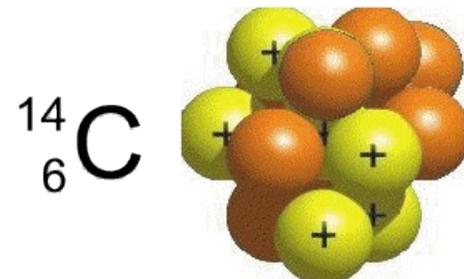
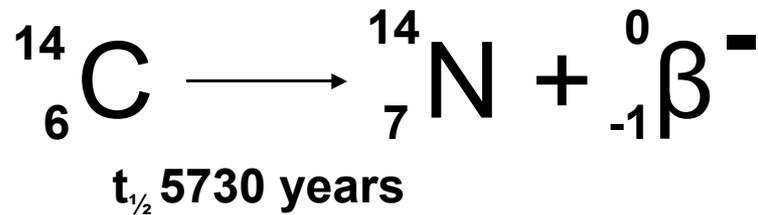
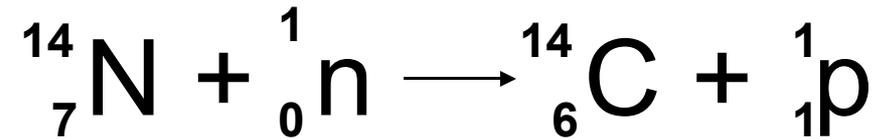
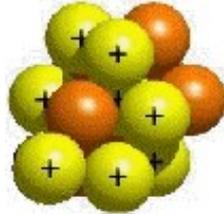
N 14 Atoms convert into C 14 Atoms



$t_{1/2} = 5,730$ years



Nitrogen - 14



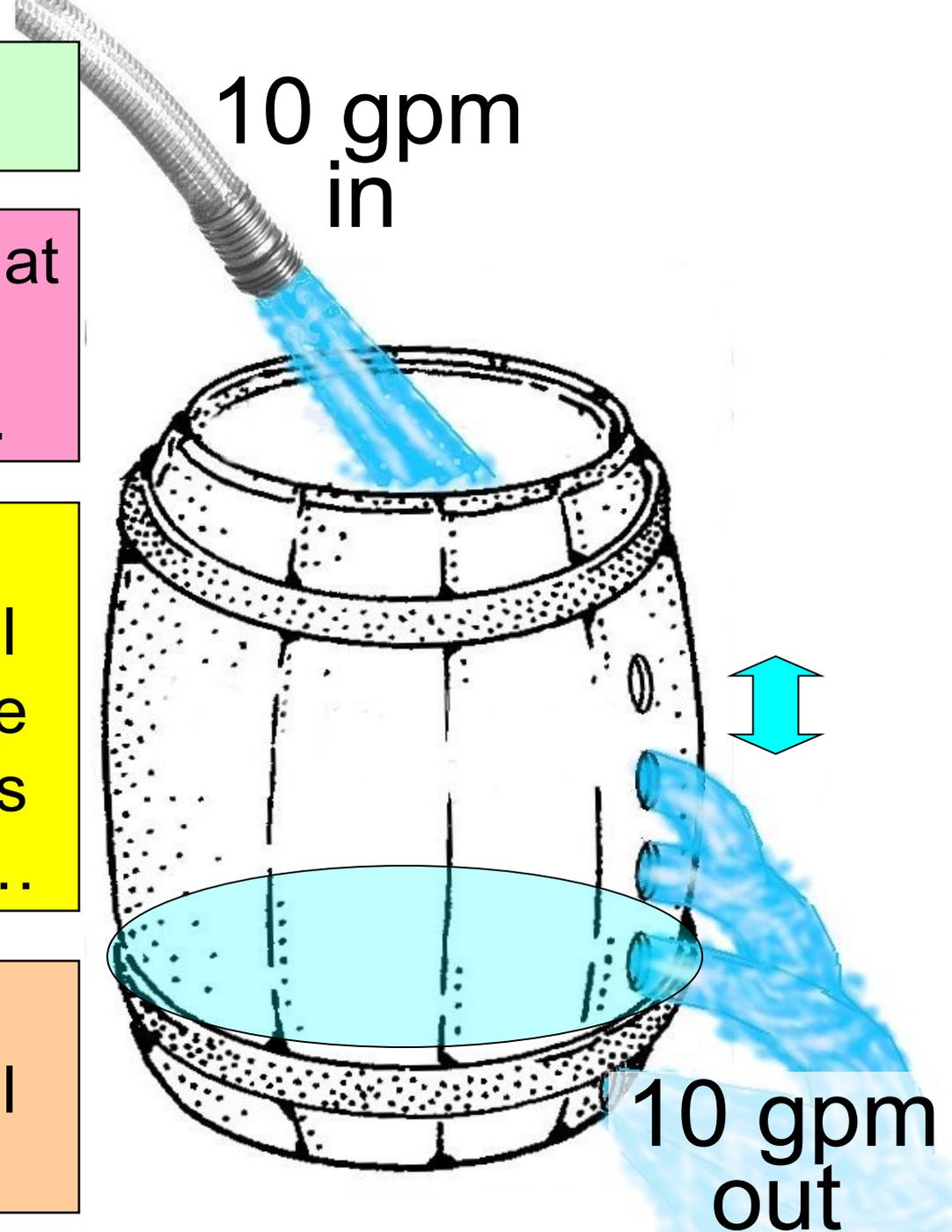
Carbon - 14
Unstable
5,730 year half-life

Equilibrium

If the hose adds water at a constant rate of 10 gallons per minute ...

Then the amount of water in the barrel will rise until it reaches the point where 10 gallons per minute leaks out ...

Then the amount of water in the barrel will remain constant.

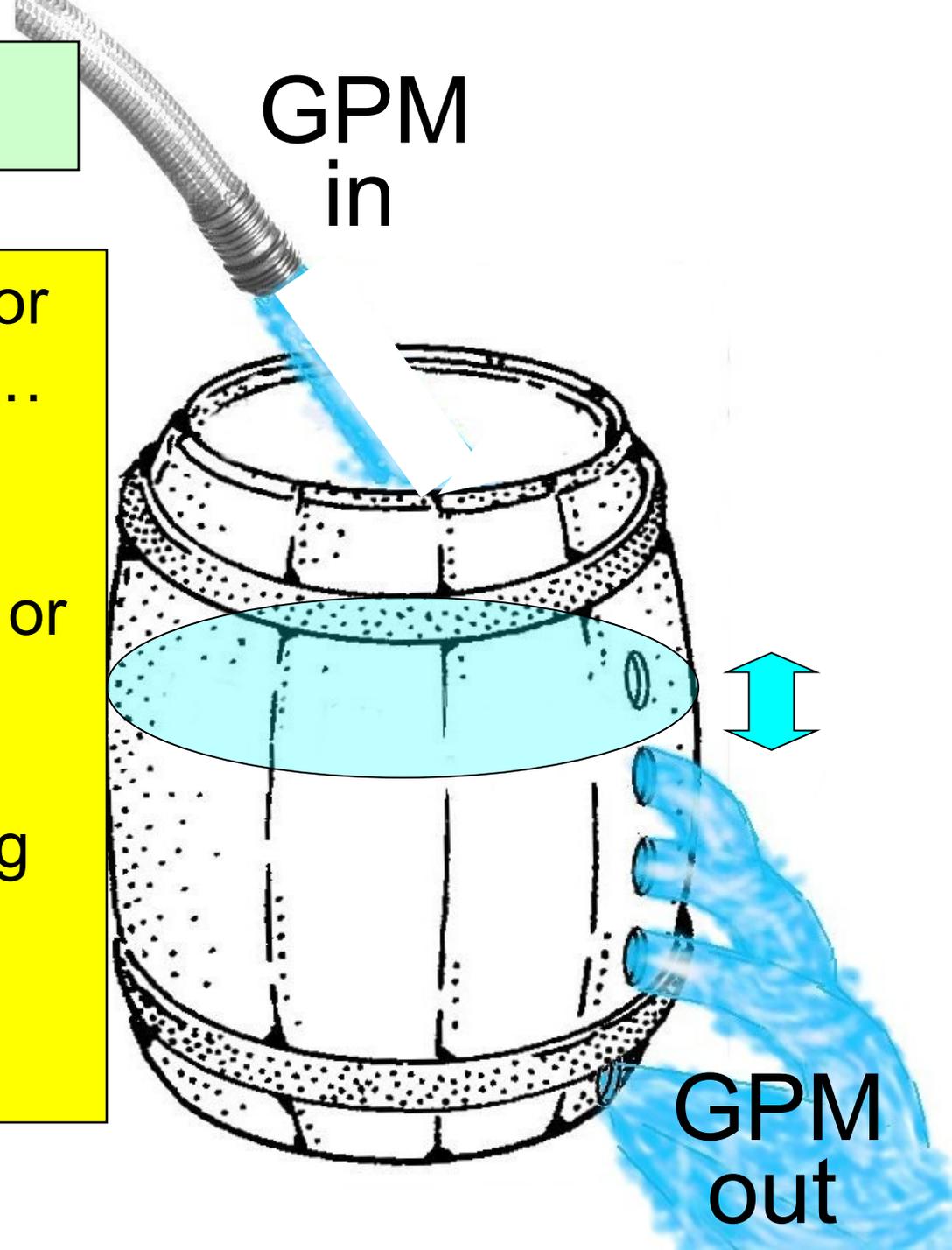


Equilibrium

If the hose adds more or less water per minute ...

the amount of water in the barrel will increase or decrease ...

until the amount leaving the barrel once again equals the amount entering the barrel.



Equilibrium C-14

Cosmic rays produce about 8 Kilograms of C-14 per year.

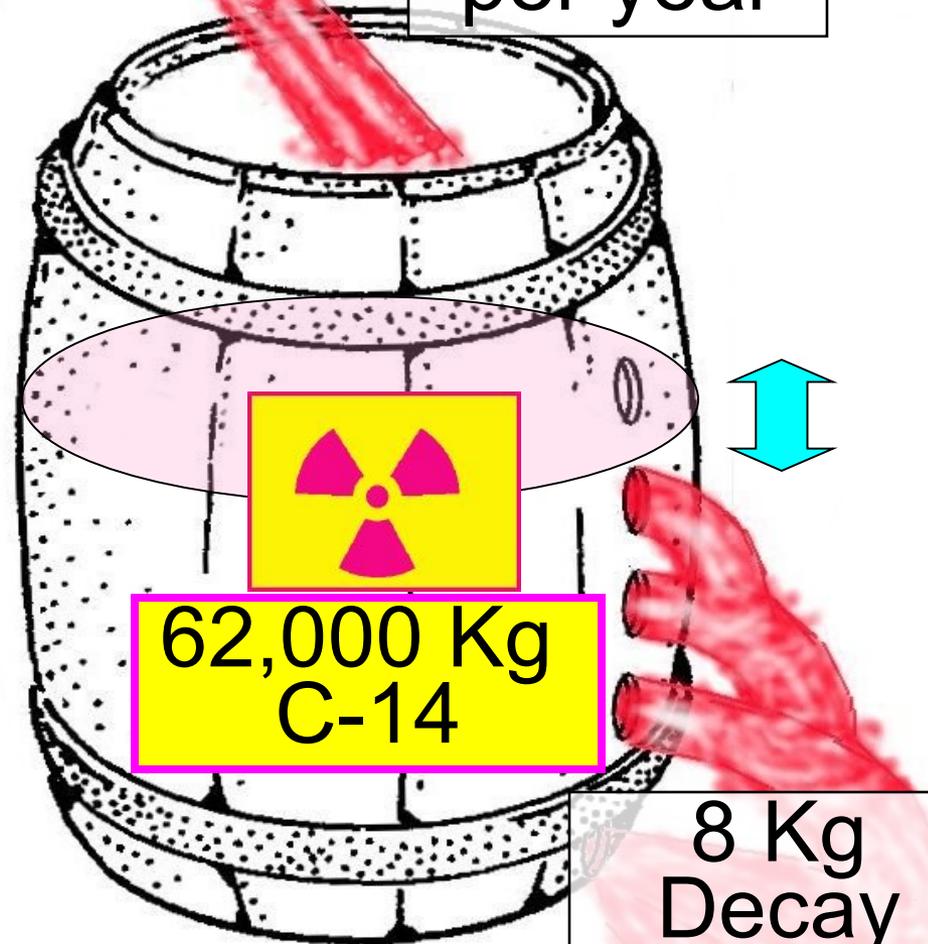
This rate is assumed to be constant for the past few million years.

If 50% of C-14 decays in 5,370 years then ...

0.013 % of C-14 decays per year.

When the amount of C-14 reaches 62,000 Kg then 8 Kg will decay per year.

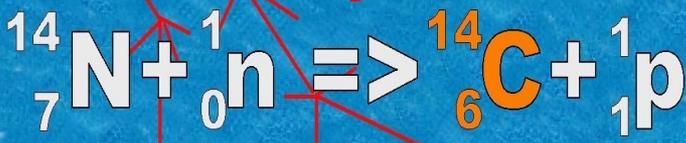
8 Kg
Formed
per year



62,000 Kg
C-14

8 Kg
Decay
per year

Cosmic Rays



Carbon-14 is produced by cosmic rays from Nitrogen in the upper atmosphere.
Carbon-14 then combines with oxygen to form carbon dioxide.
Plants then use this carbon dioxide in photosynthesis to form glucose.
Carbon-14 enters the food chain as animals eat these plants

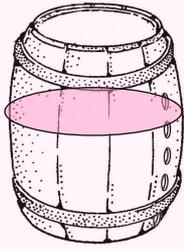
Photosynthesis



- Glucose -> Sucrose ->
- Fructose -> Starch ->
- Cellulose -> Fatty Acids ->
- Amino Acids ->



FOOD CHAIN

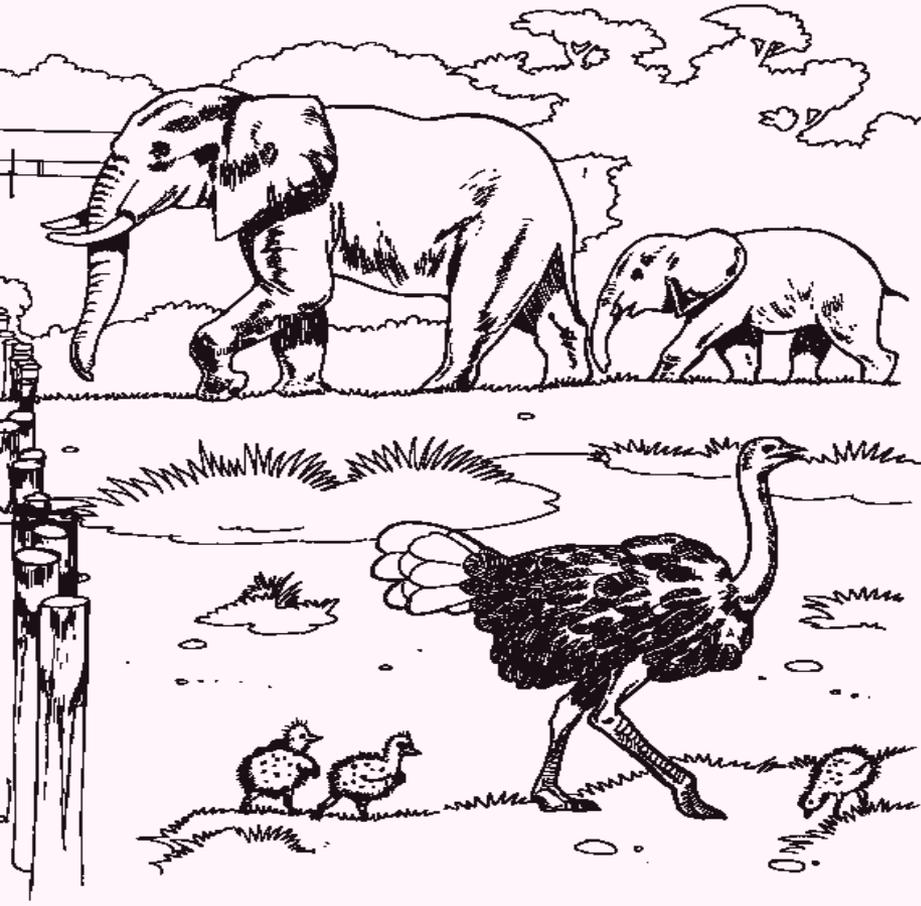


**62,000 Kg's
of Carbon 14
in**

**In 75,000,000,000,000,000 Kg's
of Carbon in the Biosphere**

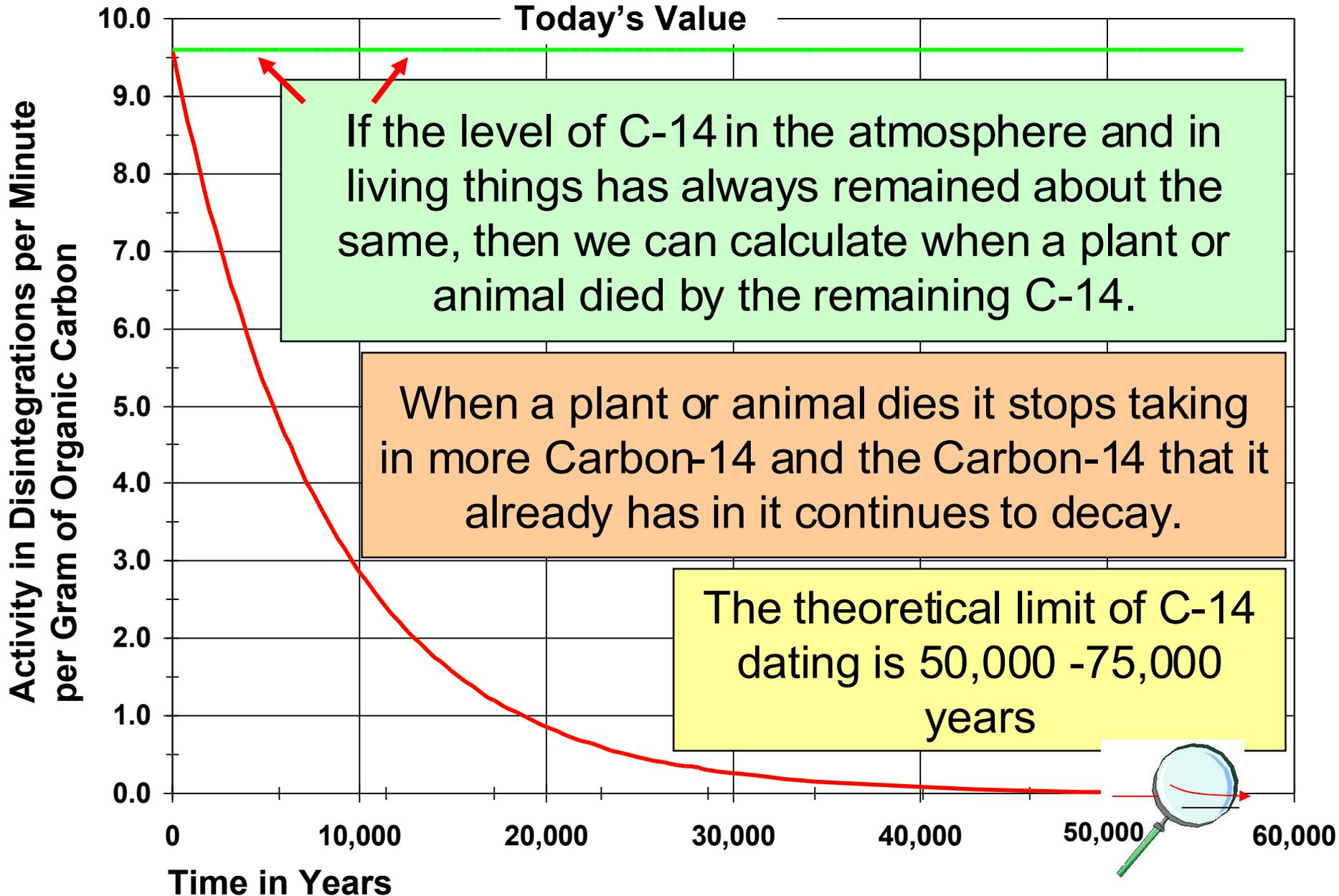


**Is equivalent to
1 drop of water
in 24
Olympic size
swimming pools**



**1 Olympic Size Pool
24 Times**

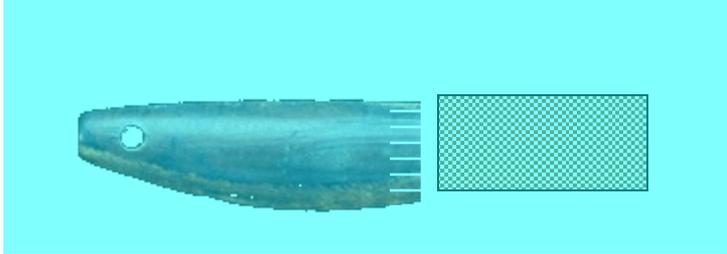
Carbon-14 Radioactive Decay Curve



GEOLOGIC TIME SCALE

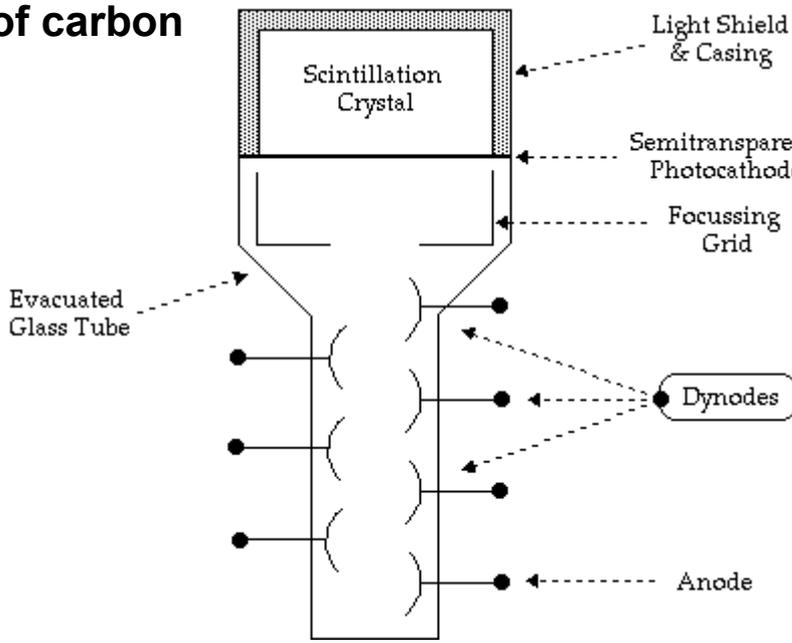
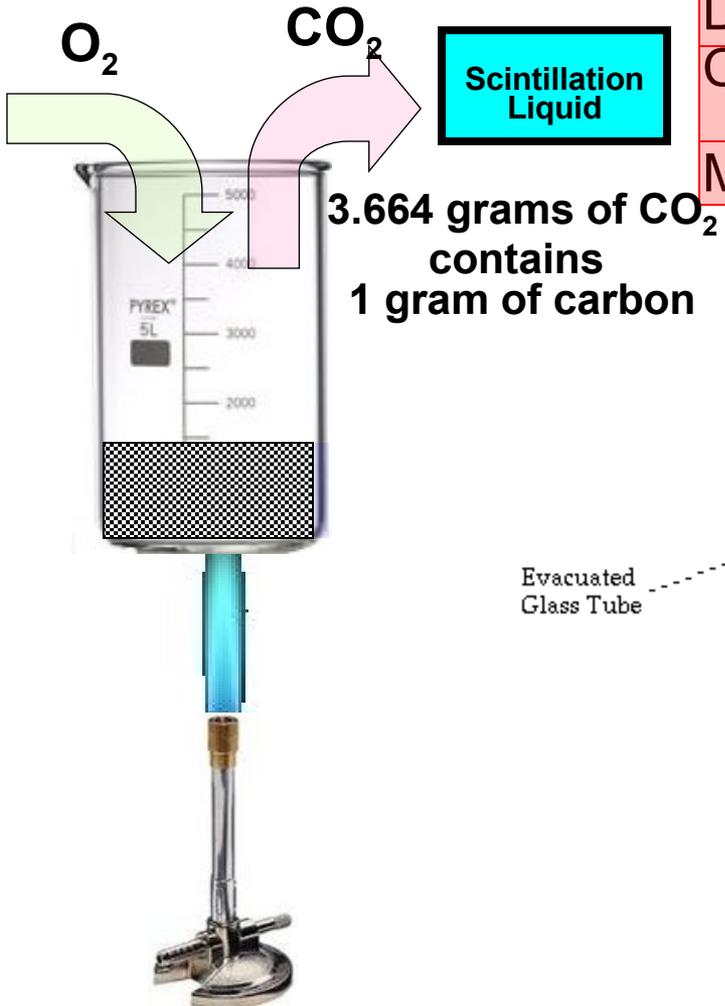
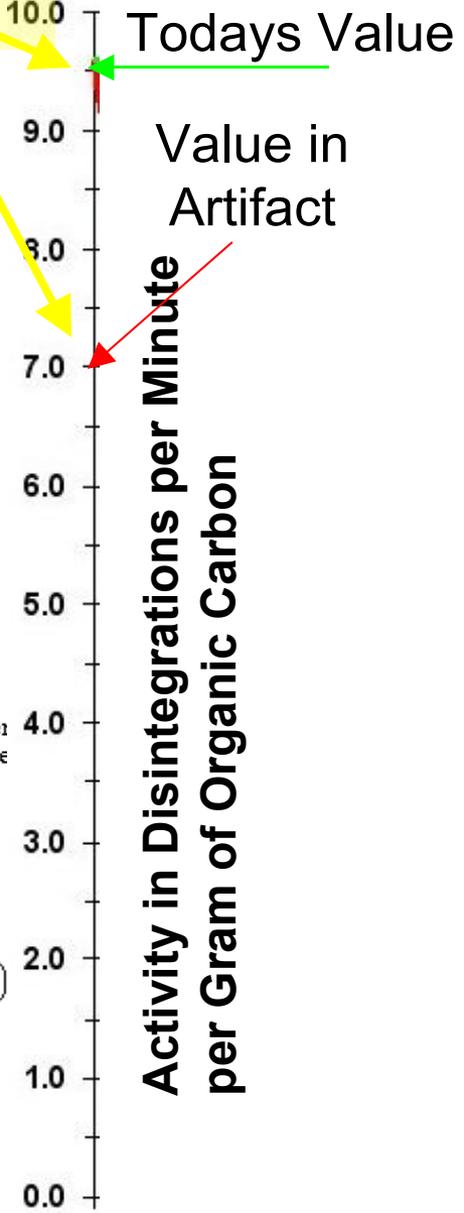
ERA	PERIOD	EPOCH	SUCCESION OF LIFE	INDEX FOSSILS
CENOZOIC Recent life	QUATERNARY 0-1 Million Years Rise of Man	Recent Pleistocene		BElemnites
	TERTIARY 60 Million Years Rise of Mammals	Pliocene Miocene Oligocene Eocene Palaocene		NAUTILENA
MESOZOIC middle life	CRETACEOUS 72 Million Years Modern seed-bearing plants, Dinosaurs		GASTROPODS 	
	JURASSIC 46 Million Years First birds		BRACHIOPODS 	
	TRIASSIC 49 Million Years Cycads, first dinosaurs		TRILOBITES 	
PALEOZOIC ancient life	PERMIAN 50 Million Years First reptiles		BRACHIOPODS 	
	CARBONIFEROUS 30 Million Years First insects		BRACHIOPOD SHELLS 	
			MISSISSIPPIAN 50 Million Years Many crinoids	CRINOID STALKS
	DEVONIAN 60 Million Years First seed plants, cartilage fish		FISH BONES 	
	SILURIAN 20 Million Years Earliest land animals		TRILOBITES 	
	ORDOVICIAN 75 Million Years Early bony fish		BRACHIOPODS 	
	CAMBRIAN 100 Million Years Invertebrate animals, Tracheopods, Trilobites		BRACHIOPODS 	
PRECAMBRIAN Very few fossils present (fossils are only pre-cellular)		BRACHIOPODS 		

Carbon-14 with a half life of 5,730 years can only be used to date back 50,000 – 75,000 years.



- Wash
- Powder
- Acid Wash
- Caustic Wash
- Wash
- Filter
- Drive off organic vapors
- Convert to Carbon Dioxide
- Measure Activity

All we know



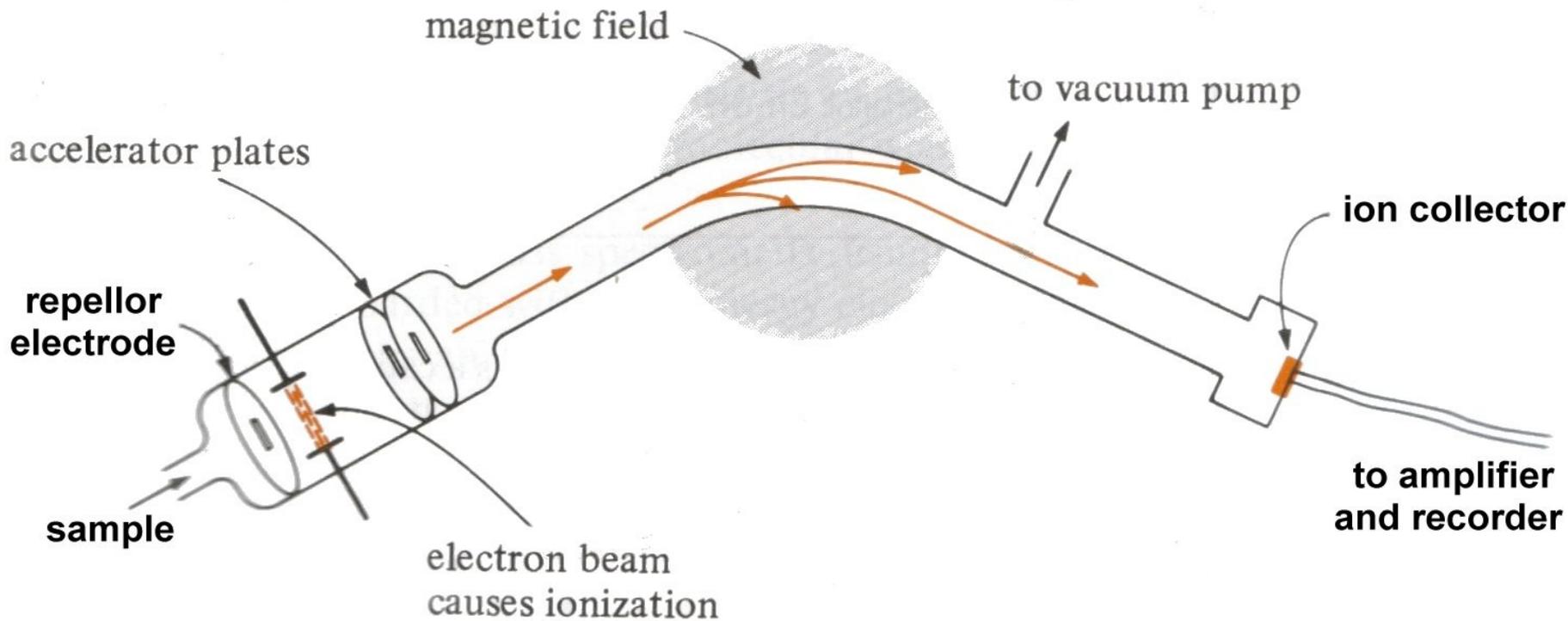
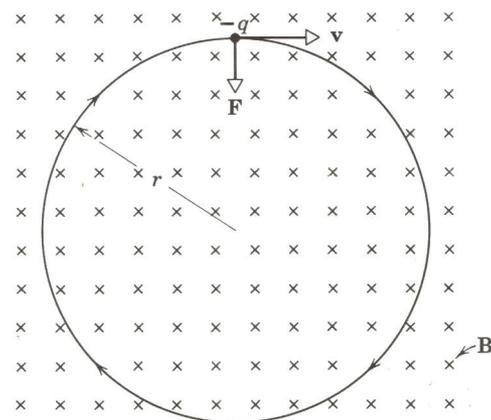
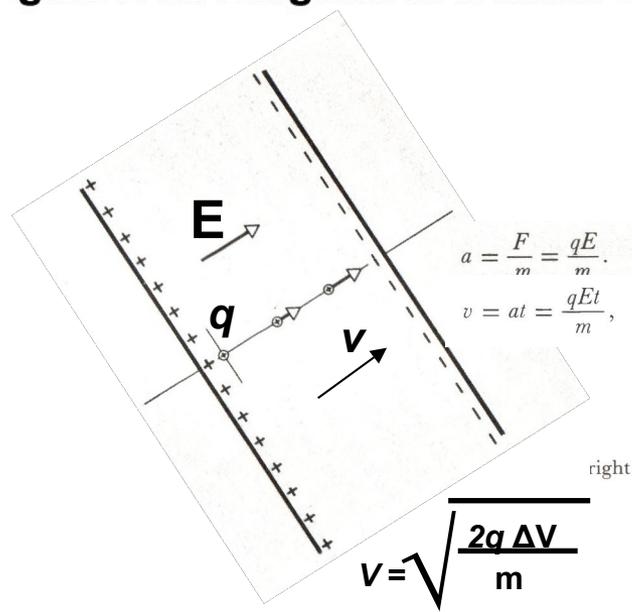
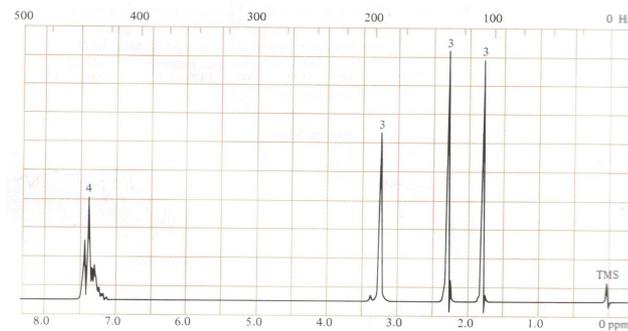


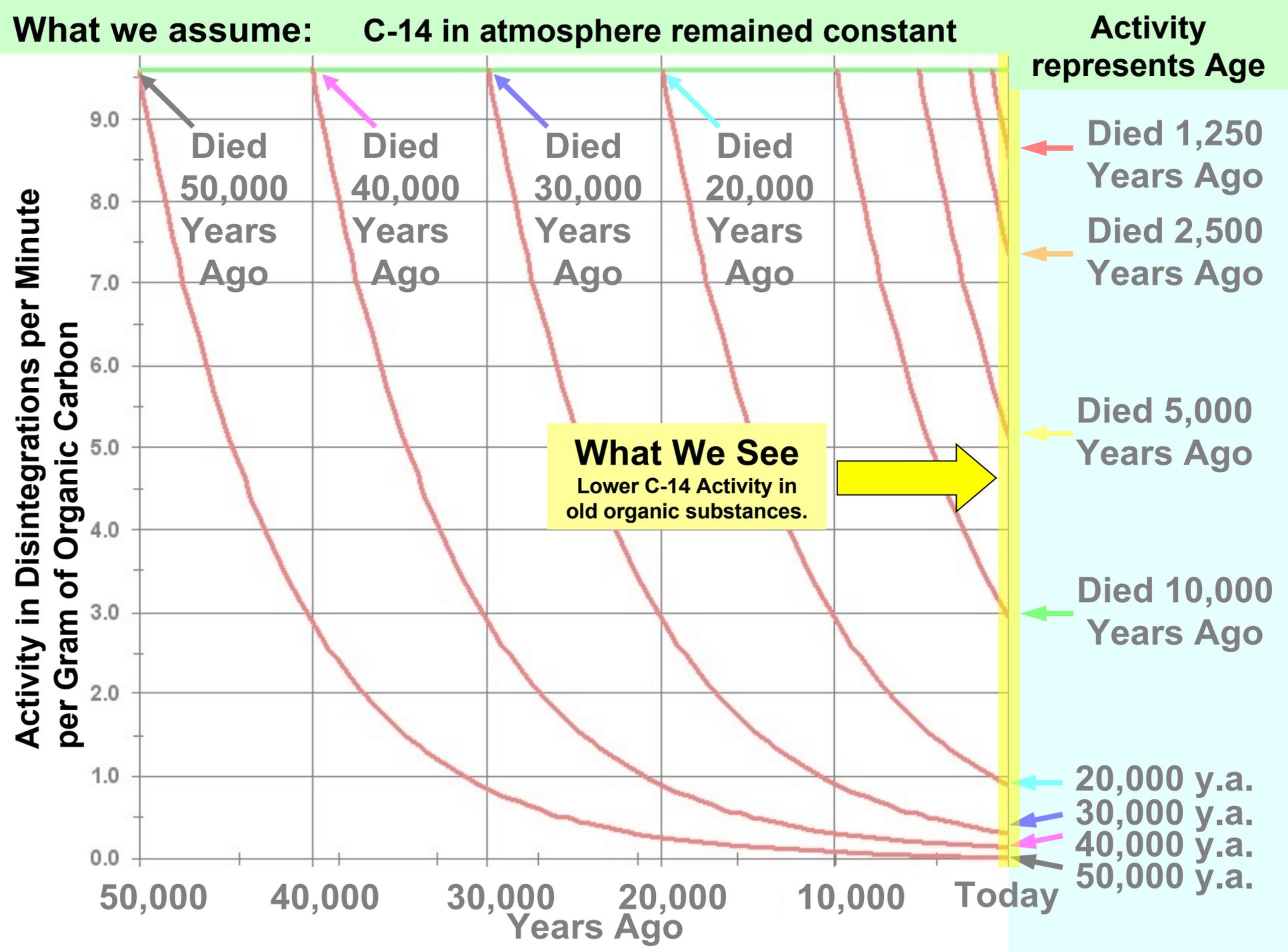
Figure 21.9 Diagram of a mass spectrometer



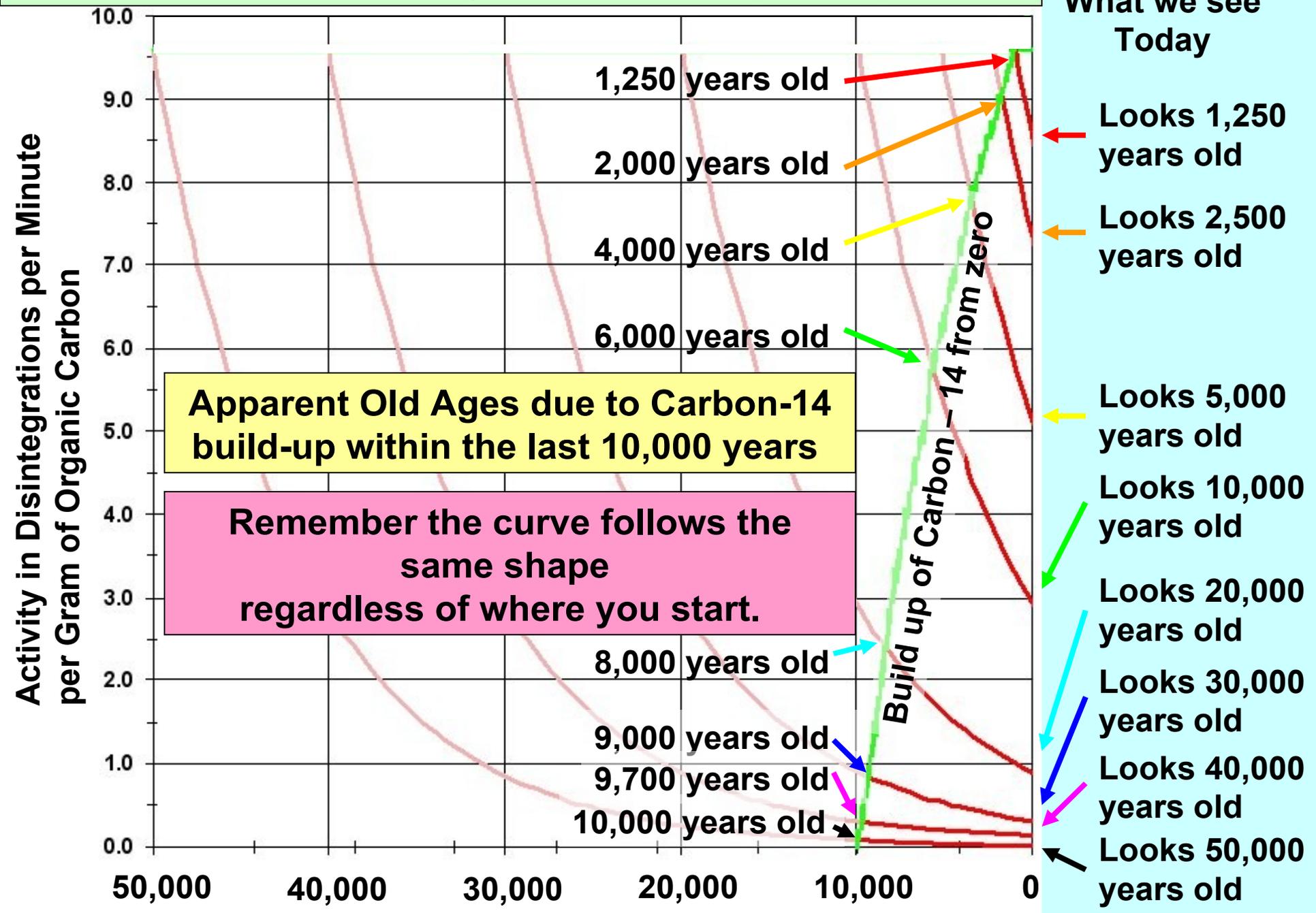
$$qvB = \frac{mv^2}{r} \quad \text{or} \quad r = \frac{mv}{qB}$$



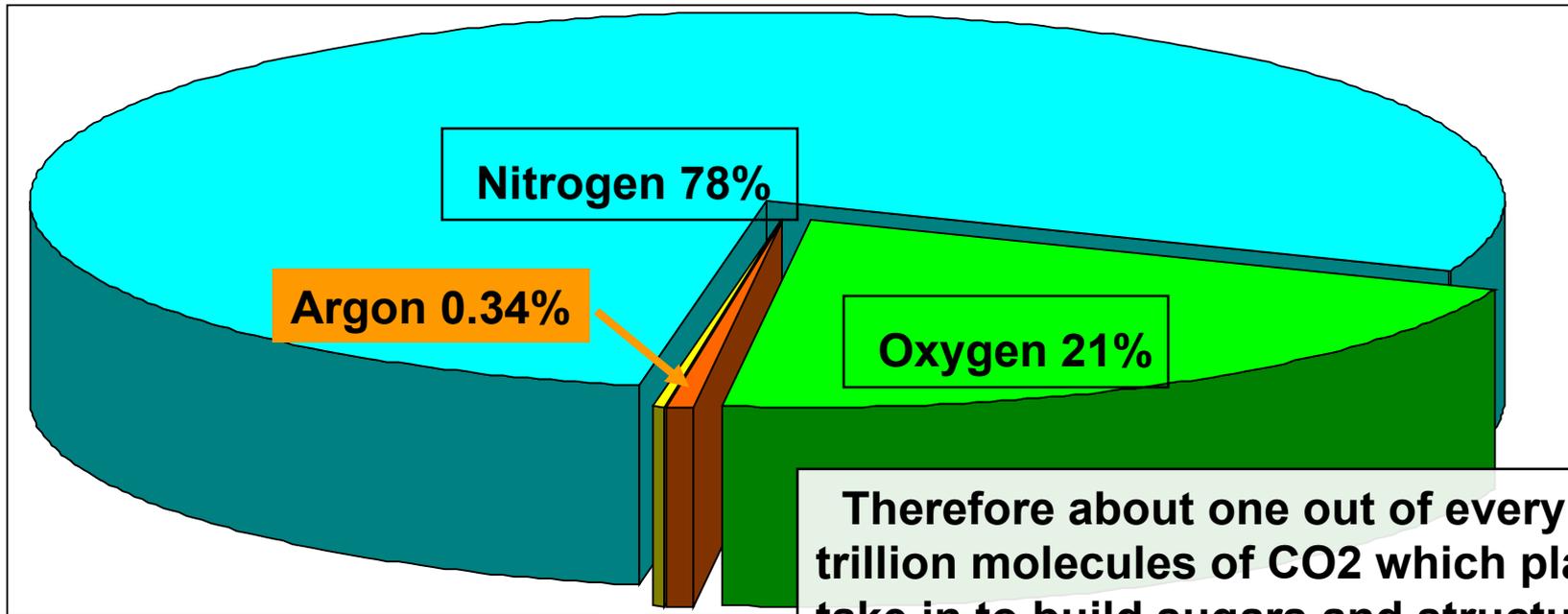
By varying the magnetic field (B) or the accelerating voltage.



But we could see the same thing if the earth was only 10,000 years old.



Composition of Atmosphere



Therefore about one out of every trillion molecules of CO₂ which plants take in to build sugars and structural components contains C-14.

Therefore about one out of every trillion molecules of carbon in the plants that animals eat is C-14.

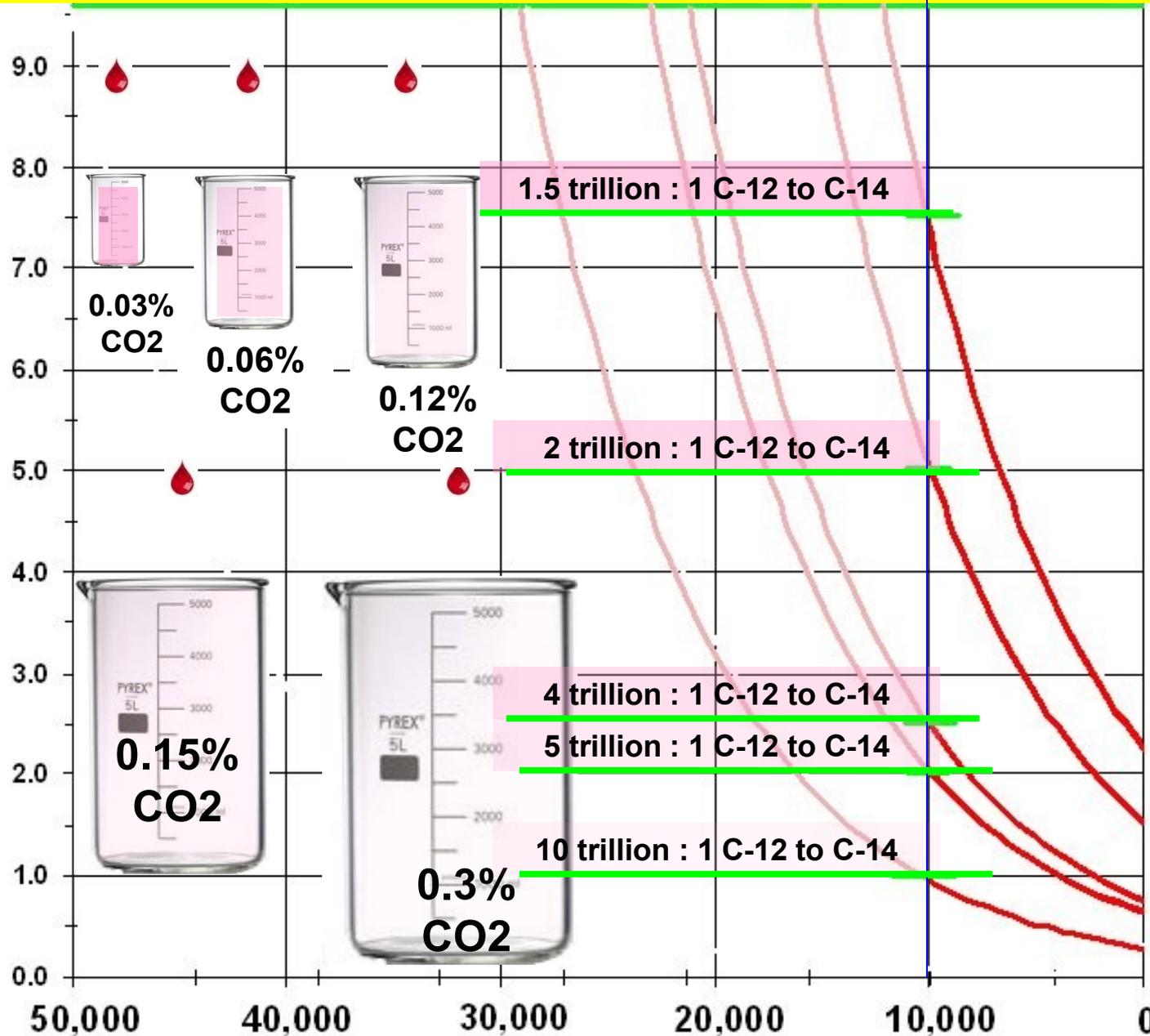
Therefore about one out of every trillion molecules of carbon in animals is C-14.

Carbon Dioxide 0.035%

About 1 in a trillion molecules of Carbon Dioxide contain Carbon -14

That's 1 : 1,000,000,000,000

What if there was more CO₂ in the ancient atmosphere to mix the Carbon -14 with



A 10,000 year old sample could look:

12,500 years old

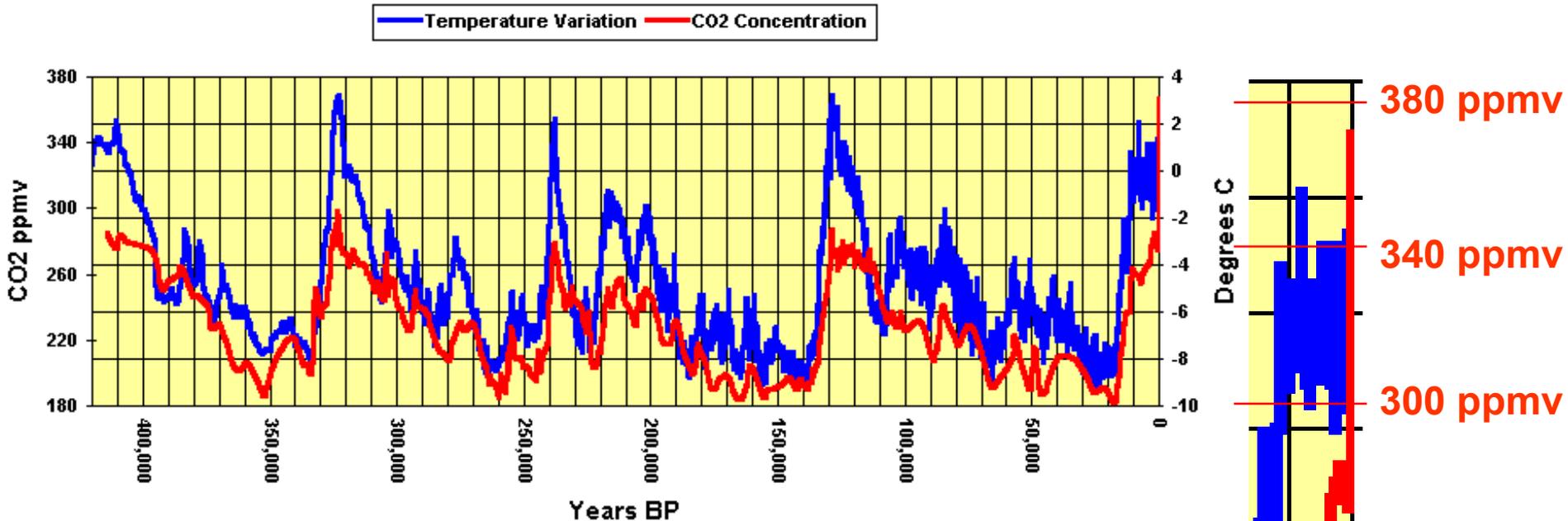
15,000 years old

21,000 years old

23,000 years old

29,000 years old

Antarctic Ice Core Data 1



**Most scientists agree;
CO₂ levels have changed over time.**

**They think CO₂ levels were ½ of
today's value 10,000 years ago but
that's not what we see reflected in
carbon-14 dating.**

10,000 y.a. 0



**Yale University
Virginia Tech**

www.sciencedaily.com/releases/2005/06/050622134142.htm

...based on calibration of carbon-containing compounds produced by ancient sea surface algae that were recently isolated in deep sea drill cores ... 45 - 34 million years ago the atmospheric carbon dioxide level was up to five times greater than today...

www.sciencedaily.com/releases/2003/09/030918092804.htm

Atmospheric CO₂ level 1.4 billion years ago was at least 10 to 200 times greater than today...according to carbon-12 versus carbon-13... studies on the microscopic fossil *Dictyosphaera delicata* from Proterozoic shales...

Plants turn CO₂ into organic molecules.

Plants and animals release CO₂ as they convert sugars to energy.

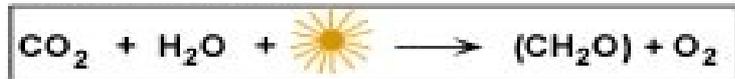
Decomposition of plants and animals releases CO₂ back into atmosphere.

Burning of plants (wood) or fossil fuels releases CO₂ back to the atmosphere.

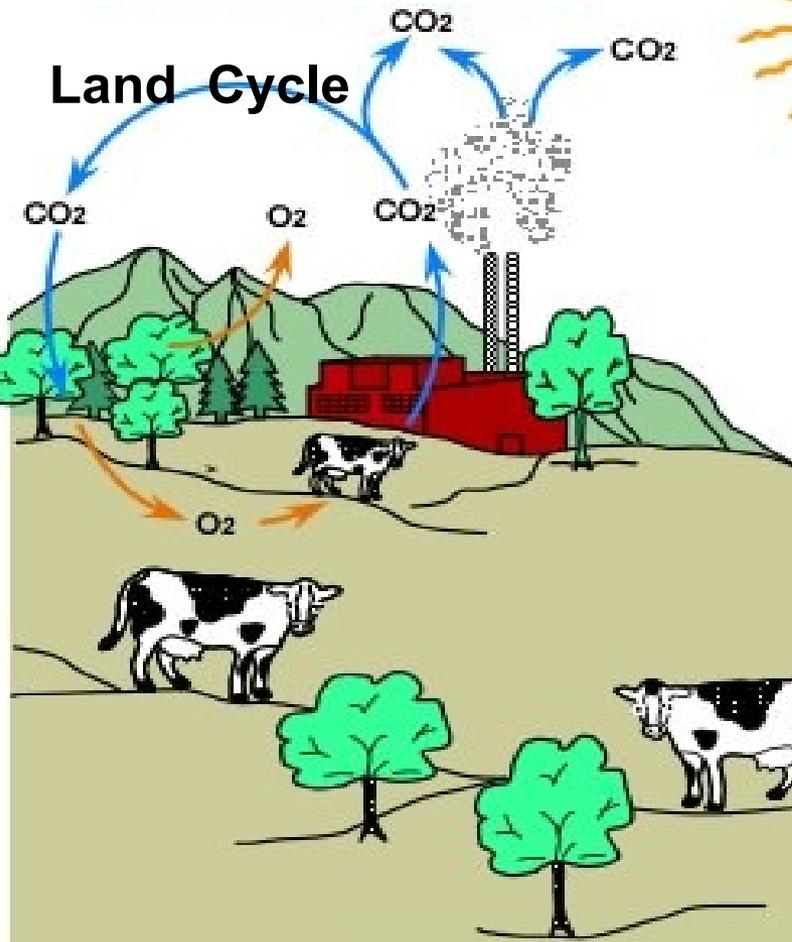
Carbon Dioxide is stored in plants and animals and then some returns to the atmosphere.



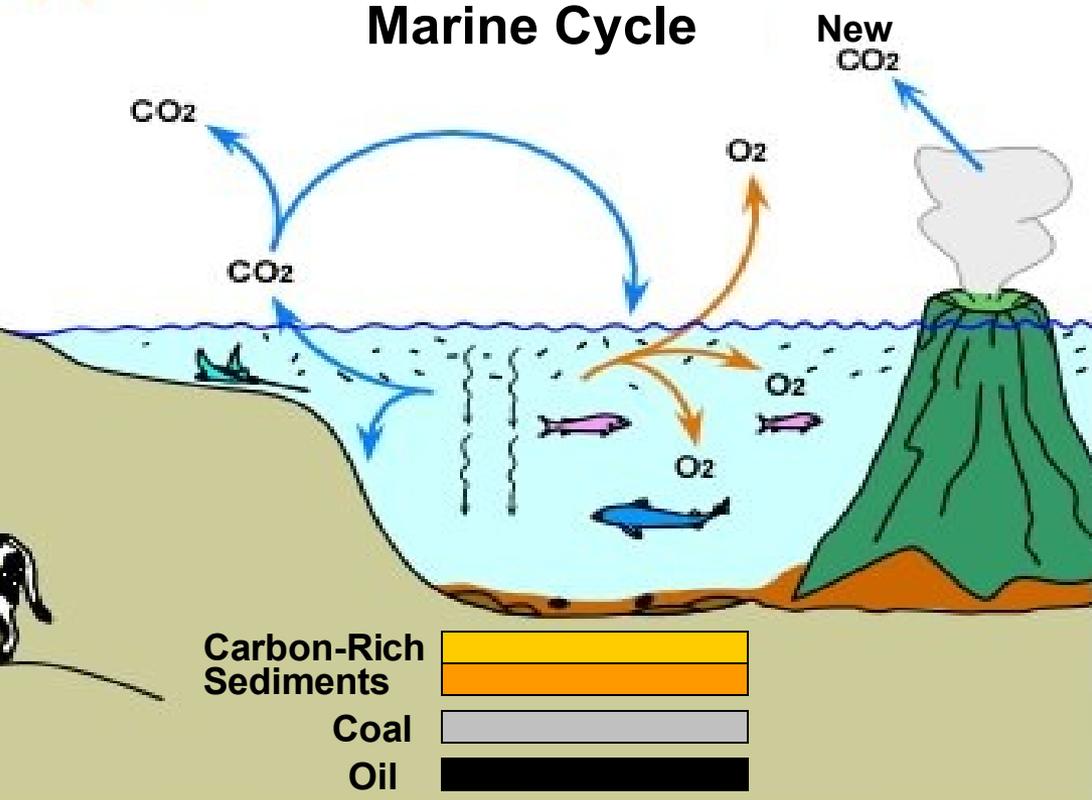
Photosynthesis



Land Cycle



Marine Cycle



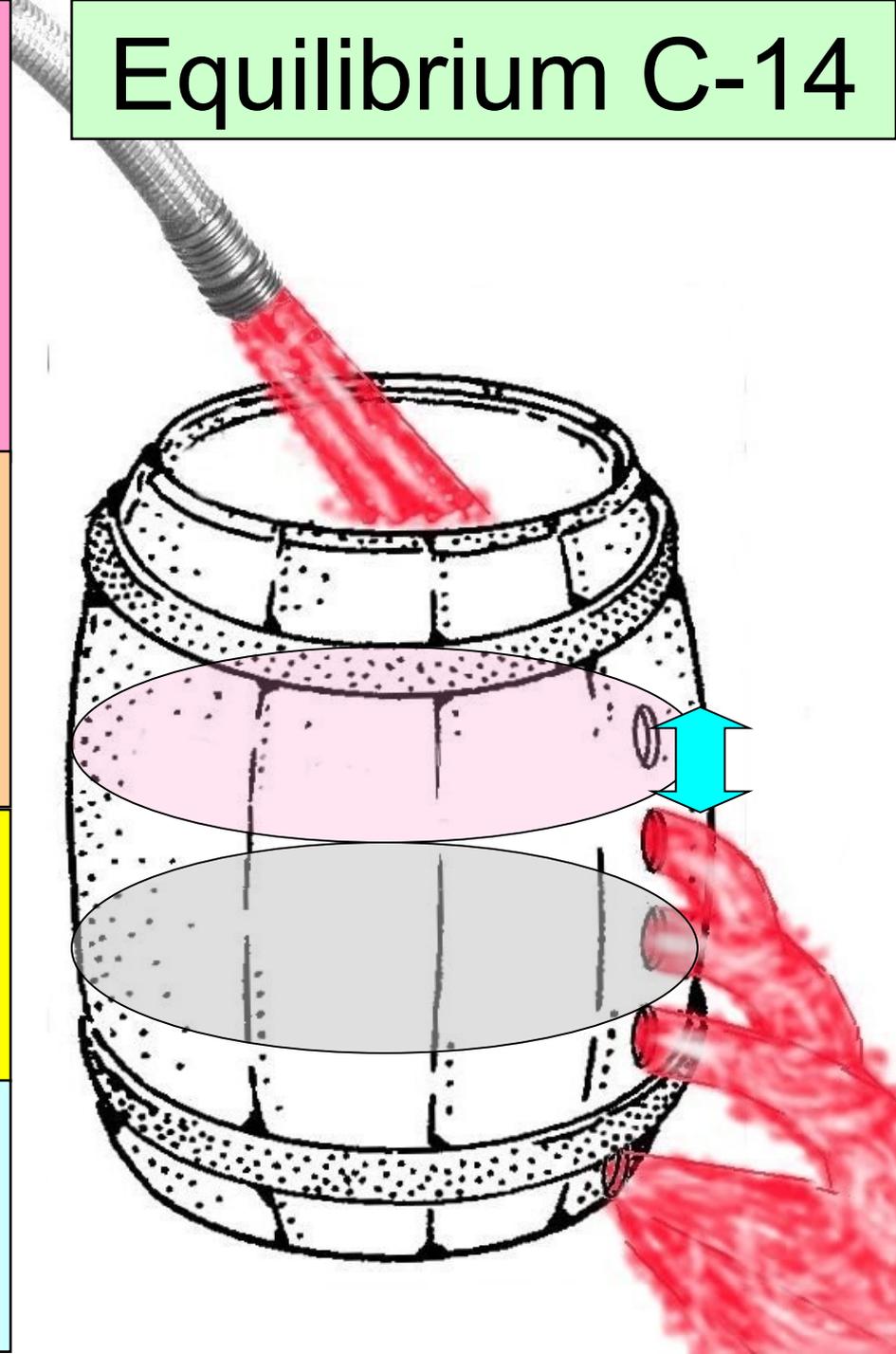
Equilibrium C-14

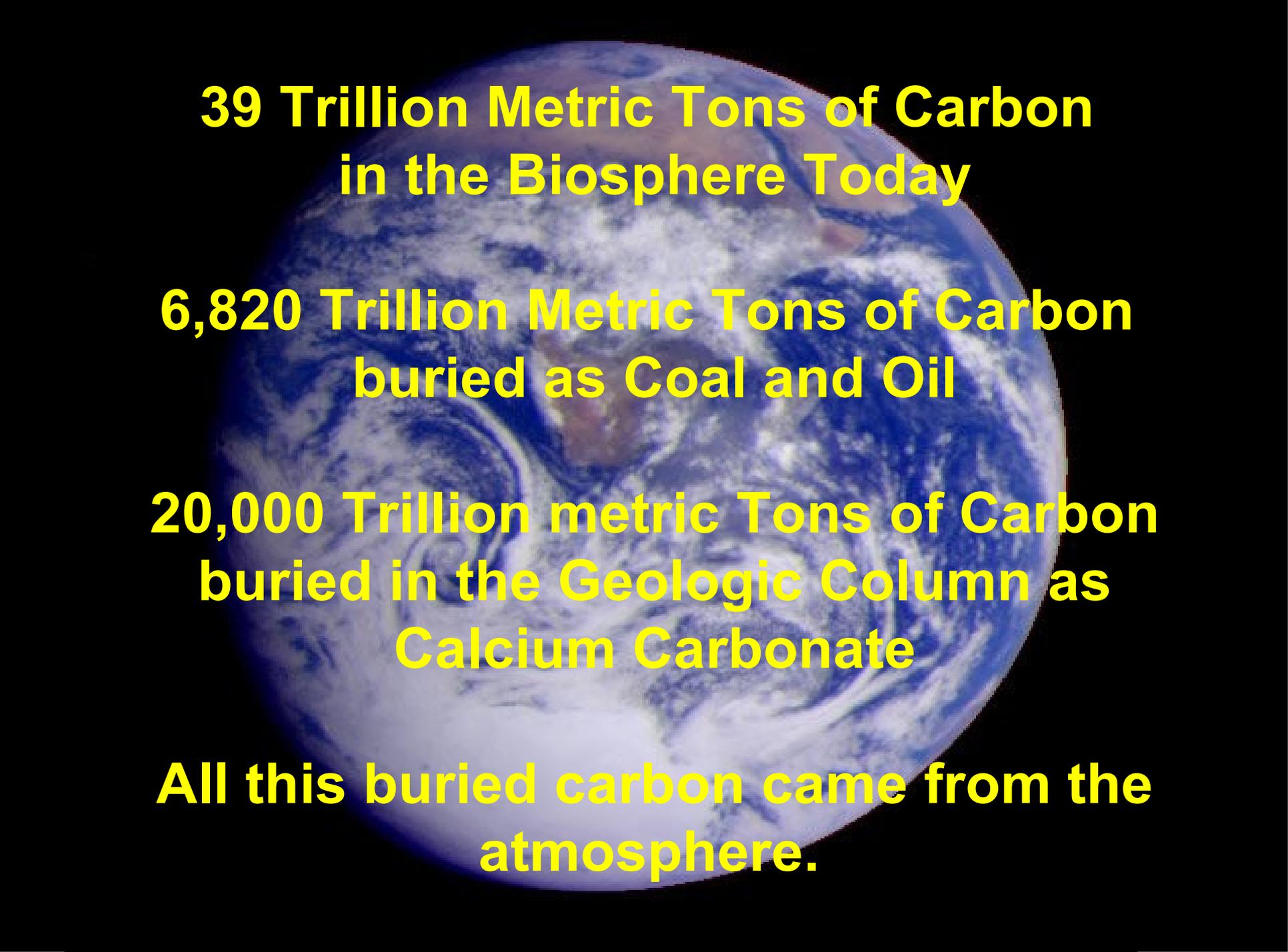
Carbon fixed by plants is returned to the air as CO_2 by respiration in plants and animals and by the decomposition of dead plants and animals

A large part of the C-14 in the biosphere is that which is contained in plant and animal bodies

What if a large portion of these plants and animals were suddenly buried?

C-14 in the atmosphere and in the remaining plants and animals would begin to rise.





**39 Trillion Metric Tons of Carbon
in the Biosphere Today**

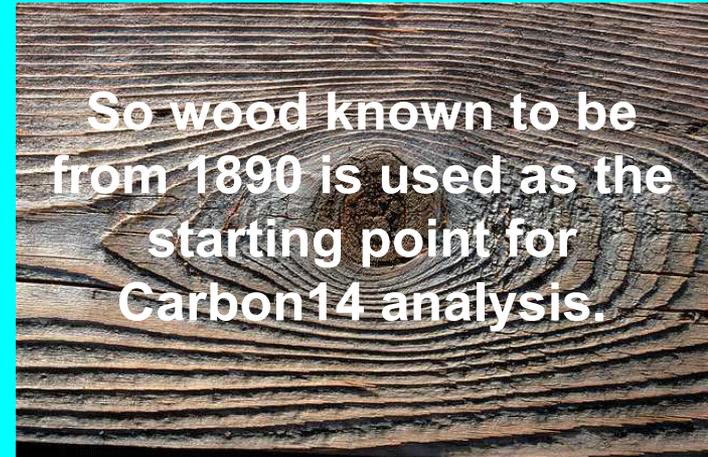
**6,820 Trillion Metric Tons of Carbon
buried as Coal and Oil**

**20,000 Trillion metric Tons of Carbon
buried in the Geologic Column as
Calcium Carbonate**

**All this buried carbon came from the
atmosphere.**

The Amount of Carbon-14 in **today's atmosphere** is not used to as the starting point for Carbon-14 analysis.

1. Today's atmosphere contains **too much Carbon Dioxide** from industry
2. The Carbon Dioxide released released by burning fossil fuels has **too little Carbon-14** because coal, oil and natural gas contain very little Carbon-14.
3. Atomic testing has **doubled the amount of carbon 14** in today's atmosphere

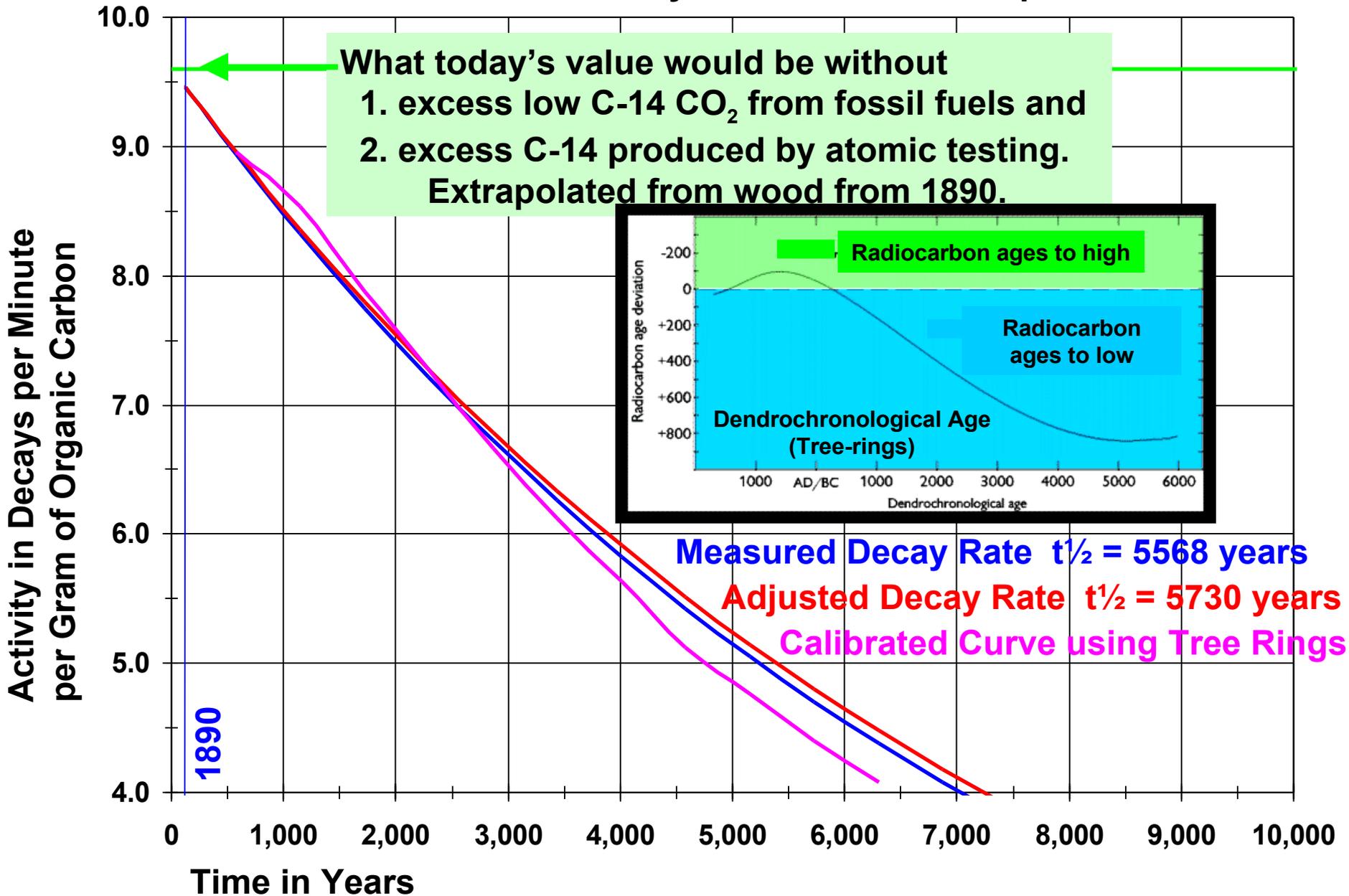


Problem?

- C14 formation and decay is not in equilibrium today
- Radiocarbon forming 28% - 37% faster than it is decaying

Melvin A. Cook, 'No equilibrium Radiocarbon Dating Substantiated', Vol. 2, Pittsburgh, 1986, pp. 59-68

Carbon-14 Radioactive Decay Curve – Not So Simple



Why do samples that are thought to be millions or 100's of millions of years old consistently show detectable Carbon-14 ?

Sample	Equivalent C-14 Age	C-14/C-12 Ratio re 1950 A.D. Standard	Excess Over Machine Background
Machine Background without a sample	60,000 - 73,000	.00070 - .00015	—
Unprocessed Finland Bedrock	63,500 ±2,000	.00046±.00011	0
Unprocessed Meteorite	56,500 ±1,500	.00108±.00020	ca. .00040
Unprocessed Natural Graphite	54,000 - 64,000	.00146 - .00043	.00080 - 0
"Infinite" Age Samples: anthracite coal, bone, calcite, graphite, limestone, shell, wood	40,000 - 52,000	.00792 - .00185	.0072 - .0011

AMS Data for "Infinite" C-14 Age Samples. Data from seven laboratories reporting in *Radiocarbon* 28(2A):177-244

Why is there so much radiocarbon?

Material	Residual Carbon-14 (% of modern C-14)
Anthracite Coal	0.44 +/- 0.13
Fossilized wood	0.21 +/- 0.02
Natural Gas	0.17 +/-0.03
Shell (Mytilus edulis)	0.13 +/- 0.03
Graphite	0.1 +/- 0.01
Petroleum	0.1 +/- 0.05
Whale bone	0.18 +/-0.03
Charred wood	0.38 +/- 0.05
Wood	0.46 +/- 0.03
Marble	0.26 +/- 0.02
Fossil carbon dioxide	0.21 +/-0.06

**This
astounding
evidence for
a young
earth is
simply
ignored!**

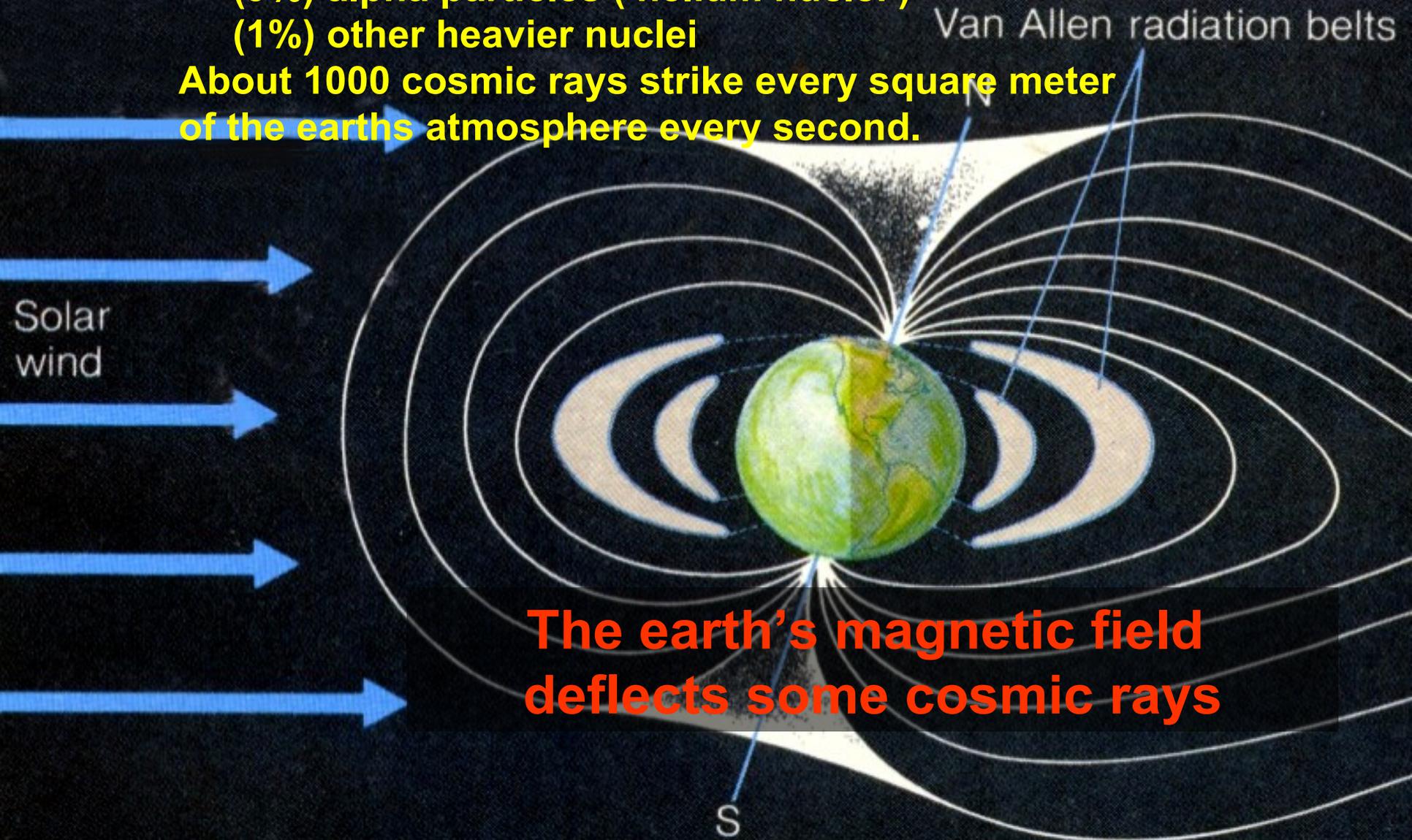
Cosmic Rays are high speed particles from high energy sources in our galaxy.

(90%) protons

(9%) alpha particles (helium nuclei)

(1%) other heavier nuclei

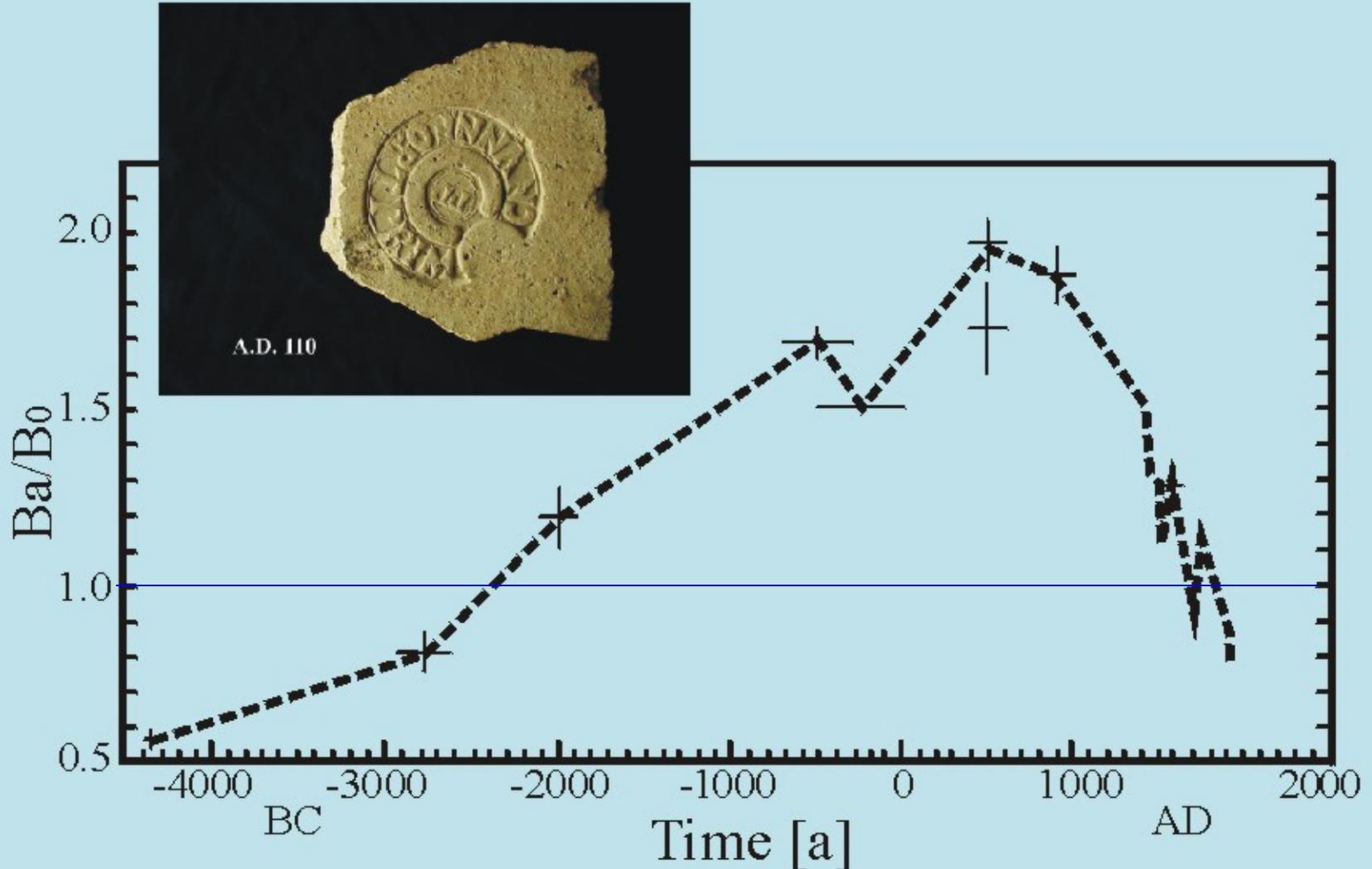
About 1000 cosmic rays strike every square meter of the earth's atmosphere every second.

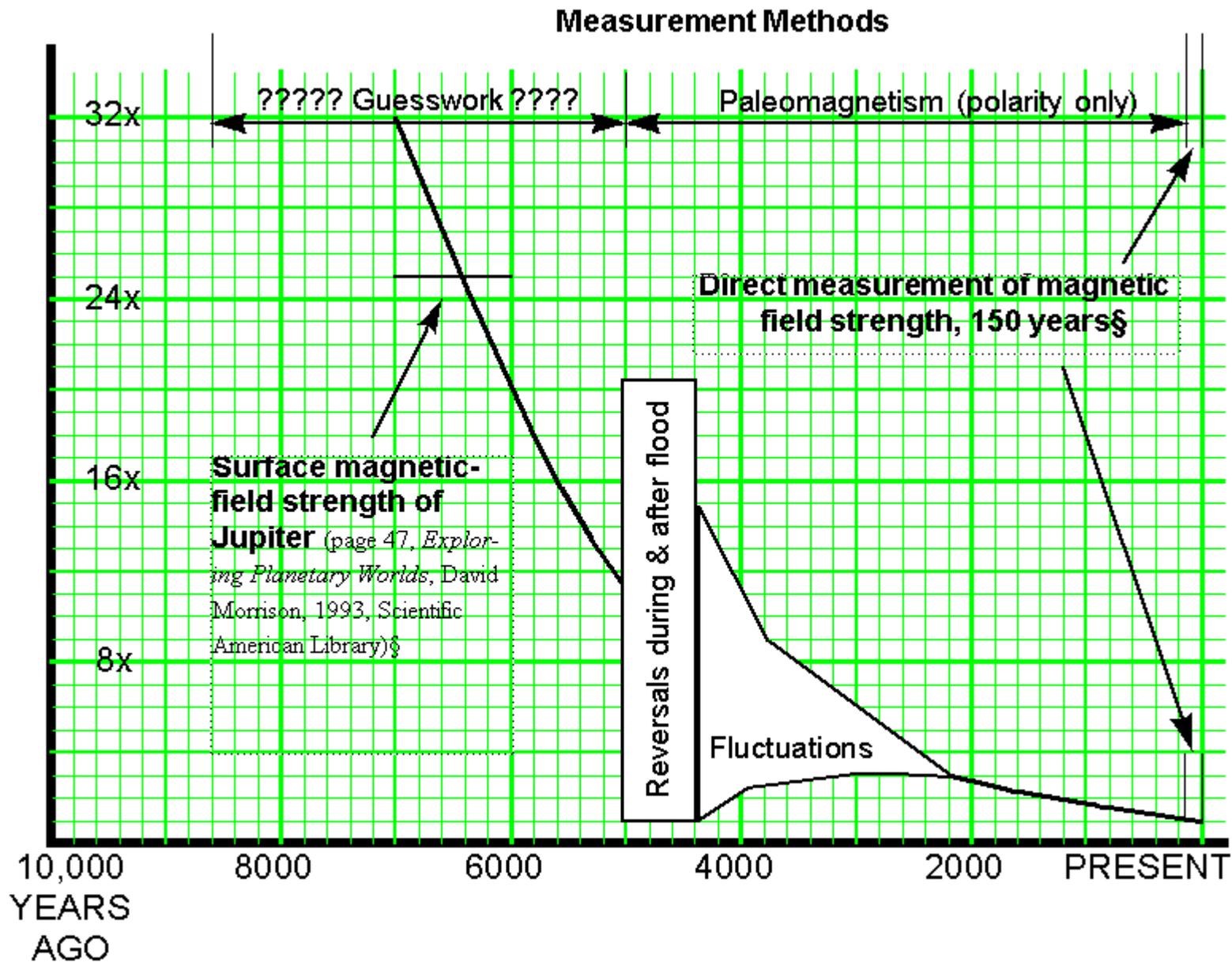


The earth's magnetic field deflects some cosmic rays

Scientists believe that the Earth's magnetic field has varied from $\frac{1}{2}$ to 2 times the present value in the past 6,000 years.

This would affect how much cosmic radiation strikes the atmosphere and how much Carbon - 14 is produced.





History of Earth's Magnetic Field - Humphrey Model

Has any real scientist ever doubted Carbon -14 Dating ?

“If a C-14 date supports our theories, we put it in the main text. If it does not entirely contradict them, we put it in a footnote. And if it is completely ‘out of date’, we just drop it.”

T. Save-Soderbergh and I.U. Olsson (Institute of Egyptology and Institute of Physics respectively, Univ. of Uppsala, Sweden), C-14 dating and Egyptian chronology in Radiocarbon Variations and Absolute Chronology”, *Proceedings of the twelfth Nobel Symposium*, New York 1970, p. 35

“No matter how ‘useful’ it is, though, the radiocarbon method is still not capable of yielding accurate and reliable results. There are gross discrepancies, the chronology is uneven and relative, and the accepted dates are actually selected dates. This whole blessed thing is nothing but 13th-century alchemy*, and it all depends upon which funny paper you read.

Robert E. Lee, “Radiocarbon: ages in error” *Anthropological Journal of Canada*, Vol. 19(3), 1981, pp. 9-29

* Alchemy (ˈæl.kɪ.m.ɪ): magical power or process of transmuting, (*American Heritage Dictionary*).

Living mollusk shells were dated up to **2300 years old.**
Science vol. 141,

A **freshly killed** seal was carbon dated
as having died **1300 years ago!**
Antarctic Journal
vol. 6 Sept-Oct. 1971 p. 211

Shells from **living** snails were carbon
dated as being **27,000 years old.**
Science
Vol. 224, 1984 p. 58-61

Living Penguins have been dated as being
8000 years old!

“One part of the **Vollosovitch mammoth** carbon dated at **29,500** years old and another part at **44,000.**”

Troy L. Pewe, *Quaternary Stratigraphic Nomenclature in Unglaciaded Central Alaska*, Geological Survey Professional Paper 862
(U.S. Gov. printing office, 1975) p. 30

“One part of **Dima** [a **baby** frozen **mammoth**] was **40,000**, another part was **26,000** and the ‘wood immediately around the carcass’ was **9-10,000.**”

Troy L. Pewe, *Quaternary Stratigraphic Nomenclature in Unglaciaded Central Alaska*, Geological Survey Professional Paper 862
(U.S. Gov. printing office, 1975) p. 30

“The lower leg of the **Fairbanks Creek mammoth** had a radiocarbon age of **15,380** RCY (radio carbon years), while its skin and flesh were **21,300** RCY.”
Harold E. Anthony, “Natures Deep Freeze,” *Natural History*, Sept. 1949, p. 300 See also: *In the Beginning* Walt Brown p. 124

“The two **Colorado Creek mammoths** had radiocarbon ages of **22,850 +/- 670** and **16,150 +/- 230** years respectively.”

Robert M. Thorson and R. Dale Guthrie, “Stratigraphy of the Colorado Creek Mammoth Locality, Alaska,” *Quaternary Research*, Vol. 37, No. 2, March 1992, pp. 214-228, see also: *In the Beginning* Walt Brown p. 124

Russian scientists Kusnetsov and Ivanov
carbon dated **dinosaur bones**
at under **30,000 years**.

Hugh Miller, Columbus, OH
had **dinosaur bone** samples
carbon dated at **20,000 years old**.

The samples were not identified as dinosaur in advance.

Noah to Abram the Turbulent Years,
by Erich von Fange p. 36

Material from **layers** where **dinosaurs** are found
carbon dated at **34,000 years old**.

R. Daly *Earth's Most Challenging Mysteries*, 1972, p. 280

Ancient human skeletons, when dated by the new Accelerator Mass Spectrometer technique, give surprisingly recent dates.

In one study of eleven sets of ancient human bones, all were dated at about **5,000** radiocarbon years or less.

R. E. Taylor, "Major Revisions in the Pleistocene Age Assignments for North American human Skeletons by C-14 Accelerator Mass Spectrometry", American Antiquity, Vol. 50, 1985, pp. 136-140.

In 1993 scientists found wood (trees) buried in basalt flows (69 feet deep)

Wood samples sent to two laboratories to be carbon-14 dated **44,000 years old.**

Basalt sent to two laboratories to be potassium-argon dated **45 Million years old.**

Professor Reiner Protsch von Zieten lied about the age of Neanderthal skulls and artifacts for 30 years. A university panel **exposed his frauds and he resigned Feb. 2005.**

Protsch had dated the “Bischof-Speyer” skeleton at 21,300 years but testing at Oxford showed them to be 3,300 years old.

www.worldnetdaily.com Feb. 19, 2005