

**1. A sample with 35.4% of its  
K40 left is how old?**

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**Age=(number of half lives) \* (time of one half life)**

1. A sample with 35.4% of its K40 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(number of half lives) \* (1.3 billion years)

*half life data for potassium 40 is from the textbook*

1. A sample with 35.4% of its K40 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(      ? ? ? ?      ) \* (1.3 billion years)

**Number of half lives = ?**

1. A sample with 35.4% of its K40 left is how old?

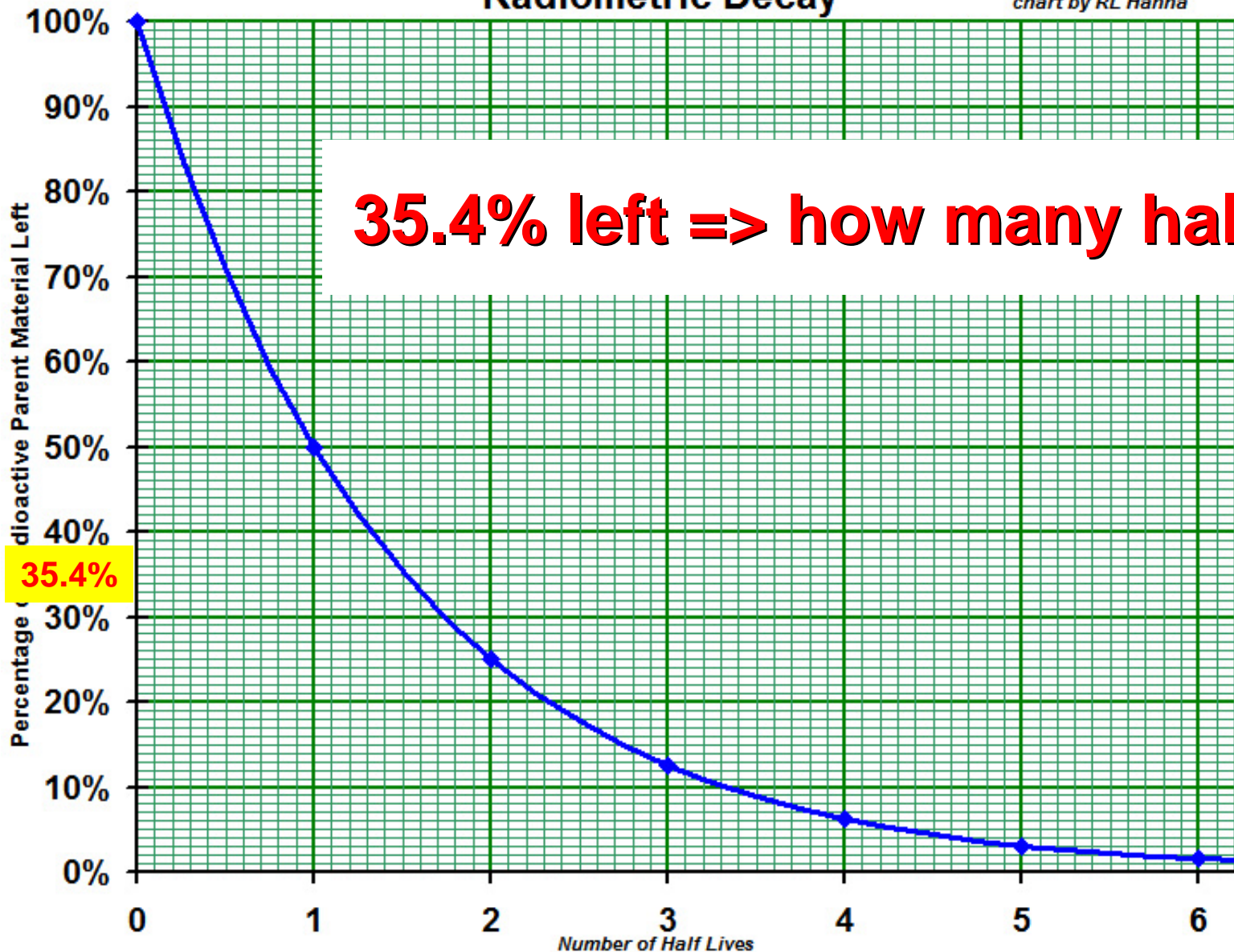
Age=(number of half lives) \* (time of one half life)

Age=(     ? ? ? ?     ) \* (1.3 billion years)

**35.4% left => how many half lives?**

# Radiometric Decay

chart by RL Hanna



**35.4% left => how many half lives?**

35.4%

chart by RL Hanna

# Radiometric Decay

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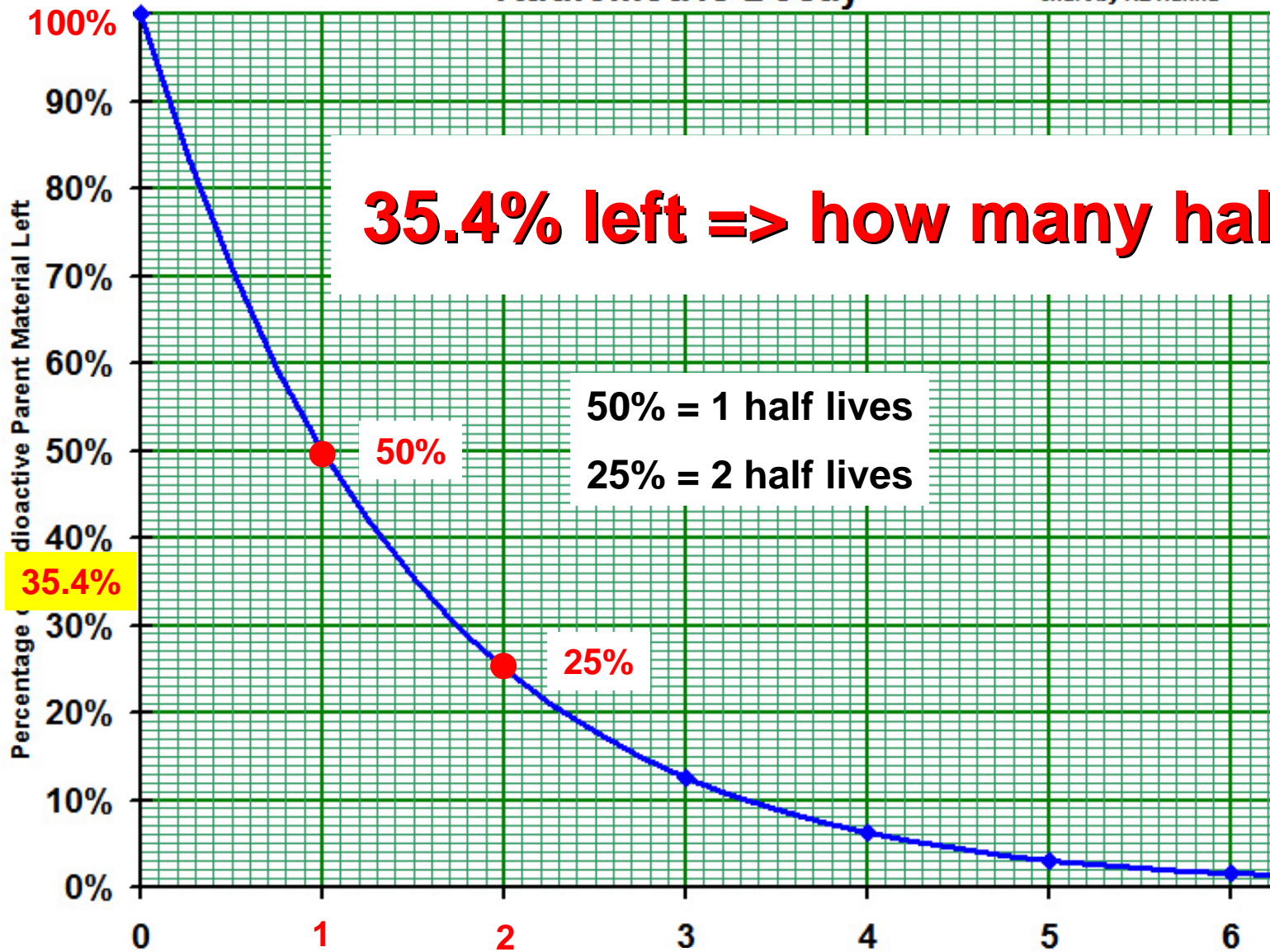


chart by RL Hanna

# Radiometric Decay

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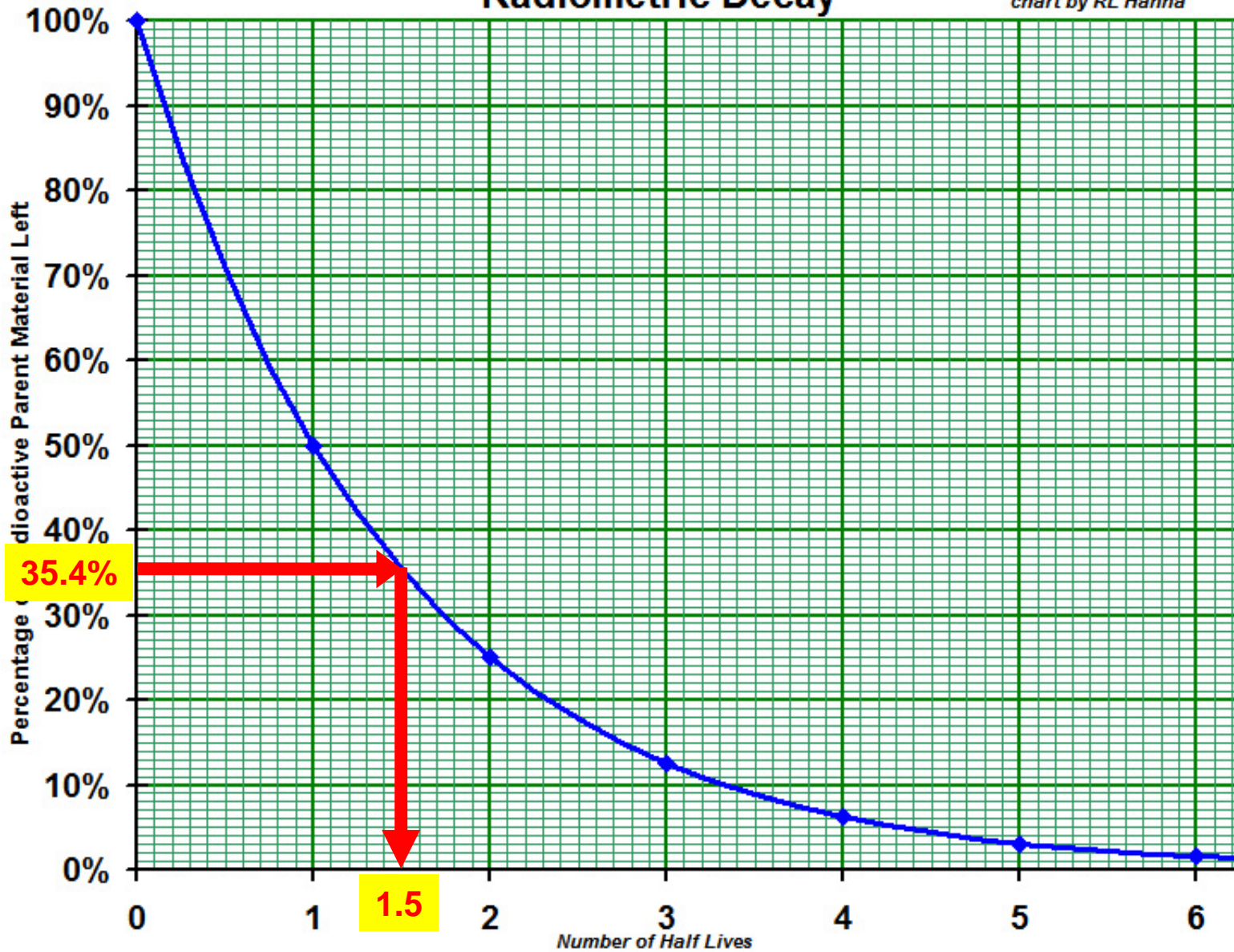
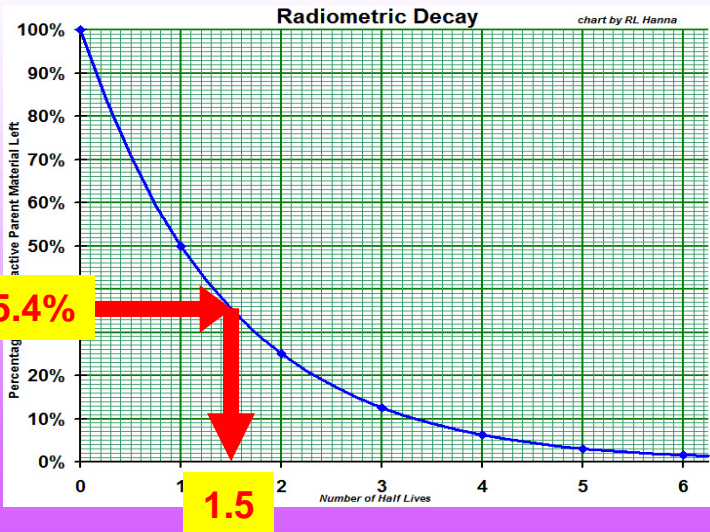


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1. A sample with 35.4% of its K40 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=( **1.5 half lives** ) \* (1.3 billion years)

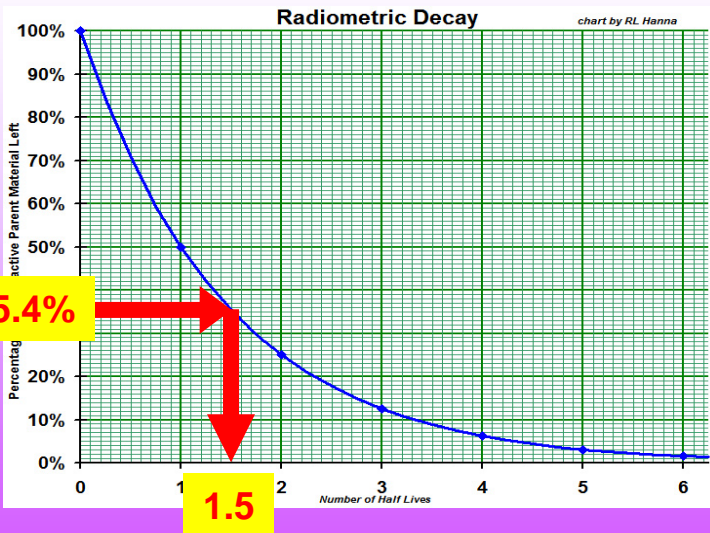


1. A sample with 35.4% of its K40 left is how old?

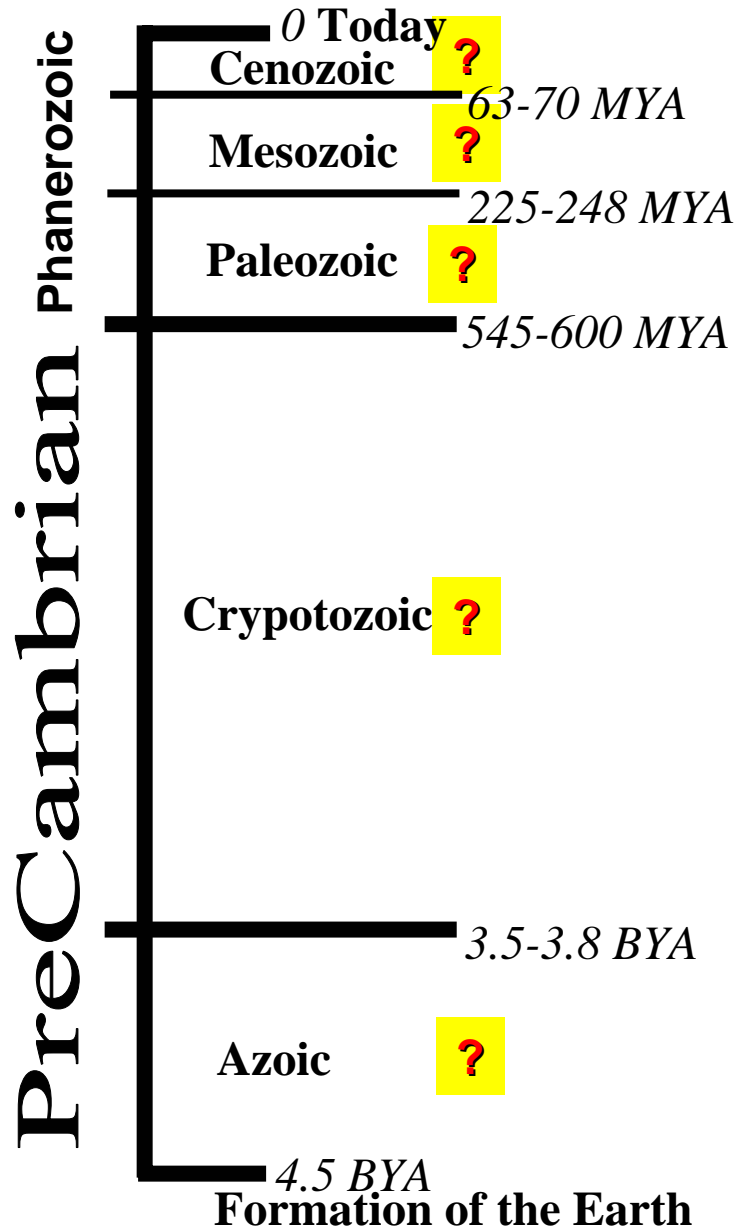
Age=(number of half lives) \* (time of one half life)

Age=( 1.5 half lives ) \* (1.3 billion years)

**Age = 1.5\*1.3= 1.95 billion years old**



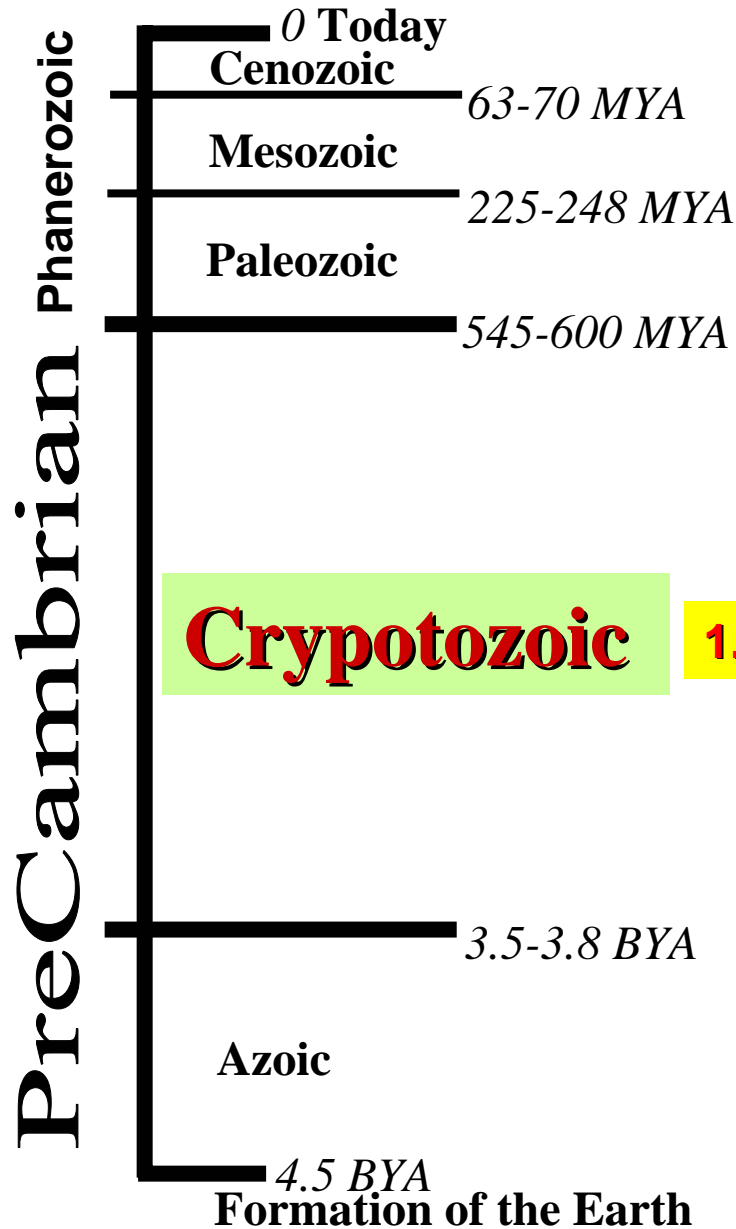
# The Geologic Time Scale



A sample with 35.4%  
of its K40 left is  
1.95 billion years old

What age is the sample?

*The Geologic Time Scale*



**A sample with 35.4%  
of its K40 left is  
1.95 billion years old**

**What age is the sample?**



**2. Radioactive element Gx75  
has a half-life  
of 140 million years.**

**A sample with 10.5% of its  
Gx75 left is how old?**

**2. Radioactive element Gx75 has a half-life  
of 140 million years.**

**A sample with 10.5% of its Qg98 left is how old?**

**Age=(number of half lives) \* (time of one half life)**

2. Radioactive element Gx75 has a half-life  
of **140 million years**.

A sample with 10.5% of its Qg98 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(number of half lives) \* (**140 million years**)

**2. Radioactive element Gx75 has a half-life  
of 140 million years.**

**A sample with 10.5% of its Qg98 left is how old?**

**Age=(number of half lives) \* (time of one half life)**

**Age=(        ? ? ? ?        ) \* (140 million years)**

**Number of half lives = ?**

2. Radioactive element Gx75 has a half-life of 140 million years.

A sample with 10.5% of its Qg98 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(      ? ? ? ?      ) \* (140 million years)

**10.5% left => how many half lives?**

# Radiometric Decay

chart by RL Hanna

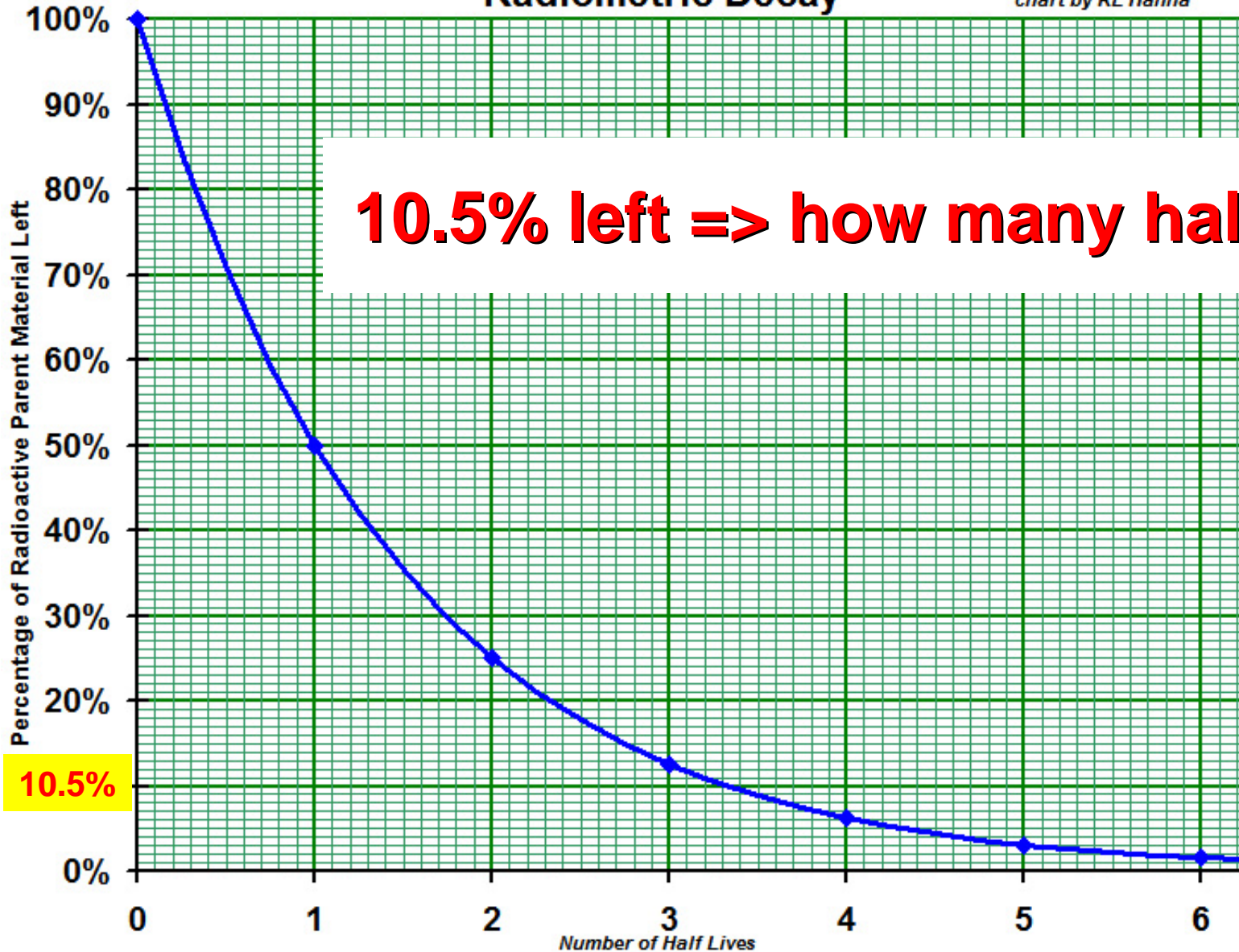


chart by RL Hanna

# Radiometric Decay

chart by RL Hanna

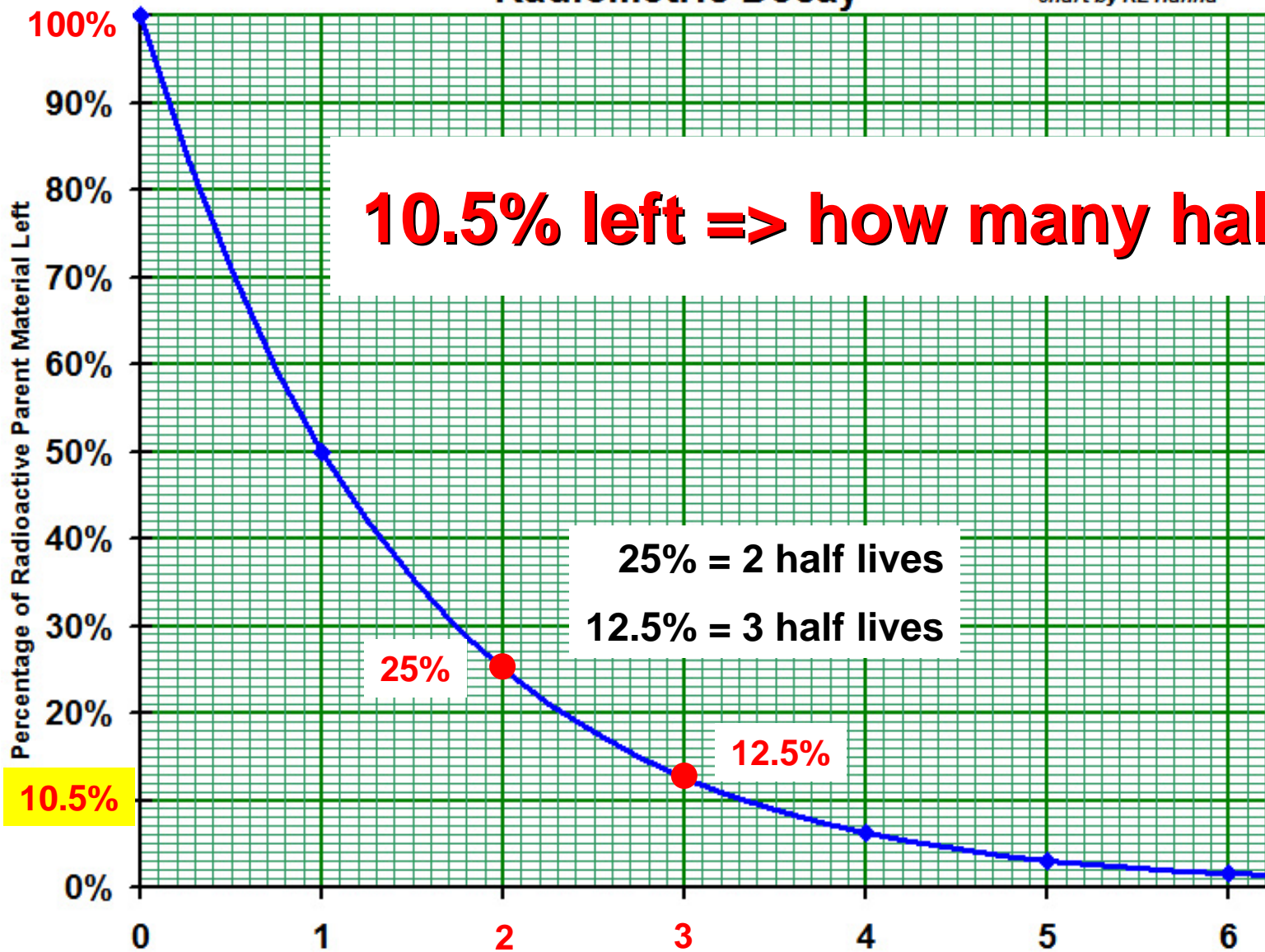


chart by RL Hanna

# Radiometric Decay

chart by RL Hanna

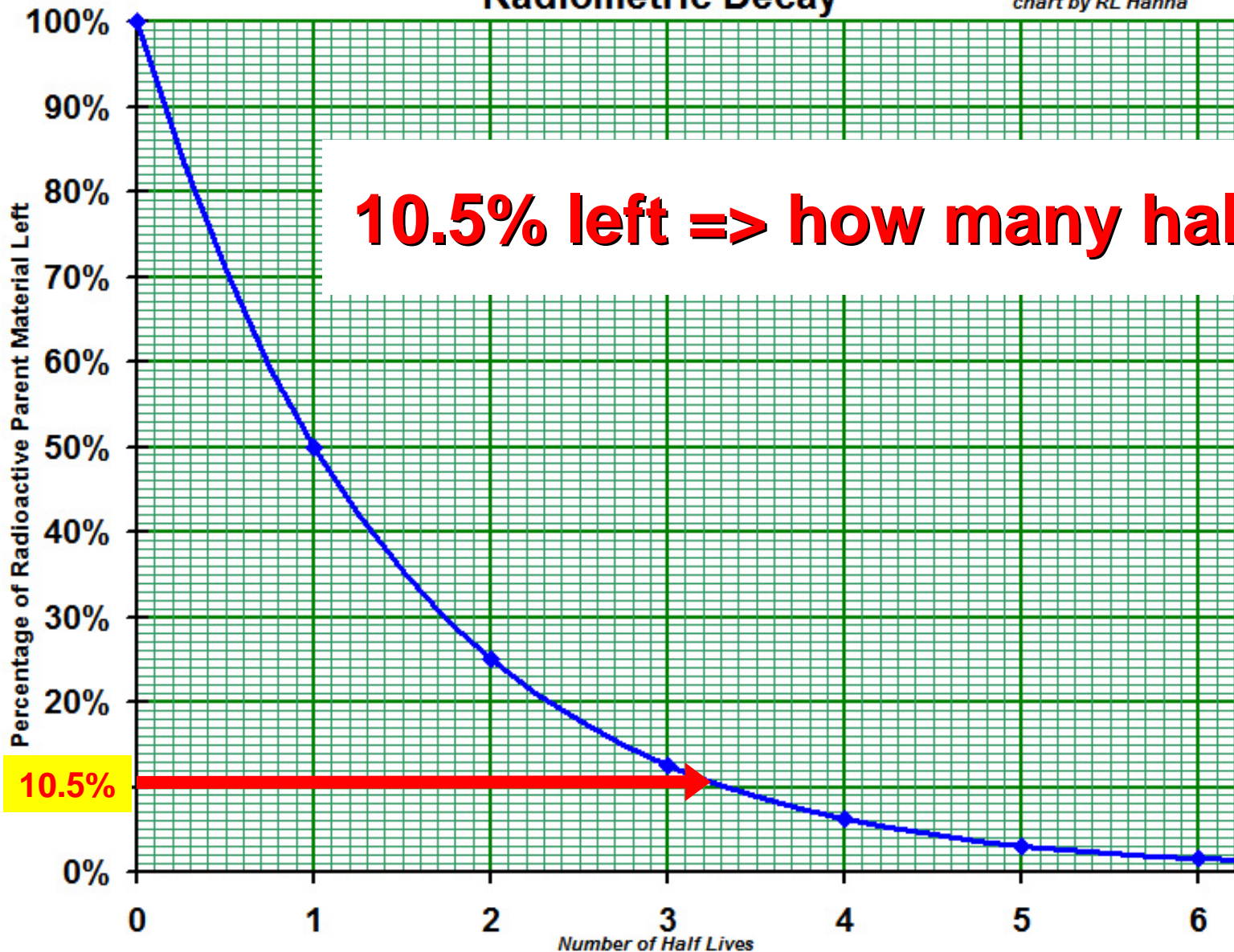


chart by RL Hanna

# Radiometric Decay

chart by RL Hanna

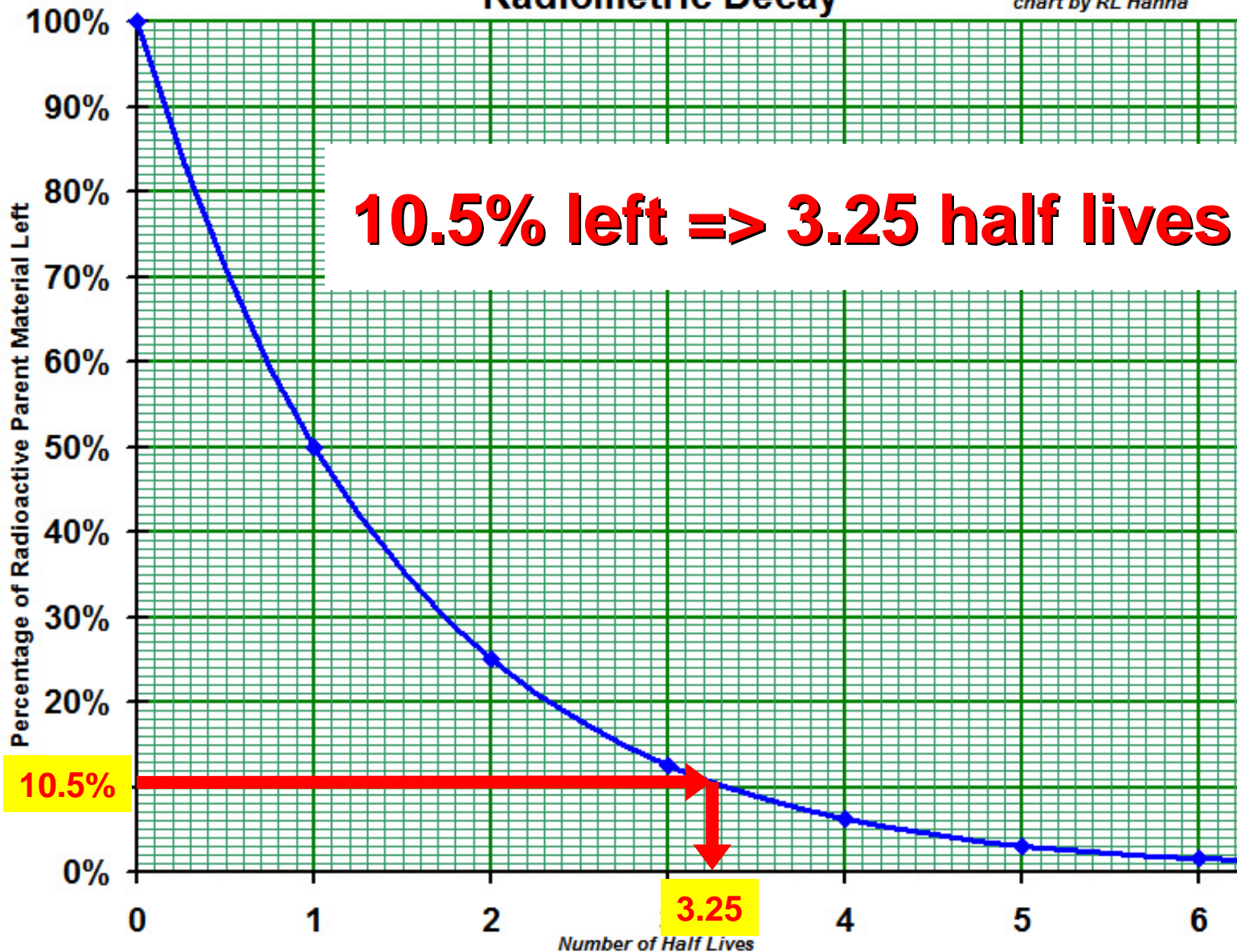


chart by RL Hanna

2. Radioactive element Gx75 has a half-life of 140 million years.

A sample with 10.5% of its Qg98 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=( **3.25 half lives** ) \* (140 million years)

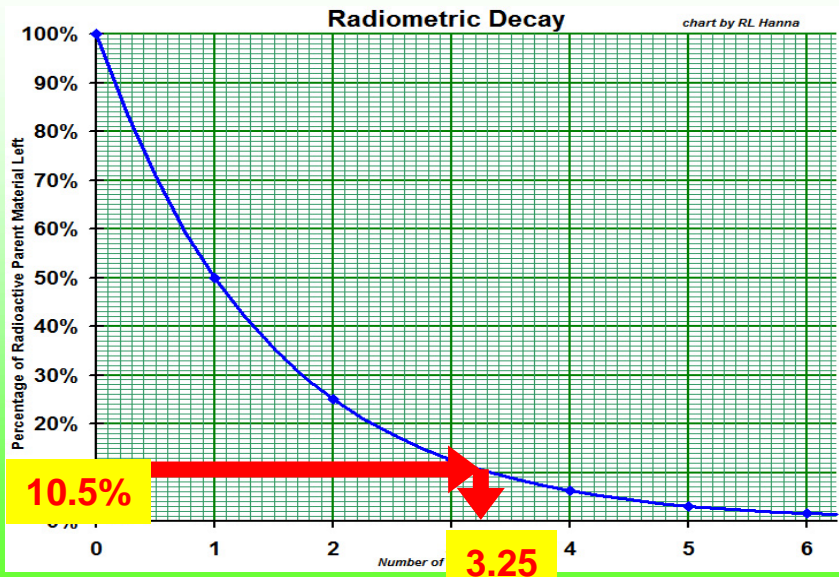


chart by RL Hanna

2. Radioactive element Gx75 has a half-life of 140 million years.

A sample with 10.5% of its Qg98 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(3.25 half lives) \* (140 million years)

**Age = 3.25\*140= 455 million years old**

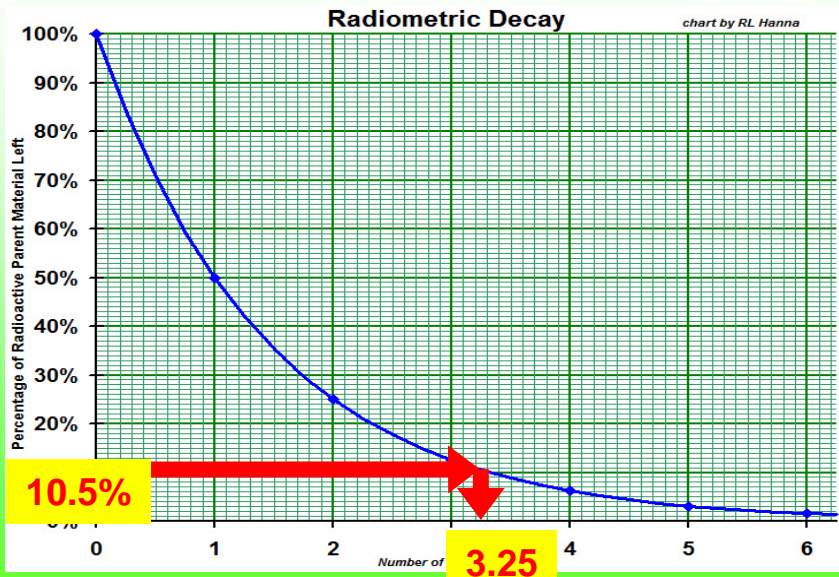
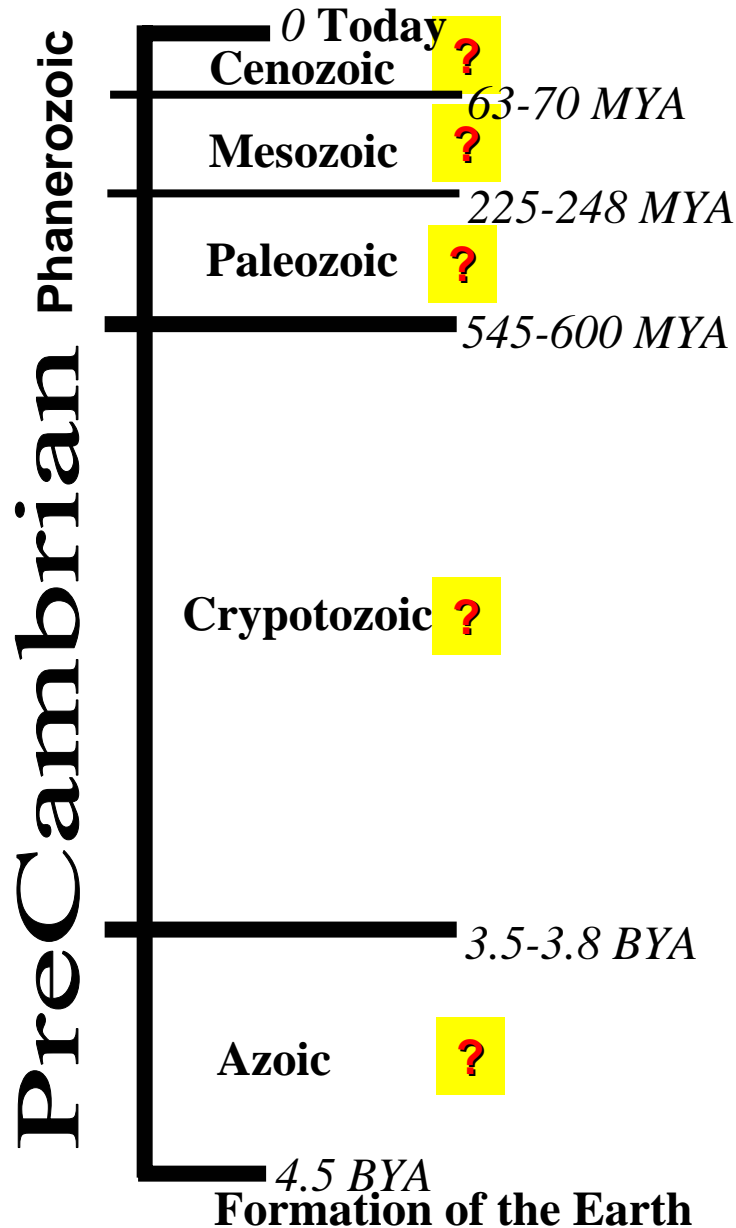


chart by RL Hanna

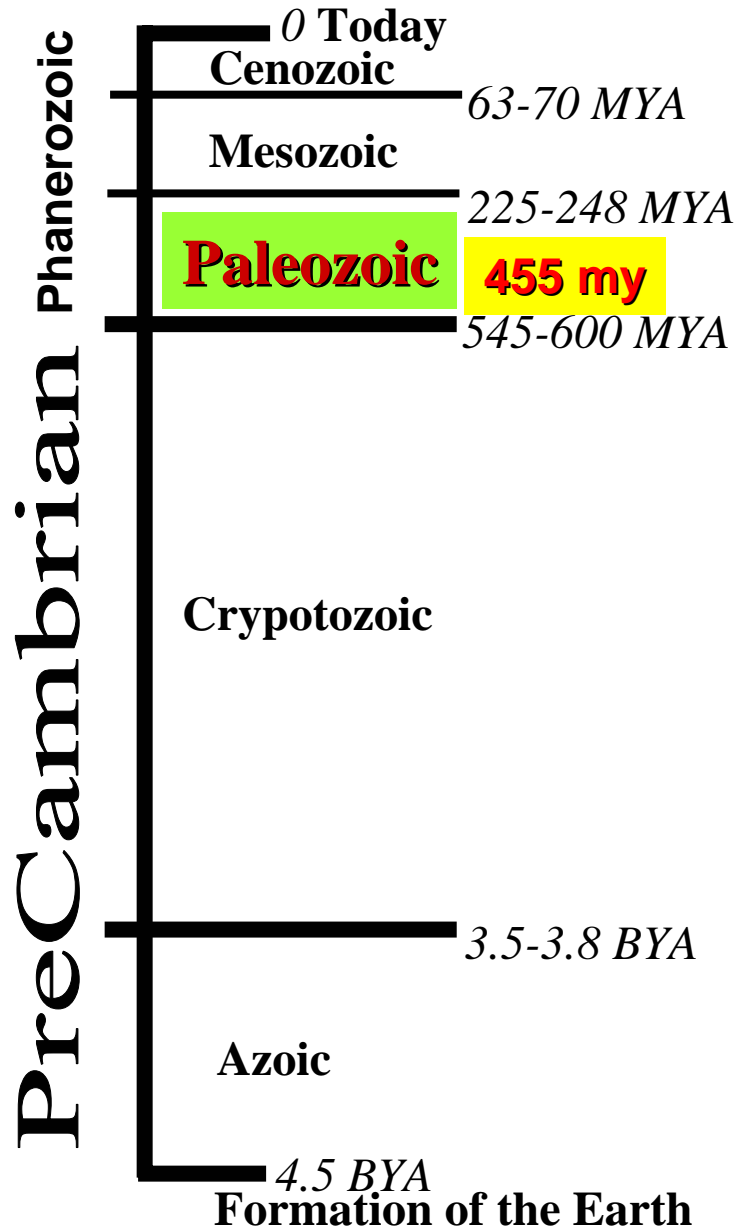
# The Geologic Time Scale



A sample with 10.5% of its Gx75 left is 455 million years old

What age is the sample?

# The Geologic Time Scale



A sample with 10.5% of its Gx75 left is 455 million years old

What age is the sample?



**3. Radioactive element Qg98  
has a half-life  
of 75 million years.**

**A sample with 70% of its  
Qg98 left is how old?**

**3. Radioactive element Qg98 has a half-life  
of 75 million years.**

**A sample with 70% of its Qg98 left is how old?**

**Age=(number of half lives) \* (time of one half life)**

**3. Radioactive element Qg98 has a half-life  
of **75 million years**.**

**A sample with 70% of its Qg98 left is how old?**

**Age=(number of half lives) \* (time of one half life)**

**Age=(number of half lives) \* (**75 million years**)**

**3. Radioactive element Qg98 has a half-life  
of 75 million years.**

**A sample with 70% of its Qg98 left is how old?**

**Age=(number of half lives) \* (time of one half life)**

**Age=(      ? ? ? ?      ) \* (75 million years)**

**Number of half lives = ?**

3. Radioactive element Qg98 has a half-life of 75 million years.

A sample with 70% of its Qg98 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(      ? ? ? ?      ) \* (75 million years)

**70% left => how many half lives?**

# Radiometric Decay

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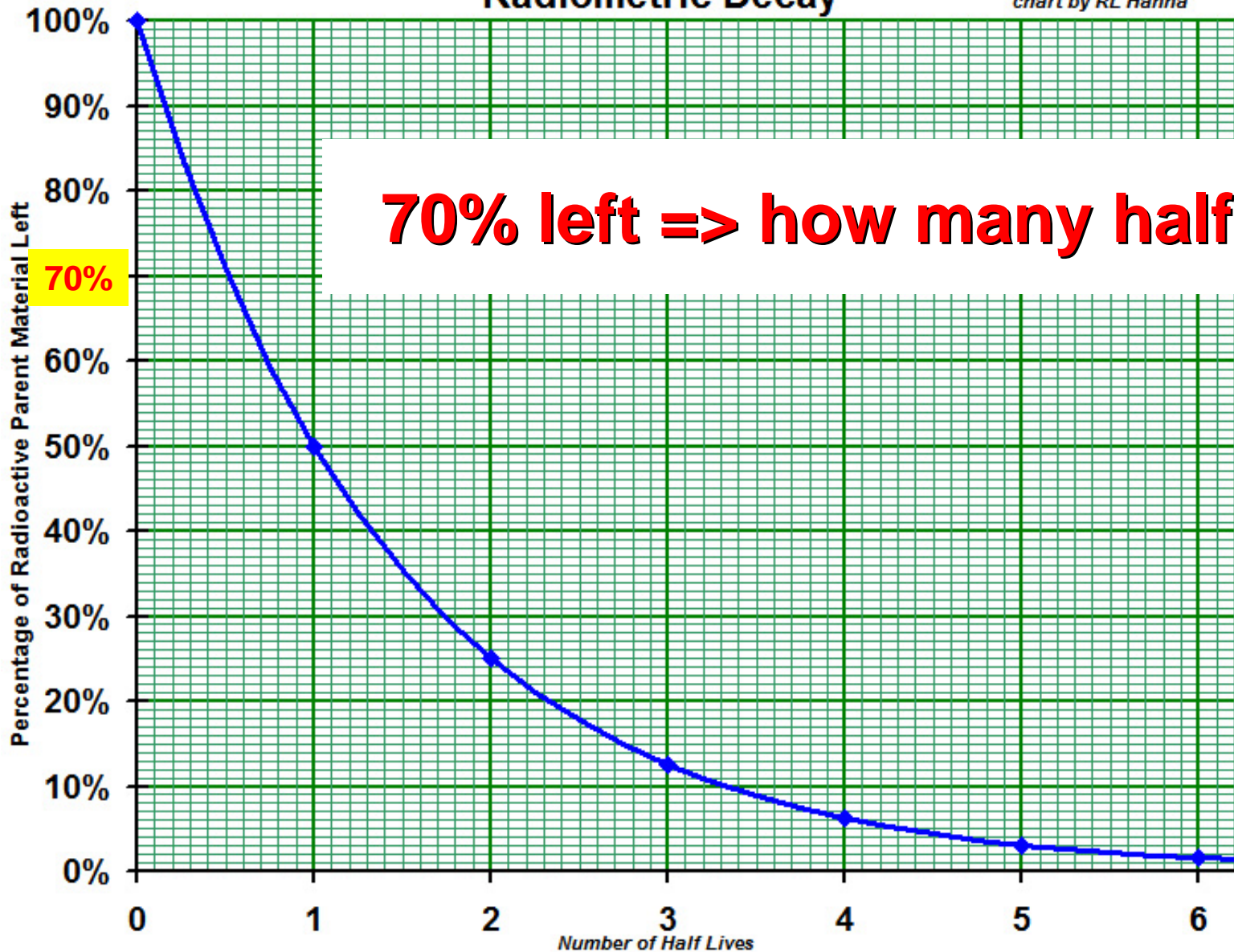


chart by RL Hanna

# Radiometric Decay

chart by RL Hanna

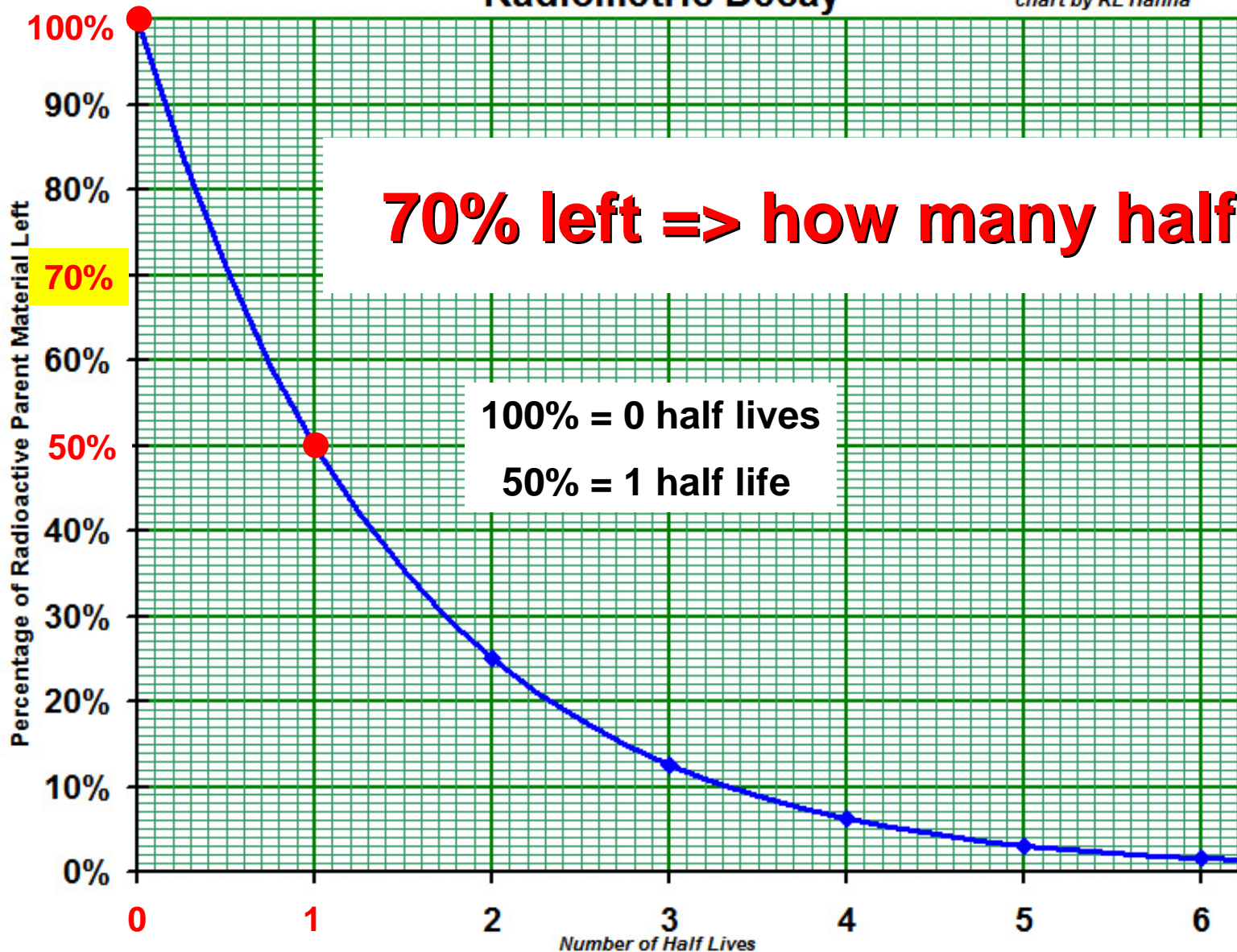
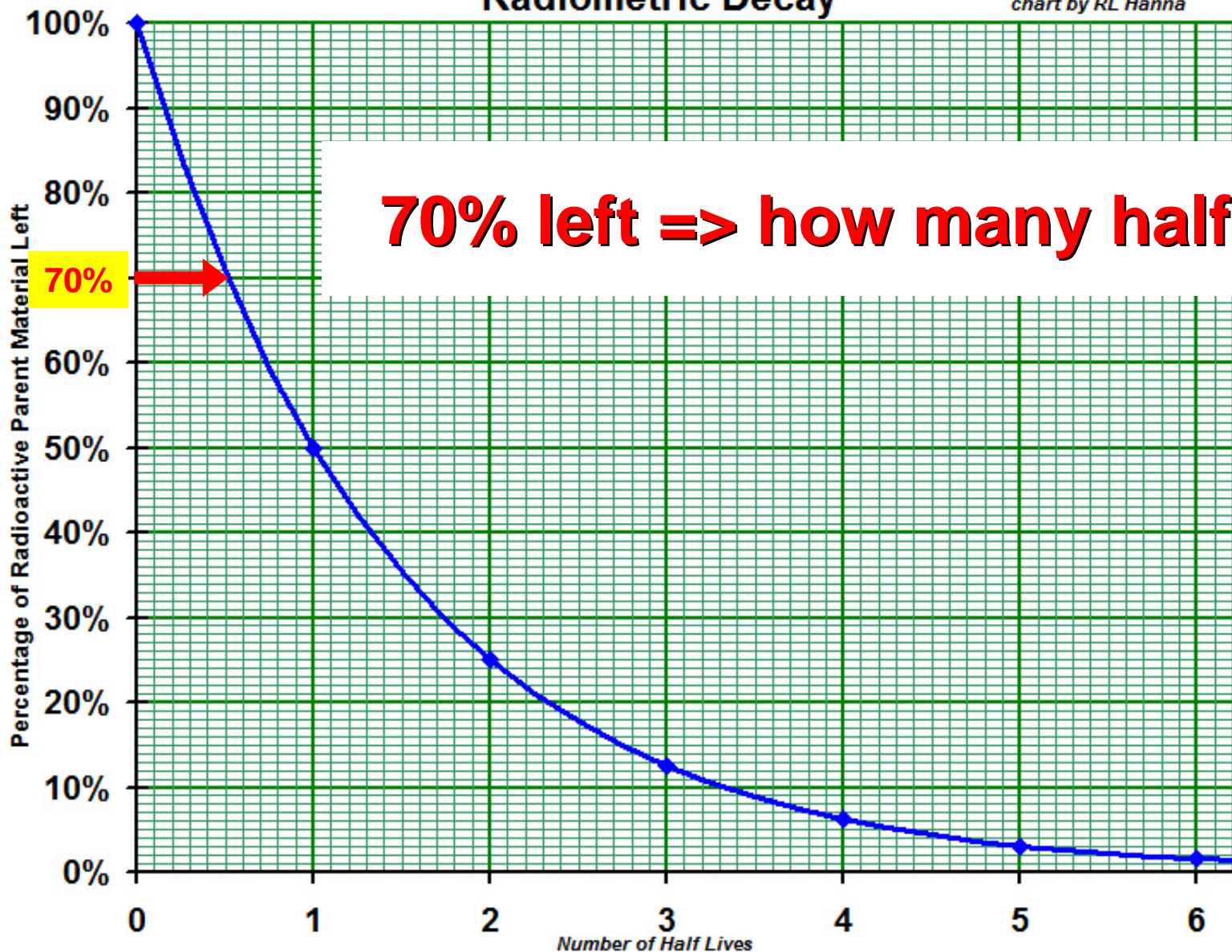


chart by RL Hanna

# Radiometric Decay

chart by RL Hanna

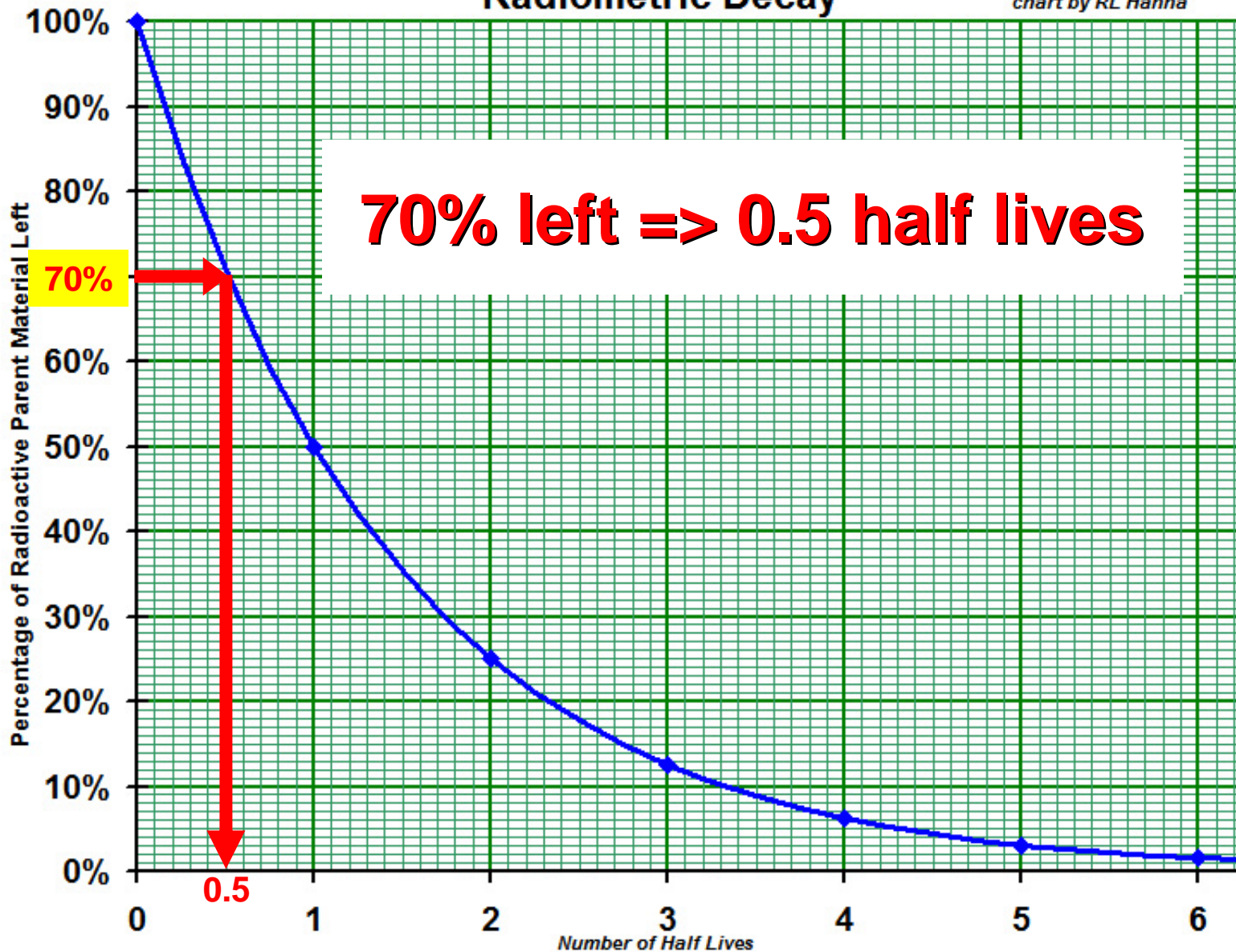


**70% left => how many half lives?**

chart by RL Hanna

# Radiometric Decay

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**70% left => 0.5 half lives**

chart by RL Hanna

### 3. Radioactive element Qg98 has a half-life of 75 million years.

A sample with 70% of its Qg98 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=( **0.5 half life** ) \* (75 million years)

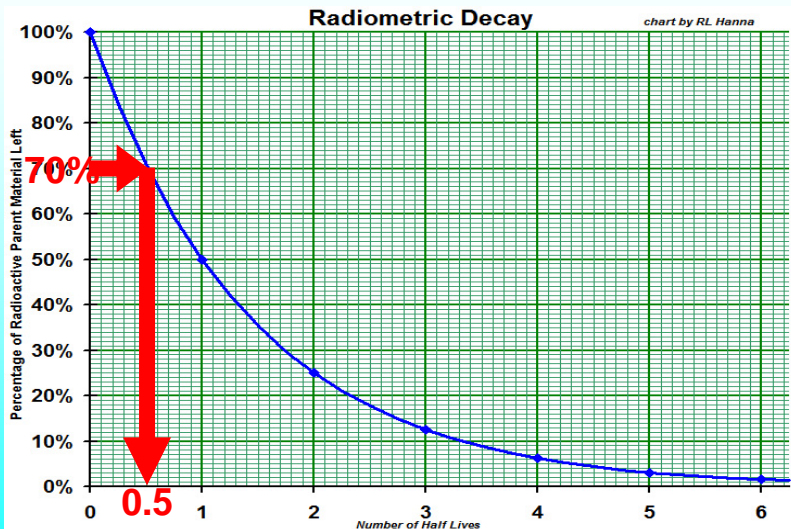


chart by RL Hanna

3. Radioactive element Qg98 has a half-life of 75 million years.

A sample with 70% of its Qg98 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(0.5) \* (75 million years) = 37.5 million years old

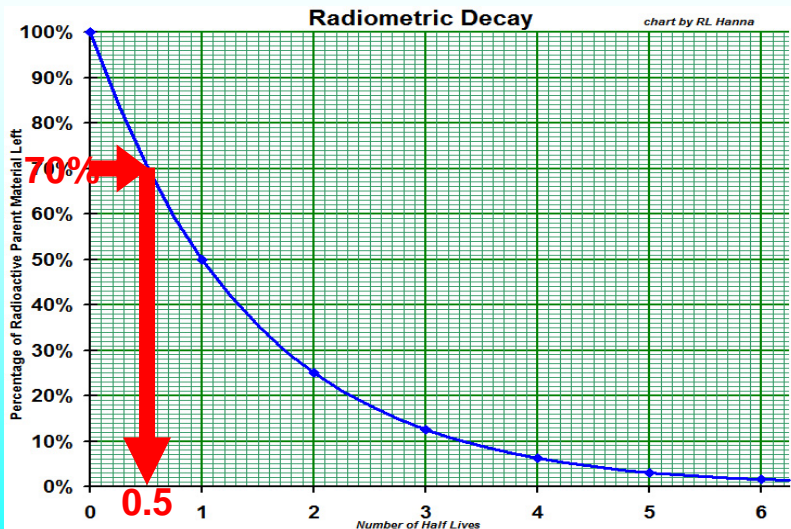
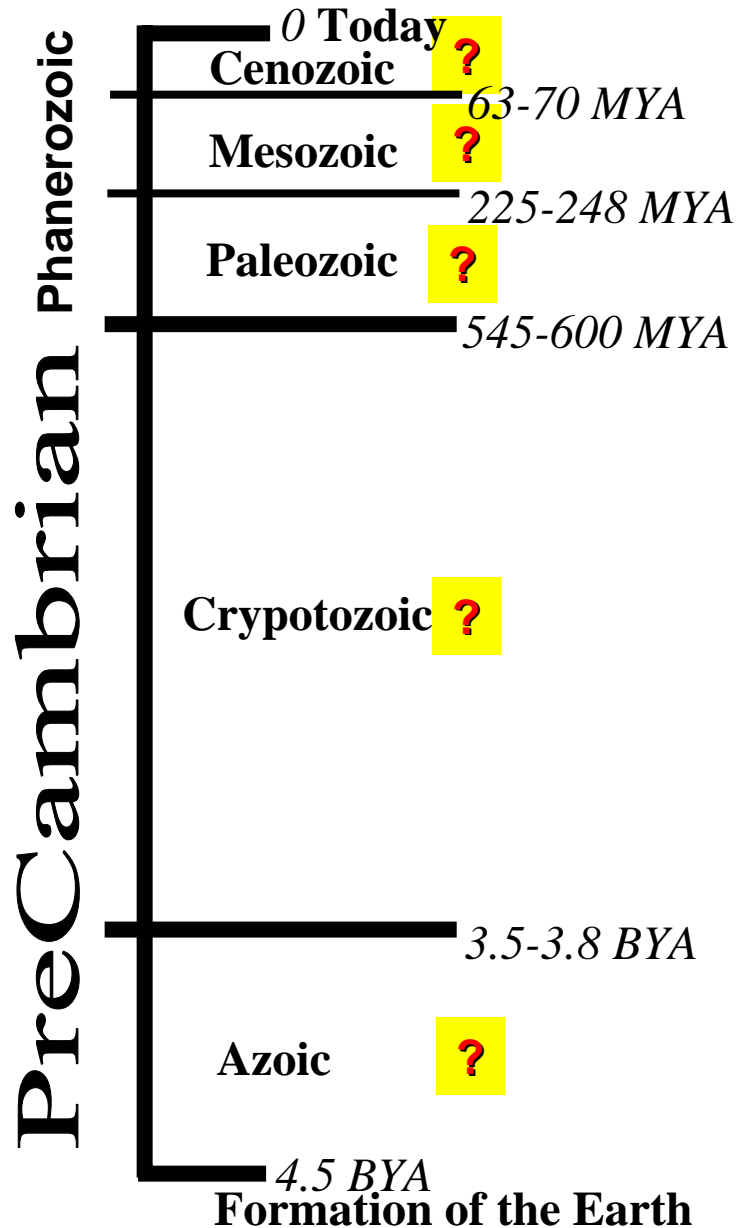


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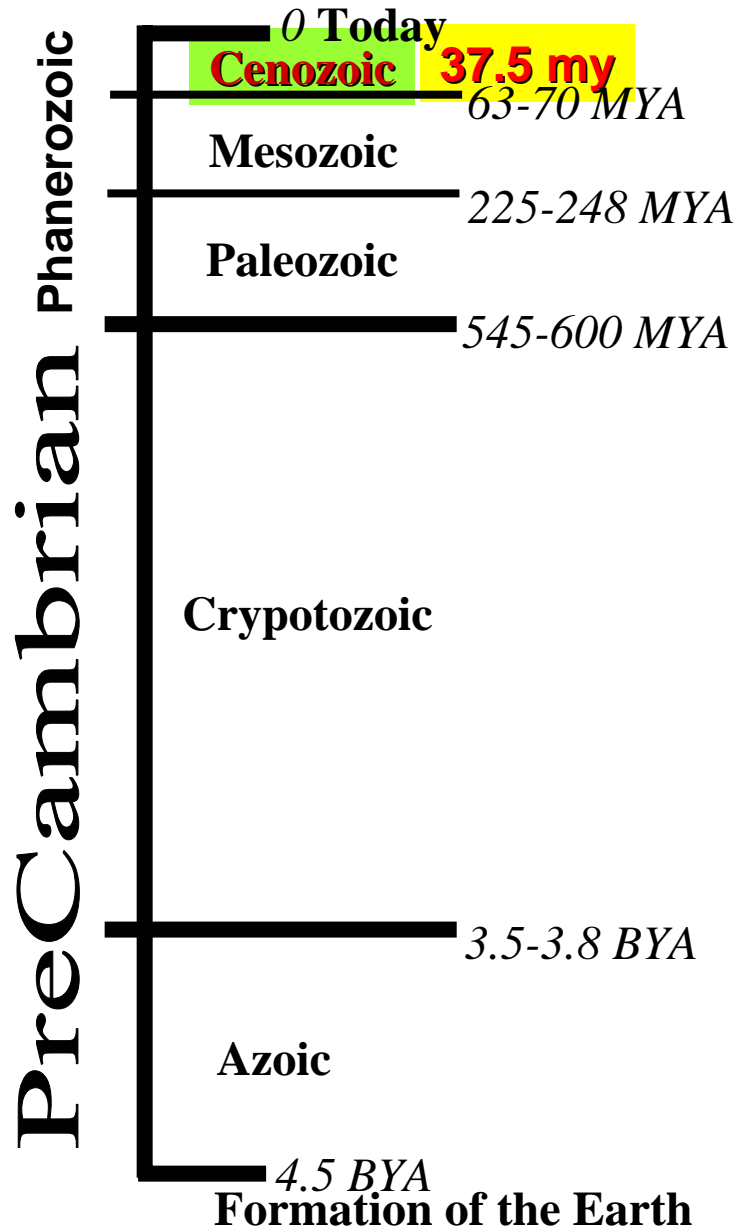
# The Geologic Time Scale



A sample with 70%  
of its Qg98 left is  
37.5 million years old

What age is the sample?

# The Geologic Time Scale



A sample with 70%  
of its Qg98 left is  
37.5 million years old

What age is the sample?



**4. Radioactive element Zv99  
has a half-life  
of 125 million years.**

**A sample with 42% of its  
Zv99 left is how old?**

4. Radioactive element Zv99 has a half-life  
of 125 million years.

A sample with 42% of its Zv99 left is how old?

**Age=(number of half lives) \* (time of one half life)**

4. Radioactive element Zv99 has a half-life  
of **125 million years**.

A sample with 42% of its Zv99 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(number of half lives) \* (**125 million years**)

4. Radioactive element Zv99 has a half-life of 125 million years.

A sample with 42% of its Zv99 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(      ? ? ? ?      ) \* (125 million years)

4. Radioactive element Zv99 has a half-life  
of 125 million years.

A sample with **42%** of its Zv99 left is how old?

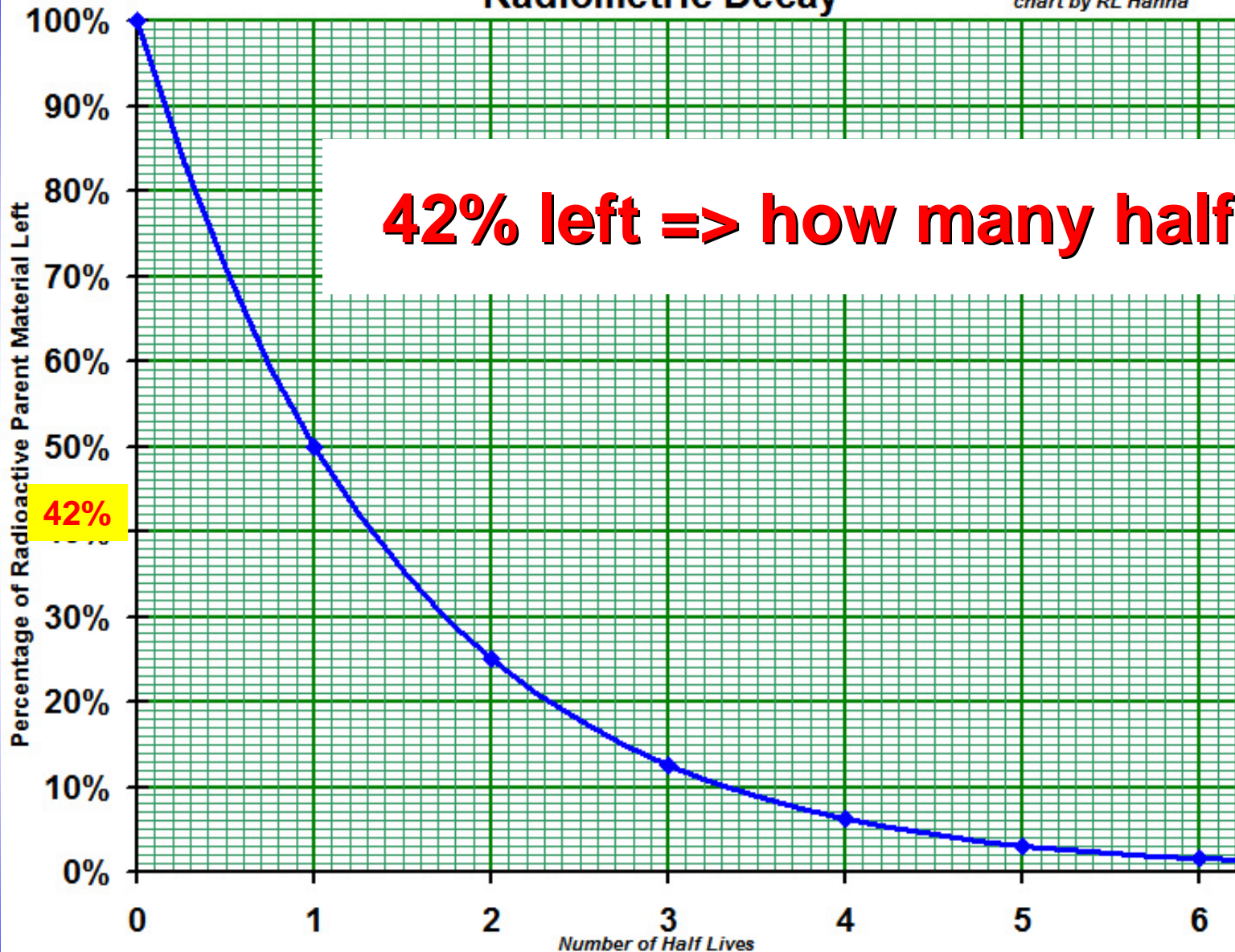
Age=(number of half lives) \* (time of one half life)

Age=(  **? ? ? ?**  ) \* (125 million years)

**42% left => how many half lives?**

# Radiometric Decay

chart by RL Hanna



**42% left => how many half lives?**

chart by RL Hanna

# Radiometric Decay

chart by RL Hanna

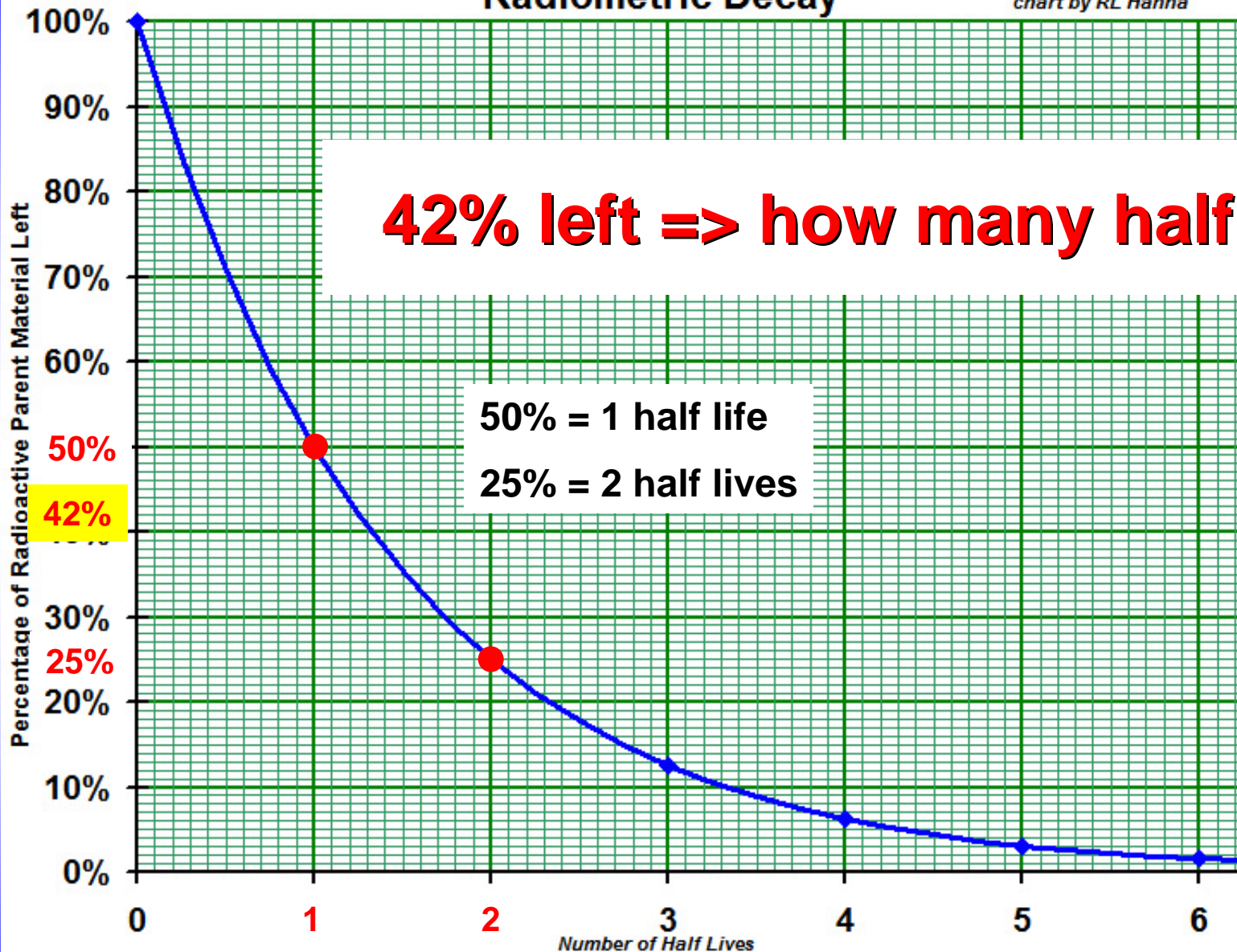


chart by RL Hanna

# Radiometric Decay

chart by RL Hanna

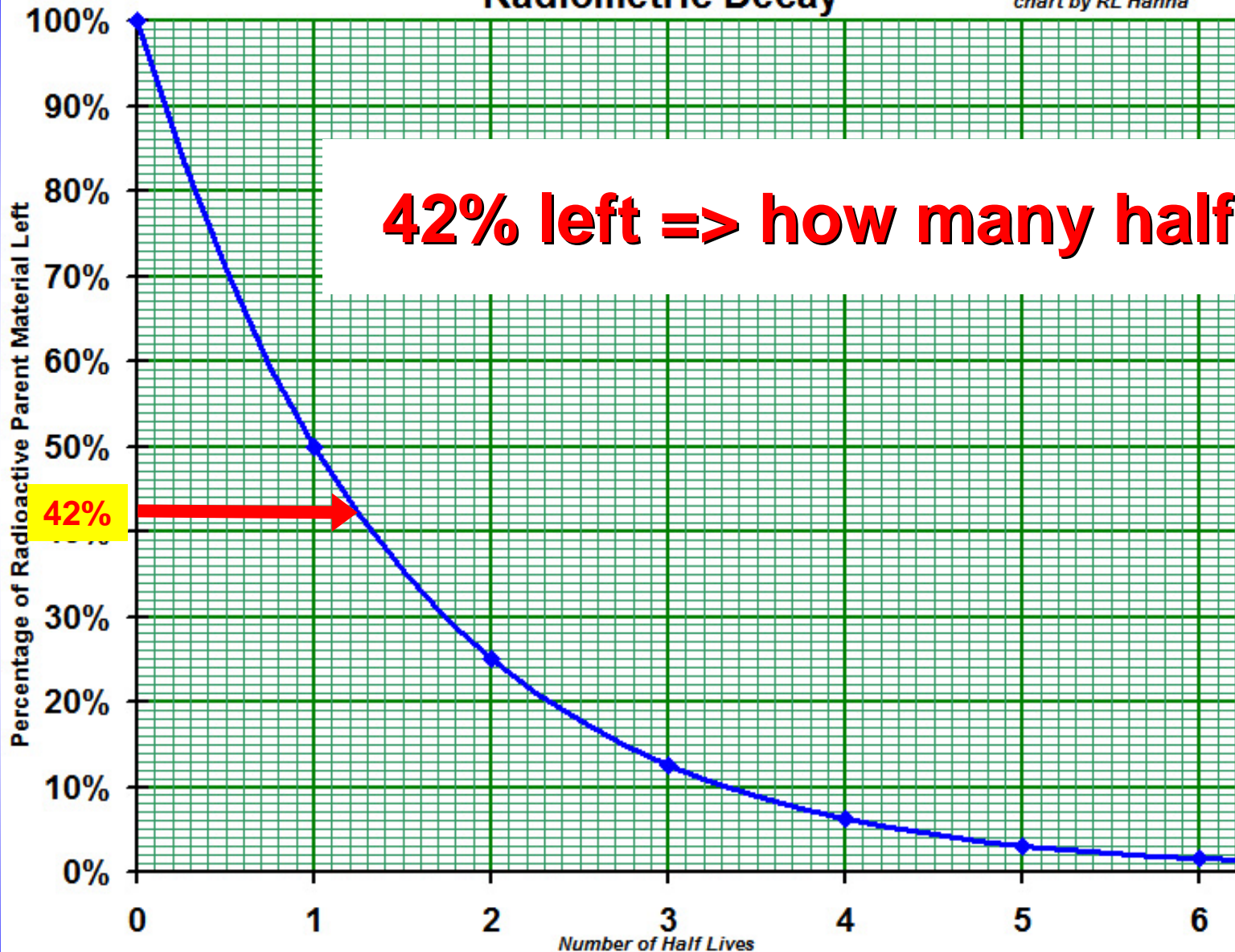


chart by RL Hanna

# Radiometric Decay

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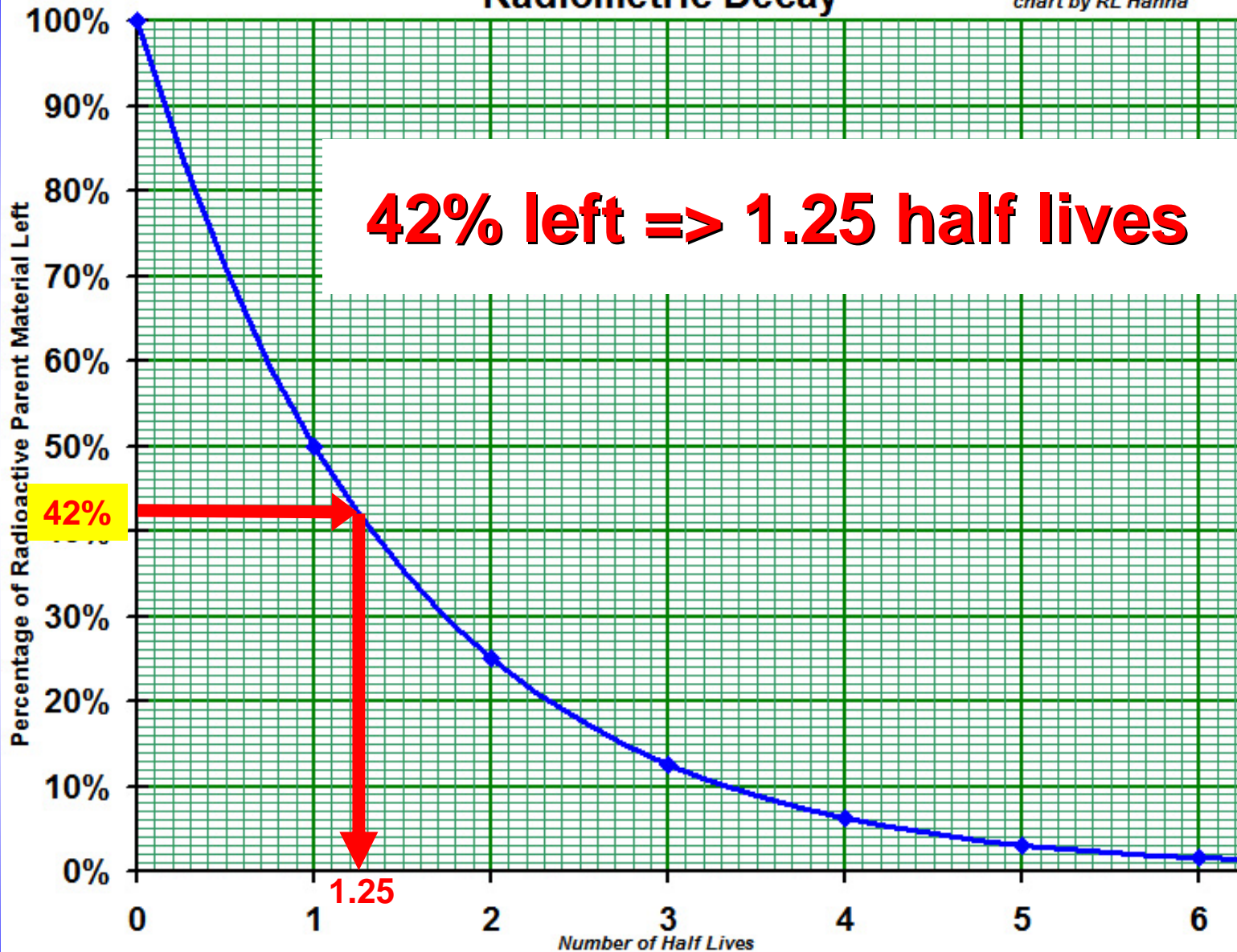


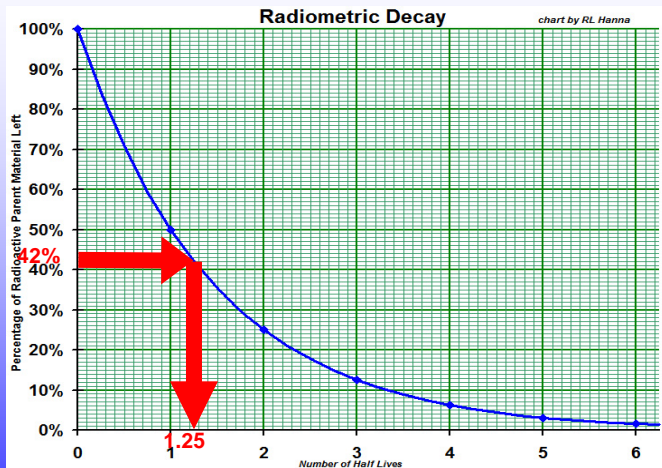
chart by RL Hanna

4. Radioactive element Zv99 has a half-life of 125 million years.

A sample with 42% of its Zv99 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=( **1.25 half life** ) \* (125 million years)

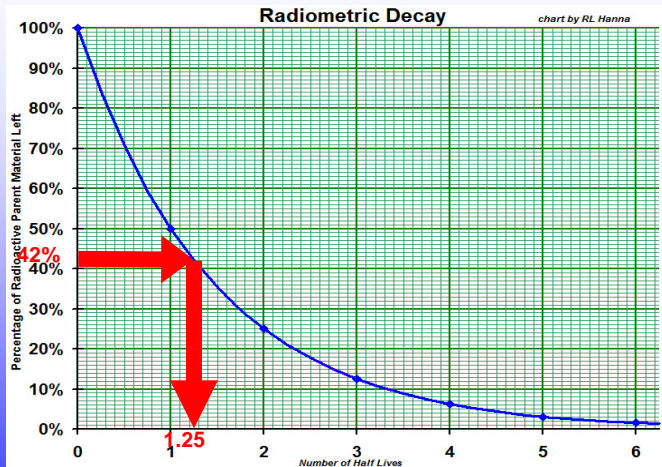


4. Radioactive element Zv99 has a half-life of 125 million years.

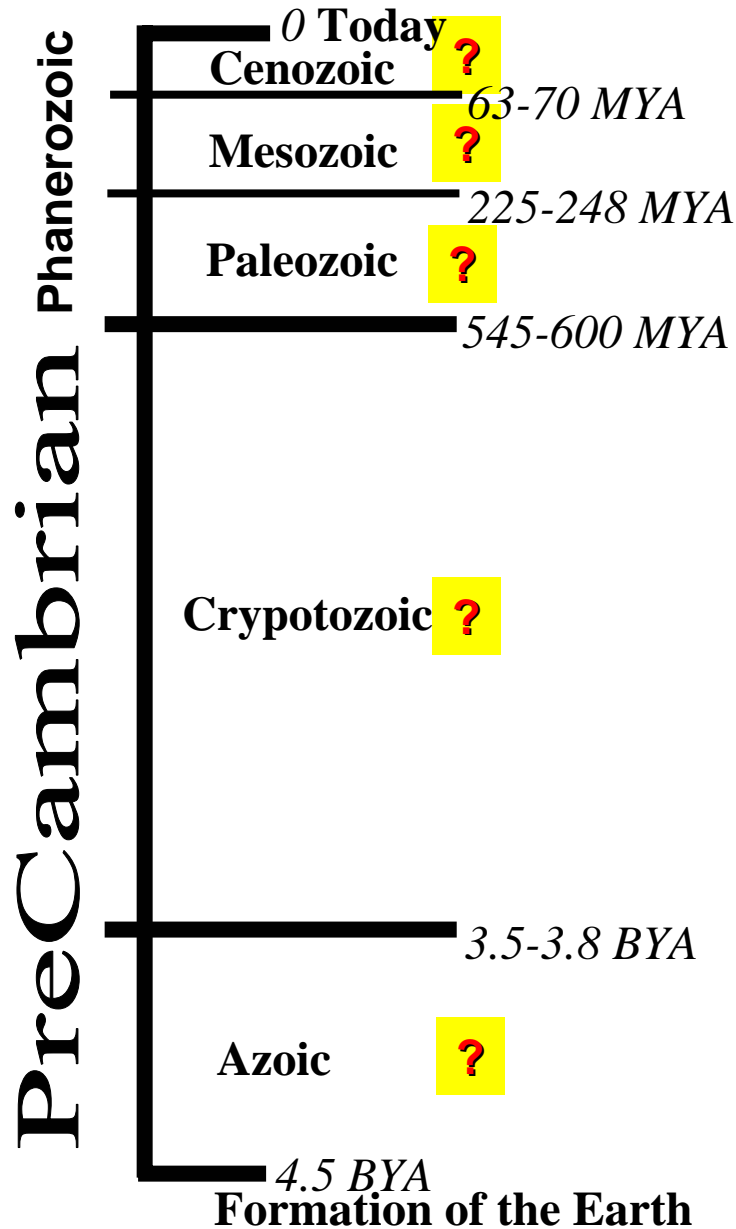
A sample with 42% of its Zv99 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(1.25) \* (125 million years) = 156 million years old



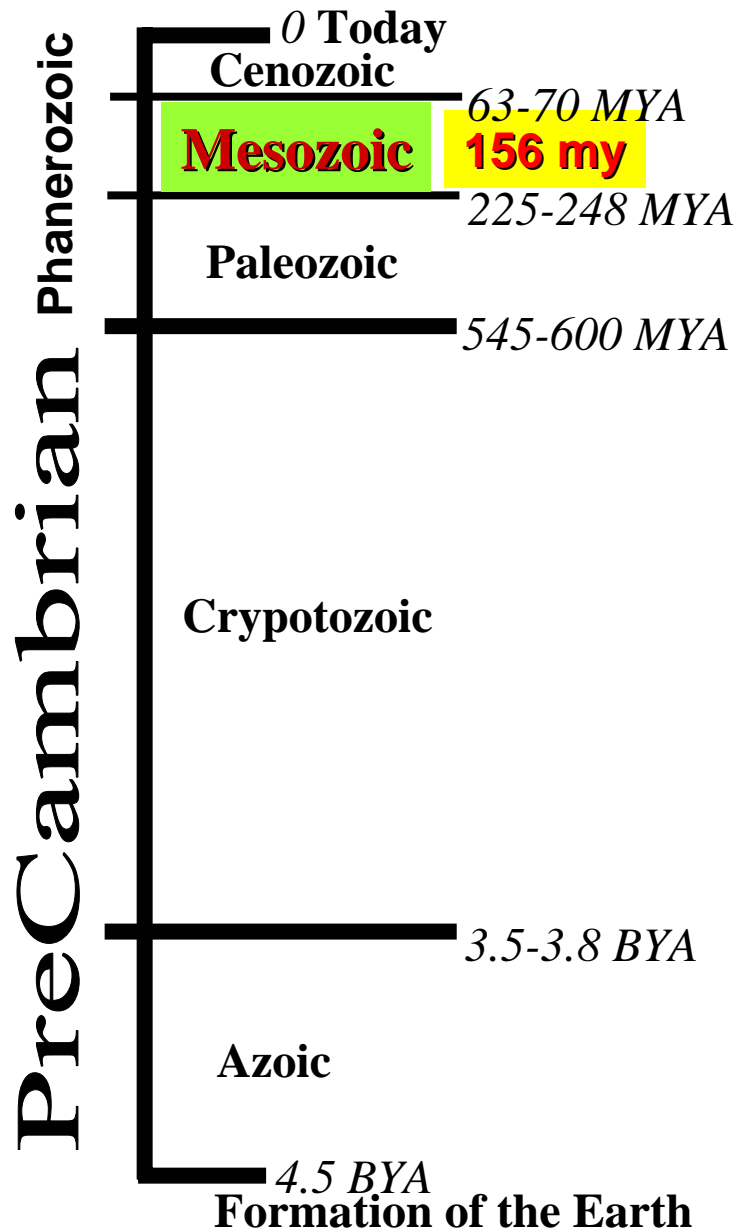
# The Geologic Time Scale



A sample with 42%  
of its  $Zr^{99}$  left is  
156 million years old

What age is the sample?

# The Geologic Time Scale



A sample with 42%  
of its  $Zr^{99}$  left is  
156 million years old

What age is the sample?



**5. A sample with 84% of its  $K^{40}$  left is how old?**

**5. A sample with 84% of its  
 $K^{40}$  left is how old?**

**Age=(number of half lives) \* (time of one half life)**

# 5. A sample with 84% of its K40 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(number of half lives) \* (1.3 billion years)

*half life data for potassium 40 is from the textbook*

# 5. A sample with 84% of its K40 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=( **?? ??** ) \* (1.3 billion years)

# 5. A sample with 84% of its K40 left is how old?

Age=(number of half lives) \* (time of one half life)

Age=( **?? ??** ) \* (1.3 billion years)

**84% left => how many half lives?**

# Radiometric Decay

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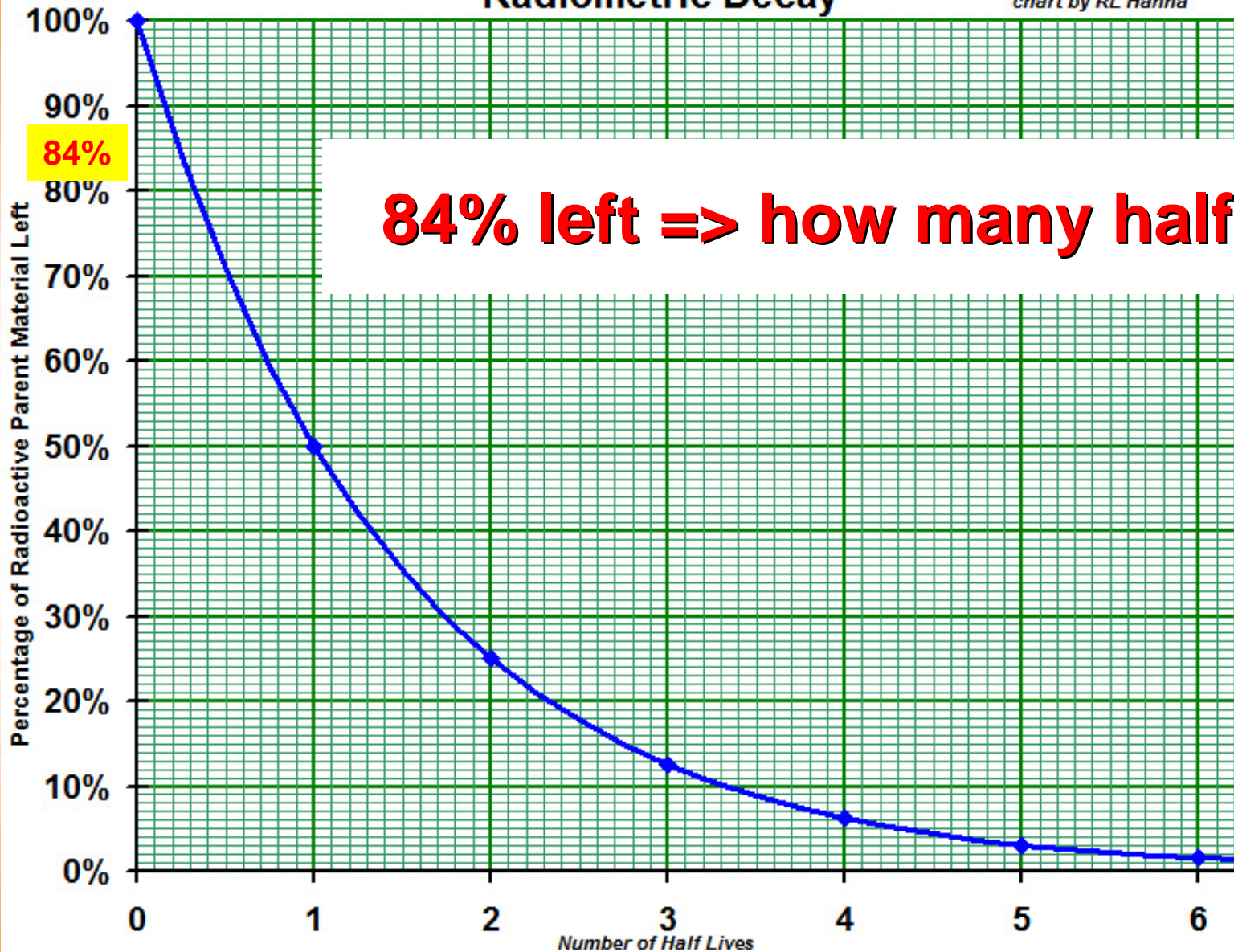


chart by RL Hanna

# Radiometric Decay

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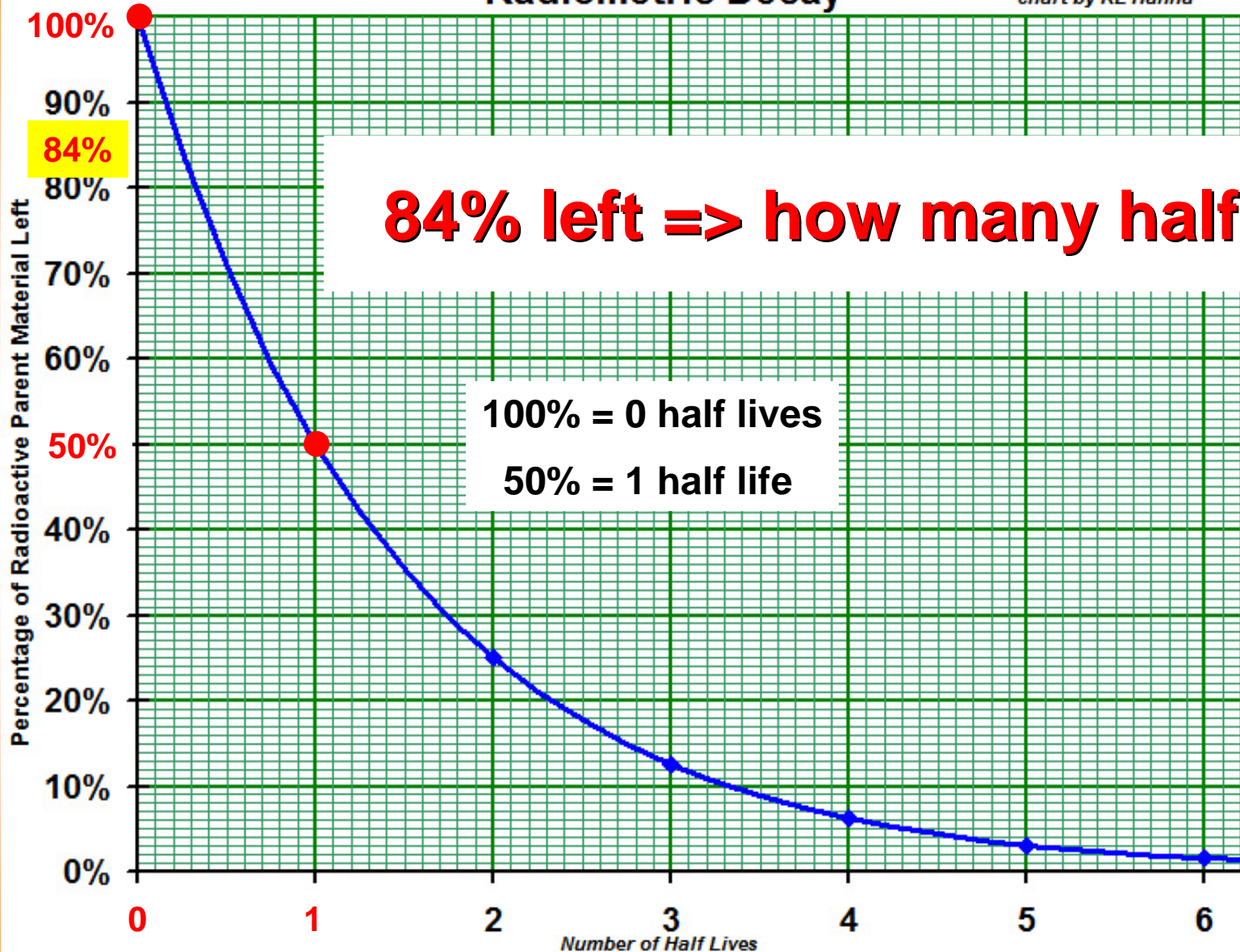
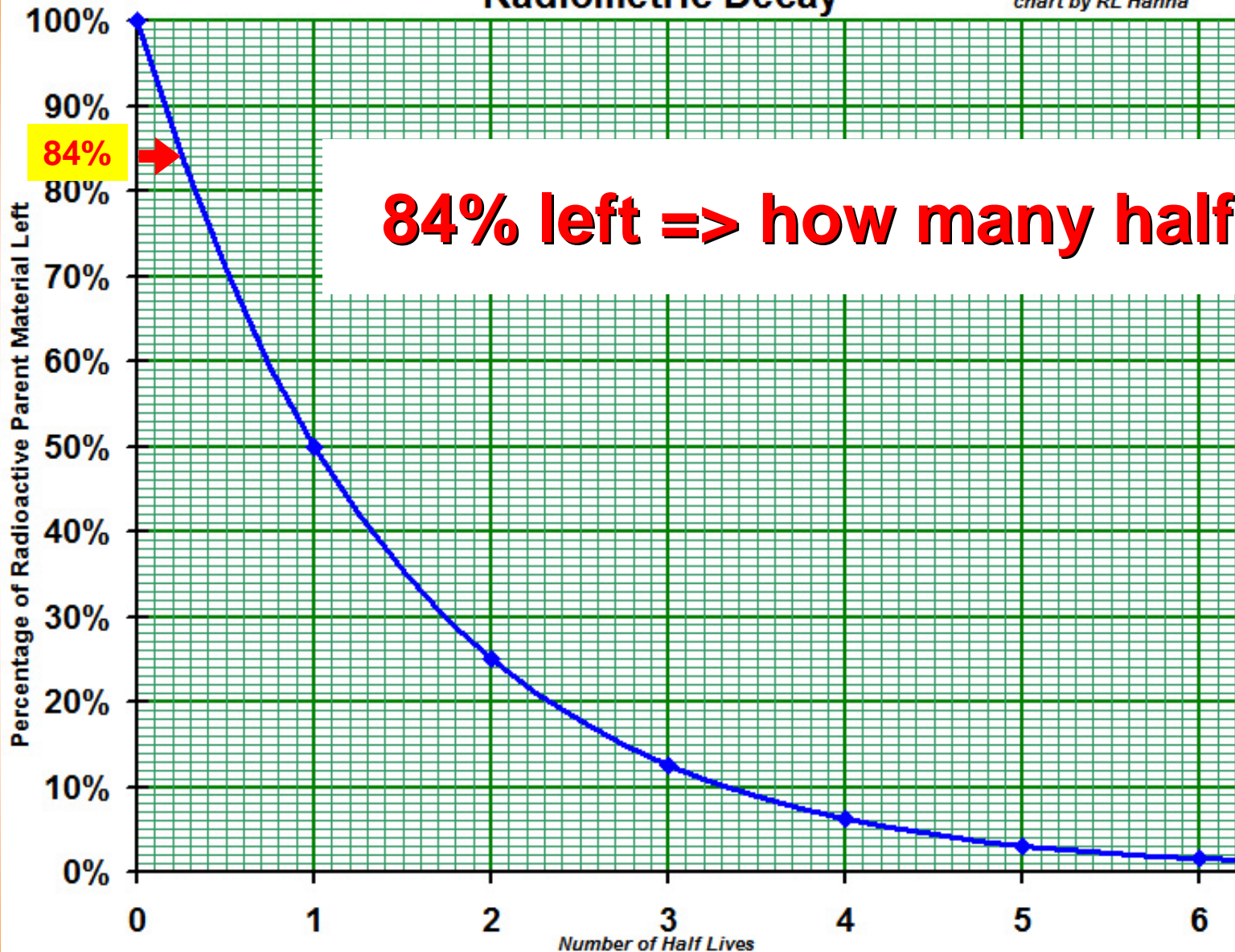


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# Radiometric Decay

chart by RL Hanna



**84% left => how many half lives?**

chart by RL Hanna

# Radiometric Decay

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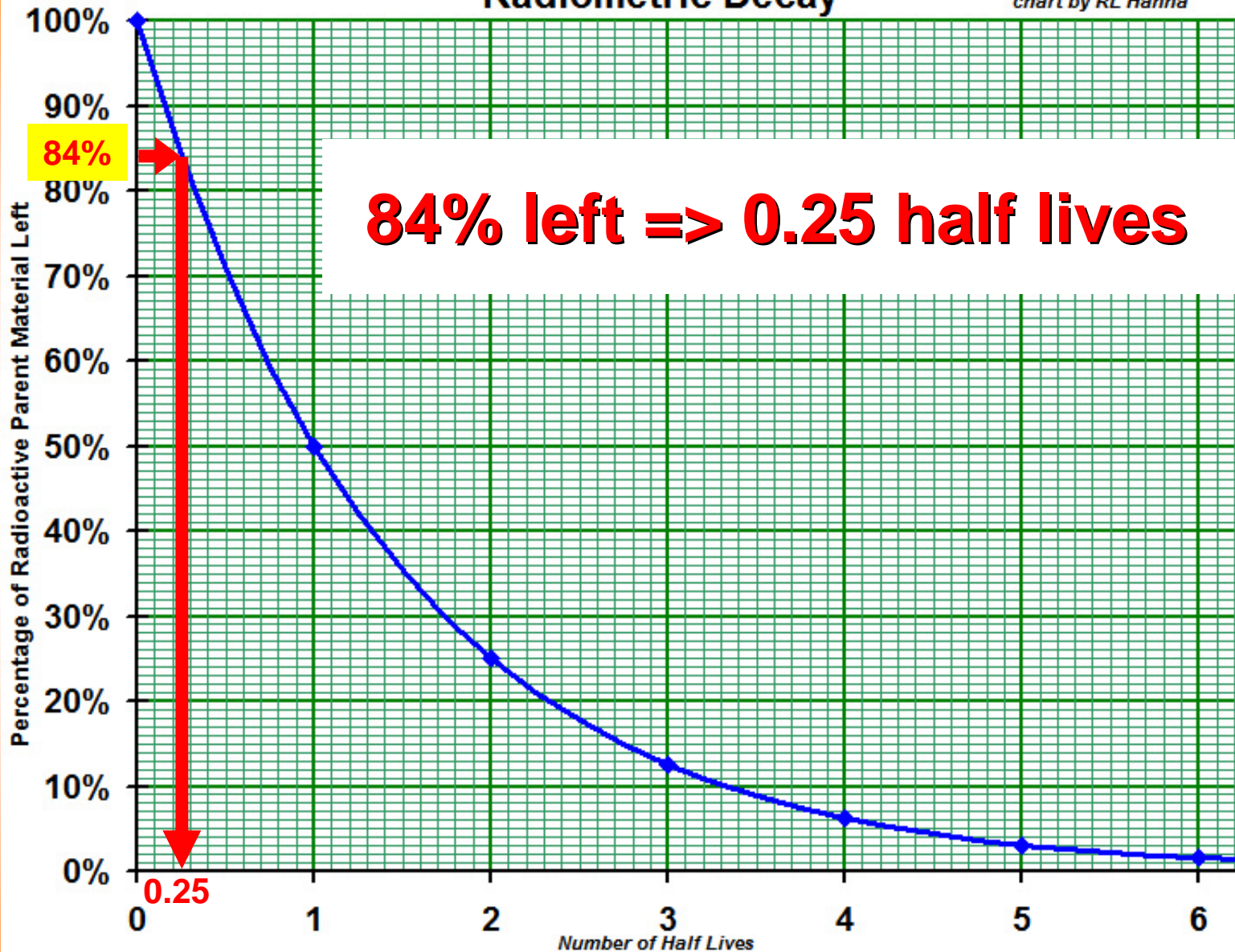
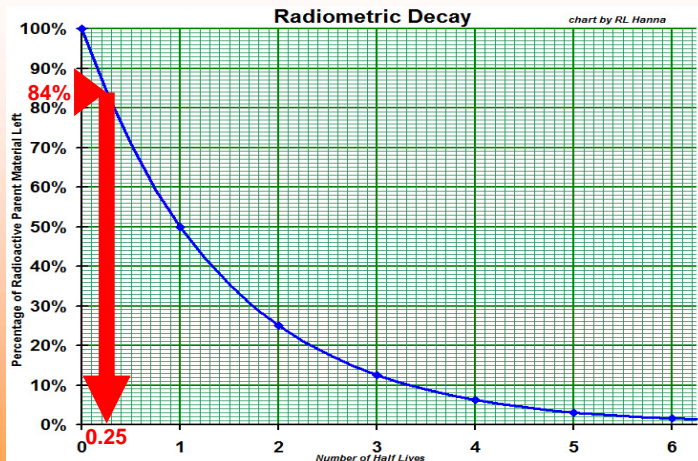


chart by RL Hanna

# 5. A sample with 84% of its K40 left is how old?

Age=(number of half lives) \* (time of one half life)

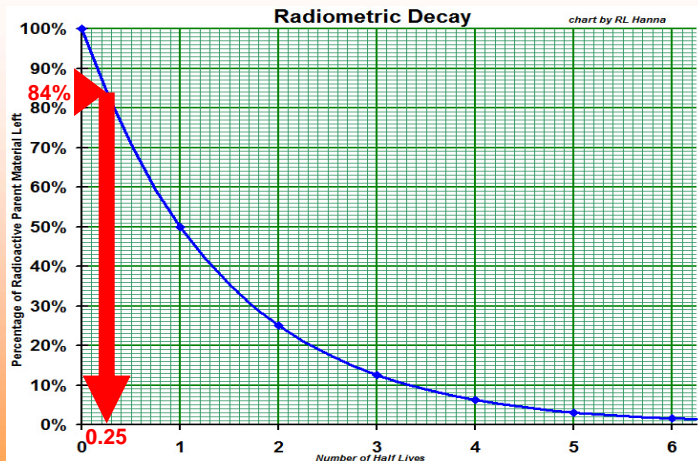
Age=( **0.25 half life** ) \* (1.3 billion years)



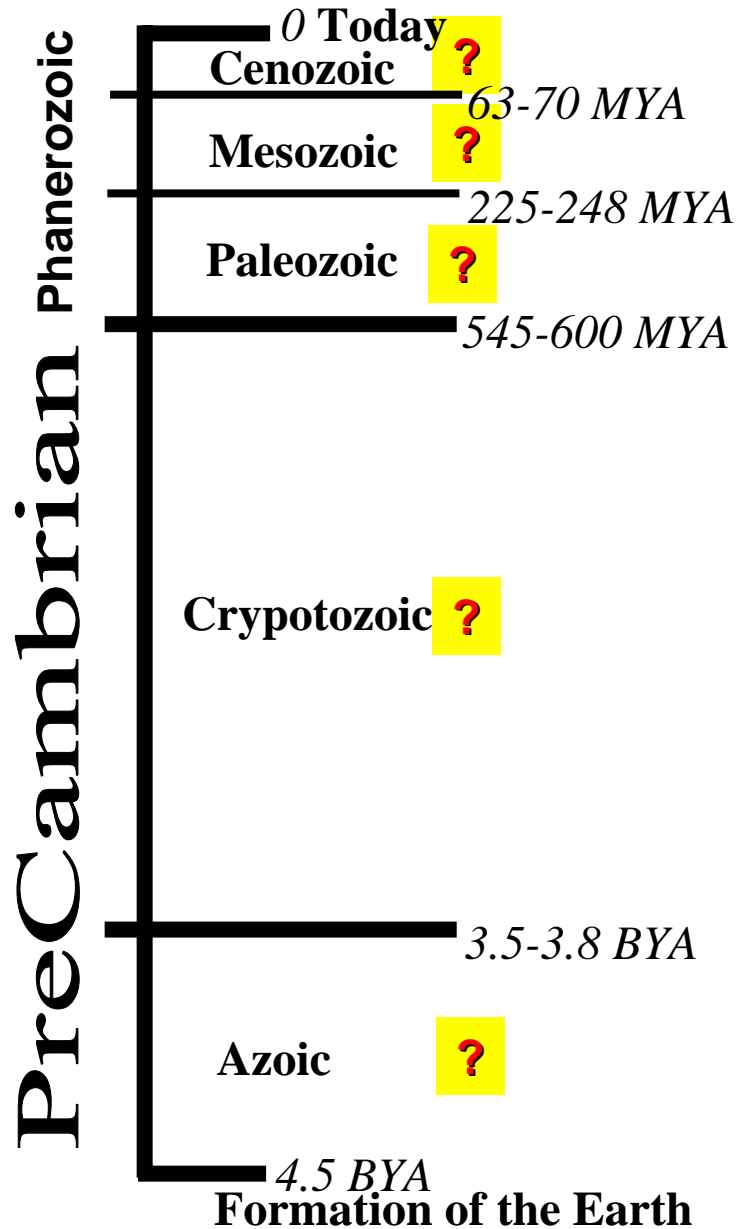
# 5. A sample with 84% of its $K^{40}$ left is how old?

Age=(number of half lives) \* (time of one half life)

Age=(0.25) \* (1.3 billion years) = 325 million years old



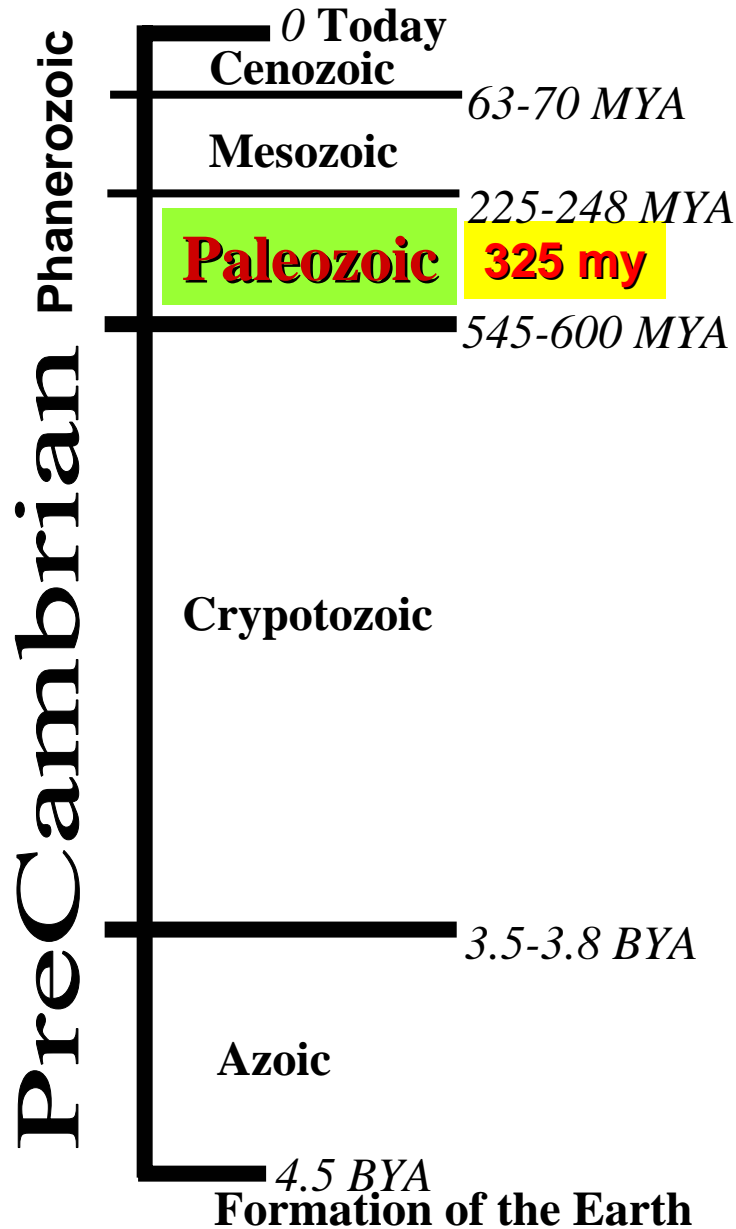
# The Geologic Time Scale



A sample with 84%  
of its  $K^{40}$  left is  
325 million years old

What age is the sample?

# The Geologic Time Scale



A sample with 84%  
of its  $K^{40}$  left is  
325 million years old

What age is the sample?

