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Help, what's the logic on what your wise men can research?

Discussion in '[Civ1 - General Discussions](#)' started by [Tristan_C](#), Jun 3, 2009.

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Chieftain

Joined: Aug 16, 2006

Messages: 1,309

I was wondering why some research paths simply aren't available, for some reason, at some times, in some games 🚫

I started up a civ today, and I wished to pick up The Wheel near to the beginning (success), then either go for mapmaking or get started towards monarchy. I got mapmaking next, with great satisfaction, too, because I'm figuring out I'm on a pretty small island. There was only 1 rival and I gg'd him with a chariot.

So here's where I stand:

1. Alphabet (started with it)
2. The Wheel - first research
3. Mapmaking - second research
4. Code of Laws - third research

The pic is my list of new possible paths: masonry, bronze working, pottery. There is no Ceremonial Burial, which was my next target in the line for Monarchy. I reckoned a tech like that, with NO prereqs, would always show up in the list.

So... why do I need to spend the next few hundred years on a tech I don't need yet? 😞 What governs the filtering of techs from this depressingly short list, so I can avoid these setbacks in the future?

Attached Files:

[flaw.jpg](#)

File size:

51.5 KB

Views:

182

[Tristan_C](#), Jun 3, 2009 [Report](#)

[#1](#) [Like](#) [+ Quote](#) [Reply](#)



[Bratmon](#)

Super Bratmon 3

Joined: May 2, 2009

Messages: 584

Location: /dev/random

Check your science advisor. Do you already have COL?

Position your cities in such a way as to spell dirty words on the minimap!

Now those points of data make a beautiful line
and we're out of beta, we're releasing on time.

[Bratmon](#), [Jun 3, 2009](#) [Report](#)

[#2](#) [Like](#) [+ Quote](#) [Reply](#)



[void](#)

Chieftain

Joined: Apr 14, 2002

Messages: 113

[Tristan_C](#) said: ↑

I was wondering why some research paths simply aren't available, for some reason, at some times, in some games 🤔

Sometimes the game randomly, and intentionally, excludes some techs from the list.

The rationale could be that not every possible advance had occurred to those ancient wisemen as something they might invent. And from a gaming point of view, it adds some variety to the gameplay. (I believe something to this effect is even stated in the manual.)

As far as I recall, Chieftain is an exception, and always lists all techs.

[void](#), [Jun 3, 2009](#) [Report](#)

[#3](#) [Like](#) [+ Quote](#) [Reply](#)



[Tristan_C](#)

Chieftain

Joined: Aug 16, 2006

Messages: 1,309

[Bratmon](#) said: ↑

Check your science advisor. Do you already have COL?

Absolutely, I opted to get code of laws prior before ceremonial burial (force of habit: if the order doesn't matter to you, go for the tech with actual benefits first), and COL was the tech I had just completed when I noticed this issue.

[void](#) said: ↑

Sometimes the game randomly, and intentionally, excludes some techs from the list.

The rationale could be that not every possible advance had occurred to those ancient wisemen as something they might invent. And from a gaming point of view, it adds some variety to the gameplay. (I believe something to this effect is even stated in the manual.)

As far as I recall, Chieftain is an exception, and always lists all techs.

Ahhhhh... randomness. I thought I smelled it.



[Tristan_C](#), Jun 3, 2009 [Report](#)

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[Urtica dioica](#)

Chieftain

Joined: May 8, 2008

Messages: 76

I did my own research on this several months ago. It's totally not random, but rather similar to the way Civ 2 does it. I'm going mostly from memory, but the procedure is to take a tech's position in the list (below) and wipe out all the indexes with a certain remainder after dividing by 3, just like Civ 2. Unlike Civ 2, the top two possible techs in the list are always available, instead of just the first.

I still have the list. The order makes no sense at all, which helps explain why it might seem random. You can find the list yourself if you look inside the binary CIV.EXE.

Alphabet
Code of Laws
Currency
Atomic Theory
Democracy
Monarchy
Astronomy
MapMaking
Navigation
Mathematics
Medicine
Physics
Engineering
University
Magnetism
Electronics
Masonry
Bronze Working
Iron Working
Bridge Building
Invention
Computers
Writing
Steam Engine
Trade
Ceremonial Burial
Mysticism
Nuclear Fission
Philosophy
Religion
Literacy
Horseback Riding
Feudalism
The Wheel
Gunpowder

Industrialization
Chemistry
Combustion
Flight
Advanced Flight
Space Flight
Mass Production
Pottery
Communism
The Republic
Construction
Rocketry
The Corporation
Metallurgy
RailRoad
Nuclear Power
Theory of Gravity
Steel
Banking
Electricity
Refining
Explosives
SuperConductor
Automobile
Genetic Engineering
Plastics
Recycling
Chivalry
Robotics
Conscription
Labor Union
Fusion Power
Future Tech

Just a quick run through, and it seems, in your game, you're missing 3 techs off the list: Writing, Ceremonial Burial, and Horseback Riding. Assuming Alphabet, at the top, is number 1, then the missing techs are numbers 23, 26, and 32. All three of those numbers have a remainder of 2 when divided by 3. Your list includes Bronze Working and Pottery, neither of which has remainder 2, and Masonry is included anyway because it's the first possible tech on the list.

On your next tech, you can expect techs with remainder zero to disappear, and after that remainder one will disappear. Then the cycle repeats.

[Urtica dioica](#), Jun 4, 2009 [Report](#)

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Wow this thread was interesting, but I'm not sure I still understand, the list is different per game or per exe binary?



[C1v1l1z@t10n](#), Jun 4, 2009 [Report](#)

[#6](#) [Like](#) [+ Quote](#) [Reply](#)

[C1v1l1z@t10n](#)

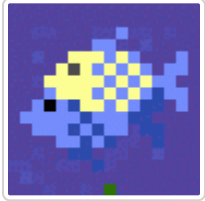
Chieftain

Joined: Nov 19, 2004

Messages: 100

Gender: Male

Location: France



[Indm](#)

Chieftain

Joined: Oct 20, 2008

Messages: 589

Location: Australia

I always thought that the techs weren't available if other civs were researching them at that given moment. You'll see that it happens more if you are slow in advancing and the techs are usually available next time round.

[Indm](#), Jun 4, 2009 [Report](#)

[#7](#) [Like](#) [+ Quote](#) [Reply](#)



[Tristan C](#)

Chieftain

Joined: Aug 16, 2006

Messages: 1,309

Urtica dioica said: ↑

Just a quick run through, and it seems, in your game, you're missing 3 techs off the list: Writing, Ceremonial Burial, and Horseback Riding. Assuming Alphabet, at the top, is number 1, then the missing techs are numbers 23, 26, and 32. All three of those numbers have a remainder of 2 when divided by 3. Your list includes Bronze Working and Pottery, neither of which has remainder 2, and Masonry is included anyway because it's the first possible tech on the list.

On your next tech, you can expect techs with remainder zero to disappear, and after that remainder one will disappear. Then the cycle repeats.

Excellent!!! A very interesting breakdown of this issue. By looking at the list, you can tell it's not totally nonsensical. There is a basic progression from ancient to future tech, but noticeably, the expansive academic techs seem to be bumped upward whilst military objectives (the terminal fruits on the research tree) seem to be lower, thus having a tendency to appear less frequently.

[Tristan C](#), Jun 4, 2009 [Report](#)

[#8](#) [Like](#) [+ Quote](#) [Reply](#)



[Urtica dioica](#), I am intrigued by your hypothesis.

I ran the following

There are 7 advances that require no previous advance.

01,00,00, Alphabet

17,00,00, Masonry

18,00,00, Bronze Working

[Dack](#)

Terra Form

Moderator

Joined: Nov 26, 2003

Messages: 530

Location: civ dos 474.05

26,00,00, Ceremonial Burial
32,00,00, Horseback Riding
34,00,00, The Wheel
43,00,00, Pottery

In a game where I'm given no advances at the start I'm offered the following:

01,00,00, Alphabet
17,00,00, Masonry
18,00,00, Bronze Working
34,00,00, The Wheel
43,00,00, Pottery

choice 1: Alphabet

after completion (* marks choices offered, no asterisk= advance entitled to but not offered)

02,01,00, Code of Laws *
08,02,00, MapMaking *
17,00,00, Masonry *
18,00,00, Bronze Working
23,01,00, Writing *
26,00,00, Ceremonial Burial *
32,00,00, Horseback Riding *
34,00,00, The Wheel *
43,00,00, Pottery *

choice 2: Code of Laws

after completion

08,02,00, MapMaking *
17,00,00, Masonry *
18,00,00, Bronze Working *
23,01,00, Writing *
26,00,00, Ceremonial Burial *
32,00,00, Horseback Riding *
34,00,00, The Wheel
43,00,00, Pottery

choice 3 map making

after completion

17,00,00, Masonry *
18,00,00, Bronze Working *
23,01,00, Writing
26,00,00, Ceremonial Burial
32,00,00, Horseback Riding
34,00,00, The Wheel *
43,00,00, Pottery *

I don't see how this corresponds to your formula.

I did my testing with version .05, king, 7 countries.

I used CIV\$ to fill the bulb counter.

There appears to be a pattern to this other than randomness as the choice display was constant over many games.

HTML:

First number advance number
2nd & 3rd advances that allow this advance

00,00,00, Dummy Advancement
01,00,00, Alphabet
02,01,00, Code of Laws
03,18,00, Currency
04,12,52, Atomic Theory
05,29,31, Democracy
06,02,26, Monarchy
07,27,10, Astronomy
08,02,00, MapMaking
09,08,07, Navigation
10,01,17, Mathematics
11,29,25, Medicine
12,09,10, Physics
13,34,46, Engineering
14,29,10, University
15,09,12, Magnetism
16,55,13, Electronics
17,00,00, Masonry
18,00,00, Bronze Working
19,18,00, Iron Working
20,46,19, Bridge Building
21,13,31, Invention
22,16,10, Computers
23,01,00, Writing
24,21,12, Steam Engine
25,03,01, Trade
26,00,00, Ceremonial Burial
27,26,00, Mysticism
28,42,04, Nuclear Fission

[Dack, Jun 5, 2009](#) [Report](#)

[#9](#) [Like](#) [+ Quote](#) [Reply](#)



[Urtica dioica](#)

Chieftain

Joined: May 8, 2008

Messages: 76

Dack, since your results match my formula exactly, I'll have to assume I didn't explain it well enough. Now that you've given me a scenario to work through, I should be able to make it more clear.

First off, I note that the top 2 possible techs in each set are possible in each case. So we can ignore those in each example.

Next, let's run through each tech list, each tech next to its index, remainder of division by 3, and whether it can be researched. I'll parenthesize the top 2 each time, to make it clear they will always be included.

(01 1 Y Alphabet)
(17 2 Y Masonry)
18 0 Y Bronze Working
26 2 N Ceremonial Burial
32 2 N Horseback Riding
34 1 Y The Wheel
43 1 Y Pottery

Remainder 2 is out, except Masonry, which is in the top two.

After alphabet:

(02 2 Y Code of Laws)
(08 2 Y MapMaking)
17 2 Y Masonry
18 0 N Bronze Working
23 2 Y Writing
26 2 Y Ceremonial Burial
32 2 Y Horseback Riding
34 1 Y The Wheel
43 1 Y Pottery

Remainder 0 is out.

After Code of Laws:

(08 2 Y MapMaking)
(17 2 Y Masonry)
18 0 Y Bronze Working
23 2 Y Writing
26 2 Y Ceremonial Burial
32 2 Y Horseback Riding
34 1 N The Wheel
43 1 N Pottery

Remainder 1 is out.

After MapMaking

(17 2 Y Masonry)
(18 0 Y Bronze Working)
23 2 N Writing
26 2 N Ceremonial Burial
32 2 N Horseback Riding
34 1 Y The Wheel
43 1 Y Pottery

Remainder 2 is out, except Masonry, which is in the top two.

So, yeah... perfect match.

I'm glad you used CIV\$ to fill the bulb box, instead of gifting the tech, like I did for a while. When I just added the tech (with CIV\$), the remainder counter didn't turn, which was really confusing for a while. 😊

[Urtica dioica](#), Jun 5, 2009 [Report](#)

[#10](#) [Like](#) [+ Quote](#) [Reply](#)



[Valen](#)

TWAYF Builder

Joined: Mar 8, 2004
Messages: 255
Location: Left Coast

Wow! How long have I been playing Civ and not noticed this pattern? Great sleuthing Urtica dioica!

The attachment shows the science advisor's display when researching future tech. The advances are listed in the same order as Urtica dioica's list. Initially, when you have no advances, the denied advances are in column 2. With one discovery, the denied advances are in column 3. Next, denied advances are in column 1. The cycle repeats. The science advisor's display just makes the pattern easier to see.

Attached Files:



[Research2180Full.png](#)

File size: 4.9 KB
Views: 207

[Valen](#), Jun 5, 2009 [Report](#)

[#11](#) [Like](#) [+ Quote](#) [Reply](#)



[Bratmon](#)

Super Bratmon 3

Joined: May 2, 2009
Messages: 584
Location: /dev/random

I've played Civ 1 for three years, and I didn't even notice techs were missing!!

Position your cities in such a way as to spell dirty words on the minimap!
Now those points of data make a beautiful line
and we're out of beta, we're releasing on time.

[Bratmon](#), Jun 6, 2009 [Report](#)

[#12](#) [Like](#) [+ Quote](#) [Reply](#)



[Osvaldo Manso](#)

Chieftain

Joined: Jul 28, 2006
Messages: 226

I've been on vacations and now I find out that I missed a wonderful thread...

Urtica dioica did a great great work! He deserves an "honoris causa" degree.

This feature of the game was introduced during the test phase by Sid Meier himself, because he thought that the game needed a little randomness when it comes to choose what to research next.

I like it lot because it's like the real world: sometimes you plan things carefully and they turn out the way you wanted; but other times even if things were carefully planed they will go wrong!

Location:
Lisbon, Portugal,
Europe

[Osvaldo Manso](#), Jun 24, 2009 [Report](#)

[#13](#) [Like](#) [+ Quote](#) [Reply](#)



poecraft
Chieftain

Joined: Jun 26, 2009
Messages: 15

Hi dudes !

Sorry for my bad english. I think I am the unique latin in this forum. I am beginner in this excellent web, i found it "googling", because i want know how to play the original pc Civ. I have been reading it is the best for a lot people.

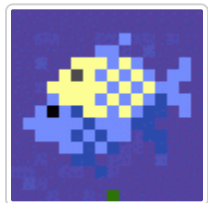
I m curious, when you open a city, there is some draws or icons inside, no no, sorry, i can t write good. Sorry.

Anybody knows a bilingual user that could helpme write in correct way my questions in this web ? I could write in spanish and then someone helpme translate into english. ?

I hope someone understand my disaster english, I really want to play this game, but I feel buggy my mind .

[poecraft](#), Jun 27, 2009 [Report](#)

[#14](#) [Like](#) [+ Quote](#) [Reply](#)



Indm
Chieftain

Joined: Oct 20, 2008
Messages: 589
Location: Australia

Hi poecraft, your English is good enough for me to read.

Are you talking about the icons at the top on the left? The icons of people, shields, gold coins and arrows?

[Indm](#), Jun 27, 2009 [Report](#)

[#15](#) [Like](#) [+ Quote](#) [Reply](#)



poecraft
Chieftain

Joined: Jun 26, 2009
Messages: 15

Indm said: ↑

Hi poecraft, your English is good enough for me to read.

Are you talking about the icons at the top on the left? The icons of people, shields, gold coins and arrows?

Hi thanks for your answer and disposition !! I have found in the Civilization 1 section, a lot of information and charts and screenshots of the game, with that I think is enough to begin read and understand the logic, I gonna read it, really I give you my thanks Indm !!

Greetings ! 😊

[poecraft](#), Jun 27, 2009 [Report](#)

[#16](#) [Like](#) [+ Quote](#) [Reply](#)

You're welcome 😊



[Indm](#)

Chieftain

Joined: Oct 20, 2008

Messages: 589

Location: Australia

[Indm](#), [Jun 27, 2009](#) [Report](#)

[#17](#) [Like](#) [+ Quote](#) [Reply](#)



[Dack](#)

Terra Form

Moderator

Joined: Nov 26, 2003

Messages: 530

Location: civ dos 474.05

A few Sundays ago on some whim I decided to add the mod three algorithm that [Urtica dioica](#) has so clearly described to **CIV\$**. I used my tried and true method, define the event and compare the before and after **SVE** file with a binary compare program. About an hour later I found the *advance mod counter* starting at HEX 04D8 (first byte in file is 0)

Code:

Hex		
04D8	(2 bytes)	0 Barbarian
04DA		1 Russian / Roman
04DC		2 Babylonian / Zulu
04DE		3 German / French
04E0		4 Egyptian / Aztec
04E2		5 American / Chinese
04E4		6 English / Greek
04E6		7 Indian / Mongol

Each civilization having it's own counter. Users of CIV\$ will note that no next advance appears on the pages that allows for manipulation of the advance bits of the games civilizations. Only the human player can select what advance is being produced. I assume the game has some pseudorandom way of assigning the advance when the light bulb count has reached the appropriate value for non-human civilizations. The researching Advance value for the human player is stored in a word (16 bits) at 000E. At this moment I assume that the *advance mod counter* is incremented when a new advance is achieved. (Does anyone know how the value for the next advance is calculated? How many light bulbs are need for the next advance? *note1). This *advance mod counter* must be used in the calculation to determine how many light bulbs will be needed. Although I seldom get into Future Tech., I had wondered where it's counter was. In testing for this change I decide to look for it data location. Future Tech is at hex8BAC only the human player appears to have a Future Tech counter. Basically I just wanted to see if I could reproduce in code the mod three algorithm so that in **CIV\$** I could see what the computer would offer. This will appear in the next version.

file date/time		24Jul10 17:17	7	year	3	AD	People	English	38	Leader	Turn	amount
			Your	People	-->	English						
Num	Advance			MOD			Listed					
05	Democracy			02			YES					
11	Medicine			02			YES					
14	University			02			YES					
15	Magnetism			00			NO					
24	Steam Engine			00			NO					
33	Feudalism			00			NO					
35	Gunpowder			02			YES					

CurrentAdvance% = 29

table(CurrentAdvance%).rank = 35

countADV% = 28

MOD 3 = 00

Advance Count = 26

-

+

0

1

2

Cancel

Exit

This line of research sent me off on a tangent. The preverbal light bulb went off. The **“Pollution Bug”** *, the descriptions of it always describe some number of Future Tech’s triggering the event.

* If you interested in the pollution bug look at post #18 in thread [Pollution "Bug"](#)


Note 1

I found two definition of advance light bulb count:

- 1)The number of lightbulbs needed for each new advance is:
(difficulty level+3)*2*(# of advances you already have).
- 2) Human Player Lightbulb Increment Per Advance
Each time an advance is discovered, the cost (in lightbulbs) of acquiring the next increases by this amount. Chieftan 6. Warlord 8, Prince 10, King 12, Emperor 14

Can anyone verify the truth of either?

Attached Files:



vbdos_004.png

File size: 4.1 KB

Views: 703



I've noticed this effect too, and have always wondered about it. Thanks for the info!