Mutations

I'm referring to the paper 'Mutations: evolution's engine becomes evolution's end!' By Alex Williams.[1] Thanks for the paper—it made me think quite a bit.

Table 1 in the paper, predicting according to certain assumptions the years to extinction of humans, is a serious possible scenario to consider if true.

It is based on a fitness decline of 1.5% per generation (taken to be 20 years) and results in a formula of [(0.985)^G]×N < 2 where:

- G is the number of generations to extinction, and
- N is the number of humans on Earth at the point in time from when onwards a constant fitness decline is assumed.

The above-mentioned formula is not given as such in Alex Williams' paper but gives the numbers of generations to extinction of his table 1 when rounded off to the nearest 10.

Before believing the figures of table 1, I would like to confirm if James Crow really meant the so-called fitness decline to imply an overall reduction in reproductive population of the 1–2% per generation, or if the current population growth of let's say 15% per generation should not be taken into account as well. If the latter is true, the formula must really be [(0.985×1.15)^G]×N for the total number of reproductive humans, but this formula won't let the number of humans decrease at all. Of course with fitness defined as implied by the latter formula, fitness times population growth must be less than one for the total reproductive number to decline.

My question really is what the exact definition of the fitness percentage of Crow is. Is the number of reproductive humans really declining in the absolute sense? Another table where both the total number of humans and the number of reproductive humans over generations are shown, will help a lot in explaining the overall meaning. If table 1 is correct, the total number of humans will anyway start declining in a few generations because it will start following, although lagging, the decline of the number of reproductive humans. This would imply that the possible over-population of the earth, as foreseen by many of the secular world, is only temporary and would seriously reverse in the short future. It would also imply that the decline of reproductive humans only happened now or one or two generations ago for the first time in history (apart from Noah's Flood), because the human population is still increasing at a very high rate at this point in time.

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1. Williams, A., Mutations: evolution's engine becomes evolution's end! *Journal of Creation* **22**(2):60–66, 2008.

Alex Williams replies:

Thank you for your letter and request for clarification of the meaning of Dr James Crow's estimate of the decline in fitness per generation in the human population.

The purpose of my Table 1 was not so much to be mathematically accurate (I tried to use the numbers in a way that non-mathematician readers could most easily understand) as to illustrate the short time scale over which even a very large human population (100 billion people) would become extinct if Dr Crow's estimate was correct.

You may recall that I used the analogy of mutations eating away our genomes like rust eating away at the metal components of a bridge. The bridge will continue to carry heavy loads of traffic (a large human population) while the rust continues to accumulate. But eventually the rust will cause the bridge to collapse and so the population will crash. The human population continues to function (reproduce and grow in size) and will continue to do so while the mutations continue to accumulate. However, as each generation adds new mutations so the total number of mutations increases and the proportion of functional nucleotides decreases—no matter what the population size—so the fitness of the whole population declines.

Fitness, in Darwinian terms, can only be measured in terms of reproductive success. As the number of mutations increases and the number of functional nucleotides decreases, the fitness decline may be reflected in declining numbers of offspring (i.e. decline in population growth rate), or it may not, depending upon the compensatory effects of other genes. Living organisms are designed with large redundant networks of gene-regulatory systems that are robust in the face of continual changes, so the early mutations may not have any immediate effect. As the number of functional nodes in the network continues to decline, however, the organism becomes much more vulnerable to further mutational damage. While the total number of nodes in a typical regulatory network may be in the hundreds or thousands, cancer cell research indicates that when as few as about 10 adjacent nodes become damaged the whole network loses its normal level of control and the cell will become cancerous.

You suggested that to take into account a population growth rate of 15% per generation, a more accurate mathematical model should be:

[(0.985×1.15)^G]×N.

However, the 15% refers to the growth in population size (N) and is not a modifier of the fitness decline, so the appropriate equation would be:

{[(0.985)^G]×N}×1.15.

When this formula is used, we get exactly the same result as the formula I used. The reason is that the increase in population numbers does nothing

to halt the inexorable accumulation of mutations.

If the average family has two, four or even 10 children, they all add the average number of mutations to the collective human genome. Only if the average number of new mutations per person per generation was less than 1 would there be a statistical probability of some people escaping the inexorable decline, but the average number is at least 100 so this is not possible. Extinction is inevitable, and on a short time scale in comparison to the evolutionary time scale.

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Is Darius the king from Ezra?

I am writing about the interesting article: Is Darius, the king of Ezra 6:14–15, the same king as the Artaxerxes of Ezra 7:1?

The report appears to have a conflict with the 70 years captivity, when those 70 years started and ended, the date for the fall of Jerusalem, and the 1st year of Cyrus. If we follow the author's historical model on page 52, we run into another time gap problem involving when the 70 years captivity ended and when Cyrus ruled.

From the destruction of the temple by Babylon until the 1st year of Cyrus, this is about 50 years if we follow James Ussher. We have 588–538 BC according to James Ussher (see II Kings 25:8–9 and II Chronicles 36:19–23). The 70 years captivity falls in this period, James Ussher dates 607–537 BC, (see Daniel 1:1–3).

It is common with modern historians to date the fall of Jerusalem in July–August 586 BC (see II Kings 25:8–9, Ezekiel 33:21), however Ussher dated the events of II Kings 25:8–9 in Saturday, August 27 588 BC (see page 104 of *The Annals of the World*, 2003).

Biblical Archaeology Review magazine reports that 17 Tamuz or July 3586 BC is the traditional date of the breeching of the walls of Jerusalem by Nebuchadnezzar.[1]

The 70 years captivity frames the time of Ezra 1:1 and II Chronicles 36:19–23. The author has the 1st year of Cyrus taking place 483 years before Christ Baptism[27] in AD which places Cyrus about 450 BC or so.

The date for the fall of Jerusalem and the 70 years captivity is a problem with the author's historical model. If the 70 years captivity ended near 538 BC, we have another time gap in Old Testament history until the 1st year of Cyrus in II Chronicles 36:22–23 which will be near 450 BC This looks like a problem for interpreting Daniel's 70 weeks in Daniel Chapter 9 if we follow the author's historical model proposed.

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References

1. Strata, In History, *BAR* **33**(4):16, 2007 (July/August).
2. Austin, D., Is Darius the king of Ezra 6:14–15, the same king as the Artaxerxes of Ezra 7:1? *J. Creation* **22**(2):46–52, 2008.

David Austin replies:

Thank you for your letter re above. The only time in my article a BC date is referred to is in the opening sentence. Here, I am not saying Ussher's date of 537 BC is correct. In fact the burden of the article is to show that because Darius of Ezra 6:14 is the same king as the Artaxerxes of 7:1, Ussher's BC dates are out by about 80–82 years. Ussher's dates were given to show his dates cover 563 years (not 483 years, equalling 69 weeks of years), evidence that his dates were wrong.

Re the problem stated that I have a gap from the time when the 70 years of captivity ended to when Cyrus became 'sole' king:

a) No BC dates were mentioned by me for this period.

b) All traditional BC dates mentioned by your letter, if we are guided by biblical chronology, (see article), would be out by about 80–82 years. The article substantiates that traditional chronology makes the Persian Period c. 82 years too long. (205 years not 123). Because of this error on BC dates and maybe others I prefer using AM dates. In any circumstance a scoutmaster, mapping out a route for his scouts to follow, would expect them to start at the beginning of the course.

c) These are the times for the 70 years captivity:

   i) c. 3520 AM (c. 526 BC): Starting point of captivity was Jehoiakim's 3rd year when Daniel, his 3 friends, and others were taken to Babylon. In the 4th year of Jehoiakim, the next year, Jeremiah prophesised the captivity would last 70 years (Jer. 25:1). (N.B. Ezekiel's captivity commenced 11 years before the destruction of Jerusalem—refer to Ezekiel 40:1).

   ii) c. 3589 AM (c. 457 BC): The year that Cyrus becomes sole king marks the end of the 70 years, the issuing of Cyrus' decree and the returning of the children of Israel to Jerusalem in the 7th month. (3520–3589 [Incl.] = 70yrs).

   Where is the gap in my chronology?

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