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## When and How Will Growth Cease?

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Only with knowledge will humanity survive. Our search for knowledge will encounter uncertainties and unknowns, but search we must. The search must persist and adapt as humanity's present knowledge is expanded and changed. Continued allegiance to the false belief that human population and our current economic system can grow indefinitely, runs directly counter to this search for knowledge. Those that espouse this belief hinder our search for the knowledge critical to humanity's survival.

Since Earth and the resources it can provide humanity are finite, both population and economic growth must cease sometime in the future. To use ridiculous examples to prove a point— Earth could not support 1 trillion people for even one moment and Earth could not support an economy 1 trillion times as large as the current economy for even one moment. Therefore, the following questions arise: 1) When will growth cease? and 2) How will growth cease?.

We can debate when growth will cease, but we cannot debate the fact that it will cease. Those who take the position that growth in the number of people, the resources they use, and the waste they create can continue on a finite Earth are, again, arrogant fools. While new technologies, recycling and any other actions taken by humanity can reduce the amount of resources used per unit of economic activity/output, neither new technologies, recycling nor any other actions taken by humanity can convert the finite and limited resources Earth provides humanity into infinite resources that will permit economic activity and population to grow forever.

Almost every resource Earth provides humanity is finite. The more we use today the less we have for tomorrow. Theoretically, Earth provides humanity with two types of resources: renewable resources and nonrenewable resources. Nonrenewable resources include fossil fuels and minerals. Renewable resources include soil, water, forest growth, fish in the ocean, and similar items. In reality, humanity is using almost every theoretically renewable resource faster than it can be naturally replaced and, therefore, for all practical purposes, renewable resources have become nonrenewable. Well before these resources are exhausted, we will find them harder to exploit. Humanity in the past has used those resources which were the easiest to obtain, had the highest concentrations of the minerals desired, the easiest to process, and closest to the place where they would be used. In the future humanity will be forced to use resources which are harder to obtain, have lower concentrations, are harder to process, and further from the place of usage. We will therefore face the challenges of higher prices, reduced returns, and greater processing waste well before the resources are exhausted. In many cases we already are.

Yet many economists, politicians, and even environmentalists will have you believe that the economy can continue to grow in spite of the fact that resources and sinks are limited. The recent budget proposal from the Trump administration relies on the assumption of 3% growth of the U.S. economy as measured by Gross Domestic Product (GDP)<sup>1</sup>. Since the economy will grow in a compound manner, a 3% annual growth rate would cause the economy of the USA to double about every 23.33 years. In 233 years there would be 10 doublings resulting in a growth factor of over 1,000 and in 466 years there would be 20 doublings resulting in a growth factor of over 1 million. In under 100 years at the same annual growth rate, there would be over 4 doublings resulting in a growth factor of over 16—2,4,8,16. The resources that will be available to the USA in under 100 years will not permit the economy of the USA to be 16 times as large as the current economy. Do you have any facts that would support the position that the economy of the USA could become 16 times as large as the current economy in under 100 years?

Instead, the evidence suggests that attempting to maintain an annual compound economic growth rate of 3% which would result in four doublings in 100 years, or a growth factor of sixteen, would result in the collapse of civilization. Why? Economic growth requires the use of physical resources. Without the use of physical resources, economic growth cannot and will not continue. It is almost certain that the earth cannot supply humanity, on an overall basis, with four times the resources it presently supplies. History suggests that resource constraints are more likely to lead to wars and disease than previously unseen economic flourishing and wellbeing.

It is not my intent to pick on Donald Trump in this essay, as the majority of candidates and major political parties, across levels of politics, have taken the position that growth is the solution to all or almost all of the problems faced today by humanity. Anyone who believes growth is a solution to any of

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<sup>1</sup> <http://www.npr.org/sections/thetwo-way/2017/05/23/529710769/trump-budget-plan-relies-on-optimistic-growth-assumptions-analysts-say>

the problems presently faced by humanity ignores the fact that Earth and the resources it can provide humanity are finite, the power of compound growth and the fact that the human population is exploding. Almost all of the problems faced by humanity today were caused, in whole or in part, by the combined impact of economic and population growth.

Which brings us to the question: when will growth cease? At what level will human population and economic production cease to grow? There are two options of the level at which each of them will peak: 1) At the current level or, 2) At some level higher than the current level. There is also the very likely possibility that growth will not only have to cease, but that the number of people and size of the economy will have to be reduced to some level lower than the current level. These options amount to a simple question: What size of the economy and population would permit humanity to survive on this planet for the longest period of time? A simple question that can be complicated for some to answer, but ultimately only has one correct answer –at the lowest population level which will permit genetic diversity so that humanity can survive and at the lowest economic level which will satisfy the reasonable needs of all of humankind. The meaning of "reasonable" is where the debate and discussion needs to take place, not the statements that have preceded it –which are where we are currently spending too much of our time and energy.

All indication is that the answer to –*What size of the economy and population would permit humanity to survive on this planet for the longest period of time?*– is not likely to be a level above what we are currently demanding of Earth. Which brings us to the question: How will growth cease? For population growth, I propose there are three, and only three, ways population growth will cease:

- 1) Wars, most likely with weapons of mass destruction, disease, starvation, civil strife and other horrors beyond the imagination.
- 2) Voluntary population control, which includes raising the standard of living of all of humanity, educating men and women, providing the most modern means of birth control to all humanity at no or very little cost, providing the safest and most modern means of abortion to all humanity at no or very little cost, changing the culture such that a person's position in society is not determined by how many children he or she produces, restructuring all religions such that women are in every way equal to men, and taking all other similar actions that anyone can think of.
- 3) Coercive population control on a worldwide basis that would be enforced by penalties, that could range from very minor civil penalties up to and including major criminal penalties.

I am open to hearing other thoughts on additional methods through which human population growth can be curtailed, but I believe these three to be the only options. With that in mind, the first option is obviously undesirable and should be avoided. Which brings us to the two methods of reducing the number of children born –yes, two methods. Currently, we are putting all our faith in voluntary population control to the point that many people refuse to even enter discussions about coercive population control. That does not make sense. What evidence do we have that voluntary population

control will reduce population growth to zero or make it negative in time to prevent the collapse of civilization? What evidence do we have that within the next 150 years there is no chance humanity will have to choose between coercive population control and the total and complete destruction of civilization? We should be prepared for that choice, and can only be if we openly discuss coercive population control.

If there is at least a 10% chance that voluntary population control will fail or if there is at least a 10% chance that humanity will face the choice between coercive population control and the total and complete destruction of worldwide civilization within 150 years, humanity must (and I have used the word "must" purposely) immediately discuss, evaluate, debate and consider all the problems and benefits of both coercive and voluntary population control so that a decision is made as to which method of population control is best for humanity. Anyone opposed to the consideration of both methods of population control must show why such a discussion will presently be more harmful to humanity than failing to have such a discussion.

To restate the position differently, there are two choices—discuss, evaluate, debate and consider both methods of population control to determine which method is best for humanity or not to have such an evaluation and discussion. Those that do not want to have such an evaluation and discussion must show why their position is better for humanity than having such an evaluation and discussion. On a personal level, I cannot think of one fact that would indicate not having such a discussion and evaluation would be more beneficial to humanity and to the survival of civilization than having such a discussion and evaluation.

Admittedly, such a discussion and evaluation may not provide sufficient evidence to guarantee the correct choice between voluntary and coercive population control. However, that should not prevent a discussion and evaluation from occurring. If, based upon today's knowledge and facts, sufficient evidence to guarantee the correct choice between the two methods of population control is not available or cannot be agreed to, the intelligent action to take would be to have additional discussions and evaluations at later periods of time. We must make a choice between the two methods of population control based on our intelligence and the facts and knowledge available to us. We cannot and must not leave the choice between the two methods of birth control to be made by default. Default, almost certainly, will result in the elimination of the human species from the face of Earth.

At the beginning of this essay, I stated that knowledge is always better than the lack of knowledge and that those who refuse to obtain knowledge are fools. That statement applies to those who refuse to consider, evaluate, debate and discuss the two methods of population control, unless they show that such an evaluation and consideration would be extremely harmful today to humanity. The fact that a large portion of humanity would be opposed to such an evaluation and discussion should not and must not prevent such a discussion as a large portion of humanity has no understanding of the problems humanity presently faces and has no understanding of the power of compound growth. Humanity must not be ruled by those that do not have knowledge and refuse to obtain knowledge.

I could go on analyzing and describing every problem presently faced by humanity today that could cause the destruction of civilization and the deaths of billions by the year 2100. However, this essay is getting too long and if I did not convince you that humanity must start a discussion and evaluation of coercive population control today, nothing additional I could write would make you change your mind.

One last comment. Many of those who will read this essay are correctly concerned by the problems of enforcing coercive population control on a worldwide basis. I concur in your concerns that the problems will be monumental. Those problems must be part of the discussion and evaluation comparing coercive control with voluntary control. However, if humanity is faced with a final choice of coercive population control or destruction of civilization, the choice must be coercive population control and those challenges will need to be resolved. As no one can guarantee, with certainty, that humanity will not face exactly that choice within the next 150 years, those discussions need to start now.

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