Why Malthus Was Wrong
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There are a lot of expressions of pessimism these days about whether we can save the environment — and thereby ourselves. Some of this pessimism is self-serving, but most of it is quite genuine. People look at the trends, and they despair — or else go into denial. And those who despair will almost invariably point to one factor above all others — the threat of overpopulation. No matter whether we recycle all our waste, switch entirely to non-polluting energy sources, sponge the skies of CFCs and greenhouse emissions, turn the deserts into gardens, and save the rainforests and the poor whales, all these gains will be washed away, these people say, by a surging tide of hungry hominids.

My topic today, therefore, is the population boom. I want to consider the following question: is it inevitable that humanity must overwhelm itself in hungry babies? And I shall argue that the answer is a firm no — that while it is possible, and maybe even probable, that this catastrophe will happen, it is not inevitable.

First, let’s take a clear-eyed look at some worrisome numbers, so that no one can say we are ignoring the facts. The world population clock has recently clicked over the six billion mark. I myself remember when it passed three billion. That was back around the time when the Beatles were driving teenie-boppers into hysterics; not all that long ago, really. We are currently adding nearly 90 million new hungry mouths every year, roughly three Canadas. Try to imagine the consequences if 90 million immigrants showed up at our borders in one year.

In fact, the rate of increase has slowed down a little bit since the sixties and early seventies. Demographic experts are desperately trying to project on the basis of current trends, but the best they can do is to guess that world population will level out around ten billions or so, roughly around 2050. Will we all breathe a sigh of relief at that point, convinced that we have dodged the bullet?

The problem is, of course, that it is not clear that we can continue, much longer, to provide even for the present world population, let alone a few billions more, given our current, highly wasteful methods of land use and resource extraction. Here are a few typically depressing facts: Since 1960, an area equivalent to about one third of all current cropland has been abandoned, due to soil erosion and degradation. Fisheries around the world are collapsing, as we stripmine protein from the sea. Our petroleum reserves, which have fuelled our current population boom, just have to run out, sooner rather than later. (Some estimates place the peak of the world oil production Hubbert curve around 2005.) And there is evidence that humans already use or inadvertently squander forty percent of the total biomass produced annually by photosynthesis in the Earth’s biosphere. How can we go on like this?

Faced with such sobering trends, many people recall the dismal predictions of the Rev. Thomas Malthus. Back in 1798, Malthus published his Essay on the Principle of Population, which argued that humanity is inevitably doomed to "misery" (that is, war, famine, poverty, and disease) because of overpopulation.

I believe that Malthus was wrong, for reasons that are very instructive — but anyone could easily be excused for thinking that he was right. There certainly have been Malthusian
crises in history. That’s the term ecologists use, when the population of some species grows so rapidly as to overwhelm the capacity of an ecosystem to support it.

The classic example is the tragic story of Easter Island. This lush semi-tropical paradise, only a total of 64 square miles in area, was invaded by Polynesian peoples about 400 AD. (Contrary to the supermarket tabloids, the giant statues on Easter were not erected by aliens.) Their population expanded over a period of about a thousand years from (probably) a few hundreds to as many as 20,000, and then suddenly crashed back to a couple of thousand or so. The island was denuded of almost all the plant life and game that had made it such a good place for people to live. The Easter Islanders simply ate themselves out of house and home, and in the process crippled the very ability of their island’s ecosystem to regenerate itself.

Many, following Malthus, will argue that nothing can prevent Earth as a whole from suffering the fate of Easter Island. The only difference, they say, is that doom will take longer to arrive because Earth is larger. Are they right?

Here is the real question: granted that Malthusian crises can happen to human populations, must they happen? Are they inevitable (like death and taxes), or are they merely something (like traffic accidents) that can be prevented with sufficient care and foresight?

It is very helpful to look at what Malthus actually said in his famous paper, which, many scholars will say, has never been refuted. His flawed and (as we shall see) disingenuous argument is prototypical of all arguments that say we are doomed because of over-population.

Malthus begins by insisting that he will eschew all wishful thinking about what people might be able to do, if only they were different sorts of beings from what they really are. Let’s look at the hard biological and mathematical facts, says Malthus; let’s stop kidding ourselves. We must accept two facts about people, he tells us: the “passion between the sexes” is “necessary” (although he does not say exactly in what sense) and is very unlikely to diminish, and we must eat to survive. Because of our irresistible urge to procreate, our population will always tend to increase “geometrically” (i.e., by compound interest), even though our means of subsistence can do no more than increase “arithmetically” (i.e., by simple interest).

Malthus offers no proof whatsoever for these mathematical assertions, which are really just conjectures. It is well known that populations of humans, and many other species, can increase geometrically (or exponentially, as we now say), given a permissive enough environment.

However, increases in resource production (or extraction) can certainly be better than arithmetical, at least for a while. For humans, the main factor that makes this possible is technological ingenuity. Nevertheless, no matter how ingenious people may be, it is certainly possible for resource production to simply fail to keep up with population. There is no question that population growth can outstrip the capacity of an environment to support it. But again, please note my careful choice of words; the issue here is to distinguish between what can be the case, and what must be the case.

Malthus insisted that it is a general law of biology that this must always happen. All organisms, he stated, must be subject to endless, agonizing cycles of boom and bust, and humans are no exception.
The real flaw in the argument of Malthus is that he made an elementary error in biology. One need not have a PhD in ecology to see the basic point; indeed, a little common sense shows that Malthus could not possibly have been right. If populations always explode out of check, the entire global biosphere would have simply eaten itself billions of years ago. But this has not happened. Instead, throughout nature, we see intricate webs of interdependencies, in which organisms (by a bewildering variety of mechanisms) moderate their tendencies to exploit their environments and each other, and cooperate to maintain the healthy functioning of their environments. Biologists call this process mutualism, and there is ever-increasing recognition that it is a centrally important factor in how ecosystems work, and even in the way evolution occurs.

Whether organisms are mutualistic out of altruism, enlightened self-interest, or simply the blind urge to survive, whether they are driven by selfish genes or some mystical urge towards self-transcendence, is entirely beside the point; the point is that this is what genuinely happens in the real biological world. Darwin was right that the fittest survive, but fitness includes the ability to cooperate, as well as the ability to compete.

Indeed, it is interesting to note that Darwin and Wallace themselves had read Malthus, and got the idea of the struggle for existence from him. It may well be that the distorted over-emphasis on competition in Darwin’s view of evolution may stem from his insufficiently critical reading of Malthus.

The crucial point is, though, that what Malthus took to be the normal population dynamic is a pathological phase that occurs when a novel organism invades an ecosystem or host that has not evolved defences against it. This happens often enough in nature; an obvious example is a viral or bacterial infection run rampant. But it could not be happening all the time, or life on Earth would be impossible.

What very often happens, instead, is that an invader nearly wipes out a susceptible host, or else the host nearly wipes out the invader with its defences, but then the host and invader somehow settle down into a phase of mutual accommodation. Indeed, it is not unusual for the former antagonists to actually become, after some generations, necessary for each other’s existence — pathology evolving into mutualism. This is a very common pattern, in nature.

A number of ecologists have suggested that the human irruption could follow this pattern, too. Modern Homo sapiens appear to have branched off only about 100,000 years ago, from earlier, less aggressive hominids. Ecologically, we are newcomers, like a mutant virus, and we possess weapons — language and technology — that give us an unprecedented ability to overcome the resistance of our host ecosystem to our depredations. However, it is not unreasonable to hope that, despite the uniqueness of the human situation, we could follow the fairly common path of a pathological outbreak blossoming into a mutualism.

Right now, it is not the sheer numbers of people, or even the human population density as such, that most threatens the integrity of our supporting ecosystem. Very small human populations have sometimes done great ecological destruction. Only a few thousand settlers, for instance, nearly wiped out the North American bison. It is our failure to live in a mutualistic fashion that is the real cause of all the bad things that flow from the population boom — pollution, exhaustion of resources, and the ever-present threats of war, famine, and disease.

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Just pointing this out does not solve the problem; we still have to learn how to be mutualistic with the global biosphere, and this will not be a simple task. But the first step toward solving a problem is to identify it correctly.

Malthus, writing 200 years ago, could perhaps be excused for his ignorance of some basic facts of ecology that have only become clear since his time. But a closer reading of his essay shows that he really had something else in mind all along.

Malthus goes on to explain that among humans, the inevitable consequences of the struggle for existence are “vice and misery”. By misery, he meant warfare, starvation, poverty, disease, and ignorance. Vice, he says, “is a highly probable consequence, and we therefore see it abundantly prevail, but it ought not, perhaps, to be called an absolutely necessary consequence. The ordeal of virtue is to resist all temptation to evil.”

The final, bizarre statement is the giveaway. For it appears that what Malthus actually meant by "vice" (although he could not bring himself to write it in plain English) was birth control. Not only did the Rev. Malthus get his biology wrong, he was so utterly lacking in compassion for humanity that he really believed that endless war, pestilence, and starvation would be preferable to the vile indulgence in sexuality for any other purpose than procreation.

In other words, Malthus was not really saying that it is biologically impossible for humanity to control its population growth. He was saying that it would hardly be surprising if we might, in our weakness, attempt to control reproduction in spite of the “passion between the sexes” — but that we should not.

In the end, the argument of Malthus falls to pieces. He ultimately concedes that people — unlike the beasts of the field — might well be capable of modifying their reproductive behaviour on the basis of intelligent foresight. However, despite his pretension to be delivering a dispassionate diagnosis, based on simple biological and mathematical facts, his real purpose is to issue a moral exhortation. It is to remind us that we are put here on this Earth to suffer — except, of course, for a few especially favoured members of the social class to which he happened to belong.

In fact, Malthus was writing in the context of debates over the Poor Laws — the social welfare net, such as it was, in Great Britain in the 1790s. The debate was hauntingly familiar: should we help the poor (which, of course, would cost money…) or leave them to their own pathetic devices. And Malthus’s purpose was to set forth an argument that is all too familiar as well: don’t bother trying to help the poor; their suffering is inevitable, and we would only prolong their agony, and perhaps weaken the species, if we try to alleviate it. Here is a pseudo-scientific argument that would be dear to the heart of Mike Harris or Newt Gingrich — a biological determinism with a vindictive spin that relishes the misery of those who would be tempted to “vice”.

I conclude with a mathematical puzzle. What demographic variable would you guess is best correlated with low birth rates and low infant mortality? Gross National Product? Wrong! How about per capita income? Wrong again!
Indicators of economic well-being do correlate fairly well with low birth rates. But, according to United Nations statistics, the best predictor for low birth rate and low infant mortality is women's literacy.

No doubt the shade of the Rev. Malthus is clucking in disapproval over this shocking fact, but it seems that when women have the opportunity to inform themselves about birth control, basic hygiene, nutrition, and infant care, they oddly tend to prefer small, healthy, well-fed families in which most children survive to maturity, than large, unhealthy, starving families in which only a few survive to maturity. Such is the disdain for "virtue" into which we have fallen in these late times.

The point is that if we choose to behave intelligently — and I include investing every nickel we can into expanding basic literacy as a good part of behaving intelligently — there is absolutely no reason why humanity cannot avoid the fate specified for us by the gloomy Rev. Malthus. If we do not, it is fundamentally because we choose not to, or can’t be bothered to, or can’t figure out how to in time, not because it is biologically impossible.

In recent years, astronomers have been listening for signs of intelligent life on other worlds. I think that these efforts are very interesting, and should continue. But the real question is whether there is intelligent life on Earth.

— 30 —