

The future of humankind after the great crash: extinction or the human hive?

Posted by Ugo Bardi*

I have no doubt that we are heading at full speed toward a major ecosystem crash. We are wrecking the climate, destroying the biosphere, poisoning the seas, dispersing heavy metals all over, creating radioactive isotopes that had never existed in the four billion years of the Earth's history. Whatever is going to happen, it will not be a pretty sight for those who will be alive to see it. But does the upcoming crash mean the end of the human species? That can't be excluded and the concept of "Near Term Extinction" (NTE) even became [rather popular](#), nowadays. But the problem with human extinction is not so much how likely it is. The problem is that it is *boring*. We go extinct and that's it; end of the story. We may even wreck the ecosystem so badly that we would sterilize the whole planet, having everything else dying with us. Even more boring, isn't it?

Yet, the future remains a fascinating subject and the remote (or "deep") future is the most fascinating one. So, suppose that not everybody dies in the great crash; what future is in store for homo sapiens? As a first hypothesis, the great crash might not be so great, after all. Maybe it could be just a bump along the way; more or less like the Middle Ages were for Europe. So, humans could emerge into the after-crash future still as a few billion strong and still having most of the technologies we have today. They could have energy from renewables, enough to keep going in the form of an industrial society. But this would imply a capacity of long range planning that we just don't seem to have. More likely, humans would emerge out of the great transition as few, battered, and poor. They would find themselves stranded on a planet badly depleted of the energy and mineral resources they had before the crash. Then, what could happen to them?

Much depends on what the after-crash climate will be. After the great warming "pulse" generated by fossil carbon burning, the Earth will stay very warm for a long period - at least some thousands of years. Gradually, it will cool down as the atmospheric carbon dioxide created by the industrial revolution will be gradually - very gradually - re-absorbed into the Earth's crust. It may well [take a hundred thousand years](#) to return to the pre-industrial CO₂ concentrations. Only at that point we may see again the climate conditions which were typical of an Earth unperturbed by human activities; perhaps with the series of ice ages that characterized the "Pleistocene," the epoch preceded the more stable Holocene - in which we are still living. So, we can say that our after-crash descendants (if any) will live in a warm, possibly extremely warm, climate. But the Earth is big, so it would be possible for them to find areas cool enough that they could survive, perhaps in the far north or even in Antarctica. On the whole, we can expect that, after the great crash, humankind could face several tens of thousands of years of survivable conditions, perhaps even a few hundreds of thousands of years.

A lot of things can happen in several tens of thousands of years, but we can be reasonably sure of one: humans will not see another industrial revolution. Fossil fuels will be gone and it will take millions of years, for the ecosystem to create

them again - maybe they will never be recreated. Then, the after-crash world will also be badly depleted in mineral resources. Our descendants won't be able to mine much, but they will be able to scavenge what their predecessors had left in the ruins of their cities. They will have plenty of iron from the skeletons of old bridges and buildings; perhaps they'll be able to put their hands on some ancient vault filled with gold ingots. But they will lack the abundance of rare metals that we are used to and an even more serious limit will be the vegetable charcoal they will need in order to process the metals they scavenge. For them, most metals will always be rare and expensive. So, we can imagine that future humans will have to settle back to simple ways of living. Perhaps they will have to revert to hunting and gathering, but they may also be able to cultivate the land, even though we can't be sure that this future climate will be stable enough for that. Whatever the case, it will be a low-tech world. It doesn't look very much like an exciting future. Hunting and gathering by hominids has been going on for millions of years, always more or less the same. And agricultural societies are static, hierarchical, oppressive, and have been described as "peasants ruled by brigands." (attributed to [Alfred Duggan](#)). Is this what we should expect for the next 100,000 years? Just new peasants ruled by new brigands? Not necessarily.

The fact is that humans can evolve. And they can evolve fast, substantially changing even in a few thousand years. The recent [results of genomic research](#) opened up a Pandora's box of discoveries. Our ancestors did evolve, oh, yes, they did! The idea that we are still the same guys who hunted woolly mammoths during the ice age badly needs an update. We are similar to them, but not the same; not at all. A lot of things happened to humans during the transition from hunter-gatherers to farmers and pastoralists. [We lost](#) a good 3-4% of the cranial capacity, many of us became able to digest milk, we developed resistance to many diseases and the capability to live on a diet that was very different and much poorer than that of hunters and gatherers. These changes were genetic, resulting from the need of adapting to a different lifestyle and to a more complex society.

So, if humans can survive the great crash and keep going for more millennia - perhaps many more millennia - there is plenty of time for more and deeper changes. Actually, humans are going to change *a lot* over such a long time span. How will they change? Of course, it is a difficult question, but we can at least identify some trends. In particular, we can imagine that some present tendencies that today we tend to see as mainly cultural, may eventually become enshrined in the human genome. Something that might happen is that humankind could *speciate*. That is, they could gradually branch out into two or more separate species. We have already seen a considerable divergent specialization among at least three different human groups: hunters/gatherers, shepherds, and farmers. Each of these three branches exploits different ecological/economic niches and has developed cultural (in part also genetic) adaptations to different lifestyles. Extrapolate this trend into the far future and you have two (or even three) species of hominids; repeating the situation that was common long ago, when different hominids co-existed at the same time. Neandertals and Sapiens, indeed, lived in overlapping times but they were different species and they had limited (although non zero) capabilities of interbreeding with each other.

If the future will see more than one species of "homo", then each one will independently specialize and adapt to their environment. Hunters/gatherers will probably revert to the already optimized toolmakers of the Pleistocene. Shepherds will become more and more adapted to their nomadic lives in areas which are poorly productive for agriculture. Farmers will keep living in villages and cities at high population densities. They will build cities, temples, and palaces. They will create armies, fight against each other, and build up kingdoms and empires. And it is there that things have a chance of getting more interesting. The past genetic and cultural evolution of agricultural humans has been all along the development of more "social" characteristics: an increase in the ability of living in large groups of highly differentiated categories (farmers, soldiers, craftsmen, priests...). If the trend continues, we may see cultural characteristics becoming more and more embedded in the genome of the species. In the (very) long run, we could see the birth of a "eusocial" humankind; the same kind of social structure of bees, ants and termites. That is, a society of sterile workers, sterile soldiers, "queens" that generate most individuals, and dumb males (on this last characteristic, we are already pretty advanced). It is not impossible. There already exist eusocial mammals, one is the naked mole rat of Central Africa. So, maybe the future for humans will not involve advanced technological gadgetry (of which we are so fond) but, rather, advanced social engineering, with the development of more and more efficient and stratified societies.

Is the future of humans a beehive? We can't say, but it looks more and more likely that some old ways of seeing the future are now wholly obsolete. Likely, our descendants will have no flying cars; no spaceships, no robot butlers bringing the martinis to them as they relax on the pool's edge. But the powers of a human hive could still be impressive even without the gadgetry of our times. Maybe the "superintelligence" that some see as developing in our computers could actually appear in an eusocial human organization (this is one of the themes of Frank Herbert's novel "[Hellstrom's Hive](#)"). Will these superintelligent entities avoid the mistakes that we have done? We can't say; of course, it is a future that none of us will ever see. But it is a fascinating future and the interest in the future is part of the fact of being human. Perhaps, our hive descendants will have to think in the same way.

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Retrieved 24th May, 2015

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