

ing to profound changes not only in human culture but human physiology as well), and alter landscapes in our favor.²⁴

The second was the development of language—likely a gradual process that began many tens of millennia ago, but an equally fateful one: it enabled humans to coordinate their actions over time and space, and it slowly altered the internal architecture of our brains. With language we told stories, and with those stories we wove religions, philosophies, and eventually scientific theories and computer programs.

The third turning point was the agricultural revolution 10,000 years ago. Seasonal surpluses of storable food enabled full-time division of labor (society became segmented into peasants, soldiers, accountants, merchants, and kings) as well as the emergence of cities and empires—which brought with them writing, mathematics, and money.

The industrial revolution, only about two centuries old, liberated the energies of fossil fuels, which replaced muscle power in production and transportation, thereby dramatically increasing the speed and scale of those processes. Fossil-fueled economic growth enabled human population to expand seven-fold and led to an explosion of scientific research, practical innovation, and trade. So much economic activity was now possible that a phenomenal expansion of credit was needed to connect potential producers with potential consumers.

Now we are participating in the turning from fossil fueled, debt- and growth-based industrial civilization toward a sustainable, renewable, steady-state society. While previous turnings entailed overall expansion (punctuated by periodic crises, wars, and collapses), this one will be characterized by an overall contraction of society until we are living within Earth's replenishable budget of renewable resources, while continually recycling most of the minerals and metals that we continue to use. No one who is alive today will be around to see the culmination of this fifth turning, and there is no way to know exactly what the end result will look like. The remainder of the current century will be a time of continual evolution and adaptation as we head, in fits and starts, toward that distant goal—which will itself be a dynamic rather than a static condition, in that human beings will still be evolving and society will still need to adapt continually to its changing environment.

There is no guarantee that the participants in this evolutionary and revolutionary transformation will view it as an extension of human progress, rather than as the ending of civilization as we have known it. Unless we completely fail to rise to the occasion, in which case the human project will simply cease, there will probably be elements of both collapse and renewal.

History suggests that it's hard to understand and deliberately navigate one of these great turnings as it is happening. Adam Smith lived through the early Industrial Revolution and laid the basis for the economic ideology that would shape the remainder of the industrial period. Yet there is no evidence in his writings that he understood the implications of the coal-based economy that was emerging around him. The thought that fossil fuels would utterly transform the world during the next two centuries evidently never entered his head. We can only speculate about his reaction if he could somehow be revived to witness today's massive global trade via fuel-powered ships, planes, trains, and trucks, or participate in a computer-mediated stock trade enabled by coal-fired electrons. When Smith imagined the economy of the future, he foresaw one comprised of shopkeepers, artisans, small factories, and trade via sailing ships, because those were his customary terms of reference.

We're at a similar juncture today. Before us lies a future that will necessarily be very different from the one that our political leaders encourage us to envision. The only mental tools we have with which to imagine the possibilities that await us are ones honed in the past era of growth, extraction, and combustion. As a result, we can't hope to have a very clear picture of what life will or even could be like for grandchildren of the children now being born.

What we *can* hope to do is to make sure they have a future—that they will have even the possibility of existing and making their own contributions to our species' unfolding story. In order for future generations to enjoy the barest of chances at life we must avoid the monetary-financial wall in our path, or ensure that the impact is minimal. And we must set a course toward sustainability and away from collision with Earth's environmental limits. All of this will require us to question what we think we know, to leave our comfort zones far behind, and to engage in hard, challenging work.

We will be tempted to waste time fussing over aspects of our current way of life that may not be salvageable (including many of the goods we associate with economic growth). We will be tempted also to waste time apportioning blame for the failure of our existing economic and industrial systems, and venting anger over the greed and stupidity that stand in the way of building a new economy. None of this will help. The only efforts that will aid in the long run are those that contribute, in some tangible way, to the realization of a pattern of human settlement that is culturally and psychologically rewarding, and that supports rather than undermines the integrity of Earth's living skin, our only home.