

THE FITTEST BIG ANIMAL: REMARKS ON HUMANITY'S GROWING DOMINANCE OVER THE REST OF LIVING NATURE

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The subject-matter of my contribution is very broad: I will deal with nothing less than long-term trends in the history of humanity. In this endeavour I am inspired by the work of Norbert Elias and Johan Goudsblom. Whereas Goudsblom continued and elaborated parts of the work of Elias, I for my part try to set forth the work of Elias and Goudsblom in certain ways.

The central question of this paper is, simply: What makes the human species such a successful animal in terms of survival and reproduction? How to explain that humans in the course of history increasingly came to dominate and control other living organisms? How to describe and explain the process that Goudsblom (2002) phrased as 'the expansion of the anthroposphere within the biosphere'? I will try to sketch in broad outlines what this development entailed, and to offer a general explanation. Subsequently, I will discuss some main trends in the history of humanity. And finally, I will draw attention to setbacks and drawbacks in this human success story.

THE EVOLUTION OF *HOMO SAPIENS*

First of all, I will say something about the evolutionary processes that led to the emergence of our species, *Homo sapiens*. Around 3 million years ago our earliest human ancestors who formed the genus *Homo* started to walk on two legs and to make simple tools with their hands. From then on, we may speak of a process of hominization, of becoming human, in which genetic, biological evolution interacted with sociocultural change: a gene-culture co-evolution (Wilson 1998; Henrich 2016). On the one hand, biological evolutionary changes created the conditions for human culture: larger brains

that enhanced human learning capacity, greater dexterity with the hands that enabled humans to make more complicated tools, anatomical changes in the mouth and the throat that enabled them to develop a repertoire of vocal signs to communicate with one another. On the other hand, cultural innovations changed the conditions of natural selection, which brought about genetic changes that in turn created the conditions for further cultural development.

An example of this interaction between sociocultural development and biological evolution is the control of fire, which started among human groups more than 500.000 years ago. As Goudsblom pointed out in his book *Fire and Civilization* (1992), control of fire was a cultural innovation by which humans acquired important power advantages in relation to other animals. Fire served as a weapon, a source of warmth and light, and a device to make eatable plants and animals more digestible by cooking. Control of fire was at the basis of a large number of important technological innovations later in history, such as pottery, metallurgy, and the steam engine. Without control of fire the increasing dominance of humans over the rest of living nature could not have occurred. What Goudsblom did not point out, however, is that the human control of fire also had an impact on the biological evolution of humans long before the emergence of *Homo sapiens*. As primatologist Richard Wrangham (2009) has argued, when early humans or hominids learned to cook, they needed less energy for digesting their food; their jaws and teeth and their intestines became smaller, their brains could become larger as a consequence, and a greater proportion of bodily energy could be devoted to the functioning of these larger brains – which enabled them to learn more, to invent more, to build more complex cultures. In other words, the control of fire was a crucial link in the long process of gene-culture co-evolution. The emergence of *Homo sapiens* around 200.000 years ago was an outcome of this process.

Initially *Homo sapiens* was not the only human species. For a long time, they lived with other humans or hominids, such as *Homo neanderthalensis*, who also had developed a whole range of cultural skills, including control of fire. The Neanderthals disappeared from the earth around 40.000 years ago. We do not know exactly why and how, but one plausible reason is that they were outcompeted

by *Homo sapiens* because the latter's cultural capacities and social organization were better suited for survival.

THE SPREAD OF INCREASING NUMBERS OF PEOPLE OVER THE EARTH: POPULATION GROWTH AND MIGRATION

The biological success of *Homo sapiens* in terms of survival and reproduction is most clearly indicated by their numbers; in other words, by the growth of the world population. This is shown in Table 1.

Table 1: Development of world population (estimates)

Year	N x 1 million	Yearly growth average (%)
200,000 BP	0.03	
75,000 BP	0.01	
8000 BCE	4	
1	250	0.05
500	205	- 0.04
1100	257	0.04
1300	429	0.25
1400	374	- 0.14
1500	458	0.20
1700	682	0.20
1800	968	0.35
1900	1613	0.51
2000	6172	1.35
2020	7887	1.23

Sources: *Encyclopedia of Population* (2003);
www.worldometers.info/world-population.

While the numbers for most years and particularly the early years in this table are very rough estimates, they clearly indicate an enormous growth of the world population in the long run. This growth was not continuous. There were periods of temporary population decline, as the table shows. It also appears that population growth strongly accelerated in the past few centuries. Whereas the yearly growth rate was always far below 0.5% before 1800, it rose to an average of more than 1.3% in the twentieth century, only to decline somewhat in recent years. A curve that corresponds with the numbers in the table would show a transition from slow and sometimes negative growth

during most of human history to a very steep rise after 1800.

Another aspect of the increasing human dominance on earth is the migration of human groups from Africa to almost all other parts of the world. While *Homo sapiens* was not the first human or proto-human species that migrated from Africa, the spread of our species was more extended and more durable. According to paleontological and archaeological evidence, groups of *Homo sapiens* migrated from Africa to Southern Europe and the Middle East between 100.000 and 75.000 years ago. From there they went to other parts of Asia, including the Indian subcontinent (around 65.000 years ago) and Japan (40.000 years ago). They reached Australia around 50.000 ago. In Europa they moved gradually from the South to the North, occupying Scandinavian regions about 12.000 years ago. They crossed the Bering Street from the North Eastern tip of Asia (Siberia) to the North Western tip of the American continent (Alaska) around 15.000 years ago, from where they gradually moved in Southern direction, to reach South America about a thousand years later. More recent was the human occupation of the Pacific Islands (from about 1500 years ago) and New Zealand (around 1000 years ago).

This dispersion of humans over almost the whole landmass of the globe in the course of thousands of years reflects both necessities and capacities. Necessities: the main reason to migrate to unknown territory was probably a lack of resources to survive in a given area, which could be caused by either ecological change, or population pressure, or a combination of both. Capacities: migrating human groups managed to survive in their new environment because they were able to develop new knowledge and technology by which they adapted to the environment's requirements. While survival-enhancing adaptation to a new environment over a long period could have a genetic component (think of the development of lighter skins among humans in Northern, colder regions with less sunlight), adaptation through newly acquired and socially shared skills was crucial. Through cultural adaptation, groups of the same human species were able to live in the most diverse natural environments, ranging from tropical rain forests to the extremely cold Arctic regions. Adaptation to widely divergent environmental requirements was a source of cultural differentiation among human societies that had spread over the

earth.

WHAT EXPLAINS THE HUMAN SUCCESS STORY?

What made our species so successful in terms of survival, reproduction and dominance? The basic answer has already been suggested here: it follows from the evolution that led toward *Homo sapiens* and from the way in which our species spread over the earth. The key is the human capacity for adaptation through innovation and social learning, - in short, through culture.

Humans are not the only animals who have culture in the broad sense of the term. As primatologists have argued, groups of chimpanzees, for example, have also developed distinct cultural traits that are not determined by their genes and are transmitted over generations through social learning (De Waal 2001). But this animal culture is quite rudimentary compared to the culture of any human group. It is the cumulative and symbolic character of human culture that makes human groups highly adaptive to changing conditions. This is also at the basis of self-reinforcing social developments far beyond what is adaptively necessary for survival.

Human culture is *cumulative*: it evolves through step-by-step innovations that build progressively upon one another. This can be most clearly seen in the development of technology (cf. Lenski 2005).

Human culture is *symbolic*: human knowledge about the world is expressed and transmitted through symbols, that is, signs whose meanings fully rest on social conventions. While the human capacity for communication through symbolic language is genetically given and the result of a long evolutionary process, any human language is man-made and in no way genetically determined. Nothing better than language illustrates the fact that the evolution of the human species has resulted in a new level of reality, sociocultural reality, which is relatively autonomous with respect to the reality of living nature. This has been clearly pointed out by Norbert Elias in his last large essay, *The Symbol Theory* (1991) (Elias 2011; cf. Saramago 2023).

Immediately connected with the cumulative and symbolic character of human culture is another basic characteristic that distinguishes human beings from other animals and gives them a power

advantage: the *capacity to cooperate in large groups*, comprising hundreds or thousands or even millions of individuals. With the help of symbols, humans are able to conceive of such large entities, to distinguish members from non-members, to formulate behavioural rules, and to develop collective feelings of identification and solidarity. The prime examples in our age are national states, with their names, territorial borders, central governments, laws, and rituals, but we may also think of churches, cities, companies, armies, universities, hospitals, or labour unions (cf. Harari 2011).

This human capacity for cooperation too has deep evolutionary roots (Bruggeman 2024). Coordination of activities was important for successful hunting of big game, and it was probably by participating in larger groups that humans in the course of time developed genetic dispositions for more developed linguistic and social skills that in turn were functional for establishing and maintaining more extensive social connections (Aiello & Dunbar 1993). By cooperating in larger groups, humans increased their control of nature and their dominance over other animals. The larger the group and the more cooperation within the group, the larger the power chances of the group and its members are. This means that there is a competitive drive toward the formation of increasingly large groups. Much of human history can only be explained by taking this mechanism into account.

LONG-TERM TRENDS IN HUMAN HISTORY

The cumulative and symbolic character of human culture combined with the human capacity for cooperation in large groups is at the basis of a number of interconnected long-term trends in human history, in addition and related to the trends that we already noted: the growth of the human population, and the extension of the areas in the world inhabited by humans. Four trends will be shortly discussed here: accumulation of culture, the growth of material production and energy use, functional differentiation and specialization, and the growth of networks of human interdependence. Subsequently I will enter into the question whether civilization in the Eliasian sense might be counted among the long-term trends in human history.

Accumulation of culture.

The cumulative nature of culture implies that there is indeed a long-term trend of accumulation of culture, which comprises the growth of human knowledge and the substitution of more for less adequate or effective knowledge. As Elias put it in a groundbreaking essay in 1971: “[...] the advance and expansion of knowledge in its scientific form, which in some fields has become more or less self-perpetuating, is merely the latest phase in a much slower and more erratic, but nevertheless – seen over longer periods – cumulative and steadily accelerating advance and expansion of human knowledge which with many ups and downs has been going on for many thousands of years.” (Elias 2009a: 14) And in the same essay: “The fact that in many areas human knowledge progresses in the course of millennia, in spite of all stagnations and regressions, suggests that in the long run advances in knowledge have a considerable survival value.” (ibid.: 17).

As remarked, this long-term process can be most clearly observed in the development of technological knowledge. Through step-by-step innovations humans improved technologies with which they exploited nature more effectively and thereby enhanced their survival chances. Many of these innovations were adaptations to the local environment and tied to specific ecological conditions. But some had wider significance and could therefore diffuse from one society to another, even to the point that they could come to cover all human societies, so that they became part of world culture. Examples are the innovations that marked the transition from gathering and hunting to agriculture and pasture as the basis of food production and, much later in time, the innovations that made possible the use of fossil fuels as the source of energy for production and transport. Other examples are the invention of the wheel, the use of metals, the weaving of textiles, the introduction of fire-arms, and, in recent times, the invention of the computer. Some innovations in communication and organization also attained a global scope; such as, most importantly, the invention of writing.

In all these cases, as Goudsblom (1996: 24; 2023: 51) has remarked, there is a sequence of three stages in the development on

the world level: in the first stage, *no* society has one of the mentioned traits (agriculture, or metallurgy, or mechanical industry, or fire-arms, or writing *et cetera*); in the second stage, *some* societies have that trait; and in the third stage, *all* societies have the trait. They spread because they give competitive advantages to individuals and groups in the societies in which they function. They can be regarded as power resources, that is, as means of control that enhance the survival chances of the members of a society and their collective power in relation to other societies. Members of these other societies are then pressured or forced to take over the power-enhancing trait; or they are driven away, destroyed, or incorporated into the more powerful society (Wilterdink 2023). In these ways agriculture spread from some to more and eventually all human societies. In more or less similar ways, mechanical industry spread since its beginnings in the 18th century to more and more areas of the world until the whole world population was incorporated into a global industrial system.

Goudsblom's 'law of three stages', as I have called his proposition (Wilterdink 2023), implies that cultural accumulation on the world level takes place through diffusion of power-enhancing socio-cultural traits from, predominantly, more powerful to less powerful societies. It is, I think, a fundamental mechanism for understanding the course of human history in the long run.

Increasing control of nature, and growth of material production and energy use.

The accumulation of culture and in particular the development of technology brought about increasing human control of non-human nature for human purposes. Thus, agriculture meant the selective cultivation of certain plants for food and other consumption goods, such as clothing. Animal husbandry meant the domestication of certain animals for food (meat, milk) and other goods (such as sheep's wool), transport (horses, donkeys, camels), and production (think of oxen or horses used for ploughing). Through such innovations, the food production per square kilometre was strongly raised, which made possible more population growth and higher population densities in a given area. As a consequence of changing food production, changing food consumption and increasing sedentarism (which

had the effect of higher fertility rates), the rate of population growth tended to rise since the beginnings of agriculture, though with much variation in time and space.

Population growth ate away most production growth, which meant that per capita growth of production and consumption was limited or non-existent; whereas total material production in the world grew with the extension of agriculture, most people in agrarian societies remained poor, with living conditions near the subsistence level. As economic historian Eric Jones (1988: 20 ff.; 1996) put it, economic growth during most of history used to be ‘extensive’ (i.e., related to population growth) rather than ‘intensive’ (i.e., related to rising standards of living). Luxury goods that were not necessary for survival were predominantly consumed by wealthy minorities. This was particularly the case in large military-agrarian societies with land-owning aristocracies and rulers who exploited the peasant population (Goudsblom 2023: 53-57). The huge inequalities in these societies were an impediment to intensive, per capita economic growth, since most of the production surplus acquired by the wealthy was spent on luxury consumption, status display and military force instead of invested in material production (Jones 1988). Yet in these societies too technological innovations leading to production growth took place.

The long-term trend of growing material production was immediately connected with a growth of energy use. Since the beginnings of the control of fire, humans had learned to make use of energy sources other than the food in their own bodies. Until quite recently, wood was the main direct source of energy induced by fire, only to be supplemented in parts of Europe since the late Middle Ages by coal (England) or peat (the Netherlands) as alternative fuels for warming. Another source of energy, since the beginnings of the transition to agriculture and animal husbandry, were domesticated animals for transport and production. Besides, wind and streaming water became energy sources for traffic and transport when humans started to build and use boats. With watermills (from around the beginning of the Christian Era in Europe, the Middle East and China) and windmills (from the Middle Ages) these same energy sources also served material production. The progressive use of all these

energy sources depended on technological innovations that resulted in an overall growth of total and per capita energy use by humans since the beginnings of agriculture around 11,000 years ago.

This growth of energy use accelerated enormously with the industrial revolution that took off in Britain around 1800. Human and animal muscular energy for producing and transporting material goods was increasingly replaced by the energy that machines derived from burning fossil fuels. Between 1800 and 2020, when the world population grew with a factor 8, estimated total nonhuman energy use for human purposes increased about 30-fold. Per capita energy consumption thus grew with a factor 3.7, with strong variation between different regions in the world (Christian 2023: 68-69).

Functional differentiation.

Cultural accumulation or growth of knowledge after a certain point can only take place when it goes hand in hand with functional differentiation, specialization, and increasing division of labour, a process in which different people increasingly fulfil different functions, each of which requires special knowledge and capabilities. It encompasses occupational specialization, the formation of goal-directed organizations (such as state bureaucracies, armies, companies, schools and hospitals), and differentiation between institutional fields or sectors. It is causally intertwined with the other long-term trends discussed here: accumulation of culture, growth of production, and the extension of networks of interdependence. Classical sociologists in the nineteenth century, such as Herbert Spencer and Émile Durkheim (1964), identified this process already as a central aspect of social evolution or long-term social development. It has been reaffirmed time and again by later social scientists, including Elias (2009b: 28-31) and Goudsblom (2023: 54).

Growth of networks of interdependence.

Part of the set of intertwined long-term trends is also a tendency of expanding networks of human interdependence in terms of numbers of people and geographical distances. As remarked, the capacity for cooperation in large groups is a distinct characteristic of the human species. I also noted that there is a competitive drive

toward the formation of increasingly large social entities, such as states and empires. However, such very large entities are vulnerable to disintegrating forces, as history has shown from time to time. Yet we may speak of a long-term trend of growing networks of human interdependence; more people over larger distances became more dependent on one another in the course of history. Three aspects of this long-term development can be distinguished: 1) the expansion of units of cooperation in terms of numbers of people and geographical distances; 2) increasing density of interdependencies within large units of cooperation (manifested, for example, by the extension of state functions within national borders); and 3) the extension and intensification of interdependencies between members of different units of cooperation over increasingly large geographical distances. The clearest example of the latter process is the extension and intensification of cross-border trade relations, eventually leading to what is called now the world market of goods and services. This whole process is clearly related to the other trends just mentioned. Thus, when people living in different areas specialized into producing specific goods they became dependent on each other for exchanging goods; and when chains of interdependence became longer in this way, this in turn enhanced the opportunities for profitable specialization.

The extension of networks of interdependence is also related to cultural accumulation. It has stimulated numerous innovations to facilitate long-distance transport and communication, which have contributed to the further growth of interdependency networks. The domestication of horses and other pack animals, the construction of wheeled cars, canoes and sailing ships, followed by trains, trucks, steamships, tankers and airplanes – all these innovations greatly enhanced the capacities for long-distance travel, transport and trade in the course of time. Similarly, an accumulation of inventions brought about an enormous growth of long-distance communication: writing systems to begin with, printing, telegraph and telephone, modern mass media like radio and television, and, finally, computer networks and smartphones.

Most of these inventions are of recent times. Like the other long-term trends, the trend of expanding networks of interdependence has undergone an enormous acceleration in the past few hundred

years. ‘Globalization’ has become a common term to express this. Indeed, we can say that we live now in a globalized world, in which all people in the world take part in one global network of interdependence which comprises the whole of humanity. While humanity was increasingly differentiated into territorially bounded societies when humans spread over the earth, all these societies have become now, to a greater or lesser extent, part of one world society. It is, as we know, a far from harmonious society. It is a divided world in which hostilities and violent conflicts abound.

The civilizing process: a long-term trend in human history?

The long-term trends discussed here pertain to the relations between human beings and the rest of nature, the social relations among human individuals and groups, and their means of communication and orientation. The question is, can we also speak of an overall long-term development in people’s emotions, mentality, and personality structure, which is related to these structural trends? Or, to put it in terms of the theory that Elias advanced in *On the Process of Civilisation* (2012 [1939]), can we speak of a ‘process of civilization’ that encompasses the whole history of humanity?

In his study of 1939, which focused on developments in Europe from about 1200 until the nineteenth century, Elias did not enter into that question. He dealt with it much later in an article entitled ‘Toward a theory of social processes’, where he gave an affirmative answer. In this essay he advanced four long-term trends in human history: differentiation, integration, the development toward more object-adequate knowledge, and, fourthly, ‘the change in social behaviour [...] and the corresponding change in social personality structures in the direction of an increasing civilisation of human feelings and behaviour’. Two aspects of this process of civilization are ‘an increase in the importance of self-control relative to the fear of others as a means of control’, and ‘a change in the direction of more comprehensive, more even and, above all, milder and more temperate self-regulation [...]’ (Elias 2009b: 32-33).

It is not easy to assess empirically civilizing processes on the basis of these formulations. If this was already problematic in Elias’s original study on changes in Europe since the Middle Ages (cf. Wil-

terdink 1984), it is even much more a problem when the concept is extended to the history of humanity as a whole. We might define the process of civilization on that level as referring to long-term changes in social standards, self-regulation, emotions and personality structure that are adaptively connected with (other) long-term trends in human history, including increasing population densities, cultural accumulation, functional differentiation, and the growth of networks of interdependence. The question then is, what the nature of these long-term socio-emotional changes is, and how to assess them empirically.

One long-term socio-emotional development that Elias regarded as part of the overall process of civilization is clearly linked to the noted long-term trends in human history: the widening of circles of orientation, identification and solidarity. This is immediately connected with the trend of the extension of networks of human interdependence. When people increasingly participate in larger units of cooperation and more extended interdependency networks, their feelings of identification and solidarity tend to widen - from smaller we-groups such as the family and the village community to larger groups such as the nation-state and, ultimately, humanity as a whole. This process may result in widespread feelings of identification and solidarity with humankind in general, contributing to cooperation and peacefulness on the world level. But if and when the widening of circles of solidarity stops at certain culturally defined borders it may also strengthen nationalism and similar feelings of particularistic group identification, and thereby lead to the hardening of intergroup oppositions and contribute to large-scale conflicts.. While both tendencies can be observed in the history of the past few centuries, the latter tendency has taken the upper hand quite often. The 'civilizing process' enhances in these cases the risks of large-scale violent conflicts. We may call this the paradox of civilization.

Setbacks and drawbacks in human history

These last remarks bring us to the final question of this paper: What are the drawbacks and setbacks of these long-term processes? Needless to say that my answer will be far from exhaustive. I will deal briefly with instances of, successively, negative population growth, ecological deterioration, growing inequality, and increasing

large-scale violence.

Setbacks in population growth.

Let's go back first to Table 1. As you can see in this table, there were periods of negative growth of the world population. A very early setback occurred probably around 73,000 years ago when the number of humans of the species *Homo sapiens* was reduced to around 10,000, according a very rough estimate. This was the consequence of climate change, which introduced a period of extreme aridity and coldness. The main cause, according to researchers, was an enormous volcanic eruption of mount Toba, located in present-day Indonesia, which resulted in a sharp drop in temperatures in many places around the world (Frankopan 2023: 47-48). After this temporary setback, humanity resumed its tendency to grow.

With the start and subsequent spread of agriculture, world population tended to grow more steadily. Yet there were also setbacks in the long period of agrarianization, such as in the first half of the first millennium of the Christian era. The last setback on the world level occurred in the fourteenth century CE. The main cause of this reduction of the world population is well-known: the pandemics called the Black Death that roamed throughout the Eurasian continent, from Eastern China to Western France, killing many millions of people (McNeill 1976: 150-159).

In general, we can say that there have been two main causes of a temporary reduction of the world population: climate change, which modifies the ecological conditions on which people's lives depend; and epidemic infections by microbes. The first cause was particularly threatening for human survival in the early development of humanity, when people were extremely dependent on local ecological conditions, the total population was still relatively small and humans still inhabited only a limited part of the earthly landmass. This was the case around 70,000 years ago. The subsequent spread of human groups over the earth made humanity as a whole less vulnerable, since ecological disasters were confined to certain areas or at least had different effects in different parts of the world.

Epidemics, on the other hand, became more threatening when population size and population density increased, and long-distance interdependencies between human groups grew stronger. As world

historian William McNeill pointed out in his pioneering study *Plagues and Peoples* (1976), infectious diseases caused by bacteria or viruses broke out in densely populated areas, particularly cities, and spread through trade and traffic over large distances. They were, as McNeill put it, “diseases of civilization par excellence” (1976: 54). And they still are, as we have seen in the recent global corona pandemics (2020-2022). While medical specialists since the nineteenth century have developed effective means to prevent or cure such diseases, the struggle between humans and pathogenic micro-organisms is still going on. When we say that humans in the course of history have become increasingly dominant over the rest of living nature, we should add that this hardly applies to the smallest organisms.

Population reduction has been much more frequent on regional levels. Tables 2 and 3 show some instances of such negative growth, based on a distinction between five world regions: Asia, Europe, Africa, North (Anglo-Saxon) America, and Meso-/Southern (Latin) America. Australia and Oceania are left outside consideration. As in the first table, most numbers in Table 2 are rough estimates with a large error margin.

Table 2 - Development of population in world regions 1300-2020; numbers in millions

Year	Asia	Europe	Africa	North America	Latin America	World
1300	240	86	69	3	29	429
1500	243	84	86	3	39	458
1700	436	125	106	2	10	682
1800	646	195	101	5	19	968
1900	902	422	118	90	75	1613
2000	3748	728	831	312	521	6172
2020	4688	750	1381	378	647	7887

Sources: *Encyclopedia of Population* (2003); www.worldometers.info/world-population.

Table 3 - Development of population in world regions; yearly growth average (%)

Year	Asia	Europe	Africa	North America	Latin America	World
1300						
1500	0.00	- 0.00	0.11	0.00	0.15	0.03
1700	0.29	0.20	0.10	- 0.20	- 0.68	0.20
1800	0.39	0.45	- 0.05	0.92	0.64	0.35
1900	0.33	0.77	<i>0.16</i>	2.93	1.38	0.51
2000	1.43	<i>0.55</i>	1.97	1.25	1.95	1.35
2020	1.13	<i>0.15</i>	2.57	0.96	1.09	1.23

Calculated from the data in Table 2. The highest growth rate in a given period is indicated with numbers in bold; the lowest growth rate with italics.

It appears that the population development was very different in different regions. Take the two centuries between 1500 and 1700: whereas total world population grew considerably, there was a dramatic reduction of the population in the Americas, most drastically in Middle and South America. This was, as we know, the consequence of the European “discovery” of America in 1492 and the subsequent invasion of Europeans in America. Armed Europeans destroyed existing states, such as the Aztec and the Inca empires, drove away and killed indigenous people, and infected them with lethal microbes to which they themselves had grown immune. Violence and lethal infections combined to bring death to many millions of native Americans.

The European conquest of the American continent is a dramatic example of a common pattern in human history: societies in different regions develop unevenly in connection to different ecological conditions; some societies grow much more powerful than others; and the more powerful societies expand at the cost of the less powerful. The less powerful societies are marginalized or destroyed, which means that their members are killed or robbed of their means of survival, or are incorporated into the dominant society in subservient roles, as members of the lowest strata. This is what happened to the indigenous peoples in the Americas since the European invasion. Though there were remarkable parallels in the development of agrarian societies on both sides of the Atlantic, even the most

powerful agrarian states in America could not withstand European military force since they missed some of the means of power that the Europeans disposed of: iron weapons, firearms, horses as well as the hidden, unintended weapon of lethal microbes. Other factors were that the Europeans participated in larger social networks and had better devices for large-scale cooperation and coordination (Diamond 1997: 67-81).

Let's have another look at Table 2. Whereas the population of North, Middle and South America diminished between 1500 and 1700, it grew at extraordinary rates in the two subsequent centuries, between 1700 and 1900. This was partly due to declining mortality rates, but above all to massive immigration from Europe. In these centuries, and particularly in the nineteenth century, we see an acceleration in the growth of the world population because of increasing population growth in Europe and America; the numbers of white-skinned people *in* Europe and *from* Europe grew very rapidly in that age. This reflected declining mortality and rising life expectancy thanks to better food, sanitary and hygienic provisions, organization of public health, expansion of medical knowledge and improvements in medical care, including more effective means to combat infectious diseases. All these developments started in the relatively rich and industrialized countries of the West, which therefore saw their populations increase not only in absolute numbers but also in proportion to the world population.

This changed dramatically in the twentieth century, when basic improvements in medical care and sanitary provisions were extended to poor countries. The effect was a spectacular decline of mortality rates, which in combination with high birth rates resulted in steeply rising rates of population growth. In the meantime, population growth in rich countries diminished because of declining birth rates. This has brought about a reversal of the correlation between the wealth of a region and population growth: throughout history, this relation was positive, as wealth enhanced survival chances and therefore led to more population growth. Today, the correlation has become negative. The highest population growth is now in Africa, the poorest continent. In connection with the extension of education, particularly for women, improvements in health care, decrease of

child labour and, in general, rising standards of living, birth rates tend to decline now everywhere, but in very different degrees. Particularly in Africa birth rates continue to be high. The proportion of the world population living on this continent rose from 7.3% in 1900 to 17.5% in 2020, and is expected to rise further to more than a quarter around the middle of this century. In contrast, the proportion living in Europe, one of the richest regions of the world, declined from more than a quarter of the world population in 1900 to less than 10 percent in 2020.

The decline of birth rates, which started already in upper and middle strata in Europe around 1800, manifests an extension of human control over human lives. Birth control, or planned parenthood, was helped by inventions such as contraceptive pills, but the degree to which it was and is practiced and actually leads to lower birth rates depend on a set of social conditions that can, at best, be controlled only partially. Demographers expect that overall birth-rates will continue to decline, which will result in a transition from growth to degrowth of the world population. This is not only likely but also can also be regarded as desirable. The present world is already overpopulated by humans, we might say, and this problem will only get worse in the coming decades.

Ecological problems.

The main reason to speak of human overpopulation in the present-day world is the overloading of the natural environment, with negative feedbacks on human living conditions. Or, to use a well-known metaphor, the human 'ecological footprint' has become too large. Overpopulation and environmental degradation are problems with a long history, but they aggravated and shifted from local to global with the industrialization and the accelerated population growth since the nineteenth century. In recent decades, scientific observations and reports made a new problem manifest: global warming as a consequence of the strong and still increasing emission of greenhouse gases in the atmosphere, mostly as a consequence of our industrial economy based on burning fossil fuels.

While previous changes in the climate of the planet have played an important role in human history (Frankopan 2023), the

current climate change is unique in that it is, according to most experts, wholly or largely caused by humans; thus, humans are not only the victims but also the instigators. This one of the arguments for the contention that we now live in a new geological epoch: the Anthropocene, in which one species, the human species, has become overwhelmingly dominant, determining to a large extent the basic conditions of life on earth.

Inequality and exploitation.

When human groups in different parts of the world made the transition from gathering and hunting to agriculture, they created conditions not only for larger populations and higher population densities, but also for more inequality in power and privileges. In large, differentiated agrarian societies, relations of human exploitation, including slavery, were established, and huge differences in power, status and life chances came into development (Lenski 1966). Power inequalities increased not only within but also between societies, as some of them became large, highly differentiated and technologically advanced, whereas others remained small, undifferentiated and technologically relatively stagnant. When members of these very different societies came into contact with one another, such in the Amazon Area since the seventeenth century, it was almost inevitable that relations of inequality between them were established, and that the members of the more powerful society had a much stronger influence on the members of the less powerful society than the other way around.

Throughout history there were counter tendencies of decreasing inequality, but these were usually only local and temporary. In the nineteenth and twentieth centuries, however, tendencies of democratization and decreasing inequality became dominant within some relatively rich, industrialized countries. But in this same period economic inequalities *between* countries only increased, even when after the Second World War Asian and African countries gained political independence from European colonial powers (Bourguignon and Morrison 2002).

Current tendencies with respect to social and economic inequality are also mixed, but in a different way. During the last de-

ades, economic inequalities *within* most countries have tended to increase, whereas overall economic inequality *between* countries diminished, though with strong regional variation (Milanovic 2016). Both tendencies can be seen as related to tendencies of accelerated globalization since the 1970s (Wilterdink 2021: 31 ff.).

Violence

The human success story becomes also less bright when we look at the history of physical violence. Norbert Elias (2012) in his great work on the process of civilization has argued convincingly that with processes of state formation and monopolization of the means of violence by the state, daily life within state borders became safer and more peaceful. This thesis has been confirmed by later studies in historical criminology, which found that in countries where state authority became stronger, the number of assassinations in proportion to the population diminished strongly (Eisner 2003). But this concerned non-state violence defined as criminal, not the violence by or on behalf of the state itself. State formation in Europe from the late Middle Ages went hand in hand with militarization, the building of large standing armies, who clashed with one another in wars. State formation led to pacification within state borders but also to the increase of the means of violence that could be used against other states. Goudsblom (1998) has called this the ‘paradox of pacification’. With the invention of increasingly effective weapons, war tended to become more destructive, as appeared dramatically in the two world wars of the twentieth century. Today, we have to live with the awareness of the possibility of a nuclear war that could annihilate large proportions of the world population if not the whole of humanity. Moreover, the means of violence monopolized by the state can also be used against parts of the population defined as outsiders, as became a brutish reality in the genocides and mass killings of the past hundred years (De Swaan 2014).

CONCLUDING REMARKS

All in all we can say that the risks of massive destruction and human-induced disasters on a global scale are today greater than

ever before. On the other hand, we can also argue that the chances for survival, security, well-being and freedom today are larger and more widespread than ever before. Here we are confronted again with what may be called the paradox of civilization.

Today, pessimism about the present state of the world and the future seems to be the dominant mood. Apocalyptic feelings about the end of the human species have become widespread. The human success story appears to be, after all, a story of failures and disasters, many people think. It is not difficult to find arguments for such a dismal view. But this apocalyptic pessimism is, I think, too one-sided, too simple, and, in the end, empirically inadequate. It is more realistic, and more in the spirit of Norbert Elias, to recognize both the positive and negative sides of human development, and to keep a certain amount of optimism about the future. Human beings are learning animals, who are able to learn in particular from their errors. The history of humanity has shown that, and there are grounds for the hope that the future will show that too.

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