Industrial Labour and the Environment

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Notes for a History of a Global Transformation

Edited by

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CONTENTS

INTRODUCTORY NOTE

This book arose from collaborations between the editor and the other four authors who, together, found themselves participating in numerous conferences held by international scientific associations dedicated to the study of urban and environmental history. Thus the idea came about to gather some food for thought on the complex relationship between industrial work and the transformations of urban and natural environments.

The creation of industrial sites has triggered complex processes of change involving economic, social, territorial and eco-systemic dynamics. This book recounts some of these, touching on the United States (North America), Italy (Europe) and Taiwan (Eastern Asia). We believe its contents represent an interesting mosaic (even if very partial) of territories that are geographically distant from one another but have all been incorporated into the global industrialisation process.

Federico Paolini's introductory chapter traces the global ecological impact of industrial activities from the Industrial Revolution onwards (without any pretence of being exhaustive) and discusses the need to incorporate historical-social (as well as possibly historical-cultural) reflection in the study of the relationship between industrialisation and its environmental consequences.

The second section contains four case studies concentrating mainly on events occurring between the 19th century and the present day.

In Chapter II, Gray Fitzsimons uses a long-term perspective (from 1640 to 2015) to examine land-use transformations along River Meadow Brook in Lowell (Massachusetts), one of the most celebrated and studied early industrial cities in the United States.

Augusto Ciuffetti (Chapter III) analyses the case of Terni (in Southern Umbria, about 100 kilometres from Rome, Italy), one of the few Italian examples of rapid industrial development.

In Chapter IV, Salvatore Romeo presents the case of Taranto, a steel town in Apulia (a region of Southern Italy) which houses Europe's largest steelworks.

Finally, Ts'ui-jung Liu (Chapter V) discusses the transformation of a fertiliser factory into a business and software park, located in Nangang District, Taipei City, Taiwan.

In presenting this book, all the authors hope it will contribute to the current debate and provide an incentive for future explorations into the subject.

CHAPTER I

INDUSTRY AS A DRIVING FORCE OF ENVIRONMENTAL TRANSFORMATION: A GLOBAL OUTLOOK

FEDERICO PAOLINI

From the Industrial Revolution to the first half of the 20th century

Starting in the 16th century, a complex set of factors affirmed Europe as a region of internal cooperation. These factors included: an increasingly integrated system of political and cultural relations between various European countries; a political-economic model based on liberalism and liberism; the meeting of scientific culture and technological innovation which, especially in the British context (high wages, low-cost energy and the peculiarities of the political system) favoured a process of uninterrupted innovation (the steam engine, mechanical inventions in the textile sector new systems for producing iron and steel, etc.) and sustained economic growth, commonly referred to as the Industrial Revolution; the emancipation from material scarcity thanks to the conspicuous availability of cheap natural resources from the colonies and the discovery of coal deposits in Great Britain, Germany, Belgium, France and Poland; and the social model originating from industrialisation, the cornerstones of which were urbanisation, the culture of consumption, schooling and secularisation (Pollard 1981; Rosenberg and Birdzell 1986; Cameron 1989; Pomeranz 2000; Allen 2009 and 2011).

In this context, the success of the new economic-social system was due to the capacity of institutions and economic actors to radically transform the daily lives of citizens. For the first time in human history, in fact, people's biological rhythms were coercively bent to the needs of industrial work. The most profound revolution – the true watershed that gave rise to

contemporary society – was precisely the subjugation of biological time to that of the factory. As Piero Bevilacqua wrote: "In fact, in all past ages, however subservient, and rendered even more intense and painful by the direct control of a master, the work of men and women had always used tools, but had never been forced to serve machines with their own rhythm, their own temporality. And what's more, all this spanning a day of work that monopolised all of a person's waking hours in a totalitarian manner, making their rest period coincide with nocturnal sleep. […] A new organization and length of human labour had been founded and it did not only establish itself in the rest of the Western world, but also shaped the rhythms and temporal articulations of the whole society" (Bevilacqua 2005: 409-411).

Between 1820 and 1913 the industrial model established in the United Kingdom successfully spread to continental Europe, North America, Japan and, to a lesser extent, some Latin American countries (Mexico, Argentina, Brazil and Chile), as well as Australia and New Zealand. This process further contributed to widening the division of wealth between Europe (with its extensions) and other geographical areas (Maddison 2008: 427-439). For the first time in history, in 1870, Western Europe and the United States produced a share of the world's GDP that was greater than that of Asia (42%, compared with 38.3%); and the four main Western countries (United Kingdom, United States, Germany and France) exceeded China and India with their share (342,803 million dollars, compared with 324,622). The GDP per capita of the United Kingdom (3,190 dollars) and the United States (2,455) exceeded (respectively) 6.1 and 4.6 times those of China (530) and India (533), while the average GDP of Western Europe (1,813) was roughly three times that of Asia (627).

By 1913, the Euro-Atlantic ascent was well established: 33% of the world's GDP originated in Western Europe, while 25% originated in Asia, 21.3% in Western extensions, 8.5% in the territories of the former Soviet Union, 4.9% in Eastern Europe, 4.4% in Latin America, and 2.9% in Africa. In terms of global GDP, 51.9% was produced in Western European countries and the USA, while the share held by China and India declined to 16.3% (8.8% and 7.5% respectively). As for GDP per capita, this was 5,027 dollars in the Western extensions, 3,155 in Western Europe, 1,695 in Eastern Europe, 1,493 in Latin America, 1,488 in the territories of the former Soviet Union, 899 in Asia, and 637 in Africa (Maddison 2008: 427-439).

The United States excelled with 5,301 dollars, followed by the United Kingdom (4,921), other Western extensions (4,752), Switzerland (4,266), Belgium (4,220), Holland (4,049), Denmark (3,912), Germany (3,648),

France (3,485), and Austria (3,465). The richest country in Asia was then Japan with a GDP per capita of 1,387 dollars, against 673 in India and 552 in China (Maddison 2008: 427-439). At the end of the second period of industrial development, therefore, the geo-economic situation was significantly changed. The United States (18.9% of the global GDP share) had replaced the United Kingdom (8.2%, even less than the 8.7% of Germany) in the role of leading country, and the two traditional Asian powers (China and India) had fallen into a declined state destined to last until the 1990s.

The affirmation of the United States, Western Europe and other European extensions as industrialised, came about through a complex combination of factors that included the use of energy sources, scientific research, technological innovations, and new economic and social models which, starting from the last decade of the 19th century, can be summarised as what John McNeill (2001) called the "cluster of the motorized city." This system was based on the large Fordist industry (the assembly line), innovative industrial products (above all, car and motor vehicles), new energy sources (oil and its derivatives, as well as electricity), and chemistry (artificial fertilisers and plastic). The United States took the lead with this system, not only because they had large quantities of the main energy source available (oil, extracted from fields in Pennsylvania, Oklahoma, California and Texas), but also because they were able to win the world record for both the production of technologies and education and university research. The ascent of Germany in Europe was due to its ability to build a solid industrial context based on energy, steel, advanced mechanics, and the chemical industries.

In Latin America, the process of industrialisation failed to produce development similar to that in North America because of technological delay, a high indebtedness caused by imports of industrial manufactured goods from technologically advanced countries, literacy that was substantially limited to the white population, and political-social systems based on racial prejudices and defending the privileges of the descendants of European colonisers (Allen 2011).

The growth of Japan in Asia was a consequence of the modernisation policies introduced during the Meiji Era (1868-1905), which featured the creation of a national market, compulsory elementary education, development (although slow) of a banking system, effective technological innovation suited to a low-wage environment, and the presence of large industrial groups (the *zaibatsu*) that operated mainly in the steel, electricity and mechanical sectors. On the other hand, the regression of China and India – certainly attributable to the crisis with the imperial authorities and the role

of Western colonisation – was due to an inability to initiate adequate paths of modernisation and, therefore, the failure to establish economic and social systems based on technologically-advanced industry and widespread education. The serious delay in Africa was determined by the political-social consequences induced by colonialism, including the slave trade, the creation of low-quality institutions, a lack of schooling policies, the subjection of traditional societies to a European model that was completely foreign to the African context, and land expropriation in favour of European investors. The affirmation of an economic system specialising in the production of primary products such as palm oil, peanuts, and mineral raw materials, was also implicated in the delay.

Within this context, until the first half of the 20th century, the main sources of industrial pollution were fumes from the iron, steel, mechanical, metallurgical and chemical industries, which introduced large quantities of carbon dioxide, sulphur dioxide and metals such as lead, zinc, copper, nickel and cadmium into the atmosphere. Overall emissions of metals grew from around 41,500 tons in the 50 years between 1850-1900, to over 293,000 tons in the decade 1941-1950 (McNeill 2002: 63-148).

Furthermore, the industrial effluents and solid waste produced via processing began to pollute water and land more and more extensively.

The growing need for raw materials resulted in the alteration of entire ecosystems: between 1700 and 1940, forests and grasslands were respectively reduced from 62 million km^2 to 55 million, and from 63 to 47 million, while increasingly large volumes of water were incorporated into industrial processes (from 7.29 billion cubic metres in 1800 to 176.8 in 1950). The greatest damage to the environment was caused by mining activities that upset the ecological balance of vast areas in Japan, Chile, South Africa and the United States. In Montana, for example, the copper mines of the Anaconda Copper Company seriously contaminated the soil and waters where significant traces of zinc, cadmium, copper, lead and arsenic were detected (Mc Neill 2002: 37-39, 106-109; Diamond 2005: 40-46, 460-463).

The rapid growth of industrial production and international trade guided the complete transition that began during the 18th century, from an energy regime based essentially on biomass and human and animal strength, to one based on fossil fuels. Coal production moved from 283 million tons in 1875 to 1.8 billion in 1950, while oil production went from 9 million tons in 1890 to 267 million in 1940 (Ponting 1992: 311-324).

Simply to provide a quantitative example of the extraordinary importance fossil fuels took on during the first decades of the 1900s, we can see that, in Italy alone, their consumption – indicated in TOE (tons of oil equivalent) – increased from 834,009 in 1861 to 9,545,949 in 1939 for coal

and from 1,593 in 1864 to 2,572,160 in 1939 for mineral oil (Malanima 2006). As far as petroleum is concerned, its production was stimulated by the improvement of internal combustion engines and their application in the transport sector which, thanks to the use of the new propulsion systems, underwent intense development. The tonnage of the world's merchant fleet passed from 30 million tons in 1901 to over 66 million in 1939; the number of airborne passengers increased from 2.5 million in 1937 to 21 million in 1947; and by 1939 there were 45 million vehicles.

On the European continent, the main environmental modification was caused by the consumption of soils that were reclaimed to make arable land, incorporated into urban areas and swallowed up by new industrial settlements that were rapidly developing. Many natural habitats were thus transformed into highly anthropised, artificial ecosystems that were greatly compromised by pollution.

One of the most well-known and studied cases concerns the basins of the German rivers Ruhr (which flows from Rhineland-Westphalia to Duisburg, where it flows into the Rhine) and Saar (which originates in French territory in the Vosges and, after having travelled the Saarland, flows into the Moselle near Konz), which cross two of the most industrialised areas of Europe, characterised by the extraction of coal, iron, and a high density of steel and mechanical companies. In the Ruhr, the exploitation of carboniferous deposits began in 1837 and, from the 1910s, production exceeded 100 million tons. Fossil-fuel mines, together with the presence of large plants for iron and steel production led by companies such as Thyssen and Krupp, transformed the Ruhr into the most polluted industrial region of Europe. The rapid growth of the industrial districts of the Ruhr-Saar rivers and the equally rapid rise of the German chemical industry caused serious pollution of the Rhine, which is one of the largest of the European rivers, starting in Switzerland and flowing into the North Sea on the Dutch coast after 1320 km. As early as 1914, its waters were so inhospitable that it experienced the gradual disappearance of goldfish, salmon and sturgeons, the last specimen of which was captured in the early 1930s (McNeill 2002: 109-117; Cioc 2002). From the early decades of the 1800s, the Midlands (a region of central England that stretches between Wales and the North Sea, and very rich in iron and coal deposits) became one of Britain's major industrialised areas. Most activity was located in Birmingham (iron and steel, metallurgy and engineering), Coventry (mechanics), Derby (textiles and mechanics) and Leicester (iron, steel and textiles). The western area of the Midlands was so polluted by industrial fumes that it earned the nickname the Black Country. In the short story, *The Old Curiosity Shop* (1840), Charles Dickens described the area as perpetually darkened and made

melancholy by the thick fumes of the chimneys, while J.R.R. Tolkien modelled the macabre land of Mordor (one of the fantastic places in *The Lord of the Rings*, 1954-1955) on the Black Country (Ponting 1992: 326-346). The region of Silesia (divided between the Czech Republic and Poland, comprising the upper basin of the Oder River, the north-eastern area of the Sudetes and the cities of Wroclaw, Gliwice and Katowice) constitutes a third example of a territory radically changed by anthropisation. The flattest section was transformed into a rich agricultural area, while thanks to bituminous deposits, Upper Silesia became one of the world's main producers of coal. Its availability encouraged the iron and steel, mechanical and chemical industries to establish themselves in the region, making Silesia the second European industrial district after Ruhr. As in Germany, intense emissions of sulphurous fumes in Silesia caused the acidification of surface and underground waters, as well as damage to the forests (Ponting 1992: 120, 139; McNeill 2002: 113-117).

In North America, the development of industrialisation based on the use of coal seriously polluted the air of US cities such as St. Louis, Chicago, Cincinnati and Pittsburgh. In 1884, after steel production had taken off, 5% (3 million tons) of the entire amount of coal used in the United States was consumed in Pittsburgh (McNeill 2002: 81-88).

In 1936, the US chemical industries dumped about 85% of their toxic effluents into rivers, ponds and wells (Colten 1994).

In Asia, the industrialisation process caused serious pollution in Japan, India and China. Between the end of the 19th century and the first half of the 20th century, the extraction of copper in Japan caused the pollution of rice fields connected to numerous river basins; the copper mines of Ashio, Besshi and Hitachi severely polluted the air and waters of the surrounding territories. The Hanshin region — an important industrial district for textile, chemical, iron and steel and cement production — had levels of air pollution comparable to those of the large industrial cities of Europe and the United States. From the 1880s, Calcutta became the main industrial centre of India, thanks to its proximity to the Bengal coalfields, which allowed the establishment of the textile, paper, chemical and steel industries. The pollution was so intense that, during the 1920s, the city was equipped with one of the first effective smoky-emissions monitoring systems in the world (McNeill 2002: 117-126; Anderson 1995). From the final decades of the 19th century, industrial sites (textile, iron and steel, and cement) in China and the relative effects of pollution (mainly atmospheric coal) were concentrated along the south-eastern coast (Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, and Hainan) which was home to 65.7% of industrial production in 1933 (Brandt, Ma, and Rawski 2016).

As for Africa and Oceania, industrial areas based on coal combustion arose between 1880 and 1920 in South Africa and Australia. In Oceania, the intense exploitation of mineral resources caused significant environmental changes in New Caledonia and the Ocean and Nauru Islands. The ecological balance of the former (an island of 16,750 km^2 located in the Pacific just above the Tropic of Capricorn and governed by France since 1853) was disturbed following the discovery of nickel in its subsoil in the second half of the 19th century. In the 1920s, French investment transformed New Caledonia into the world's largest producer of metal highly sought after as a component of ferrous and non-ferrous alloys. Mining activities gave rise to a veritable environmental disaster: the two mountain ranges of the island were irreparably disfigured by excavations, the abundance of fish in the waters drastically declined due to the huge amounts of debris and silt produced by excavations, the agricultural activities of the plain were seriously damaged by the masses of debris which periodically slid downstream from the sides of the mountains, the air was polluted by the sulphurous miasmas emitted by the numerous factories for metal processing, and the coral reef was damaged by processing sludge dumped into the sea.

The environmental history of the two coral atolls of Ocean (also known as the Island of Banaban, home to people of Melanesian origin) and Nauru was marked by the discovery of phosphate deposits, highly sought after as fertilisers. After the annexation of Ocean to Great Britain (1901) and of Nauru to Australia (1914), the exploitation of the deposits allowed Great Britain, Australia and New Zealand to secure the raw material without having to pay the high prices imposed by the market. The intense extraction rates (over 540,000 tons/year in the 1920s and 900,000/year in the 1930s) involved the rapid deforestation of the two atolls and the removal of the surface layer of soils, thus causing serious alterations to the ecosystems. Just like in New Caledonia, mining activities in Ocean and Nauru also caused social imbalances strong enough to undermine the life systems of the indigenous peoples (Ponting 1992: 243-246).

The years of accelerated development (1950-1985)

Between 1950 and 1985, the value of global economic activities quadrupled, rising from 4.9 to 20.7 trillion dollars. In the same time period, the different economies became increasingly integrated with each other. In fact, the value of trade passed from 380 to 2,958 billion dollars.

From 1960 to 1980, the GDP of the United States multiplied by five, that of Italy by 10, France and Federal Germany by 11, and that of the Netherlands by 15. The growth also involved developing countries:

Nigeria's GDP increased 29 times, that of Uganda 24, Iraq 23, Syria 15, Mexico 14, Thailand 13, Argentina 12 and Tanzania 8 (World Bank 1982, 1984 and 1992).

The boom in industrial activities drove the consumption of raw and processed materials. For example, the demand for aluminium grew from 6,699,000 to 16,038,000 tons, that for copper from 5,750,000 to 9,281,000, lead from 3,179,000 to 5,308,000, crude steel from 459,300,000 to 714,970,000, and iron ore from 620,982,000 to 858,817,000. In the three-year period 1982-1984, the average annual production of wood for industrial uses was 1,426,147,000 m^3 with a 21% increase compared to 1966-1968 (141% in South America, 53% in Africa, 47% in Asia). Although in no particular order, these statistics are useful for providing a quantitative representation of the pressures to which natural resources were subjected. The result was a decisive acceleration in the degradation of the natural environment (World Resources Institute 1987; Worldwatch Institute 1998 and 2001).

According to the UNEP (United Nations Environment Programme), 100 million tons of sulphur oxides were released into the atmosphere in 1980, along with 59 tons of suspended particles, 69 of nitrogen oxides, 194 of carbon monoxide and 53 tons of hydrocarbons. From 1950 to 1985, the emissions of the two most commonly used chlorofluorocarbons (from aerosols to insulating foam packaging) recorded a real surge: those of trichlorofluoromethane (cfc-11) multiplied by 51 (from 5.5 to 280.8 thousand tons) and those of dichlorodifluoromethane (cfc-12) multiplied by 12 (from 29.5 to 368.4 thousand tons). These two compounds, together with other less common chlorofluorocarbons and bromofluorocarbons, acted as catalysts in the process of destroying the atmospheric ozone, the decrease in which, according to the UNEP, had already assumed considerable scale at about 40% "in the total ozone column in the lower stratosphere, between 15 and 20 km above the Antarctic". Then there was the problem of daily emissions of toxic chemicals. The UNEP has estimated that industry produced 80,000 different organic and inorganic compounds: between January 1983 and March 1985, the United States National Response Center received 24,000 notifications of accidental spills connected to normal manufacturing processes or minor incidents that released about 2,000 chemicals into the air (UNEP 1987 and 1989).

A large part of industrial waste (the United States alone produced 664,000,000 tons, 39% of which was highly toxic) was discharged directly into water, causing serious pollution episodes. It was common practice to pour sewage and industrial-processing waste into the oceans until the mid-1970s: "ocean dumping" was predominant in the Atlantic and the North Sea,

but discharge sites existed almost all over the world. The inadequate disposal of industrial waste was also one of the main causes of soil contamination: scattered almost everywhere, in fact, there were some hundreds of thousands of locations dedicated to the storage of sewage and industrial waste (McNeill 2002: 33-34, 174-187).

The growth in human activity gave rise to a veritable explosion in energy consumption. Between 1950 and 1985, coal consumption rose from 1,074 to 2,127 billion TOE (tons of oil equivalent); oil consumption rose from 451 million to 2,933 billion; and that of natural gas from 190 million to 1,683 billion. In 1968, oil exceeded coal for the first time: 1,661 billion TOE of oil were used, compared to 1,660 of coal. The quest for "black gold" never quelled, even after the two oil crises of 1973 and 1979, caused by the fourth Arab-Israeli conflict (the so-called "Kippur War") and the Islamic revolution in Iran, respectively. In fact, the price-increase policy pursued by OPEC (Organisation of Petroleum Exporting Countries) did nothing but stimulate a general search for new deposits. In 1984, the energy demand reached 259,542 peta-joules: 78,791 in North-Central America; 60,984 in Europe; 54,415 in Asia; 48,308 in the Soviet Union; 7,433 in South America; 6,332 in Africa; and 3,278 in Oceania. Further, between 1950 and 1985, hydroelectric power-generation rose from 44,956 to 560,956 megawatts (+1,148%). The electricity generated in 1984 amounted to 9,267,420 gigawatts/hour: 3,048,728 in North-Central America; 2,362,999 in Europe; 1,664,058 in Asia; 1,493,000 in the Soviet Union; 330,643 in South America; 224,149 in Africa; and 143,843 in Oceania (Worldwatch Institute 1998).

Energy consumption produced significant environmental consequences. The total emissions induced by the combustion of fossil fuels multiplied by almost three and a half times, from 1,612 billion tons in 1950 to 5,271 in 1985. The atmospheric concentration of carbon dioxide, the measurement of which began in 1958 at the Mauna Loa Observatory in Hawaii, increased from 316.1 ppm (parts per million) in 1959 to 345.6 in 1985. Furthermore, between 1975 and 1985 the concentrations of nitrous oxide and methane rose respectively from 291.4 to 301.5 and from 1,525 to 1,711 parts per billion. These data brought the problem of the greenhouse effect (the increase in the average global temperature) to the attention of the international community (Ponting 1992: 421-431).

The extraction and transport of oil greatly contributed to the degradation of soils and the seas. In fact, starting in the 1960s, frequent accidents involving oil tankers caused leakages of large quantities of crude oil that polluted waters and coastlines. The most serious episodes were that of Torrey Canyon, off the coast of Cornwall (1967: 123,000 tons and 180 km

of beaches affected in France and England); Urquiola, in the bay of La Coruña (1976: 91,000 tons); Amoco Cadiz, in front of Porstall (1978: 233,564 tons and 200,000 hectares of devastated coast); Atlantic Express-Aegean Captain, off the coast of Trinidad and Tobago (1979: 272,000 tons); and Castillo de Beliver, near Cape Town (1983: 250,000 tons).

As for the geography of the environmental change, there were 76,000 industrial dumps in the United States that contributed to contaminating the soils and waters. Photochemical smog plagued the main cities of the country: in 1953, Los Angeles' motor vehicles emitted 1,300 tons of unburnt hydrocarbons into the air, in addition to significant amounts of nitrogen and lead oxides. Moreover, 50% of the Adirondack Mountain lakes suffered the effects of acid deposition (Ponting 1992: 403).

One of the most serious episodes of environmental degradation struck the Erie, a large lake (25,786 km^2) of the San Lorenzo basin on the border between Canada and the United States. During the 1960s and 1970s, discharges of organic matter, nitrates, pesticides, and industrial effluents caused the oxygen level in its waters to drop to such a point that fish survived in only a small part of the eastern area. Around the end of the 1960s, one of its tributaries — the Cuyahoga River, which flows into the Erie and crosses the city of Cleveland — was the scene of fires due to the waste and hydrocarbons floating in its riverbed (McNeill 2002: 171-174; Ponting 197, 412; McGucken 2000).

In Cubatão, Brazil (a city in the State of São Paulo that provided 40% of the national production of steel and fertilisers in 1980), air pollution was so intense that the infant mortality rate was ten times higher than the average, while particulate levels were double those of the vigilance threshold. In Mexico, a liquid-gas storage accident caused 1000 deaths and resulted in thousands of people becoming homeless (McNeill 2002: 103-105).

The major factors of change in Europe were also pollution and anthropic pressure, closely connected with the expansion of the economy. Atmospheric pollution only began to be taken seriously after "the great smog" hit London in December 1952 and caused thousands of deaths. Four years later, in 1956, the Clean Air Act was approved, which aimed to limit domestic emissions by favouring the replacement of coal with gas and electricity (McNeill 2002: 81-82).

Acid deposition, caused by an increase in sulphur and nitrogen oxide emissions, resulted in the acidification of groundwater in the Netherlands, Sweden and the Federal Republic of Germany. Around the mid-1980s, acid rain also seriously damaged millions of hectares of forests. The most affected country was West Germany (50% of forest ecosystems), but the phenomenon was also significant in Switzerland, Austria, the Netherlands,

France, Belgium, Denmark, Sweden, Czechoslovakia, Poland, East Germany and Romania (McNeill 2002: 126-136; Ponting 1992: 401-404).

Despite the success of some clean-up activities, the inland waters continued to be highly polluted. In 1986, for example, two accidents at chemical plants led to the sterilisation of a long stretch of the Rhine. There was further pollution in the Mediterranean which, in just two years (1980 and 1981) experienced 820,000 tons of spilled oil.

As for the soil, dumps were decommissioned in many countries (4,000 in the Netherlands and 3,200 in Denmark), but without internal coatings they were a potential source of contamination. Furthermore, between 1970 and 1980 there was a significant loss of biodiversity (Ponting 1992: 181-185; 272-275) due to the conversion of agricultural land into urbanised areas (2.5% in Italy, 1.2% in Great Britain and 1% in France).

As for the consequences of anthropic pressure, the most relevant cases occurred in the Soviet Union. The first concerns Lake Bajkal: defined by UNESCO as the "Galapagos of Russia" because of its extraordinary biodiversity, it is located in southern Siberia and is the deepest freshwater basin in the world. The Soviet government decided to build pulp mills there at the end of the 1950s, and the effluents created such an environmental disaster that, as Ponting recalls in his *Green History of the World*, it was necessary to purify the water just to be able to use it in production processes (Rainey 1991; Ponting 1992: 412).

The second concerns Aral Lake, located on the border between Kazakhstan and Uzbekistan. Starting in the 1920s, the Soviet regime decided to divert the tributaries of the lake (the Amu Dar'ja and the Syr Dar'ja) to transform a vast desert region into an agricultural area for supplying cotton to the textile mills of European Russia. Between 1965 and 1980, the irrigated agricultural surface area doubled in size and the water level constantly decreased: the lake began to retreat, leaving an expanse of salt which was eroded by the winds and caused serious salinization, even many kilometres away. The progressive drying-up of the Aral changed the climate of the region, causing the fishing industry to die out, as well as massive emigration (Kobori 1998; McNeill 2002: 204-209).

Still in the Soviet Union, uncontrolled industrialisation caused considerable environmental degradation in the city of Dzeržinsk because of the production of chemical weapons; in Noril'sk due to mining and the steel industry; and in Rudnaya Pristan because of lead processing. In Dzeržinsk, water turned into a whitish slime softened by 190 chemical substances, including dioxin and carbolic acid. In Noril'sk, the air was plagued by heavy metals, phenols and radioactive isotopes, such as strontium-90 and cesium-137. In Rudnaya Pristan, the waters and soil had much higher concentrations

of lead than the values established by the World Health Organization (Blacksmith Institute 2006).

In 1976, an accident in Seveso (Italy) at the Icmesa chemical factory, (owned by Givaudan, of the Hoffman-La Roche group) released a cloud of dioxin that fell in an area of 18 km^2. The consequences were numerous cases of chloracne among children, a significant increase in abortions, and soil pollution that was so deep the surface layer had to be removed to clean it. After Seveso, the European Community approved a directive (Seveso Directive 96/82/EC) concerning the "control of major-accident hazards involving certain dangerous substances" (Ziglioli 2010).

In Asia, the main environmental changes were generated by the significant expansion of agricultural activities, but the industrial sector also contributed to the radical transformation of natural environments.

Between 1949 and the first half of the 1980s, China was the scene of one of the grimmest environmental changes in history. The policy of the *Great Leap Forward* promoted by Mao Zedong and, subsequently, the new economic progress based on an intense process of decisive industrialisation (started in 1977 by Deng Xiaoping), translated into a real war against nature. In 1958, the second five-year plan led to the construction of 600,000 backyard furnaces for the production of steel which, in addition to emitting polluting fumes derived from the combustion of coal, caused rapid deforestation: over a third of the forests disappeared in the Hunan and Guangdong Provinces, while it is estimated that 10% of all the existing forests were deforested within a year. The creation of a large steel-rolling plant in Panzhihua, in the south of Sichuan, gave rise to significant air pollution due to sulphur dioxide and dust emissions, concentrations of which (at least until 1979) were hundreds of times higher than those established by the national standard (Shapiro 2001).

Between the 1950s and 1980s, steel became one of the engines of industrialisation and, at the same time, of India's environmental transformations. Large factories for the production and processing of steel were present in the states of Odisha (Kalinganar, Raigarh, and Rourkela), West Bengal (Durgapur and Asansol), Uttar Pradesh (Ghaziabad, Kanpur, and Muzaffarnagar), Andhra Pradesh (Visakhapatnam), Karnataka (Hosapete and Bhadravati), and Jharkhand (Jamshedpur).

The waters of the Ganges River in India were poisoned by the industrial effluents of the chemical industries and by the sewage discharges of the cities (only 209 of the 3,000 major urban areas had purification systems in the 1980s). In 1984, a spill of 30 tons of methyl isocyanate from a pesticide plant owned by Union Carbide in Bhopal, in the Indian state of Madhya Pradesh, poisoned the 200,000 residents of a poor neighbourhood. The

accident was the most serious in the history of the chemical industry, causing a few thousand deaths and nearly 20,000 people to suffer severe disabilities. The Bhopal area is still heavily polluted today: the waters contain high concentrations of mercury, the soils reveal the presence of heavy metals, and the air continues to be ruined by toxic fumes released by the Union Carbide site (Charbonnier 2004).

In the bay of Minamata on the island of Kyūshū, Japan, Nippon Chisso built a chemical factory in 1910 for the production of vinyl chloride, and began discharging its effluents into the waters. The factory used mercury in its production processes which, over time, entered the food chain through fish, organisms which can concentrate up to 10,000 times the amount of mercury present in the waters. The result was that, between 1953 and 1960, 111 people were seriously poisoned by mercury and, among these, a high percentage of deaths occurred (George 2001). In 1968, a similar case occurred in the prefecture of Niigata, located on the island of Honshu (the largest of those that make up Japan): 25 people were intoxicated and five died. During the 1960s, mercury poisonings also occurred in Iraq (35 dead, 321 intoxicated) and in Western Pakistan (4 dead, 34 intoxicated).

In Africa, the main environmental problems linked to industrial activities came from the mining sector: in the 1980s the Niger delta appeared severely polluted by oil spills from the Port Harcourt and Warri plants (Ba 2019), while acidic pollution (cyanide, mercury, and sulphuric acid) came from gold-mining sites (Mali, Ghana, Burkina Faso, Ivory Coast, Guinea, Senegal, Nigeria, Sudan, Egypt, Ethiopia, Democratic Republic of Congo, Zimbabwe, and South Africa). Copper mines in Zambia, the Democratic Republic of Congo, South Africa, Mauritania, and Botswana also had a significant impact, as did uranium mines in Niger, Namibia, and South Africa.

From the affirmation of neoliberalism to the first part of the 21st century

Between 1985 and the first five years of the 21st century, anthropic pressure on the environment grew increasingly intense.

This is generally explained by population growth (the world's population increased from 4,855,264,000 individuals in 1985 to 6,514,751,000 in 2005), massive urbanisation (urban residents have increased from 1,988,195,000 in 1985 to 3,164,635,000 in 2005), GDP growth (+59.46% between 1986 and 2002) and the rapid industrialisation of certain developing countries such as China, India and Brazil. These factors have undoubtedly led to a further increase in the demand for natural resources.

In reality, the growth of the population and the gross domestic product are not enough to explain the current level of anthropic pressure. In fact, consumption is another fundamental factor (Worldwatch Institute 2004). For example, a country with a significant average expenditure per household, such as the United States (over $20,000 per capita) has a much greater impact on the environment than that of Brazil ($2,779) or India ($294). In the United States, 12,331 kilowatt-hours were consumed per capita in 2000 compared to 1,878 in Brazil and 355 in India, and for every thousand inhabitants, there were 835 televisions (compared to 349 in Brazil and 83 in India), 659 telephone lines (223 and 40), 451 mobile phones (167 and 6) and 625 personal computers (75 and 6).

During the 20th century, therefore, consumerism was the main driver of the extensive use of raw materials. According to the Worldwatch Institute, between 1960 and 1995, the worldwide use of synthetic materials increased by 560%, that of minerals by 250%, timber by 230% and metals by 210%.

Until the first half of the 1980s, the "consumer class" (that is, those whose income guarantees sufficient purchasing power) was concentrated in Western Europe, North America, Japan and the two main countries of Oceania (Australia and New Zealand). From the second half of the 1980s, however, the process of economic integration known as globalisation led to the consumer class being distributed almost uniformly between developed countries (53%) and developing countries (47%). Thanks to the economic booms in China and India, 29% of the consumer class in 2002 was in East Asia (including the Pacific), 20% in Western Europe, 16% in North America, 10% in Latin America and Eastern Europe (including Central Asia), 8% in Southern Asia, 4% in the Middle East-North Africa, 2% in sub-Saharan Africa and 1% in Australia-New Zealand. In the same year, among the top five economies (by number of consumers), China and India were in second and third place (239.8 million and 121.9, respectively) after the United States (242.5) and before Japan (120.7).

Considering that, in 2002, the consumer class in Eastern and Southern Asia still comprised only 16% of the total population, it is easy to imagine that during the 21st century these economies will be placed side by side with the traditionally consumerist ones as being mainly responsible for environmental degradation deriving from consumption styles. In fact, in the first two decades of the 21st century, the late bloomers' adoption of the production and consumption patterns of advanced economies has already translated into a decisive acceleration in consumption.

World consumption of mineral water has increased at an annual rate of 12% since the 1990s. In 2002, 14 billion bottles were sold in the United States alone. In 1999, the demand for PET, the plastic generally used to

make bottles, was 738 million kilograms. The environmental problems caused by bottled water relate to the large volumes of waste to be disposed of, the huge amount of resources needed to produce the bottles (17.5 kg of water for 1 kg of PET), as well as the air pollution caused by the production processes (the production of 1 kg of PET releases 2.3 kg of carbon dioxide, 40 grams of hydrocarbons, 25 of sulphur oxides, 20 of nitrogen oxides and 18 of carbon monoxide into the air).

World automotive production increased from 32.9 million vehicles in 1986 to 41.1 in 2000. Between 1980 and 1999, the number of circulating vehicles increased from 155.8 to 213.5 million in the United States; from 37.1 to 71.7 in Japan; from 24.6 to 45.8 in Germany; from 1.7 to 12.8 in China (+653%); from 1.9 to 8.2 in India (+332%); and from 3.4 to 6.6 in South Africa. The automotive industry is one of the world's largest consumers of raw materials and natural resources and the use of motor vehicles is one of the main causes of air pollution. Between 1986 and 1998, paper production increased from 203 to 294 million tons: the largest consumers are the United States (331 kg per capita) and Japan (250 kg per capita). Besides being highly polluting, the paper production cycle consumes large quantities of water, wood (one fifth of the world's forest felling) and energy (Worldwatch Institute 2004).

The consumption of electronic products demonstrates a real explosion: mobile phones went from 1 million in 1986 to 995 million in 2001 (+99,400%); computers with internet connections rose from 28,174 in 1987 to 147,344,723 in 2001 (+522,881%); and the value of global semiconductor sales went from 39 billion dollars in 1986 to 140 billion in 2002 (+259%). From an environmental point of view, the production of a 32-megabyte microchip requires 32,000 grams of water, 1,200 of fossil fuels, 700 of elementary gases and 72 of chemicals. Due to the high disposal costs — the various electronic components contain lead, phosphorus, barium, cadmium, beryllium, hexavalent chromium and brominates — computers and mobile phones are sent to Africa and Asia to be recycled with makeshift systems which, in addition to seriously damaging the health of workers, cause widespread pollution of the soil, water and air (Worldwatch Institute 2004).

Between 1990 and 2000, the amount of greenhouse gases emitted into the atmosphere increased by 12.5% (+58.6% in the Middle East, +42% in South America, +35.1% in Asia). In 2002, 44.52% of emissions came from energy production (+68% compared to 1980), 20.59% from transport (+58%), and 17.93% from industries (-10%). Furthermore, between 1990 and 2006, only Russia (-29.3%), Germany (-19.3%), Great Britain (-15.6%) and France (-9.4%) succeeded in reducing emissions, among all the main

countries of Annex I of the Kyoto Treaty (World Resources Institute 2005; Germanwatch 2010).

The de-industrialisation policies implemented in the richest countries, and the transfer of the most polluting industrial productions to developing countries, means that environmental problems caused by the industry have been mainly confined to the low- and middle-income countries in Asia, Africa and Latin America (Blacksmith Institute 2007, 2012, 2013). Of the 30 most polluted sites in the world in 2007, 15 were on the Asian continent (including six in China, four in India, and one each in Azerbaijan, Bangladesh, Kazakhstan, Kyrgyzstan and the Philippines), six were in the Asian regions of Russia, one was in Eastern Europe (Ukraine), six were in Latin America (Argentina, Ecuador, Mexico, Peru, and the Dominican Republic), and two were in Africa (Kenya and Zambia). Of the ten most polluted sites in the world in 2013, three were in Asia (Bangladesh: Hazaribagh, tanneries; Indonesia: Citarum River Basin, industrial effluents; Indonesia: Kalimantan, gold extraction), three were in Africa (Ghana: Agbogbloshie, e-waste dump site; Nigeria: Niger River Delta, petroleum; Zambia: Kabwe, mining), one was in Latin America (Argentina: Matanza-Riachuelo, chemical manufacturers), two were in Russia (Norilsk, mining; Dzerzhinsk, chemical manufacturers) and one was in Ukraine (Chernobyl, nuclear energy).

According to the Blacksmith Institute, since 2012, the four main pollutants have been lead (16 million people at risk, 500 contaminated sites mainly in Africa, South America and Southeast Asia); chromium (about 6 million people at risk, 150 contaminated sites, most of them in India and Pakistan); mercury (10 million people at risk, 350 contaminated sites, mainly in Asia, Africa and Latin America); and asbestos (about 350,000 people at risk in China, India, Russia and Brazil).

As for the sources of pollution, the main ones were: battery recycling (100 contaminated sites in Southeast Asia, Africa, Central and South America); lead processing (70 sites in China, Southeast Asia, South America, eastern Europe); mining and the processing of minerals (350 sites in Africa, Southeast Asia, Eastern Europe); tanneries (100 sites, the majority in Asia); industrial landfills (150 sites, mainly in northern Asia, Africa and Eastern Europe); industrial areas (100 sites, of which the most polluted are located in Asia, Africa and Latin America); artisan gold mines (200 sites in Africa, Southeast Asia and Latin America); the manufacturing industry (100 sites, of which more than half are located in Southeast and southern Asia, and Africa); the chemical industry (200 sites, mainly in China, Southern Asia and Eastern Europe); dry cleaners (50 sites, mainly in India and the southern area of Asia); the petrochemical industry (75 sites, mainly in

Africa, Southern Asia, South America and Eastern Europe); electronic equipment recycling (between 20 and 50 tons a year disposed of at 50 sites located mainly in China, Africa and South America); heavy industry (70 sites, of which the most polluted are located in China, Asia and Eastern Europe); production and the use of pesticides (the areas mainly affected are China, Southern Asia, Latin America and Central Europe); and uranium mining and processing (Eastern Europe and Africa).

Some reflections about the present

If we consider the correlations between the development of industrialisation processes and environmental changes while only considering the preceding paragraphs, then in a context dominated by concern for the effects of climate change, the catastrophic perspective of humanity launching itself towards apocalypse may seem the most plausible scenario. In the second decade of the 21st century, radical environmentalism is fuelling a growing opposition to industrial work by using a rhetoric that ignores how, since the Neolithic age, *homo sapiens* has pursued the desire to become something other than its biology (a species belonging to the primate family) and move away from its natural state. Jewish and Christian traditions, the Phaedo of Aristotle, Dante Alighieri's Ulysses, but also the more banal "stay hungry, stay foolish" of Steve Jobs are nothing but historicised representations of this desire.

In modern and contemporary times, this process can be divided into two macro-periods. The first began with 17th-century scientific thought and ended around the mid-1970s, when the accelerated phase of industrial development had completely ended. In this first period, the process of moving away from the state of nature was characterised by three topical moments: 1) the development of the mechanism (1600-1700), and the use of the machine model as a way of understanding nature (Robert Boyle considered the universe as a self-propelled machine, while Johannes Kepler regarded it as a large clock); 2) the spread, around 1800, of the economic system theorised by the classical economists Adam Smith, David Ricardo and John Stuart Mill, who considered the exploitation of resources to be a measure of man's ability to successfully dominate nature in order to increase his material well-being; 3) mass acceptance of the modernisation process (1900-1974), characterised by industrialisation based on machine technology, by the functional specialisation of the different spheres of social life, and by the recognition of the role of science and technology, understood as primary sources of economic growth and social change.

The second macro-period began to take shape in the second half of the 1970s and has not yet ended. Its first phase can be identified between 1974 and the early 1990s, when the ecological crises produced by industrialisation cracked the paradigm of modernisation by soliciting the environmental movement. Starting in the second half of the 1990s, a strong dualism developed between the paradigm of modernisation — adapted by "post-thought sorcerers' apprentices" (a term coined by Giovanni Sartori) to a hyper-technological society dominated by artificial intelligence tasked with guaranteeing the progress of humanity, therefore continuing to ensure humanity remains extraneous from the state of nature — and the radical environmental movements that began, according to Slavoj Zizek, to convey the paradigm of a benevolent mother nature violated by human arrogance.[1]

In the 21st century, movements such as primitivism (which preaches a return to a pre-agricultural social model), deep ecology (the objective of which is to subvert the current counter-nature civilisation), and vegetarianism (especially its more radical variations in some who are vegans and fruitarians) have increasingly become part of the public discourse, to the extent of becoming a real mainstream alternative line of thought, in contrast to the system of values imposed between the 17th century and the 1970s. The appropriation of radical environmentalism theories (often trivialised and reduced to being "cool trends" that are typical of urban hipsters) by the globalised elite and the media has perpetuated a point of view which has become widespread, and which seeks to always (and in any case) make nature a friend and ally of man. The growing condemnation of industrialisation by environmental movements and the spread of citizens protesting against industrial sites derive from this context.

The adoption of this sort of attitude was to be expected (and will continue) in a context marked by the loss of the industrial sector's importance. Environmental awareness has been triggered by a scaling-down of the workforce and the fact that more and more citizens, whose economic status no longer depends on factory work, have found themselves living next to lifeless industrial pachyderms. Between 2000 and 2019, the percentage share of industrial workers decreased by 5.05% in high-income countries, while it remained substantially stable globally. In the United States, it decreased by 5.25%, in Japan 7.3%, in the United Kingdom 7.2%, in Germany 6.65%, in France 6.13%, and in Italy 6.17%. The industrial workforce also reduced in three of the so-called BRICS: -0.9% in Brazil, -4.07% in South Africa, and -2.32% in Russia. Only India and China

[1] http://inthesetimes.com/article/19787/spaceship-earth-lessons-of-airpocalypse-slavoj-zizek-climate-ecology-smog.

recorded growth, respectively of 8.56% and 3.96%. At global level, in 2000, agriculture was still the economic sector with the highest number of employees (40.11%), followed by services (38.67%), and industry (21.22%). In 2019, the main sector became services (48.99%), followed by agriculture (28.18%), and industry (22.83%). In 2019, the services sector was predominant in countries with high incomes (74.83%) and upper-middle incomes (51.78%), while agriculture continued to be predominant in lower-middle (39.18%) and low-income countries (62.25%)[2].

Considering the data cited above, if we broaden our perspective to matters of human development, the context appears to be much more complex and the liquidation of industrial work, understood as an unwelcome legacy of an anthropocentric past, appears much more problematic.

The development model that emerged from the first Industrial Revolution undoubtedly contributed to ensuring that more and more people could benefit from the living conditions that the United Nations defines as "human development":

> Human development is a process of enlarging people's choices. In principle, these choices can be infinite and change over time. But at all levels of development, the three essential ones are for people to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living. If these essential choices are not available, many other opportunities remain inaccessible. […] According to this concept of human development, income is clearly only one option that people would like to have, albeit an important one. But it is not the sum total of their lives. Development must, therefore, be more than just the expansion of income and wealth. Its focus must be people (UNDP 1990: 10).

As shown by the Human Development Index elaborated by the United Nations, the three essential levels of development are at the highest in developed countries characterised by high incomes, which are those with a history of industrialisation or ones affected by industrial development in the years between the golden age and the start of neoliberal globalisation. The levels are and at their lowest in less developed countries characterised by low incomes and the inability to overcome a substantially agricultural economy. Citizens of countries in the first group enjoy an average income of $36,605, which is about 15 times higher than those of the second group ($2,649). The first group also has a life expectancy of 20.1 additional years

[2] International Labour Organization (ILO). *Employment by Occupation. ILO Modelled Estimates, Nov. 2018*; *Employment by Sector. ILO Modelled Estimates, Nov. 2018*. Documents downloaded from the website www.ilo.org, January 2019.

(respectively 79.4 and 59.3) and school attendance which is almost triple of that seen in the second group (12.2 years versus 4.6).

The rhetoric of environmental criticism focuses on the negative externalities (including damage to health) produced by the growth of urban areas, but UN reports show that inequalities are at their utmost in rural areas. At the beginning of the 1990s, access to health services, water and good hygiene practices was only guaranteed in developing countries to a level of 45% (88% in urban areas), 41% (79%), and 14% (61%) of the rural population, respectively.

> *Health facilities.* Access to health care is better in urban areas than in rural areas in every developing country. In some 20 developing countries the percentage of the population covered by health facilities in urban areas is more than twice that covered in rural areas. Even these figures understate the disparities since rural health facilities are usually simple clinics while urban facilities include hospitals with sophisticated equipment. *Water and sanitation facilities.* The rural and urban differences in the provision of water and sanitation are even greater. The coverage of the rural population is on average less than half that of the urban population. In seven countries the proportion of rural dwellers with access to water was less than a fifth of that in urban areas. In Nepal access to sanitation facilities in urban areas was 17 times that in rural areas, and in Brazil the urban figure was as much as 86 times higher than the rural figure. *Income.* In most countries, urban incomes per person run 50% to 100% higher than rural incomes. The differences are particularly large in Africa. In Nigeria the average urban family income in 1978-79 was 4.6 times the rural income. In Sierra Leone the average urban income was 4.1 times the agricultural income. And in Mexico urban per capita income was 2.6 times the rural. Rural-urban income differences remain wide, even after taking into account the differences in the cost of living between rural and urban areas. To sum up, national data conceal large rural-urban differences, with rural areas performing systematically worse on the basic indicators of human development [UNDP 1990: 30].

Moreover, the disparity in rural areas is also related to environmental peculiarities: according to the UNDP, in the early 1990s three quarters of the poor people in developing countries lived in ecologically-fragile areas, with low agricultural potential (UNDP 1990: 22).

If we consider the long term, it is noted that, in 1820, at the beginning of the second period of industrialisation's expansion, 89.15% of the world's population lived in conditions of extreme poverty, 87.95% were illiterate,

47.25% of children died within the first five years of life, and only 0.92% of people lived in a regime that could be defined as "democratic"[3].

These conditions appeared significantly changed in 1950, despite the numerous conflicts on the geo-political chessboard, the imperialist expansion of Europe and the two world wars. The share of the world's extremely poor population was 63.35%, the percentage of those who were illiterate had fallen to 44%, and the figures for children who died within the first five years of life had decreased to 23.90% (this percentage refers to 1940 because there is a void in statistics until 1960), while democracy had expanded to include 31.29% of the population.

From 1950 until the present there has been a very profound change which has led to an epochal improvement in living conditions. In 2015, the percentage of the world's population who were living in extreme poverty and were illiterate had diminished, respectively, to 9.98% and 13.98%; the percentage of children dying before the age of five was 4.19%; and democracy had reached 55.8% of the population. The percentage of the population living in colonial areas was zeroed — in 1820, 37.72% lived in colonial conditions and, in 1950, it was 12.84%. The weight of autocracy also appeared to be reduced: in 1820 it involved 44.82% of the population, in 1950 the percentage had dropped to 29.47%, and by 2015 it was 23.23%.

These data show that a "great acceleration" (to use the expression of John McNeill and Peter Engelke) began in three categories in 1950: the wealth produced by economic activities, an improvement in living conditions, and environmental transformation.

The acceleration of human activities, today described as Anthropocene[4], has produced an unprecedented change, the result of which has, on the one hand, been "human development" but, on the other, environmental change

[3] Data from the internet portal ourworldindata.org, based at the University of Oxford. The last consultation took place on 11 July 2019.

[4] In 2000, chemist Paul Crutzen used the term "Anthropocene" — coined by the microbiologist Eugene Stoermer in the 1980s — to emphasise how the use of fossil energy had started a new geological era in which all major environmental transformations were attributable to human activities. According to Crutzen, the exceptional extent of anthropic impact would mean considering the present time as an era distinct from the Holocene. In 1999, the entomologist Michael Samways introduced the term "Homogenocene", to indicate the new historical-biological era that began with the European journeys of discovery in the 15th century, characterised by a progressive, biological homogenisation of global ecosystems. In 2016, the environmental historian, Jason W. Moore, coined the concept "Capitalocene", to indicate a world-system based on capitalism, which he understood as an ecological regime that adopted ever-larger portions of "cheap nature", starting in the 15th century.

driven by the energy transition which, thanks to the exploitation of fossil fuels, has allowed man to overcome the energy shortages that had conditioned human activities until the first Industrial Revolution.

Interpreting the dynamics of this three-fold great acceleration by focusing primarily on environmental failures — perhaps, as in the case of the environmental historiography most influenced by eco-centrism, with the aim of offering scientific support to radical environmentalism and some areas of political environmentalism — does not render a great service to historical investigation. If we only study the relationship between industrialisation and the environment, concentrating the analysis exclusively on eco-systemic change, it is all too obvious that we will identify a significant disruption in general conditions. In short, there is nothing new under the sun because, as Jared Diamond (2005) demonstrated, since the Neolithic Revolution, man has profoundly changed the natural environment to such an extent that the prosperity or decline of human societies has depended, in large part, on the ability to more or less profitably manage the environmental resources on which they were dependent.

It is therefore evident that historical research must go beyond the mere description of environmental change and ask questions to understand why, from the mid-18th century, people have accepted working and living in environments that have certainly not been healthy. It is likely that the answers will not be easily identifiable or unambiguous, because they require the unravelling of a tangled bundle of complex interactions between production, consumption, technology, and political, cultural and economic models that are still waiting to be studied. For this reason, the historical-environmental literature that continues to highlight the role of industry and urban areas does not appear convincing; it underestimates the weight of consumption, as if people's lifestyles have depended exclusively on media-conditioning. In this way, the complex utilitarian and hedonistic dynamics that drive consumption choices end up being vaguely placed in the background and researchers cease investigating the reasons that have led millions of people (in today's world, billions) to accept living in unhealthy and alienating environments just to feel like part of progress and civilisation.

This interpretation fails to free itself from the influence of stereotypes that are so dear to an antagonistic Marxism, which sinks its roots into parts of the environmental movement and historical environmental historiography; it is an interpretation that can be suggestive and meet with broad consent, but it consciously filters the dynamics through a lens of ideology and, in so doing, bends and distorts them for their own use of environmental events.