The Post-Neolithic Anomaly? How 'Civilisation' Might Be An Aberration in Human History.

Abstract.

For the majority of its existence, our species did not live in settlements, did not have agriculture, writing or metallurgy. These are all features of the Holocene Epoch, and the global human population during most of the time since the start of that epoch remained both low and relatively constant until the beginning of the 19th Century, accelerating through the 20th Century, following the Industrial and Agrarian Revolutions. The enormous population, and the complex, planet-wide capitalist technological civilisation on which they depend, but which also exploits them, are now faced with numerous dangers, which are likely to prove insuperable.

Keywords: *Homo sapiens*; Pleistocene Epoch; Holocene Epoch; Palaeolithic; Neolithic; agriculture; settlements; metallurgy; writing; (human) population; technology.

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[1] Introduction.

The earliest extant anatomically modern *Homo sapiens* fossil remains date from *circa* 200,000 years ago, and were found in Eastern Africa [1], Africa being the *fons et origo* of both genus *Homo* and species *H. sapiens* [2]. This time period corresponds to the Middle Pleistocene, or Chibanian Age [3]. As the developments of agriculture, settlements, metallurgy and writing all post-date the onset of the Holocene Epoch

some 11,700 years ago, i.e., in *c.*9,674 BCE, what might be called 'civilised existence' has only occupied some 5.85% of the total lifespan, thus far, of our species [4, 5, 6, 7]. If we accept 1750 CE as the last year prior to the Industrial and Agrarian Revolutions – that year being the last time atmospheric carbon dioxide was a mere 278 ppm – the subsequent 276 years of increasingly advanced technology represent just 0.138% of the lifespan of our species [8, 9].

The *H. sapiens* population during the Palaeolithic and Mesolithic rose from *c.*120,000-325,000 in sub-Saharan Africa ~130,000 years ago to 4 million in 10,000 BCE, and the annual growth rate in the modern human population remained 0.04% from that year until 1700 CE, when the global human population was 595 million [10, 11]. To reach an approximate 1 billion by 1800 CE, the population growth rate would have had to accelerate to 0.68% p.a. over the 18th Century [11]. The relationship between technological development, increased agricultural production and faster human population growth is clear, although that is linked to both damage to the environment and a decline in the agricultural workforce, as people moved to urban centres in search of industrial jobs [12, 13, 14, 15].

It shall be the thesis of this paper that the intellectual, cultural and technological innovations that have taken place since the Neolithic will, alas, turn out to be aberrations in the overall history of our species, precisely because of our self-destructive nature, and because of the ecologically destructive nature of much of our technology, even if we discount the technology that is *intended* to be destructive, such as nuclear weapons.

Human gains, both in population and in average per capita material well-being, have been at enormous expense, both to the biosphere and to the planet. Malthus has not been 'proved wrong', as his critics have maintained – his predictions have merely been postponed [16].

[2]. The Human Impact on the Planet and Its Consequences.

Human appropriation of Earth's mammalian biomass, including our food-related appropriation (farm animals) has now reached 94.44%

[17]. Global human appropriation of net primary production (HANPP) was estimated to be between 8-14.81 PgC, or 14.1-26.07% of annual NPP (net primary production) [18, Table 2, p.872].

The physicist Erwin Schrödinger maintained that all living organisms – which would obviously include humans – could only stay alive for as long as they could reduce their own entropy by increasing that of their environment [19]. Humans are now approaching the biophysical limits of growth, and an unsustainably large share of the Earth's free energy budget [20, 21]. Rees and the present author have argued that the result will be catastrophic for human civilisation and humanity [22, 23, 24].

In summary, the human impacts on our planet – the only one known for certain to be a harbinger of any form of life – are increasing atmospheric greenhouse gas pollution; increasing chemical pollution, including 'forever chemicals' (PFAS); ditto plastic pollution, including by micro- and nanoplastics; destruction of rainforests and wetlands; warming, acidification, desalination, deoxygenation and eutrophication of seas and oceans; and this list is by no means exhaustive [25, 26, 27, 28, 29, 30, 31, 32, 33, 34].

Loss of wildlife habitats, such as destruction of rainforests in Indonesia caused by oil-palm plantations and logging, have led to sharp declines in particular species populations, including Bornean orang-utans (*Pongo pygmaeus*) and Sumatran tigers (*Panthera tigris sumatrae*) [35, 36].

Many of the public tend to be indifferent to these extinctions, for reasons which we shall discuss below, but some extinctions, at least, would have a direct, and indeed fatal, impact on our own hopes for survival. For example, if all the insects on Earth were to become extinct (and they are threatened by, *inter alia*, our pesticides), human extinction would swiftly ensue [37].

[3]. Speciesism and Anthropocentric *Hubris*.

White long ago outlined what he termed the 'historical roots of our ecologic crisis' [38]:

> **'Christianity inherited from Judaism not only a concept of time as nonrepetitive and linear but also a striking story of creation... Especially in its Western form, Christianity is the most anthropocentric religion the world has seen... Man shares, in great measure, God's transcendence of nature' (p.1205).**

White accounts for the difference between the Western, Latin, version of Christianity and its Greek, Eastern Orthodox, variety, thus:

> **'The Greeks believed that sin was intellectual blindness, and that salvation was found in illumination, orthodoxy – that is, clear thinking. The Latins, on the other hand, felt that sin was moral evil, and that salvation was to be found in right conduct. Eastern theology has been intellectualist. Western theology has been voluntarist. The Greek saint contemplates; the Western saint acts. The implications of Christianity for the conquest of nature would emerge more easily in the Western atmosphere' (p.1206).**

White (ibid.) points to what for him is a contemporary example of hostility, or indifference, to nature, in a remark of the then newly elected Republican Governor of California, and (although he was not to know it) future President of the United States, Ronald Reagan:

> **'The newly elected Governor of California... spoke for the Christian tradition when he said (as is alleged), "when you've seen one red wood tree, you've seen them all."'**

Many of California's redwood trees (*Sequoioideae*), particularly its giant redwoods (*Sequoiadendron giganteum*), which are endangered in any event, have been destroyed in that State's recent wildfires [39, 40].

The assumption of human separation from, and ascendancy over, nature, apart from being implied by Genesis 1:26, 28, which – like the rest of the Bible – was taken to have divinely inspired authority, was reinforced in the 16th Century by the concept of the 'chain of being',

whose intellectual history can, in fact, be traced back to Plato, Aristotle and the Neo-Platonists [41; 42, Ch.4, pp.33-44; Ch.5, IV-V, pp.73-90].

In the 17th Century, the sense of separation and superiority of human beings over the natural world was further reinforced by Cartesian dualism, with its view that humans possessed immortal souls, whilst non-human animals and other organisms were mere biological machines, devoid of souls [43].

These negative tendencies were reinforced by the mechanistic materialism of the 18th Century Enlightenment, by increasing urbanisation during the 19th and 20th Centuries, which exacerbated the divorce between many humans and the natural world, as did consumerist capitalism, and what Max Weber terms '*die Entzauberung der Welt*' ('the disenchantment of the world') [44, 45, 46, 47].

The consequences of this divorce between humanity and the rest of the biosphere, not only for biodiversity loss but for human civilisation itself, were explored by [48]. Contemporary ideologies and philosophies such as transhumanism and accelerationism express the kind of hubristic attitude to nature depicted by Mary Shelley in her fictional character of Viktor Frankenstein [49, 50, 51, 52].

A perhaps less extreme figure on the American Christian right-wing, but nevertheless well to the right of the political spectrum, is Peter Thiel, co-founder of PayPal and Palantir. He has identified the Swedish climate activist Greta Thunberg as an enemy of advanced technology and unbridled *laissez-faire* capitalism, and thus as a potential candidate for the apocalyptic figure of the enemy of God, the Antichrist [53].

[4] Gaia and Human Civilisation.

The *fact* of the collapse of civilisations since the Neolithic is indisputed, even if the *reasons* for those collapses are. The late German biologist Ernst Mayr counted a total of 20 civilisations over the course of the last 10,000 years, which would give each one an average life-span of 500 years [54]. Arnold Toynbee maintained there had been 19-21, so perhaps Mayr got it about right [55]. Popper claimed there were no 'iron laws of history', but there appear to be at least two: namely, that

all civilisations and all empires, having risen and reached their zenith, then go into a decline and collapse [56].

The 'Gaia' concept, promoted by Lovelock and Margulis, presents us with a picture of the biosphere able to maintain itself in equilibrium with its non-living environment, sustain itself in being, and defend itself against all possible threats, including from within. It is not some 'goddess' or conscious, conative entity, but a complex, and completely impersonal, system of positive and negative feedback mechanisms [57, 58, 59].

The proposed geological time period, the 'Anthropocene Epoch', which, it has been claimed, has succeeded the Holocene, but was rejected by the International Union of Geological Sciences (IUGS) in March 2024, emphasises the impacts of humans on Earth, but fails to take account of the fact that Gaia is not passive, and is fighting back, vigorously [60, 61, 62, 63, 64, 65, 66, 67, 68, 69].

Mr Peter Thiel might claim, as he has done, that Greta Thunberg is, possibly, at least, the 'Antichrist' on the strength of her alleged 'Luddism', but his Republican political allies President Trump and Vice-President Vance, whilst admirers of the benefits of advanced *technology*, such as artificial intelligence, are opponents of *science*, as Paul Krugman points out, forcefully – especially when it tells them that coal may not be mined and oil and gas extracted [70]. There is no advanced technology without pure science, however, and without scientists engaged in it [71].

The current US President's insistence, contrary to all the scientific evidence, that anthropogenic climate change is a 'hoax', and his efforts to prevent a transition to renewable energy, at considerable expense to the American taxpayer, come at a time when the UN Secretary-General has repeated his warning that the world is 'on fire', and the wildfires taking place in North America and Europe are emphasising that he means that literally, not merely metaphorically [72, 73, 74].

Other political leaders may not be climate change deniers in the explicit sense that Mr Trump is, but, whilst acknowledging that it is real, argue that climate action is 'too expensive', or insist that we must go on extracting remaining fossil fuel assets to the full for economic

reasons, apparently oblivious, or indifferent, to whatever ecological harm may be done in the process, and whatever impact that might, in turn, have on humanity [75, 76].

The level of atmospheric carbon dioxide (CO_2) in June of this year was 431.44 ppm, compared to 429.61 ppm in June of 2025, a gain of 1.83 ppm over the year, which is 3.8979 gigatonnes (billion tonnes) of CO_2 [77, 78].

These atmospheric carbon dioxide levels have not been experienced on Earth since the Mid-Piacenzian Warm Period of the Pliocene Epoch, some 3.25 million years ago, prior to the existence of genus *Homo* [79, 80]. As [79] point out, global annual mean-surface temperatures during the Mid-Pliocene were between 3°C-5.3°C (mean: 4.15°C) warmer than the pre-industrial norm, and for at least part of this geological epoch, the Earth's orbital and axial parameters were the same as they are today [81]. The present author has discussed the possible implications for the climate of the anthropogenic changes to atmospheric chemistry [82]. Sea levels are rising, due to the melting of the Arctic and Antarctic ice-caps, and the effect of the inundation of coastal settlements and cities would be devastating [83, 84].

[5]. The Survival of Our Present Civilisation.

It is a perennial lament of small 'c' conservatives that the present state of affairs is worse than things in the past, and is deteriorating: to quote the Roman statesman, Cicero, '*O tempora, o mores!*' [85]. *Ecological* conservatives, insofar as they have been opponents of the effects of mechanised industry on both people and the natural world, have been denounced and derided as 'enemies of Progress'.

These 'enemies of Progress' have formed quite a distinguished company, however. The Whig interpretation of history, and the idea of 'Progress' (complete with its initial capital letter), which was supposedly intrinsic to history, were all but completely discredited by the First World War [86, 87, 88, 89, 90]. McDonald is heavily critical of the whole concept, arguing that it is 'humanity's worst idea' [91].

The view that our current global advanced technological civilisation is foundationally secure, and destined to make further

advances into the indefinite future, is unlikely to satisfy the hopes of its advocates, even though it found expression in 'techno-Utopian' science fiction, and was given a theoretical framework in the writings of Nikolai Kardashev [92, 93, 94, esp. Section 2.2, pp.4-7; 95].

Tainter identified increased complexity as the key to understanding the collapse of societies, but Diamond argued their collapse was due to a failure of collective decision-making with respective to the management of environmental resources, as with the notorious case of the trees on Easter Island [96, 97, Ch.2, pp.79-119; Ch.14, pp.419-440]. Clearly, ten-spined sticklebacks (*Pungitius [formerly Pygosteus] pungitius*) are much better able to manage their relations with their ecology than humans are, as Desmond Morris observed long ago, even if that means becoming homosexual for a period [98]. However, neither Tainter's nor Diamond's explanations seem adequate, and nor do any based on the concept of *social entropy*, although that is undoubtedly valid [99].

[6]. Conclusion. Is the Collapse of Our Global Civilisation Inevitable, and What Happens After?

The short answer to this question is 'Yes', because all civilisations and all empires collapse, as we have seen, and none have been immune to the forces that have propelled them into decline and destruction since humans began living in towns and cities in the Neolithic. Not only are we, collectively, subject to social entropy, but we have allowed ourselves to become alienated from the biosphere, and have become (as [91] points out) parasitic upon it, rather than either commensal or, better, symbiotic. We cannot expect to do the damage that we are doing to our environment, or our climate, or the other species on our planet, with impunity [100].

The variables of the 'IPAT' Equation (see [12]) or the Kaya Identity cannot go on increasing indefinitely [101]. It will be a case of 'What goes up must come down', because Gaia will insist on it [102].

The further question ensues: what happens *Après le Déluge*, or after the catastrophe [103]? As noted above, Krugman has strongly condemned the anti-science and anti-scholarly tendencies of the current

US Administration (see [70]). The present author has argued that neither science nor the political and social ideas which developed after the 18th Century Enlightment – ideas such as liberalism, socialism, social democracy, democracy itself, and beliefs about equality, for example – will survive the demise of global technological civilisation [104].

If these things are all part of the 'ideological superstructure' (*ideologische Überbau*) of capitalist society, and that is dependent on, not merely the relations of production, but the technology that underpins them, as Marx argued, then, if his dialectical process fails (as it will, precisely because of its historicism – see [56] - if for no other reason), and our global economic system, because of over-population, over-exploitation of natural resources and pollution, reverts to a simpler, far less parasitic and exploitative scale of activity, then the thesis in [104] will be confirmed [105, 106, 107].

The author has young relatives, and he would far rather his gloomy prognostications proved well wide of the mark, but he cannot sacrifice what he believes to be the truth to his personal feelings.

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