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The Superhuman Upgrade

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Homo Deus: A Brief History of Tomorrow by Yuval Noah Harari
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Hedda Gabler’s husband, Jørgen Tesman, is an academic historian – diligent, if a little plodding. He is researching a book which he hopes will make a splash, secure him a coveted professorship and support his wife’s taste for life in Oslo high society. When Tesman’s aunt asks him what the book will be about, he says it will deal with the domestic industries of Brabant in the Middle Ages. ‘Fancy,’ she says. ‘To be able to write a book on such a subject as that!’

Ejlert Løvborg is Tesman’s academic rival – and Hedda’s former lover. He has recently published an enthusiastically received book dealing with nothing less than ‘the march of civilisation – in broad outline, as it were’. Now he calls on Tesman carrying the completed manuscript of yet another great work. Tesman asks what this one is about and Løvborg says it’s ‘the continuation’. The first book traced the history of civilisation from its beginning up to the present; the new book will be about the future. ‘Good heavens,’ Tesman says, ‘we know nothing of the future!’ Yes, Løvborg concedes, but ‘there is a thing or two to be said about it all the same.’ His book will describe ‘the civilising forces of the future’ and forecast ‘the probable lines of development’. Tesman is astonished: ‘I never thought of writing anything like that.’ Quite, Hedda thinks: Løvborg’s history of the future is sexy; her husband is just a dull ‘specialist’.

Today’s Ejlert Løvborg is the Israeli historian Yuval Harari. His *Sapiens: A Brief History of Humankind* appeared in English in 2014, having been published in Hebrew three years earlier. Following ‘the march of civilisation’ from the Neolithic to the present in a punchy four hundred pages, it was an international bestseller, endorsed by Barack Obama and tagged as essential reading by Bill Gates and Mark Zuckerberg. There were TED talks, public lectures, a dedicated YouTube channel, a hugely popular online course, speeches to the futurologists at Google and the Singularity University in Silicon Valley.

There’s a new and expanding readership for this sort of thing. It is said that the humanities

are ‘in crisis’: students aren’t enrolling in the same numbers and the monographs don’t sell. Increasingly exposed to ‘market forces’, some historians, risking the eye-rolling disapproval of colleagues, are attempting to satisfy a demand for the Book That Explains It All. They take encouragement from recent prods to produce work of greater scope. In *The History Manifesto* (2014), Jo Guldi and David Armitage worry that the production of scholarly miniatures disqualifies historians from contributing to urgent cultural and political discussions – about climate change, sustainable production, international governance etc – in which the longue durée would give valuable perspective. The focus on local historical meaning should give way to the search for overall historical pattern. Grand Histories weren’t uncommon in Ibsen’s time; by the middle of the 20th century, exercises such as Løvborg’s had come to seem ridiculous. Today, the tide may be turning again.

The probable lines of humanity’s future were heavily trailed in the last chapter of *Sapiens*, which Harari has expanded to form the core of *Homo Deus: A Brief History of Tomorrow*. As he tells it, our species has done great things already and unimaginably greater things are surely in store. There are reasons to be cheerful. Once upon a time, we accepted three score years and ten as our divinely allotted lifespan; we reckoned there wasn’t much we could do to prevent or counter epidemic disease; we looked on dearth and famine as bad hands dealt by fate or divine judgment; we considered war to be in the nature of things; and we believed that personal happiness was a matter of fortune. Now, Harari says, these problems have all been reconfigured as managerial projects, subject to political will but not limited by the insufficiencies of our knowledge or technique. We have become the masters of our own fate – and ‘fate’ itself should be reconceived as an agenda for further research and intervention. That is what it means to refer to the world era in which we live as the Anthropocene: one biological species, *Homo sapiens*, has become a major agent in shaping the natural circumstances of its own existence. The gods once made sport of us; the future will ‘upgrade humans into gods, and turn *Homo sapiens* into *Homo deus*’.

A hundred years or so ago, historians’ predictions were driven by their conception of the laws of change – the rationally knowable principles that accounted for past events and made it possible to forecast the future. Providential history – invoking God’s plans for human affairs – had lost its academic authority in the 18th century, displaced in the 19th and early 20th centuries by secular schemas: progressivist Whig interpretations of history; Auguste Comte’s law of three successive stages in human history (the ‘theological’ giving way to the ‘metaphysical’ and then to the ‘positive’ or ‘scientific’ stage); the narratives of the march of civilisation from myth to science offered by such anthropologists as E.B. Tylor, L.H. Morgan and J.G. Frazer; the determining force of class conflict in Marxism; the environmental ‘challenge and response’ theories of writers from Montesquieu and Malthus to Arnold Toynbee; the selection pressures identified by Social Darwinisms. The title of Herbert Butterfield’s *The Whig Interpretation of History* (1931) is today commonly used as shorthand to warn against histories that presume inevitable progress, but the book was,

fundamentally, a freewheeling condemnation of what Butterfield called ‘general history’ – any attempt to reduce change to the workings of a definable ‘historical process’.

The past trajectories that Harari describes and the futures he imagines are driven by no such immanent law-like process: in his view, it is spontaneously appearing science and technology – innovations emerging from the minds of a visionary technical elite – that write the script. No social history ‘from below’ for him: ‘History is often shaped by small groups of forward-looking innovators rather than by the backward-looking masses.’ The revolutions of the last two hundred years in the treatment of pathogenic bacteria and the production of antiviral vaccines have made death from infectious disease far less common, and Harari assures us that ‘medicine in 2050 will likely be able to deal with’ new bugs ‘more efficiently’ than it does today. If we fail to cope with new strains of flu or with multiply resistant microbes, it won’t be because the threat is insurmountable or our science inadequate but because of a failure of political will or the proper mobilisation of resources. We can look forward with confidence to continued increases in human longevity: ‘In the 20th century we have almost doubled life expectancy from 40 to 70, so in the 21st century we should at least be able to double it again to 150.’

That’s some of the good news. The bad news isn’t what you might expect. Climate change, environmental collapse and the renewed threat of nuclear war do get a mention – on global warming, ‘we shall have to do better’; on ecological disaster, ‘we could lessen the danger by slowing the pace of progress and growth’; nuclear weapons have compelled the superpowers ‘to find alternative and peaceful ways to resolve conflicts’ – but Harari focuses fears for the future not so much on species annihilation as on species transformation. Here too science and technology drive the future. *Homo sapiens* may cease to be, not because Earth will become uninhabitable or because Donald Trump or Kim Jong-un will push the button, but because we will become new kinds of beings: our bodies, minds and relationships with the environment and with mechanical devices will be altered in fundamental ways. Our capacities to know and to do things have always depended on our tools, but now these tools are acquiring the potential to transform what it means to be human. New tools will become parts of our bodies: we will have bionic hands, feet and eyes; nanorobots will cruise the bloodstream keeping an eye out for disease and repairing the damages of age and injury; wearable and implanted devices will expand our sensory repertoires and alter our moods; biological tools will infiltrate our cells, redesign our genes, and give us new and improved flesh, blood and neurons.

So the biggest threat to *Homo sapiens* is that the technological ‘upgrade’ that makes us as gods will, at the same time, redefine human capacities. Harari here enthusiastically repeats the lessons taught by Victorian scientific materialism. Religious legend notwithstanding, we are nothing special in the animal kingdom: we have no immortal soul; there is no essential human ‘self’; our thoughts and emotions are the product of electrochemical impulses which can, in principle, be modelled by the formal problem-solving rules we call algorithms; our

bodily frames and mental capacities have evolved over time and there is nothing fixed in our ‘nature’. The only thing that can be predicted with certainty about human nature is that it will change. Harari’s prediction is that we will become more god-like as we become more machine-like and as machines’ capacities become more god-like. Humanity’s future is in the hands of technical experts – in biotechnology, artificial intelligence, cognitive and computer science.

It is a fact, Harari announces, that the ‘last days’ of *Homo sapiens* ‘are fast approaching’. Absent some unforeseeable calamity, our species will be replaced ‘by completely different beings who possess not only different physiques, but also very different cognitive and emotional worlds’. The current version of *Homo sapiens* will become surplus to economic and military requirements. War will be waged by drones and work will be done by robots: ‘Some economists predict that sooner or later, unenhanced humans will be completely useless.’ Algorithms embedded in silicon and metal will replace algorithms embedded in flesh, which, Harari reminds us, is what biology and computer science tell us is all we really are anyway. In the argot of Silicon Valley, now-useless human beings are just ‘meat puppets’. New life forms will be created, breaking the chain which – from protozoa to *Homo sapiens* – made life an exclusive function of organic compounds. Harari sees all this as an index of the great ‘decoupling’ of intelligence and consciousness that is being brought about by advances in artificial intelligence.

There has been a vast increase in computer intelligence in recent decades but, Harari says, none at all in computer consciousness. There are now huge disparities in the practical and cash values of different sorts of mental capacity. So far as political economy is concerned, ‘intelligence is mandatory but consciousness is optional.’ Human beings will cease to be agents, their authority taken over by algorithms – written at first by human beings but ultimately by algorithm-writing machines. Confronted with the new ‘post-humanist’ technologies, liberal society will disintegrate. We will no longer be able to sustain belief in the unique, free-acting, free-judging individual as the basis of liberal social order: ‘We – or our heirs – will probably require a brand-new package of religious beliefs and political institutions.’

The new religion will be called Dataism. The boundaries between animals, machines and social systems will dissolve: all these will come to be seen as algorithmic information-processing systems. The notions of ‘right’ and ‘wrong’ will be superseded by the unchallenged virtue of the flow of information – which, as Stewart Brand, the editor of the *Whole Earth Catalog*, announced in the 1980s, ‘wants to be free’. The ‘cosmic data-processing system’ will be what God once was, omnipresent and omniscient, wise and all-powerful: ‘It will be everywhere and will control everything, and humans are destined to merge into it.’ We will worship Information and our hearts will belong to Data.

Harari isn’t certain how much time we have before Information takes over – some futures are

predicted for the middle of this century, some for the next – or whether any recognisable members of the early 21st-century human species will make it through to the other side. As far as I can tell, there will be a transitional state, before the Information System absorbs everyone into the black hole that its human designers created. Wealth will be concentrated in the hands of the ‘tiny elite that owns the all-powerful algorithms’. Some of us will then be as gods: members of a new species, *Homo deus*, ‘a new elite of upgraded superhumans’ clever enough, and rich enough, to control for a time the knowledge that controls the rest of humankind, and to command the resources needed to transform themselves through intellectual tools and biologic prostheses. ‘In the long run, we are all dead,’ Keynes said. If some of the wilder ambitions of anti-ageing prophets are realised, the dictum will need to be reformulated: ‘In the long run, *most* of us will be dead.’

‘Unenhanced’ human beings will scurry about in the shade of the ‘upgraded’ elite, neo-Nibelungen whose riches have been ripped from them by algorithm-wielding, neo-Siegfriedian cyborgs. The masses will have to be fed and supported – Harari doesn’t go so far as to imagine the superhumans accepting the logic of a Final Solution – but neither the master race nor the residuum will find any point or meaning in their lumpen lives: ‘People must do something or they will go crazy. What will they do all day?’ Will they discover the joys of art? Probably not: it’s more likely that the ‘useless masses’ will find whatever satisfaction they can in shopping, drugs, computer games and the thrills of virtual reality, which will ‘provide them with far more excitement and emotional engagement than the drab reality outside’.

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It’s a hell of a story, told with flair and fizz. Harari’s popularity has a lot to do with entertainment value, including his way with zingers: ‘Sugar is now more dangerous than gunpowder’; ‘Epicurus was apparently onto something: Being happy doesn’t come easy’; ‘The yang and yin of modernity are reason and emotion’; ‘God seems to be making a comeback. But this is a mirage. God *is* dead – it’s just taking a while to get rid of the body.’ *Homo Deus* is a didactic, even oracular performance but, despite the dystopian future it describes, the book is, as they say, a fun read. There are, though, some nagging questions. Who can predict the future? How do you predict the future? How can you assess the quality of predictions?

Today’s academic historians don’t as a rule like to take on the future: most feel it’s not their job. Absent the ‘historicism’ – the telling of human history as the working-out of inexorable laws – that writers like Karl Popper judged so impoverished, historians now overwhelmingly confine themselves to knowing what they can about unique pasts, leaving unknowable futures to seers and fools. There are genres of ‘environmental history’ which project human futures on the basis of natural laws affecting our planetary habitat, but these tend to lack the texture and sense of contingency that most historians now value.

Still, historians seem no worse placed than anyone else to tell the future. Many of them know

a lot about past futures – the history of utopias and dystopias; stories of rises, declines and falls; ends of the world, worlds without end, tomorrow’s worlds; all sorts of imagined futures – and they understand the poor success all these have had in predicting what eventually happened. There is no present that doesn’t imagine its future, and the way past presents have done so tells us something about those presents. Some predictions extrapolate trends from knowable pasts to unknown futures; here, too, historians have skills in describing such trends. Such extrapolations have as good a track record as any other mode of prediction. Unless there is secure information suggesting otherwise, the weather tomorrow will probably resemble the weather today; next winter will be colder than next autumn; marathon times will continue to get lower; and, in technology, computing power will get cheaper, as will the cost of photovoltaic cells. These aren’t certain bets, but they’re good ones.

Yet some extrapolations from historical trends have been notable failures. Longstanding predictions of ‘electricity too cheap to meter’ from nuclear power have not been realised; cancer treatment has greatly improved, yet despite decades of ‘war’ on cancer it remains a major cause of death; an effective anti-ballistic missile technology remains an outrageously expensive dream. Moore’s law, which predicts the doubling of transistor density on a computer chip every couple of years, was borne out for decades but may now be running out of steam. Malthus’s trend lines for agricultural productivity proved wrong; mid-20th-century predictions about increases in the speed of civil air travel, the ‘paperless office’, the colonisation of space, the inevitability of nuclear war or the end of war altogether, have all – so far – been losers. (Predictions worth paying attention to should have an expiration date.) Harari’s extrapolations from historical trends of a vast increase in human longevity may prove similarly unsafe.

There are further difficulties with predictions of the future, especially when they’re dependent on advances in science and technology. One problem is the poor fit between the security of forecasts and the unpredictability of what science and technology actually deliver. H.G. Wells predicted the invention of a sort-of atomic bomb, and many predicted versions of the airplane and the submarine. The comic-book character Dick Tracy had a two-way wrist radio (eventually elevated to a wrist TV), which as children we all considered a complete fantasy. But essentially no one predicted such world-changing innovations as the polymerase chain reaction (the DNA-multiplying technique central to biotech), the ubiquitous personal computer or the world wide web, and it’s now at least possible that the equally unanticipated bitcoin will end up radically transforming the nature of commercial transactions. Predicting the future is tough enough, but when you make the outcomes depend so heavily on spontaneously appearing science and technology, it becomes all but impossible, and you diminish the shock of the genuinely new. What can’t be imagined can’t be predicted.

A final problem is the recursive nature of some predictions, where the outcome is not in fact independent of the prediction. Some prophecies are self-fulfilling: if people are agreed that certain things can happen, or will happen, they may devote resources and co-ordinate their

energies to make them happen. In the case of Moore’s law, you could say the increase in computing power was the result of technological expertise and self-fulfilling prophecy combined: the ‘law-like’ increase in semiconductor density held up in part because technologists’ confidence that such things were possible encouraged the mobilisation of resources. Then there are self-negating prophecies. If you believe, for instance, that automated computerised systems are safe, you may neglect due care and vigilance, so making them dangerous; but if you believe that buildings may be vulnerable to earthquakes, or that nuclear power stations are inherently dangerous, you may take steps to ensure their integrity, so making them safe.

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How confident should we be about Harari’s future? How confident, indeed, is he? Critics may reason – f0llowing the logic of the self-negating prophecy – that we will put a stop to out-of control technologies. But Harari doesn’t think this is going to happen. First, nobody knows enough – about the range of new technologies, their likely course of development or their consequences – to make the judgment that we should ‘hit the brakes’. Second, even if we did know enough, ‘capitalism’ would keep us well away from the ‘brakes’: a slowing down of technological advancement would cause our economy to collapse, ‘along with our society’. (This is Harari’s one glancing concession to the dependence of accelerating technological innovation on a particular political order, and it naturalises hellbent-on-growth capitalism just at a historical moment when it is possible to imagine a different political and economic future.) However, just a few pages later, Harari allows that the dystopian futures he predicts may, after all, be avoided: ‘Precisely because we have some choice regarding the use of new technologies, we had better understand what is happening and make up our minds about it before it makes up our minds for us.’ (Maybe it’s Harari who needs to make up his mind.)

Much in Harari’s vision of the future channels the oracles of Silicon Valley – many of them hyperactive cheerleaders, only a few worried about tech-driven catastrophe. In 2000 the computer scientist Bill Joy, a founder of Sun Microsystems and then its chief scientist, wrote an article for *Wired* titled ‘Why the Future Doesn’t Need Us’ – not mentioned by Harari – in which he argued that machines won’t only replace human intelligence and work, they will also usurp control from human agents. ‘Biological species almost never survive encounters with superior competitors,’ Joy wrote, and neither will *Homo sapiens* in a future struggle for existence with the machines human beings have created. Biological humans will be ‘squeezed out of existence’ and genetic technologies may transform human nature itself. ‘I’m as fond of my body as anyone,’ another prominent computer scientist, Danny Hillis, said around the same time, ‘but if I can be two hundred with a body of silicon, I’ll take it.’ Joy’s anxieties have been echoed since by Bill Gates and the Apple cofounder Steve Wozniak, and Stephen Hawking too has warned that ‘the development of full artificial intelligence could spell the end of the human race.’ So to the degree that Harari’s vision of the future seems plausible, it’s perhaps because it’s familiar: we’ve been well warned before.

Some evidence of its plausibility is more directly available. I live near MIT. If I meet a friend for lunch near there, my walk takes me past outposts of Google and Microsoft; past major for-profit and nonprofit centres for biomedical research and engineering, gene sequencing and bioinformatics, synthetic biology, artificial intelligence and robotics: cathedrals of Dataism, algorithm factories, workshops for the production of posthuman futures. But before I get there, my walk also takes me past people sleeping in cardboard boxes and I am panhandled half a dozen times by hungry ‘useless’ people, too poor to pay for virtual reality devices. What the market now seems to require is an imagined future exotic enough to be thrilling but recognisable enough to be credible. *Homo Deus* hits that market’s sweet spot.

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