GALILEO COMMISSION
Report Supplement

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Next Step in Human Development, Dangerous Ideology, Negligible, or What?

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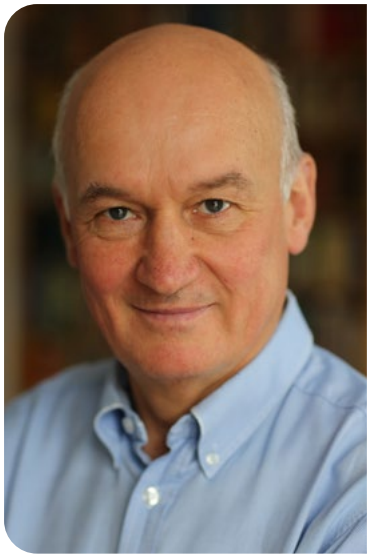

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FOREWORD

THE HUMAN EVOLUTIONARY TRAJECTORY: SPIRITUAL RENAISSANCE OR TRANSHUMANIST UPGRADE?

by David Lorimer, Co-Chair, Galileo Commission

This supplement to the Galileo Commission Report provides a brilliant critical analysis of the quasi-utopian projections for a transhumanist future, building on the original report from the same philosophical approach that questions the validity of scientism and materialism in relation to the study of consciousness, where the key unexamined proposition is that the brain gives rise to consciousness. Here, Harald Walach argues that transhumanism is an extension of the same scientism and materialism, and that these constitute religions, or at least ideologies. Aldous Huxley reminds us that "it is impossible to live without metaphysics. The choice that is given is not between some kind of metaphysics and no metaphysic: it is always between a good metaphysic and a bad metaphysic."

The starting point relates to our basic concept of the human being. Spiritual traditions insist on the basis of the testimony of the great sages and saints that there is a transcendent component to the human being, identifying the Spirit as the immanent divine core of our humanness. Such exemplars are the very embodiment and manifestation of love, wisdom, truth, beauty, compassion, joy and peace. By contrast, transhumanists regard human beings as biochemical machines, data algorithms or even hackable animals. The machine is a key metaphor here, dating back to the 17th century and corresponding to computational theories of consciousness. If humans are biochemical machines already, then the Fourth Industrial Revolution merging humans with with AI silicon-based technology may seem natural extension and fit. Interestingly, both Christianity and Transhumanism treat humans as flawed creatures in need of redemption and enhancement respectively. Machines and hackable animals are to be programmed and manipulated for optimal control and conformity through technocratic social engineering. This is branded as progress, but as far back has 1937, Aldous Huxley remarked that "Technological advance is rapid. But without progress in charity, technological advance is useless. Indeed, it is worse than useless. Technological progress has merely provid-

ed us with a more efficient means of going backwards." This is an arresting remark, and one which calls into question the adequacy of a narrow technological definition of progress.

Both Mattias Desmet in his *The Psychology of Totalitarianism* and Aaron Kheriaty in *The New Abnormal* have written about the link between scientism and totalitarianism, to which one might add Iain McGilchrist's characterisation of the culturally dominant left hemisphere as manipulative, controlling and sure of itself. Kheriaty quotes Augusto del Noce's observation that *scientism is intrinsically totalitarian*, a profound insight of enormous importance for our time. "Many people do not realize that scientism and the technological society are totalitarian in nature," he wrote fifty years ago. To understand why, consider that *scientism and totalitarianism both claim a monopoly on knowledge*. The advocate of scientism and the true believer in a totalitarian system both assert that many common-sense notions are simply irrational, unverifiable, unscientific, and therefore outside the scope of what can be said publicly." This attitude is intrinsic to mechanistic and technocratic mindsets and can be seen in the injunction to "follow the science", which effectively means imposing the mainstream consensus view backed by censorship and persecuting dissidents and heretics, as religious fanatics have done for centuries.

In a book that should be better known and that builds on the work of C.S. Lewis (*The Abolition of Man*), Michael Aeschliman in his *The Restitution of Man* highlights the way in which philosophy necessarily underpins the fundamental presuppositions of science – a point made by Walach in his original report. He frames this as the *Sapientia* vs Scientism: "Issues such as the procedures and validity of rational thought and argument are presuppositions on which scientific thought and experiment rest, *but they are themselves not scientific: they are philosophical*. Science depends upon philosophy for the validity of its terms and procedures and the determination of the uses to which scientific knowledge will be put. To say… that only factual statements have validity is to be not only dogmatic but self-contradictory, since the statement itself is not factual."

Moreover, as C.S. Lewis insists: "Truth, meaning, purpose, and goodness are none of them scientific facts: they are wholly immaterial relations." And it is precisely in this existential crisis of meaning and purpose with its consequent moral relativism – even moral vacuum – that afflicts our materialistic age and finds its philosophical roots in the metaphysical nihilism of the neo-Darwinian evolutionary narrative of chance, randomness and a neurogenetic determinism that eviscerates free will and moral responsibility. Mary Midgley regarded this as a performative contradiction, as the very scientists and philosophers who take this position live personal lives involving agency and decision-making. As Federico Faggin points out, this is an indication that the postulated primacy of matter must give way to the foundational role of consciousness that is necessary for the generation of such theories in the first place…Values, ends and purposes provide the orientation for practical work and cannot be provided by science.

The following tables summarise what Jennifer Gidley characterises as human-centred and the technotopic futures:

Biochemical machine	Living organism
Hackable animal	Spiritual being
Secular	Sacred
Trans/posthumanism, Human 2.0	Transcendence, 'Superhuman'
'Upgrade software'	Spiritual refinement & transformation
Enhancement/Augmentation	Inner evolution and enlightenment
Manipulation/Control	Enablement, empowerment
'Head'/outer, left hemisphere	'Heart'/inner, right hemisphere
Technocracy	Liberal democracy
Slavery/Monopoly/Inhumanity	Freedom/Pluralism/Humanity

In broader terms these two paths can lead to coercive technocracy or the further development of humane democracy as outlined below:

Human as biochemical machine	Human as Evolving Spiritual Being
> Transhuman 'caterpillar'	> Transpersonal 'butterfly'
Fear, Separation, Isolation, Division	Love, Connection, Community
Control, Surveillance, Compliance, Abolition of Privacy	Freedom, Responsibility, Integrity, Trust
Realism, Cynicism, Manipulation	Idealism, Meliorism, Inspiration
Force, Violence, War, Militarism, Coercion, Propaganda, Infowars	Power, Non-violence, Peace, Harmony, Satyagraha (Power of Truth)
Centralisation, Globalisation	Decentralisation, Localisation
Digital ID, health passes, social credit	Bodily autonomy, cash
Fourth Industrial Revolution, 'Smart' Internet of Bodies and Things	Spiritual Renaissance, Revolution of Love, Wisdom and Beauty
Inhuman Technocratic Dystopia	Humane Supportive Communities

As both Gregg Braden and Anne Baring emphasise in their most recent books (*Pure Human* and *Divine Wisdom and the Holy Spirit – The Forgotten Feminine Face of God),* humanity is at an inflection point, a critical moment of choice involving our very nature as humans; if we pursue the transhumanist trajectory, this transition will prove irreversible, and we will lose the very qualities of empathy and compassion that reflect the essential Spirit within us all. We have to chart ethical and humane uses of our technology without surrendering our freedom and humanity in the process. You will find this report an essential briefing that will enable you to raise the crucial issues covered in your own circle of influence.

EXECUTIVE SUMMARY

1. *Transhumanism is a scientistic worldview* of great allure. By "scientistic" is meant a stance that accords to "science" a position in our cultural-political life that is actually unwarranted. It assumes that all important questions can be answered by the scientific method, and that all questions that cannot be so answered are unimportant and negligible. The first Galileo Report (https://galileocommission.org/report/) has dealt with scientism extensively, hence this topic is only cursively touched.
2. Importantly, *all theoretical systems, also scientism and transhumanism have to make assumptions that cannot be proven by the methods that are assumed* by them to be foundational. In other words, the foundations of scientism, part of which is materialism and the idea that conscious activity is derived from material interactions and produced by the brain, cannot be proven by scientism itself. *Scientism* is the methodological stance. *Materialism* is the ontological assumption about the true nature of the world. *Naturalism* is the reductionist idea that there are only natural causes, mediated by material interactions, that play a role in the world. This report uses these terms also interchangeably, depending on the context.
3. In a sense, both *scientism and transhumanism can be considered post-modern religions.* I deal briefly with the conceptual differences between true religions and ideologies such as Transhumanism. One major aspect, why transhumanism can be called a novel, post-modern religion is the hope it places in the power of science. Many of transhumanism's expectations concern the future and expected or hoped for breakthroughs. This is, among others, the hallmark of religion: to expect a better future. While the Christian religion places the fulfilment of this hope in a transcendent reality, transhumanists expect it to be realized here, materially, on earth. In that sense, *transhumanism is a religion of matter and science.*
4. *Transhumanism has many sources*. Some trailblazers of transhumanism, like Google's former Chief Scientific Officer Ray Kurzweil, make out the miniaturization of computer technology, as well as the exponential *growth of processor speed* and capacity, as one of the major drivers of the technological side of transhumanist developments. In addition, *robotics, nanotechnology and genetic therapeutic developments* play an important role.
5. They all contribute to the basic theoretic-philosophical assumption of Transhumanism: *Biological evolution is a given*. It has produced human beings and with them science as the pinnacle of development. Now, *we humans can take evolution into our own hands and steer its direction*.

6. For instance, *we can and should 'upgrade' human beings* to make them smarter, healthier, give them desired traits, and, in general, improve on evolution to change the chances of an 'unfair lottery' in distribution of desired genes. This is, in the eyes of some authors, not only a possibility, but a moral obligation.
7. This upgrading will entail both *genetic engineering techniques and the interaction of technical systems*, such as computers and microprocessors, *with biological systems*. The goal of such interventions will be a kind of Übermensch, like foreseen by Nietzsche, or a *cyborg*, a mix of biological and cybernetic system.
8. Thus, *the medical field is one of the major play grounds for the enaction of transhumanist phantasies*. In order to bring transhumanist ideas to fruition it will be necessary to *mainstream genetic interventions*, as all upgrading that is not by interfaces such as brain computer interfaces, demands genetic interventions. These interventions will either have to deal with changes of the operations of cells, or with changes to the germline.
9. Arguably, the *COVID-19 vaccinations were the first step towards such an enaction*. They were the first gene-therapeutic interventions propagated world-wide and distributed to a considerable number of the world population. They forced human cells into changing their behavior, and thus constitute a proof-of-principle *experiment* conducted world-wide *of the applicability and acceptability of gene-therapeutic intervention*s. This is not to say that it was consciously devised as such by single individuals, although this might be possible. It is rather an example for the power and grip of transhumanist ideas.
10. One can also see other medical interventions in that light. Sildefanil (Viagra®) was argued to be the first transhumanist medical intervention. *Transhumanists also often refer to mood enhancers and other psychoactive drugs as examples of 'enhancements'*. These drugs, their efficacy and side-effect profiles are discussed critically.
11. When doing so, one can see a *common bias* which in summary constitutes a grave error on part of transhumanist believers: *Efficacy data are overrated and negative effects are ignored*. This is likely due to the lack of detailed knowledge of the major actors, none of whom have a detailed medical research background or the respective methodological skills to critically evaluate such research outcomes.
12. This bias is likely due to the *general assumption that all science is always good, and its results are by default benevolent and useful*. There are reasons to doubt that stance in medicine, at least regarding some aspects. These doubts are substantiated with some data that are normally conveniently ignored by scientistic enthusiasts.
13. *Another example of the transhumanist mindset is the recent transgender movement.* Long-term epidemiological data show that there is a very small percentage of the population who feel that their gender at birth is at odds with their experience. However, this group has grown over the last 20 years. It is unclear, whether the growth is due to the activism of a vocal minority, or whether it is a true phenomenon. One reason could be the release of endocrine disruptors into the environment, by pesticides, hormonal products or components of industrial processes. At any rate, one of the most vocal and wealthiest funders of both the transgender agenda and Transhumanist activities is Martine Rothblatt, a transhumanist and transgender person.
14. *If some of the flagships of medical gene-therapy are examined in detail*, for instance gene-therapy for cystic fibrosis, *one discovers major problems that face such therapies*, despite decades of funding and research. The same is true of some other interventions such as gene therapy for sickle cell disease or thalassemia. Although they work, currently the length of observation is some 12-16 months, they come at heavy costs, financially and in terms of side effects.

15. *The difficulties are inherent in our genetic make-up*: even cells have immune systems and expel alien genetic material. Also, the *genetic knowledge shown by some of the transhumanist enthusiasts is very defective and ignores the complicated interaction of genes with the epigenetic network and the role of this epigenetic network itself.*
16. Thus, the discussions are somewhat bizarre, as they *often start from assumptions that are wrong and express hopes that are unwarranted*.
17. Nevertheless, *the transhumanist stance is very powerful* and influential, *because it is* not a scientific hypothesis, but *a quasi-religious belief system*.
18. This can be seen in the promise and *attempts to abolish death*, which is seen as the final defeat of human life and of science. Thus, some transhumanist authors, such as Aubrey de Grey, argue for a concerted effort and funding to abolish aging and death. Others opt for cryopreservation until the diseases they might die of can be cured at a later time in the future of human research. Then they might be brought back to life, they hope. Foundations that offer this service have been extant for some time but up to now no one has been brought back to life.
19. I argue that this hope and *expectation to abolish death is self-defeating and based on flawed foundations*. If it were possible, it would lead to a gerontocracy and by default to a fascist regime that would have to control population growth drastically, apart from the fact that it is likely unsustainable economically and colonialist in its thinking.
20. *Brain-computer interfaces* have been in operation for some time now, for controlling some conditions such as epilepsy or amyotrophic lateral sclerosis. However, the hope to produce a viable system to hook up brains to computers are far out on the horizon. There are *some formidable obstacles to overcome*, and also here we see that the hopes are sustained at the expense of neglecting the problems, such as side effects and potentially negative effects, for instance of the microwave radiation necessary to operate some aspects of the devices.
21. The same seems true of the so-called *mind-uploading*. This *would necessitate flooding our bodies with billions of nanobots that could trace the activity of the brain in real time,* provided they pass the blood-brain barrier. It is, of course, predicated on the assumption that our personality is identical with our brain states, and consciousness is produced by the brain. This issue has been addressed in the last Galileo Report. The result was that such a materialist stance is likely not tenable.
22. Difficulties and reality notwithstanding, *transhumanist ideas have already a strong grip on the imagination of the population at large*. I have developed a short 9-item questionnaire asking about transhumanist beliefs. The questionnaire is reliable and in the process of being published. I present here the findings of a representative survey in Germany for the first time: *20% to 47% of the population in Germany hold beliefs that are expressions of some transhumanist belief system*. For instance, the item 'God is dead – we are God' is confirmed by 20% of the respondents.
23. Thus, *transhumanism* is not just a straw-man and belief system of some techno-freaks and mavericks, but *has penetrated our culture quite widely* already.
24. Hence, *it is necessary to start an open and critical discourse* about the question to what extent we wish this transhumanist agenda, such as genetic interventions or technical implants, to dominate our research plans and draw on public funds and resources. This report is meant to give a basis to such a critical discussion.

INTRODUCTION AND SUMMARY

In the first part of the Galileo Report (https://galileocommission.org/report/, accessed 26th March 2025) I argued that the materialist world-view, often dubbed the scientific world-view, or a naturalistic outlook, has to be distinguished from the scientific endeavour and from scientific practice (Walach, 2019). While science proper, what scientists do every day, is an important achievement that has brought numerous insights and benefits to mankind, the materialist ideology that often underpins a kind of scientism, or the scientific world-view is a stumbling block for progress. It ostracizes many phenomena that are germane to our human experience and it limits the scope of scientific exploration illicitly. I argued that we need an extended kind of science that integrates the first-person perspective, subjective experience in all its diverse forms, importantly also spiritual experience. This kind of extended science would provide a place for consciousness as an ontological reality, either as primary or coprimary to matter.

This current extension of the first Galileo Report focuses on Transhumanism, as a special version of scientism and naturalism. Transhumanism is not a special scientific discipline, strictly speaking, but more akin to a postmodern mythology or religious stance. Although the arguments of the first part of the Galileo Report also pertain to this kind of naturalism, it seems important to address it specially. It seems to me that Transhumanism is pervasive in our Western culture and has very much impregnated folk-lore, popular culture and some types of economic activities. Thus, it has a more subconscious hold on the public, and perhaps less so on the scientific community. It is also surreptitiously creeping into our portfolio of medical interventions in the form of gene-based, modified RNA interventions as a platform for all kinds of potential preventive or therapeutic purposes, or through the promise of allegedly extending human cognitive capacities through brain-computer-interfaces. One of its economic promotors, Elon Musk, is both owner of one of the biggest companies offering such promises, Neuralink, and a satellite network of some 7,000 satellites that cover the globe with microwave radiation to potentially coordinate a network of such an extended internet of things (IOT), and finally also human bodies (IOB). As Musk has been nominated an important figure in the new Trump administration, this transhumanistic vision is much more than a mere academic sand-play in small specialist conferences. It has the potential of changing the way we, ourselves, as humans will understand each other in the future, how we will interact with each other, and it will, most importantly, become a factor of political and economic power.

This is among the reasons, why it deserves a special treatment and also a dedicated analysis. Because the scope is very broad, I will mostly focus on the medical aspects of Transhumanism. I will not cover, or only sketch, issues around artificial intelligence and IT. But I think by thoroughly analysing one aspect of Transhumanism one can get an overall understanding of the movement, its promises and drawbacks.

Some transhumanists have identified death as the major enemy of humankind. They strive to abolish death. By that programme they are themselves assuming the place that has been traditionally held by an entity that goes by the name of 'God', 'The Sacred', 'Tao', 'Dharma', 'Nature', or by various other names. I do not want to suggest that these notions are all the same, but the principle is the same: that there is a reality that points beyond human nature, human understanding, and human power to act, and that it is within the remit of a cosmic intelligence, however named, to orchestrate evolutionary processes such as the lifespan of biological organisms, including human ones. It is important to note here: I am not favouring an old-fashioned, strawman-type of a transcendental entity, that acts from outside by doing something, such as the deistic watchmaker of old, who was supposed to have wound the clock, set it in motion and now observes it ticking. This would be bad theology by all means. One would rather have to develop a deeper understanding that positions such a transcendent entity right at the very heart of all evolutionary processes, like Whitehead did (Whitehead, 1932, 1978), and in his tradition process theology (Cobb, 1966; Epperson, 2009; Griffin, 1989), or as Hans Jonas has argued in his famous speech 'God after Auschwitz' (in Jonas, 1992, Chapt. 9).

Therefore, some sidelines into theology and philosophical-religious discourse might be appropriate. This will result in refuting the transhumanist claim that abolishing death is a worthwhile enterprise into which public or private money should be invested. While it is up to private benefactors how they want to use their money, there are quite a few examples that research programmes, once entrenched, tend to suck away at public funds as well. One famous recent example is how the sugar industry succeeded in turning the interest of the research community to fat as the culprit in causing cardiovascular disease, thereby setting the agenda for decades, diverting research money into flawed research, and, as an aside, contributing to the obesity epidemic (Kearns, Schmidt, & Glantz, 2016; Nestle, 2016; Taubes, 2001, 2013)

Thus, it seems important to analyse critically this claim that the abolition of death is a worthwhile goal. This leaves aside the question, whether it is at all possible to abolish death. Granted it might be possible the question is: should we pursue this path? My answer is: no. And I think I have good reasons for this answer, apart from the fact that I hold the a-priori chances that the programme will be successful for very slim, and hence investments of public funds would be squandering money.

A general strand of transhumanist thinking is the idea that we, as products of evolution, have now come to be the engines of evolution ourselves and that we define not only the pace, but also the goal and the trajectory of evolutionary progress. In order to do this, we need to be able to access the basis for evolutionary diversity, our genetic code. While we now can access and read it, even though we may only understand it partially, we need to actively change it, if we want to direct the evolutionary lottery towards what we see as beneficial. This would mean genetic engineering, but not with tomatoes, potatoes or corn, but with humans. This has been a moral taboo except for very narrowly defined therapeutic situations up to now. A transhumanist agenda would require the lifting of this moral taboo and also intervening in the germ lines of humans in order to fix genetic changes thought to be benevolent.

This is a huge step, and the thinking, the preconditions and promises behind this enterprise need to be carefully scrutinized. In the literature this goes by the benign term of 'enhancement', suggesting a kind of linear improvement of something. However, I think it is fair to say that 'enhancement' is a purely theoretical term. Sir Karl Popper once called a materialist ontology 'promissory' (Popper & Eccles, 1977), analogous to promissory notes that promised the owner of the note some money in the future if handed in to the right person. The term 'enhancement' is promissory in a similar sense: It promises us something that many people purportedly want, namely enhancement of some kind, if, and only if, we are willing to lift the

taboo of genetic intervention into germlines. In contradistinction to an economic promissory note there is no capital and no true value behind the promise. It is purely speculative, and this speculation denounces this whole movement for what it is: a religious hope for a kind of heaven immanent in our world. While the 'heaven' of religions all over the world is always transcendent, i.e. not to be found here in the material world but in some other realm, Transhumanism as a secular religion tries to drag heaven into its materialization here on earth. This is in a way intriguing, but also naïve to the extreme. For it happens without the necessary awareness of what is being attempted and without proper reflection on the terms and conditions.

'Heaven', traditionally speaking, is a place in the future and a place in another world which has the function to motivate us here, in this world, towards moral, constructive and human action. This is precisely so, because it is in a way utopian, a no-place. The term 'utopia' has Greek roots (ou - no, topos - place) meaning 'no place' or 'nowhere'. In the same sense Thomas Moore's Utopia had the function to motivate political and behavioural change (Starbatty, 2016). If such a utopia is supposed to materialize, if heaven is to be enacted on earth, then this particular utopia has lost its function and thrust. We should be wary of such attempts. The history of the 20th century is full of promises to construct heaven on earth. These attempts have been extremely bloody, inhuman, and were more akin to hell on earth than anything else, whether it was the Nazi ideology in Germany, the communist ideology in the Soviet Union and its satellite states, or the cultural revolution of Mao Zedong in China. Let us remember: all of them said they were following the path of science. All of them were denying any transcendent reality. All of them were promising a better life, which never arrived, nowhere. All of them were claiming to have the true theory of something, based on scientific evidence. And all of them crushed, bitterly, taking millions down in their fall.

Let us take the example of eugenics, which was the pet theory of German National Socialists. It was developed by Huxley and Galton in England, embraced by eugenicists in England and the US. Race theory and eugenics was considered a fact of science, irrefutably empirically supported, and probably one of the first fields where 'scientific consensus' about a fact was achieved (which should teach us: whenever a scientific 'consensus' is being proclaimed we should be careful). The intellectual elite of the time was 'following the science' in embracing eugenics. It formed the basis both of negative eugenics, which strove to get rid of 'bad' genetic traits by either eliminating their bearers, as the German Nazis attempted in their euthanasia program and in the holocaust, as well as of positive eugenics which strove to breed better humans by organizing optimal mating matches, as the SS did in Germany in their 'Lebensborn (source of life)' institutions. It is not by accident that these ideas resulted in fascist political systems. If something is purportedly without alternative, because it is embraced with alleged scientific support and unblemished religious fervour, then there is a tendency marching the whole world down the lane to happiness, and those who do not want to be made happy have to convinced, by force if need be.

We saw this very mindset in action during the COVID-19 'vaccination' campaign. I put 'vaccination' in inverted commas, because it was no vaccination, but a gene-therapeutic preventive strategy masquerading as vaccination and appropriating the positive connotation of the term 'vaccination'. It was in fact a huge field experiment in genetic engineering with humans. This unmasks this whole enterprise as a somewhat crude test of one of the most important instruments of a transhumanist agenda, namely genetic interventions on a mass scale. What happened during this COVID-19 'vaccination' campaign is clearly a field experiment of a hitherto unknown type of intervention with dramatically lowered safety thresholds due to the pandemic state of the world. I do not at all insinuate that vaccinations are superfluous or

bad, nor do I claim that the COVID-19 pandemic was a complete scam. Vaccinations are in all likelihood beneficial in a public health sense, even though some individuals may suffer severe side effects. And SARS-CoV-2 was a virus potentially dangerous for certain groups of people. It was likely of military origin, and hence potentially problematic. Therefore, the anxiety and fear that was being propagated was at least partially understandable and warranted.

Therefore, it will be important to analyse this situation in more depth, both scientifically and politically, especially how the genetic preventive strategies were implemented without any serious regulation and to what effect. This will necessitate going into some details and also some technicalities, which I will strive to reduce as much as possible. We will see that the promises were overblown and that these products are more problematic than normally communicated. I draw here not only on the scientific literature, which I have followed closely, but also on quite a few original studies of our own. I conducted an extensive interview study with some 40 experts from medicine, health, politics, economics, the media, to name but the most important groups. All of them were vocal in the public scene and brought some important element of expertise to the table, which more often than not was either not taken up by the mainstream narrative or fought against. The interviews are not formally published yet, but I used the material to write a German language novel, where I have condensed my insights. I will draw on this material in the context of this report as well, as it helps clarify some matters.

No doubt, some readers will at this point, at the latest, shout 'conspiracy theory' and stop thinking and reading. It is important to realize that the concept of a 'conspiracy theory' is analytically void. It has only one function: to delegitimize a legitimate question and ostracize the claim from public discourse. While the term has older roots, it was actively instrumentalized by the CIA in the aftermath of the assassination of John F. Kennedy 1963 in their well-known memo that was sent out to the press and to press agencies, saying that everyone doubting the official version of the Warren Commission, the official commission, should be branded a 'conspiracy theorist'. If we follow US polls, then more than half of all Americans are conspiracy theorists, because they do not believe the official narrative of the murder of John F. Kennedy. The term 'conspiracy theory', as I said, is analytically void. This is the case, because it does not clarify anything. It does not explain why someone holds an opinion that is going counter to the mainstream narrative. It does not clarify why the mainstream narrative is disbelieved. If we look at attempts to operationalize the construct, for instance in questionnaires, we see that the items used make so many assumptions that it is easy to spot: the term conspiracy theorist or conspiracy theory is simply an attempt at disqualifying political opposition without taking arguments seriously (Wood, 2016). This disqualification happens in the service of political power. In Marxist terminology – which I am not a fan of, just to clarify – it is an instrument of domination in the hands of the powerful. This does not exclude or deny that some theories are so silly or irrelevant that they do not even qualify as 'conspiracies', let alone 'theory', simply because they serve no other purpose than to create a consistent narrative. They cannot be empirically tested, in principle, and hence are scientifically and politically irrelevant. Most theories, however, that are branded 'dangerous conspiracy' theories are simply going counter the mainstream narrative of the politically powerful and could, in theory, be tested, vindicated or proven wrong, if enough information were available.

Historically speaking, conspiracies were rather the norm than the exception in times of upheaval, and an instrument of power change. The topical example is the conspiration to murder Caesar. But we can also go into the recent past and focus on the burning of the German Reichstag in 1933 (Kugel, 2016). It was politically engineered by the SA and made to appear as arson by a single arsonist who was said to be in liaison with communists. This gave the Nazi party reason to install specific laws that restricted democratic freedom rights, the 'Reichser-

mächtigungsgsetz – Empire Enabling Law'. Without this event Hitler might not have received such a full-fledged power so quickly. These are only two examples of how conspiracies are active agents of history in many cases. During the COVID-19 pandemic it became obvious that what was called a conspiracy theory initially, became a fact a few weeks later. For instance, in Germany initially everyone was called a conspiracy theorist, who, at the beginning of 2020 said there was a dangerous virus coming our way. A few weeks later those who doubted the seriousness of the threat were called conspiracy theorists. This terminology is analytically void and should therefore be avoided. I am critical of any theory that tries to explain each and every event by recourse to a grand scheme. But that does not mean that sometimes there are smaller or grander schemes operative back stage, and it helps, if we understand these. In that sense I think that transhumanist ideas, economic interests, and political attempts at control have formed an implicit alliance, not in the sense of actual pacts being made, but by way of common ideology and interests that have led to anti-democratic and quasi-fascist legislation and action. Was this a foretaste of things to come? I hope not, and I will analyse what we need to do and be aware of.

The way how the COVID-19 pandemic was instrumentalized to nudge whole countries into vaccination mandates is a good example how a transhumanist stance is, implicitly, coupled with a politically fascist way of exercising power. It will therefore be necessary to analyse this example carefully to understand limitations, mechanisms, promises and dangers of such a stance. The Secretary General of the WHO has assembled a kind of scientific board that advises him on matters of behavioural action, communication and public relations, among other things. The head of this group used to be Cass Sunstein. He used to work with the only psychologist ever to earn a Nobel Prize, Daniel Kahneman. He is the co-author of the seminal work 'Nudging', which explains how one can use behavioural techniques to nudge people towards goals that are thought to be beneficial for them, even though they themselves do not know that they are beneficial, or do not want to adopt them, although they know they really should (Thaler & Sunstein, 2008).

Such a strategy is underpinned by a paternalistic stance that pretends to know what is good for others, even for all. It is a typical overstatement of the remit of scientific insight. Scientific insights are rarely permanent. More often than not they have limits, temporal and population-wise. Medical knowledge usually has a half-life of a few years, and it refers to the average person who actually does not exist. It is extremely difficult for practitioners to apply this knowledge to an individual patient, who is unique and not average. What was true and necessary yesterday may be dangerous and ethically or legally problematic tomorrow. Small example: in former times mercury was the only known bactericide, and it was lavishly employed to treat syphilis. This was the mainstream teaching, thought to be true and helpful. The toxicity of mercury was only poorly understood. It is quite likely that more patients died of the cure than of the disease, among them the composer Franz Schubert and the writer Karen Blixen (Goldwater, 1972; Weismann, 1995). Even in our days the potential danger of mercury was played down due to powerful political reasons and fear of litigation (Mutter, 2011; Mutter, Curth, Naumann, Deth, & Walach, 2010; Mutter, Naumann, Schneider, Walach, & Haley, 2005; Walach, Mutter, & Deth, 2015).

Using science to know what is good for others is a dangerous stance. There is one striking example: For decades eggs were said to be bad for you, because of their potential cholesterol content. Apart from the fact that the whole science of fat has become scrutinized critically (Kealey, 2019; Taubes, 2001, 2013), a definitive meta-analysis, after analysing data of 5,54 million of man-years worth of observation concluded: eggs are no risk for premature mortal-

ity (Drouin-Chartier et al., 2020). We cannot use a scientific status quo to derive goals that people can be forced to accept beyond any political discourse.

It might be tempting here to go into a deeper political analysis: There have been many attempts at installing 'global governance' to overcome the fragmented responses of nation states in situations that demand unified action (Chatterjee & Finger, 1994; Kennedy, 2007). And these supporters of global governance are often using medical threats to move their own agenda forward. This was obvious during the COVID-19 pandemic as well. It is visible in the current discussions around the WHO pandemic treaties and international health regulations (Bell, 2023; Stuckelberger & Urbina, 2020). They have been accepted, and currently only the practical application rules, documented in an Appendix, are to be discussed in the next World Health Assembly 2026. But apart from that the first step to a global governance structure in the case of global health emergencies have been successfully implemented. In such a situation – to be determined by the General Secretary of the WHO and his advisors – local governments are obliged to bow to the greater wisdom of this global governance structure, which itself is not answerable to people and cannot be simply divested of powers by an election. I will not pursue this avenue more deeply, but it should be taken into consideration.

Medicine is the field where the fears and hopes of humans, their pains and joys, their aspirations for a life without suffering intersect with economic added value and hence with political decisions. It is the area where transhumanist aspirations have to enter the field if they are to be taken seriously and if they are to offer a proof of concept of their ideas of enhancement of the human condition. *Hence, medical progress and the transhumanist agenda are deeply intertwined.* Most medical researchers that work on some aspect of improving the human condition are not transhumanists and most will be probably completely unaware of the transhumanist agenda. But many may be implicitly following such an agenda without even being aware of it. Therefore, it is useful to spell out that intersection, it seems to me, such that better informed and conscious choices can be made.

After all, it is an important driver for scientific and medical progress not only to understand conditions, but also to use this understanding for improving health. This is a genuine scientific and human striving. Where does it intersect with a transhumanist agenda or might even profit from it? How would a genuine scientific progress and a quasi-religious concept of progress as transpiring through the transhumanist discourse be similar or different?

There is hardly anything on this earth that is completely wrong or purely bad. In most cases, each and every idea has some truth and value to it, even though it is often hidden beneath the rubbish of sloppy thinking and limited understanding. The same is likely true for Transhumanism. A more philosophical stance is one of the final lessons the German philosopher Gadamer taught (Gadamer, 1975, orig. 1960). He was one of the major proponents of hermeneutics, the art of understanding. When asked a few years before his death, after he had passed his hundredth birthday, by a reporter, how he would sum up his teaching in one sentence, he said, after a period of thinking: 'The other person might be right.'

This is also the hermeneutical stance I want to apply: There will be something worthwhile. Otherwise, Transhumanism would not have such an appeal. It is important to understand this element of fascination and to perhaps channel it into proper courses. In my view, some of the potential nuggets of gold might be the utopian character, the attempt to bring some, albeit secularized, religious fervour back into the oftentimes dull practice of science. Another important message might be to reconnect to our hopes and aspirations, which would entail going beyond the hedonistic satisfaction of our senses and drives, dedicating ourselves to some higher goal.

This is a broad outline of what I am going to discuss in this report.

Transhumanism – A Précis

The term 'transhumanism' is precisely the same age as I am. It was coined by Julian Huxley in 1957 (Huxley, 2015 (orig. 1957), p. 15):

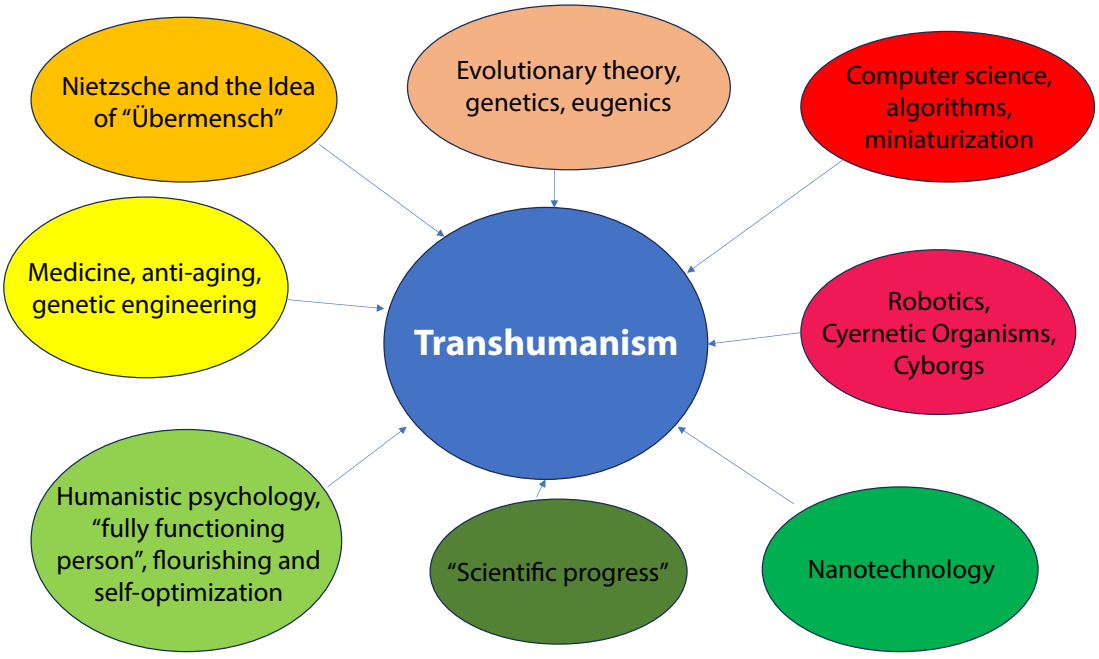
> *'The human species can, if it wishes, transcend itself... as humanity. We need a name for this new belief. Perhaps transhumanism will serve: man remaining man, but transcending himself, by realizing new possibilities of and for his human nature.'*

This is quite an innocent wording which emphasizes the self-transcending aspect. This was always part and parcel of all spiritual traditions: human beings felt obliged to transcend themselves, to overcome their selfishness, their self-centredness, their moral limitations. In that old ascetic sense self-transcendence was the currency of moral and spiritual growth. What is new with the advent of evolutionary theory in liaison with technical gadgets, computer science, nanotechnology, robotics, and genetic engineering is the idea that we might be able, even should have the moral obligation, to use our knowledge to steer this process of self-transcendence (Harris, 2007, 2009).

Transhumanism is like a lake that is fed by many rivers. The most important of them I have depicted in Figure 1.

Some of the influences are obvious, such as the generic stance of 'scientific progress', which has been an important motive since the Enlightenment movement. Others are less obvious but important nevertheless, such as the humanistic psychological tradition. Maslow emphasized the fact that humans are developing and trying to go beyond their own limits into self-transcendence. He described such persons and coined the term 'fully functioning person' (Maslow, 1954). He meant someone who has completely realized all his or her potentials and by the same token was happy, fulfilled, empathic and sociable, in short, a perfect human being. At the end of his career he realized that even that was not sufficient and emphasized the

Figure 1 – The most important tributaries to Transhumanism



necessity of continuous self-transcendence in what he called his 'Theory Z' (Maslow, 1970). To what extent this idea was actively appropriated by transhumanist writers I am not sure. But it certainly was in the air of the cultural climate in the 70ies and the post-Vietnam war protest era, when some of the transhumanist activists were raised. So, an educated guess would be that this idea that finally led to the idea of Positive Psychology and 'human flourishing' (Diener et al., 2010; Jankowski et al., 2020; Seligman & Csikszentmihalyi, 2000) was an important stepping stone toward the idea of transhumanism. Certainly Steven Pinker made human flourishing one of the central goals of the modern enlightenment endeavour (Pinker, 2018), and thus transported Maslow's ideas into the realm of naturalistic theorizing that is very close to the agenda of transhumanists.

Perhaps the deepest and oldest ideological roots are with Friedrich Nietzsche who, in his concept of a 'Übermensch' or superhuman coined the idea of a human being that has transcended all boundaries of moral, religious and other limitations. It is of little help that this Nietzschean idea was also the beacon for Hitler and the like. This does little to diminish the fascination of Nietzsche, and active confessing transhumanists like the German philosopher Stephan Sorgner explicitly refer to Nietzsche (Sorgner, 2010, 2019), even though critical thinkers like Hauskeller point out the massive ideological differences (Hauskeller, 2016). We are on the way to the 'Übermensch', Sorgner says. We either follow that path, or we will soon become extinct. Thereby, he connects the Nietzschean concept with evolutionary theory, a *topos* that most transhumanists use. Whether Nietzsche would have been happy with that move, I am not so sure. But that is perhaps also irrelevant.

Evolutionary theory is an important source. This is already clear with the text by Huxley quoted above that is at the origin of the whole movement. Julian Huxley was an evolutionary theorist and evolution is one of the major arguments throughout the realm of transhumanist writing. The argument is simple and convincing at first sight: we are products of evolution. This is clearly a kind of axiom that no one in his right mind would currently openly contest, except some American religious fundamentalists who have not understood that biblical texts are in need of understanding, and not factual descriptions (Walach, 2007). While there are still many details to be filled in, especially regarding steps, thresholds and mechanisms (Hands, 2015), evolution is a given (Jonas, 1992). If evolution is accepted as a principal axiom, then it follows that we, as results of this evolution, are also the first organisms that have understood this and evolution's basic mechanisms. Therefore, we are also the ones who can make use of our understanding and direct the process of evolution. We make the step from objects of evolution to the subjects of evolution. We become the maker and the designer of the evolutionary process.

The vehicle for this is our understanding and unlocking of the genetic code, as it is precisely this code that is supposed to be the material manifestation of the evolutionary process. Now, since we understand this code, at least in its basic workings, its molecular machinery associated with it, we might also want to actively use it: by changing genotype in order to change phenotype. By changing the genes, we will be changing the traits and qualities of human beings.

At this point it might be important to point out this fundamental difference: phenotype is what we see, how an organism appears to us from the outside, for instance whether we are blonde or dark, bald or full of hair. Genotype is the genetic make-up that causes this phenotype. A common misunderstanding, also in the transhumanist community it seems to me, is the idea that phenotype is determined by the genotype *alone*. We know meanwhile that the epigenetic landscape plays a very important role. Genes are not always active. All our cells contain the full genetic material. But cells in my fingers do not express liver enzymes, although they potentially could, and liver cells do not contract like muscle cells. And white

blood cells fulfil yet other functions, although they contain the same set of genes as all other cells. While white blood cells die after some 6 to 200 days or so and are being regenerated, liver cells are regenerated after some weeks. All cells are regenerated after some time, such that within a couple of months we are completely 'new', materially speaking, although we have the same appearance, genetic make-up etc. This is so, because there is an important layer between our genes and what they produce, called the epigenetic landscape. This is a set of proteins, enzymes and little understood snippets of DNA or RNA that determine, which genes are being switched on or off. They surround the genes, and the way they are folded or activated allows other proteins to access genes and read their message, or they are blocked.

The way this happens is still not sufficiently understood. Likely, this epigenetic landscape is also an additional vehicle for transmission of experiences to offspring. While we thought until recently that only genes are being transmitted and are the carriers of phenotypical expression, we know now that some epigenetic expressions can also be transferred. This might explain a type of heredity, that was claimed by Lamarck and long shunned by scientists. Lamarck claimed that individual experiences can be transferred through heredity. This idea was outlawed until the importance of epigenetics became clear. Now some researchers assume that some of it is transmitted. Clearly, the basic dogma of molecular biology introduced by Watson and Crick has fallen: that there is only one direction of causal influence: from genes to proteins to behaviour. There is also a reverse causality: from behaviour to proteins to genetic expression via the epigenetic pathways. It seems to me that only a few transhumanist writers are aware of this and have understood the massive implications of this biological fact.

Transhumanists and their kin fall short of the scientific insights if they think that a little bit of genetic engineering will do. The important point is not only the genes, but the epigenetic landscape that determines which genes are being switched on and read, and which are being switched off and silenced. A lot of what we think is genetically based is not only not localized in genes, but more often than not in a network of genes, and, even more importantly, defined by epigenetic variation and changes. This is hugely complex.

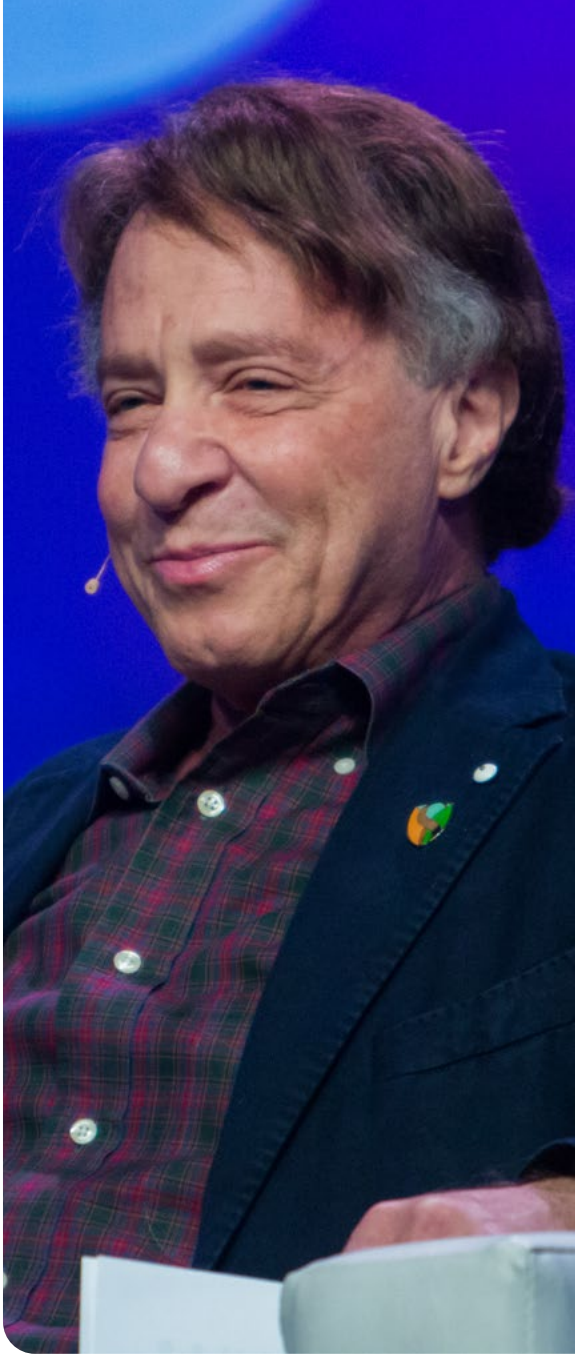
Nevertheless, progress in genetics has fuelled phantasies of engineering. There are some genes that are quite strongly and monocausally linked to a certain phenotype of a disease. By influencing these genes via gene-therapy we can beneficially intervene in some severe cases of disease. This suggests that we might be able to also actively intervene by genetically engineering future humans. Why would a couple not want their child to have better genes that improve cognition, memory, impulse control, sociability, etc.? Why should we not alter the genetic outfit to be more socially acceptable? We will discuss that later, but we see already: the lure of manipulation is strong, because it is immanent in the scientific enterprise. Once we understand something, we use this understanding to change the world to suit our needs. We have managed to understand Bernoulli's laws and now build airplanes that make use of them and fly reliably most of the time. Why not do the same with genetics?

The manipulative thrust is germane to science, and following it was mainly beneficial up to now, it seems. Why not here? The very short introduction to epigenetics above might actually provide some of the answer: this is because it is exceedingly complex and because we ignore complexity at our peril. But we can see why and how evolutionary theory and biology is one major driver of transhumanism.

A major inspiring voice of the transhumanist movement is the futurist and engineer Ray Kurzweil. He used to be Google's Chief Scientific Officer and developer of its future programmes. He predicted already 20 years ago that the major drivers of the transhumanist revolution will be the rapid pace of computer development and miniaturization, robotics, gene-therapy and nanotechnology (Kurzweil, 1999; Kurzweil & Grossman, 2004). He thought

that these four will go hand in hand, such that intelligent nanomachines will be developed which have enough computing power in miniature format to steer organismic processes such as immune processes more efficiently than the organism. These nano-machines, combined with exceedingly rapid computers and clever algorithms will revolutionize nearly everything, he thought. These elements will go hand in hand to allow systems that outperform all organismic systems, from brain to immune system, and will therefore help humans to overcome many of their conventional limitations. In his fantasies, he foresaw a completely re-engineered human biology, based on technical gadgets: nanobots that contain all the genetic code, perform all the functions of the immune system, without fail and consequent illness, do whatever our cells do, but much better. The human being is completely reengineered on the basis of computer science, robotics, and nano-technology.

Here, he touches base with quite another movement that comes from medical anti-ageing research. Understanding the processes that lead to ageing and eventually death is an important field in medicine. This is so, not only because it helps people stay healthy for longer. Ray Kurzweil confessed to taking some 70 supplements of different kinds each day to help his organism stay healthy and get infusions once per week (Kurzweil & Grossman, 2004). The idea would be: once we understand these processes fully, we might be able to reverse-engineer ageing into health and longevity. We know that our genetic makeup would allow for roughly 120 or so healthy years of life, if no genetic catastrophe like cancer, cardiovascular disease, Alzheimer's, or an accident intervenes. Anti-ageing research tries to figure out how we might achieve this. Some radical thinkers in the transhumanist movement like Aubrey de Grey are trying to solve the problem of death for good. If we know how to stop aging and falling ill, we might extend life indefinitely and thus overcome death. Yuval Noah Harari has analysed correctly, in my view, that the project of abolishing death is one of the major projects of the postmodern era (Harari, 2017). A whole community of adepts are following this path, trying to solve little puzzles in order to achieve the goal of postponing senescence in order to abolish death. There are a lot of people around that share the sentiment that death is the ultimate evil of humanity. I shall argue on the contrary that it is the ultimate goal of our lives.



Ray Kurzweil

Another important element of this tradition is the idea of a cyborg, a cybernetic organism, where technological implements are married to biological systems. The simplest example is a pace-maker, where an intelligent system monitors heart activity and, if syncopes or similar irregularities happen, activates the heart autonomously by a slight electric shock. Here, a technical implement is intimately connected to a biological system, the heart, without the bearer ever realizing it except in case of an emergency. And if the bearer realizes the emergency through the electric shock, the emergency is already dealt with and over.

In the same vein, one can imagine that various other implements might be developed, such as brain-computer interfaces, which might allow the bearer to access huge amounts of data which are externally saved in cloud storage for instance, or to muster processor power externally. The US army already uses a large number of such implements, like night goggles, exo-skeletons, and we can anticipate the moment, were electrodes implanted in certain brain areas will be used to steer soldiers or give them certain impulses, enhance their aggressiveness or stamina, etc.

The end product will be a hybrid between human being and machine, a cyborg. Pop culture has already exploited this vision in many Hollywood films, graphic and literature novels. Whether it will remain a vision, or become true is currently a matter for speculation. At any rate, this vision seems to be another important driver of the transhumanist agenda.

Miniaturization helps along: we have been able to develop nano-bots the size of a few nano-meters to a micron or so that can deliver medications to specific places in the body, where they are needed (Leary, 2022; Storrs Hall, 1993, 2008). They can be introduced into the body, their passage passively monitored and once they reach their target, the liver, for instance, or a tumour, they can be triggered by an outside electromagnetic signal such that they open and deliver their cargo. Network architectures that combine small nano-engines implanted in the body and taking electric energy out of physiological processes with outside signals, from network stations, perhaps controlled by various outside monitoring stations have already been developed (Balghusoon & Mahfoudh, 2020; Huang et al., 2019; Wiley, 2022). The idea of remote monitoring and control of human physiology, at least partly, is already a potential reality.

For now, I hope I have illustrated the most important tributaries that lead to transhumanism as an ideology. There are certainly many more, smaller and broader ones. But these are the most important ones. In the next section I want to delineate why I see Transhumanism as an ideology, and what distinguishes an ideology from a scientific theory and a religion.

But before I do this, another distinction is in place.

Transhumanism and Posthumanism

Postmodernity is the intellectual climate that arose out of Lyotard's analysis that the time of the great narratives, mainly the great religious narratives of salvation, like in Christianity and Judaism, is over (Lyotard, 1979). Nor is there any truth available apart from the realm of social discourse, language and political power (Foucault, 1991, orig. 1974). Science is also only one narrative among many. If there is no truth, and we are only dealing with images and simulacra of reality that bear only a vague resemblance to its original and that are constructed for certain purposes, then our world is actually strung between the poles of arbitrariness and power. The work of academic analysis can then only be to analyse the power discourses, unmask their goals and describe the network of actors (Latour, 1999; Latour & Bastide, 1986).

One such discourse is the discourse around the human nature and its special role in the universe. This essentialist talk is poisoned thinking for true postmodernists. Hence one of the

early postmodern projects was to deconstruct the discourse around human nature. Humans are not special. They are not different and not better than animals, nor are they different from machines. The political, practical and theoretical goal of this type of thinking is the 'posthuman' (Birnbacher, 2008; Miah, 2008; Valera, 2014), a person who has fully understood that it – one would not even say he or she – is no different from anything else, neither better nor worse, not even different (Haraway, 1991).

This posthumanism is radically different from the transhumanist discourse. While the transhumanist discourse is firmly rooted in the natural sciences and their realism, the posthumanist discourse has rejected all realism, all superiority of scientific approaches to nature and all talk of superior knowledge and agency by virtue of scientific methodology. Although some transhumanists also use the term 'posthuman' as the final goal of the transhumanist enterprise (Agar, 2008; Bostrom, 2008; Hughes, 2004; Miah, 2008; Savulescu, 2009), this must not be mixed up with the postmodern discourse of 'posthumanity'.

I am not going to dive into that type of post-modern discourse. I must confess not only my aversion, but also my lack of depth in knowledge here. I am in keeping with Michael Esfeld here, professor of history and theory of science in Lausanne, who has recently published an important book in which he criticizes this postmodern stance for giving up all relationship with reality, which in the end leads to complete arbitrariness in science, and to a fascist stance in political decisions, because certain postmodern positions become politically correct , despite or irrespective of real situations and scientific facts. (Esfeld & Lopez, 2024)

Suffice it to say here that the postmodern academic discourse of 'posthumanity' is radically different from the natural science inspired discourse of transhumanism. It is only the latter which interests me here, and if transhumanist authors use the term 'posthumanity', they normally do it as a visionary project of the future, when all transhumanist visions are fulfilled.

Michael Esfeld

TRANSHUMANISM – A POSTMODERN IDEOLOGY – OR RATHER: RELIGION?

I said in the Introduction that I see Transhumanism as a kind of ideology or postmodern religion. This requires some justification, as 'religion' seems to be the typical antithesis to 'science.' And in what sense would the two terms be different from 'ideology'? And in what sense would Transhumanism be an ideology? And would that be bad, desirable, or neutral? Let me elaborate.

I can give only preliminary definitions to make clear what I mean. Final definitions are always the result of complete understanding, as Aristotle already realized. Such a complete understanding is arguably beyond the horizon. In that sense, I can only offer preliminary definitions to elucidate usage of terms.

Science

'Science' I have already defined in my first Galileo Report pragmatically: It is the joint activity of scientists around the world to understand nature and in that process of understanding guard, as much as possible, against error. This happens by using controls in experiments and critical discourse in public communication. It is worthwhile to point out: this is a purely pragmatic definition which points to the activities of scientists, not to any body of knowledge, certainty or laws. This is deliberate: knowledge changes, so does insight into laws. For instance, Newton's laws of motion, once thought to be universally valid, changed in scope with the advent of relativity theory and quantum theory. These new insights made clear: in the realm of the very small different laws are operative, namely the laws of quantum theory. In the realm of the very large scales of the universe relativity theory has to be applied. Newton's laws are approximations that are valid in the macroscopic realm of our world. In the same sense, what is considered knowledge at one point of time might be turned upside down a few years later. Today's knowledge might be tomorrow's error. Hence, I contend, a good definition of science should be pragmatic and operational and not refer to any current knowledge or content. It is the very essence of science to query consensus critically and to question purported secure knowledge.

The history of science is full of examples where once accepted knowledge has been overthrown, securities thought unshakeable have been destroyed, and things thought impossible prove to be true. I have given an example of the first kind above: eggs were thought to be bad for you (Keys, 1953). It has been shown that this is wrong (Drouin-Chartier et al., 2020).

Formerly people accepted that the Earth was flat, and once ships would venture out too far, they would drop off the rim of the world into the void. Already Roger Bacon in his *Opus Majus*, written 1267, doubted this wisdom and advanced arguments that the Earth was rounded and likely a globe (Bacon, 1897, orig. 1267),[1] and it took another 200 years, roughly, until it became accepted knowledge, when Magellan in 1520 sailed around the globe. Why it was that people, houses, stones and chairs did not fall off the Earth into the cosmos was only explained with the idea of gravity, what was codified another 150 years later with Newton's theory. A final example for things thought impossible is quantum entanglement, the fact that a quantum system remains correlated no matter how far in time or space it is separated, with seemingly instantaneous effects that defy causality and special relativity. Einstein thought it a ridiculous idea (Einstein, Podolsky, & Rosen, 1935), but now it is an accepted fact, worthy of a Nobel Prize and empirically proven in a multitude of cases (Aspect, Dalibard, & Roger, 1982; Aspect, Grangier, & Roger, 1982; Gröblacher et al., 2007; Handsteiner et al., 2017).

Thus, it is a very bad idea to define science or a scientific stance with reference to currently accepted knowledge or insights thought to be definitive. If there is anything final in science then it is the likelihood that there is no final security and insight. Bernoulli's laws seem secure and true. They explain why airplanes fly. But it might be possible that one day someone finds a way to engineer the quantum vacuum such that gravity and Bernoulli's laws become irrelevant and that ways of transport might become possible we cannot even dream of. It might be conceivable - and some physicists deem it necessary - that an overarching physical field theory will be developed that allows integrating relativity theory with quantum theory to find a grand theory of physics (Carr, 2015). No such theory is currently accepted but

Time Magazine:
Cholesterol, *1984 and 1999*

[1] The decisive arguments can be found in Chapter IV.10 in the first volume (p. 152 ff.), De Figura Mundi. Here Bacon argues that the world must be round. This can already be deduced geometrically, because when on the mast the approaching coast can be seen earlier than from the ship itself. Hence there must be a curvature. He also mentions other arguments and data. This information was likely contained in a compendium of Bacon's which Columbus had in his possession.

many attempts are underway. If such a theory is found it might explain novel phenomena currently thought beyond the scope of science.

These are only some reasons why I think only a pragmatic and operational definition of science is the best way to describe science, and that all references to laws, purported definitive knowledge, etc. should be discarded. And when I use the term 'science' I will use it in this operational, pragmatic way. Such a view also accepts that methodological standards will change according to new insights.

I will give one example: currently the methodological stance accepted for the testing of new pharmaceutical substances is the double-blind, placebo-controlled trial. Here, a new substance is being given to an experimental group, while a control substance called a placebo is given to a control group. The placebo is normally manufactured in a way that recipients of true medicine and placebo cannot distinguish the two, nor should doctors or nurses be able to (that this is very rarely the case, we leave out of consideration for now, as we are concerned with the ideal case). Because of that situation all participants can be 'blinded', i.e. they do not know who is receiving what, thereby eliminating all psychological factors like hope, expectation, knowledge, etc. (Kaptchuk, 1998). Now, importantly, this set-up, considered current best practice, makes some very clear assumptions that are rarely discussed or criticized. One assumption is that pharmacological and psychological effects are simply additive. i.e., if we study the pharmacological effects separately from its psychological effects, we know the 'true' pharmacological effect size, which we can later add up with all the placebo-effects to a full effect size.

This assumption is probably wrong, as the effects are likely not additive but form some kind of interactions, that may enhance or diminish the purported 'true' pharmacological effect (Boussageon et al., 2022; Walach, 2016; Walach & Loef, 2015). Another assumption is the separability of the two groups. Currently, it seems completely rational to assume that the entity in such a methodological set-up are individual patients, and hence you can blind them and separate out effects. But what, if these assumptions are wrong? What, if the entity is the full trial and effects might be correlated across groups as we have repeatedly found (Schmidt, Loef, Ostermann, & Walach, 2024; Walach & Maidhof, 1999; Walach, Sadaghiani, Dehm, & Bierman, 2005)? Perhaps the separability assumption is wrong? Then the effects could be 'smeared' and correlated between the two groups, but only, because the randomized blinded setting creates a system, within which this is possible, an instance of a generalized kind of entanglement perhaps (Walach & von Stillfried, 2011a, 2011b)? If this were so, then the knowledge from such trials would be incomplete, because artificial. Another assumption is that the context of an intervention is irrelevant. Against this assumption we have also many empirical data that throw doubt on its veracity (Schmidt, 2023). These are three potential arguments as to why the current methodological best standard of pharmaceutical testing could be wrong. If these arguments are proven true in the future, this will lead to a change of methodological standards.

This current standard was only introduced about 100 years ago when pharmacologists like Martini (1932), and later the group assembled in the Cornell Conferences on Therapy realized the power of psychology and introduced blinding and placebo-control into medical testing (Conferences on Therapy, 1946, 1954). This shifted methodological standards. In the same way, they might be shifted again.

Thus, it is always a bad idea to consider current standards the best. They are simply the best for us currently, because we do not know any better, and because we humans have a bias by which we consider current standards to be better than what was around previously, and by the same token we find it difficult to conceive things differently. Therefore, it is not possible to

use any method or any standard to define science, such as the experimental method, or mathematical modelling, as it is always conceivable, as has happened with methods in the past, that shortcomings will be discovered and thus methods be discarded and new methodological standards set up that were previously unthinkable. It is the essence of science to transform our knowledge and new creative insights. And it is the essence of methodological progress to change the face of science.

Ideology

It is one of the profound insights of theorizing in the last century that we cannot prove the foundations of any theoretical system with its own methods and from its own assumptions. I have elaborated on this structure in my earlier Galileo Report. Hence, I will keep it short:

Collingwood had pointed out this structure in philosophy, as far as I know, for the first time (Collingwood, 1998, orig. 1940): we always make, and have to make, assumptions that are not rationally justified by discourse or open debate, but that are taken out of the cultural background assumption, the world-view or zeitgeist of a certain time. He called those assumptions *'absolute presuppositions'*. They are presuppositions, because we presuppose their validity without being able to test it. This is so, because, for one, most of the time we are not even aware of these presuppositions being adopted. But more importantly this is the case, because no system can be used to verify its own presuppositions. Formally speaking, Gödel has shown this in his famous 'Unabschließbarkeits-Theorem' of 1931, his theorem of incompleteness (Devlin, 2002; Gödel, 1931). He proved mathematically that in every formal system there are sentences or axioms that have to be assumed to be true that cannot be decided upon by the methods or sentences of this system itself. Hence, every theoretical structure must assume some things to be true or acceptable, or presuppose such assumptions for it to work. These are the 'absolute presuppositions' that Collingwood pointed to, or Gödel's 'undecidable sentences.'

This is the reason why no systematic philosophy will ever be able to convince opponents, because these can always doubt the assumptions that a philosophical system makes (if they discover them, of course). In philosophy, this insight led to the linguistic turn, because Wittgenstein and others have pointed to this situation as well (Wittgenstein, 1958, orig. 1953).

Robin G. Collingwood (1889-1943)

Science has also made such absolute presuppositions along a more methodological vein: it assumes that the most important elements in nature are material particles of some sort and analyses all natural phenomena as interactions between such particles. In that it was highly successful and will be for many years to come, I am quite sure. But it is important to recognize that this is an assumption, and not 'the truth'. It may turn out that non-material entities that are not in the focus of our methodology also play a role, such as conscious activity. In other words: science has *a priori* committed itself to a materialistic ontology. This in itself is not a problem. It is a methodological decision which has grown out of the history of science and has proven itself useful through the pragmatic results.

Now, if this methodological decision to base current methods and scope on a materialistic ontology becomes an *overarching* belief system, materialism becomes an ideology, which is being used and seen as a system of thought in parallel and in contradistinction to religion(s) or other ideologies, such as Marxism, or Libertarianism, or similar systems of thought. This sentiment has been clearly expressed by E.O. Wilson, the famous inaugurator of sociobiology, or the idea of applying evolutionary thought and methodology to social and psychological phenomena. He called scientific materialism a 'mythology', which is a slightly friendlier name for ideology, and he clearly saw that the assumptions are believed, not proven:

> *'But make no mistake about the power of scientific materialism. It presents the human mind with an alternative mythology that until now has always, point for point in zones of conflict, defeated traditional religion. Its narrative form is the epic: the evolution of the universe from the big bang of fifteen billion years ago through the origin of the elements and celestial bodies to the beginnings of life on earth. The evolutionary epic is mythology in the sense that the laws it adduces here and now are believed but can never be definitely proved to form a cause-and-effect continuum from physics to the social sciences.... sociobiology can account for the very origin of mythology by the principle of natural selection acting on the genetically evolving material structure of the human brain'* (E. O. Wilson, 1995, orig. 1978, p. 184)

Thus, scientific materialism, or naturalism,[2] the idea underpinning scientism and also Transhumanism, is an ideology that makes the assumption that material entities are the only important ones; that the great narrative of evolution of these material entities is the best and a sufficient description; that there is no further or predefined purpose to the universe and by the same token to the lives of human beings; and hence that all values, goals, purposes or moral laws are also derived from that process; most importantly: since we humans are the final result – and to some: the pinnacle – of this process, we might as well change it to our liking. If there is no moral essence to the universe, over and above the rules that guide evolution, then there is no reason why we should not change, or define those moral laws as we like.

Now comes an important distinction: as long as this narrative is clearly seen to be a scientific hypothesis and it is submitted, at decisive points, to empirical or experimental tests, we are dealing with a scientific model or theory. As soon as certain statements or assumptions are accepted as veridical without further testing, we are dealing with a mythology or an ideolo-

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[2] I know that these two are not identical. Scientific materialism denotes an ontology, naturalism a methodological stance, which assumes that hitherto unexplained phenomena or seemingly supernatural phenomena will ultimately be explainable by scientific methods. But the fact of the matter is that most naturalists, as far as I can see, are also ontological materialists, and some, like Pinker, use the terms interchangeably. See (Walach, 2020b) for further elucidations.

gy. Wilson clearly saw this: in that sense scientific materialism is an ideology or mythology, precisely because not all of its assumptions can be empirically vindicated and because some assumptions must be made that are not further critiqued.

Ideas become ideologies, in the way I am using the term here, once their preliminary status is not realized, once the assumptions made are not recognized as assumptions but taken for truth, and once they exert a certain motivational pull to change the world, other people's thinking or actions in the way one thinks the truth of one's own ideology demands.

It is always easier to recognize ideologies in others. Let us use a historical example to make this clear: Marxism. Marxism as an ideology is largely a thing of the past, and quite obsolete, except in a few pockets of academic debating clubs, it seems. I was confronted with Marxist ideologies in my university days in the late 70ies and early 80s by continued discussions with other students who went on strike or tried to sabotage seminars. Those subscribing to it were convinced that there was an ideal state of humankind which Marxist analysis has described following a crude form of Hegelian historical dialectics. They were convinced that we are at the verge of making this happen via revolutionary action. They were convinced that egalitarian possession of productive means, such as capital and factories, would help advance this ideal state. They were convinced that all that matters was matter, and all spiritual and religious ideas were bogus, or worse still, dangerous, because they kept people from following the 'right path' of scientific materialism of the Marxist form. They were also convinced that the change would not happen peacefully but that one had to engineer a revolution. These were just the most important creeds such Marxists subscribed to.

We can, from our vantage point, see that most of these ideas were ill conceived and wrong, mainly because history has proved them wrong. The only vaguely Marxist and somehow successful society is the People's Republic of China, which is communist in all but name and political organization, and otherwise just as capitalist as the rest of the world. But if one were to discuss with one of those Marxist students of the 70ies, as I frequently have, one would hit ideological and mental granite, once it came to basic assumptions: the assumptions of the primacy of matter, of the correctness of the Hegelian-Marxist type of historical analysis, the importance of scientific methodology, to name but the most important ones. But the granite was not by argument, proof or experiment, but by faith alone, even more so than in a devout Catholic the belief in the immaculate conception.

Perhaps the most disconcerting trait of these followers of Marx was their quasi-religious fervour. This, I contend, is what distinguishes ideologies from scientific hypotheses or theories. A scientist must be in the position to potentially doubt his hypothesis, to devise ways of disproving the idea or of refuting his own claims. One need not be a fallibilist in the Popperian sense to do this. One can even be a firm believer, as a scientist, in the truth of a certain hypothesis. Yet, in order to prove one's claim as a scientist, one has to embark on experimental or empirical tests, step back and devise them in the most rigorous methodological way and be willing to fail or be proven wrong. That is the essence of science.

Not so the ideologist: he or she is convinced of the truth of his or her position. The idea is not to prove the ideology wrong, but the a-priori-knowledge of its truth is undoubted, and the will to spread this truth by all kinds of means is paramount. Ideologies have the inborn drive to be spread about, and followers of ideologies have the zeal of converting disbelievers. Ideologies (and religions) are in the business of proselytizing.

If one reads the texts of Transhumanists, one will detect many traces of such proselytizing fervour. In that sense, Transhumanism, as an offspring of scientific materialism in the sense of E.O. Wilson's grand mythological narrative, is an ideology. Perhaps it is a more mature or scientifically better-grounded ideology than Marxism, but nevertheless it is on the same

footing: it promises a better future for us, perhaps only for some, but that is rarely discussed. It takes strong recourse to science and scientific findings. It even dubs itself as 'scientific', adopting one of the strongest scientific meta-narratives, that of evolution, as its guarantor of truth and veridicality. It urges others to actions. It demands public visibility and even funds. It argues very rationally. It appeals to those emotions and hopes that were formerly addressed by religious myths and promises. And it is completely oblivious of its own assumptions, its own preconditions and presuppositions. Very rarely will one find a critical discourse about its goals and values within transhumanist texts. It is taken for granted that death is bad, that long, if possible everlasting life is good, improving one's cognitive abilities is valuable, etc. Never ever have I seen a critical evaluation of those assumed goals and future ends in any of the transhumanist statements. Such a critique is only ever articulated by critical writers (Estep et al., 2006; Hansmann, 2015; Hauskeller, 2013; S. B. Levin, 2021; McNamee & Edwards, 2006; Sandel, 2009), only to be swiftly rebutted by Transhumanist believers (Persson & Savulescu, 2012; Savulescu, 2009). The hallmark of a scientific stance - critiquing one's own assumptions, methods, findings, and theories - is completely absent. This alone, together with the pseudo-religious tone, qualifies Transhumanism as an ideology, or, to use the words of E.O. Wilson, as a mythological narrative.

This is not to say that it is bad. But it is important to specify its status: Transhumanism is an ideology, or, perhaps better, a postmodern pseudo-religion. In order to understand that, we need to ask what a religion is, in contradistinction to an ideology.

Religion

A religion is, in my view, similar to an ideology in that it makes some absolute presuppositions that cannot be proven but have to be assumed. In the context of religions, the acceptance of these assumptions is normally termed 'faith', for instance the assumption that there is a reality beyond human reach and realm that is given certain attributes like 'loving', or 'knowing', or 'source or creator of the universe', or such like.[3] Different religions give different names and attributes to this reality, but most would agree that there is such a 'transcendent reality,' which they describe differently in its attributes. I am not concerned here with these particular differences, between, say, a Jewish, Christian, Hinduist, Buddhist, Taoist or other description of this transcendent reality, but simply with the fact that such a reality is assumed and believed to be important and operative by all religions worth the name. Thus, religions refer to something 'beyond' the realm detectable by our senses. Some say that this realm is invisible, or 'visible' in a special sense only under certain conditions of consciousness. Some assume that this realm and its entities make themselves known under certain conditions and can be 'seen' by certain mental activities and proclivities. Often, this 'seeing' takes a certain form of either 'revelation', where this realm shows itself to some chosen individuals who then become its prophets or guarantors, or of 'enlightenment', where a spontaneous and sudden insight into the nature of this reality occurs.

Sometimes, there are certain specially trained individuals who mediate between us and this invisible realm, such as in shamanism. Some claim that humans can train themselves to

[3] In analytical philosophical discourse faith or belief is often opposed to knowledge: 'I know that the prime minister is a liar", versus, 'I belief that the prime minister is a liar". In that sense, belief, or faith, is deficient when compared to knowledge. However, religious faith or belief has a completely different status. It means 'trust'. The New Testament word for what we translate as 'faith' is the Greek word 'pistis', which means 'trust' and describes a kind of existential trust in the final benevolence of Being.

make contact with this realm, either by spiritual practice or exercises, or by certain pharmacological methods, such as ingesting mind-altering substances in rituals, like Ayahuasca or mushrooms. Whatever the particular stance, the generic common denominator of religions is the assumption of a transcendent realm or reality that reaches over and beyond our material world and is often conceived as being non-material and outside time and knowable space.

Thus, one important element of all religions is this transcendent reality, which I term here 'the Sacred'; C.S Lewis called it the 'Tao' (C. S. Lewis, 1955, orig.1947). To what extent this sacred realm is knowable, accessible, or even active in the world is quite a matter of debate that does not concern me here. But the claim of its existence seems to be quite universal. Now, the existence of this transcendent realm of the sacred is nothing we can prove. We have to assume, or in religious language, we have to believe or have faith or trust that it is a reality that is relevant for our lives. In this point religion is very similar to ideologies: the final truths have to be assumed or believed. They cannot be proven, in principle.

The big difference between ideologies and religions is the question of transcendence and immanence. Ideologies, especially scientific materialism, assumes its final principles to be completely immanent in the world. They describe how the material world is composed and how it will develop, hopefully. It calls on us to help with this development and progress. Religions assume those principles to be transcendent, its relevant entities to be of non-material nature. In some religions, like in Christianity, we are also called upon to help with the development of the state of the world. In that sense, Transhumanism and Christianity have some commonalities. But while in Transhumanism this development has to be brought about by us, out of our own ideas and power, in Christianity this development is already visible: it is the 'kingdom of heaven' to be realized, which is already 'within and among you'. In Christianity, it is not engineering, but discovering what that future state should be, following some moral and spiritual guideposts such as love, forgiveness, etc. In Transhumanism, this future state will be engineered by us humans. In Christianity, this future state will be beyond what we see in the material world, in Transhumanism it is entirely immanent in this world. Who decides about this trajectory? In Christianity the development is both in the hands of a transcendent reality *and* in the hands of humans. In Transhumanism it is only in human hands.

While proponents of scientific materialism would probably argue that in some future time, we will be able to see and prove all that what we currently only assume and hope, such as the possibility of altering our genes and upgrading humans, prolonging life and abolishing death, religious believers will likely say that their beliefs will come true only in a non-material world, or in a future realm. This is sometimes termed 'heaven', in the Abrahamitic traditions, sometimes by other names, sometimes irrelevant. But it is always non-material and transcendent.

All religions have one thing in common: they anchor morality and ethics in a realm outside human discourse. In Mosaic law it is God that gives the law and guarantees its importance. The same is true for the other Abrahamitic religions. In most other religions there is some moral codex taught which humans are supposed to obey. This moral codex seems remarkably similar, as the statements assembled by C.S. Lewis at the end of his 'The Abolition of Man' testify (C. S. Lewis, 1955, orig.1947). Evolutionary theory goes a long way to argue – and show to some degree – that values and moral teachings might be hardwired through their benefits for natural selection. For instance, altruism and cooperation would allow the gene-pool of one's family or tribe to trump the one of less cooperative and altruistic groups (Bowles, 2009; Melis, Hare, & Tomasello, 2006; Norenzayan & Shariff, 2008). But there are quite a few values and moral codes that are difficult to derive from evolutionary theory, for instance truthfulness, the prohibition of manslaughter, or cultural values such as fidelity.

The Silver Rule – don't do to others what you do not want to be done to you – or the Golden Rule – do to others what you want them do to you – are examples of moral codes that are quite ubiquitous but not necessarily evolutionarily grounded, it seems to me. In the same vein, religions seem to be morally essentialist in the sense that they assume some ethical values and moral teachings to be grounded in reality beyond biological nature and beyond human social discourse. One of the signatures of this essentialism is the fact that all religions that deserve the name describe some mechanism of justification, recompense or punishment for keeping or breaking important rules such as the proscription of murder or theft or the abuse of other people. Whether it is the Christian teaching of a reckoning after death, or the Eastern idea of a meeting with the consequences of one's actions in another life, is irrelevant for our purposes.[4] In both prototypical cases there is the assumption of a natural order and anchoring for those ethical values in the fabric of the universe, as it were.

I must confess: I find this idea more convincing than the materialist idea of reducing values to evolutionary fitness and social discourse. One can abstract the religious sentiment about moral and ethical values into the idea that values are somehow intrinsic to the fabric of the cosmos as ideal or purely theoretical structures in a similar way as mathematical structures are ideal structures. Clearly, no one has ever seen directly a fourth power as is used by Einstein in his gravitational constant. But obviously, Einstein's intuition was correct, when he wrote down his laws. He seems to have tapped into some truthful structure, describable by mathematical equations quite true to Galileo's sentiment that the book of nature is written in the language of mathematics. This language is describable by abstract notions. It describes the physical make-up of the world quite truthfully and usefully. But it is itself an idea, or a noetic structure that is reflected in the material world and is derived thereof, but resides itself beyond the material world in the realm of pure ideas.

In the same sense, I suggest, one can understand moral structures or ethical values, as taught by religions, as *transcendent noetic structures*. They reside in the deep-structure of the world and are just as relevant as the mathematical structures physical theories have unravelled. As physico-mathematical structures were intuited by gifted physicists such as Einstein, Heisenberg, Bohr, Pauli and others, so those ethical deep structures of the world can be intuited and have been by individuals with deep insight, or by enlightened individuals like the founders of religions, or individuals who immerse themselves into that exercise of inner vision and experience (Walach, 2020a). How we can develop any knowledge out of these inner experiences that is in the same sense scientifically purified as our current empirical knowledge is, that is quite a different and difficult matter, which I am not going to elaborate on (Walach & Runehov, 2010).

Such moral structures pertain to the realm of human interaction with each other and the world. This is why religions take ethics and morals very seriously and why, content wise, they are quite similar regarding the very basic values across times, cultures, and religions.

This is perhaps another, even more important point of departure between religions and ideologies: religions see values and morals guaranteed in an essential way. We can violate them, because we are free agents. But if we do, we somehow have to face the consequences. I know that this is a very unpopular and also very old-fashioned stance. All the discourse around vindicating God in the face of injustice and really bad luck in the world stands against it. I am

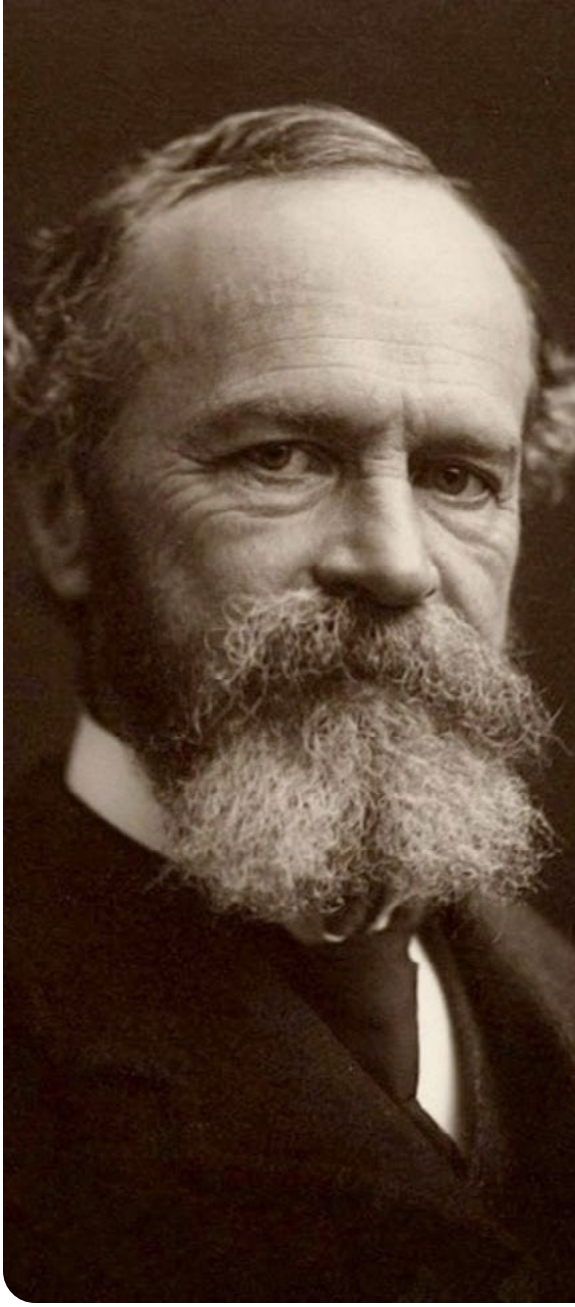
[4] It might be interesting to point out here that there was a strong tradition in ancient Christianity, associated with the name of Origen as the most prominent voice, that also favoured a reincarnation type of moral justification. It is being taken up by some writers and theologians (Lorimer, 2017; Origenes, 1992; Popkes, 2019a, 2019b; Rosenberg, 1952; Schmidt-Leukel, 1996).

not going to solve it. I am just saying: religions have, in contradistinction to ideologies, an essentialist attitude towards morals and ethics, and they have teachings that transport justice into the realm beyond our current world. They do that either by the means of some justice through reincarnation and growth over lifetimes, or by means of a transcendent judgement.

Perhaps a final point of contradistinction between ideologies and religions. Ideologies normally refer to some final point of departure that must not be doubted: the truth of the scientific-evolutionary narrative, the axioms of a theory, but at any rate something that cannot be proven or tested. The warranty for the scientific-materialist stance is the success-story of science which, by extension, seems to prove scientific materialism a natural and rational choice for an ideology. But as Wilson correctly saw (E. O. Wilson, 1995, orig. 1978): there is no final proof.

The final axioms of religions are normally, at least in principle, accessible by experience, even though it is some form of inner experience in our consciousness (Walach, 2014, 2020a). This is not immediately obvious for the so-called religions of revelation, like the Abrahamitic ones, where divine revelation is said to stand at the beginning. I think that this is a mis-understanding. To make that clear, let me start at the other end of the religious spectrum, at Eastern experiential religions, such as Vedanta or Buddhism. Here we have religious structures that claim origin from a paradigmatic first experience, for instance Buddha's primordial insight into the nature of being. The same is true for the various types of Vedanta (which, by the way, was the original practice of the historical Shakyamuni who became the Buddha) (MacPhail, 2013, 2017). It is experience within one's own consciousness that reveals the true nature of reality in a kind of enlightenment experience. I think one can read the founding stories of Judaism, like the call on Moses, or the baptism and vocation of Jesus in the same way.

Now the decisive difference is: these experiences are all *inner* experiences of our consciousness. They are individual, personal, first-person-singular experiences which are conscious subjective experiences, and thus they are private. There is no outer referent. If I see a tree, I have a conscious experience as well. I can point to the tree and my wife looking at the same tree will have a similar experience, also as her private experience. But as there is an outer reference point, we can discuss it and can compare our experiences and ask others as referees.



William James (1842-1910)

With religious experiences it is quite different: enlightenment experiences are very individual and very personal. Although their phenomenological qualities are often very similar, as has been established by some famous collections such as the ones studied by William James (James, 1985) or the Zen-enlightenment experiences reported by Philip Kapleau (Kapleau, 1969), they have no clearly visible outer referent, but, by definition only an inner or even transcendent referent. The existence of this referent cannot, like with the tree, be verified by simple methods. It has to be deduced, and the spiritual experience itself is *the prime* method of this deduction. Now, we run into a circularity: the method of spiritual experience establishes the reality of its referent, whose existence can only be established by – another – spiritual experience. Here we arrive at the communal and pragmatic aspect of religions: it is only by shared experience, by communicated experiences of others, by the practical consequences, by the narratives and stories around such experiences that religions are established and their reality verified. Spiritual experience, in some way, is very similar to seeing a tree: it is an act of consciousness that refers to an Other, outside or beyond one's own consciousness. But different from a tree, the referent is not a material entity, but Being as Such, one could say. 'Esse est Deus – Being itself is God', Meister Eckhart, the medieval Dominican mystic and professor of theology (1260-1328) used to say (Eckhart, 1964, p. 38).

How it is, what it is, all this is a matter for communal debate and discourse, for narrative formulations, for ritual testimonies, all of which I do not wish to discuss. But at the very basis is always an experiential component. Religions are the outflow of an experiential contact with reality as such.

This experiential base is the big difference to ideologies. No doubt, religions can become ideologies. This happens, when the experiential contact to its original source is lost, when the ritual enactments become void of this original experience, and the teaching shallow. But originally, religions are not ideologies but experiential realizations of reality as such.

In that sense religions have much more in common with science than normally thought (Plantinga, 2011): They are derived from experience. They normally also have a method of verification, namely some predictions and promises. They deal with reality in a very deep sense. And they make some presuppositions which are made explicit and transparent. These are the basic principles of faith. Even though they may be derived from experience, not all followers of religions will have had such experiences themselves. So, they can only believe that what they are taught is right. The Three Great Preconditions to follow the way in Zen are the Great Doubt, the Great Belief, and the Great Decisiveness (Aitken, 1988; Kapleau, 1969): Doubt as to why things are in the state as they are, while the teachings say otherwise; Belief that the masters of old have said something truthful and do not want to trick us, i.e. belief in the tradition. Decisiveness to follow the teachings and the practice, i.e. personal commitment.

So, it is belief that finally leads to insight and knowledge. But it is belief or faith nevertheless that we need as a precondition. In addition, out of this follows practice. While ideologies are mostly an intellectual game, religions inspire and demand practice. Whether it is a ritual practice, like in a worship ritual, or spiritual practice, like in meditation, contemplative prayer or other is not of concern. The decisive point is: religions have certain types of ritual practice that distinguish followers of a religion from others. In that sense, Transhumanism might not only be an ideology, but also a post-modern religion, because it also inspires some practices that might be considered 'ritualistic'. We will come to it.

The final question everyone can ask and answer for themselves at the end: what kind of faith or belief is more worthwhile, healthier and promising? The kind of promises of a paradise immanent on earth that Transhumanism makes? Or the belief that we can gain access to the fundamental realm of Being itself, and from there find peace and fulfilment, as reli-

gions promise and the historical Jesus promised when he said: the kingdom of God is among and within yourself? I am not going to answer these questions, but I contend that in the end everyone has to decide between true religion or an ideology. It is impossible to be without either. If we do not decide, we have already chosen, most likely scientific materialism, and an ideology at that. The dividing line, it seems to me, is between those who accept the reality, importance and relevance of a transcendent reality of the Sacred of some kind, and those who do not. The philosopher Charles Taylor has spent hundreds of pages wondering and working out how it came that the naturalistic stance, once an outlandish exception, has become the default position in our modern time (C. Taylor, 2007). And surely, the default position it is for most academics, it seems, and certainly for the most influential ones (Larson & Witham, 1998). However, it is wrong to insinuate that this stance is 'scientific'. It is a possible personal choice, but it is not so by necessity and by rational force alone.

My colleague Steve Taylor (S. Taylor, 2018) once put it in the following adage: A Catholic knows he is a Catholic, a Muslim knows he is a Muslim, a Jew knows he is a Jew, a Hindu knows he is a Hindu. Only a materialist doesn't know he is a materialist. He thinks he is a scientist.

Now, one final word of clarification: the exposition of religion I have given is quite different from what authors who posit 'science' as an antithesis of 'religion' mean, when they say 'religion'. They normally have in mind a straw man that does not exist, or certainly not as an ideal type. When they say 'religion' they normally mean an oppressive psychological and political system of thought, backwards oriented, creating slaves of their ideology. They think religion is identical with oppressive political power and crushing psychological abuse. And surely, there are many instances in real lived religion of our and former days where such sentiments were actually true and still are. But this is not religion itself, it is rather a bizarre image and false enactment of the true idea. Alvin Plantinga has pointed out that the 'religion' scientism is set against is not really religion but what scientistic believers take religion to be. He also argued and made a clear case that true religion and good science never were, nor will be, in opposition to each other, because they have the same goal: to understand the world, life and the position of human beings within it. In short: they both seek the truth, albeit coming from different angles and directions (Plantinga, 2011).

Transhumanism as a Religion

After those clarifications it should be clear that and why I take Transhumanism to be a post-modern religion or ideology. It is an interesting phenomenon in itself. For it enacts all those principles traditional Christian or Jewish religion holds dear, but in a completely secularized form. It secularizes hope in a better future. While religions – and here I am just referring to the dominant religions in the West, Judaism and Christianity – position that hope in a transcendental future, either at the end of all times or after death, Transhumanism brings it down into materialization. To be sure, it also promises the fulfilment not now or in the short term, but in the future. But the fulfilment will be here, materialized on earth, and not in some transcendent realm.

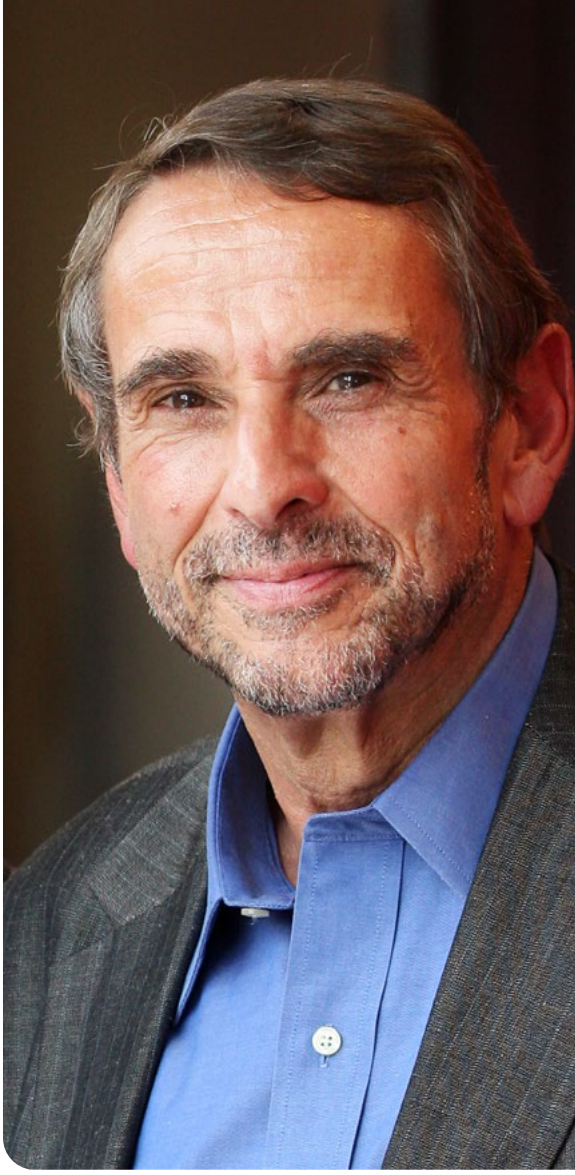
Importantly, this is still hope, i.e. the expectation that something, which we desire, will happen in the future, for instance that we will be able to defeat aging or death. Hope is clearly a religious category. The medieval definition of hope, stemming from the classical textbook of theology, Peter Lombard's Sentences compiled sometime during the 12th century, is as follows: *'Hope is the certain expectation of future happiness – est enim spes certa expectatio futurae beatitudinis'* (Petrus Lombardus, 1879, Vol 3, 811). This is exactly what we see in Transhumanism: the certain expectation that death will be defeated, ageing abolished, and complete happiness will prevail. It is the Christian heaven brought to earth. Not in reality, though, but as *'certain expectation of future happiness'*, hope, that is.

The agent behind all events is, in religious terminology, God. In Jewish thinking, He is the Lord of History. In Christian thinking he is the innermost essence of whatever happens. Nevertheless, God is transcendent, even though he is deeply involved in his world. This role has been taken over in Transhumanism by Nature and the evolutionary process.

There is another point of commonality between Transhumanism and Christianity: Religions give orientation and provide meaning. The Christian religion provides meaning, among others, by the teaching that humans are uniquely loved by God and Christians are 'saved' despite the fact that they behave badly – they might have to cue up in the end, but nevertheless they will be saved. The road to this salvation is a morally upright life. The orientation is given by the moral code of the Sermon of the Mount, i.e. Christs unique interpretation of the Commandments.

Transhumanism gives meaning by opening up the potential heaven of enhanced human flowering on earth in some future paradise. It certainly gives his followers some orientation: 'follow the Science', wherever progress leads us, and whatever progress means.

There is another interesting common denominator between Christianity and Transhumanism, and this is, why I would call Transhumanism a kind of depraved Christianity: the core of the Christian belief system is the incarnation of God in this world: 'And the Logos became flesh – *kai ho logos sarx egeneto*', we read at the beginning of the gospel of John. The Greek fathers pondered a lot on this term. It means, among others, that God has immersed Him- or Herself into this world completely, thus making us humans Godlike and giving the world into our hands. Gregorios of Nazianz, one of the Greek Fathers, famously said in his Christmas Oration: 'God has become Man in order for Man to become God.' This is the old Christian-Platonic *topos* of *'homoiosis theo'*, the assimilation of man to god (Merki, 1952). In essence this means bringing out, ever more along one's life trajectory, the hidden spiritual essence of man in his or her life in order to become godlike. But this will be a final goal to be reached in a life beyond this one. Transhumanism has taken up all those *topoi* and secularized them: We are gods, but we engineer the world however we wish. We make ourselves God and forge the world according to our visions. In a theological sense, Transhumanism is a direct religious antithesis to Christianity, a perverted type of Christian faith.



John Harris

These examples may suffice to make plausible my claim: Transhumanism is a postmodern, secular religion. It uses religious terminology and imagery, but materializes and secularizes it. It demands belief in its final principles, and it promises heaven on earth, never mind today, but in some real future paradise. It also demands appropriate action: we need to see improvement, 'enhancement', of humans as a moral duty, abolish obstacles and organize society and its funds towards that goal. Says John Harris, one of the vocal proponents of a Transhumanist agenda (Harris, 2007):

> *'I propose both the wisdom and the necessity of intervening in what has been called the natural lottery of life, to improve things by taking control of evolution and our future development to the point, and indeed beyond the point, where we humans will have changed, perhaps into a new and certainly into a better species altogether.'* (pp. 4 ff.) *'I will argue strongly not only for the freedom, but also for the obligation to pursue human enhancement'* (p. 9)

ENHANCING THE HUMAN BEING

'Enhancement' is the most frequently used chiffre of transhumanist authors to denote active intervention into evolution. That can mean transitory enhancements by pharmacological means which help humans become more alert, less depressed, better at various tasks. It can also mean more stable improvement, for instance by an implanted device such as a brain-computer interface, or by genetic 'enhancements' that would allow us to change some attributes into what we desire: less susceptibility to some disease, better cognitive capacities like memory, etc.

Usually, the argument is simple: most of us are using some type of enhancement already. Some are wearing glasses, some have a pacemaker inserted, some have artificial hips or other prosthetic items implanted. Most of us enhance our alertness by drinking various amounts of coffee. I drink lots of tea each day, because it keeps me alert, I like it and can afford it, because my blood pressure is constitutionally low. Because my blood pressure is low and tea keeps me awake for too long, I am not drinking tea after 5 pm, but I like a glass of red wine or two in the evening. It helps me stay warm, it relaxes and I like it. Thus, I am 'enhancing' myself pharmacologically on a regular basis. And many people do. Those enhancements are all transitory. I can stop drinking tea or wine, and I do on a regular basis (at least drinking wine) for a few weeks each year to avoid dependency and recreate a space for a free decision, because I also believe in agency, and that way I experience that I am a free agent and not a bio-robot.

Most of us will have used binoculars to increase our visual acuity in the distance, and some may have used telescopes to look at the stars or planet. Science upgrades our senses in incredible ways, by being able to see into the micro-realm through electron microscopes, and into the vastness of the cosmos using huge telescopes. Immunological probes tell us a lot about our biochemical processes in the body, etc.

So why, and in what sense, should enhancement be wrong? It can't be wrong in principle, because we do it all the time. We are enhancing our children by sending them to good schools, music or dancing lessons. Some of us teach them how to ski, and most of them learn to drive in their adolescence, thus enhancing their range of motion. Even conquerors in antiquity were enhanced, when they were able to use the horse for larger distances and higher impact in battle. We could go on. All this shows: enhancement is part of the portfolio of human ingenuity.

The next step, then, would be to implement durable enhancements, either as implements, or as genetic changes. The vision of transhumanist writers is to eradicate all that is 'bad', to 'make the world a better place' (Harris, 2007, p. 3), by engineering human beings to be enhanced and thus better in all important respects: more intelligent, better looking, stronger physically, gentler mentally yet intellectually sharp. Why should that be wrong or a problem? Why even that uphill battle against so called bio-conservatives who refuse to listen to that reason? Enhancement is natural, so the argument goes. Why should it suddenly be stopped? We all enhance all the time, if we can, why should more radical enhancement be evil?

One of the dividing lines, it seems, is the step towards genetic engineering with humans. Here, an invisible wall of a strong taboo seems to be going up. Another dividing line is our agency or free will. Authors who criticize enhancement normally refer to something like 'human nature', a 'factor X' which is defining of humans that must not be touched (Fukuyama, 2002, 2004; Sandel, 2009). Others argue that such a step makes children – if genetic engineering is effected on children – dependent on the choice of their parents and thus deprives them of their own freedom (Habermas, 2013, orig. 2005). Transhumanists argue that up to now the evolutionary lottery has made the choices. Now we can be the chooser and engineer. Let's take over from nature and improve on her. It is not only possible; it is an imperative. Nature has blundered, because she has made us mortal, susceptible to sickness, less than intellectually brilliant and artistically excellent. We know now how to fix those blunders. Let's do it!

We will step back and examine those claims critically. We will start with a few examples of temporary, pharmacological enhancements and ask ourselves: How true is the claim that these enhancements are good, safe and without problems? The implicit story line is usually: 'enhancements are good, because they improve our performance. Never mind the risks or the costs.' I think in order to assess the benefit of some intervention or in that case enhancement, one would have to also fairly assess the risks and costs. If benefits are paid for out of private pockets and the buyers are aware of the costs and the risks, I cannot see a problem. But more often than not the purported benefits are paid for by public spending, and the risks and costs are redistributed onto the community, while the profits are gained by private companies offering the drug or the services. This is what I find problematic. Often this is the case with transitory, pharmacological enhancements. They are taken as universally good, and the costs are generally paid by the public purse. So are the risks, if someone falls ill from the intervention or its side effects. And this needs to be seen more clearly, before the magnificent hymn of enhancement has to be sung by all, morning and evening.

So let us look at some prominent examples now.

"The most obvious side-effect of having a chip implanted in my brain is a constant craving for onion dip."

CORRECTING NATURE – PLAYING GOD: MEDICAL TRANSHUMANISM IN ACTION

Medical Transhumanism or Transhumanism in the medical domain is about improving the human being. The technical term is 'enhancement'. Whether it is looks, intelligence, favourable traits such as being empathic and sociable, numeracy, musical skills, immunological competence, resistance against diseases, longevity, all this goes under the rubric of enhancement. I will not deal with all of them, but will look at some particular instances in more depth.

Higher, Wider, Longer – The Sex Olympics Thanks to Viagra

It has been observed that the first transhumanist medical intervention was Viagra® (sildefanil), introduced by Pfizer in 1998 (Elbek, 2023). More, longer and into higher age became the 'new normal', grace to this pharmacological agent that promises better and longer sex to men; whether women find that a good idea does not seem to come into play, but this just as an aside. Sildefanil is quite prototypical for this whole discourse. It seems a completely innocuous substance, a clever invention which is prescribed medically for erectile dysfunction, but can be used, of course, also as recreational drug for the benefit of improved sexual performance and experience. As such it is exactly the type of enhancement Transhumanism has vowed to achieve. In that case it is a physiological enhancement of virile performance. It works by a simple and clear pharmacological mechanism and thus is a clever example of the power of molecular-biological knowledge: The blood flow in the corpus cavernosum, the erectile tissue of the penis, is regulated as everywhere else by local vasodilatation effected by nitrous oxide (NO). NO is a versatile little molecule, which can be a hormone, a neurotransmitter and an immunological agent used by immune cells to produce oxidative stress to kill bacteria. Locally and as a hormone it acts as a vasodilator that is maximally effective in a relaxed state of mind and thus is also a signature molecule of relaxation (Stefano, Fricchione, & Esch, 2006; Stefano, Fricchione, Slingsby, & Benson, 2001). A second messenger, cyclic guanosine monophosphate (cGMP), is involved in effecting this vasodilation and keeping it in place. The degrada-

tion of cGMP happens via an enzyme, type 5 phospho-diesterase (PDE5). Sildefanil inhibits this degrading enzyme, thus prolonging vasodilation in the erectile tissue and thus erection. So far, so good.

Efficacy

Early meta-analyses and systematic reviews were positive: 60% of patients on sildefanil had successful intercourse compared to 11% on placebo in the first meta-analysis of 10 studies (Moore, Edwards, & McQuay, 2002). The number needed to treat was low (NNT = 1.7), because the effects were so strong. Adverse effects were seen in 30% of the men taking the drug with an optimized dose regime, and the number needed to harm was 5.4. The most frequently reported side-effects were headache, dyspepsia and vasodilation. With higher fixed doses side effects were more frequent.

A second meta-analysis, obviously conducted in parallel but including 27 studies reached the same conclusions: sildefanil improved performance in 57% of men compared to 21% on placebo. (Fink, Mac Donald, Rutks, Nelson, & Wilt, 2002) These significant therapeutic effects came also with significantly more side effects: flushing (12%), headache (11%), dyspepsia (5%), and visual disturbances (3%). Observe: the success-rate vis-à-vis placebo is already declining. We also see: the effect is mainly visible in men with mild to moderate erectile dysfunction and less so with severe dysfunction.

Sildefanil works, for instance in erectile dysfunction due to antidepressant use (M. J. Taylor et al., 2013), in diabetic men (Vardi & Nini, 2007), even after kidney transplants (Liu, Sun, Liu, Sun, & Ma, 2019) or for erectile dysfunction after spinal-cord injury (García-Perdomo, Echeverría-García, & Tobías, 2017).

An interesting study using Swedish data could show that the suicide rate in Sweden dropped after the patent protection ended and Viagra was freely and cheaply available in Sweden (Catalano, Goldman-Mellor, Bruckner, & Hartig, 2021).

Side effects

Obviously, wherever vasodilation is useful this might be a good drug. So, it is also being used for pulmonary arterial hypertension, also in newborn babies. But there are downsides as well: if drugs are used concurrently that reduce blood-pressure and induce vasodilation, such as nitrates or alpha-blockers, it is counter-indicated. It is metabolized quickly in the liver by cytochrome P450, our major detoxifying system. If dosed too high, too frequently or together with other substances, liver toxicity might ensue. This has only recently come into focus, and some five cases of liver toxicity have been reported in the scientific literature; the estimated number of unknown cases is unclear, because a lot of self-medication and black market dealing is happening (Graziano et al., 2017). In the case of the phytotherapeutic drug kava-kava, a plant based drug traditionally used in Polynesia and marketed for anxiety and as such very effective (Pittler & Ernst, 2002, 2003), seven cases of liver toxicity were sufficient to take it off the market in Germany (Kraft et al., 2001).[1] It is very doubtful that even ten times as many

[1] I am a member of the Commission D of the German Federal Office of Drugs (Bundesinstitut für Arzneimittel) that advises about the regulation of homeopathic substances. I was privy to the seven cases for retraction of Kava-Kava at the time. In none of them was the drug the only cause of liver toxicity, as all of them were polytoxicomaniac and took a diverse array of drugs.

cases would lead to a market retraction of Viagra. The hopes, the investments, and the market shares are too high.

Side effects, as we have seen from the meta-analysis, also include ocular problems. A recent pharmacovigilance study scrutinizing the US pharmacovigilance data-base (FDA Adverse Reporting System) found higher reporting odds-ratios for all PDE5-inhibitors, and the highest odds ratios for sildefanil (reporting odds ratios are ratios of reporting particular side effects for a certain substance compared to other substances reporting the same side effects) (G. Chen, Zhang, Zhao, Huang, & Fu, 2024). Cyanopsia, where visual perception for colours is shifted into the blue spectrum, has a reporting odds ratio of 1148, i.e. a much higher likelihood of being reported. A drastic case of retinal damage by self-overdosing has been reported (Brader, Athappilly, & Loewenstein, 2019). Apart from that, deep-vein thromboses are reported in the literature (e.g. Robles-Marhuenda, Romero Gallego-Acho, & Arnalich Fernández, 2019), also in a young person aged 29 with severe neurological problems (Karti, Karti, Aktert, Gokcay, & Celebisoy, 2017).

Because cyclic guanosine monophosphate (cGMP) is a well-known pathway in migraine pathogenesis, it is easy to understand why blocking cGMP degradation, the pharmacological principle of sildefanil, might lead to headaches, at least in those who have a predisposition. This was indeed shown in a provocation trial, where 23 of 27 migraine patients developed migraine after sildefanil ingestion (Younis et al., 2019).

Undoubtedly, Viagra might help a man's sex life in older age, which is certainly beneficial, as the Swedish study quoted above showed (Catalano et al., 2021). However, dangers are often underplayed. The proverbial sudden heart attack in a brothel after Viagra intake is only spoken about as common lore. But occasionally such data find their way into the scientific literature, like a recent case of Viagra self-medication that lead to brain haemorrhage (Lucchese, Dhaliwal, Kaur, & Qi, 2019). Another type of cost one may incur for improved sex-life is melanoma, which has been reported after repeated consumption of Viagra, because of the influence on the small vessels in the skin (Lambert et al., 2018).

Observe that the reports on side effects – currently there are 65 entries in the Pubmed-data base under the Medical Subject Heading 'sildefanil citrate/adverse effects' – are quite recent. I have not listed all of them, only some more prominent ones. And we can safely assume that with all life-style and blockbuster drugs reports about problems trickle in only after the initial enthusiasm has waned.

Thus, we have quite a typical situation here: Pharmacologically, erectile dysfunction can be treated, and perhaps even normal function enhanced pharmacologically, as we have uncovered the molecular mechanisms of male erection and thus can intervene. A typical scientific success story it seems: understand the mechanisms, intervene, problem solved. Along those lines modern pharmacology operates and makes money. Viagra's market share was 3.2 billion USD in 2022 and is projected to reach 4.9 billion USD in 2030 (https://www.verifiedmarketreports.com/product/sildenafil-market/, accessed 6th March 2025), testimony to the sexual misery or enhancement desires of male humankind.

But every boon, it seems, is also associated with a bane: these are called side-effects in pharmacology. There is no such thing as a free lunch. With sildefanil the side-effects are present, but not at a rate that would make the drug really dangerous. They are considerable, as the meta-analyses reported above show. They can be dangerous, especially if higher doses over a long time are used. And they reflect the usual picture: every beneficial effect in pharmacology has to be bought at certain costs, only some of which are monetary, the rest is the risk of side-effects. And some of them can be serious. More often than not one should ask the

question seriously, whether the side-effects one might incur are worth the benefits one wants to achieve.

That is, why the transhumanist stance, which is just the reflection of the common lore 'for every ill a pill', needs to be assessed very critically that modern pharmacology can help us fix the odd problems of everyday life with easy pharmacology. Often, benefits are overstated and risks or side effects underrated. In our own meta-review of Cochrane Collaboration systematic reviews we found positive and clear effects only for 5.6% of all interventions tested, while in 8% of all reviews that reported such data there was clear evidence for harm (Howick et al., 2022). Thus, the therapeutic benefits of medical interventions are much smaller as commonly believed, while the potential harms are not to be neglected.

Antidepressants are another highflyer in the eyes of transhumanists which we will be dealing with below in more detail. They are widely used, although their actual pharmacological effect is much smaller than usually thought, mainly due to the massive placebo-effects induced by the myths created around such antidepressants. But they come with a heavy-leaning side effect profile, with weight gain and sexual dysfunction being the milder ones, and suicidal ideation and suicides the more serious ones. Lucky we that we now have sildefanil which works against erectile dysfunction induced by antidepressant (M. J. Taylor et al., 2013). The market for fluoxetine, Pfizer's Prozac, is valued at 2.12 billion USD in 2022 and forecasted to grow to 3.74 billion USD in 2030 (https://www.verifiedmarketreports.com/categories/?search=prozac, accessed 6th March 2025). Fluoxetine is only one out of a series of drugs of the same category, all with roughly the same side-effects profile. We have a good market model here: offer people a drug for a serious problem like depression. Never mind that it creates impotence in many male users of this drug. For there is a cure for this problem as well. Good it's the same company. Double shot, double earnings.

The thinking is of course typical for modern minds: therapy by pharmacological means following a known, or purported causal molecular mechanism, side effects taken as another problem which can be again solved by the same recipe, whose side effects can then be again taken as leverage for the next step, and on it goes. I say 'purported causal mechanisms' because in the case of selective serotonin reuptake inhibitors against depression we know now quite for sure that the underlying theory is wrong (see next section). But that just as an aside. The theory does not have to be right, but the story has to be believable and plausible.

Whenever I read one of those transhumanist texts I am flabbergasted by the simplistic mindset regarding pharmacology. Either these authors have no clue whatsoever about the real data on those drugs they are talking about, or they blissfully ignore reality in favour of their theory, as Esfeld and Lopez have analysed the postmodern situation (Esfeld & Lopez, 2024). I once confronted Sorgner in a public plenum at a conference in Berlin, when he spoke about the ease of getting rid of mental problems by drugs, for instance antidepressants. When I mentioned the lack of scientific support for the theory, the smallness of the clinical effect size and the potential of side-effects it was clear that he was not aware of these facts. We see this throughout the transhumanist literature: People *assume* that 'pharmacological enhancement' is a free lunch, that it works, that it is without any problems, that it is a natural path to pursue, and that our scientific ingenuity has given us the holy grail of happiness at last. I have never ever encountered one single critical remark there. This is bias and ignorance pure and clear. Bias in the sense that no one seems to think that this might be problematic, and ignorance in that obviously the data are ignored that signal problems.

Improve your Mood: Antidepressants

So, let's turn our attention now to those purported 'happy pills', anti-depressants. I will keep my treatment short, but I want to highlight a few facts that are often ignored. In public perception antidepressants 'work', because we have a clear theory that is scientifically proven and the medication is engineered to fit the theory. Here is the theory, one should rather say, the myth: Depression is a biological problem, a psychiatric disease located in the brain, specifically in the fact the neurotransmitter serotonin is not available in sufficient quantity. Hence, the situation has to be improved pharmacologically. This was possible for the first time thanks to scientific progress, when the so-called selective serotonin re-uptake inhibitors (SSRIs) were discovered. This is a class of pharmacological agents that are able to move across the blood-brain barrier, which normally shields the brain and the central nervous system from stuff that is being transported around by the blood in the periphery. SSRIs can enter the brain and prevent that the serotonin which is used as a transmitter by many neurons in the brain is degraded too quickly. Normally, neurons recycle the transmitters quickly they use for passing on their excitation via the synaptic cleft to neighbouring neurons. They get excreted, do their job, and then are being taken back up. Our biology is frugal. We reuse, whatever we can. SSRIs prevent this frugality from happening too quickly, and thus allow serotonin to be available for a longer period. This is really a good myth, because it is simple, not to say simplistic. Even the most simple-minded consumer can understand such a rationale. It sounds ingenious. It can be pharmacologically enacted. Its only problem is: it is simply wrong, as a very extensive umbrella review of the most important models in the literature shows (J. Moncrieff et al., 2023).

That the theory was deficient and that data were poised against it is nothing new. Critics had raised their voice nearly 20 years ago and ever since (Fava, 2006; Fava, Ruini, & Belaise, 2007; Fava, Tomba, & Grandi, 2007; Healy, 2015; Lacasse & Leo, 2005). The largest outcome study on antidepressant therapy in real-life psychiatry ever done, the STAR*D trial (Rush et al., 2006), could not show long term improvement (Kirsch, Huedo-Medina, Pigott, & John-

"No, I'm not handing out antidepressants.
I'm from Sewer System Rooters, Inc."

son, 2018; Pigott, Leventhal, Alter, & Boren, 2010). One of the more rigorous meta-analyses of antidepressants, which also used non-published data submitted to the FDA for approval, found that the effect size of all antidepressants against placebo was small: the standardized mean difference d[2] was 0.38 standard deviations difference for antidepressants versus placebo (Turner, Matthews, Linardatos, Tell, & Rosenthal, 2008). This has not changed much since. And although psychotherapies are equally effective, and often even better in treating depressed patients (Barth et al., 2013), or mindfulness is effective for depression relapse prevention (Kuyken et al., 2016), the default option seems still to be the pharmacological treatment of depression.

Use and Effects

Antidepressants are used a lot despite the flimsy data. Analyses that look at the difference between the baseline of a treatment and its end, report huge pre-post differences, beyond d = 1.0 effect sizes (Joffe, Sokolov, & Streiner, 1996; Locher et al., 2015; Rief et al., 2009). This suggests to naïve users that the effects are drastic. However, vis-à-vis placebo they are minute, between d = 0.29 and d = 0.39, depending on the severity (Locher et al., 2015). So how come that they are perceived as hugely effective and produce huge effects in individual patients? It's the mythology, stupid! (Ioannidis, 2008)

The marketing has produced this enormous myth of a 'scientific theory' of depression – which is flawed, as we now know. This engenders a 'scientifically proven treatment, SSRIs' – which do not really work as well as they should according to theory. The major effect, as has been repeatedly pointed out, is due to the inherent placebo component of anti-depressants (Khan, Faucett, Lichtenberg, Kirsch, & Brown, 2012; Kirsch et al., 2008; Kirsch, Moore, Scoboria, & Nicholls, 2002; J. Moncrieff, Wessely, & Hardy, 2004; Schmidt et al., 2024). How was this myth produced? It's the money, stupid! Even at the market introduction of Prozac, the first SSRI to enter market, it was bribery that marched the drug into regulation. This has been vividly described by John Virapen, who was the responsible marketing manager. He bribed Sweden's chief psychiatrist by buying him a sail boat in the services of Eli Lilly (Virapen, 2010). This was done in Sweden, because the company reckoned that once Sweden, one of the toughest countries regarding regulation at the time was won, the other European countries and later the US would follow. Ever since, there is a very tight union between academic psychiatry, which is deeply conflicted as it receives a lot of money from the pharmaceutical industry, and the companies that produce psychiatric drugs such as antidepressants (P.C. Gøtzsche, 2015; J. Moncrieff, 2011).

[2] The standardized mean difference d, often also abbreviated as SMD, or d, or in a slightly different version as g, is a standardized measure of difference for metric outcomes, such as depression scales used in depression studies. It is the difference between treated and control group means, standardized by the common standard deviation. Thus the 'unit" of measurement is a standard deviation of the standard normal distribution. d = 1.0 would be one standard deviation difference, a large effect. d = 0.38 is a small effect, according to Cohen (1988). The English regulator NICE defined a clinically viable effect in depression as anything above d > 0.5, or half a standard deviation, a margin that is only met, when non-significant studies that are normally hidden in the drawer, are not included in analyses.

Side Effects

This myth has also helped to mask the enormous side effects of these drugs. Among them are, apart from erectile dysfunction (M. J. Taylor et al., 2013), which we have already met, also female sexual problems such as a lack of libido and a lack of sexual sensation (Antonuccio, Danton, DeNelsky, Greenberg, & Gordon, 1999; Bala, Nguyen, & Hellstrom, 2018). This comes in handy, as the same drugs that produce these problems are now also marketed for a newly discovered disease entity, female sexual appetence disturbance or female sexual dysfunction, as its official title goes (Clayton & Valladares Juarez, 2017; Nappi et al., 2022). (This is a funny coincidence, by the way, as it is a direct demonstration of the homeopathic law of similars: a similar stuff that produces a problem can be used in the clinical situation as its remedy. The only thing that is left out is the successive dilution, as it would drain the revenues.) The drugs also produce massive weight gain and diabetes as potential side effects (P.C. Gøtzsche, 2015). And there are numerous reports that people have difficulties coming off them, if they do not want to take them any longer (Horowitz, Framer, Hengartner, Sørensen, & Taylor, 2023). It is officially denied by psychiatrists and the industry that the drugs create a dependency. But after a systematic review has unveiled a withdrawal syndrome in newborn children (J. Wang & Cosci, 2021), whose mothers were medicated with SSRIs during pregnancy, it cannot be seriously doubted that these drugs create dependencies.

Suicide risk, especially in children and adolescents (Fergusson et al., 2005; Furukawa, 2004; Whittington et al., 2004), but also in other users of SSRIs, one of the more serious side effects, was long hidden from public view (Lenzer, 2005). In older people, a large cohort study found a hazard ratio of 5.16, that is, the risk for older people who are depressed and take an antidepressant is 5 times higher than if they did not take the drug (Coupland et al., 2011).

It took nearly 20 years until suicide risk as a potential side effect found its way onto the inserts of the drugs, but the way into public perception it has not found to this day. Most people perceive these drugs as simple 'happy pills', mood enhancers, which can be taken, if you feel a bit of the blues, or down and out, without thinking of potential costs.

We see the same as we have seen with Viagra here as well: benefits are hugely overrated, potential costs in the form of side effects are neglected, brushed over or denied for as long as possible. And our transhumanist friends, who seem to be pharmacologically illiterate and drowned in a bath of blissful ignorance, transport the myth into the wider arena of supposedly scientific knowledge.

Improve your Performance: Ritalin

Transhumanists are adamant: we will be able to improve our cognitive performance by pharmacological enhancements. The showcase is another popular drug: Ritalin (A. L. Caplan, 2009; Hughes, 2004). This is the brand name for methylphenidate, a stimulant which is somewhat similar to amphetamine, although its pharmacological effects are milder and it is said to produce less of a dependency. Nevertheless, in Germany and many other countries it is regulated by the law on narcotic drugs. Its mechanism of action is similar to that of SSRIs in that it inhibits the reuptake of a transmitter, dopamine, by blocking the dopamine transporter. Since dopamine transporters are numerous in the basal ganglia, which is the neurological

substrate of our propensity to focus and generate attention, it helps with focusing and thus also with cognitive performance. This is the reason why it is the standard medication for attention deficit and hyperactivity disorder (ADHD), especially in children, but also in adults.

It works, at least from the teachers' perspective, although quality of life is not improved (Storebø et al., 2023), and side effects might be considerable (Storebø et al., 2018). The only really well conducted long-term trial that had an observation period of three years could not show any difference after 3 years between the Ritalin group and the control group (Jensen et al., 2007). The effects that were visible after 14 months (Jensen et al., 2001) were blurred after 3 years, likely because children in the treatment group went off treatment because of side effects, and those in the control group tried out the treatment.

Side effects are frequently reported. For instance, the incidence of insomnia and sleep disorders is roughly threefold in a meta-analysis of 35 studies (Faraone, Po, Komolova, & Cortese, 2019). The Pubmed entries for adverse effects of methylphenidate contain 825 papers. If the drug worked without problems, parents would not seek out alternative treatment for ADHD; yet they do, for instance homeopathy (Frei et al., 2005). This is a good indicator that the mainstream myth of Ritalin's unproblematic pharmacological profile is less smooth than assumed. With the recommended dosage of 60 mg methylphenidate the reduction in ADHD symptom severity is a moderate effect size of d = 0.55 (Farhat et al., 2024). At this dose, tolerability against control has an odds ratio of 3.76 with a number needed to harm of 19. I.e. the likelihood of not tolerating this dose or dropping out of a trial is nearly 4 times as high. One out of 19 people will suffer such an outcome. Often higher doses than the recommended 60 mg are used. With them the increase in effect size tapers off, but the decrease in tolerability grows more quickly.

We see again the same lesson: no free lunch, not even for transhumanists. We can try to pharmacologically upgrade our cognitive performance, and for a short period of time this may even work quite well with a comparatively small risk of side-effects. But like with all centrally effective drugs there is the danger of addiction, the necessity to increase the dosage over time and the risk of side effects, or else withdrawal symptoms and continued dependency on the drug (Toates, 2001).

James Hughes

Choose Who You Want to Be – The Transgender Agenda as a Transhumanist Project?

The Transhumanist Project is about 'improving Nature' and fixing things where she has made mistakes (Bostrom & Sandberg, 2009; Ida, 2009; Porter, 2017). Hughes goes as far as calling all those who disagree 'bio-Luddites' (Hughes, 2004). Luddites were followers of a legendary weaver, Nedd Ludd, who was supposedly the leader of a weaver revolt in the North of England between 1811 and 1816. The term refers to a varied group of people who rebelled against losing their jobs due to the mechanical loom that had been introduced at the time. Although the history seems considerably more complicated than insinuated by Hughes (Linton, 1992), it is sufficient to note that the term is associated with a kind of rebellion against progress, in that case against machines that made people unemployed. Thus, the association is clear: like the historical 'Luddites' were against progress in form of mechanical looms, so the 'bio-Luddites' are against progress in the form of upgrading human Nature, whatever that will be. The implication is: Look what became of the real, historical Luddites: they were rounded up, beheaded, brought under control, and the mechanical loom made England's textile industry the best in the world for more than a century. Why stand against progress? It is stupid at the best, and dangerous at the worst. That is the subtext.

Part of upgrading Nature is changing actively, where something seems amiss. One of the areas where medical progress has made intervention feasible is medically changing 'gender'. There is a large discourse about 'gender', and gender differences are a topic going through psychological research right from the beginning. But with the rise of feminist discourse that raised critical questions about patriarchal structures in science, history, and society (Downing, 1990, orig. 19981; Saini, 2017; Stoppard, 2000), 'gender' has become a mainstream topic in recent times, especially in the social sciences. Originally, this meant the social construction of gender identities: how, for instance, the notion that women are homemakers and men are breadwinners is not a given biological fact but a social construction of our society. Anthropological studies, like those of Margaret Mead or Claude Lévi-Strauss and others showed how different societies dealt differently with the female role of giving birth and nourishing infants, and who was the dominant party in providing food for families. In some cultures, males hunted and women collected plant food, seeds, roots, or tended garden plots. In other cultures, women were more active in organizing food than males, and the other way round. With the constructivist and postmodern turn in the social sciences the idea got traction that 'gender' is largely a social construct, or rather, can be socially moulded to a degree.

Now, take this discourse about the plasticity of gender roles and their social determinants in a certain historical-political situation together with medical opportunities of intervention. Use a recently discovered problem that affects about 0,3 to 0,03 % of the population, called gender dysphoria, mix it with medical intervention options, sprinkle some left-leaning social engineering on top, and a add some billions of a steady stream of funding (Bilek, 2024), and what you get is the current gender wokeism.

The idea to medically adapt one's gender to one's whims and wishes is certainly multi-faceted. Some of it pertains to a small group of suffering people, who should be taken seriously. Some of it reflects an environmental problem: it is quite possible that the rise of gender dysphoria is directly associated with hormonally active substances in our food and water. And some of it likely reflects the overheated social discourse that iatrogenically induces problems, and biases views, via labelling and attribution processes, in young people in a certain way.

Some Empirical Data

The biological aspect is the genetically determined gender, often called 'gender at birth', which is determined in humans by the 23rd pair of chromosomes being usually either XX, i.e. female, or XY, i.e. male (Gibson, 2015). But apart from this hard-wired biological reality, there are, as with most genetic bases of human traits, malleable kinds of expressions. They depend on epigenetic aspects, such as embryonic development, environmental, or cultural effects (Bale & Epperson, 2015; Jablonka & Lamb, 2020; M. Levin, 2014), i.e. other biological individual realities and social-behavioural interactions (Polderman et al., 2018). According to an extensive review, heritability studies with twins show that the heritability of the felt gender, i.e. the subjective gender identity over and beyond what is determined at birth, is around 38%. This means: a major part of the way we feel about our gender and what gender we attribute to ourselves is determined, apart from our biological gender, by a large network of genes that is inherited. Twin studies also show that shared environments play a role, and exposure to different environments, or their epigenetic regulation, can also have an effect (Polderman et al., 2018). A recent first study of transgender people compared with controls indeed suggests that epigenetic changes might play a role (Ramirez et al., 2021). Notably, epigenetics is not genetics tough and hardwired. Epigenetic changes can result from physical or symbolic interactions with the environment, or from intra-organismic interactions and feedback loops (Jablonka & Lamb, 2005, 2020).

That gender is a non-binary construct has been clear for many centuries. Besides the well-known phenomenon of hermaphrodites in many different variations, it is obvious that one can be a straight biological male and have still many female psychological traits, such as nurturing, or sociability, or one can be a woman and be very assertive, aggressive and dominant, which are traditional male traits. Carl Gustav Jung has made this concept a main anchor of his psychology, when he spoke about the opposite-sex 'shadow' in a person, the anima in a man, and the animus in a woman (Jung, 1984, 1996). Psychological research has produced thousands of papers on the topic of malleability and non-binarity of gender identities. Most adolescents and youths in puberty are confronted with identity issues, starting from choices regarding professional trajectories and ending with gender identity (Erikson, 1976, orig. 1959). I can remember myself a phase in my teens, when I thought I might have not enough male hormones, because my voice was very slow to shift in register and callers on the phones used to mistake me for my mother. Had someone at the time suggested some diagnosis like 'gender dysphoria' to me, I might have fallen for it. Today I am glad such a diagnosis did not exist in the 70s, and I know today that I am a male with a tenor voice with quite a large range. I may have some traits stereotypically often associated more with women than with men, which I am actually quite glad about, such as some sociability and the capacity to empathize, which helped me in my initial career as a clinician. Also, I am not very fond of aggressive behaviour, both in me and in others, and I guess I know more women who I would label as aggressive and tough than I know men who fit that description. This is only a single vignette. Adolescents in puberty often have identity issues of all kinds. There is a huge danger of medicalizing these instead of letting them develop naturally. Depending on attachment histories and developmental experiences, violence and abuse, sexual, physical, and emotional, by whom and in what way, gender identity might be affected. Hence, this topic is a standard clinical-psychological one and will be part of most clinical situations one way or another.

The American Psychological Association defines gender identity *'as a person's deeply felt, inherent sense of being a girl, woman, or female; a boy, a man, or male; a blend of male or female; or an alternative gender'* (American Psychological Association, 2015, p. 834). How often

does felt gender disagree with the biological sex? In our own large representative surveys in Germany, as well as in that of colleagues who have conducted online surveys with more than 10,000 participants, we see something between 0.3 to 0.5 percent of people who identify as neither male nor female in anonymous surveys. This tallies nicely with international figures (American Psychological Association, 2015; Polderman et al., 2018). These are 'transgender' persons who do not identify with their biological sex. However, there is a wide area of inconclusiveness that has been medicalized over the past decades. The largest prospective study today, and probably also the most comprehensive one, the Amsterdam Transgender Cohort that has serviced most of the Dutch population who felt transgender or had gender issues since 1972, estimate the prevalence at 0.03% (Wiepjes et al., 2018), with a difference between men who feel they are women (36.4 per 100,000) and women who feel they are men (19.3 per 100,000). Thus, we are dealing with a small group of people, smaller by a factor of 10 than those that die of influenza each year in Western countries.

The diagnosis 'gender dysphoria' has only been added to the latest versions of the diagnostic manuals ICD 9, 10 or DSM V around 2012 (American Psychiatric Association, 2012). This diagnosis describes a person who experiences considerable distress because his or her felt gender identity disagrees with the biological sex. It is a phenomenon that tends to start in late childhood and puberty (Pham, García, Tsai, Lau, & Kuper, 2021). Surveys report a prevalence of 1.2% to 2.7% of children and adolescents who report such gender dysphoria. Worldwide, 1.4% of the population are estimated to suffer from gender dysphoria (Zurada et al., 2018), according to other sources 0,5% - 1.3% (Zucker, 2017). As we saw with the large Amsterdam cohort, a realistic prevalence estimate of truly transgender persons is 0,03% (Wiepjes et al., 2018). Thus, we need to distinguish between gender dysphoria, which is a wider social phenomenon and to a large extent also prone to overestimation because of social factors, and transgender identity proper. The latter is much less frequent, yet still on the increase. The authors of the Amsterdam Transgender Cohort study observed a 20fold increase over 35 years. It is rather unlikely that a disease category which is said to be genetically embedded should increase over time at such a rate. Thus, it is more likely that either the openness in social climate has encouraged people to come out who would otherwise have stayed silent, or that the increasing vocality of political activist groups has engendered the phenomena they are activists about. Studies show that there are clear brain differences (Skordis, Kyriakou, Dror, Mushailov, & Nicolaides, 2020) and epigenetic differences (Ramirez et al., 2021). The question is: what explains the recent rise in the prevalence figures, and the fact that it seems to be quite a novel phenomenon?

Sharyl Attkisson tells the story of Prof. Hayes, a zoologist of Berkeley, who investigated the effect of atrazine on growing frogs (Attkisson, 2024). Atrazine is an herbicide, no longer licensed in Europe, but its license was renewed after a review by the Environmental Protection Agency in the US despite a critical review. In Europe, public awareness grew when in 1986, after a huge fire at the production and storage plant of Ciba-Geigy (now Syngenta) in Basel, the company producing the herbicide, large amounts of atrazine were flushed into the river Rhine and fishes died by the thousand. Atrazine, so Prof. Hayes demonstrated, was able to change the sexual phenotype in frogs, when applied at a certain developmental stage. As an academic he was attacked by a character assassination campaign of staggering dimension. There was a lot at stake, as atrazine was, and in the US still is, widely used in agriculture.

This is only one striking example of how the growing issue of gender dysphoria might be a medical cover for quite a different problem, namely the gradual toxification of our natural resources by toxic and hormonally active waste products. Indeed, gender dysphoria as a clinical problem is of recent origin. The literature documenting it dates into the early years of the new

millennium, as do the relevant guidelines (American Psychological Association, 2015). There is clear evidence that a lot of the chemicals and hormones found in our drinking water come from either agricultural or medical waste and sewage, and are not sufficiently filtered out (Almazrouei et al., 2023). Most of these residues count as endocrine disruptors, and all of them have effects on the reproductive system (Gonsioroski, Mourikes, & Flaws, 2020). For instance, bisphenols are compounds used in the plastic industry. They are found in wastewater and are highly estrogenic and antiandrogenic. They lead to male sexual dysfunction and reduced sperm count in workers. And they also affect human foetuses: typical measures of masculinity and femininity are altered by it. There are many other sources of estrogenic activity, like residues of hormone-containing pharmaceuticals, such as contraceptive pills. Thus, such environmental toxins or endocrine disruptors may directly contribute to what is later found as gender dysphoria (Holladay, 2023).

This scenario also demonstrates a typical catch, which we have already encountered in the sections above: Our dealing with problems is frequently based on a limited, restricted type of rationality which does not take into account important aspects and misses important contexts. This creates a problem. We take this emerging problem as a new isolated one and offer a fix that comes out of the same mindset. An adage attributed to Einstein goes: *You cannot fix a problem with the same mindset that produced it in the first place.* If bad science or a bad application of science produces a problem, it makes no sense to use more of that to fix it. If gender dysphoria is in part co-produced by bad waste and sewage management, by toxic products for the sake of economic gains, or by medical treatments for the sake of other aims, then it would actually make sense to start from scratch and discuss the original causes.

The fact that a diagnostic category exists reifies a problem, as has been amply discussed by the stigmatizing or labelling discourse in psychiatry (Rosenhan, 1973). Give a problem a name, and you think you have something concrete in your hands. There is discourse. Media take it up. Teachers discuss it. Political pressure and awareness groups push the agenda. And suddenly a small problem that is being given publicity, appears magnified. A recent survey in a US school district demonstrated that nearly 10% of all children reported some gender incongruity (Kidd et al., 2021). Such a situation feeds the beast. If there exists a diagnosis, you can have it, and with it the disease, which the diagnosis installs. If there is no diagnosis, all you can have, is a set of symptoms and some distress. But you do not have a disease. Jennifer Bilek has described in detail the history, the funding, and the political pressure groups of the transgender discourse in the US (Bilek, 2024).

The other side of the coin is: something with a medical diagnostic category, a name and distress associated with it, forces the medical community and the public to do something about it. Who would doubt that people with 'rheumatoid arthritis' should get medical care at the expense of the public purse? Who would dare to challenge the common wisdom that 'people with depression' should get treatment? In the same vein: If someone has 'gender dysphoria' or is in doubt about his or her gender and suffers from it, something needs to be done about it. They often consult with their doctor, who more often than not is stretched to his limit. That is why specialist centres have to be brought in who are willing to serve (Pham et al., 2021). A recent short-term observational study on hormonal treatment of transgender individuals shows that these people do suffer a lot: The incidence of depression and anxiety is much higher than in normal controls, and their quality of life is much lower (Foster Skewis, Bretherton, Leemaqz, Zajac, & Cheung, 2021).

Enter the medical profession who has so many options on offer for treatment: surgical (Zurada et al., 2018), which has a long history (Frey, Poudrier, Thomson, & Hazen, 2017), and hormonal (Meyer, Boczek, & Bojunga, 2020), which is a more recent invention. The current

standard-of-care guideline has more than 200 pages, is in its 8th edition (Coleman et al., 2022) and focuses of course on these major treatments as well.

Let us make no mistake here, before proceeding: there is a constant and small minority of transgender people who feel born with the wrong sex and who experience a genuine urge to do something about it. The ethical discourse around this issue is long-standing, and I do not wish to meddle with it, nor would I ever want to question the right of anyone to get help if he or she is suffering, especially as the individual costs of such a treatment are minor (Baker & Restar, 2022), compared with other, more common treatments like immunotherapy of cancer (V. Prasad & Mailankody, 2017).[3]

The procedures are effective in the majority of cases, as a meta-analysis of surgical procedures in men who want to become women documents (Manrique et al., 2018): 93% of all patients undergoing vaginoplasty are satisfied with the outcome, and complications are in the range between 2% and 14%. However, another, more comprehensive review speaks of a complication rate of 32.5% and a re-operation rate of 21.7% for non-aesthetic reasons, most often because of stenosis (Dreher et al., 2018).

For women who undergo plastic surgery to become men (transgender men) the outcomes are less favourable, it seems. The complication rate is high at 76.5%, and functional outcomes are not reported by all studies. Where reported, the functional outcomes are good, but the authors of this meta-analysis observe that the evidence is very limited (A. M. Q. Wang et al., 2022). Another meta-analysis reports between 38% and 39% of complications, mostly due to infection (E. Fraiman et al., 2024). A more recent review of complications in both types of operations observed pelvic organ prolapse in trans-women with vaginoplasty in 1-7.5% of all operations, 15% incontinence, and sexual dysfunction in 25%-75% of all patients. With transmen, pelvic organ prolapse was observed in nearly 4%, incontinence by 50%, and sexual dysfunction by 54% (Dominoni et al., 2024). There is a risk of thromboembolism in about 2% of cases in hormone treatment of trans-men, i.e. women who wish to become men, which increases with higher age and longer duration of the therapy (Totaro et al., 2021). There is also a risk of coagulation disorders in women who wish to become men, when taking testosterone (Tienforti, Pastori, & Barbonetti, 2024), as well as a risk of liver toxicity (Tienforti et al., 2025). The latter seems to be rather small. Thus, treatments are possible. And people who suffer seem to be prepared to carry the risks.

But let us not make a mistake on the other side: such a treatment is very complex. Oftentimes several surgical procedures are necessary, from plastic surgery to gonadectomy and breast reconstruction or amputation. Hormonal treatments, too, are severe interventions that cannot be reversed, except puberty blocking to some extent. Hormonal treatments need to be applied over long time spans, and some of the medications have to be taken lifelong, and side effects are sometimes severe (Meyer et al., 2020). Although studies usually emphasize the positive psychological effects (Allen, Watson, Egan, & Moser, 2019; D. Chen et al., 2023; de Vries et al., 2014; Foster Skewis et al., 2021; Karalexi et al., 2020), higher psychiatric morbidity and suicide rates are also reported after gender affirming interventions (Dallas et al., 2021). For instance, Kuper and colleagues (2020) report an interesting study: They assessed 148 youths

[3] Jennifer Bilek (2024) points out that in sum such treatments add up to considerable amounts, and the companies selling the hormones and other medications make huge profits of it, and the more people feel 'gender dysphoria' and want some treatment and perhaps back again after a while, the bigger the profits. Hence, keeping the transgender discourse active is the economic interest of companies and in the ideological interest of the pressure groups funded by benefactors with a large purse and a strong commitment such as Martine Rothblatt, formerly a male, now a female, and an avowed transhumanist (Rothblatt, 2014).

with a mean age of 15 years undergoing 'gender affirming hormone therapy' before and one year after therapy. They report in their abstract significant improvements in depression and anxiety. Yet, if we look at their outcome tables, we see: The effect sizes are small, about half a standard deviation, sometimes even smaller. There are more youths with suicidal ideation, suicide attempts, non-suicidal harm behaviour and psychiatric treatment after the intervention than before. I would not call such a treatment effective or 'critical', as they do in their abstract.

The whole scientific discourse has already entered the stage of political correctness: It is 'morally good' to support the case of the outcast and ostracized, among whom transgender people have been located to be those who can be medically treated. Interestingly enough, only few of the morally superior woke people have funded or worked in NGOs that avow to make homelessness a thing of the past, even though homelessness is a problem affecting more people than 'gender dysphoria'. Homelessness is simply not profitable enough or perhaps a bit too difficult. At any rate there are no medical interventions to cure homelessness that could generate a profit.

Jennifer Bilek (2024) points out the diverse connections of the transgender network backstage: Activists, who identify as transgender, and at the same time move forward a Transhumanist agenda. Often they are worth several billions, such as Martine Rothblatt (2014), entrepreneur, activist, and transhumanist. They fund NGOs, media outlets, activist groups, research funding trusts, educational pressure groups, while others act as legislators, such J.B. Pritzker, governor of Illinois – at the time of Bilek's writing in 2021 – and brother to the heir of a multi-billion dollar enterprise, Jennifer Pritzker, a transsexual herself, and one of the major activists and funders of the transgender movement. People like J.B. Pritzker produce the relevant regulations for schools, sports clubs, or public spaces. Incidentally, some of the apparent benefactors earn massive amounts of money by investing in the agenda and the pharmacological solutions. Other funders of the movement named by Bilek (2024), are George Soros, the Buffet brothers to name but the better known ones (Bilek, 2024, p. 18ff., 73 ff.).

But the solutions offered to the purportedly massive problem which is in fact artificially blown up are less than innocent. They come with side effects and often with lifelong suffering. Only this suffering is not the original one, but a secondary one created by the solution. No free lunch here either: if someone suffers seriously, he or she might be willing to take the risks, and society should be prepared to help him or her. It is unethical in the extreme, in my view, to heat up this discourse for ideological or political reasons, and drive adolescents who might feel unsure about their identity into a crisis out of which only a medical escape route seems to exist. And it is also unethical, as well as irrational, to neglect some potential and obvious root causes.

Questions and Hunches

This is why I do want to raise critical questions about the apparent rise in figures, mainly about the obvious situation that societal discourse creates both new problems and new demands, as well as about the potential root causes: toxic and medical waste in our water table due to pollution, inefficient waste management and sewage treatment. There are so many hormonal excretions, due to contraceptives, and chemical wastewater compounds, that have potential influences on gender identity, that it is quite rational to ask, whether the modern preoccupation with gender identity might potentially be the result of our lack of consideration regarding what we eat and drink, how we treat the animals and livestock we depend on, and how we grow our food. It is also rational to ask: why, apart from the obvious medical reasons, is there suddenly such a disproportionate rise in interest in this topic? Why are whole bureaucracies, in universities and in the polity, busy observing and working along this agenda? Policy

manifestos, treatment documents, training workshops for teachers, for nursery school personnel, for all kinds of groups are being developed, handed out, discussed in the media. It feels, as if a new epidemic of unknown dimensions is rolling over us. In fact, we are talking about 0.3 per mille of the population, or 30 per 100,000 persons. I do not want to negate their right to be seen and treated. But I do want to question the disproportionate attention the topic receives. This is documented in the rise of figures that transgender diagnoses, including gender dysphoria have received in the US. These data stem from a large company dealing with insurance claims of 200 million US citizens and are presented in Figure 2, taken from the original publication (Baker & Restar, 2022).

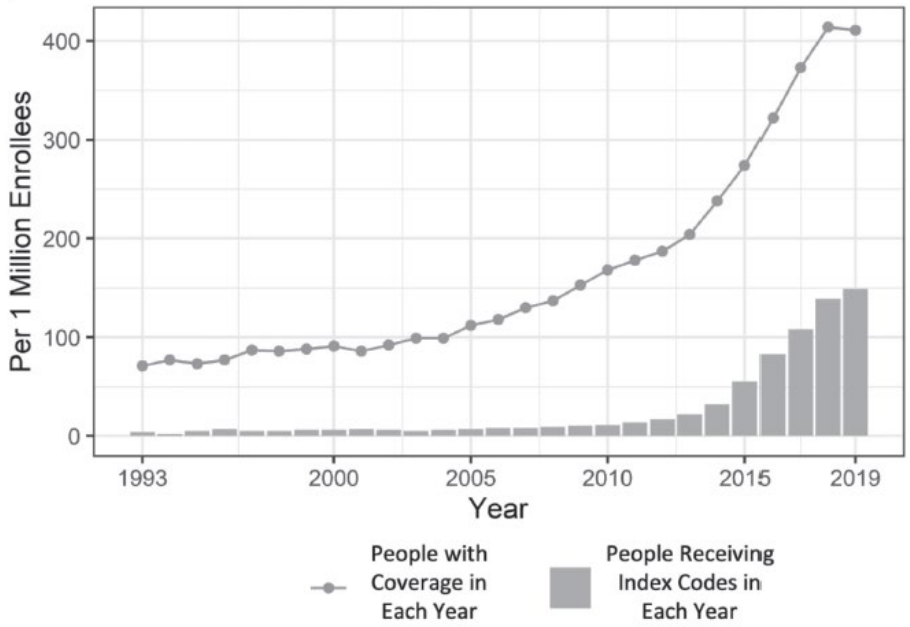
One can see clearly, how the figures of prevalence stayed roughly around and below the 100 per 1 million persons mark, i.e. 0.01 % to rise gradually since 2005 and then more steeply from 2012 onwards, when the new diagnosis 'gender dysphoria' was published in the new DSM V.

How realistic is it that such a diagnosis is increasing so quickly? In any other case – say with cancer or myocardial infarction – people would guess: lifestyle changes, environmental factors, or eating habits are the cause. What caused the rise here? We can only speculate, but an educated guess would be that some environmental toxin might play a role, and perhaps also the louder social discourse.

The early years of the new millennium were also the years, when the transhumanist discourse became more vocal, getting out of the closet of small communities into the open of published books, conferences and the like (Bostrom, 2008; Bostrom & Ord, 2006; Hughes, 2004; Kurzweil, 1999, 2005; Kurzweil & Grossman, 2004). The idea that we have to help nature, engineer the human being to feel better, use medical treatments to achieve this end more aggressively, have become mainstream and acceptable.

Some transgender activists who are at the same time transhumanists, like Martine Rothblatt (2014), who is also an activist, author, rich funder, have certainly also contributed to this climate. But the main point here is: Different strands of influence have created a cultural

Figure 2 (Figure 2.1 from Baker & Restar 2022): - Numbers of people with coverage by the insurance system (mainly Medicaid and some private insurers; total 200 million: dots) and people receiving some index code of gender affirming treatment



climate in which transhumanist ideas are welcome and discussed benevolently, in which transhumanism has shed its erstwhile skin of being a somewhat mad idea of a few IT freaks and futurists into an acceptable option for modern scientifically minded people. Such a climate will automatically embrace the transgender agenda. This embrace will not only be by political sympathy, as if every left leaning liberal person would more or less automatically subscribe to the LBGTQ-agenda. It will likely be positive, as the basic ideas are quite similar: we can medically engineer the human being to be whatever he or she desires to be. We have the means. Therefore, we can and should employ those means and make it widely known. We focus on positive outcomes, we neglect the rest. This rest, however, is, as we have seen, not negligible, because we are talking about final decisions in young people who are malleable and often unsure about what they really need and want. No medical intervention is harmless, innocent and free. Gender affirming therapy is no exception.

COVID-19 Vaccination – The Jumping Board into the Era of Genetic Engineering in Humans

I am now going to touch a very hot and politically highly charged topic. Therefore, let me start out with a few caveats, position descriptions, and reminders. I will put forward arguments and data that suggest that the COVID-19 vaccinations were promoted to further an existing wider agenda. This does not mean that there was a 'central conspiracy' of some group, although there might have been. But this question is not relevant for my argument. My conviction stems from close observation about how the pandemic developed, what political instruments were used, which arguments dominated, what discourse elements were used, and which ones were amplified by the media, i.e. a kind of informal discourse analysis (Arribas-Ayllon & Walkerdine, 2008). It also stems from my own experience, which we have described (Walach & Klement, 2024c), as well as from our own original research (Klement & Walach, 2021, 2022a, 2022b; Klement & Walach, 2023a; Klement & Walach, 2024; Walach & Klement, 2024a, 2024b; Walach, Klement, & Aukema, 2021b, 2022; Walach, Ofner, Ruof, Herbig, & Klement, 2022b).

Another important source of information is an interview study with 40 experts who raised various concerns internationally. They were professionals in diverse fields, from medicine, academic research, clinical practice, immunology and virology, law, economics, politics, psychology, philosophy, media, insurance, data analysis. I approached them, because I wanted to understand why and with what arguments they opposed some aspect of the diverse Corona public health containment measures that had been implemented quite similarly in different Western countries. Some were quite in agreement, others risked or had risked their career by speaking out. I have not yet formally published the data, but I have published the gist of it in the form of a novel in German (Walach, 2024). Thus, I dare say I have gathered enough background for my argument. It is irrelevant, exactly which was the source of the original SARS-CoV-2 virus outbreak.

The SARS-CoV-2 Pandemic

What emerged clearly from my interviews with immunological, biochemical and virological experts early on at the beginning of 2022 was that the virus must have been fabricated in a lab and was not of natural origin. That was at a time, when the lab origin thesis was considered 'conspiracy theory' by the mainstream of the press and the public in Germany, and I think elsewhere (Goddard & Dalgleish, 2023). One of my informants, an academic experimental immunologist from a large German university and well published with more than 300 papers to his name, stated this fact quite emphatically, right at the beginning of our interview, even before I had asked him anything. The way he uttered it testified to the importance of this information for him. Also, he realized that at the time this information was 'dangerous.' That was, why he said he would not want me to associate his name with this piece of information (although just before that he had opted for being known as one of my interviewees, but not for this bit of information). Various other experts, immunologists and molecular biologists, supported this view. Now, an interesting piece of discourse analytical contradiction is the following: obviously, this information was known to some experts in the political decision centres early on. Just now, news is circulating that the German Secret Service might have known this all along already in 2020 (https://childrenshealthdefense.org/defender/germany-knew-COVID-lab-leak-early-2020-hid-evidence-from-public/; accessed 18th March 2025). So why was this news withheld? Why were people character assassinated who spoke up? What was to be hidden?

One rational explanation would be: the government, at least the German government, and with it likely all Western governments, knew about the lab origin, and by the same token they knew that it might be a bioweapon and therefore they might have been scared. This would explain why the government used the media to scare the whole population, without revealing the facts. The facts about infection fatality rates (IFR) became known quite early on: the IFR, i.e. the rate of infected people who die as a result of the infection, was very quickly established to be roughly the same as that of a severe influenza, and those who did die, died at an age that was about three years beyond the average age of people dying from all sorts of other causes (Axfors & Ioannidis, 2021; Ioannidis, 2020, 2021a, 2021b). Although the relevant publications were officially published only in 2021, the preprints were already available in 2020, and thus it was known early on that the scare was not really necessary. These insights were also emphasized by the Great Barrington Declaration, published on Oct 4th 2020 (https://gbdeclaration.org/, accessed 18th March 2025), which was signed by nearly 1 million signatories within weeks. Why did no one in the circles of the powerful listen, and why were the authors of the Great Barrington Declaration decried and character assassinated, although they were scientists of the highest reputation with unblemished expertise? (See the Wikipedia entries on this declaration. Ironically, Jay Bhattacharya is now the director of the NIH in the US and was on the appointment list as Secretary of the Department of Health and Human Services (HHS), changes completely unthinkable even one year ago.)

Using a discourse analytical mindset, I have three explanations that would explain this set of facts: people in political office were aware of the military lab origin of this virus and they were scared. They feared it might prove more dangerous than it was initially seen. Perhaps they even suspected some hormonal switch or homing mechanism built into the virus that escaped initial description. Therefore, they did whatever they could to suppress any opinion that took this pandemic lightly. Had there been a hormonal switch and a homing mechanism built in, my expectation is that by the time I did my interviews in 2022 and onwards, this would have become widely known and discussed. I did not hear any of this, neither publicly, nor in my interviews. Therefore, it is unlikely that this explanation is sufficient to explain the behav-

iour of those in political office. The second possibility that comes to mind is: after the initial scare it became increasingly difficult to return to normal, without losing face. This is certainly true. However, politicians have lied to the public about many things in the past and changed track abruptly without any qualms. Thus, I doubt that this explanation holds water. A third explanation would be: early on some people discovered that this situation, whether it was by accident or not, could be conveniently used to push an agenda that was already dormant in the drawer: namely to roll out a new type of intervention, gene-technological prevention strategies, based on virus-vector technology or modified (mod-)RNA technology.

Modified RNA Technology: Genetic Prevention Techniques, and the Funnel Towards it

Such a technology, whether modRNA[4] or vector virus based, does the following, briefly summarized: Either it uses liposomes to transport RNA into the cell, which correspondes to a piece of genetic code of the relevant viral antigene, in this case the spike protein (modRNA). Or it uses a different, replication incompetent virus as a vector to transport the desired genetic code that encodes the spike protein into the cell. In both cases the cell is forced to express the central viral antigen, the spike protein, on its outer surface, alerting the immune system, which then produces antibodies, which in turn convey immunity to the organism. That rationale sounds very clever and did work to a degree.

It was sold as a 'vaccination,' which is a clear mislabelling. Hijacking the positively connotated term 'vaccination' for this technique was a first-rate PR coup, because it is a clear misnomer. In a genuine vaccination, the organism is directly confronted with the full antigen, i.e. the virus or bacterium, live or incapacitated, or with an appropriately dosed viral protein.

In this novel technology, a gene-based therapeutic approach was used. The correct term would have been 'gene-therapeutic prevention technique.' Only, had it been called such, it is not very likely that it would have stirred much enthusiasm. But in fact, it was a clear gene-therapeutic approach. The viral vector method is exactly the same technique that is used for some established gene-therapeutic medical interventions, that transport desired genetic elements into an organism – animal, plant or human body - to produce desired effects, such as the silencing of a deficient gene or the addition of a novel gene.

The modified RNA technique had not previously been used for such purposes in humans, to my knowledge. One of my informants, an experimental immunologist and toxicologist, told me that he had worked on exactly the same technique about 10 years earlier, in a research programme of the German government, where RNA was used and where he also lab-engineered viruses, in that case syncytial viruses. The German government had always denied that it participated in gain-of-function research, i.e. research that made pathogens more virulent or more dangerous. This is exactly what had happened with the SARS-CoV-2 virus. It was the result of gain-of-function research, as my informants said. Similar research had been officially published earlier (Menachery et al., 2015). The German government had been funding such a programme as well, and one of my informants participated in it and was therefore very well informed.

The outcome of the project on RNA, he said, was negative, because it was not possible to control the location of the production, the amount of end product produced by the cells, and

[4] It is important to realize that the RNA used in those interventions was not normal RNA, but modified RNA in which uracil was replaced by pseudo-uracil. This makes the substance longer lived, but is also a potential source for irritation.

there was no stop switch that could have been engineered into the system. It violated all three fundamental tenets of pharmacology: to know how much of an end product is transported to which end organ and for how long. None of these important points could be answered by the technique, and this is still the case to this date. We do not know in what cells the modified RNA released by the cationic lipid nanoparticles that are injected by the billions into cells will become active. We do not know for how long it will be active, and how much end product, i.e. spike protein, is going to be produced. And we do not know when the process is going to stop, nor can we regulate the process, and bring it to a controlled and desired end, because there is no stop switch built in that can be operated. I am not discussing the lipid nanoparticles, although they would be an interesting topic themselves (Ndeupen et al., 2021).

All this was known to the German government, and likely also to other governments quite some years before the Corona-pandemic hit, because it was part of the official report my informant had handed in to the government. Apart from that it was common scientific knowledge, which all of my informants who were active in this field confirmed.

Thus, it is one of the reasonable reconstructions arising out of this situation to stipulate: this corona pandemic, notwithstanding the question how it arose and how it became a pandemic in the first place, was used by influential people or by people in political offices to push a dormant agenda: namely to make modRNA and vector-RNA genetic interventions the standard for a 'vaccination' campaign. These techniques were obvious candidates, because classical avenues of vaccination development against corona-viruses had been tried out and had not been very successful (Tseng et al., 2012).

This agenda to use the pandemic for the roll-out of novel gene-therapeutic products seems to have been developed comparatively early on, if one is to believe the material collected and documented by Kennedy (Kennedy Jr., 2021). Anthony Fauci, the head of the National Institutes of Allergy and Infectious Diseases (NIAID) at the time, as well as some influential funders who have a stake and shares in the relevant companies seem to have discussed this option early on, according to documents released after Freedom of Information Act requests presented by Kennedy. Interestingly, the company who became rich manufacturing the modRNA 'vaccine' for Pfizer, BioNTech in Germany, was practically broke in autumn 2019. At that point, Bill Gates came and invested 55 million USD into this company, which had previously developed cancer treatments that did not work well. This is common knowledge and can be found in some relevant local German newspapers; it is reported on the Website of the German ministry of research on the 5th of September 2019 (https://www.go-bio.de/gobio/de/aktuelles/_documents/bill-gates-investiert-in-mainz.html, accessed 18th March 2025). One of my informants offered to connect me to the accountant of that company saying: the company was broke in late summer 2019. And then Gates invested, and the story turned golden. The same Bill Gates appeared on German TV, on Easter Sunday 2020, preaching to the German public at 8 pm, on the national news channel: the pandemic will be over, once we have vaccinated everyone. We will vaccinate 7 billion. He did not say who 'we' was. And he did not say what gave him the authority. And he did not say what the source of his knowledge was. But he said that this was so. This is the stance of the religious preacher, preaching the gospel of freedom by the power of new science, as I have outlined earlier.

This message was repeated by our chancellor Angela Merkel: the pandemic will be over, once we have a vaccination. Until then, everyone fasten your seatbelts, stay at home, keep your mouths shut, don't contradict, don't question. This was literally said in one of his public appearances by the director of the government agency Robert-Koch-Institut, Prof. Lothar Wieler: 'Those public health measures must never be doubted, never.' It turned out that the supposedly scientific Robert-Koch-Institut, the German public health office (which does not

have any executive powers, in contradistinction to the American CDC) acted according to political commands and desires, rather than strict scienific considerations. This became clear, after a whistle blower opened all the minutes up to the public (https://corona-protokolle.net/gremium/rki-krisenstab-COVID-19/, accessed 18th March 2025).[5]

It became obvious from these files that the public health measures were politically enforced, and not dictated by scientific evidence: keeping people at home, keeping schools closed, pubs, restaurants and other public places, enforcing curfews. These were all public health measures that no one had a clue about whether they would work and how they would be evaluated. We now know they did not have any beneficial effects (Bendavid & Patel, 2024; Quinn et al., 2024; Sagripanti, 2024).

In fact, one of my informants was a former official from the German ministry of the interior. He said that no one was ever interested in information that would ease the fear and the pressure. Everything was geared to increasing pressure on the public. And after considering everything he concluded: this must have happened on purpose.

Such behaviour makes sense, if there is a clear agenda: this agenda, arguably, was to push this genetic technology towards public acceptance. If you increase the pressure, first by lockdowns, later by continuous requirement of testing, or proving that you have had the disease, and later also by proving that you are vaccinated, then the pressure rises to accept the 'vaccination.' The fact that such an agenda was in the background also explains stories like those reported by Aaron Kheriaty, who was infected and recovered early on as a doctor, and yet his university wanted to force him to accept the vaccine, which he did not. He lost his job as a consequence (Kheriaty, 2022). But if the goal is to make the population accept the 'vaccination', then it is rational to not accept any other types of immunity.

One of my informants told me that especially in the US the use of other early treatments was actively banned. Those who advocated those treatments, such as hydroxychloroquine or ivermectin, were character assassinated. A WHO study with a toxic dose of hydrox-

Aaron Kheriaty

[5] It should be noted here that some experts see these leaked documents as fakes. Earlier, documents had been handed out after a FOA request and a court order. The length of the blacked-out passages does not conform to the length of the passages in the leaked documents. And one week after the leak a court decision on another FOA request was expected, whether the full documents without deletions were to be handed out. That was avoided by the leak and the court felt the request was already fulfilled.

ychloroquine was used to discredit this treatment. After the dust of public condemnation had settled the study was retracted (Mehra, Desai, Ruschitzka, & Patel, 2020), but the condemnation of the treatments remained. It was necessary to make the point: There is no treatment for this disease. This was the precondition for the special and expedited licensing procedure.

The analysis of my colleagues who analysed official data from the public health office Robert-Koch-Institut and from the central institute of German laboratories regarding the number of positive PCR tests in Germany and positive IgG tests and their temporal relationship showed something interesting: already by the end of 2020, 90% of the German population presented positive IgG tests, meaning that they have had some contact or other with SARS-CoV-2 and thus had gained some immunity (Günther, Rockenfeller, & Walach, 2024). This means: even before the vaccination campaign started in earnest on Dec. 22 2020 in Germany, the government was aware (or could have been, had it used its own data) that nearly the whole population had already built up some immunity. It could have halted the campaign on those grounds, as it is common immunological knowledge that natural immunity is superior to artificial immunity produced by any type of vaccination. In the case of the SARS-CoV-2 immunizations by modRNA technique this was soon shown to be the case (Gazit et al., 2022). It is also common knowledge that pushing immunization on people who have just recovered from the infection will increase the danger of antibody dependent enhancement and evolutionary pressure on the virus into mutation (Iwasaki & Yang, 2020; Sørensen, Susrud, & Dalgleish, 2020; Yahi, Chahinian, & Fantini, 2021; Yamamoto, 2022).

In Germany, the public health measures, publicly known by the cuddly name 'lockdown', were clearly a means to terrorize the population into accepting the 'vaccination' programme. Science allowed itself be instrumentalized for that purpose. The German scientific academy Leopoldina, the successor of the proud academy founded by Leibniz after the Royal Academy in London and the French one in Paris, supported this lockdown, in a statement issued by its president, conveniently on the day chancellor Merkel proclaimed it publicly. Prof. Esfeld, a member of the academy, protested publicly, not without suffering some attempts at character assassination (Esfeld & Lopez, 2024). Politically, it was clear that this statement of the academy was engineered by Merkel to support her policy (Mai, 2024). The government had built up a funnel. It had only one exit: vaccination.

The ICU Scam

Some further aspects of my data support the view that many measures served the purpose to make the population accept the gene therapeutical interventions:

There was a political attempt to give the impression that the number of intensive care beds available were drastically shrinking, due to the Corona pandemic. This was publicized on all channels. The story line was: our hospitals are full with corona patients. They cram the ICUs. We have no more beds. So please go and get vaccinated to ease the pressure on our hospitals. The same was true in the UK, where the story line was: Save the NHS (not the patients or yourself!) (Goddard & Dalgleish, 2023). The true facts, also laid out in a good book and some papers (Lausen, 2021; Lausen & van Rossum, 2021; van Rossum, 2021), were very prosaic: the number of hospital beds in Germany was due to be reduced in any case, as had been planned already since 2019 at the latest. There was a long-standing initiative that officials worked on. A new law was created in 2020 with the effect that hospitals received an incentive to reduce their ICU beds. They only got a bonus for offering ICU beds, if their capacity had reached a certain ceiling of at least 80%. So, some hospitals simply reduced the total number of ICU beds to meet this requirement. Others, who did not have enough, produced fake ICU beds by fitting normal

beds with some oxygen support and some machinery, which, however, could never be used as ICU units, because there were no personnel, and these beds were never officially counted. The net effect was that it appeared as if all the ICU beds were full. However, this was never the case as a website which monitored the data showed and still does (https://intensivstationen.net/, accessed 18th March 2025). This information was never publicly communicated. Instead, the narrative of overflowing ICU units was perpetuated. What was true was the fact that there were not enough nursing personnel around. But that had been so all the years before and was nothing new (Karagiannidis et al., 2019; Karagiannidis, Janssen, Kluge, Walcher, & Marx, 2021).

One of my informants, a specialist in social legal law and insurance practice in Germany, said: if a law is made and enacted, whose consequence is a numerical and factual reduction of beds at a time, when the official story line is that we need all beds available, then this is intentional. When I asked whether it could not also have been accidental, he said: these people in the ministry, they are professionals. They know exactly what they are doing. They do what they are told, and they achieve the effect they want to achieve.

Thus, one intention seems to have been to create pressure on the public and increase the fear factor. The goal: to create acceptance for the vaccination programme. Our representative survey in Germany asking about vaccination and vaccination motives showed that this was quite successful (Walach, Ofner, Ruof, Herbig, & Klement, 2022a): the majority of people accepted the vaccination programme, because they were afraid. Secondary motives were the wish to help eradicate the virus, i.e. an altruistic motive and the wish to lead a normal life.

The Fight against 'Fake News'

When the first rumours about potential side effects and danger of the vaccination spread in the social networks, there was an aggressive campaign to suppress such 'fake news.' A brave director of an insurance company who had the data, evaluated the risk of serious side effects of the vaccinations. He asked a specialist to do the stats, went public and raised the alarm. He demanded a large-scale investigation, calling on his colleagues from larger insurance companies to do the same. This would have been easy, as there were particular codes for the doctors who claimed reimbursement for treating such patients. There was a public outcry, and the CEO of that small company was sacked immediately and all investigation stalled. There might have been an innocent, if uncomfortable explanation: there was so much public pressure to make this programme work that everyone who cried 'foul' was immediately removed from the field lest they disturb the game. A more likely explanation in my view is: the vaccination campaign was all important. This was why the whole lockdown thing had been staged. Everyone trying to question this had to be removed immediately.

The fact that all worked so smoothly together is likely due to a preparatory exercise, Event 201. This was a world-wide pandemic exercise where politicians, public health officials, press representatives and other public figures around the worked practiced, in a dry role play, what would happen, and how they should react, if a serious pandemic hit their country and the world. Incidentally, the pathogen discussed was a mutated corona virus out of Brazil, and the timing was perfect: October 18th, 2019 (https://centerforhealthsecurity.org/our-work/table-top-exercises/event-201-pandemic-tabletop-exercise; accessed 5th June 2025). Therefore, the whole public machinery was geared to 'fighting the pandemic', and the only real help would come from the 'vaccine', as practiced in the table-top exercise Event 201. Therefore, critical questions and alternative avenues were to be prevented at all costs.

My colleagues and I had a similar experience. We used early data from a large Israeli field study (Dagan et al., 2021) to calculate the Number Needed to Vaccinate (NNV) in order to

prevent one case of death from COVID-19 (Walach et al., 2021b). This was possible, because this was the only study, up to that date, that was large enough, with roughly one million people enrolled. Such a large number is needed, if such a NNV is to be calculated in a situation like with SARS-CoV-2, i.e. when the incidence rate is very low, which it was, and the outcome of interest, death, is even less frequent. The NNV is an effect size. It is the inverse of the absolute risk reduction (ARR). And the absolute risk reduction is the ratio of cases in the control group to the size of the control group minus the ratio of cases in the treated group to the size of the treated group. In contradistinction to the often communicated 'vaccination efficacy' this is a figure in which the whole number of the cohort is entered. To calculate vaccination efficacy only the relative ratio of cases in the treated group to those in the control group is used. If in the treated group 1 person dies and in the control group 20, we can easily see that the ratio is 0.05 and the effectiveness 1-0.05 is 95%. Now if this is a ratio of 1 out of 20 in the treated group, and 20 out of 20 in the control group, the information will be evaluated differently than if it were 1 out of 100,000 and 20 out of 100,000. The absolute risk reduction takes the overall size of the cohorts into account. So, if 20 out of 100.000 died in the control group this would be a ratio of 0.0002. If 1 out 100,000 in the treated group died this would be a ratio of 0.00001. The absolute risk reduction would be 0.0002-0.00001 = 0.00019. In that example the Number Needed to Vaccinate would be 1/0.00019 = 5.263. In that fictional example the interpretation would be: we need to treat 5.263 people to prevent one case of whatever.

This is an artificial example to show: what can be made to look highly effective – 95% effectiveness – is in fact not very effective, if the size of the cohort is taken into account, or rather, the size of the effect depends on the denominator, the size of the cohort.

We used this procedure in our study. We used the Israeli study mentioned above to calculate the number needed to vaccinate (NNV) to prevent one COVID-19 death by vaccinating. This study, I said, was at the time the only one which could have been used that way, because it was large enough and because it was from a naturalistic field setting. The number needed to vaccinate turned out to be roughly 16,000 in order to prevent one death. Now, is that good or bad? This depends of course on the safety of the intervention. We did not have many data at the time, and no official prospective documentation, which is in itself a very strange observation. We only had pharmacovigilance data. Pharmacovigilance data are data that are passively collected. Anyone, usually a doctor, or a pharmaceutical company who is obliged to enter cases, or sometimes patients themselves report any type of side-effect they feel is associated with an intervention into a database. Each country has such a pharmacovigilance database. We screened all European pharmacovigilance databases to see how many side-effects were reported.

We decided to use the Dutch pharmacovigilance database, because it presented the public with the highest counts of side effects and we thought we need a worst-case scenario to be realistic. The Dutch database also was proudly reported by its director to have a good curation, and most data were entered by professionals or license holders, i.e. companies (van Puijenbroek, 2021). At the time, and for a long time after that, the Dutch pharmacovigilance database reported 4 deaths per 100,000 vaccinations attributed to these COVID-19 vaccines. So, we calculated: One can prevent roughly 6 deaths per 100,000 vaccinations. We likely have to expect 4 deaths associated with these vaccinations, perhaps more, because pharmacovigilance data are known to notoriously underestimate adverse effects (Alatawi & Hansen, 2017). We argued that we found this not a very good risk-benefit ratio, and we called for pause to reconsider the campaign and to install a good prospective documentation study. We published the paper (Walach, Klement, & Aukema, 2021a). A shit storm hit us. The paper had nearly 800,000 views in the first week, and then it got retracted. I abbreviate here. We have reported the details elsewhere (Walach & Klement, 2024c). We republished it after a thorough triple

peer review (Walach et al., 2021b), and the editor of the journal asked in an editorial accompanying the publication what pharmacovigilance data are there for, if they cannot be used to make such comparisons (Lyons-Weiler, 2021).

All this shows: the stakes were incredibly high. Why else would a simple risk-benefit analysis using available data be retracted? None of the classical reasons for retractions – falsified data, wrong analysis, plagiarism – applies. There is a simple answer: This was a political issue. *The vaccination campaign was to succeed by all means, and whatever threatened it had to be removed.*

I have another little vignette to offer here: one of my colleagues is a member of the Economic Council of the German State of Brandenburg. This is a semi-official body of invited members, mostly academics and leaders of the local economy. This group had invited the candidate for the office of Bundeskanzler before the last election in 2021. One in the group had asked the candidate, Olaf Scholz, who was later to become the Bundeskanzler, what he would do or foresee to re-establish economic wealth, if he were elected. He said, my colleague reported: 'Germany will become the world champion in vaccine production, as it had been the world champion in automobile building.' It was a clear political agenda.

The COVID-Narrative

If I wrap up what I have said up to this point then the story is easy to read: the COVID-19 pandemic was a prime situation to push an agenda that had been dormant in the drawers for quite some time, namely to bring the modRNA and vectorRNA interventions to people on a grand scale, worldwide. That this was a huge experiment is pretty clear to any open-minded observer. Although there were procedures followed and studies conducted, the procedures were shaky and the studies were flimsy (Doshi, 2020, 2021). There were no safety data at the time of approval. When the Pfizer phase IV trial was published (Polack et al., 2020), I asked the corresponding person with Pfizer, Judith Absalom, via email, whether she had safety data. She answered promptly and openly: 'Not yet.' The product was thus licensed without proper safety data, a fact unthinkable until then, and only explainable as a consequence of the mad pandemic state of the world. We leave that political charade out here. It would lead us into the WHO, its financing etc., and we would again meet some familiar names. But we leave it here. The purpose of the previous data and considerations was to make one simple point:

The COVID-19 pandemic had, among others, one main goal: to install gene-technological pharmaceutical procedures in the public perception, and make them acceptable. It is psychological standard knowledge about changing attitudes, which comes from the theory of cognitive dissonance by Festinger: if a person can be brought to act against his belief, and the costs are comparatively high, his only option is to change his belief (Harmon-Jones & Mills, 2019). A second goal was to organize a showcase for regulatory approval of such substances, with the likely aim to make this technology a platform technology for more, and different, vaccines, as well as other interventions. One of the chief agents during this crisis, the company Moderna, has the major principle in its name: modRNA (read loudly and in one go). This is already visible: during the summer of 2024 the FDA licensed a modRNA-based vaccine for human syncytial virus (Britton et al., 2024; Shaw et al., 2024; E. Wilson et al., 2023). Thus, the consequences are clear. The way has been paved and will be walked, now that the general hurdles have fallen.

The Further Reaches: Gene Technology as an Important Transhumanist Project

Gene technology is one of the bearers of light for the transhumanist movement. Ray Kurzweil had prophesied already in 2004 that four novel developments will catapult us into the new era by 2020: development of computing and its miniaturization, nano-technology, robotics, and gene therapeutical interventions (Kurzweil & Grossman, 2004). The COVID-19 pandemic has proven him correct. Here gene therapy and nano-technology have touched hands: nano-technology was used to create the nanoparticles that were the packaging for the modRNA. And gene technology was used to create the modRNA and virus vector products that were delivered. This is the reason why I see these COVID-19 prevention techniques as a transhumanist project, even though no individual transhumanist activist might have been in the foreground. This is irrelevant, as it was the ideology that was operative here (Desmet, 2022).

Upgrading humans necessitates gene-technological interventions. Virtually any of the transhumanist texts will contain a reference to gene technology. For instance Hughes (2004, p. XII), the former secretary of the Transhumanist Association predicts:

> *'In the twenty-first century the confluence of artificial intelligence, nanotechnology and genetic engineering will allow human beings to achieve things previously imagined only in science fiction. Life spans will extend well beyond a century. Our senses and cognition will be enhanced. We will gain control over our emotions and memory. We will merge with machines, and machines will become more like humans. These technologies will allow us to evolve into varieties of 'posthumans' and usher us into a 'transhuman' era and society.'*

Elbek (2023, p. 326) argues:

> *'Risk medicine not only eliminates disease but also upgrades the human body by eliminating the risks it carries that lead to disease and promises mankind a life where cheating old age and death is an achievable goal.'*

This elimination, he makes clear, will happen through gene-editing, which can be used to switch off genes, and perhaps insert desired genes. Observe that the same ideas are still active 20 years later.

The wish list in the transhumanist literature is long and quite unrealistic (S. B. Levin, 2021). One could combine the genes that code for quick contraction of the muscles in sprinters with the gene that code for the durability of the contraction in long-distance runners and then have both, sprinters that have a great durability. One could combine the genetic make-up of an intelligent person with traits and genes that code for social competence and amiability, notwithstanding the fact that highly intelligent persons are often not very sociable and socially competent. There is a famous anecdote of a beautiful but somewhat less than brilliant lady who, at a cocktail party reportedly said to Einstein: 'Imagine, professor, what children we would have: your intelligence and my beauty!' Einstein allegedly said: 'Imagine, it came the other way round!' The transhumanist discourse around gene updating and improving is a bit like that. It only focuses on the potential gains, without even considering potential problems.

It is easy to see: this transhumanist discourse uses a very simplistic model of genetics and genetic engineering. The starting point of the discussion is always: Nature has not dealt optimal cards. Everyone has the right to a fair hand (Buchanan, Brock, N., & Wikler, 2000). So let us help out Nature and change the cards. Discussions then centre round the ethical issues: is it not only allowed, but ethically demanded (Harris, 2007)? Should we allow it at all, or ban and regulate it (Fukuyama, 2002, 2004)? Are we not taking away the freedom of choice from the child, if parents meddle with his or her genome (Habermas, 2013, orig. 2005)?

These discussions remind me a bit of discourses of the kind: suppose, the Adirondacks or the Cumbrian Mountains were, underneath, perhaps after 50 yards of granite, made of gold. Would we be allowed to mine the gold? Would we be allowed to destroy beautiful landscapes by mining? What happens to the gold-eating tree frog living there? Would it have to go? And where would it go? To the London Zoo? And if we mined the gold under the Adirondacks or the Cumbrian Mountains, who would it belong to? In England to the crown? Would it belong to the ancient Celts and their descendants? Or to all English people? Or only the farmers and landowners who hold the rights to the land? Or the Chinese mining company that was clever enough to buy mining rights in the Lake District 10 years ago, when no one knew about the gold underneath? And on it goes. Only: there is no gold underneath the Adirondacks or the Cumbrian Mountains, not that we know of. And hence discussing it is futile.

The idea that we can actually engineer all those desired traits and outcomes like we change the colour of a car or the size of an airplane is silly in the extreme, despite protestations to the contrary (Bostrom & Savulescu, 2009). I am not a geneticist, but simply by reading a few basic texts on genetics and epigenetics that would be available to everyone I can see: there are extremely few traits that are coded for by just one gene (Gibson, 2015; Jablonka & Lamb, 2005). Of all the genetically determined diseases, only 1% at the most is associated with one single gene, where a genetic intervention might make sense at all, such as cystic fibrosis. All other diseases where we know or suppose a genetic basis for are associated with huge networks of thousands of genes. Altering one gene does not do anything, or will certainly not have the desired outcome. It has been pointed out that such a concept of genetic determinism is not

only completely outdated and impossible, but unscientific in itself. It is unscientific, because it neglects to do what every undergraduate student is told, before he or she is writing something, namely to make themselves thoroughly acquainted with the literature, i.e. with the state of the knowledge.

The state of the knowledge seems to be: The old-fashioned view that genetics, i.e. DNA-sequences, determine complex traits is long given up by geneticists. Only 1% of all DNA-sequences code for proteins. The rest has some controlling or feedback function that is not even understood. Thus, saying 'let us change the genes to produce the outcome y' is simply silly, because it is never going to work. Here are a few interesting facts:

Empirical Facts: The Example of Cystic Fibrosis

Take cystic fibrosis as an example. This is a monogenetic disease, which becomes dominant, when all two alleles carry the defective gene, else it is recessive and dormant, but can be passed on. The genetic defect leads to a misformation of the protein 'cystic fibrosis transmembrane conductance regulator' (CFTR). This protein codes for a membrane channel that transports negative chloride and bicarbonate ions to the apical part of epithelial cells, where they organize the lubrication and the reabsorption of liquid. Such cells are very important in the lungs, but also in other organs like the intestines. That is the reason, why a defect in the gene coding for this protein can have devastating effects. The effect is a high susceptibility for infections and constant inflammation which leads to premature death. Worldwide about 100,000 people suffer from the disease and the only curative treatment would be a gene-editing treatment that cures the gene defect (G. Wang, 2023). This has been made possible by the development of various gene editing techniques, like the one that uses a RNA sequence that functions as a genetic immune system (CRISPR) and can work alongside a bacterial enzyme that targets the DNA (Cas9) (Cong et al., 2013). This works like molecular biological scissors which can be used to cut out and insert genes. There are about 2,000 mutations of that CFTR gene known but only some are dangerous; others lead to suboptimal functioning. It would be sufficient, if at least some function could be restored using gene editing (Griesenbach & Alton, 2013). Since the detection and cloning of the gene in 1989, many attempts at gene editing have been made. Several viral vectors have been tried; without success. Viral vectors are benign viruses or viruses that have been engineered to be harmless, and can no longer replicate. They are supposed to enter the host cells and then deliver their target, the new genetic code which is then supposed to be built into the host cell's genome. Because there are many millions of epithelial cells affected in cystic fibrosis, these gene therapeutic interventions or viral vectors have to reach a relevant proportion of them and revert their genetic expression in order for the therapy to be effective. In trying to do so the host's immune system has to be overcome, which is no small feat. It turned out: the immune system is far too competent to allow such viral vectors to function properly.

That is why DNA formulations packaged in lipid-nanoparticles were tried next, for 'The question 'can gene therapy' improve CF lung disease remains unanswered' (Griesenbach & Alton, 2013, R56). We know those gene-therapeutic formulations. They are what have been used as preventive gene-therapeutic interventions in COVID-19, discussed above. A large clinical trial was initiated that involved a large group of authors and hospitals and probably recruited a large part of the UK's cystic fibrosis patient community, namely 140 patients in all who were randomized to receive this new gene-therapeutic preparation, which was applied via an inhalator once a month over a year and compared to saline as placebo (Alton et al., 2015). The trial was certainly a very well conducted one, professionally planned and analysed and published

well. The effects were significant, but clinically small. The effect size in the primary outcome after one year treatment was d = 0.39, i.e. a bit more than a third of a standard deviation. Secondary outcomes did not fare much better. From a clinical point of view, even a third of a standard deviation is a clinically worthwhile effect. But this is a far cry from a causal, curative therapy.

Hence Wang concludes:

> *'Genetic therapy for CF has been pursued for decades [...]. The early strategy was focused on gene addition by supplementing the diseased cells with a functional copy of CFTR [...]. Multiple vectors have been developed and tested pre-clinically or clinically in the lungs, including adenoviral vectors [...], adeno-associated viral vectors [...], lentiviral vectors [...], and non-viral vectors [...]. Unfortunately, clinical improvement of lung functions has never been achieved. Retrospective reflection often points to multiple issues, including vector transduction efficiency, stem and progenitor cell targetability, and duration of the transgene expression [...]. However, a key and largely overlooked issue is that we do not know whether restoration of CFTR function in epithelial cells alone is sufficient to rescue CF clinical diseases.'* (G. Wang, 2023, p.8)

This is the current state of affairs with a 'simple', mono-genetic disease which has been known for a long time and whose genetic location has been known for more than 30 years. In order to really causally treat it with gene therapy, one would have to either overcome the external barriers of epithelial cells and reach the cell bodies with gene therapy. But the underlying stem or progenitor cells of the epithelial cells would have to be reached as well. Virus vectors have been hampered by the immune system. Lipid nanoparticle packaged gene therapy was not very effective either. Whether systemic approaches, i.e. coming from the blood stream will be possible and effective, no one knows.

This example also illustrates a general problem of genetic editing: this can either be done in somatic cells, like here, in the millions of epithelial cells. To be effective, most cells, or a sufficiently large number of cells have to be reached. And because not only the organism has an immune-systems but cells as well, which suppresses exogeneous genetic material by silencing it, such procedures would likely have to be repeated.

Stem Cell Editing: Sickle cell anaemia and Thalassemia

A second path is targeting stem cells. Stem cells are pluripotent precursor cells that are as yet not in their final shape. Foetal stem cells can become any cell, and precursor stem cells are cells that start dividing and then produce many cells of a certain kind. For instance, hematopoietic stem cells, normally found in the bone marrow, will divide and produce diverse blood cells, for instance erythrocytes, i.e. red blood cells. Treating stem cells, when possible, is of course more elegant, as from them many novel cells will arise. Bone marrow transplantation in order to get stem cells into ill patients is one therapeutic option with various cancers and has been used successfully for quite a while.

Hence it is a natural idea trying to target the genetic profile of stem cells in certain diseases. Sickle cell anaemia and thalassemia are two diseases, where we also have a genetic point mutation that is known to be causally responsible for the respective disease. Both diseases are somewhat similar, because they affect the hematopoietic system, and the red blood cells that are produced by it. Both diseases also have a kind of similar evolutionary history (Kegel, 2023, orig. 2009). Sickle cell anaemia is typical of sub-Saharan Africa, while thalassemia

is found in Southern parts of the Mediterranean. In both regions malaria was a problem, in Africa it still is, in the Mediterranean there used to be quite some malaria in former days. If a person has sickle cell disease, he or she has two alleles of a gene coding for the shape of the red blood cells. If there is only one allele affected, then this provides some resistance against malaria. The same is true for thalassemia. This is the reason, why those genotypes could develop and become stabilized in the first place. However, if both alleles are affected, then the disease arises, and chances for living into higher age and producing offspring, are minimal. Thus, evolution sought a middle way between resistance to malaria, which would have threatened the survival of the population, and the disease, which also threatened the survival of the population. Having only one allele prevents the disease, but conveys immunity. But when both come together, because two persons mate who have both one allele, then the disease flares up.

The diseases are dangerous and painful, because the viscosity of blood is altered in sickle cell disease, which leads to all sorts of problems. In thalassemia other problems arise, but in any case, the disease is debilitating and patients need lifelong transfusions and medications or die at a young age.

Therefore, it was natural to use gene therapeutic approaches, as the mutations and genetic loci are known and the technology to edit them was now available. The CRISPR-Cas9 technique was used in a recent study of two patient cases, one of sickle cell anaemia, and one in thalassemia (Frangoul et al., 2021). As mentioned above, this technique uses an RNA-repeat sequence from a bacterium that is normally part of the cell's immune system and a protein from that bacterium, Cas9, that guides the RNA to cut out certain parts in the DNA that is to be removed. This can be engineered to target certain genes. In that case it was used to target the genes coding for the two diseases in these two patients. Hematopoietic stem cells were taken from those patients. These were genetically edited using the CRISPR-Cas9 technique to remove the faulty gene and insert the correct one. This was repeated until at least 70% of the stem cells had the correct sequence. Then the blood was reinfused into the patients and the ratio of different types of erythrocytes was monitored for over a year. It turned out that the desired goal, to have a majority of foetal haemoglobin, i.e. good and functioning haemoglobin, was reached after a few months and stabilized for a year.

The authors embarked on a larger phase-3 study in the form of an open label prospective observational study, which is perfectly in order for diseases like that, where spontaneous remission is not an issue, and hence comparisons or randomized controls are unethical. These two studies, one with sickle cell anaemia, one with thalassemia were very successful (Frangoul et al., 2024; Locatelli et al., 2024). Both studies chose clinically significant outcomes: no occlusion disease for a year in the case of sickle cell disease, and no transfusion for one year in the thalassemia patients. 28 out of 30 patients reached that endpoint in the sickle cell study and 32 out of 35 patients reached their endpoint in the thalassemia study. All had severe side effects, but that seems to be the price. Thus, the treatment has now proven effective in those two diseases and also kept its promise for a reasonable time of one year. It remains to be seen, for how long the effects will last.

As a consequence, the Canadian Health Technology Assessment Agency that makes recommendation for Health Canada, the official body for reimbursement of treatments, recommends that these treatments are now reimbursed for patients of 12 years of age or older, if no other stem cell donor can be found, other treatments do not work and a certain severity of the disease is given plus a stable general health. The cost of one course of treatment is 2.8 million Canadian Dollars.

A recent review of this technique for rare genetically fixed diseases concludes that it remains to be seen how effective and how safe these procedures are, before they can be widely accepted (Badwal & Singh, 2024).

We see: direct editing of the genome of hematopoietic stem cells for single point mutations of severe diseases works, at least for the time that has been overseen, some 15 to 17 months so far. It comes at a price: side effects and monetary. It is very difficult to tell to what extent the exorbitant prices are really justified or just fictional because that is what the market allows. But we can glean that gene editing therapy is not just a humanitarian act, but also a highly lucrative business, not only for the industry, but also for the authors of those studies, most of whom are on the payroll of the relevant or similar companies.

Germ Line Genetic Editing

A third path of genetic therapy is via genetic engineering of the germline, before the organism develops into the myriads of differentiated cells which all carry the defective gene. That is only possible when foetuses are produced in vitro, tested, and, if found deficient in a gene, treated right before the development begins. Then, there might be a chance of correcting a defective gene. Whether it works for a defective single-genetic disease like CF, is an open question.

The first germline editing in human foetuses have been reported in 2015 in China (Liang et al., 2015). Twins with genomic anomalies were used for that, and the effects were very mixed. The editing efficiency was reported to be only 14% and quite a few additional problems such as gene mosaicism were also found. This is a situation, when various genes, new and old ones, are mixed and produce a strange genetic picture (Adashi & Cohen, 2020). There were four further experiments until in 2018 a Chinese researcher Jiankui He announced at the 2nd World Summit of Human Gene Editing that he had edited the germline of two twins https://www.nytimes.com/2018/11/28/world/asia/gene-editing-babies-he-jiankui.html, accessed 21 March 2025), born after in vitro fertilization of a female egg with sperm of an HIV positive father (A. Caplan, 2019; Cyranoski, 2019). The researcher's stated intention was to cure the genetic susceptibility for HIV in the twins by editing a certain gene that made cells vulnerable to the virus. This benevolent intention was widely doubted and his experiments decried as unethical to the extreme, because he had mostly sought publicity and monetary reward, via filing patents (Le Buhan, 2018), and opening a clinic, as well as for lack of proper ethical concerns and informed consent. Also, the condition could have easily been treated otherwise (A. Caplan, 2019). Most vocal were two Chinese gene researchers, who demanded the government investigates and countries should ban that type of research until clarity was reached (H. Wang & Yang, 2019).

This episode raised international concerns and ethical debates (Arguedas-Ramírez, 2020; Gumer, 2019). Arguedas-Ramirez and Gumer independently of each other and for diverse reasons argued against further proceeding with this technique. The main common argument is the inequality that is produced. Although the technique is said to be comparatively cheap it will not be available for everyone. It constitutes a case of Northern scientific-technical paternalism, Arguedas-Ramirez (2020) argues. The techno-affine countries of the North dictate the pace, both in science and in international regulatory affairs, they amass the data, and then expect the world to act accordingly. Thereby, resources are funnelled down a certain track. Investors invest in those techniques, and a lot of money is syphoned away from potentially much cheaper interventions that might benefit more people. Take genetic therapy of sickle cell anaemia, one of the problems in Africa. As I have documented above, this is an extremely expensive treatment with a price tag of 2.8 million per course of treatment. While malaria is

a much more common problem in Africa, few resources are poured into its research and prevention, compared with the avenue of germline editing. The fear is real that this type of paternalism will create even more inequality worldwide.

Gumer (2019) points out that the technique is very dangerous, an assessment that other specialists agree with (Adashi & Cohen, 2020; Ishii, 2017). The technique can lead to unwanted insertion of genes, mosaicism and unintended effects that are not discovered and then enter the germline and the human gene pool. Authors like Adashi and Cohen (2020), who advise caution, have nothing in principle against the technique, but estimate that the clinical applications are decades away, if they are supposed to be safe and well embedded in public discourse and acceptance.

We can see from this short discussion: germline editing is round the corner. It has already peeped around and has been pushed back. But there does not seem to be any opposition in principle within the scientific community. Arguedas-Ramírez (2020) observes that scientists are illiterate ethically, politically, socially and historically, which is probably a safe assessment. They do their job without considering the wider ramifications. Germline gene editing requires in vitro fertilization (IVF) and the subsequent disposal of unwanted and surplus embryos. While some people and cultures might not see a problem here, many religious cultures and people do. Should IVF become the standard? Currently it is used for infertility treatment. But if germline gene editing should become an option it is a requirement.

Gumer (2019) correctly observes that there is no real divide between treatment and the attempt at enhancement, something that Jiankui He had explicitly stated in his public appearances. Transhumanist authors are adamant that the separation between therapeutic treatment and enhancement is artificial and nonsensical (Bostrom & Savulescu, 2009; Buchanan et al., 2000; Kamm, 2009; Savulescu & Bostrom, 2009). So, it is clear: the way to enhancement is via propagating germline editing for diseases. The latter might be more acceptable to the public, as it is all about preventing or treating severe diseases, and it is all about winning prizes and a lot of money. But once it is established, the money will flow with parents wanting to use the technique for enhancing their children. This is something which the transhumanist discourse is trying to establish not only as a right, but as a plight (D. W. Brock, 2009; Harris, 2007, 2009).

Jiankui He

The technical problems might be stupendous. That is not a valid general argument in the eyes of most authors against germ-line editing, only a postponing one. They will be overcome, as we have overcome other technical problems. In fact, a systematic review of all kinds or arguments raised in the ethical debate, which had analyzed 180 papers (van Dijke et al., 2018), found that more arguments were raised in favour of germline editing, namely 90 different arguments, than were mentioned against it, namely only 79 arguments. The major arguments in favour were that it might prevent suffering and disease, that it might become cheap as a treatment and that it would be unethical to withhold, among others. The major arguments against were ethical and political: that it would create inequality, because of a very small group profiting; there would be potential for misuse; human dignity was affected; and the monetarization of human genes and health.

The argument of human dignity and 'human nature' had been raised by various authors and philosophers (Fukuyama, 2002; Habermas, 2013, orig. 2005; Jonas, 1992; Sandel, 2009). But it will not find traction with transhumanist authors because they deny, as a rule, that there is such a thing as 'human nature' fixed and independent of our wishes and discourse. We are the ones that define human nature, and if we decide to edit the human genome, then human nature is changed, by virtue of our decisive power. Any reference to a transcendent power or a 'God' is not really scientifically defendable, as most scientists don't even know what that term should refer to, scientifically speaking, according to a recent answer to the claim, germ line editing is wrong because it would be 'playing God' (Locke, 2020).

What is interesting to observe is that we see a second round in the old eugenic debate coming up again. The discourse about eugenics was started with the first transhumanist author, Julian Huxley, the grandfather of the author quoted at the beginning, and his contemporary Sir Francis Galton, who suggested to improve the gene pool by statistical means and recommended the state intervened into who should procreate and who should not. This eugenic movement became strong in the United States at the beginning of the 20th century (Kheriaty, 2022). As we know it was perfected by the Nazis in Germany to a dire degree, by eradicating whole populations of what was thought to be inferior genetically. The transhumanist authors are a bit careful to open up reminiscences of that, but it is pretty clear that this is the direct consequence of this discourse, and some transhumanist authors are either as historically blind so as to not see it, or so proud of their idea that they don't care, as has been observed frequently (Buchanan et al., 2000; Hansmann, 2015; S. B. Levin, 2021; Wiesing, 2008; Wikler, 2009).

We will leave it at that. We can see: germ line editing as the most debated of the gene technological techniques is the holy grail to genetically engineering better humans. It has been already tried in proof of principle studies. And although there seems to be a kind of moratorium over the scientific community due to the scandal with Jiankui He and his designer babies, it is safe to assume that this kind of moratorium will not last long, once the dust has settled (Cyranoski, 2019). As long as the scientific community, or polities, do not establish robust regulations that are accepted, and respected worldwide, we will see this happening sooner or later. The questions that are raised here have to do with the deeply rooted question about human nature, especially about whether our genes, i.e. our material outfit, is all that makes us human.

One thing is clear: without further progress on the germ-line editing scientific front there won't be progress in the transhumanist agenda for improving humans genetically. That is the reason why it is a matter of life or death for the ideology of transhumanism that gene technology be widely used and accepted by the public. For, once it is, it is a smaller step to accepting germ line modification. That is also the reason, why the genetic prevention techniques used in the COVID-19 vaccination campaigns are important. And this is the reason why I suspect

that one of the major drivers, apart from monetary gains, was the underlying ideology.

Before we move on, let's peak into some interesting facts about genes and genetics that are important to understand whether the transhumanist agenda is even reasonable, let alone possible.

Genetics and Epigenetics

It is interesting to note: of all diseases known to have a genetic basis, only 1% at the most are caused by a mutation in a single gene, such as cystic fibrosis of sickle cell anaemia, as I have mentioned above (Allis, Jenuwein, & Reinberg, 2007; Carlberg, 2023; Gibson, 2015; Jablonka & Lamb, 2005, 2020; Kegel, 2023, orig. 2009)[6]. All other diseases with a suspected genetic cause have a network of hundreds to thousands of genes underlying the appearance of the disease. Sometimes the disease becomes manifest, sometimes it does not. The discourse of genetic mono-causality that dominates the public perception of genetics and the transhumanist discourse is a pure chimera.

Even in identical twins there are cases of genetic diseases, where one twin develops the clinical picture and the other one does not. Why? No one knows, but very likely, because there are epigenetic changes that silence some of the genes contributing to the disease. There are genetically engineered lab mice who are engineered to be genetically identical and to express a yellow coat colour and to also have some prominent diseases like diabetes and obesity. When they are crossed which each other – which theoretically should yield the same type of mouse – inevitably some revert back to the normal type with grey-brown coat and normal life expectancy, and some get speckled coats and an intermediate state. Without any change in the underlying genetics. The result is due to epigenetic changes, and obviously it is not always clear where they come from. It has been shown that feeding the aberrant yellow coated mice some methyl-donors, such as folic acid or choline in their food seems to help methylate the genes and thus silence them, producing normal mice again in the offspring.

There are many examples now how a seemingly clear underlying genetic condition leads to vastly different

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[6] In the following passages I refer to the information presented in those fundamental texts without referencing the particular source for a precise piece of information.

phenotypical expressions, in plants and in animals (phenotype is what is visible, genotype is the underlying genetic situation). Even the humble lab-workhorse drosophila shows huge variations in expression despite identical genetic make-up, if the eggs are hatched at different temperatures (Daniels, 2009). No changes in the genetics have happened. Obviously environmental factors have contributed to changing the expression of certain genes via epigenetic variations.

Epigenetics is the study of how genes are actually interrelated and expressed. There are at least four levels of epigenetic modification, and they are all interrelated with each other, and with the genome. The DNA itself is threaded through histones, which themselves consist of different proteins. These proteins carry protein tails, which can be used as signalling antennae, as it were. Depending on how they are configurated, they allow access or not to the DNA, and hence make transcription possible, or silence the respective genes. They might have also other as yet undetected functions. The DNA itself has variable CpG (cytosine-phosphate-guanin) sequences. These are the locus where a methyl-group (-CH3) can attach itself. Such an attachment of methyl-groups leads to the silencing of the gene – normally, but not always. Sometimes the silencing is only partially. Even the concept of silencing does not seem to be a dichotomic, but a continuous one. The histones can be more or less densely packed, making access to the underlying DNA-sequences possible, or not. Acetylation, i.e. the attachment of an acetyl-group (-COCH3) to a nucleic acid sequence of some DNA-code sequences, or histones, seems to make access to a DNA-sequence preferable and allows for transcribing. The interplay of methylation and acetylation is a continuous, fluent process whose regulation is not at all understood very well.

The intermingling of chromatin – the densely packed DNA in the chromosome – in the nucleus allows for exchange with other chromosomes and genetic codes which has not been fully understood as yet. The DNA is transcribed into RNA. But this RNA is not only used to serve as a template for the making of protein in the ribosomes – the textbook case. Protein coding DNA is only 1% of all our DNA, as mentioned. There are also bits and pieces of RNA that are quite small. And there is a large group of them with ever differing roles. But some of them lead to a negative feedback cycle silencing genes temporarily. Some of them are messengers for other genes. Some of them serve as cellular immune systems that get rid of alien DNA or RNA that stem from viral infections, or, you might guess, from genetic engineering interventions. We have met such a small piece of RNA that is part of a cellular immune system of bacteria already: the CRISPR-Cas9 system used for genetic engineering. It is such a small RNA sequence that has evolved to help bacteria get rid of exogeneous viral DNA in that it cuts it up.

That is also the reason why in plant genetic engineering the new genes engineered into plants will not be transferred into offspring but quickly silenced in the next or the following generation. Plants, animals, humans, cells even, are organisms that have their own immune system. It's task is to discover what is own, and what is alien, and to destroy alien stuff, and silence alien genes.

Genetic engineering without respecting the whole complex epigenome is not a feasible option. The spectacular cases reported above, all concern single-locus gene mutations, where only one or very few base-sequences in the DNA are altered, which are faulty due to mutations. But those are the exceptional cases. Currently no one has an idea how complex that epigenome might be and no one knows the missing pieces of information.

In the 60s and 70s no one had an idea about the importance of the epigenome and its existence at all. When it gradually became known, no one outside of the genetics community took note, simply because it was all very complicated, and still is. The public discourse, in non-fiction literature and the media, does not take note of it. Thus, an oversimplified text-book

knowledge which is frozen at the state of knowledge of the 1980s underlies this transhumanist discourse about 'genetic updating the human.' I doubt that any practising and knowledgeable molecular biologist and geneticist would do anything else but laugh at the idea of genetically engineering better humans, even with today's state of knowledge, let alone that which underlies the transhumanist discourse in its published works. It might be worthwhile to really interview some of the leading figures in the field to find out.

My impression is: the genetic and molecular biological knowledge at the disposal of those transhumanist writers has only a vague resemblance to the true reality of scientific facts about genetics, epigenetics, heritability, gene-expression, and silencing. Although I am no specialist in this area, but a generalist who is capable of sifting through literature from other fields, and finding out important pieces of information, I can see the scientific discourse in this field is so complex that an 'upgrading' is completely out of the question. All those predictions made 20 years ago about being able to gene-edit humans, improving them, creating traits, and optimizations at will are grossly misplaced and clearly wrong. Interestingly, these predictions were neither made by biologists, nor by molecular biologists, or geneticists. They were made by very vocal engineers, IT specialists, software programmers and advocate philosophers with inadequate knowledge.

The question that imposes itself at this point is twofold:

a. Will it ever, or at all, be possible to do such a thing like upgrading, perhaps at a later time?
b. Is not the biology of a complex self-controlling and self-evolving system like the human organism set up in a way that proscribes interventions from the outside, or, if they are made nevertheless, will they not be annihilated by the system's dynamic?

I think it is necessary to deal with the last question first, because the answer to this question will also entail an answer to the first.

Dynamic Systems Models

I observe that, in the language, and in the mental models transhumanist writers use, they adopt an overly simplistic thinking style. This presupposes a very simple cause-effect model of the universe. That is typical for specialists trained in IT, engineering and similar fields, where the underlying systems are quite simple, and can be analysed using abstractions like those which Newton used to understand movements, and cause and effect relationships. Something is set in motion, causes something else to do something, which is an effect of the first motion, which will cause something else, and so on. It is a kind of billiard-ball causal model (for which already Mach showed at the end of the 19th century that it is wrong). In between are some other trajectories that branch off, and perhaps a feedback circle is also planned in. But all these systems have one thing in common: they are dead, they are man-made, and they are very simplistic.

We humans have a strange property: we invent clever machines. Once the machines are invented and found working, we somehow hit at the great idea: perhaps we humans are like these machines (that's why we could invent them in the first place)! And we end up saying: we *are* such machines.

This happened to Descartes. He came up with the really brilliant idea: organisms are mechanistic machines (Descartes, 2003, orig. 1664). How did he arrive at that idea? At his time clever engineers built mechanical devices that could play all sorts of things. Puppets danced. Water plays directed intricate movements of figures far away from the source. Clock-

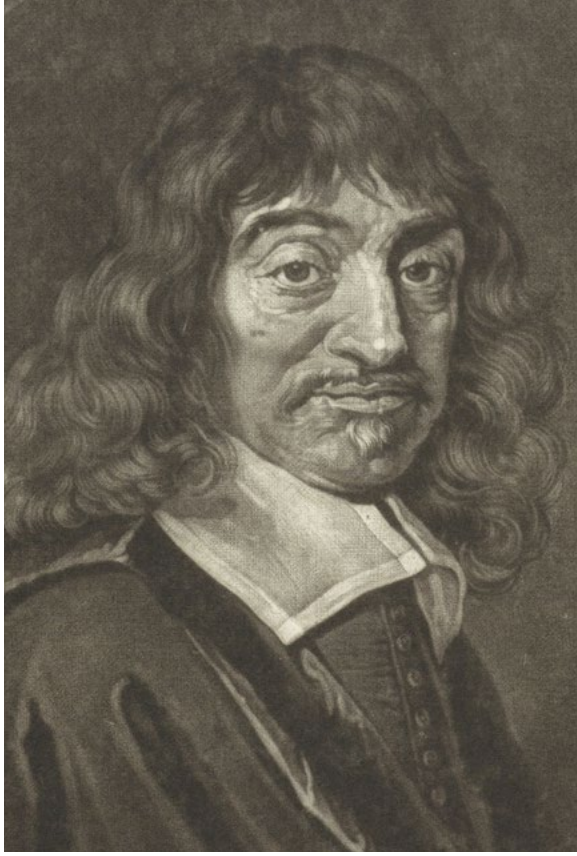
works moved planets according to their celestial position around huge clocks. So, if humans can invent such machines, why not conceive of the idea that our organism *is* just such a mechanism?

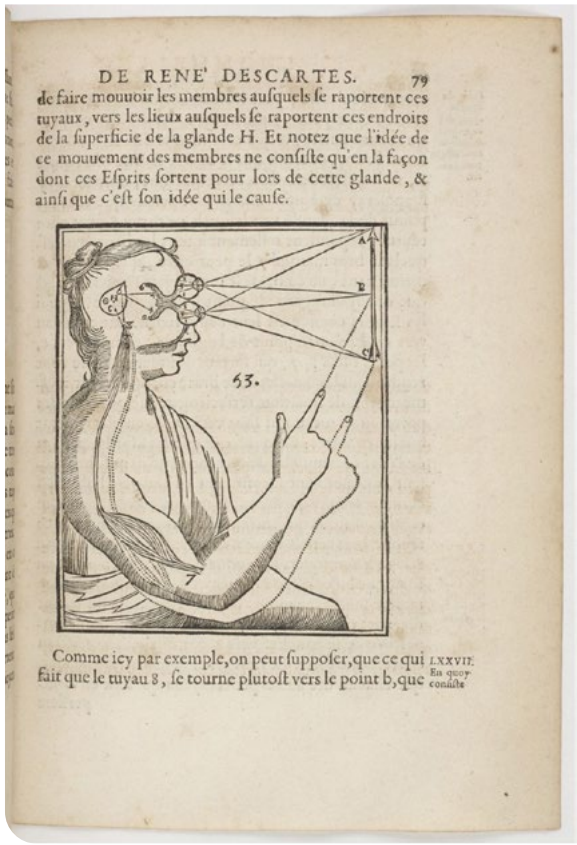
This idea was both highly creative, and revolutionary. That is why Descartes dared not publish the book 'Traité de l'homme' during his lifetime. It was published 14 years after his death. It took about 200 years until, with Virchow around 1860, this mechanistic thinking had really reached the mainstream and became the leading metaphor of medicine. Today, we do not only use it as a metaphor, we really think we *are* machines, and we conceive our mind to be a machine as well.

Now we have developed computers. And we think we *are* computers, and our body is a robot. So, we can upgrade ourselves like we upgrade the software of our computers every couple of months to fix bugs which were not discovered earlier, and we need to repair our body like we repair cars and robots. We not only say we are *'like'* computers or robots, but we say we *'are'* robots and computers. If we are only computers and robots, we might indeed well improve on what we are by engineering. The point is: the conception is wrong. But another point needs to be observed. If we believe we are robots and computers, we might as well become robots and computers. Optional ontology might hit us (Shamdasani, 2004).

We are not machines, as Descartes thought, nor are we computers or robots. The mistake made here is a classical category mistake. We mistake a metaphor for reality. The great Gregory Bateson coined a nice phrase for that: eating the menu for the meal (Bateson, 1982). Many people, certainly the transhumanists, make the category mistake of using a metaphor, an image, a simulacrum, for the reality. This is normally something that children and some patients with clinical problems do, who do not have a fully developed theory of mind (Fonagy, Redfern, & Charman, 1996), as it is called, a model, how other people function and what happens in their minds. They cannot differentiate between literal and metaphorical meaning or language. The same happens here, only that the subjects are not children or patients, but full-blown academics and widely published authors. They mistake the image for real, the metaphor for reality (Esfeld & Lopez, 2024).

Science has long left the underlying causal box-model of human function behind. At the latest with the insights of Prigogine and his group it became clear that such a




DE RENE' DESCARTES. 79
de faire mouuoir les membres auſquels ſe raportent ces tuyaux, vers les lieux auſquels ſe raportent ces endroits de la ſuperficie de la glande H. Et notez que l'idée de ce mouuement des membres ne conſiſte qu'en la façon dont ces Eſprits ſortent pour lors de cette glande, & ainſi que c'eſt ſon idée qui le cauſe.

53.

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fait que le tuyau 8, ſe tourne plutoſt vers le point b, que

Top: René Descartes.
Bottom: page from Descartes'
Traité de l'homme (1664)

simplistic model is inadequate to understand biological systems (Nicolis & Prigogine, 1977; Prigogine, 1976; Prigogine, Nicolis, & Babloyantz, 1972).

Systems biology, using insights from complex systems theory, from autopoietic systems and from self-correcting systems models, has long understood that we can understand our biological processes only, if we see our organism as a self-creating, self-correcting, learning and self-evolving system (Barabasi, Gulbahce, & Loscalzo, 2011; Capra & Luisi, 2014; Goh et al., 2007; Hankey, 2015; Kauffman, 1995; Kauffman & Roli, 2023; Klement & Bandyopadhyay, 2019; Pezzulo & Levin, 2015; Schlage et al., 2011; van der Greef et al., 2007; van der Greef et al., 2010). In such a system there are, right from the beginning, all necessary functions in place that help the system grow, correct errors, develop, learn from interactions with the environment, to decide what of the learned content is to be discarded, what to be relegated to temporary and what to permanent storage systems like the neuronal memory or the epigenetic cell memory, or even to genetic modification. It is a system that is highly complex, self-correcting and self-controlling (Jablonka & Lamb, 2005). For instance, the organism reacts against the smoke and content of one cigarette with a network that has 400 nodes and mobilizes at least 200 enzymes. This is a huge network of actively counterbalancing an extraneous challenge invading the system (Schlage et al., 2011).

We can intervene in such a system, if we think we have to. Medicine does that in case of illness. But this intervention will never be an innocent causal input that has only one goal, and one effect. The direct causal effect will be one thing. But the system will react to this intervention by an active adaptation, and an active complex reaction (Panossian, 2017). Depending on the severity of the disturbance, this reaction will be temporary, or will result in a remodelling of the system itself. Even chronic disease can be seen as the attempt of an active system to establish a new equilibrium, using certain symptoms. Thus, the disease is not something that has affected the system. It is the system's own adaptation to a situation where it could not find another way out (Hyland, 2011; Hyland & Whalley, 2008)

Take everyday pharmacology as an example: we drink coffee or tea to ingest caffeine for the alerting effect. That clearly works. It is plain and clean causal pharmacology, a direct effect, as I called it. But everyone doing this will have noticed the secondary reaction. The system counteracts the sympathico-mimetic effect of caffeine, by activating counter-measures. After this initial, causal effect, a secondary effect will ensue, after an hour or so. This is not a direct pharmacological effect. It is the effect due to the autonomous counteraction of the organism. We start feeling tired, or perhaps a little bit colder after the initial warmth, perhaps our alertness does not only bounce back to normal but even undershoots. We get drowsy and feel like having another coffee.

This secondary reaction is the autonomous reaction of a living system to extraneous interventions of any kind. It is an expression of its autonomy and its activity. The more complex the stimulus the system has to deal with, the more complex will the reactions be. And depending on the initial state of the system, the same dose of something can create completely opposite reactions (Wilder, 1957).

An immunogenic stimulus like a virus or bacterium will trigger an automatic immunological response. Such automatic responses are very complex in themselves but usually happen without us even noticing them. They happen many times a day without any necessity for conscious behavioural intervention on our part. Only if something goes wrong, and we fall ill, we notice it and then our conscious cooperation is required: we go to bed, because we feel tired, or because temperature rises. And if we are clever, we do this, because we know that doing so will help our organism to overcome the infection more quickly. This is a complex, autonomous action as well: we decide to succumb to the demand of our organism, or we don't. We have the

freedom, and meanwhile also the means, to not obey the physiological imperative. We can stay up and work despite our groggy feeling. We can take an antipyretic to lower our temperature. We do that at our own peril, because more often than not the interference with our organism's activities to deal with a disease, can lead to its persistence. Sometimes, if the symptoms become very severe, we have to intervene. That happens, when doctors curb an inflammation that overshoots. But normally, the organism knows quite well what to do. Nature has to be helped only in exceptional cases, not on a regular basis. Transhumanists got that wrong: Our nature is, if we leave it alone and do not meddle too much, normally quite well equipped to deal with all challenges that come our way.

Sometimes, if we have to intervene, or want to, and take a medication, we feel the effects of the pharmaceutical intervention directly, and also its after- or side effects. These side effects are due to the reactions of the organism against the complex disturbance that the pharmaceutical intervention constitutes. They are often minute, such as the drowsiness that sometimes follow the arousing effect of caffeine. Sometimes they are more severe, like when an infection persists because we have robbed the organism of the chance to get rid of it by taking an antipyretic, and suffer from fatigue for a prolonged time. And sometimes they are grave, for instance, if, due to a long-term medication, serious other problems develop. In any case, there is no such thing as a causal intervention in an autonomous, self-sustaining and self-creating system without the system's active reaction.

Any attempt at meddling with the genetics of a biological system will always provoke an action against the intervention on the part of the system. The silencing of newly engineered genes in plants, by the plant methylating them, is an example. It is naïve to the extreme to think such an intervention would be possible in humans without severe 'side effects', whatever those would then be. Even in the studies with the successful genetic editing of the point mutations of thalassemic, or sickle cell, anaemic patients mentioned above, all of the patients suffered side effects, some of them severe (Frangoul et al., 2024; Locatelli et al., 2024). Here, the risk of the side effects was balanced by the severe consequences of the disease.

We do not know yet what the side effects of genetic editing would be and how severe they would be, because there has not been a lot of experience with genetic meddling with humans as yet. It is naïve to expect a 'free lunch', an upgrading of humans without a backlash. But the effects of the COVID-19 'vaccinations' should teach us a lesson. And they should be enough to help us to reconsider, even abolish this programme.

COVID-19 Vaccinations as an Example of Potential Side Effects of Genetic Interventions

The difference between a therapeutic intervention and a preventive public-health intervention that affects a large part of the population is this: in a disease, say cancer, there is already a lot of suffering either present or surely to be expected. Hence an intervention that carries a risk is normally acceptable and accepted by patients. This is the reason why in severe diseases, such as cancer, even extremely risky interventions such as immunotherapeutic interventions that often carry the risk of death are used. As death is a frequent consequence, especially of aggressive tumours, people are prepared to accept the risk of death as the side effect of an intervention that might offer the chance of curing them.

The situation is different with a preventive public health intervention that is given to healthy people to prevent a theoretical or statistical risk. If the public health intervention is simple and without any known risk, such as providing clean water, then there is no question of

applying it. If the public health intervention is complex and carries risks one needs to differentiate. Vaccinations are typically public health interventions against a theoretical threat. The threat is theoretical, because it can never be known, no matter how good our knowledge in general, whether the threat will hit a particular individual. Also, often public health interventions only make sense if a majority accepts them. This is the case with vaccinations. Although there are sometimes vaccinations that only a select group has to accept, such as in health workers that enter a specifically dangerous area, or military personnel, mostly vaccinations are designed for the whole population. As these interventions are given to healthy people, the risk of becoming ill not from the disease, against which a vaccination is given, but from the vaccination itself must be known, carefully weighed and accepted.

Ideally, such interventions are tested so carefully that these parameters are known and an informed decision can be made, whether the risk of a side-effect due to the vaccination is acceptably small or not. This process normally takes at least four years, normally longer. In the case of the COVID-19 vaccines, this development was 'telescoped,' i.e. clinical trials of efficacy were initiated even before any safety, let alone teratogenic data, were available. Teratogenic data refer to potential effects of an intervention in the offspring, clarifying whether ingestion of a substance by a pregnant woman may affect her child. These tests had been introduced after the thalidomide scandal in the 60s, where tenthousands of children were born with growth anomalies in the extremities after their mothers had been ingesting thalidomide which was touted as a sleeping pill, and pain killer that was safe. It took decades until the courts accepted these malformations as side effects caused by the medication, and in turn the legal framework was altered to integrate teratogenic studies into the regulatory framework of new drugs (Grandjean, 2008; Ridings, 2013). Teratogenic studies take time. Normally some generations of rats or mice have to be treated before authorities are satisfied that no teratogenic problems are associated with an intervention.

Further studies follow, where safety is tested in healthy volunteers, then efficacy in small cohorts until finally phase 3 studies with broad efficacy testing can commence. All this was scrapped in the case of COVID-19, due to the pandemic emergency status and, importantly, due to the fact that allegedly no treatment alternatives were available. I have given some indications above and am not going to elaborate on this part, but there are some indications that existing alternatives, like repurposed drugs that were effective in treating COVID-19 (McCullough et al., 2021) were first blackmailed by extremely incompetent media campaigns and later prohibited in the US and the UK (Goddard & Dalgleish, 2023). In fact, one of my interviewees told me that the US medical board of his state sent out letters in autumn 2019 saying that the prescription of ivermectin and hydroxychloroquine without special license was prohibited. This led to the well-known precondition for emergency regulation of the SARS-CoV-2 vaccines that no other viable treatment was available. This was plainly wrong, but it opened up the possibility of telescoping the normal research and regulation procedures.

When SARS-CoV-2 was known to some officials to be circulating in late summer 2019, there seems to have been a decision to use this pandemic for the roll-out of novel types of gene-therapeutically manufactured 'vaccines.'

The pandemic situation was used not only to develop those novel agents on the platform of modified RNA-interventions or virus-vector vaccines, but also to curb the normal routines of safety testing before any clinical studies were allowed. This was all done under the umbrella of 'reaction against the pandemic,' which was provided by the Secretary General of the WHO and his select group of advisors. Without that political backing from the WHO national or supranational regulatory bodies like the FDA or the EMA might not have come round so quickly to allowing this 'telescoping' of testing.

At any rate, due to this supposed state of emergency, safety of the 'vaccines' was relegated to the back seats in scientific methodology and the question was all about efficacy. To my knowledge no independent, prospective large scale post-marketing surveillance study of safety was commissioned as a condition of licensing. When I looked up the clinical trials database (clinicaltrials.gov) of the CDC late in 2021, I saw hundreds of randomized controlled trials of many different vaccines, but no single large scale cohort study to document safety long term. Such a study should have been commissioned immediately, and the producers should have been obliged to pay the necessary moneys into a fund out of which independent researchers should have been able to pay the costs for such a study. Thus, the safety of the new interventions and their side effect-profile was unknown before the rollout started. A WHO commission had defined Serious Adverse Events of Special Interest (SAESIs) before the roll-out of the campaign. This was a set of side-effects that were to be carefully monitored, because they were known or expected to arise with interventions of this kind, such as thrombotic events, neurological events such as palsy or myelitis, and cardiac or cardiovascular events due to clotting. Had a prospective study been set up it might have become quickly obvious that the side-effect profile of these interventions was not at all benign. Apparently, these side-effects were well known by the producers. But they tried to keep this knowledge from the public eye, as the analysis of regulation documents made available after a court order shows (Wolf, 2025).

Some vaccine developers warned early on that developing a vaccine that uses the epitopes of the virus that were human-like would carry the danger of auto-immunity and antibody dependent enhancement (Iwasaki & Yang, 2020; Sørensen et al., 2020). And indeed, exactly this was seen after the novel 'vaccines' were distributed (Yahi et al., 2021; Yamamoto, 2022). It was a scandal that neither the regulatory authorities, nor the pharmaceutical companies did their homework properly, and analysed those SAESIs, those predefined serious adverse events of special interest, when the data became known. This was done by an independent group of scientists

after they had gained access to regulatory data, but before the data were unblinded. They used data from regulatory trials submitted to the Canadian authorities by Pfizer and Moderna. The researchers found indeed that such SAESis were considerably more frequent in the groups receiving the vaccine than in the controls, and concluded that the likelihood of getting one of those adverse events was higher than being hospitalized with severe COVID-19 (J. Fraiman et al., 2022).

However, when this study was published it was far too late. The campaign had been rolled out, the train was running full speed and nothing was to stop it. I explained above our risk-benefit paper (Walach et al., 2021b). After the Pfizer 6 months efficacy study had been published, which had some safety reports in their associated supplementary material, we repeated our analysis and found our results supported (Walach, Klement, et al., 2022).

In January 2025 a systematic review was published that summed up the number of calls for market withdrawals of those vaccines on the grounds of side-effects (Hulscher, Bowden, & McCullough, 2025). The authors located more than 81,000 calls from physicians, politicians, scientists or concerned citizens. 240 government officials, 17 physician and public health organizations, and six scientific studies all around the world have called for withdrawal. The US database Vaccine Adverse Events Reporting System (VAERS) that is managed by the CDC but collects data from all around the world reported 37,544 deaths associated with these vaccines all around the world. This figure exceeded the normal withdrawal threshold for vaccine products by more than a factor of 300. A review of the literature found that with gene-based vaccines in COVID-19 the same mechanisms had kicked in which I have mentioned above: wide attention in the public media to potential positive effects, neglect of safety issues in the public domain, and relegation of critical views and data to third-tier journals. And above all: conflict of interest of key players in academic medicine, politics and the media. (Rhodes & Parry, 2024)

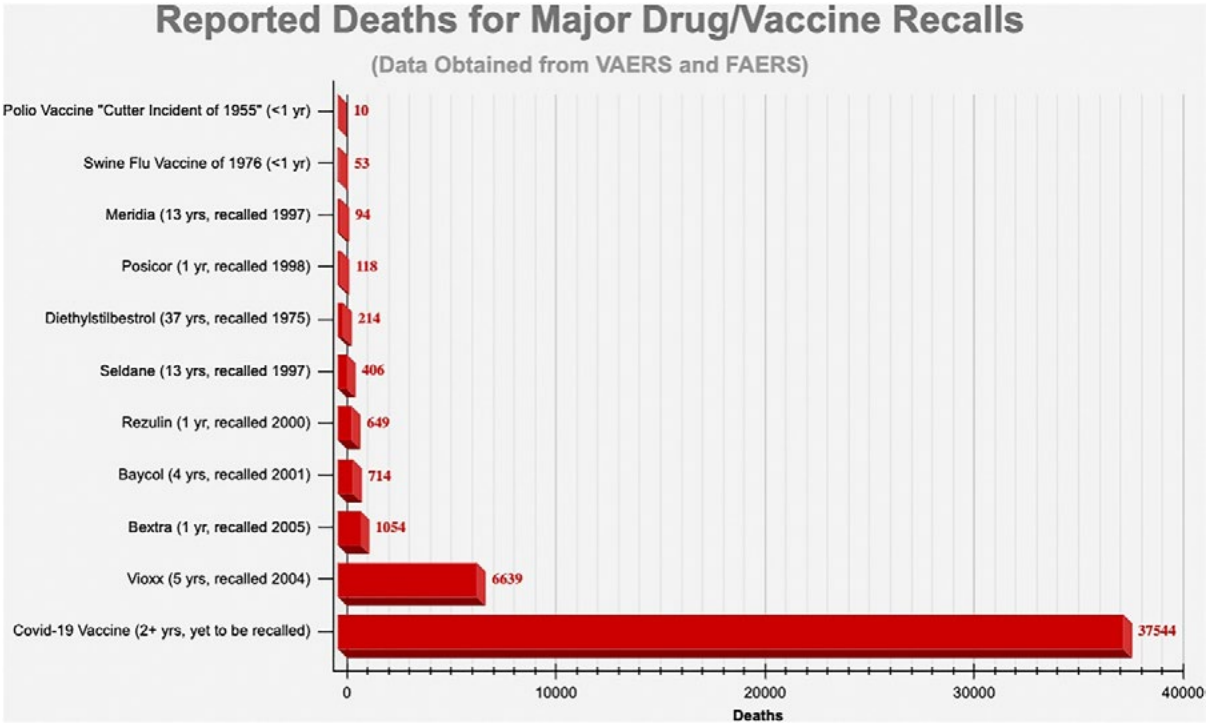
I reproduce below (Figure 3) the Figure 4 from this publication. It gives the number of deaths associated by VAERS with COVID-19 vaccines compared with other vaccines and drugs known to have been recalled because of excessive deaths associated with them.

It is easy to see that the number of deaths associated with COVID-19 vaccines in the VAERS database far exceeds anything that had been scandalized and recalled in the past. Although those are raw data and not standardized on the number of doses distributed, it nevertheless shows how large the numbers are.

The literature about side effects of COVID-19 vaccines has grown immensely. A systematic review of serious harm following those vaccines posted in March 2023 on a preprint server and not yet fully published found 18 systematic reviews and 48 other relevant studies. It concluded that the side effects were numerous and more trials need to be done (!) (P.C. Gøtzsche & Demasi, 2023). It also found that reporting rates were not reliable. Some systematic reviews found comparatively high rates of adverse events (Yasmin et al., 2023), other studies were more complacent (Hviid, Hansen, Thiesson, & Wohlfahrt, 2022). Without summarizing all the literature, one can see an interesting pattern: while publications in the first-tier journals are largely supportive of the mainstream narrative, critical papers mostly appear in the second- and third tier journals or, sometimes, remain only published on preprint servers. Sometimes, they are even retracted, like (Hulscher et al., 2023; Hulscher, Alexander, et al., 2024); the paper is now published in separate smaller units, which documents deaths as side effect in various domains (Hulscher, Hodkinson, Makis, & McCullough, 2024).

Autopsies have now found the causal processes: these are mostly auto-immune reactions against the body's own cells, for instance against epithelium cells in the vessels, leading to aneurisms and occlusions, or myocardial infarctions and neurological damage (Hulscher, Hodkinson, et al., 2024; Krüger & Lang, 2024; Mörz, 2022). This proves the critics right: those genetic interventions are dangerous and are prone to induce autoimmunity (Sørensen et al., 2020).

Figure 3 – Number of deaths associated in the Vaccine Adverse Events Reporting System with COVID-19 vaccines, compared to other famous cases of drugs and vaccines that have been recalled; data from 12th Jan 2020 to 15th Dec 2023; Figure 4 from (Rhodes & Parry, 2024)



Studies on population statistics show: It is exactly after the onset of the vaccination campaigns in 2021 that excess mortality figures rise. This seems to be a world-wide phenomenon. My colleagues have clearly demonstrated this trend in Germany (Kuhbandner & Reitzner, 2023; Mörl, Günther, & Rockenfeller, 2023b; Rockenfeller, Günther, & Mörl, 2023), and estimate the excess deaths attributable to the vaccination campaign at roughly 16.000 (Mörl, Günther, & Rockenfeller, 2023a).

While many single cases have been reported and in the US a staggering number of fit athletes seem to have died (Dowd, 2022), this is not a good scientific argument, as single cases are difficult to put into proportion. But systematic analyses of data from the large 'Our World in Data' (OWID) website that keeps track of many data worldwide showed that in 41 to 43 out of 47 Western countries excess death figures were seen (Mostert, Hoogland, Huibers, & Kaspers, 2024). While in 2020, when the pandemic ruled without any vaccination, but lockdowns were called in most countries, excess deaths were calculated to be around 1.0 million deaths in the Western world. In 2021, when vaccines were supposed to help the pressure, and containment measures were frequently still in place, the excess death figures were 1.2 million, and in 2022, when the vaccination campaign should have reached and protected most of the population, and containments were often lifted, the excess death rates were some 800,000 cases.

The analyses of my colleagues showed that the excess death rates change depending on the length and the trends of the baseline periods that are used (Rockenfeller et al., 2023). They used 20 years' worth of data and could show that the differing models of the WHO came to different conclusions because they used much shorter baseline periods and thus unstable estimates. The OWID data only source mortality data as of 2015 (Karlinsky & Kobak, 2021). Thus, the estimates are bound to be unstable, as there are large trends in the mortality data

in the whole of the Western world, as my colleagues showed. This would mean that the figures reported by Mostert and colleagues very likely underestimate the true figures. At any rate they show: whatever the COVID-19 vaccinations might have brought in terms of short-lived benefits, if they did, the long-term benefits were certainly not visible in mortality figures. On the contrary, a case can be made that they were causal and instrumental in increasing mortality. This was also shown for the European mortality figures (Lataster, 2023). They are clearly significantly and positively correlated across countries with the vaccination rates in European countries. Hence, we should really look at this more carefully (Lataster, 2024; Lataster & Parry, 2025).

So why is this not taken seriously? Why do we not see broad discussions in the media, in politics, in the scientific journals? Well, I suggest the reason for this is fivefold:

First, the public is still under a kind of posthypnotic message that the vaccinations were necessary to fight the pandemic, and that they were safe and effective. This message was touted through all channels of the scientific press, the official media, government websites and many others. Although it is definitely wrong, it is still the official story line. It is very difficult to uphold reason against such an armada of disinformation (Bendau et al., 2021; Esfeld & Lopez, 2024; Goddard & Dalgleish, 2023; Grothe-Hammer & Roth, 2021; Schwilk, 2023; Shir-Raz, Elisha, Martin, Ronel, & Guetzkow, 2022).

Second, the pandemic was declared on the basis of a mathematical model that was shown to be wrong (an der Heiden & Buchholz, 2020; Ferguson et al., 2020). Instead of looking to reason and data, people, policy makers and media, were looking to models. Models were used to justify containment measures (Dehning, Zierenberg, et al., 2020; Flaxman et al., 2020). Observe that these modelling papers have all appeared in the best scientific journals and hence are imbued with high authority in the eyes of media journalists and the general public. It is of little importance that the data they used were derived from other models or, as we could show in the case of the German model, was plain wrong. We wrote to the authors. They acknowledged that they have used wrong data (Dehning, Spitzner, et al., 2020). But they did not withdraw their publication. A formal rebuttal of that paper took two years to publish (Kuhbandner, Homburg, Walach, & Hockertz, 2022), because none of the journals we submitted our critique to was willing to publish and often rejected the paper after a lengthy period of doing nothing, and at the time it was published the containment measures were a thing of the past. Later, a careful analysis of all available data showed those containment measures to be largely ineffective (Bendavid & Patel, 2024; Quinn et al., 2024).

Models were also used to justify the effect of the COVID-19 vaccinations as positive and cemented the myth that they have saved millions of lives (Watson et al., 2022). Our deconstruction of the myth took again a while to be published, because of the unwillingness of journal editors to smear the nice picture they have helped to paint. It was finally published in an off-target journal which not many relevant decision makers read (Klement & Walach, 2023b).

The third reason, why the data about negative effects are being deflected is the massive conflict of interest of many players: large foundations like the Gates-Foundation which has massive stakes in the COVID-19 vaccine products, and in vaccination campaigns in general have no interest in getting a truth out that goes against their core-policy agenda. So, they will do all that is in their power to prevent the true story from being known. Having invested in the media, for instance support for the German weeklies 'Der Spiegel' and 'Die Zeit', will have bought them benevolence. I am quite sure that this also happened in other countries. Politically influential people like Dr. Fauci had quite some leverage to cover the truth (Kennedy Jr., 2021). Once a certain story line has gone through virtually all media outlets, it becomes very difficult to recall this and to admit a mistake, and the longer something lasts the more diffi-

cult it becomes. The only chance to come out of a PR disaster of that dimension is to let it rest, let a lot of PR grass grow over it, until some time later it can be revisited and corrected. That time has not yet arrived.

The fourth reason has to do with compensation: The vaccine producing companies have, in the US in general terms and in Europe for this campaign, pressured governments into taking over liabilities for damages that might ensue. In the US, this has happened quite a while ago. Patients who can convince the authorities that they suffer from a vaccine associated damage are recompensated out of a pot that is fed with surplus money that consumers pay on top of the products, i.e. a kind of hidden tax. This fund is in government control. But the recompensation scheme for COVID-19 vaccine damages is different from this general scheme and not very clear, and also not very likely to pay, as the medical journalist Maryann Demasi revealed (2022). In Europe, the vaccine producers called for indemnity, and here the governments are responsible for recompensating potential claimants. This leads to a situation, where none of the major players have any interest in uncovering potential damages due to vaccines.

The fifth reason is the implicit and explicit discussion in this report: the gene-based therapeutics are an essential step for a transhumanist agenda to be moved forward. That is one reason why they must not fail, and must not be associated with dangerous effects in the public eye. We do not have to assume some officially laid out agenda that marches through editors' offices. It is rather an implicit understanding. It creates scissors in the head so that editors, reporters, and writers censor themselves. The most efficient procedure of censorship is installing self-censorship in those who are powerful enough to change the public perception of things. If they self-censor, then all is well. For some reason such self-censorship seems to have been enacted on a grand scale. Why? I guess that the transhumanist agenda, the mindset, the belief in science as a motor of salvation, has become widespread. It would be interesting to conduct a discourse analysis of the religious symbols associated with the vaccination campaign: how images on TV and in print media took religious imagery – salvation, hope, better life, new epoch, delivery – and associated it with the vaccination procedure. This anchored the procedures deeply in the public psyche. It will take some effort at clearing this up, and this will take time.

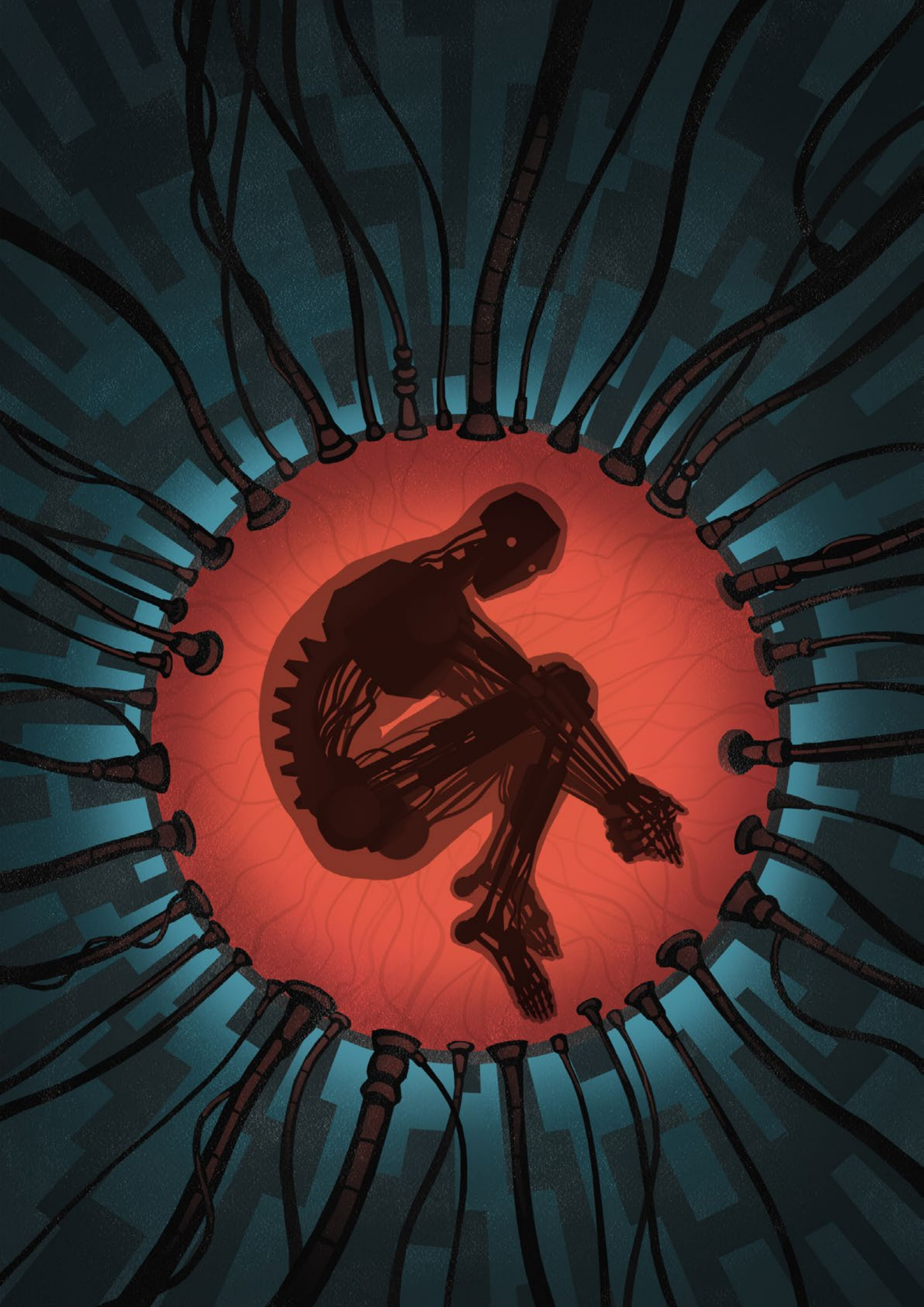
Hence, we will have to live with the curious situation that in academia, even in regulatory data the truth is pretty obvious that those gene-based therapeutics have a devastating risk-benefit ratio. They are unsafe. They are immunologically dangerous. Their effectiveness is small, because the effects only last for a short while of perhaps 4-6 months (Katikireddi et al., 2022; J. Moncrieff et al., 2021; Wu et al., 2023), and each repeated intervention increases the odds of suffering from a side effect. I have not touched on many other issues that should be taken into consideration: the fact that the spike proteins from the vaccination circulate in the bloodstream and reaches many organs, because the containment in the muscles cells is another myth (Bhattacharjee et al., 2025); the fact that it passes the placenta (Schwartz et al., 2021); the fact that it might hamper fertility (A. R. Brock & Thornley, 2021); the fact that the vaccinations might be the very cause of the epidemics of 'long-COVID' (Asadi-Pooya et al., 2024; Bhattacharjee et al., 2025; Marschalek, 2023).

But I hope I have made plausible through the discussion and data presented above: the COVID-19 gene therapeutically based vaccines were all but innocent. Their introduction was only possible through a set of political and psychological tricks. They would have never passed a standard regulatory procedure. Whether the pandemic was engineered to allow the introduction of these products I do not know, and in the end it is irrelevant. My data are certainly not contradicting such an idea, but they do not prove it either. But it is not necessary to go that far. The pandemic opened the way for these products to be speeded through regulation, and

this is sufficient. Now we have to live with them. But the safety profile of these products is devastating. This assessment has to be seen against the background of a full-blown propaganda machine that runs for the purpose of promoting them.

This is a bad head-start for the transhumanist agenda of genetically updating human beings. If the simplest of genetic interventions, a preventive gene therapeutic vaccination campaign, comes out so badly plucked, the chances are that more complex interventions intending to target larger issues will not fare much better. Put differently: the transhumanist promise of upgrading humans through gene editing is likely not only wishful thinking, but an outright lie. Reality confronted with the idea unmasks this transhumanist promise as what it is: pure ideology that is as far from reality as can possibly be. We should not take refuge in the thought that this is only an initial problem that will be solved at later stages. I think the physiology and biology of the interventions, and the analysis of the underlying models show: the model itself is flawed, because it neglects the reality of human biology and physiology. It neglects the autonomous status of our organism that is an active system which combats interference. Autoimmunity is just one such a signal. It is likely to not go away so quickly.

Now, if transhumanists were willing to use their own money and their own bodies to experiment, nothing can be said against it. But here public money and innocent humans are used to do the experiments. The COVID-19 vaccination campaign was arguably a huge field experiment to see how genetic interventions would work. Well, it failed, I would say. Huge amounts of public money were sunk. Profits came out at the private end. Those who profited are also sometimes the drivers of this transhumanist agenda. So, I think that public awareness should be raised to initiate a discourse asking whether this is what people want. The awareness should also be about the full agenda and its ramifications. This agenda should not be allowed to be pushed through by the hands of some powerful individuals who have the money and the political clout to realize this. It should be openly discussed. Hence, a first step would be a thorough scrutiny of the effects of such gene therapeutic interventions. The COVID-19 vaccination campaign actually provides us with the data. All that is needed now is the political will and a scientific effort to mine them.



ABOLISHING DEATH AND THE LONGEVITY ESCAPE VELOCITY

Longevity Escape Velocity and Strategies for Engineered Negligible Senescence (SENS)

'Science is the industrialized world's new religion', writes Aubrey de Grey (de Grey, 2007, p.421). He is the transhumanist movement's frontman in the quest to abolish death. This quote also condenses the quasi-religious emphasis of the movement. Similar to traditional religion that offered the solace of a better life after death or even immortality, de Grey and his transhumanist pundits think that transhumanism has a better offer to make, because it concerns life here on earth. This apparently tangible promise is far more attractive, it seems, because one does not have to wait for death to occur, we can wait for life to occur, without death interfering. This is also part of the traditional religious wisdom of Christianity: *'There shall be no more death,'* says the author of the Book of Revelation (21,4). But the religious promise is transcendent. It might be fulfilled in a transcendent world beyond death, or not at all, who knows? The transhumanist promise is about this world, but nevertheless a promise to be fulfilled in the future. Let us examine its substance.

De Grey, a computer programming specialist turned gerontologist, promises that by 2030 or so we will have understood enough about ageing to be able to prolong life substantially (note: the promises were made some 20 years ago, so might be a bit off-target today). We will then be able to enter what he calls 'longevity escape velocity.' That is the velocity that is needed for scientific discoveries and their implementation to prolong life such that people's death can be pushed into the future or even avoided (de Grey, 2004a, 2004b; De Grey & Rae, 2005).

There are various aspects to this programme. One is what is already being pursued by myriads of researchers: to understand the mechanisms of ageing and to develop life-style advice, medications, or nutritional supplements against them (Mkrtchyan et al., 2020). This is of course also part of the transhumanist agenda. I mentioned that Ray Kurzweil confesses to taking some 60 or so supplements each day to combat whatever declining of strength and health he might suffer (Kurzweil & Grossman, 2004). One can look at his appearance on YouTube to judge for oneself whether this was successful (https://www.youtube.com/watch?v=Qh4l63k4O2Q, ac-

cessed 24th March 2025). This line of research is more or less uncontested and not really problematic in my eyes, as long as other people's freedom, the public purse, or other communal aspects are not threatened by it. We know that our genetics allow for some 120 to 150 years of living. So, one might as well try to extend one's lifespan to this physiological end in as good a state of health as possible.

But the programme to abolish death is much more radical than finding cures for some couple of years off the full record. It comes with a series of really massive interventions, called Strategies for Engineered Negligible Senescence (SENS) (de Grey, 2006, 2004b). I am not going to discuss them all; it is sufficient to look at its core, WILT – Whole Body Interdiction of Lengthening of Telomeres - to understand why it has drawn much criticism shortly after its publication (Estep et al., 2006), and why nothing much was heard about it except a moody defence (de Grey, 2006), and a flurry of editorials without any further elucidation (e.g. de Grey, 2020).

Strategies for Engineered Negligible Senescence (SENS) are, as already implied by the name, a series of interrelated ideas how aging could be halted by various engineering approaches. The various components would be implementable, de Grey claimed, with 100 Mio USD per year over 10 years, i.e. 1 billion, to create longevity mice by 2030 or so. Although he reportedly inherited some 16 million USD and donated 12 of them to the SENS Research Foundation (https://en.wikipedia.org/wiki/Aubrey_de_Grey, accessed 24th March 2025) and entrepreneurs dedicated some 300 million USD (https://en.wikipedia.org/wiki/SENS_Research_Foundation, accessed 24th March 2024, whether to this foundation or in principle is not quite clear), the promised land remains far from sight.

The core of the SENS project is WILT, the whole-body interdiction of lengthening of telomeres. This needs a few words of explanation: telomeres are repetitive DNA sequences at the end of chromosomes, a little bit like caps at the end of a stick, that prevents the DNA from disintegrating. Stress and aging seem to affect telomeres negatively (Epel et al., 2004; Lin, Epel, & Blackburn, 2012; Wolkowitz, Epel, & Mellon, 2008). Their physiological function is to keep chromosomes working. But every time a cell divides, some of the telomere length gets ablated, and the organism sets out to repair this, using the enzyme telomerase whose function is to repair telomeres. If the abrasion overtakes the repair the cell dies. If too many cells die, the organism dies.

Aubrey de Grey

Now, cancer cells divide very quickly, as we know, and hence have a larger loss of telomere length compared to other cells. Therefore, they recruit more telomerase to repair this loss (and high telomerase activity in the body is a proxy for cancerous processes). Some cancer cells have other mechanisms as well that are not well understood yet. Hence, focusing on telomerase activity is a bit short sighted, but that is overlooked. De Grey's proposal now is the following: if the whole organism were deprived of telomerase, telomere lengthening would not be possible at all, and hence cancer cells would have to die eventually, and much quicker than other cells. In order to keep the other cells from dying, we just install a little bit of stem cell engineering, bringing new stem cells into the body every now and then that make up for the losses. Of course, in order to make this radical anti-cancer cure work, the gene coding for telomerase would have to be knocked out everywhere. The body would then be deprived of all capacity to make telomerase and could not repair the defects in telomeres stemming from any cell replication anywhere in the body, not just that of cancerous cells. And the stem cell therapy that would be necessary to counteract this depletion of telomerase would have to be the support system of the body from now on, and would have to be repeated all the time. I am not sure anyone has calculated how much such a program would cost, but the 1 billion to just get the mouse model working probably speaks for itself concerning costs and viability.

It is not very difficult to see why this idea has not only not found any traction so far, but even elicited hefty criticism. To deprive an organism of a system that has evolved over millions of years that helps repair chromosomes, for the purpose of making progress towards the promise of longevity and abolishing death is a pretty daft step in my view. It also exposes the hubris of the main actors: 'We are now so much more intelligent and cleverer than nature that we can do away with all that plunder and start from scratch to build a much better organism.' We would be taking away a life-sustaining system – because organisms without that repair system die – in order to reach a promise that is currently nothing but theoretical, and founded on a flimsy theory at that. No one knows whether depriving cancer cells of telomerase would do anything to cut cancer out of the picture. De Grey realizes that and therefore says it can only be known by experimenting: *'The comprehensiveness of the SENS categories is a hypothesis that, I claim, is unlikely to be testable other than by implementing treatments for the seven categories and determining their joint effect on mammalian lifespan.'* (de Grey, 2006, p. 437)

The other categories are: cell therapy, i.e. injecting cells including growth factors; ablation of cells that don't die by suicide gene therapy; getting rid of intracellular and extracellular aggregates such as amyloid plaques by a special kind of endo-phagocytosis that would be the result of virally derived phagocytosis or derived from other microbes; targeting of mitochondrial mutations by transgenes. All of these techniques require genetic engineering approaches, and also some repetition over time, as the body will still age, and the antiaging procedures will have to be repeated (de Grey, 2004b; De Grey et al., 2004).

If one compares the prophetic soundtrack of these ideas accompanying the sober presentation of facts in the original publication in the secondary texts, for instance by Kurzweil or other authors, with the reality, it is easily seen: none of these predictions from 20 years ago hold water, have been tried out, or have even inspired further experimenting, except some anti-aging research that is quite conventional (de Grey, 2020; Mkrtchyan et al., 2020; West et al., 2019). The SENS foundation has got rid of de Grey, the respective Wikipedia entry notes, and does conventional anti-ageing research.

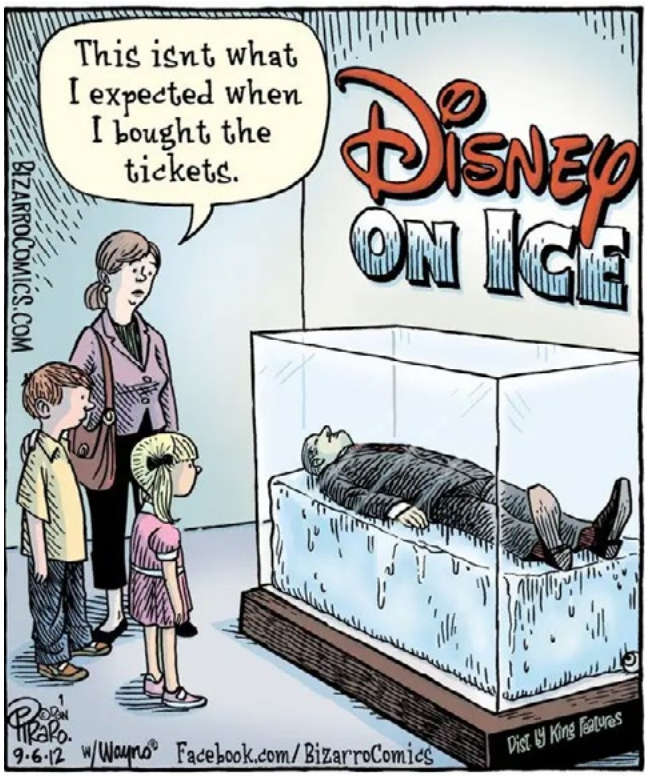
So, are we fighting a straw man? I do not think so. The ideas have been widely disseminated, and as is true with religious ideas, they do not go away because reality is too stubborn to allow them realization. On the contrary, such ideas become more entrenched with every martyr of science. And in his editorials de Grey stylizes himself as a martyr whose grand scheme

has not been taken up due to the bloody-mindedness of his critics, but whose time will come soon. There is no discernible self-criticism that the ideas might not have been as great as he thought in the first place, or that the mindset of a computer-engineer might not be the right one to understand the intricacies of living systems.

It is therefore in order to probe the idea of abolishing death a bit further toward its philosophical merits.

Abolishing Death – Wishful Thinking, Promise, Madness, or What?

De Grey is the most prominent figure in this movement to abolish death, but by no means the only one (Pearce, 1995). There is a broad movement and a wide belief in the transhumanist community that this is only a matter of more research and a few years, and then science will have bested death. First there will be the fatal diseases, cancer, myocardial infarction and cardiovascular disease, Alzheimer's and other dementias, that will be overcome and finally death itself. Those people who believe in the progress of medical science to cure these diseases and eventually prevent death often subscribe to a cryopreservation scheme, such as that offered by Alcor Life Extension Foundation (https://www.alcor.org/, accessed 24th March 2025). This foundation has been offering cryopreservation services for some 53 years now. It is a subscription plan which gets cheaper the earlier you get involved. You pay a monthly fee between 17 to 100 USD per month, depending on the age you enter. Let's say you enter at age 25 and pay 20 Dollar per month and live to the age of 85, you will have paid 14,400 USD. That feels cheap considering you might live another eternity, does it not? The idea is: on or shortly before your death you get a cryopreservation treatment. This consists of a kind of replacement of your body fluids like blood with an artificial preservation liquid and the cooling down of your whole body to a temperature that will keep it crisp and physiologically viable. You enter a box, and if a treatment for the disease you died of, or were about to die of, is found, your body gets revived, will be treated, and off you go into a new life. The foundation has 1,442 members; two years ago, when I last looked, it was 1,418 members, so a growth of 12 members per year. The growth is not staggering, but constant. Leading figures of the transhumanist movement like Nick Bostrom subscribe to the programme. So, the idea finds sympathizers, and will only be viable, when more subscribers find the idea appealing. The company fairly states that no cryogenic company can currently guarantee revival and no one has been revived up to now, but is confident it will be possible in the future. Here it is again: 'certain expectation of future glory' – hope. And we see an-



other interesting detail: the idea of cryopreservation is predicated on a principle that is expected to be found sooner or later by science. Religious hope has transformed into trust in science.

So, how come death is such a frightening companion? If one has a world-view in which his or her material life and the immanent reality is all there is, then death is the final catastrophe because it cuts us off from our conscious awareness and enjoyment of this life. Hence, death needs to be prevented at all cost. Every life is valuable, every death is a catastrophe, we heard during the pandemic. But the value of life does not logically entail the belief that death is a catastrophe. This is what Goddard and Dalgleish (2024) call 'specious logic.'

Let us consider a life without death, a world without people dying, and imagine this transhumanist world (Overall, 2003).

The Overpopulation Argument

First, we would have a very simple numerical fact: if everyone, or at least many people had access to this technology – and who could deny it to others if he were not utterly chauvinist and elitist – then the world would be pretty crowded very soon, even more so than with normal population growth. Because people stopped dying and would not necessarily stop reproducing, there would be a massive growth of population. This can only be curbed by various options:

a. There is an active prohibition on procreation, either to all, or to a certain segment of society, similar to the former one-child-policy in China, only it would be a zero-child policy. Perhaps only those could have children who forgo the abolition of death?
b. The abolition of death is a privilege available only to very few people, either to the very rich, or to the very powerful, or to the very clever, or any combination of these. Then overpopulation would not matter so much, because there are not that many very rich, very powerful or very clever people. And it is likely their numbers are going to shrink anyway, because power and richness are going to be condensed in the hands of ever fewer people. Thus, this will lead to a gerontocracy of overprivileged people that determine the fate of the rest. If the rest are complacent enough that might work for a while, but it is more a recipe for civil war than for happiness for all.

This will eventually lead to a radically separated society of those who have those privileges and those who don't (Rubin, 2008). This, and all other options, will lead to a fascist political system, as it is very unlikely that the majority of people will condone such ideas. At any rate, this is a recipe for chaos, as it stands against all ideas of egalitarianism, participation and equal rights that have been the boon of humanistic movements since the French and American revolutions.

The Value Argument

These are political arguments against such an idea. But there is also a simple philosophical argument. Our life is worthwhile not because it does not end, but precisely because it is finite and will end. This forces us to choose: a profession, a partner, a place to live, the amount and goals of travel we can have, the number and kind of friends we associate with. And these choices make ourselves worthwhile to our partners, friends and acquaintances, because they know we could have done something else with our time. So, value is actually consequent on finiteness. If everything were available all the time to everyone, nothing would be of value. Gold has value, not because it is yellow, but because it has a beautiful glitter *and* is of finite availability. If the Adirondacks were discovered to be made of gold the price of gold would

drop instantly. The same is true of all precious metals. The same is true of people we treasure. They are dear to us, because they combine traits and habits which we do not know in other people in the same way, and because they care to interact with us. If those properties and traits were commonplace, we would not value them, nor the people who express them, in the same sense as we do now. We appreciate certain works of art, the music some artists make, or other things exactly because they are rare and their art is not to be had everywhere and cannot be reproduced by everyone. The portraits Holbein made of Erasmus of Rotterdam are exceptionally valuable and worthy, simply because there are only very few of them, they have been carried out in an exceedingly competent fashion and cannot be repeated in the same way, and because both, Erasmus and Holbein, are dead. Value and finiteness are interdependent. Bitcoins are valuable, because it becomes ever more difficult to find prime numbers the larger the series of figures gets. If there were an infinite number of such prime numbers to be found easily the value would melt away.[1]

Thus, the precondition for valuing something, including life, is its finiteness. As soon as it becomes infinite, or infinitely available, it loses its value. The transhumanist idea of a life without death and at the same time of valuing everything even more, is a chimera and a contradiction in terms.

The Evolutionary Argument

The final argument against the viability of this programme is a kind of logical argument. The argument that life without end is possible and valuable is a transhumanist idea. Transhumanism is predicated as an idea that makes evolution its theoretical hub. Because nature has evolved to produce human beings, and human beings have evolved to invent science and technology, Transhumanism can now step beyond this slow process and intervene in order to change it. Part of this change is abolishing death. Abolishing death will lead to those who are alive at the time, when this innovation will be available, living for ever. Now, evolution and innovation are more often than not a function of novelty and youth. It is known that most Nobel prize winners, innovators and inventors had their good ideas when they were young and spent the rest of their lives explicating their findings. If the abolition of death means the extension of lives into the future, and at the same time fewer young people growing up because one wants to halt overpopulation, then this will inevitably lead to a lack of innovation. In other words, this will lead to a halting of the evolutionary process which was said to be the very basis of everything. This is self-contradictory: the very idea that professes evolutionary innovation as its basis will make this innovation the foundation of stalling it. I would like to illustrate this by a vignette: the late Nicholas Maxwell, the philosopher of science whose idea was to promote wisdom inquiry (Maxwell, 2017), said in one of the last videocalls to a group of people I attended, perhaps two years before his death: 'It is good that I die. Because with me all the silly ideas of mine that were not good ideas will also die. Perhaps 5 % of my ideas are good and will live on. But the rest should die. This will make place for something new.' This was a very bright insight by a very bright mind.

Death is not only the fatal end of something good. It is also the beneficial end of many ideas, many intentions and actions that were less than optimal. It allows room for new people and new ideas. Imagine a university where all the old guys will teach endlessly. They might

[1] Of course there is an infinite number of prime numbers, because there are infinite numbers of numbers themselves, but the capacity to find them is limited.

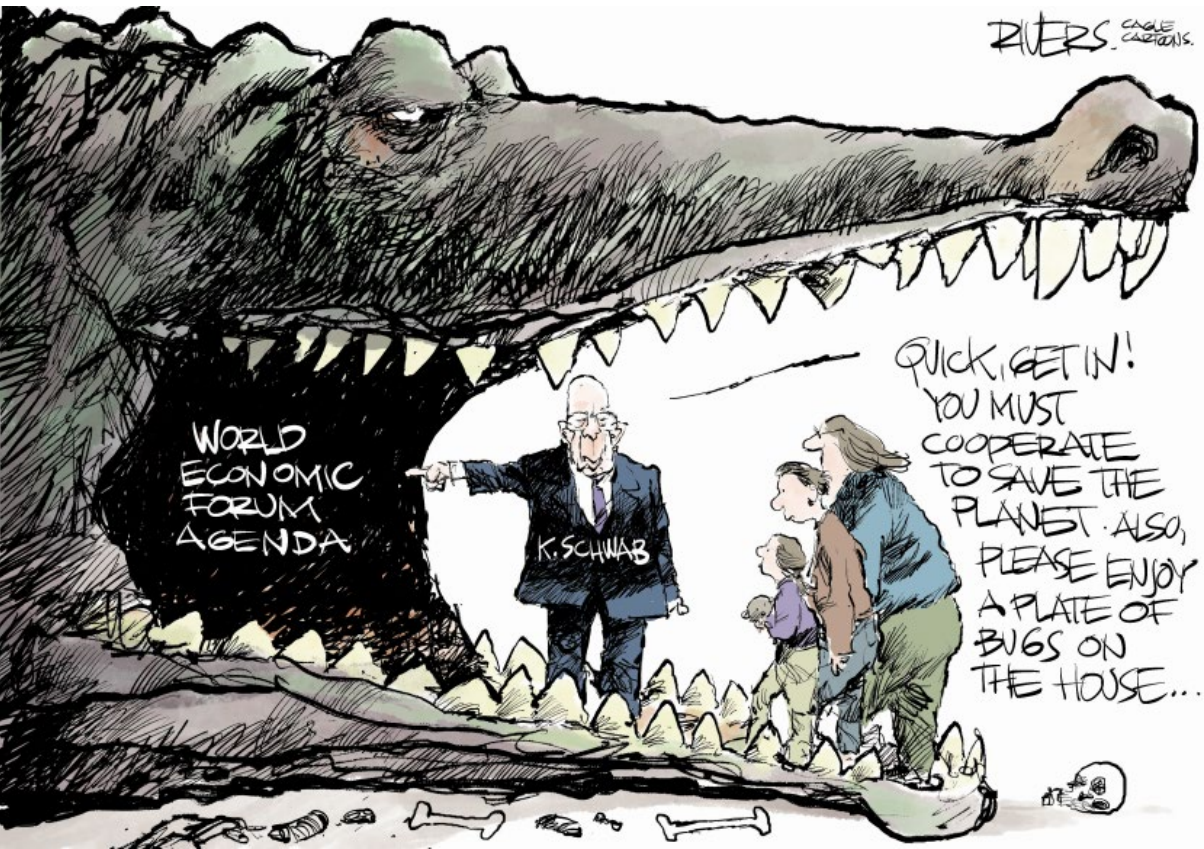
occasionally arrive at something new. But usually, it will be more of the same. The radical innovations come from younger folks and from untamed minds. Abolition of death is exactly not what will encourage innovation and new ideas. Everything in nature is about making space for new things. Trees die and make space so that light can fall on the ground and new growth is encouraged. It is the same everywhere in nature wherever we look. We may want to try to meddle with that, as Transhumanism has vowed to do. I contend: this is a very bad idea, and out of the fear of death and its frantic avoidance flow a lot of dangerous technology. The COVID-19 vaccinations were only possible because of a massive fear campaign that bullied people into accepting the gene-based interventions.

Death is perhaps not the final tragedy but the ultimate goal of our lives. Even if someone does not believe in a reality beyond this visible one and in life after death in whatever form, can death be a fulfilment. For it is the end of a life full of encounters, human experiences and interrelations which are all valuable, because they are not repeatable and because they are finite.

One can certainly find many other worthwhile goals in life, spiritual ones, like perfecting one's personality, opening up for higher insights, and bringing them into the world, or being of service to family, friends, and the world at large, or finding insight, knowledge, and wisdom, or creating beauty. But all of them will be tested for durability in the light of death. If we look back, from the vantage point of impending death, on our decisions, actions and valuations, we know, whether they were right. This can be done, by the way, as a mental exercise, long before death, if one is unsure about which turn to take: How would I have liked to have decided in the face of death. Insofar, death is the great helper, not the great disaster.

Concluding

In conclusion: the transhumanist project of abolishing death is not only not viable technically speaking. It is self-defeating philosophically speaking. It neglects basic issues of internal logic and denies its own foundations, evolution and evolutionary logic. But it is also dangerous, because it infests people's minds with illusory ideas that will eventually find traction somewhere. As they are inevitably bound up with fascist mentalities, else they cannot survive, this is a political time bomb which needs to be stopped sooner than later.



BRAIN COMPUTER INTERFACES, CYBORGS, AND THE INTERNET OF BODIES AND THINGS

An avowed aim of many transhumanists is the transition to a post-human being that has its physiology upgraded by technical implants, and its neurological system by artificial intelligence (AI) and interfaces to computers, brain-computer interfaces (BCIs). One of the early transhumanist propaganda texts is James Hughes' 'Citizen Cyborg', which projects such a future (Hughes, 2004). And others, such as Kurzweil and Bostrom foresee an 'uploading' of our personality into a huge computer cloud which will make us immortal, at least in silico and for what they think 'we' means. The US military has already far advanced the cyborgization of humans. Soldiers with lost limbs receive smart implants that allow them to use their brain activities to move artificial limbs. We will be looking at some of these issues in more detail in this section. Before we do that one word of principal importance:

5G Networks and Microwave Radiation

Most of the techniques that deal with man-machine interfaces, with an internet of body and things, will only work if there is a dense network of microwave controlling of smart meters and effectors implanted in bodies that can be controlled from the outside. This is part of Klaus Schwab's Fourth Industrial Revolution (Schwab, 2016; Schwab & Malleret, 2020). The idea is that intelligent implants in bodies can be connected to computers that supervise and control them, and that nanobots within bodies will be able to effect smart moves: to deliver medications, to supervise and control vital functions, or to scan other physiological activity. The theoretical concepts and potential infrastructures have been developed and could be implemented (Balghusoon & Mahfoudh, 2020; Wiley, 2022). I will be dealing with these concepts only on the periphery. But it is worthwhile remembering: these ideas will function technically only, if we will set up a dense network of high frequency microwave radiation technology, commonly known as 5G. Why? Because there is a simple relationship between frequency and data-density that can be modulated onto the frequency: the higher the frequency, the more data can be transported in a shorter period of time. The higher the frequency, the shorter the reach of the radiation and the lesser the depth of penetration into the body. Hence,

the antenna and repeater stations have to be spaced more closely to each other, i.e. more such stations will have to be set up, and repeaters have to be placed also shortly below the surface of the body.

Hence, the coverage needs to be improved to be continuous without any holes. This is particularly important for technical innovations like autonomic driving. This is part of the reason, why Elon Musk does not only develop electric cars, and has a company providing the electrical energy, but also a company, Starlink (https://www.starlink.com, accessed 25th March 2025), that offers space-based internet connectivity. This is made possible by a dense network of satellites that orbit our planet at a height of about 550 km. Currently, there are 7,086 Starlink satellites in orbit, and the company is hoping to send up some 42,000 to make the network of radiation dense enough (https://www.space.com/spacex-starlink-satellites.html, accessed 25th March 2025). All those satellites have one single purpose: to send microwave radiation to stations on earth that allow wireless connectivity everywhere. First and foremost, this is of course for the Musk companies' own sake, such as autonomic driving of cars and lorries everywhere on the planet. But secondarily, such a dense network of connectivity can and will be used elsewhere. One such usage is likely to be the internet of bodies and things.

In such a connected network, bodies which are populated with sensors and effectors, will be transparent to computer systems that will be able to monitor physiological states. Miniature nano-systems that can energize themselves by the physiological environment of the body are already operative, and will function as small routers within the body, as well as sensors (Huang et al., 2019). They need repeater stations close up. But this can be achieved with 5G-wireless technology. Then remote monitoring of health states of an organism will be feasible. And perhaps also remote control of some of the functions as well. Modern implants already allow physicians to operate smart devices like pacemakers, or diabetic monitoring and pumping stations from outside. It is only a small step towards full remote control of humans in the sense of controlling the physiological environment, and perhaps also controlling the organism itself. This is the eventual dystopic vision of a remotely controlled human robot as has been presented in good and bad science fiction movies. Such technologies are all triple use: They can be used for therapeutic benefit, and as such they are presented. But they can also be used for enhancement. This is the transhumanist perspective. But more critically, they can also be disruptive. That is the military and control perspective. And when looking at the developments, it is not clear at all that behind the transhumanist vision might not lurk the much darker vision of manipulation and control, using transhumanists as "useful idiots", as Lenin used to say, to promote the agenda.

This implementation of 5G technology would warrant its own report. Microwave radiation is far from innocent, contrary to what is the common narrative. 5G radiation has never been assessed for its safety. Even microwave radiation of lower frequency is problematic, as some reports have already demonstrated (Benson et al., 2013; Cardis, Schüz, & The INTERPHONE Study Group, 2011; Cha, Choi, Ryu, & Moon, 2023; Cordelli et al., 2024; Geronikolou, Johansson, Chrousos, Kanaka-Gantenbein, & Cokkinos, 2020; L. Hardell, Carlberg, & Hedendahl, 2018; Lennart Hardell, Carlberg, Söderqvist, & Mild, 2013; Jakusova & Hamza Sladicekova, 2022; Leach, Weller, & Redmayne, 2018; R. C. Lewis et al., 2017; Mevissen et al., 2025; Dimitris J. Panagopoulos, 2019; D.J. Panagopoulos, Johansson, & Carlo, 2015; M. Prasad, Kathuria, Nair, Kumar, & Prasad, 2017; Schuermann & Mevissen, 2021; Starkey, 2016; Thill, Cammaerts, & Balmori, 2024; Yakymenko, Mor, et al., 2015; Yakymenko, Sidorik, Kyrylenko, & Chekhun, 2011; Yakymenko, Tsybulin, et al., 2015). I will therefore just point out a few aspects here:

The often-heard argument that the energy is the relevant parameter and that this is some orders of magnitude below the threshold where it can affect biological systems is flawed. First of all, the energy is measured in dummies and is always averaged. However, when mobile phones or microwave devices power up and seek connection, the energy is a manifold of the average and can reach problematic thresholds.

Second, the institution that controls safety levels of radiation, ICNIRP, the International Commission of Non-Ionizing Radiation Protection, is not an official body but a private organization, which is constituted of many individuals that have massive conflicts of interests, either by being employed by the industry, by their former employment there, or by receiving research money from it. It is a common adage among researchers in this field that studies supported by the industry do not show harmful effects while all those which are supported by public or other money do.[1] Thus, we have the curious situation that the industry which is to be regulated has been allowed to regulate itself. Third, a neglected issue is the question as to how resonant frequencies, i.e. frequencies whose wave length is a manifold or a direct divisible of the size of biological structures such as cells or mitochondria might affect such structures. These relationships have been worked out by Fröhlich already in the 70ies, but not been followed up (Fröhlich, 1988). Fourth, most testing systems are static. It is likely that if interference of microwave radiation with biological systems happens at a low energy density, such interference happens in dynamic states, for instance during cell division or some cell signalling. It would be necessary to develop dynamic models and test them step by step. To my knowledge, there is no such thing as a theory driven, staged research programme that would do that. Yet, it would be highly timely before we set out to embrace a technology with unknown effects.

This, as an aside, is the typical situation in the 'New Abnormal': the precautionary principle has been given up for the sake of 'progress,' whatever that means and wherever it leads. This could be witnessed in the positive regulations for the COVID-19 gene-based interventions. It is the same with the rollout of 5G without sufficient safety data. I am not aware that there were any public discussions as to who actually owns the orbit around earth. Whether single individuals or companies have the right to use it commercially for their own financial gain, or whether international law-making should make sure that the common interest of the world's population is taken into account. Currently the likes of Musk and others proceed as if they were the benefactors of the world, yet it is pretty clear that the interest is primarily commercial and entrepreneurial. I think it is important to support entrepreneurs and new inventions. But this has to be balanced by a fair assessment of the risks and benefits, and it has to be accompanied by an open and broad societal discourse that arrives at a supportive and evidence-based consensus.

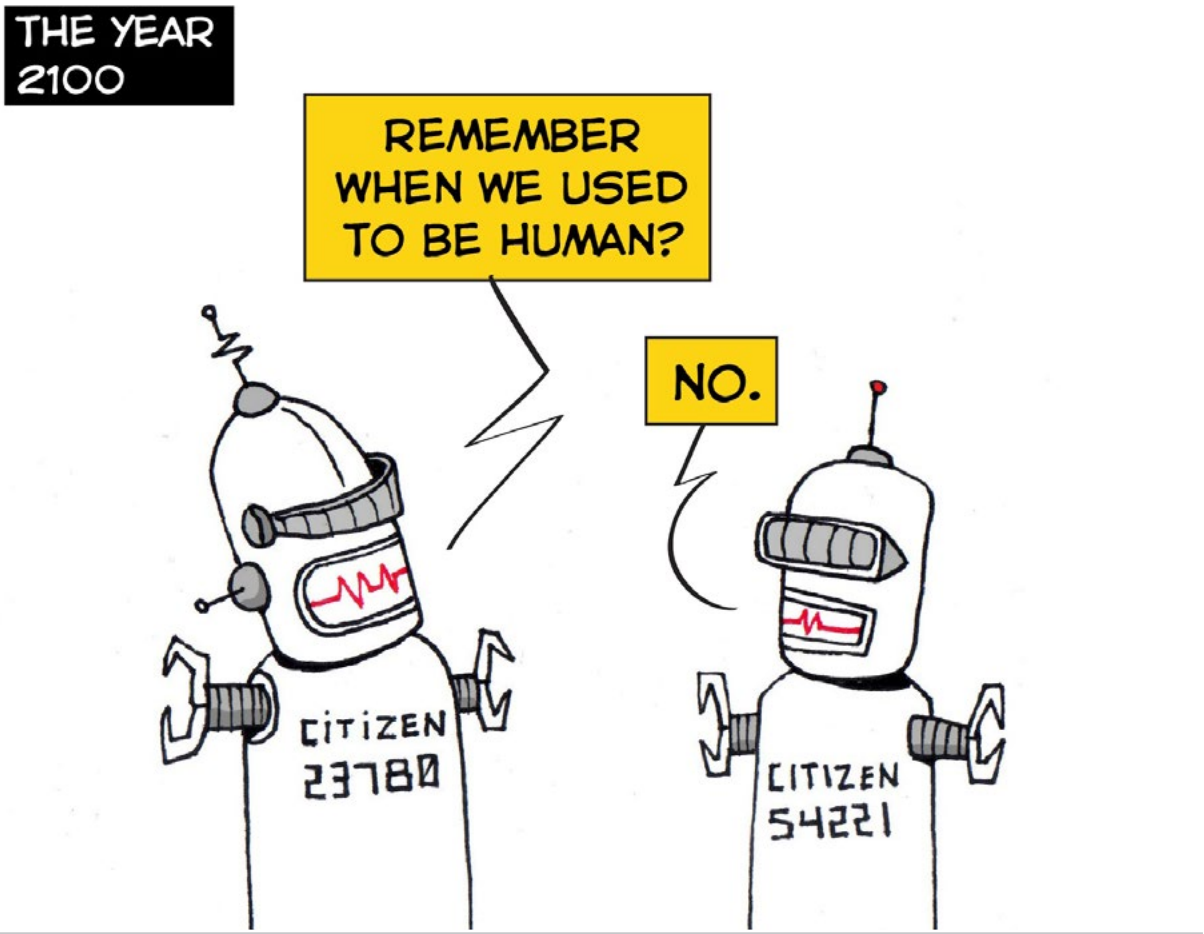
Brain Computer Interfaces

To my knowledge, one of the first, if not the first, brain-computer-interface (BCI) was developed by my colleague and former co-worker Dr. Thilo Hinterberger for his PhD thesis with the department of psychology at the University of Tübingen under the supervision of

[1] Personal communication by Drs. Scheingraber and Buchner at a private meeting.

Prof. Nils Birbaumer to support patients with Amyotrophic Lateral Sclerosis (Birbaumer et al., 1999; Hinterberger et al., 2004; Hinterberger, Veit, et al., 2005; Hinterberger, Wilhelm, Mellinger, Kotchoubey, & Birbaumer, 2005). Patients with Amyotrophic Lateral Sclerosis (ALS) suffer from a gradual degeneration and denervation of their motoneurons which results in a growing incapacity of voluntary muscle control. At an end stage they are conscious but unable to communicate, although all vegetative muscle movements like breathing, heart-beat, etc. controlled by smooth muscles are still operative for some time. Thus, these patients can be alive in a 'locked-in' state for years before they die. They can hear and see, they can have a rich inner life, but they are unable to communicate.

For such patients, Birbaumer and his group devised a system that allowed them communication. They used EEG signals, in that case the slow negative contingent variation (CNV). This is a slow shifting of the electrical polarization of the brain's electrical field from negativity into positivity and back. This was picked up by EEG electrodes and fed back to the patient via a computer and a computer screen. The changing electric potential was translated into a visible object moving on the screen, and the patients learned via operant conditioning to influence this movement using their brain activity. In the end, they were able to use this learned relationship to move a cursor on the screen to a keyboard and write text. This learning happened of course intuitively. The reinforcement was the success of the procedure itself, and the learning was the connection between CNV and the movement of the cursor on the screen. In the end, patients were extremely happy to be able to use their brain activity to communicate by writing letters. The same system could of course also be programmed to answer simple binary questions. It allowed patients who would have otherwise been completely isolated from their environment to communicate.



From there, it is only a short route to using brain activity that is being picked up either by EEG or by other means to steer external things of all kinds. All sorts of signals, EEG signals from the motor cortex that reflect imagined movements, P300 signals that reflect conscious detection of signals or mismatches, blood oxygenation or blood flow through near infrared techniques, magnetic signals, really any kind of signals can be used to construct feedback from the brain to any desired system (Chaudhary, Birbaumer, & Ramos-Murguialday, 2016).

Using direct electric stimulation of the brain to produce sensations has been a long-standing research topic in epileptic and other kinds of neurological research. Usually the curious findings are quoted: rats with an electric stimulus in their limbic system kept pressing levers that delivered the stimulus to them. Patients who are due to receive some brain surgery, are routinely electrically stimulated to find out about individual anatomical locations and to prevent inadvertent harm to brain areas that should keep functioning. Parkinson's patients often receive deep brain stimulation to sub-thalamic nuclei to stimulate the production of dopamine, and spectacular research showed that this is also partially possible by placebo stimulation (Pollo et al., 2002). Meanwhile bidirectional systems have been piloted that can record and stimulate for more than a year (Swann et al., 2018).

Epileptic patients often receive whole little systems of electrodes implanted to control the epilepsy. A novel BCI was implanted in the first human trial of bi-directional BCIs in humans (Cook et al., 2013). Fifteen epilepsy patients who could not be sufficiently treated by conventional therapy volunteered to have the BCI implanted. The BCIs had an AI component that learned the patients' individual brain signature before a seizure happened and warned them via a wireless system that connected to a kind of pager. This flickered a light or produced a sound such that patients could take action, for instance taking an escape medication or go to a safe place. In a qualitative study with six of the patients the sense of agency was explored. While one patient had an increased sense of control and agency, one patient felt completely alienated. Two patients had not much feeling of a changed self and the other three had some mild improvements of control (Gilbert, Cook, O'Brien, & Illes, 2019).

Novel BCIs use signals that can be picked up from the motor cortex. If a subject imagines a motion, neurons in the motor cortex will fire. These signals can be used, for instance to steer a prosthesis, if a leg or an arm has been amputated or lost. This was shown in a completely tetraplegic patient that was unable to make any voluntary movements with his limbs. He had microelectrode arrays implanted in his posterior parietal cortex, which is an area linking sensory input to motor output and supposed to be responsible for planning of complex movements. It could be shown that the person could activate different areas by imagining different types of movements, and that by using those imaginations prostheses could be moved (Aflalo et al., 2015).

In the same sense, virtually all types of signals can be used to steer external instruments or internally attached devices. Such BCIs are indeed operative and help users of wheelchairs to operate their wheelchair (Galán et al., 2008). The most recent ones can even integrate other EEG data that reflect the individuals psychological state, and thus can adapt the output of the system accordingly (Hussain et al., 2025). Using such devices, patients with prostheses can perform the desired movements just by imagination. Bublitz and colleagues (2019) present interesting case vignettes from an interview study with users of such BCIs. But they also warn that the question of responsibility, and the legal framework is quite unclear. Risks are identified from physical to legal ones, and risk assessment is largely lacking (King, Read, & Salmon, 2024).

What happens if a BCI user in a wheelchair, hits and injures someone? What if the executive arm of the BCI picks up an aggressive emotion of a BCI-connected wheelchair user, and hits the person the aggressive feeling is directed towards? Who is then responsible? Can the wish to hit someone, translated into movement of the wheelchair via BCI, be incriminated?

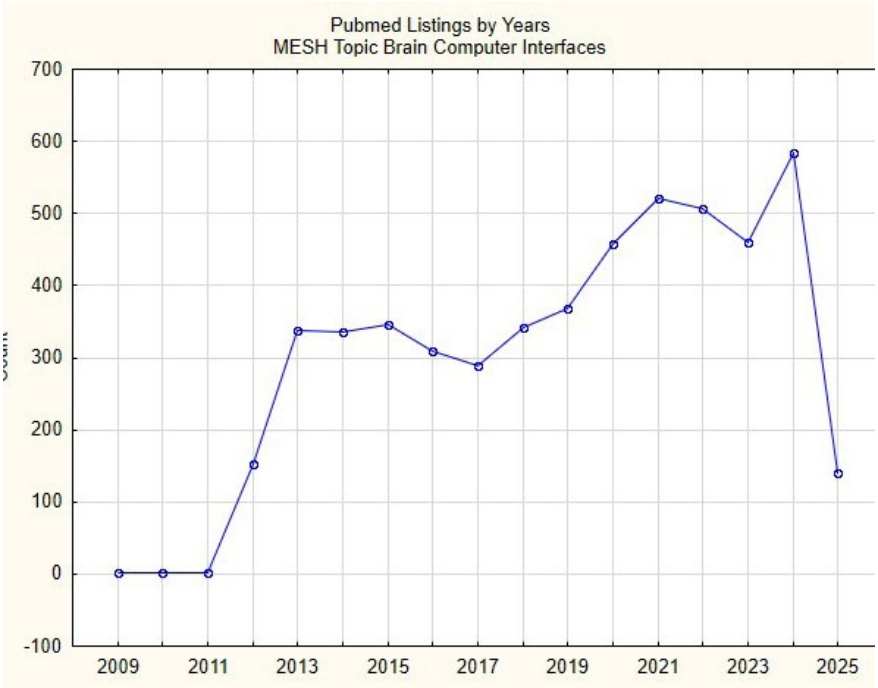
Bublitz and colleagues (2019) point out that BCIs now allow for disembodied action: a person can wilfully act in the world without having to use their body. Remote control of bombers and self-propelling rockets in the military have already perfected that kind of disembodied action and made killing a seemingly morally neutral issue. Now, such a situation of disembodiment is reaching the single individual as well.

This will lead to a peculiar situation: Since actions have to be intended and controlled, a BCI user who can intend an action and thereby control it will be liable, for instance if the wheelchair wilfully hits someone and creates serious damage. How is this to be legally proven? The BCI user might simply deny both intention and action. So, in the foreseeable future, control and monitoring devices have to be built in, that can monitor the intentions and actions performed by imagining those movements that will then be carried out by the BCI. What will that result in? You guessed: total control.

Looking at BCIs clinical prospects, the idea is lying close at hand to implant electrodes or other interfacing systems to access brain activity for read-out, as well as for supposed enhancement. The Pubmed data-base lists 4.665 hits for the Medical Subject Heading 'Brain Computer Interfaces' as a major topic. That is a figure which testifies to some interest. The research started in 2009 with two publications, and another one and two in the following years and then started to pick up with 152 in 2012 up to 585 in 2024. The graph is presented in Figure 4. (Note: at the time of looking up the database in March 2025 there was only a quarter of a year past. Hence the roughly 120 hits have to be multiplied by 4 and we will see a linear extension to something of 600 or more by the end of 2025.)

The trajectory is going up; it remains to be seen, whether it is going to be a continuously trending topic. Compared with another trending topic, 'mindfulness', the trend is similar, but less pronounced with BCIs. Mindfulness scores 6,960 hits, with 1,102 at its peak three years ago. Thus, it looks like BCIs are a trending topic in medical research with a moderate interest. This has to do, of course with the important application aspects in the treatment and rehabilitation of debilitated or injured persons or patients with severe diseases such as Parkinson's disease, epilepsy and similar diseases for which bidirectional BCIs might be therapeutically useful. But will BCIs also be useful for other purposes, for instance for simply enhancing the cognitive capacity of individuals with the desire to do so?

Figure 4 – Number of Hits in the Pubmed Search 'MESH Major Topic Brain Computer Interface'



Neuralink Brain Chip and the Future of Upgrading

On January 29th 2024 Elon Musk announced the first implant of a Neuralink brain computer interface by neurosurgery in a human. The recipient is supposed to be able to move a computer cursor with his or her brain activity, similar to other BCIs. 1,024 electrodes register the activity of single neurons. The neurosurgeons interviewed by the Nature news piece are quoted as being 'underwhelmed' (Drew, 2024). Other and simpler techniques – see above – can be used to control computer cursors, they say. However, it is certainly another proof-of-principle study that such a thing is possible. Two other companies are active on the market as well whose products have been tested in studies (Cook et al., 2013; Hussain et al., 2025; Swann et al., 2018).

Currently, all BCIs under research and in clinical testing have one thing in common: they are used to help patients with severe limitations, like intractable epilepsy, severe Parkinson's disease, para- and tetraplegic patients, or patients with limb prostheses. For such severe diseases the risks of neurosurgery and failing implants are certainly ethically acceptable and are accepted by patients as well. However, such interventions are, like all medical interventions, not without side effects. The surgeries themselves seem to be largely well tolerated without severe side effects.

But the implantation of BCIs leads to some problems. A recent systematic review of 58 publications documenting risks, analysed 20 different types of risks, some of which concern physical health, but also social and legal risks are mentioned. The article criticizes that little attention is given to risk monitoring, and this demands specific studies (King et al., 2024). It is known that the implants are immunologically attacked, leading to inflammation that can persist. Implants destroy the neuronal tissue around them and glial cells, the immunological and metabolic support cells of neurons, grow densely around the implants (Groothuis, Ramsey, Ramakers, & van der Plasse, 2014). This changes physical properties, such as the impedance, of the implants in turn, which requires workarounds. The inflammation can be fought by systemic corticosteroids, which, however, carry themselves serious risks of side effects, if they have to be given over a longer time period. One might conceive of better material, better shapes of electrodes. But it is highly unlikely that the single one problem will go away: *every*

Elon Musk

time something alien is inserted into the body, we have an immunological and physiological reaction of the system to cope with the insertion. The brain is a specifically sensitive system, and it is unreasonable to expect that the problems described will vanish completely.

Would such a situation warrant implantation in healthy volunteers? Currently the implants offered by Neuralink are for therapeutic purposes only (https://neuralink.com/, accessed 25th March 2025). But it is no rocket science to guess that the final aim is enhancement, once the therapeutics are mastered. (And it might not be a rocket-science type of conspiracy theory to presume that at one point the disruptive element will also be employed.) Here, we face the same issue as with other enhancement technologies used in the healthy: is it ethical to incur potential problems, and to risk a state of health, which is currently unchallenged, in order to receive a future goal with an uncertain probability and with a likely set of problems? In simple words: is it worth it?

An important proof of principle study that casts a severe doubt on the positive hopes the transhumanist community attributes to such devices was published a couple of years ago (Goss-Varley et al., 2017). The authors implanted a microarray of electrodes without any function into 16 healthy rats and compared them with 10 healthy control rats which had been also operated on but without an implant. They checked for fine-motor control, gross motor control, various parameters of neurological health such as a compromised blood brain barrier and neuron loss. They found that no matter what parameter was looked at, the intervention led to a loss of fine motor control and some problems with gross motor control. The neurons retreated around the inserts, the blood-brain barrier was compromised, and all the functional outcomes were directly correlated to the severity of the neuronal damage. The observation period was four months, and the animals have not recovered.

This is an animal experiment, but one which is important. Such studies cannot be done with humans for obvious ethical reasons. The authors caution against BCI enthusiasm, especially of the enhancement type, because the intervention itself is neither benign nor without problems: *'Despite the incredible enthusiasm, it is widely understood that microelectrodes for BMI devices exhibit limited long term viability where recordings typically fail 6 months to 1 year after implantation.'* (Goss-Varley et al., 2017, p. 2)

The qualitative study mentioned above showed that in patients, beneficial experiences and disorienting experiences are just about balanced, even if a slight bias towards positive outcomes could be observed in the patients (Gilbert et al., 2019). But we are not talking about patients, we are talking about perfectly healthy individuals. The animal study shows: interfering with a healthy brain is not without problems. And the question will arise, whether such an intervention is at all useful, and if so for what purposes. To help patients move who are wheelchair bound, or even immobile, is one thing. It is quite another thing to meddle with a healthy system to 'upgrade', whatever such 'upgrading' would then mean.

It seems clear, from the literature, that it is possible to engineer BCIs. All such devices have, up to now, dealt with one form or other of motor control, epileptic control or control of tremor and initiation of movement. This is neurologically speaking a comparatively simple thing to achieve, as we are dealing with circumscribed areas of the brain. But as brain imaging research of the recent decades has made clear, higher cognitive function or execution is quite another matter. Such functions are, as a rule, arranged in widely distributed networks that change connectivity quickly and shift areas engaged, depending on tasks, and intentions. We have no clue, currently, how complex memories are stored or retrieved. We know that somehow the hippocampus is involved, and temporal and parietal networks, as well as deeper brain areas. But when it comes to details our knowledge dissipates.

It is a myth to assume that we can connect to computers, and then have all the knowledge directly at our finger tips, or rather at our neurons' axons. The same is true for most higher-order cognitive and emotional functions.

Looking closely at these issues it becomes obvious: the idea of a seamless crossing over from human physiology to technical gadgets and implants, and back is even more of a myth than it looked at first sight. It exposes Transhumanism for what it really is: a futuristic scientistic religion that places unrealistic hopes into the future achievements of science. It is not science, for it is not itself developing ideas and testing them, but it is banking on future developments that are supposed to happen. 'Upgrading' seems to be a religious hope, nothing else. Currently there are no signs in sight that would signal a remote possibility of such an achievement.

Cyborgization, Brain Uploading, and Superintelligence

Brain Computer Interfaces would be one important milestone on the road to becoming a cyborg, a cybernetic organism that has a seamless connection between physiology and technology in one organism. The discussion above has shown that this is unlikely to happen in the near future regarding BCIs. But perhaps other achievements will come first?

Kevin Warwick, a retired engineering professor from the University of Reading in the UK, reportedly was one of the first cyborgized persons (Warwick et al., 2003). In an experiment on himself he had an electrode microarray implanted in his forearm that was connected to his nerves. He could use this device to steer a prosthetic arm that was connected to the internet. According to Wikipedia he wanted to become the world's first cyborg (https://en.wikipedia.org/wiki/Kevin_Warwick, accessed 25th March 2025); but the reference to this statement leads to the study quoted above. Thus, having implanted those electrodes together with a radio chip and moving a robotic arm was this cyborgization referred to. The procedure testifies to the earnestness in Warwick's attempts at elucidating certain issues. However, the full cyborgization he seems to have avoided. A colleague once told me that Warwick had announced that he would have his arm amputated and replaced by a robotic arm.[2] That has not happened, it seems; perhaps my colleague got that wrong, or Warwick decided in the end for the rational choice not to meddle too much with his physiology.

Cyborgization, the mixing of physiology with technology in order to produce a superhuman or transhuman, seems some time away. We have seen that BCIs allow for a close cooperation of technical systems with physiology. But these are all therapeutic applications, and enhancing applications are far away at the horizon, if ever they are to appear.

A similar issue is 'mind uploading'. The idea is: once we have very precise brain imaging, we can image not only brain structures but activities in real time. Nanobots will circulate by the billions to scan and record brain states and activities. If we do that with enough calculating power, we can imitate the activities of an individual brain in silico, by reproducing this activity in a computer system (Kurzweil, 2005). To be fair, very likely this brain scanning would in

[2] Personal communication from Dr. Roland Benedikter.

the end even be the death of the living system. But who would care, as long as the personality persists, even in silico?

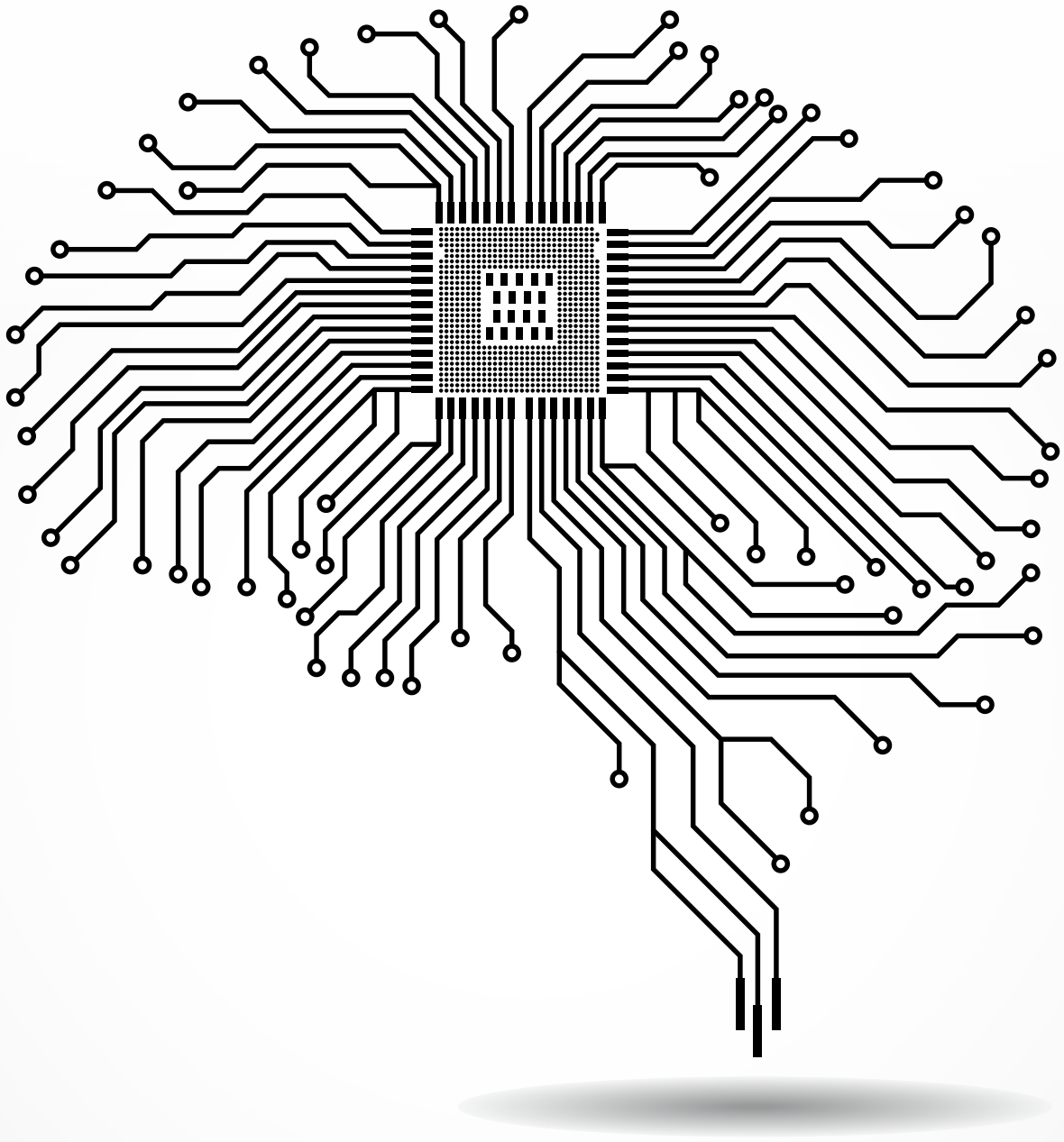
Such a view is quite bizarre, I find. It reduces the personality and a subject's mind to brain activity, and brain architecture, at a certain point in time, or perhaps over an extended period of time. But it commits an important error, which I would call the *disembodiment error*. It assumes that mental activity is simply computer activity, only based on carbon instead of silica. Harry Collins has made a very stringent point, difficult to counter, that all our mental activities are dependent on continuous social interaction, which would make 'mind' not only an individual-personal, but also a social category (Collins, 2018). At any rate, currently this is dreamland. We have no clue about the complexity of our brain activity. We do not even know whether the brain theory of mental life is correct, namely that our brain produces mental activity and consciousness. This is simply assumed to be correct by transhumanists. Stuart Hameroff has rightly pointed out, in his presidential address at the Science of Consciousness Conference in Taormina 2023, that the field has not made any progress over the last 20 years on the idea that consciousness is predicated on neuronal brain activity. Rather, it seems that this is not the case, else we would see some light at the end of the tunnel. As I have made clear in my first Galileo Report (https://galileocommission.org/report/, accessed 25th March 2025), I think data speak against such a local-material model of consciousness. Hence, mental activity is likely more than brain activity, or, put the other way round, simulating brain activity will not lead to a recovery of mental content, and subjective feelings of personhood, emotions, thoughts, ideas, motivation, sensations, etc. Whatever people think that a 'mind upload' onto computers will be, provided it will be at all technically possible at one point, it certainly won't be a 'person' or a 'mind' that is being conserved, and if it will be conserved it won't be alive. Susan Levin has pointed out that transhumanists are preoccupied with cognition, intelligence and cognitive capacity and neglect a whole array of other mental states, such as emotions, volition, affects, etc. (S. B. Levin, 2021). We leave it at that, and to the future to show, whether those ideas of Kurzweil's and others are viable.

We will soon discover. Because according to Kurzweil and his ilk 2045 will be the year of the singularity, when computers will have more cognitive capacities than all of humanity together and when computers will likely wake up into consciousness. Whether computing capacity is equal to consciousness is rather dubious, and remains to be seen. But at some point in the future, provided our economy and energy systems are sustainable, computers will outcalculate humans. This is rather easy to see. Nick Bostrom warned, a while ago, that this is not only benign (Bostrom, 2014). What if a computer system gets out of hand that is programmed to use all resources to, say, calculate the decimals of pi into infinity. Will it not trick all his handlers and human operators into doing its will, perhaps even killing or destroying everything in its path in order to fulfil its mission? Bostrom observed correctly that motivation and cognition or intelligence are orthogonal, i.e. independent of each other (Bostrom, 2012). Therefore, there can be superintelligent beings that have no motivation, and no ethics whatsoever, or the other way round, a will to achieve something which uses all resources to achieve a goal however silly. The machine trying to calculate the decimals of pi is an example. Thus, we need to be prepared for a regulation on AI and superintelligent machines, before it is too late. For Bostrom this is not a question whether this happens, but only a question of when it will happen that artificial systems will outmanoeuvre humans. For others, like Tristan Harris, it is a question of choice and conscious debate (https://www.ted.com/talks/tristan_harris_why_ai_is_our_ultimate_test_and_greatest_invitation, accessed 6th June, 2025).

This is the dark side of the transhumanist movement or rather the technological advances we are currently making. AI is being hailed and used by the majority of people, and very little

critical discourse can be detected. Nick Bostrom, a confessing transhumanist, was one of the few who has seen the potential dangers. I skip all secondary AI effects that might be worth discussing here: the dumbing down it will inevitably cause, when whole generations of students will not learn how to write an essay properly, and hence how to think. For thinking and writing are two processes that entail each other to some extent. I will not cover the propaganda effect generated by AI modules selecting information on the internet according to the taste of users, discovered via their previous behaviour, the nudging commandeered by this, and the willing self-immolation of freedom and liberties on part of the users. All this and more would deserve to be covered.

I leave it at that and turn to an important question: is Transhumanism in fact really that influential as I have suggested?



THE TRANSHUMANIST MINDSET IN REALITY – HOW MANY PEOPLE HOLD TRANSHUMANIST VIEWS? A REPRESENTATIVE SURVEY

Is it not a straw man I have set up and am fighting against, one may ask? Are not transhumanist writers like Aubrey de Grey pathetically powerless as testified by the huge amount of opinion pieces they publish in contradistinction to original, substantial contributions? Are the ideas not so obviously self-defeating that even one page of paper printed against them is too much? Is it not obvious to common sense that these ideas are misplaced at a grand scale?

Perhaps this is so for many well-educated readers with a solid grounding in life and academic reading. But we should not forget the following: ideas are disseminated via many channels. Science fiction films propagate ideas they have taken, more often than not, from maverick science papers. Such ideas then become entrenched in some minds. Scientism as such has become the default position of many scientists and science managers, as has been observed by several authors (Attkisson, 2024; Esfeld & Lopez, 2024; Feyerabend, 2011; Goddard & Dalgleish, 2023; Hasler, 2015; Loughlin, 2021; Plantinga, 2011; Williams & Robinson, 2016). In my observation it is also a default position of many science editors in newspapers and journals, and probably also in TV and radio stations, although to my knowledge there are no reliable data.

This is the reason why I developed a short 9-item scale to measure a transhumanist belief system. I have developed several questionnaires in my career, among them the widely used Freiburg Mindfulness inventory, which has been translated into several languages (Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006). I drew on this experience in developing this new scale.

We gave it first to an ad-hoc sample of 200 respondents of an online panel to allow for psychometric assessment and improvement. We then gave it to 1051 respondents of that online-panel that were sampled to approach representativity of a German population.[1] The scale has good psychometric properties (it is currently for peer evaluation with a journal (Walach,

[1] True representativity is very difficult to reach and would require a random interview sampling plan and face-to-face interviews, which is beyond my budget. But online sampling panels can be used to approach representativity. To that purpose, sociodemographic figures like gender, age, income, family status, migrant status can be used to approach a representative sample.

Germann, & Klement, submitted)). I will report here only how the items are answered by the sample. We will see: Approximately 20% to nearly 50% answered the items in the positive.

The items themselves were developed out of the relevant literature and were formulated in a way that comparatively 'easy' items and 'difficult' items were mixed. 'Easy' means in the context of measurement theory: An item that is answered positively by a majority or many respondents. 'Difficult' refers to an item that is answered only by a minority in the positive. Depending on the goal, a mix of difficult and easy items is useful. Items that are too difficult should be avoided, because they do not contribute to variance. The same is true for items that are too easy and are answered by most. They do not contribute to variance either. So, my goal was to find formulations that are intermediate and tap the construct of Transhumanism to some degrees. The data support that this goal was reached successfully.

The items of the Transhumanism Scale were presented in German to a German population; hence I present the original with an appropriate English translation in Table 1. The items were presented in the format of 'agree,' 'undecided,' 'disagree,' and due to the online answering format no missing data occurred.

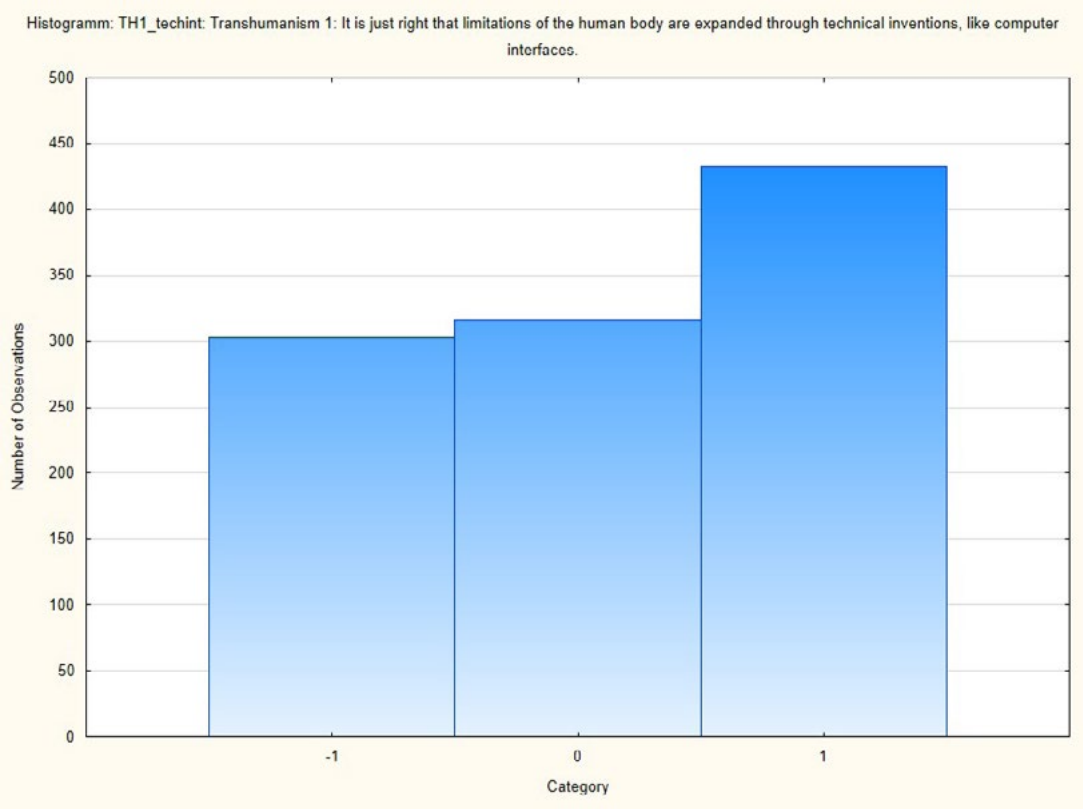
Table 1 – The new Transhumanism Scale – Original German wording and English translation suggested by us; to be answered in the format 'agree', 'undecided', 'disagree'

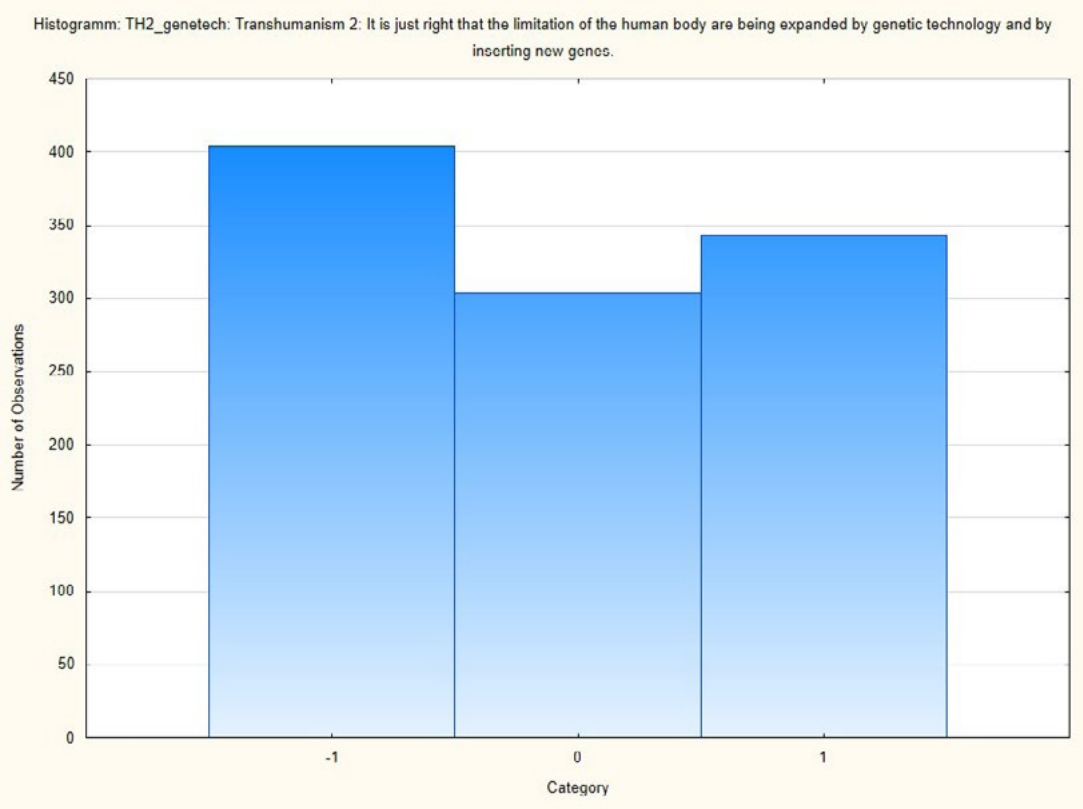
No	Item wording	Abbreviation
1	Es ist gut und richtig, dass die Begrenzungen des menschlichen Körpers durch technische Erfindungen, wie Schnittstellen zu Computern erweitert werden. *It is just right that the limitations of the human body are expanded by technical inventions, such as interfaces to computers.*	Improvement of the body by interfaces
2	Es ist gut und richtig, dass die Begrenzungen des menschlichen Körpers durch Gentechnik und das Einbringen von neuen Genen erweitert werden. *It is just right that the limitations of the human body are expanded by genetic technology and inserting new genes.*	Improvement of the body by gene technology
3	Ich bin davon überzeugt, dass in nicht allzu ferner Zukunft die medizinische Wissenschaft zusammen mit der Digitalisierung den Tod in sehr weite Ferne rückt. *I am convinced that in the near future medical science together with digitization will move death into the far distance.*	Abolishing death

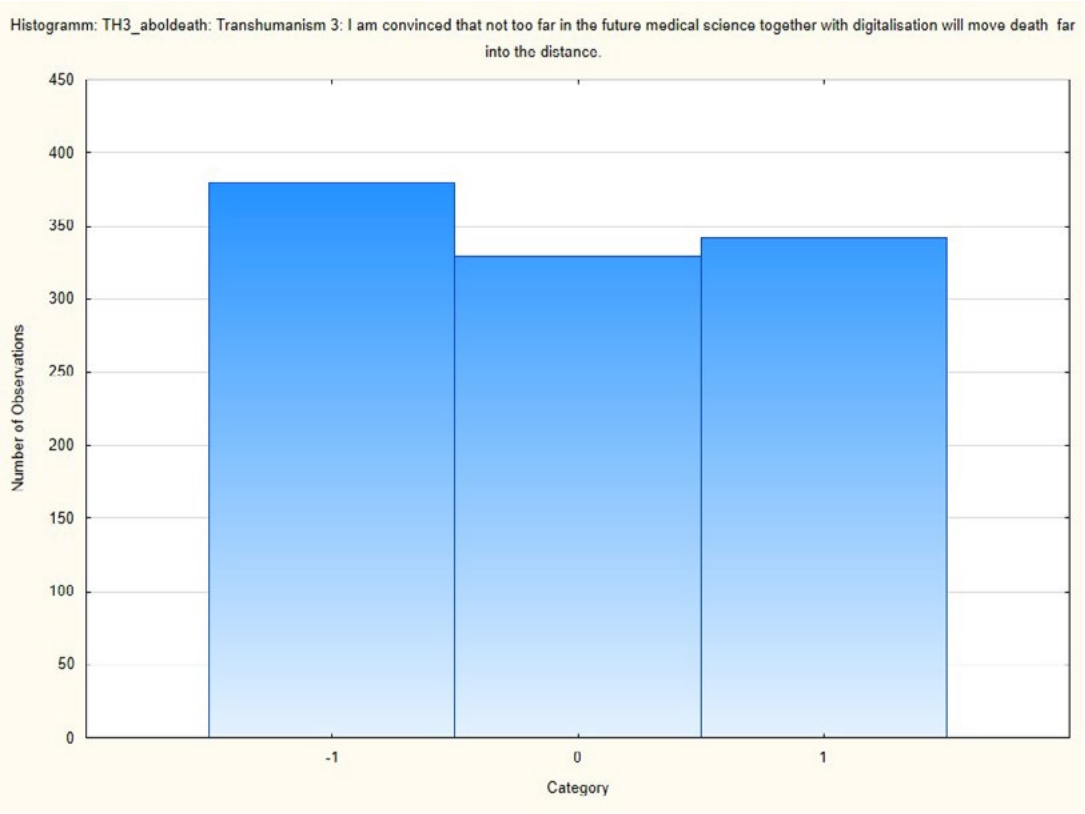
4	Wenn es eine direkte Gehirn-Computer-Schnittstelle fürs Gehirn gäbe, würde ich sie mir einbauen lassen, um direkten Zugriff aufs Internet zu haben. *If there were a direct brain-computer-interface for our brain I would have it inserted in order to have direct access to the internet.*	Enhancement
5	Die mRNA-COVID Impfungen haben gezeigt, dass man fremde Gene in den menschlichen Körper einbringen kann zum Vorteil der Menschheit. *The mRNA-COVID vaccinations have demonstrated that it is possible to insert foreign genes into the body to the benefit of humanity.*	Progress
6	Wir werden in naher Zukunft mit Computern und Künstlicher Intelligenz verschmelzen und zu einem Supermenschen werden. *We will merge in the near future with computers and artificial intelligence into a cyborg and super-human.*	Cyborg and Übermensch
7	Die Digitalisierung wird uns helfen, über unsere Grenzen hinauszuwachsen. *Digitization will help us to transcend our boundaries.*	Digitization
8	Gott ist tot – wir selber sind Gott. *God is dead, we are God ourselves.*	Homo Deus
9	Der Fortschritt der Wissenschaft wird uns vor allem Segen bringen. *The progress of science will bring us mainly blessings.*	Belief in progress

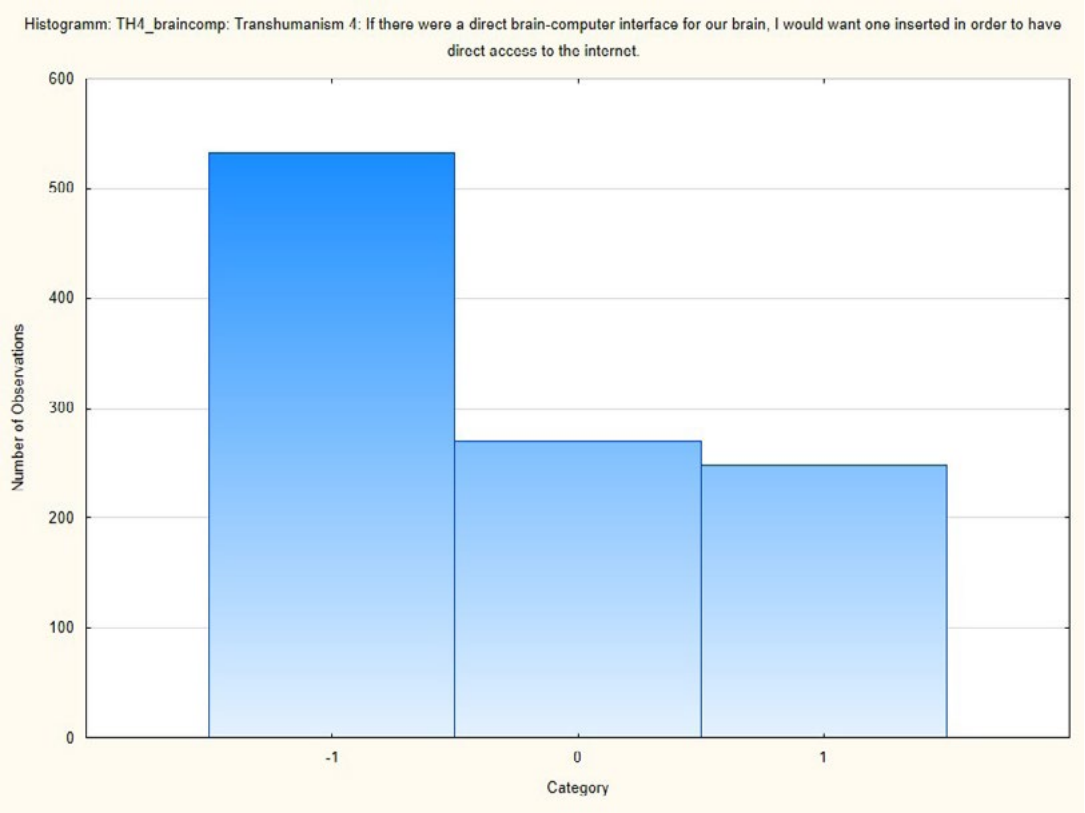
I describe in the graphs in Figure 5 how the answers were distributed per item. Minus 1 hereby denotes dissent, 0 is the undecided category, and plus 1 is agreement with the statement. Below in the table I present the full item statistics numerically.

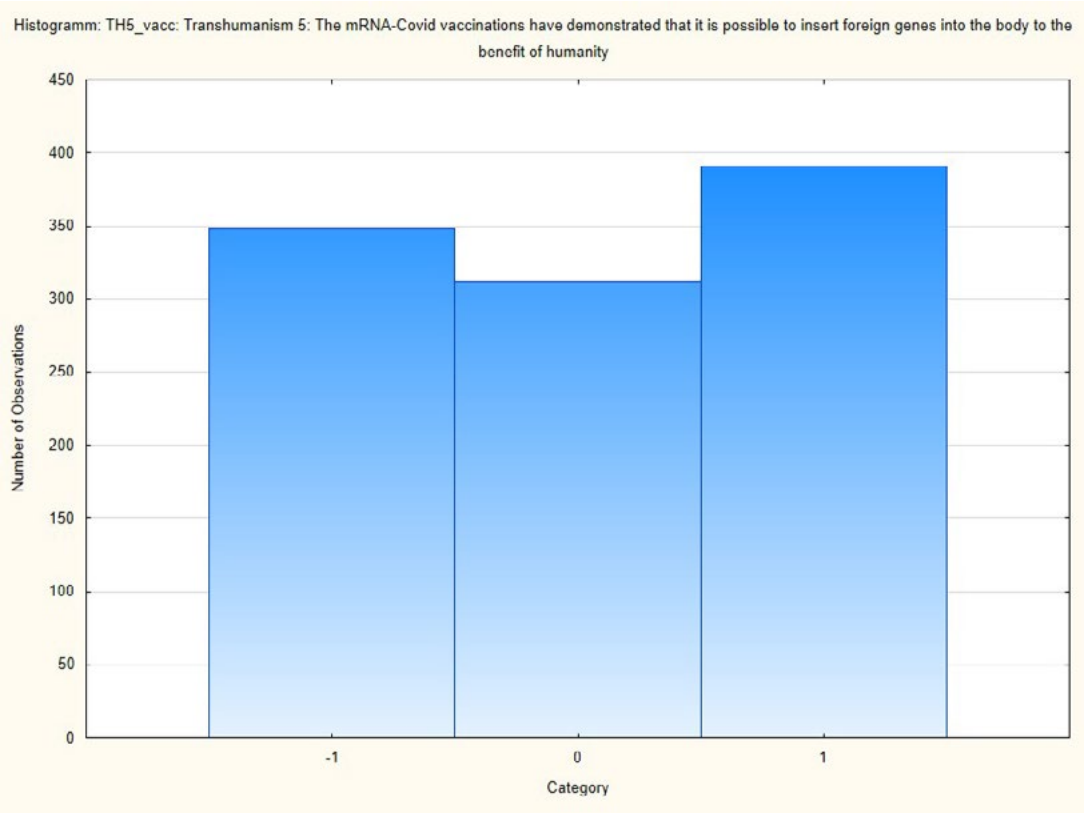
Figure 5 – Histograms of the distribution of the answers to the 9 items of the new Transhumanism Scale from a quasi-representative German sample of n = 1051 respondents; -1: disagree, 0: undecided; 1: agree. The data are presented in condensed form in Table 2.

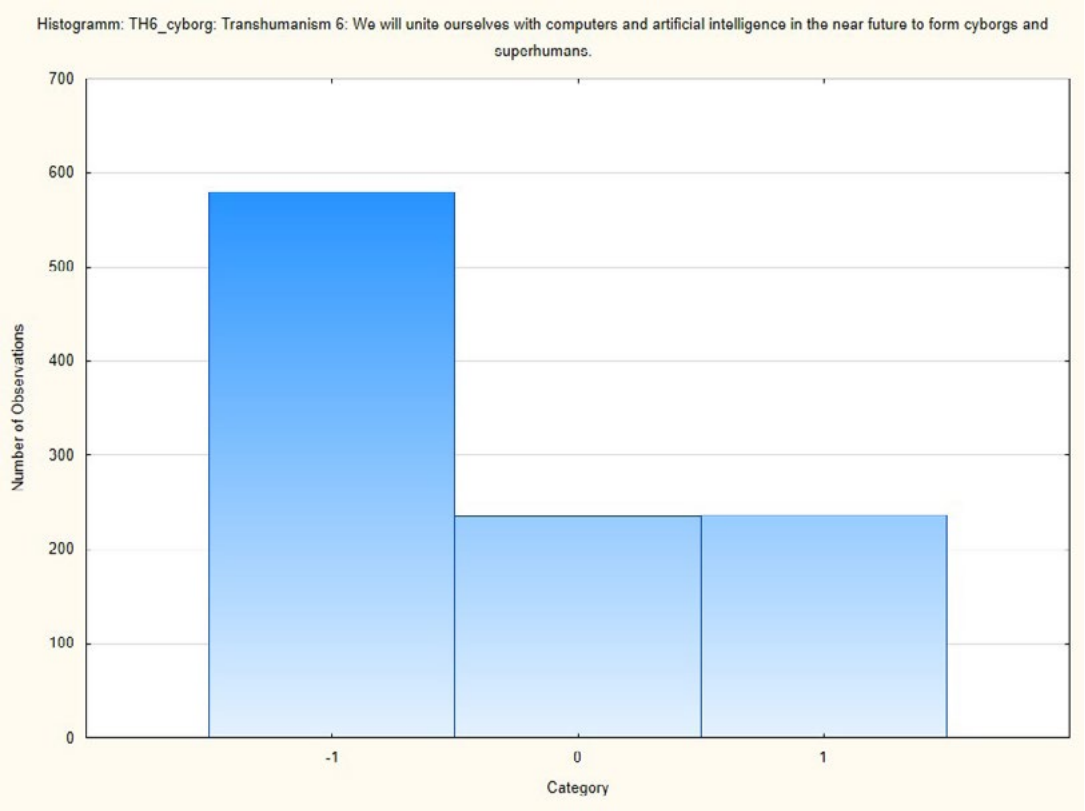


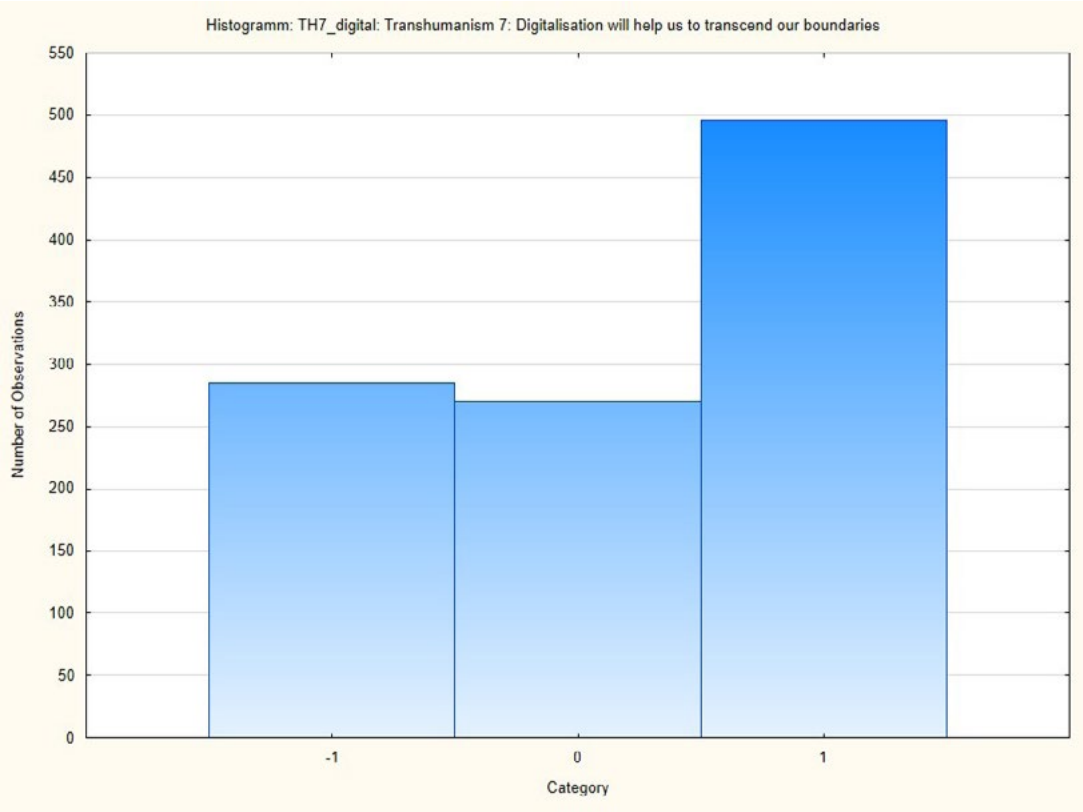



Histogramm: TH3_aboldeath: Transhumanism 3: I am convinced that not too far in the future medical science together with digitalisation will move death far into the distance.
Number of Observations
450
400
350
300
250
200
150
100
50
0
-1
0
1
Category


Histogramm: TH4_braincomp: Transhumanism 4: If there were a direct brain-computer interface for our brain, I would want one inserted in order to have direct access to the internet.
Number of Observations
600
500
400
300
200
100
0
-1
0
1
Category


Histogramm: TH5_vacc: Transhumanism 5: The mRNA-Covid vaccinations have demonstrated that it is possible to insert foreign genes into the body to the benefit of humanity
Number of Observations
450
400
350
300
250
200
150
100
50
0
-1
0
1
Category


Histogramm: TH6_cyborg: Transhumanism 6: We will unite ourselves with computers and artificial intelligence in the near future to form cyborgs and superhumans.
Number of Observations
700
600
500
400
300
200
100
0
-1
0
1
Category


Histogramm: TH7_digital: Transhumanism 7: Digitalisation will help us to transcend our boundaries
Number of Observations
550
500
450
400
350
300
250
200
150
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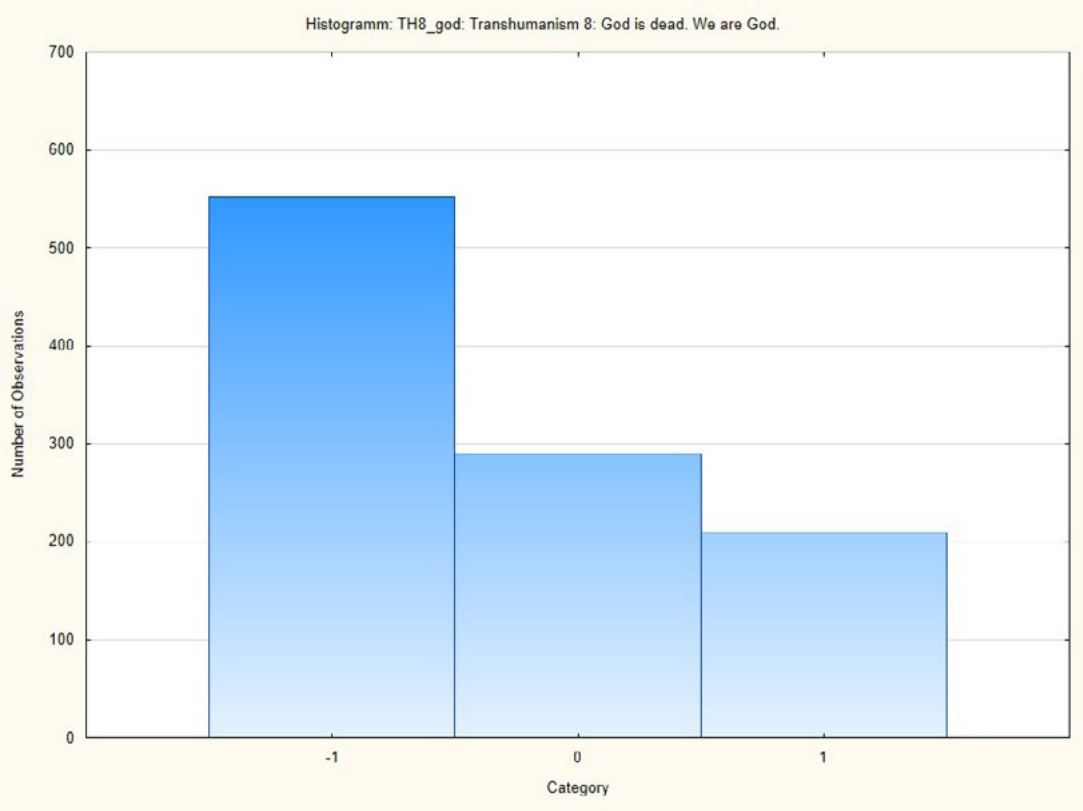
50
0
-1
0
1
Category


Histogramm: TH8_god: Transhumanism 8: God is dead. We are God.
Number of Observations
700
600
500
400
300
200
100
0
-1
0
1
Category

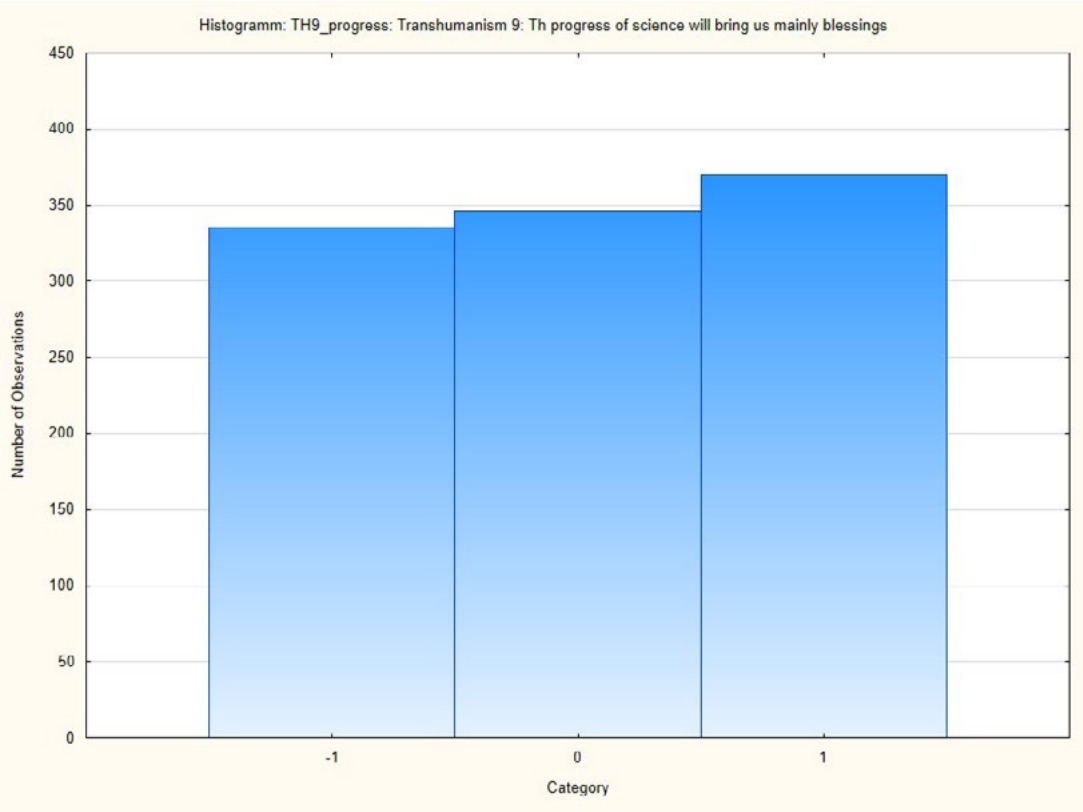


Table 2 – Descriptive Statistics of the 9 Transhumanism Scale items in a quasi-representative sample of n = 1051 respondents: Items; number of respondents

Transhumanism Scale items	Scale mean: -0.62 ± **4.3; Cronbach's alpha = 0.75;** r_{it} = 0.25 Median: - 1.0; range: -9 to +9				
n = 1051	**Support (+1)**	**Undecided (0)**	**Disagree (-1)**	**Mean**	**± standard deviations**
Improvement of the body by interfaces	432 (41.1%)	316 (30.1%)	303 (28.8%)	0.12	0.83
Improvement of the body by gene technology	343 (32.6%)	304 (28.9%)	404 (38.4%)	-0.06	0.84
Abolishing death	342 (32.5%)	329 (31.3%)	380 (36.1%)	-0.04	0.83
Enhancement through BCIs	248 (23.6%)	270 (25.7%)	533 (50.7%)	-0.27	0.82
Progress through modRNA	391 (37.2%)	312 (29.7%)	348 (33.1%)	0.04	0.84
Cyborg and Übermensch	236 (22.4%)	235 (22.4%)	580 (55.2%)	-0.33	0.82
Digitization	496 (47.2%)	270 (25.7%)	285 (27.1%)	0.2	0.84
Homo Deus	209 (20.0%)	290 (27.6%)	552 (52.5%)	-0.33	0.79
Belief in progress	370 (35.2%)	346 (32.9%)	335 (31.9%)	0.03	0.82

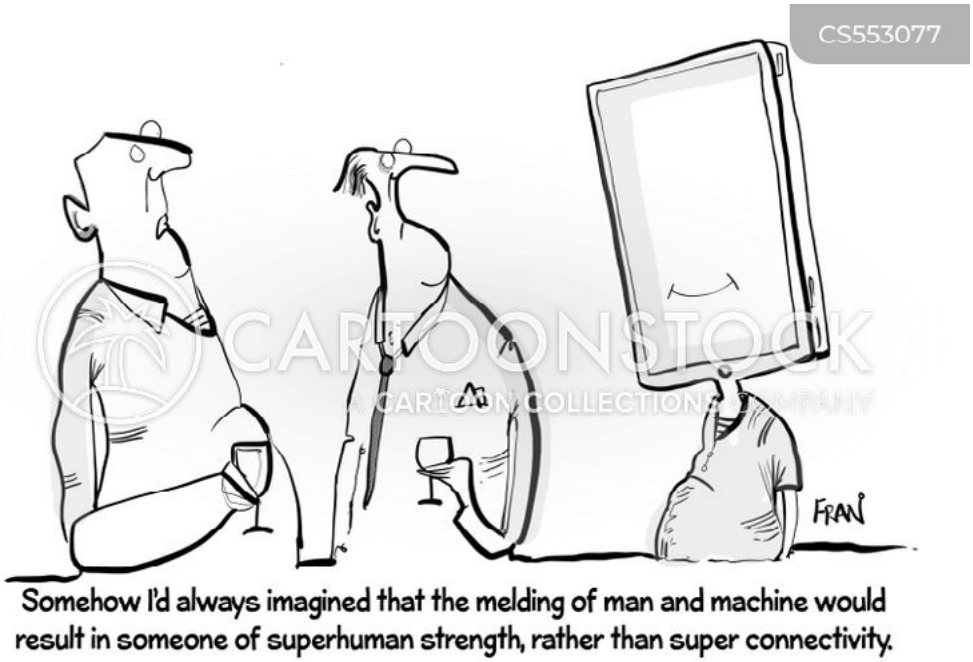
The 'easiest' item No. 7 *'Digitization will help us to transcend our boundaries'* is supported by 47.2% of all respondents. The most difficult item No. 8 *'God is dead. We are God ourselves'* is supported by 20% of the respondents. 35% believe in progress. 37% believe in progress through modRNA technique. 41% are positive about interfaces between the body and computers. And 32% believe in gene-technology and in the future abolition of death. Nearly a quarter of the population, 23%, are willing to have a brain-computer interface inserted.

This in a nutshell is Transhumanism live in the German population. It would be interesting to see how it is represented in other populations or in subsamples of the populations such as religious people, people active in academia, or in the media, politics, or economy.

As our sample was drawn from an online-panel it can be expected that this is an overrepresentation of people who have some affinity to computers and the respective technology and hence answer these items more positively than the rest of the population might. We have no way of knowing currently. But I don't think that the bias is so massive as to completely turn round the results. Rather, I submit, this is a fair image of the population's attitudes. And this image *shows that transhumanist ideas have already been deeply absorbed*.

Transhumanism, it seems, has become one new option to see the world and one's life. This is happening at a seemingly fast pace, without any proper discourse or public debate. The process reminds me of the instalment of the last big religious movement in the West, Christianity. This started out from the fringes of the civilized world, carried by a few eloquent and passionate proselytizers, who were later called apostles, and conquered Rome. After the fall of Rome, a second wave of apostles from the Celtic-Irish fringe made their way south and converted the German tribes that had driven out Rome. In all these instances very few individuals with enough personal conviction converted the powerful, and these in turn made their followers convert as well, and a new religion was born.

It seems to me that a very similar process is happening today. There are a few people, very convinced of their ideas, even if they are madness squared to some observers. Many of them are very rich. They team up with the mighty and powerful: witness the support of Elon Musk for President Trump. My view may be too parochial and idiosyncratic. But my data speak an objective language. Transhumanism has reached a relevant minority, and thereby everybody to some degree.



CONCLUDING REMARKS AND THE WAY FORWARD

Aubrey de Grey's statement that science is the modern world's religion is nearly correct. Only, it is not science, but scientism that is the modern world's religion. Transhumanism is a particular strand of such scientism. Transhumanism is not science. It is a belief in the potential of science to achieve goals that were formerly part of religious belief systems (Adorno, 2021; S. B. Levin, 2021, 2024). It is a set of mythologies, i.e. narratives that have the sole purpose to explain the world, our place in it and our future hopes and developments (Hauskeller, 2016). That is, what previously religions did for people. They explained the world, offered narratives about their purpose on earth, the meaning of their lives and how they should behave, and finally, towards what goal all things are developing. Transhumanism is just such a modern religion. The fact that it is not a science or scientific discipline, as is often stipulated, can be gleaned by some simple observations:

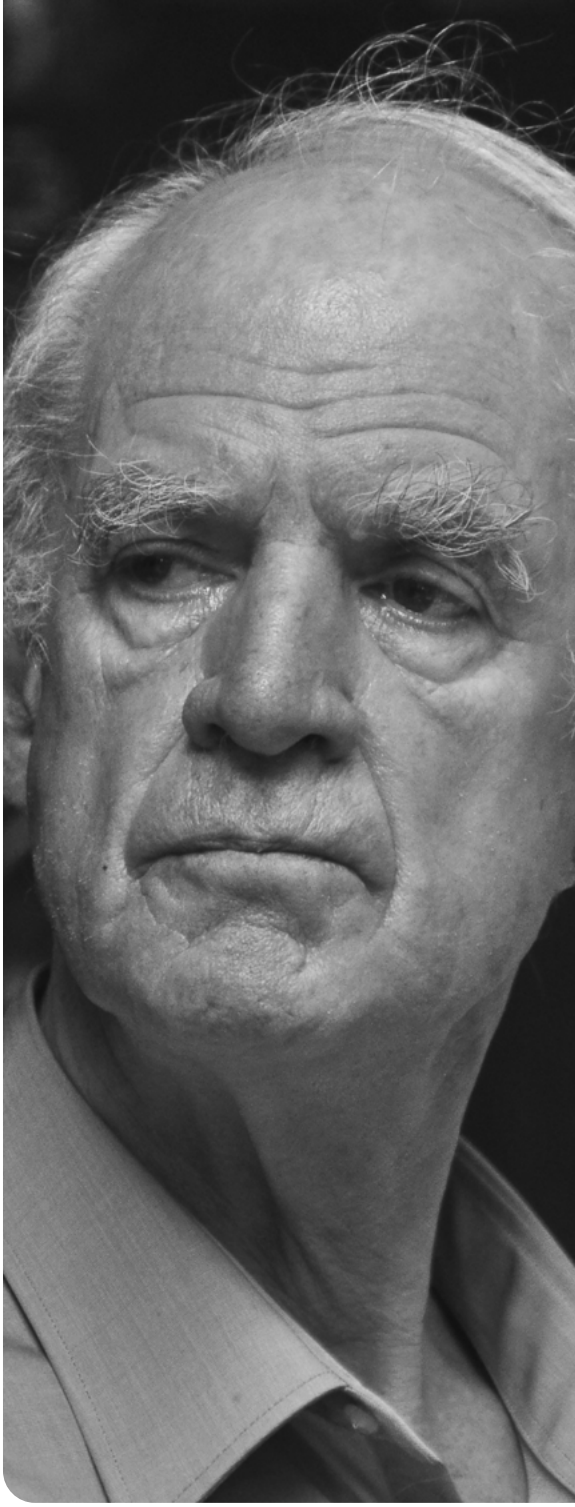
None of what Transhumanists say is directly derived from scientific work or theory. Rather, they take scientific findings and ideas and project them into the future, without even considering ramifications, possibilities or collaterals. I have shown a few examples of that: Transhumanist writers profess cyborgization. They assume that implanting Brain Computer Interfaces is just a matter of simple surgery, neglecting all potential problems and the state of the art. True, Warwick did his own proof-of-principle study early on. But that was a one-off. Nothing in the current state of the science of BCIs suggests that this is both easy and without complications. Nor can we assume that the 'upgrading' works as suggested. The same can be said of genetic engineering to 'upgrade' humans. The state of our knowledge in genetics and epigenetics suggests that this will be very far out in the future, if it will at all be possible.

The examples used by Transhumanists, genetic therapy for point mutations that cause diseases, are in themselves complicated and fraught with side effects. Above all, they concern a small minority of all cases, where genetics play a role in the causation of diseases. This again is a tiny part of all diseases. In all cases of complex traits, diseases, propensities or attitudes we will have to deal with an exceedingly complex network of genes and epigenetic systems that are not even understood partly, let alone fully. And where understood, our knowledge points to the impossibility of an innocent interference with such systems. Transhumanists operate on a defectively simple understanding and a dangerously flawed knowledge of genetics and epigenetics, which even I as a non-specialist can pick up, when just reading a few up-to-date textbooks on genetics and epigenetics. How any true 'upgrading' and 'enhancement' should ever be engineered by people with such a type of defective knowledge, is completely mysterious to me. How such ideas find their ways into the books of serious publishers is quite an interesting matter. We are obviously witnessing what I have described:

A new ideological movement has constituted itself that has achieved enough attention for its claims and ideas that enough people are willing to listen, to read the outpourings of those writers. Some scientific achievements, like discoveries of gene-therapies for some diseases like sickle cell disease and thalassemia, seem to offer proofs of principle, and off goes the train of mighty speculation into the future, without even considering potential restraints.

This ideology has obviously achieved a strong grip on the imagination of a considerable proportion of the population, as my representative survey in Germany has shown. How? This would be a very interesting question, and I have nothing but speculation to offer here, as I do not think it has been researched. I have mentioned Charles Taylor in the Introduction, who has shown that the decline of religion and the rise of a secular mindset is a complex phenomenon (C. Taylor, 2007). Part of it is due to the advance of an aggressive materialist mindset in the wake of the enlightenment movements of the 18th and 19th century. But this, initially, only affected a small minority of intellectuals. In parallel, the attraction of religious ideas waned, according to Taylor and others (e.g. Buckley, 1987), due to a failure of religious leaders to really inspire people, and be available for the population in times of political or economic hardships. Religious leaders more often than not sided with the powerful, rather than the needy. This happened during the Third Reich in Germany, just as an example. It happened during the COVID pandemic, when all church officials supported the mainstream narrative, save a few dissidents. Thus, gradually, formal religion became unattractive for many.

Our own survey of German psychotherapists, quite representative as surveys of psychotherapists can be in Germany, showed that a minority of about a third of them is atheist or agnostic. The rest calls themselves spiritual. Very few are religious in a traditional sense (Hofmann & Walach, 2011). This mirrors data from the US, Canada, and New Zealand (Smith & Orlinsky, 2004), that found that 20% are agnostic or atheist, while about 50% are high in spirituality, but low in traditional religion, and about 30% are spiritual and religious or religious and not spiritual (only 2%). Such a distribution is likely representative for many academically trained people in the West. Thus, we see a large segment of the population calling themselves spiritual, while a minority of a third, roughly, can be associated with an agnostic or



Charles Taylor

atheistic mindset. It is likely this group that is also prone to subscribe to transhumanist ideas, but this would have to be researched more carefully.

At any rate, the retreat of formal religion, the withdrawal of the population from formal religion has opened up a kind of vacuum. At the same time an aggressive type of scientism has made its way into the centre of the educated elite. Scientism is, as Esfeld and Lopez (2024) have shown, a complement to the ever-growing state-based paternalism of governmental institutions. Both are fed by a post-modern mindset that retreats from reality and rationality into supposedly deconstructed worlds of simulacra. Transhumanism is just such a world. It builds up the simulacrum of a human being that can mould itself according to his or her own wishes, being God, or rather taking over the historical role of God, in making come true whatever one wants. Science will foster the means. Science is all-powerful to overcome all limits. Like Jesus walked on water, cursed the fig tree into withering, and healed the lame and deaf, science will now make us all-conquering, surely one's own nature and limits, but also that of our world. As I said: all transcendent hopes that used to be placed in religious language and contexts are now being couched in secular language and (pseudo-)scientific contexts.

The strange thing is that the promises of Transhumanism are easy to see through as unrealistic and phantasy like. That does not hinder clever people from subscribing to them. One could also say: intelligence and wisdom or common sense are orthogonal. Nick Maxwell observed that many years ago (Maxwell, 1984, 2017). This is also the reason why it will be difficult to argue against Transhumanism, as it is not a rational mindset despite its followers protesting to the contrary. It is an ideological mindset. And as every ideology, it only has to accept a few basic axioms, most of which go unnoticed, and from there the system can be built up with seemingly unflinching logic. We have looked at communism as an example. There were times when we had communists among us. It was very difficult to argue with them. Their foundations, the Marxist type of historical dialectics, was said to be scientifically grounded. From there everything followed. If you tried to doubt the foundations you were an unscientific idiot. Who would argue against science? Only it was not science, but pseudo-science.

Similar here: it will not be possible to persuade Transhumanists rationally into giving up their ideas. No convinced Christian or Muslim would give up their faith because someone came with the argument that the foundations of their faith – accepting a transcendent entity named God as a basis for everything – were unscientific and not provable. Whoever has a strong faith in something will not give up to reason. What will likely have an impact is experience, personal experience, perhaps painful experience. But that is not something that can be engineered or produced, it must likely come from the course and trajectory of an individual life.

So, what to do? Despite my scepticism, I still believe in enlightenment principles, in the power of a reasoned argument. It will not convince dyed-in-the-wool transhumanists. But it will likely affect others, mainly those who subscribe implicitly to some transhumanist ideas, without even realizing this. For instance, understanding the reach of gene therapy for the transhumanist project of enhancement is vital. Once this is clear, it also becomes clear why gene-based interventions where so radically pursued: because quite a few among the decision makers, economic, and political players already follow a transhumanist-scientistic agenda, whether they do it consciously and willingly, or simply by following the zeitgeist, is irrelevant.

Pointing out those connections, the goals of Transhumanism, the means that are adopted, and making the public aware is important. But it will be vital to reach multipliers in the media and in the public discourse, such as teachers or journalists. Seminars and conferences might be good avenues. University courses on ideology, scientism and critical thinking could also be a good means. The highest hope I have lies in those among the public who belong to those roughly 50% of people who call themselves spiritual and are on the look-out for narra-

tives that explain the world for them. They are those that are likely open, and who might profit from explanations and teaching. So, a series of podcasts, videos, interviews that reach this segment of society might be a good means. Once such alternative media appearances reach a certain level of attention, conventional journalists usually latch onto a topic. This is the way how the Canadian psychologist Jordan Peterson reached an audience of millions, and made it into most mainstream outlets in Europe, as far as I can tell. His anti-woke messaging reached many young minds, who were on the lookout for something different.

In the same sense, a series of videos of different length, together with an online academy, perhaps also with a real-contact academy at some point, might be useful to expose young people to the flurry of wishful thinking that makes up Transhumanism. Classical means like writings, publications, conferences might also prove valuable. I doubt that head-on controversies are useful.

More research might help as well. I mentioned interviews with top-notch biologists, geneticists and molecular biologists to probe the gene-therapeutic enhancement ideas of transhumanists. Using my questionnaire to find out about a transhumanist mindset and its relationship with other important constructs, as well as its endorsement by different kinds of samples might be another way forward.

My conclusion is: Transhumanism is a scientistic ideology. It seems to have infiltrated quite a strong minority, probably many without even realizing that they have been infiltrated. Some transhumanist activists are likely situated in high places, politically, scientifically, economically, Elon Musk being a prominent example (even though he might not call himself a transhumanist; we do not know). The ideology is widespread, probably much so in the IT world, in Silicon Valley, and among decision makers there. This is a hunch, which I have heard many times in interviews, but I doubt that data are available. My questionnaire instrument can be used to conduct empirical research to find out such things. It is the implicit imbuing a population with an ideology like Transhumanism that is the dangerous thing. People are not aware of what they believe in, nor that they are following an ideological type of thinking. They believe they are 'following the science.' It is a bit like a mushroom: the mycelium, the real organism, grows underground and spreads widely, without being noticed at the surface. If the conditions are right, the mushroom fruit bodies start sprouting very rapidly and seemingly independently of each other. But they are not independent. They are all driven by the mushroom organism. Similar here: the seemingly independent elements and unrelated bits and pieces are related to each other underground and unconsciously by the ideology of scientism, and its specific transhumanist brand. This is also the reason why I think that COVID-19 vaccination campaigns and cyborgism have something in common: the transhumanist ideology that needs gene technological upgrading. And gene technological upgrading has an urgent requirement: proof of principle experiments and acceptance by the population. Both have been fostered by the COVID-19 pandemic. This does not mean the pandemic was engineered. It simply means: these elements are related underneath the surface by the common ideology.

And because this ideology is already widespread and threatens our current understanding of what a human being is, our dignity and our core, we need to make the public aware. By saying that Transhumanism threatens our current understanding of a human being I am not implying that we have a clear and unshakable understanding of this human nature. But I would like to offer some ideas that Transhumanists would likely denounce as bio-Luddite or bio-conservative.

Human Nature

I think it is a core understanding of our Western notion of human dignity that there is such a thing as a human person that should go untouched. This is commonly called humanism. If we use material markers, such as our genetics, like Fukuyama (2004) does, we might end up in trouble. I personally think that this core is non-material. But whatever it is, it demands respect and it should not be meddled with. Perhaps we need a new discourse to settle what we think makes up a human being in its core, a kind of post-materialist anthropology.

Another element of the core notion of a human being in my view is his or her relatedness to others, both in the family heritage, i.e. the wider family, but also to those, one chooses to connect with, such as partners and friends. These relationships are central and must not be meddled with, as happened during the pandemic response in most Western countries. They are a source of human peace, satisfaction and safety. In contrast, the Transhumanist vision is rather egocentric and individualistic, not to say narcissistic (S. B. Levin, 2021).

It is also part of human nature to become active in the world, through labour and participation in communal structures such as in politics. Thus, a fascist type of political system, be it an elitocracy, a gerontocracy, an oligarchy or any similar political system that curbs individual participation is not really adequate. It seems to be part of human nature to have ownership of various things; one's own body is one obvious element for which ownership is important. This forestalls any meddling with the integrity of the human body beyond any medical need or individual wish. It also prohibits nudging strategies to get people to do what is supposedly good for them. There is no external expert that knows what is good for an individual, except the individual him- or herself. And where the individual does not seem to know this, educational strategies are in order to help individuals discover their own good, and not external interference. Ownership seems to extend to things and places: humans have a tendency to mark what is their own, similar to animals that mark the area they claim for themselves. Thus, ways of ownership that do not interfere with those of others need to be found. This would, in principle, militate against economic and political systems that inherently allow some people to attract all kinds of goods and powers towards themselves at the expense of others. It also goes against the grain of oligarchic structures which try to assuage the populace that they do not need any ownership, as they will be given anything they need by the elite, the famous 'you will own nothing and be happy' that the World Economic Forum touted a while ago. Another human existential is freedom and liberty. Freedom to decide and to choose – friends, jobs, homes, food. Liberty to move – travel, go to places one likes, stay at home or go out, etc.

Perhaps the deepest element of human nature and the most controversial is the human soul or a spiritual entity that the old tradition called 'synderesis', the spark of the soul or the summit of the mind. This is a term from Neoplatonic philosophy that was used by the medieval mystics and moralists to denote an inner place, where the soul is connected to the divine (Ivanka, 1964). The moralists maintained that it is untouchable, even by the worst evil (Lottin, 1942, 1948). The mystics claimed that it is the organ in which the human mind reaches up to God and can unite with Him or Her (Walach, 2010). Even in the worst offenders, the moralists said, this is a place, where God has his home and where one can convert to goodness, even after a life of evil. Viktor Emil Frankl, the Viennese psychiatrist who had survived the Nazi death camps and who initiated logotherapy, used to say that the highest mind – he used the German term 'Geist' – is untouchable, even by the worst experiences and by the wildest madness. It was this belief he said, that kept him sane in the camps, because from there also flows the experience of meaning. I had the privilege to listen to him as a teacher in my first

semester of studies in Vienna, and I must say, his teaching was convincing, because he had lived through it.

This deepest element of the human soul we would probably nowadays call 'consciousness', because this term comes with less religious baggage than the term 'spark of the soul' or 'synderesis'. It is also more compatible with non-Western views. But nevertheless, its function is the same, wherever we look: it is an element of indestructible being, conscious and likely not caused by the brain (see my arguments in the first Galileo Report). The brain certainly has an important function, perhaps as a transmitter or mediator, but not as a generator. This is, of course, currently a non-scientific stipulation, but no less non-scientific than any of the transhumanist ideas. But it has a better standing practically. One can always use the old practical discernment strategies, if one wants to understand, whether an idea is useful. Then we can ask: which of two options makes my life happier, makes me a freer human being, one that is more open, accepting and supporting of others? If we pose these questions and ask ourselves to decide between the materialist idea of consciousness being wholly derived from brain activity or consciousness being something that is modulated or mediated by the brain, perhaps even with a divine kernel, we might find that the latter view passes the practical test of discernment better. It certainly makes us less egocentric, I would claim, and that is a lot in our days.

It will not be possible to prove this claim using scientific means. Anyone who has had a spiritual experience will likely agree that this view of a consciousness semi-independent of our brain activity is a viable one. But spiritual experiences are personal, individual and subjective experiences. There are phenomenologically many similar ones and they have some interesting commonalities (James, 1985). One of them is that people are usually sure that consciousness has a basic nature that cannot be reduced to material entities, or rather, that matter and consciousness are one at a deeper level, but that matter as we see and experience it is not sufficient to explain and understand consciousness.

So, I contend, our spiritual nature of being conscious in a deeper sense, our inner 'spark of the soul,' is the deepest defining element of our humanity. This cannot be engineered, nor will it be something that can arise out of any machine, however complex. We will see, once such a machine comes into existence, if we live to see it. Until then I prefer to maintain the view that our consciousness makes us unique and therefore, the meddling with our physiology and anything that impacts this underlying human nature should be given up. It is worthwhile to convey this message to as many people as possible. Some of them may intuitively grasp that his view also entails that there is a larger Consciousness, written with a capital C, that is the guarantor of our being. Like Meister Eckhart said: 'Esse est Deus. Being is God' (Eckhart, 1964, p. 38). Being is Consciousness. Consciousness is Being, and connects us to the larger Consciousness, which by the author of the Gospel of John in the New Testament has called '*logos.*' One could translate that as supreme consciousness. This logos, so the story goes, became flesh. He became us. We are Him. He is us. That is the supreme reason why we should stop meddling with our nature.

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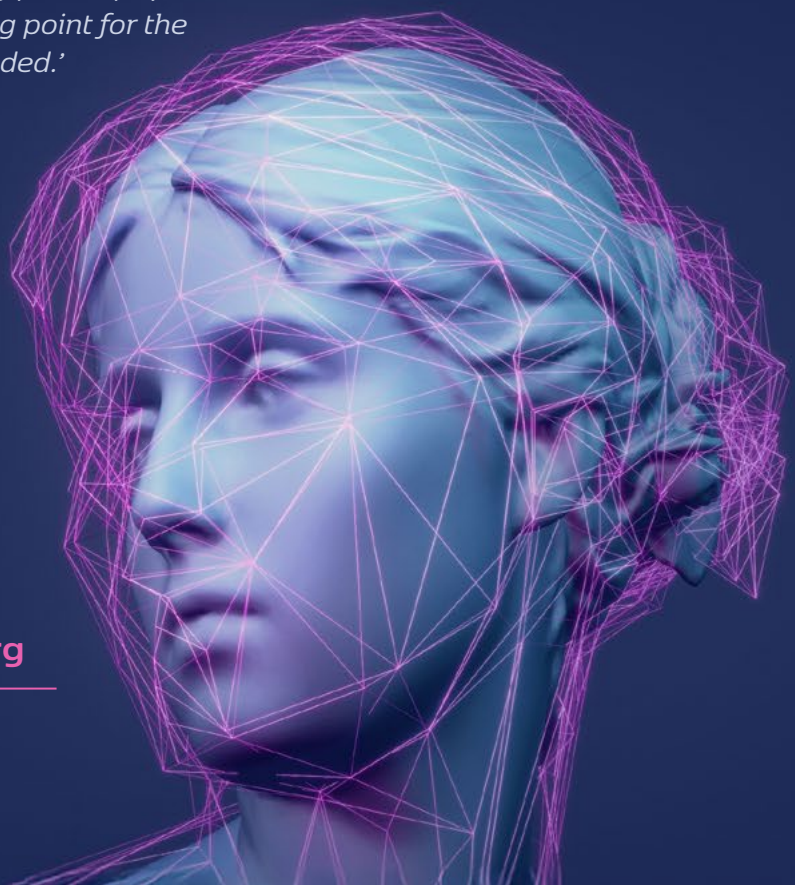
Transhumanism: What Future Do We Want? – A Critical Analysis

Transhumanism looks like a fringe movement of some tech freaks and science fanatics. In truth and reality, it is rather more like a novel religion that has installed itself surreptitiously over the last decades. It is about engineering the better human, helping out nature, where it has allegedly blundered. The instruments would be genetic engineering and technical implants like brain-computer interfaces, or nanobots. Empirical data coming from a representative survey show that the mindset is already widespread. The COVID-19 vaccination campaign has mainstreamed one important transhumanist intervention: gene-therapeutic interventions as preventive techniques sold as "vaccinations". The philosophical and scientific preconditions and facts are critically analyzed in this report. They promise more than they can deliver. This should give us pause, and most importantly, it should raise far more critical questions and a broad, critical societal discourse which this report is meant to inform.

'Harald Walach's brilliant exegesis of transhumanism exposes the shallow logic and self-serving optimism that often animate today's techno-futurists, while delivering a startling exposé of medicine's complicity in advancing a false and dangerous ideology. In response, he calls for a re-sacralization of nature, the prioritization of ethics over raw technological power, and a wholehearted return to communion with the mystery from which we have emerged—and which still holds us. He embraces the value of personal death in deep contradiction to the techno-futurist drive for immortality. Death is not an error to be corrected but an integral part of the evolutionary and spiritual order, embedded in the very fabric of life by a reality beyond human control. To seek its abolition is not progress, but a profound misunderstanding of our place in the cosmos—a displacement of wisdom by technological hubris.
While his diagnosis is masterful and profound, I hope the treatment plan will follow with equal insight and urgency.' **Bernard Beitman, MD**

'This is an impressively clear and deeply thoughtful survey of a subject of paramount importance to human flourishing. The threats posed by transhumanism inevitably cover the whole spectrum of human life: sociology, psychology, the law, medicine, education, the arts, spiritual life and every branch of philosophy. Harald Walach's work is a most valuable starting point for the coherent action that is now urgently needed.'
Dr Iain McGilchrist

'Transhumanism is the latest attempt to abuse science for social engineering in order to create a new human being. Harald Walach shows in this remarkable book how transhumanism will end up, like all the other attempts in this vein, in the destruction of human dignity. We should refuse to cooperate with any attempt in that direction.'
Prof Michael Esfeld,
University of Lausanne



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