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# The Scientific-Technical and Media-related Future of Man and the World

## **Abstract**

*The scientific-technological future often implies hardly conceivable social-philosophical consequences. The range of media-related changes in the very near future, which will significantly change the current mediation of man and the world, is difficult to predict, but they are inevitable. The technological and biological reality of the upcoming era cannot be viewed as separated from all the sociological, psychological, and media aspects of the society and the individual. What will these irreversible consequences in the networked reality of the media and humans imply in bioethical terms? How should we already now think of man, the human community, and the emerging, globalized world? We are approaching a great “tipping point” in which human life and the possible coexistence of artificial and natural intelligence will be tested and one can only speculate on the media picture of such a reality. Will we look for new frameworks for the Heideggerian age of the Image of the World, return to the premises of Wiener’s cybernetics, or perhaps reaffirm some of the traditional premises?*

**Key words:** science and technology, future, media, artificial intelligence, cybernetics.

## 1. Introduction

*The future is already here – it's just not very evenly distributed.*

**William Gibson**, author of the novel *Neuromancer* and the term *cyberspace*

*The good news is that it is not impossible to foster a human revolution  
capable of changing our present course.*

*The bad news is that we are running out of time.*

**Aurelio Peccei**, president of the Club of Rome, **1983**

The task of modern philosophy is to think in terms of the scientific-technical era. However, the present often imposes debates in which more attention is paid to thoughts and arguments on what has already happened or how to interpret what has already passed through several levels of history and “structured” thoughts about the past. The circumstances we are facing in the “post-truth society”<sup>269</sup> urge us to re-examine mostly the past of science, technology, and the media. And it is rather with the intention of changing it as an *image* (the *image* of reality instead of the reality itself), due to certain interests and global-local goals, than to engage in actual scientific-professional research and philosophical thinking on the essence of time. When it comes to thinking about the future in the present, the habit of constantly comparing the causes and consequences of past phenomena and the course of history on the one hand, and what we expect in the future on the other, is of little help. Forecasts on the future as we imagine it today remain at the level of a logical mind game while we measure and analyse the said causes and consequences, and we rarely use predictions that contain unusual interactions between future changes.

Before exploring the essence of these future changes, the scientific-technical sphere, the media environment, and the social and/or geopolitical phenomena, we must ask how these future changes might begin and how they are influenced by individual “breakthroughs” or leaps from one level of understanding and interpretation of the world to another. These are already well-elaborated scenarios or rational warnings about the ultimate unification of human and technical. A step further is the idea that the future will bring radical, essential changes in the perception of humanity and the human species, in compounds and permeations that will result in one or more new species. The robotic way of life, cyborg worldviews, and artificial intelligence that may lose its designation of “artificial” might become “normal” phenomena in science and everyday life. Already now the term of normality has less and less to do with the traditional attitudes and settings, although science and the media have already tried to enforce the hypotheses about the so-called Y, X, or Z generations, net-generations, and the like.

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<sup>269</sup> The age of post-truth, subsequent truth, or actually non-truth enhances the problems of the contemporary society, the position of science, and especially the media environment, because instead of revealing half-truths and lies, it “proves” that the truth itself is no longer important! Public opinion and the public, which apparently decide on what is to happen, are increasingly guided by emotions, personal beliefs, and manipulations, rather than objective facts. The new coin terms such as “alternative facts” are actually an oxymoron of the “wooden iron” type because they imply that facts do not, after all, have to be (true) facts... all this has a profound effect on the spheres we are talking about here.

In all this, discussions about the future almost always include the inevitable reflection on the notion of *change*, by which all initial achievements in predicting the future are determined: whether it will be gradual and easy, an evolutionary process, or sudden, accelerated, and unpredictable, a revolutionary leap to another level of our perception of existence. Therefore, it is necessary to ask questions such as those seen on the Edge website,<sup>270</sup> very well formulated by John Brockman, the publisher and editor of Edge: “Some of the fundamental questions posed are: Where did the universe come from? Where did life come from? Where did the mind come from? Emerging out of the third culture are a new natural philosophy, new ways of understanding physical systems, new ways of thinking that call into question many of our basic assumptions of who we are, of what it means to be human.”<sup>271</sup> With all these possible discussions and efforts in which not only scientists and technologists, but also and inevitably humanists and bioethicists, should understand and interpret the latest and most important movements and trends that are about to come or have already started, the point is here to “halt” and become aware that a growing number of questions might, in fact, obstruct the essential considerations on the future. Can this heap of questions and dilemmas be reduced to simpler and deeper reflections that will lead an increasing part of mankind to think and act on the principles of intersubjective ethics, while at the same time facilitating the rapid development of science and technology in the service of mankind?

Thinkers and scientists, philosophers and technologists try to describe the future as a time that will open up new perspectives and human opportunities. The very path to the future, outlined by the memory of past experiences and the sense of the present reality, should be such, at least because of the generations whose present this future will be. John Brockman is of the opinion that by creating new technologies and using new solutions for our current scientific-technical problems we are already shaping and creatively designing the fundamental future principles of the human mind and corporality. This level of heading towards the future must also include confidence in the humanity of action, because merely abandoning ourselves to *progress and hunger for energy*<sup>272</sup> has often led to less than human results. “Nobody ever voted for printing. Nobody ever voted for electricity. Nobody ever voted for radio, the telephone, the automobile, the airplane, television (...) space travel, massively parallel computing, nuclear power, the personal computer, the Internet, e-mail, cell phones, the Web, Google, cloning, sequencing the entire human genome. We are moving towards a redefinition of life, to the edge of creating life itself.”<sup>273</sup> If we avoid lowering ourselves to the interest levels of political power, which largely see the future as fulfilling certain “visions” and prosperity

270 Edge ([www.edge.org](http://www.edge.org)) actually affirms questions posed by the new community of intellectuals and thinkers who, with their works and comments present ideas that go a “step further” from traditional thinking and concern the deeper meaning of life and science, trying to define “who and what we are.” Their theoretical contribution expands the limits of thinking in the areas such as evolutionary biology, genetics, neurophysiology, computing, psychology, and so on.

271 Brockman, John (ed.), *This Will Change Everything: Ideas that Will Shape the Future* (Harper Collins e-books, 2009), preface.

272 As George Sorell emphasized in his criticisms of infatuation with social progress in the 19<sup>th</sup> and 20<sup>th</sup> centuries, these words practically did not exist before the modern era, when they were (ab)used to describe something “normal, desirable and inevitable.”

273 Brockman, J. (ed.), *This Will Change Everything*, preface.

for certain “chosen” groups, it is necessary when entering new time systems to encourage ethical thinking (without the stated voting on inventions and discoveries) according to a consensus on the basic frameworks of values and moral action. Changes that are in progress and those that are about to come may for the most have irreversible consequences for the scientific, social, psychological, bioethical, and philosophical notion of the social community and individuality, the human species, and the worlds inside and outside of the human being.

## 2. The future is among us

A philosopher among physicists and a physicist among philosophers, Michio Kaku, seeks to answer questions about what will happen over the next hundred years, or what the world will be like in the middle or end of that period. Kaku has argued that the key to understanding the future is to understand the fundamental laws of nature<sup>274</sup> and their application in inventions and discoveries, machines, processes and relations that will be established in the future. His desire is to fill a certain void in the previous attempts to predict the future world of science, in which, according to him, the scientists did not have enough say. Kaku has warned: “Of course, it is impossible to predict the future with complete accuracy. The best one can do, I feel, is to tap into the minds of the scientists at the cutting edge of research, who are doing the yeoman’s work of inventing the future. They are the ones who are creating the devices, inventions, and therapies that will revolutionize civilization.”<sup>275</sup> He is interested in the “stories” of scientists at the source of the latest discoveries, their way of thinking, and the frameworks in which they creatively analyse paths towards the future, as well as the consequences that will follow if their predictions begin to come true.

Predictions, especially those in the long run, are not reliable – as confirmed by the example when, back in 1893, as part of the World’s Columbian Exposition in Chicago, 74 prominent personalities answered the question of how they saw the world and life in a hundred years. Their predictions that there would be transatlantic commercial airships in 1993 now seem a bit ridiculous, as everyone thought they would be – balloons.<sup>276</sup> Today, far more important and deeper questions are raised, among other things about the possible changes in the essential characteristics of human life and human nature, all the way to the almost inevitable coexistence of natural and artificial intelligence. “Dreams” as well as realistic predictions about the scientific-technical future have also tended to rely on reflections on a sort of “tipping point”<sup>277</sup> or point of sudden change, in which the future

274 Kaku has indicated two passions that have inspired him in life: the desire to understand all physical laws of the universe and the desire to look into the future. As for the first wish, he would like to see this understanding within a coherent (unique) theory, and research has led him to the insight that these two passions are actually complementary...

275 Kaku, M., *Physics of the Future: How Science Will Shape Human Destiny and Our Daily Lives by the Year 2100* (Penguin UK, e-book, 2011), introduction.

276 Thus, Senator John. J. Ingalls said that it would be “as common for the citizen to call for his dirigible balloon as it now is for his buggy or his boots.” Kaku, M., *Physics of the Future*.

277 Malcolm Gladwell has observed certain social trends and orientations, and their dynamics, through the prism of “epidemics”, geometric progressions in which “viruses” (individual social phenomena and/or possibilities of change) are doubled and multiplied until they turn into something previously unpredictable. It is difficult to understand this “rede-

history will “spin” to finally gain acceleration and also take directions that no one expected. Certain inventions, discoveries, or unpredictable events direct the historical and social lines towards a future that we have hardly imagined or have not supposed in this form at all. The point is that, if we try to understand the real and potential possibility of change, “to appreciate the power of epidemics, we have to abandon this expectation about proportionality. We need to prepare ourselves for the possibility that sometimes big changes follow from small events, and that sometimes these changes can happen very quickly.”<sup>278</sup>

Precisely in these failed predictions lies the possibility of making more accurate forecasts of the future, which would ultimately help both experts and lay people determine the general local, regional, national, and global trends, as well as their personal and individual roles in the upcoming changes. The scientists themselves, regardless of their knowledge and openness, scientific caution, and the desire to be as objective as possible, cannot avoid major oscillations in the temporal pinpointing of such changes. For example, when it comes to artificial intelligence, Vernor Vinge stated in 1993 that “within thirty years, we will have the technological means to create superhuman intelligence. Shortly after, the human era will be ended... I’ll be surprised if this event occurs before 2005 or after 2030.” Douglas Hofstadter voiced a contrary prognosis, saying: “I’d be very surprised if anything remotely like this happened in the next 100 years to 200 years.” One of the founding figures in the history of artificial intelligence, Marvin Minsky of MIT, was more cautious and refused to predict the precise date of birth of the superior AI: he believed in it, but shied away from being the oracle.<sup>279</sup> After all, the question of “superiority” is a complex question – it is the question of what it means for artificial intelligence to assume and exceed human intelligence. Usually one refers to “conscious machines”, but what does it really mean? These are the essential issues of our time.

As for the blending of humans and machines, cyborgs and artificial intelligence that creates its own algorithms, and other, more perfect machines, or quantum and bio computers that will surpass the number of brain neurons and their synapses, part of the public and professional circles seems unwilling even to start the discussion. “To be present on the Web is ipso facto to be archived on the Web.”<sup>280</sup> Man becomes himself an object of changes with an ever-lesser impact on their character. However, it is not excluded that the current system and the characteristics of social networks “like a prison without walls”<sup>281</sup> – despite all their potential abuses, the creation of superficial thinking, and the fact that they divert attention from the relevant issues – will also lead to communication advantages, because owing to the rapid and leaping progress of networking, information will be

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signed” phenomenon, as its final effect and consequences surpass the proportions of its initial cause by far.

278 Gladwell, M., *The Tipping Point: How Little Things Can Make a Big Difference* (Boston, New York, and London: Little, Brown and Co., 2000), 11.

279 Cited from: Kaku, M., *Physics of the Future*.

280 Levinson, P., *Digital McLuhan: A Guide to the Information Millennium* (London and New York: Routledge, 1999), 155.

281 Alić, S., *Masmediji, zatvor bez zidova* [Mass Media: A prison without walls] (Zagreb: Centar za filozofiju medija i mediološka istraživanja, 2012).

exchanged in the interest of the public and democracy. Masses of individuals throughout the global system, although it is not certain that this will happen as a mega-change by 2050, will be embedded in advanced systems of international participation and uniform life. Despite this gain for mankind, there is a warning that science and technology might be the subject of change, rather than man.

According to Martin Giles, *The Economist's* US technology correspondent, we are heading for a "growth of cloud computing, which involves storing large amounts of information on servers that can be accessed almost anywhere and via many different kinds of device. As further innovations drive down the cost of this computer power, they will make it even easier and cheaper to tap into social media on the move. Coupled with advances in areas such as artificial intelligence, this will help produce a kind of social super-cloud by 2050 that automatically serves up the most relevant information and contacts from a person's social networks."<sup>282</sup> When speaking about the media and networking the future, Ray Kurzweil examined "the time it took for various new technologies to become mass media – defined as reaching a quarter of the American population, which was typically the lead market. By this measure, it took the telephone 35 years after it was introduced in 1876. Radio and television needed increasingly less time (30 and 25 years, respectively, I.G.). But once silicon took over, adoption sped up dramatically. By the time the web was born in 1991 it took a mere seven years to reach a quarter of the American population."<sup>283</sup> Kurzweil also predicted that sometime by 2045 computers would reach the level of human intelligence; many consider it as impossible, but one must take into account that owing to exponential growth there will be exceptionally significant shifts in this sphere of "coexistence" of people and artificial intelligence. "Since our new electric technology is not an extension of our bodies but of our central nervous systems, we now see all technology, including language, as a means of processing experience, a means of storing and speeding information. And in such a situation, all technology can plausibly be regarded as weapons."<sup>284</sup>

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282 Franklin, D. and Andrews, J., ed. *Megachange: The World in 2050* (The Economist, e-book, 2012), 115.

283 Kenneth Cukier, "The Web of Knowledge," in: Franklin, D. and Andrews, J., ed. *Megachange*, 403.

284 McLuhan, M., *Understanding Media: The Extensions of Man* (Cambridge, MA and London: The MIT Press, 1994), 344.



### 3. The divine status of technology and digital DNA

*“We look at the present through a rearview mirror.  
We march backwards into the future.”*

(McLuhan & Fiore, 1967)<sup>285</sup>

For McLuhan, the rear-view mirror becomes “a fundamental operating principle for the evolution of media and its effects (...) Thus, McLuhan’s notion of older media becoming content for newer media, and therein becoming more visible to the point of being mistaken for the newer media, is but a rendition of the rear-view mirror, and its redirection of our gaze ahead to the just-passed. So too is his observation that we fall in love with ourselves when we look into our reflections in our media, and become blind to their real effects, for we are the media’s proximate creators.”<sup>286</sup> Levinson states that, according to McLuhan, “we hypnotize ourselves via our media (‘Narcissus Narcosis’),” which means that “we are its products or effects rather than vice versa.”<sup>287</sup> The Narcissus myth wants to show us that by uncritically accepting technology we are thrown into the role of Narcissus, the state of stupor and narcosis: “The youth Narcissus mistook his own reflection in the water for another person. This extension of himself by mirror numbed his perceptions” (McLuhan, 1964), with the consequence that he drowned.<sup>288</sup> Are we really so numbed today that we cannot grasp the ultimate effects and consequences of the media and technology?

In his study “Human Replay: A Theory of the Evolution of Media,” Levinson has set up a general theory that can help with predicting the future of communication: “Media evolve in a Darwinian manner, with human beings acting not only as their inventors (obviously) but their selectors (i.e., the selecting environment, in Darwinian terms). We make our selections on the basis of two criteria: (a) we want media to extend our communications beyond the biological boundaries of naked seeing and hearing (this only restates McLuhan’s view of media as ‘extensions’ across time and space – a view which he in turn had constructively adopted and expanded from Harold Innis); (b) we want media to recapture elements of that biological communication which early artificial extensions may have lost – we want, in other words, our hearth of natural communication even as we exceed it in our extensions.”<sup>289</sup>

Levinson argues that “discarnate man coincides with the godlike attribute of being everywhere at once,”<sup>290</sup> while Carpenter associates the idea of an omnipresent centre with discarnate man, as “God is a Being whose center is everywhere, whose borders are nowhere.”<sup>291</sup> Already Sigmund Freud noticed

<sup>285</sup> Levinson, P., *Digital McLuhan*, 173.

<sup>286</sup> Ibid., 174-175.

<sup>287</sup> Ibid., 183.

<sup>288</sup> Ibid., 98.

<sup>289</sup> Ibid., 52.

<sup>290</sup> Ibid., 57.

<sup>291</sup> Ibid., 82.

that when we don our technologies, we “become a kind of prosthetic God.”<sup>292</sup> Levinson explains that “Freud had in mind much more than just electronic media, noting that boats, aircraft, eyeglasses, and photographs – as well as telephones and writing – all conspire to make us ‘truly magnificent,’ if not particularly happy or well-adjusted to this God-like stature.”<sup>293</sup> However, “each of these technologies was much more – the telephone breached the privacy of our home, the automobile empowered countries which had oil, radio became a nationwide simultaneous mass medium – and since none of these consequences were picked up in the initial retro-labels, those rear-view mirrors distracted us from crucial developments.”<sup>294</sup> Thus, “the overall evolution of media can be seen as an attempt, first, to fulfill the yearnings of imagination by inventing media that extend communication beyond the biological boundaries of hearing and seeing (...) and, second, to recapture elements of the natural world lost in the initial extension (...) From this vantage point, the entire evolution of media can be seen as remedial.”<sup>295</sup> In other words: “Any invention or technology is an extension or self-amputation of our physical bodies, and such extension also demands new ratios or new equilibriums among the other organs and extensions of the body.”<sup>296</sup> The question is: “But will this increase in art a la McLuhan – this shift in many older technologies from our unthinking use to our critical appreciation of them – result in a net improvement of society?”<sup>297</sup> Neil Postman has argued that “we ought to ask ourselves, of a new technology, what problems does it solve or seek to address for us?”<sup>298</sup>

One of the main scientists’ warnings is that we cannot predict the future use of this abundance of information and emerging technologies,<sup>299</sup> but we must create them as the qualitative rather than quantitative foundations for our future. “Technology rarely evolves in a way that people think it will (...) our processing and storage technology is nothing compared with nature itself. The DNA in roughly 60 trillion cells of every person about equals the information stored in all our computer gadgets (...) And the computational power of all the world’s computers combined in 2010, measured in processing instructions, amounted only to what the brain can process about every five minutes, in terms of the maximum number of nerve impulses.”<sup>300</sup>

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292 Ibid., 60.

293 Ibidem.

294 Ibid., 15-16.

295 Ibid., 179.

296 McLuhan, M., *Understanding Media*, 45.

297 Levinson, P., *Digital McLuhan*, 14.

298 Ibid., 180.

299 An interesting extrapolation is that on electrification, which was initially carried out for one purpose, the bulb, but afterwards supplied power to various devices, including the personal computer. Thus, sensory networks, artificial intelligence, and the huge amount of information will also eventually be used for phenomena and things that are now hardly conceivable.

300 Franklin, D. and Andrews, J., ed. *Megachange*, 405.



Perhaps it is comforting to imagine that such an “inevitable” future will not come “too soon”, unless the human species destroys itself and the Planet. But it is certain that we are already approaching, with mathematical or geometric progression, a future that we will “share” with a more intelligent and more or less destructive species. Our “robot creations will gradually rise up the evolutionary tree. Today, they are as smart as cockroaches. In the future, they will be as smart as mice, rabbits, dogs and cats, monkeys, and then they will rival humans.”<sup>301</sup> Probably it will take decades or a century, but overcoming human intelligence nevertheless seems to be just a matter of time, regardless of our anthropocentric habits or our wounded human ego. Far more important, given the inevitability of the future (r)evolutions, are considerations of the “actual” nature of man and humanity, and the need of finding one or more solutions for what follows, which Bernard Cazes presented in an extremely stratified and almost futuristic manner back in the mid-1980s: “Whether one sets on to speculate or to paint, the human mind obviously does not operate erratically: it draws on a limited number of figures: purposeful evolutionism, breaks in progress, decadence (...) We will note that after 1945, the desire to observe that hidden face of time which is the future gradually captures all sorts of authorities...”<sup>302</sup>

Recalling that one of the symbols of Prometheus, that courageous and daring representative of the human race – whose name, by the way, means “*the-predicting-one*” – Cazes has reduced thinking about the future on images or branches. The first is in the *intention* to paint and draw the future, and largely related to satisfying the need for spiritual food through novels, journalistic and technical texts, and discussions about the future. The second branch is related to the *idea of change*: the story of the future is actually one about change, about confronting changes based on common sense. The third image refers to the content of the future, in which one must participate and develop in accordance with the desire to progress in the society and the world. After a complex elaboration and clarification of historical and technological pathways and the development of human thinking, behaviour and attitudes, Cazes addresses his contemporaneity with the conclusion that “behind the modern forms of attention directed at the future, whether they are called pro-spective, possible future or *future research*, one can discern a more or less clearly expressed belief that humanity is heading towards a radical transformation.”<sup>303</sup>

301 Kaku, M., *Physics of the Future*.

302 Cazes, Bernard, *Histoire des futurs. Les figures de l'avenir de saint Augustin au XXI<sup>e</sup> siècle* (Paris: L'Harmattan, 2008), 11.

303 Ibid., 466. Cazes also quotes Emmanuel Bern's lucid ideas from 1972: “I do not think that I am predicting anything when I say: the world will change, since it can not continue to be the way it is,” as well as Gaston Berger's statement: “Nothing has happened since the Neolithic, finally something is happening again in the history of mankind.”

#### 4. The end of biological consciousness

For the ancient Greeks, memory was Mnemosyne, mother of the Muses. Today, “not only memory has lost its divinity; it’s well on its way to losing its humanness. Mnemosyne has become a machine.”<sup>304</sup> Our brains turn into “simple signal-processing units, quickly shepherding information into consciousness and then back out again.”<sup>305</sup> Futurologist Ray Kurzweil has argued that “although we can’t yet build a brain like HAL’s (...) we can describe right now how we could do it” in that we are “ascertain the architecture of interneuronal connections (and) design simulated neural nets that will operate in a similar fashion.”<sup>306</sup> The difference between biological memory and computer memory is that biological memory is alive. “The process of long-term memory creation in the human brain (...) is one of the incredible processes which is so clearly different than ‘artificial brains’ like those in a computer. While an artificial brain absorbs information and immediately saves it in its memory, the human brain continues to process information long after it is received, and the quality of memory depends on how the information is processed.”<sup>307</sup>

In his book *Computer Power and Human Reason*, Weizenbaum has argued: “To understand the effects of a computer (...) you had to see the machine in the context of mankind’s past intellectual technologies, the long succession of tools that, like the map and the clock, transformed nature and altered ‘man’s perception of reality.’ Such technologies become part of ‘the very stuff out of which man builds his world’.”<sup>308</sup> Merzenich is of the opinion that the Network causes changes in the brain: “The current explosion of digital technology not only is changing the way we live and communicate but is rapidly and profoundly altering our brains (...) stimulates brain cell alteration and neurotransmitter release, gradually strengthening new neural pathways in our brains while weakening old ones.”<sup>309</sup> Will the machines be able to think? “In order for the old memory to make sense in the current brain, the memory has to be updated. Biological memory is in a perpetual state of renewal. The memory stored in a computer, by contrast, takes the form of distinct and static bits; you can move the bits from one storage drive to another...”<sup>310</sup>

Somewhere during the transition to the new millennium, Ken Wilber, an intriguing, creative, and sophisticated researcher of the development of human consciousness, historical movements, evolutionary flows, and revolutionary leaps, wrote his *Brief History of Everything*, in which he examined all the possible paths that the human society might take with regard to the level of consciousness, goals, and actions. Providing a clearer picture of the complexity of relations in social groups, among the individuals and the authorities, Wilber has demystified and disclosed the paths towards human behaviours, ways of thinking, and quests for the truth. It is, therefore, good to draw

304 Carr, N., *The Shallows: What the Internet Is Doing to Our Brains* (New York and London: W.W. Norton & Co., 2010), 387.

305 Ibid., 260.

306 Ibid., 375.

307 Ibid., 406-407.

308 Ibid., 436.

309 Ibid., 262.

310 Ibid., 407-408.

out of this extensive work some of the characteristics of the society that he wants to see, in which the future will be, in fact, a corrective of history, an orientation point for the present, and the creator of all possible abilities and worldviews. Starting from the rich and varied human culture and art, technologies and scientific discoveries and researches, Wilber wanted to create a map much like that of the human genome project, “except that this would be a type of human Consciousness and Culture Project: the mapping of all those cultural capacities that humans everywhere have access to. This would give us a rather extraordinary map of human potentials, a great map of human possibilities. And it would further help us to recognize any of those potentials that we – that you and I – might not yet be fulfilling. It would be a map of our own higher stages of growth and a map of our own greater opportunities.”<sup>311</sup>

One of the greatest contributions to researching the current “transition” from the present into an uncertain and unforeseeable future, along with Kaku’s dissection of science and technology, has been the approach of Yuval Noah Harari. In his studies, especially the book *Homo deus*, he has looked at the *new human agenda*, a more optimistic view of the world and its chances for development, based on experience from the past and history. Every scientific or technological problem has its own solution, which will be found out sooner or later, Harari says. He is of the opinion that even the social problems of inequality or poverty, violence and cultural hegemony can be solved in an adequate manner if we join forces. In his book, he has given three important temporal determinants of *Homo sapiens*: when he conquered the world, when he gave meaning to the world, and when he lost the control.

Harari’s exceptional ability to find the essence in relation to the present and the future is formulated first of all in identifying three essential, interconnected processes in which he sees both the continuation of the present and the indications of the future – firstly, the fact that modern science has adopted a comprehensive dogma according to which organisms are algorithms and life is data processing. Secondly, intelligence has separated itself from consciousness, and thirdly, the non-conscious but highly intelligent algorithms might soon know us better than we know ourselves. But, equally important are the questions that Harari asks on the basis of the above, which are crucial for all further reflections and philosophy of the future – “(1) Are organisms really just algorithms, and is life really just data processing? (2) What’s more valuable – intelligence or consciousness? (3) What will happen to society, politics and daily life when non-conscious but highly intelligent algorithms know us better than we know ourselves?”<sup>312</sup>

311 Wilber, K., *A Brief History of Everything* (2<sup>nd</sup> ed. Boston: Shambhala, 2007), xx.

312 Harari, Yuval Noah, *Homo Deus: A Brief History of Tomorrow* (HarperCollins, e-book, 2016), 807.

## 5. Challenges of the scientific future

*If you want to know your past, look at your present conditions.  
If you want to know your future, look into your present actions.*

Buddhist saying<sup>313</sup>

*We should all be concerned about the future because  
we will have to spend the rest of our lives there.*

Charles Kettering<sup>314</sup>

We shall now present some of the actual examples of the possible scientific future of mankind and the world:

- 1. Fusion of man and technology** – “By the year 2050 there will be two highly intelligent species on Earth: traditional, genetically pure humans and technologically aided hybrid humans. The latter will be ‘people’ who have been genetically manipulated by the insertion of DNA segments to prevent certain diseases or to create particular emotions or personality traits. They will also have been robotically and computer enhanced to improve strength, sight, vision or intelligence.”<sup>315</sup> It is known that “DNA is discarnate insofar as it is not itself a physical body – its relation to physical bodies is on this level no different than the relation of a computer program to the tasks it makes the computer perform. Yet just as software cannot do anything outside of an appropriate hardware environment, so too is DNA powerless, meaningless without raw living material to shape into organisms.”<sup>316</sup>
- 2. Self-medication** – In the future, people will be more focused on themselves, they will “in isolation bubbles and won’t trust doctors, hospitals or pharmaceutical companies, so self-diagnosis and self-medication will become commonplace. In 2050 smart software packages will be available to identify what’s wrong with us and websites like Genes Reunited will offer genetic histories enabling us to anticipate hereditary diseases and defects. We will also be able to hire or purchase robotic surgeons to perform operations in our own home or office.”<sup>317</sup>
- 3. Technofood – food of the future** – Nanotechnology will allow us to “change the properties of an individual product at will, so you will be able to increase the vitamin E content of an orange-juice drink after you’ve bought it.”<sup>318</sup> In addition, it will be used to “store certain ingredients or additives inside food products to be called up at will.”<sup>319</sup> By firing a command off your cell

313 Watson, R., *Future Files: The 5 Trends that Will Shape the Next 50 Years* (London: Nicholas Brealey, 2008), 17.

314 Ibid., 241.

315 Ibid., 22.

316 Levinson, P., *Digital McLuhan*, 62.

317 Watson, R., *Future Files*, 35.

318 Ibid., 173.

319 Ibidem.

phone, we will be able to “change the color of your soft drink or dial up the spice level of your ready-to-eat curry.”<sup>320</sup> People will also use foods to induce a specific kind of mood or get rid of unwanted memories.

4. **Autonomous cars of the future** – In addition to moving autonomously, cars will emit important data – if your car regularly detects an abnormal heartbeat, it will send the information wirelessly to your doctor. They will also “become mobile technology platforms linking data to other services such as healthcare.”<sup>321</sup> In the future, we will also see “mood-sensitive vehicles that adjust their behavior according to the mood of the driver or occupants.”<sup>322</sup> (...) For example, if traffic conditions deteriorate (or you receive a phone call that makes you anxious or stressful) the vehicle will compensate with relaxing dashboard instrumentation, anti-stress lighting and chillout sounds.<sup>323</sup>
5. **Life-Caching – memorizing life** – Scientists have predicted that “in a few years’ time you will be able to personalize your doll’s face (to your own choice or, more likely, to resemble a celebrity), communicate with your doll by telephone or email, have real conversations and experience your entire life history through the eyes, ears (and nose) of your doll. The latter will be achieved by the doll and linked devices preserving your emails, phone calls and other images and information.”<sup>324</sup> The doll will become “a digital storage device with the capacity to document your entire life. The so-called life-caching industry is already worth US\$2.5 billion annually. This will in turn give rise to a debate about the ethics of information, involving questions such as who owns such data, whether or not it can be sold or traded and what happens to the information once the ‘owner’ dies.”<sup>325</sup>
6. **The rise of machines** – It is assumed that by 2030 computers will become more intelligent than humans, and “humankind will be faced with something of a dilemma. If machines are more intelligent than their makers, what’s to stop them taking over?”<sup>326</sup> Futurologist Ian Pearson argues that “by the half-century mark, it should be possible to download the contents of a human brain into a computer. If the human mind is then aware of what has happened this would be a form of immortality and the start of the human race splitting into two halves: the natural and the enhanced.”<sup>327</sup> Ray Kurzweil, however, believes that “intelligence will expand in a limitless, exponential manner once we achieve a certain level of advancement in genetics, nanotechnology and robotics and the integration of that technology with human biology.”<sup>328</sup>

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320 Ibidem.

321 Ibid., 145.

322 Ibidem.

323 Ibid., 149.

324 Ibid., 24.

325 Ibidem.

326 Ibid., 41-42.

327 Ibid., 42.

328 Ibid., 43.

7. **Robotic mistresses** – Already now “Gorgeous Amanda” can *recognize voices, identify objects, and show emotions*. “Real Dolls” are silicone sex puppets whose future is in the artificial intelligence they are planning to incorporate in them, so that the doll can arouse her owner also mentally, not only physically. Matt McMullen, the creator of Real Dolls, believes that “not every person on the planet will be associated with robots and artificial intelligence. I think that it attracts a specific type of people for one reason or another. Whether this is a matter of personal choice or not, they are in a state of mind where their bond with a robot or with artificial intelligence is more appealing than a relationship with a human being. I don’t think suddenly everyone will break up their connections with others and devote themselves to robots.”<sup>329</sup> In Japan, more than two thousand ultrarealistic sex dolls are sold annually, which concerns the experts as the birth rate is decreasing.<sup>330</sup> Masayuki Ozaki has found his luck in life with an ultrarealistic silicone doll Mayu although he lives with his wife and daughter, as he says that love between him and his wife has long disappeared.<sup>331</sup>
8. Future technological achievements will supposedly include “airborne networks that allow airliners to fly without pilots (...) silicon photonics (using silicon chips to emit light to speed up data processing); quantum wires (using carbon nanotube wires to carry electricity); biomechatronics (mixing robotics with nervous systems to create new artificial limbs) (...) bacterial factories; metabolomics (a new medical-diagnosis tool using metabolic data) (...) smart mirrors (that show what we might look like next year) (...) space ladders, holographic displays and storage, home-use DNA stamps (to identify what’s really ours) (...) a fully sensory internet (all five senses delivered over the web) (...) robotic pest control (...) neuronics whips (a weapon that stimulates the nerve endings to cause extreme discomfort) (...) mindwipes (...) stress-control clothing (...) sleep surrogates and self-repairing roads.”<sup>332</sup>

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329 M. Ra (2016), “Lutke za seks i više od toga: U plastične ljubavnice stiže umjetna inteligencija” [Sex dolls and more than that: Plastic mistresses will be supplied with Artificial Intelligence], Index.hr, <https://www.index.hr/magazin/clanak/lutke-za-seks-i-vise-od-toga-u-plasticne-ljubavnice-stize-umjetna-inteligencija/927407.aspx> (last accessed on November 13, 2018).

330 Kukec, Tomislav (2017), “Bolja je od prave žene, uvijek je tu za mene i želim biti s njom zauvijek” [She’s better than a real woman, she’s always there for me and I want to stay with her forever], 100posto.hr, <https://100posto.hr/zivot/bolja-je-od-prave-zene-uvijek-je-tu-za-mene-i-zelim-biti-s-njom-zauvijek> (last accessed on November 13, 2018).

331 Ibidem.

332 Watson, R., *Future Files*, 54-55.



## 6. Conclusion

According to Weizenbaum, “What makes us most human (...) is what is least computable about us – the connections between our mind and our body, the experiences that shape our memory and our thinking, our capacity for emotion and empathy.”<sup>333</sup> But today, we are transforming man into a computer, a device that increasingly becomes “a logical ending of our technological momentum; what would remove the tension that we feel between the real and the artificial... But this tension is our last completely human trait...”<sup>334</sup> Weizenbaum is of the opinion that “the great danger we face as we become more intimately involved with our computers (...) is that we’ll begin to lose our humanness, to sacrifice the very qualities that separate us from machines.”<sup>335</sup> Will the “enhanced people regard others as lesser beings and subdue or destroy them?”<sup>336</sup> According to Weizenbaum, “the only way to avoid that fate (...) is to have the self-awareness and the courage to refuse to delegate to computers the most human of our mental activities and intellectual pursuits, particularly ‘tasks that demand wisdom’.”<sup>337</sup>

Leon Kass, an ethicist from the University of Chicago, says that “these technologies put the scientists and physicians in the ‘roles of divine creators, judges, and saviors’.”<sup>338</sup> This role has brought us into a situation where we are “confronted with the possibility of disappearing even as individuals.”<sup>339</sup> We believe that it is a happy circumstance for man that what makes us human cannot be placed in a technical device or in artificial intelligence.

In the world of technological future, populated by enhanced cyborgs, avatars, and autonomous robots (the possibility of thinking – I.G.), “moral decisions will no longer exist – what will remain is the strategic decisions (of the masters of transhuman evolution – I.G.). If we want to stop this technology, we must do it immediately, before it starts. That decision will have to be political... We have to feel deep in ourselves why this time we should tell Prometheus: ‘No, thank you’.”<sup>340</sup>

333 Carr, N., *The Shallows*, 438.

334 McKibben, *Dosta, Genetički inženjering i kraj ljudske prirode*. Planetopija, Zagreb, 2006., str. 71.

335 Carr, N., *The Shallows*, 438.

336 *Dosta, Genetički inženjering i kraj ljudske prirode.*, str. 51.

337 Carr, N., *The Shallows*, 438.

338 *Dosta, Genetički inženjering i kraj ljudske prirode.*, str. 58.

339 *Ibid.*, 61.

340 *Ibid.*, 49.

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## Znanstveno-tehnička i medijska budućnost čovjeka i svijeta

### Sažetak

*Znanstveno-tehnološka budućnost donosi često i teško zamislive socijalno-filozofske posljedice. Okvire medijskih promjena u vrlo bliskoj budućnosti koji će bitno promijeniti i sadašnje medijsko posredovanje čovjeka i svijeta teško je predviđati, ali je to neizbježno. Tehnološku i biološku stvarnost nadolazećeg doba ne možemo promatrati izdvojenu prema svim sociološkim, psihološkim ili medijskim aspektima društva i pojedinca. Kakve će biti te nepovratne posljedice u umreženoj stvarnosti medija i ljudi u bioetičkom smislu? Kako već sada promišljati čovjeka, ljudsku zajednicu i globalizirani svijet koji se pojavljuje? Bližimo se velikoj "točki preokreta" u kojoj će se preispitivati što je ljudski život i moguća koegzistencija umjetne i prirodne inteligencije i kakva će biti medijska slika takve stvarnosti. Hoćemo li tražiti nove okvire heideggerovskog doba Slike svijeta, vratiti se postavkama kibernetike Wienera, možda i reafirmirati neke tradicionalne postavke.*

**Ključne riječi:** znanost i tehnologija, budućnost, mediji, umjetna inteligencija, kibernetika.



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