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On "not having a future"

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A B S T R A C T

Given the importance of a hermeneutic extension of Technology Assessment (TA), we should ask which kind of knowledge can be created from such perspective and whether and how such knowledge can be relevant for policymaking. Hermeneutic TA aims at understanding the "meaning attributed to emerging technologies in societal discourses". In this article, I will suggest that from the perspective of hermeneutic TA it becomes clear that TA has directed much attention to the "vanguard visions" of some rather elitist visionaries, whose narratives of technological futures have attracted a lot of media attention and stirred up societal debates. Nanotechnology is the most pertinent example. Meaning has been attributed to such comprehensive, techno-scientific futures, elevating them to form the backdrop of public discourses, technology assessments and policy-making. Such attribution carries a prescriptive power and pushes to political action or further social scientific inquiry. Acknowledging this should raise the awareness that many people's visions of the future are not part of the policy debates in which TA is involved and in which the future is negotiated. This imbalance might be expressed by saying that they do "not have a future". In the present article, I will explore this notion and its normative implications.

"[A science of multiple times] will also have to come to terms with confronting 'the Other' [...], with 'the curious asymmetry' still prevailing as a result of advanced industrial societies receiving a mainly endogenous and synchronic analytic treatment, while 'developing' societies are often seen in exogenous, diachronic terms. Study of 'Time and the Other' presupposes, often implicitly, that the Other lives in another time, or at least on a different time-scale. And indeed, when looking at the integrative but also potentially divisive 'timing' facilitated by modern communication and information-processing technology, is it not correct to say that new divisions, on a temporal scale, are being created between those who have access to such devices and those who do not? Is not one part of humanity, despite globalization, in danger of being left behind, in a somewhat anachronistic age?" (Nowotny, 1992, 443)

1. Hermeneutic TA, meaning and public awareness

Technology Assessment (TA) has a social function: It is an institutionalized, problem-oriented research endeavor (Grunwald, 2015, 66;Grunwald, 2019, 52). Its research follows the societal demand to advice, inform and thereby enhance political decision-making regarding emerging technologies. By assessing emerging technologies' potential effects and social repercussion, TA provides orientation for stakeholders, policymakers and the public. As Armin Grunwald rightly argues in his paper "Modes of orientation provided by futures studies: making sense of diversity and divergence", these requirements are often hard to conform to regarding the (increasing) amount of far-fetched visions of technologies and visionary discourses that surround some currently emerging

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technologies such as synthetic biology, in-vitro-meat and artificial intelligence (Grunwald, 2014a, 7). In such cases, the non-existence (not-yet-existence) of concrete artefacts and prototypes makes modelling and prospection of these technologies' futures virtually impossible. Nevertheless, to master the challenge posed by the Collingridge-Dilemma, it is advisable to direct the attention on these technological futures *in the present.* Furthermore, there can be no doubt that those visions already have an impact in the present. They affect societal discourses, they are attributed with meaning and thus develop a significance for technological development and policy-making: "[T]he assignment of meaning is the most upstream point reachable in public and ethical debates on NEST [new and emerging technologies]." (Grunwald, 2014b, 279; Grunwald, 2017, 101) Because of this, Grunwald suggests a "third mode" of accessing the future or in other words, orienting towards the future: a hermeneutic extension of TA (Grunwald, 2014a, 7; Grunwald, 2017). By scrutinizing and understanding the emergence of those futures and their "immanence in the present", we can learn something about the here and now (Grunwald, 2012, 270). This suggests a third, "non-consequentialist", way of studying the future, which also leads, according to Grunwald, to insights that can provide orientation for policy-making, albeit of a different nature (Grunwald, 2015, 66).

Following up on these suggestions and in order to contribute to the bourgeoning – and in my mind reasonable and thoughtful – idea of a hermeneutic TA as presented before, I will ask in this contribution, which kind of knowledge can be acquainted from such perspective and whether this kind of knowledge can be utilized in policy-making. What can we learn from investigating the present(s) of currently emerging technological futures? In order to answer these questions, it will be helpful to first shed a retrospective and critical light on the recent past of TA's engagement with technological visions and scrutinize which kind of visions and how they were approached so far by TA. Hence, in the present paper, I propose a truly hermeneutic stance on the visionary research previously executed in the context of TA and reflect on its implications. This will reveal that a small group of highly educated, male, well-off people from the Northern Hemisphere has promoted the visions that attracted most of the attention of TA and the public discourse on our socio-technical future. Acknowledging this, should make us simultaneously aware that there are numerous people, who neither entertain their own vision of a desirable socio-technical future (for a variety of reasons, which I shall explore later on), nor do they have the means to strategically position them in the discourse and, thereby, contribute to their realization. We might be inclined to speak of those people as "not having a future". I will investigate the meaning of this ambiguous notion and try to scrutinize the origins and normative implications of this misbalance. Instead of providing a concluding account of the trope of "not having a future", this paper aims at initiating an important discussion about inequalities in futuremaking. The following insights should remind us that meaning is often not only affected by the content or design of a future or vision, but also by the social standing of the agent who promotes it. In this manner, my contribution wholeheartedly breathes the spirit of Future Studies (FS) in presenting a "systematic mode of critical enquiry" concerning the inequalities of future making (Sardar, 2010, 183–184). Let us start with an obvious example for such misbalance: Nanotechnology.

2. Elitist visions and profane desires

One of the emerging technologies that attracted most of TA's attention in the past 20 years is Nanotechnology (Grunwald, 2019, 53; Nordmann, 2006). While the origins of the "idea" of Nanotechnology are usually traced back to an after-dinner talk to the American Physical Society and subsequent publications by Richard Feynman (McCray, 2013, 117), it is undisputed that the activities and publications of Eric Drexler – the "apostle of Nanotechnology" – triggered an avalanche of public debates, media responses and a variety of research endeavors under the financial umbrella of the National Nanotechnology Initiative (NNI) (Amato, 1991; McCray, 2013; Rip & Voß, 2013). Even though, there was a number of legitimate arguments to resist the vision's pressure to respond to it in certain ways (Nordmann, 2007), the philosophical, political and sociological reflections on the emergence of Nanotechnology has gained a momentum leading to new Journals (*Nanoethics*), research paradigms ("vision assessment") and insights about the development of new technologies. Nanotechnology in this manner is an exemplary technology to which meaning has been attributed before any concrete artifact existed. In the twilight zone of Nanotechnologies material not-yet-existence and its making, the ubiquitous vision of Nanotechnology, as advocated by Drexler, Roco and Bainbridge, and Bill Joy, has created a sense of urgency in TA, Science and Technology Studies (STS), FS and other fields to be concerned about the promises of a technology of which little was known (Drexler, 1986; Joy, 2000; Roco & Bainbridge, 2003). The ascription of meaning induced a prescriptive power, the demand to respond to it in certain ways, for instance, by requiring justification from those who would have preferred ignoring Nanotechnology's speculative facet altogether (Nordmann, 2007).[1]

One of the central insights of this development from the previously advocated hermeneutic perspective, which is also affirmed by authors from other fields such as philosophy of technology, FS and STS, is that Drexler's idea and his promotional activities had an impact for research policy and eventually technological development despite the far-fetchedness of Nanotechnologies vision in the 1980s. The vision spurred Drexler and fellow scientists and functioned as medium or prism to negotiate the socio-technical future.

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[1] Synthetic biology is clearly another field where imbalances in future making have occurred and pertain: In a report by the ETC Group, a Canadian CSO, on "Extreme Genetic Engineering-An Introduction into Synthetic Biology" we can read about an exclusive "Asilomar-like" meeting of leading scientists in synthetic biology in Berkeley in 2006, where "no civil society representatives were in attendance-those who tried to register were turned away due to 'limited space.'" (ETC Group, 2007, 47) This setting resembles in various ways the exclusive Space Day meeting from 1977 described below. The ETC report expresses numerous concerns about questions related to power and control and "a lack of societal debate about synthetic biology." (ETC Group, 2007, 4) These concerns were picked up in deliverables and transformed into participatory actions by TA institutions such as the *Rathenau Instituut* (Stemerding & Rerimassie, 2013, 16).

Naturally this development spawned an extensive debate about a meaningful notion of responsibility for highly contingent and far-reaching technological developments (Sand, 2017; Simakova & Coenen, 2013; Cabrera Trujillo, 2014).

However, how exactly did Nanotechnology develop the momentum it developed? How did its promises extend into popular culture and reached the realm of political decision-making and the attention of important stakeholders? In his book "The visioneers. How a group of elite scientists pursued space colonies, nanotechnologies, and a limitless future", Patrick McCray describes meticulously how Drexler and other so-called "visioneers" like Gerard O'Neill "[developed] a broad and comprehensive vision for how the future might be radically changed by technology, doing research and engineering to advance this vision, and promoting one's ideas to the public and policy makers in the hopes of generating attention and perhaps even realization. Throughout all these diverse activities, people like Drexler and O'Neill worked to build technical and social foundations for their own particular conceptions of the technological future." (McCray, 2013, 13). McCray is eager to emphasize that advancing and realizing one's technological future requires financial support and suitable networks. He writes:

> "Like traditional engineering, visioneering requires money. Promoters of radical new technologies create a bricolage of patrons and supporters to finance their work. Many visioneers operated to some degree outside the patronage system that funds and supports conventional American scientists and engineers at universities, corporate labs, or federal facilities. Sometimes this was a deliberate choice, as it provided freedom without managerial oversight and peer review. […] Venture capitalists, wealthy entrepreneurs, and curious citizens all contributed in varying degrees. To help raise funds, both men [Drexler and O'Neill] setup nonprofit institutes that helped promote their visioneering." (McCray, 2013, 12)

There is clearly much to say (and much has been said) about the attractiveness and elasticity of Nanotechnology as an umbrella term (Rip & Voß, 2013) fueling our creativity and spurring imaginations of its application ranging from "Nanobots" (Nerlich, 2005), to visions of radical human enhancement through convergence of Nano- and other technologies (Coenen, 2010; Roco & Bainbridge, 2003). Furthermore, the semantic openness of such terms, their connectivity and elasticity, have been shown to enhance their potential for usage in public discourses and their fruitfulness for science journalism and popularization (Dickel & Schrape, 2017). However, McCray's remarks indicate that it is not simply the content or design of a narrative that constitute its appeal and suffices for its "success" (whether that being its realization or being considered by others as significant to a certain extend). The social backgrounds of visioneers, their country of origin, their education (technological expertise), their gender, and a variety of other features also affect the traction of their socio-technical visions and the activities surrounding them, maybe even more than the actual "nature" or guise of the visions themselves. I will subsume these aspects together in the following as the social standing of visionaries and suggest that this constitutes their power in a process, which has recently been termed "future making" (Sand & Schneider, 2017; Schneider & Lösch, 2018)[2] . Although it has been mentioned before that power is a central aspect in these dynamics (Sand and Schneider, 2017; Callaghan, 2018; Grunwald, 2012, 22;), it is crucial to further clarify what this means and emphasize its significance from the point of view of hermeneutic TA. This is important also because it can be suggested that social standing as introduced before does not only affect whether one's vision in a discourse will or will not receive attention, but also how the future is perceived (open/closed) and, thus, whether one actually has a future.

To get to the heart of the issue, we should contrast the high-tech vision of Nanotechnology with the rather "earthly" issues that concern a majority of people on the globe every day. We might realize that the pursuit of Nanotechnology is neither at the fore of these peoples' interests nor within their sphere of comprehension for reasons that we shall explore. A remarkable anecdote in McCray's "Visioneers" can be found in the first chapter, which shall be briefly recalled in the following. In August 1977, space colonization advocate Gerard O'Neill, the author of "The High Frontier", an award-winning book on the subject of space colonization and founder of the Space Studies Institute, was invited to present his ideas to a thousand or so enthusiasts at the first so-called Space Day at the Museum of Science and Industry in downtown Los Angeles. While "Trekkies", NASA representatives and other stakeholders and space enthusiasts gathered inside the Museum, Robert Crumb, an artist and one of the few critical participants of the event, witnessed a small demonstration outside. McCray notes frivolously: "While Crumb fumed outside the museum, he could have encountered laid-off workers waving signs proclaiming 'Jobs on Earth, Not in Space' and 'Brown, Hire an Earthling' that expressed more terrestrial concerns." (McCray, 2013, 3–4)

In this remarkable anecdote, we find a tantalizing confrontation between different visions of the future and subsequently a challenge for policy-making, when pursuing a common future: On the one hand, there is the far-fetched, high-technological vision of space colonization. On the other hand, there is the what seems in contrast to be the somewhat "profane" desire for more job opportunities. Obviously, the wish for employment is anything but profane; employment is constitutive for peoples' well-being and happiness. Yet, in the light of the passionately promoted narrative of space colonization of the visioneer Gerard O'Neill, employment seems to be a concern of minor importance. As argued before, the envisioning of such technological pathway instantly encourages a typical set of questions regarding the feasibility and desirability of this future, questions with which TA and STS have been repeatedly concerned. It also leads to a redirection of focus – away from issues such as unemployment. The vision's advocacy indicates a value judgment suggesting that other problems such as unemployment can either be resolved by realization of the vision in the long-run, as an incorporated but secondary value so to speak, or simply as being unimportant.[3] It should be emphasized that the previous

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[2] I am well aware that this notion is utterly imprecise: It is of course not the future that is made, when new technologies are developed or other techno-scientific research projects are undertaken. It is this research or these technologies that are being made. "Making the future" here refers to a host of such projects.

[3] It has been shown that sociotechnical endeavours that try to make believe "that nothing special is undertaken, which considers its dreams of

observations are purely descriptive: Neither do I want to justify that an advanced vision of space colonization disregards employment as a value or central source of people's happiness, nor do I want to suggest that people who demonstrate for more job opportunities are simply unable to transcend their individual desires and regard their concerns from a more external point of view and in light of the needs of society or indeed mankind as a whole, which might be the viewpoint naturally adopted by advocates of space colonies. Instead, it should be pointed out how existing misbalances in power and social standing, which have so often been emphasized (Callaghan, 2018), reappear in the ways in which people approach the future, what they envision and whether they will be able to express these narratives in a manner that increases their momentum in the process of negotiating the future. From a reflective, hermeneutic perspective that directs our attention from the futures of emerging technologies to their present. Hence, we acquire an increased awareness of the relation between social standing and future making. It is obvious that these observations are not confined to the examples of Drexler and O'Neill and their visioneering activities. Ray Kurzweil, the former CEO of Engineering of *Google*, springs to mind, who founded several companies and the *Singularity University*, a hub for Artificial Intelligence (AI) enthusiast, and author of several best-selling books on the phenomenon of Singularity and AI (Joy, 2000; Kurzweil, 1999; McCray, 2012). In a commentary to a recent Special Section in *Nanoethics*, Patrick McCray recapitulated his research on visioneering and carefully hints at a more general conclusion about the issue at hand:

> "I think the longer history of visioneering shows the clear advantage that technologists from elite backgrounds and privileged positions enjoy in developing their visions, finding resources to advance them, and getting the attention of the public and policy makers. I wouldn't go so far to say that visioneering is, *by nature* exclusive, but history suggests that it, *in practice*, often is." (McCray, 2017, 206)

In the following two sections, I will analyze this more general claim and explore its normative implications.

3. Forestalling inequalities in future making

There are a number of metaphors that connect the notion of time to certain situations or decisions, for instance, when we say that "someone's time is running out". This notion is ambiguous: It can mean that someone is forced to decide or fulfil a task within a finite time span, or, simply, that the person is about to die. Keeping the previous discussion and our specific field of application in mind, we should ask, what does "not having a future" mean in the context of the present debate? When we say about a project or an endeavor that it does not have a future, we usually mean that it is doomed to failure. This does not seem to apply to the demonstrators in L.A., which have been portrayed before. They are not doomed to fail. Instead, they might be the first representatives of a very influential social movement (Note, that I am here primarily interested in analytic distinctions not historical accuracy). In the final chapter of her recent thought-provoking book "The Ethics of Invention", Sheila Jasanoff suggests that "not having a future" means lacking the anticipatory capacities to assess the long-term prospects of emerging technologies. She also suggests in vein with my previous argumentation that the misbalance in future making constitutes an ethical problem, just like social and political inequality:

> "[…] most of the world's masses are in no position to anticipate for themselves either immediate benefits or improved long-term prospects from the forward march of technology. They must accept the promise of benevolent outsiders that their lives will be bettered through inventions designed elsewhere, by entrepreneurs closer to technology's moving frontiers, with the capital and know-how to engineer large-scale change. Inequality–not only as access but even more of anticipation–thus emerges as an un-resolved ethical and political barrier to the just governance of technological innovation." (Jasanoff, 2016, 255–56)

This paragraph neatly summarizes the heart of our previous analysis. In a central regard, however, it also goes beyond the previous proposal by highlighting a specific aspect. Many people are passive bystanders of the techno-visionary dynamics initiated by rather exclusive communities of tech-affine people in the Northern Hemisphere. Beyond being simply powerless in making a change to certain visionary discourses, Jasanoff suggests in this passage that many people also do not entertain their own narrative of what desirable change could mean. They are unable to establish their own (socio-technical) prospect, which could potentially compete in the arena of futures with proposals by more powerful and exclusive tech-visionaries. Jasanoff suggests that a lack of voice is not the problem: Rather, the problem seems to be that many people have nothing to say. This emphasizes a somewhat different connotation than the one discussed before and puts us in a great position to distinguish and categorize the different notions of "not having a future". As this task is initially explorative, I will refrain from suggesting that any one of these or a group of them has a prerogative and captures the meaning of "not having a future" more accurately than the others. Note also that this list is neither comprehensive nor are these notions exclusive: Two or more of these notions might apply to a person or a group at the same time. The following conceptual distinctions might form the backdrop for empirical studies of various political or social groups and their attitudes and stances towards social or technological futures.

I People, who do not have a future, have a short life expectancy. They will not live long.

(*footnote continued*)
control and improvement to require little external endorsement or explanation, and which is embedded within a set of master narratives in which science and technology are staged unambiguously as the solution to a range of social ills", reinforce pessimistic and bleak views in the general public about the prospects of nanotechnology (Macnaghten, 2010, 32f.).

This meaning of "not having a future" is quite literal and has a semantic overlap with our interpretation of "someone's time is running out". It is fair to assume that this is not what our concerns are centered around when discussing techno-visionary discourses and dynamics. We shall, therefore, not discuss this notion any further.

- People, who do not have a future, lack anticipatory capacities: They lack education in certain disciplines (physics, economics, information technologies, biology etc.) making them ignorant regarding the state of the art of the science and the research landscape of certain techno-sciences which undermines their ability to make suggestions about their possible futures (Jasanoff).

Jasanoff emphasizes this meaning at the end of her book. Having identified this as a problem, a large variety of methods ranging from scenario planning and anticipatory action research to science-fiction writing have been proposed by TA and FS to encourage people to create their own visions of the future despite a lack of expertise in specific fields (Miller & Bennett, 2008; Stevenson, 2002). This is suggested to alleviate the epistemic blind spots in planning processes by bringing unthought-of possibilities to the fore of decision-makers, multiplying the sources of creativity and, thus, enabling to choose from a wider range of pathways and prepare for a wider range of possibilities, making political decisions more *robust* and legitimate (Gudowsky, Peissl, Sotoudeh, & Bechtold, 2012; Ramírez and Selin, 2014; Grunwald, 2019, 64). Eventually, this approach forestalls the social construction and co-production of technologies (Bijker, Hughes, & Pinch, 1987) with the social construction of futures (Fuller & Loogma, 2009). In general, education is often considered as a means to enhance people's capacity to envision the future of a certain techno-science; education seems to be one constituent for successful anticipation (Railton, 2016, 6).

- People, who have lost *hope*, might be considered as not having a future. They lack the firm conviction that their present desires will ever be fulfilled in the future. This attitude can – but does not necessarily – imply a refusal to anticipate one's own or societies' future beyond the most existential, momentary desires for food and shelter, which might be relinquished only in cases of severe despair or mental illness (depression).

We can imagine, for instance, people who received a life sentence in prison. Consider, for instance, the protagonists of Frank Darabont's "Shawshank Redemption". After spending years in this facility and being repeatedly exposed to acts of humiliation, a person, who serves a life sentence in prison, might still *dream* of a better future, of a life outside the prison, of having a family and kids and so on. However, he has given up *hope* that such future will ever materialize. Here, we should not dwell on the question whether it is reasonable to be rather hopeful or despaired when the likelihood of a certain event such as being released from prison is rather low (Meirav, 2009, 223). I also want to neglect at this point the subtle differences between the concepts of "optimism" and "hope" because of their irrelevance for the present discussion. What is more important firstly, is that hope can affect one's attitude in terms of trust in the occurrence of future events and this attitude can be affected by *social standing*. It is obvious, for instance, that people who are victims of oppression or social exclusion can be systematically hindered to act on their values or desires. Consider a homosexual person, who lives under a conservative, religious regime, or a journalist who lives in a country in which freedom of press is eroded. It is understandable that such people doubt their life's meaningfulness (Oakley, 2010, 113–14). The oppression, however, does not have to be as severe as in these exemplary cases to undermine optimism: A few years of joblessness can take away any hope for future employment – a staggering prospect. Secondly, it must be mentioned that while optimism and hope regarding the future might be affected by social standing, there is no conceptual (analytic) connection between hopelessness and a lack of vision or anticipatory capacity. As mentioned before, it is not unreasonable to entertain a vision despite its improbability: Even a lifelong prisoner can daydream of a life in freedom. If she is hopeless, she gave up believing that this prospect will ever materialize. On the other hand, one can be extraordinarily hopeful regarding the future, without having a concise idea (a vision) of what might come. The optimistic slogan "Everything is going to be alright" is *semantically open* and applies to all kinds of future realities.

- People, who lack a comprehensive (technological) vision of a future society commensurable with the idea of technological singularity, space colonies, Nanotechnology or human enhancement, do not have a future.

We remember the previously sketched confrontation between the advanced, high-tech vision of space colonization by O'Neill and what has been termed for lack of a better concept the "profane" desire of employment (which is, to repeat, anything but profane). In this sense, people might have a vision of the future at whose center we find social reform instead of technological innovation. The particular parameter that is envisioned – such as employment in our example – links the individual desire to a more general social state. Here again the desire and vision, even the additional motivation to demonstrate and participate in a political movement (or party), might be detached from being actually optimistic or hopeful about the prospect of such sociopolitical change. While one might be tempted to consider such people as "not having a future", caution has to be dispensed before such judgment is made. To begin, we need to distinguish clearly between people who simply desire a job for themselves, without much of an idea how employment in their neighborhood can flourish and those who might not even be unemployed but understand the importance of the issue for society and develop a political agenda to challenge them. The former is a more basic notion of envisioning a future with a stronger focus on one's individual desires (this notion has close proximity to the second one described above). It attributes the responsibility to deliver policy plans to increase job opportunities to leading political bodies and social ministries.[4] The second envisions a more comprehensive

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[4] A 2015 report of the Office of Technology Assessment at the German Bundestag (TAB) notes that "the general public is hardly aware of the

picture and suggests possible ways to realize this future. Such person might become a spokesperson of a union or a more or less structured interest group or movement (Brettschneider and Schuster, 2013). Again, emphasizing this distinction here serves purely analytic purposes. Although the second type seems to be more profound, both of these types are central in a liberal democracy in which not everyone is obliged to become a politician or an expert in other fields that concern their lives. I might desire a healthy life and still leave the responsibility to ensure that this materializes in periods of illness to my doctors. Modern states are functionally highly "differentiated" in distributing this sort of real and "cognitive labor" (Kitcher, 1990), which is an important point to which I shall come back later on (Luhmann, 1977). As both imagined people *have a future* in the just described manner, we should reconsider the previously made judgement.

Most strikingly in the first case, but also in the second, these futures do not seem to be *commensurable* to the visions usually discussed in TA such as Nanotechnology, synthetic biology, in-vitro meat and many others (Grunwald, 2014b). Firstly, this seems to be because at least one of our exemplary demonstrators might have an individual desire for employment but lacks a *comprehensive* vision of the future such as those envisioned and promoted by Eric Drexler in the "Engines of Creation", or Kurzweil's "The Age of Spiritual Machines" (O'Neill even designed small models of a space colony). Secondly, they both lack a direct connection to technological innovations, which are at the center of TA research, as its name already suggests. Both of these suggestions are flawed. A sufficient amount of people who desire employment can form a movement that easily threatens even large-scaled technological endeavors (Larsen, 2003): Consider the protests against "Stuttgart 21", a railway-station project in the capital of the German federal state Baden-Württemberg (Brettschneider & Schuster, 2013; Grunwald, 2019, 70). The project aims at rebuilding the railway terminus Stuttgart to become a through railway station. From the beginning, it was criticized as unnecessary, expensive and stressful for local residents and the environment. The protests, in which up to 100,000 people participated, cumulated in a violent confrontation between protesters and the police on September 30th, 2010, where several hundred people were injured. Subsequently the reigning conservative federal government was replaced by the Greens, who advocated an anti-"Stuttgart 21" policy and a referendum was held. The 300 trees in the castle ground that had to be chopped for the building project became an epitome of the destructive consequences of "Stuttgart 21" (Novy & Peters, 2012, 134).

While such futures – "trees before railway station" – might be "narrow" and ignorant of technological possibilities, they can have a tremendous impact on technological projects. This applies even more to the second type of imaginary demonstrator, who might become an extremely knowledgeable layperson in the field of labor market policy: Although "Stuttgart 21" is still pursued, a number of lasting collectives and parties emerged from the anti-"Stuttgart 21" movement, such as *Stuttgart Ökologisch Sozial* (SÖS), which continue to be politically active in the local municipality and which contributed at the time as self-educated experts to establishing a more satisfactory station model. Therefore, while there might be an incommensurability in the *form* of those futures (comprehensive/narrow, narratively outlined/condensed in a buzzword or slogan, technological/non-technological), the confrontation at the Science Museum in L.A. sketched above, is not between people who have and others who do not have a future. The confrontation rests on a divergence in value ranking: Some futures emphasize societal change or environmental matters as the primary concern and rank technological projects as secondary. O'Neill's future displayed an inverse ranking: technology first. Hence, while there is a sense in which the demonstrators outside the museum "have no future", their futures are highly relevant for TA research. Thinking that technological futures could be challenged, redesigned or undermined only by narratives of similar texture, form or content is flawed. There is one more meaning of "not having a future" to consider, before I will draw some more general conclusions.

- People lack the means to make their visions gain momentum in societal discourses: They do not have a voice in policy-making.

When we say that someone does not have a future, we can also mean that people's futures do not matter in decision-making processes. They do have a future (with or without technology at their centers), but these futures are either ignored or dismissed when plans are established and projects are being launched. Here too, we can refer to the situation at the Science Museum in L.A. in 1977. The speakers of the Space Colonization movement presented their views on stage inside the museum, while important decision-makers were invited to join the discussions and be persuaded by the presentations (McCray, 2013). Because of his academic affiliation and involvement in expert communities, Gerard O'Neill had contacts to powerful stakeholders and decision-makers. Outside the museum, there were no stages, drinks or invited guests. This might just indicate whose voices will be heard. FS researcher Tony Stevenson notes on this account:

> "Creating the future can be controlled by the wealthy, powerful and famous, and their minders and lackeys. But in the spirit of democracy, future-creating would seek to ensure that people who have a stake in the future, either through their likely habitat there, or their successor generations, should be able to participate in that creation. This does not happen with the more traditional methodologies of futures studies, where experts stand aside from the vast majority of other citizens." (Stevenson, 2002, 418–19)

In this passage from his "Anticipatory Action Learning: Conversations about the Future", Stevenson seems to equalize the encouragement towards creating futures with their control, emphasizing, however, that control often lies in the hand of the powerful and wealthy. It is very important to distinguish these two notions, something that we have neglected so far. For several years, TA, FS

(*footnote continued*)

scientific development [of synthetic biology] at this early stage and thus would have to be **motivated actively** to deal with the issue [own emphasis]." (Sauter et al., 2015, 16) This does not mean that the public does not entertain an idea about the future of synthetic biology: This future could be that someone else – a group of policy makers or experts – should act in societies' best interests and ensure its safety and desirability.

and STS encouraged the envisioning of other pathways by employing scenario methods and other techniques that aim at increasing the number of possible pathways, diversifying the future, and thereby challenge epistemic blind spots and enhance creativity (see, for instance, this journals self-description[5] and (Ramírez & Selin, 2014; Sardar, 2010, 183)). Jasanoff's proposal, although it is not explicit in this regard, can be understood as a demand to counteract the widespread issue of "not having a future" with supporting the advancement of anticipatory capacities and encouraging future-making by involving people into scenario building and anticipatory action methods to create ever more futures. While such development is in most cases praiseworthy, it must be underlined that this cannot ensure that these futures ever materialize. There are two obvious obstacles to this: Regarding the making of the future, the previously mentioned institutions' (TA, STS and FS) power is limited. Even if these institutions were globally active and enhance anticipatory capacities worldwide (which is a mammoth task and obviously far from being a reality), they are only one amongst a host of societal agents that together (not equally) determine which future is pursued, and certainly not the most powerful either. Secondly, the creation of more futures does not erase the difficulty of choosing between them, it might be suggested that it rather increases this challenge. The more futures are on the table, the smaller the probabilities for each to materialize. If we think of this like an ideal card game–which, of course, it is not–the likelihood of picking a specific card gets smaller, the higher the stack gets.

Five different meanings of the notion "not having a future" have been distinguished and discussed. Between the lines, I have insinuated some (normative) pitfalls, which should be outlined in more detail in the following conclusions and outlook.

4. Conclusions and outlook – pitfalls of democratizing the future

Hermeneutic TA is understood and advocated as a critical perspective on the development and distribution of futures and visions *in the present*, because of the typical epistemic problems underlying predicting the future. Hermeneutic TA aims at a better understanding of how and why some futures gain traction in current discourses and why and how they are attributed with meaning. Throwing a reflective and critical light on these dynamics also means, as I have argued introductorily, considering TA as a player that does not only function as a neutral observer, but also as a significant participator in this process. Because of this, I encouraged to explore TA's focus on some particular objects of study like Nanotechnology instead of other (non-technological) visions about the future. I suggested that this truly hermeneutic stance might enhance our understanding of envisioning and anticipating as social activities and reveal knowledge about the present. From this standpoint, it becomes clear that TA has focused on high-tech visions of few elitist, powerful academics from the Northern Hemisphere and neglected rather "profane" futures. Given this rather narrow scope on future making, we might be inclined to say of many people that they do not have a future that will ever come to the fore of policy-makers, stakeholders, FS, TA, or similar such institutions. We have then explored the semantic landscape of this notion and distinguished five different meanings of "not having a future". More generally, we can understand the previous reflections as an emphasis of the issue of power imbalances in how visions are being produced and distributed.

It is important to note again, that the presented account was intended to be primarily descriptive. There might be good reasons to neglect the magnitude of uncountable futures out there. There are certainly *prudential reasons* for such ignorance, as this endeavor is beyond the capacities of any existing institution. However, I also suggested that it is not always the comprehensive, technological narratives that shape the future: If a sufficient number of individuals repudiate a certain technological future or even foster contradictory desires, the high-tech futures of white elites will not gain traction. This can happen, even if these individuals do not entertain their own alternative vision of a desirable future. For this reason, it would be equally wrong to neglect profane futures altogether.

As an institution with a social function, TA has continuously emphasized the importance of including citizens and stakeholders in future making (Grunwald, 2019, 63 ff.). Behind many such projects stands a democratic ideal, but also epistemic considerations (bringing previously unthought-of possibilities to the table) and practical values (increasing the level of acceptance of new technologies, stabilizing them and, thereby, making them more sustainable and resilient). In this vein, one might suggest that it is indeed pitiful that many people do not have a future. One might be inclined to defend an obligation or an imperative for the ubiquitous advancement of anticipatory capacities to provide everybody with the opportunity to participate in the making of the future and thereby challenge the prevailing inequalities outlined above. This is a noble and praiseworthy impulse and, in most cases, it means betterment. As an outlook, I will nevertheless attempt to outline some of the pitfalls of this motivation that shone through the lines of the previous argumentation:

i As mentioned before, we must resist considering comprehensive, socio-technical visions such as Nanotechnology, which have long been under scrutiny for contingent reasons of access and power, as the only basis of policy-making and the only adequate basis for scenario building. In contrast, we should learn to acknowledge that "profane" visions lacking technological content (like the desire for employment) are anything but negligible, just because they are incommensurable with high-tech visions. It seems that this failure gave rise to the initial assumption that many people do not have a future. Factually, such "profane" desires might well become the starting point of a technological or an anti-technological movement that alters societies more profoundly than any currently emerging technologies (again, think about the social repercussions of the anti "Stuttgart 21"-movement). We should start to think differently about such "narrow" narratives and maybe learn to acknowledge the wish for employment as a substantial vision that implies a value ranking, downgrading technological progress to second or an even lower position. Hence, the

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impulse to enhance these people's anticipatory capacities imposes an alien understanding of envisioning the future on them that demands a reassessment of their desires in light of something they might not actually value, namely a high-tech future.

ii There are certainly many people, who want to participate in discourses about the future, who lack the anticipatory capacities to establish their own visions and launch them into the discourse and who would, therefore, highly appreciate partaking in educational programs to improve their anticipatory skills. This, however, does not apply to everyone. "Not having a future" can be a choice indeed. One can choose to brush the responsibility for the envisioning and making of the future aside and trust that the futures of experts from different fields yields the best outcome for oneself. Consider, for example, that it is not unusual that people who save money and to receive interest rates, consign it to banks or other financial institutions and let them handle it. One assumes then that banks' investment plans will create more revenue than oneself possibly could. Such people's future is based on a trust into the visions of *these institutions* regarding their ways of increasing people's interest rates and a delegation of responsibility for complex and momentous decision, which they themselves do not want to bear. Such attitude is not *a priori* blameworthy. Our impulse to enhance anticipatory capacities must acknowledge that modern, liberal societies are constituted by a division of labor allowing people to choose to be guided and governed by other people of whom they believe to produce the more reliable and resilient narratives of the future for them and society in general. Although, it might be a difficult lesson to learn: It is everyone's right to "not have a future" and to trust the experts of a certain field. In practice, this means giving people a right to refuse participating in anticipatory actions and scenario building workshops.

iii Even if many people participate in anticipatory actions and scenario building methods and subsequently develop their own visions, we should not naively assume that this indeed leads to a more democratic future in which more desire are fulfilled and more visions realized. Power imbalances appear not only in the envisioning of the future, but also in their realization. Even if we manage to advance people's capacities to anticipate and create more futures, choosing some of this growing stack of possible pathways for realization remains a difficult and open task. Clearly, policy-making is not like chess playing, where one's allowed to make only one distinct move per round and where it is unequivocally determined what counts as a legitimate move. Policy-making can find compromises between diverging views or support the renunciation or amelioration of some views in light of competing interests.

Nevertheless, the practical difficulties to realize everyone's visions undeniably persist as various visions likely stand not only in a complementary but in mutually exclusive opposition to each other: How then should one decide which ones to pursue? This issue does not disappear with the advancement of anticipatory capacities: It might become even more frustrating for those who finally envisioned an own future, when they realize it will not ever materialize.

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