Ask what can be!

Modal critique and design as drivers of accidence

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Critique and design both share a special relation to the sphere of the possible. This sphere comprises all the phenomena, events or entities that are neither necessary nor impossible; this sphere contains all entities that (a) *are, but could not be*, (b) *are not, but could be*, and (c) *are, but could be otherwise*. The possible is one modal sphere besides the necessary and the impossible and it is put forward here as the sphere of *accidence*. Critique loosens the dominant structure of modal beliefs; design hardens new forms of otherness; early phases of conceptual design have loosening effects, critique might evoke defence movements that have hardening effects in turn. This chapter discusses the modal effects of critique and design, their modal transformative power and their specific relation to *accidence*.

Critique challenges the status quo. To criticize a phenomenon presupposes that it can be different. No one would criticize gravity for instance. Design, on the other hand, explores, reveals and develops possible differentness. Imagining and shaping different forms presupposes the belief that they are possible. No one designs a round square. As two dynamics of the accidence sphere, *critique* and *design* describe two different yet connected human–world relations and they reveal our worldview, our modal judgements about this world – that is what is deemed possible, impossible, or necessary. To criticize something means to reveal its accidental character – its possible differentness – which opens it up to design efforts in the first place. On the other hand, designing something – trying and finding other forms – shows the designer's conviction that new forms are not only possible, but worth the actual designing efforts, and therefore not just different, but better. Exploring and actualizing better forms is in itself a way to criticize present forms. Understood as accidence dynamics, one can be critical by design or enable design by critique. Concrete actions, i.e. practices of critique and design, possess a modally educative power; they help determine whether something could actually be otherwise. In addition to that, critique and design have transformative power over the structure of modal spheres; they work as drivers, challenges, and consequences of accidence. The transformative effects of critique and design on the modal structure can be – and mostly are – unintended side effects, but can also be strategically positioned as the actual objective. Actions oriented in the latter sense can be called *modal critique* and *modal design*.

The modal spheres

The structure of the modal spheres is highly dynamic over time, depending on each actor, and is especially prone to misjudgements: what is possible today does not have to be possible tomorrow; what is possible for me does not have to be possible for others; what one deems possible does not actually have to be possible. The modal spheres and the modal dynamics have to be further investigated in order to draw conclusions concerning critique and design as modal factors.

The modal spheres are divided into three large areas (see Table 3.1).[1] In Table 3.1, *X* stands for a phenomenon, event or entity that stands to be modally judged as being *possible*, *necessary*, or *impossible*.

Firstly, there is the modal sphere of the *possible* – that is, all those phenomena that (a) can be, (b) cannot be, or (c) can be otherwise; secondly, the modal sphere of the *necessary* – that is, all those phenomena that are and cannot be different; thirdly, the modal sphere of the *impossible* – that is, all those phenomena that are not and cannot be. The sphere of the possible can again be subdivided into the areas of the merely hypothetically or *potentially possible* and the realizable possible (real-possible). The *real-possible* comprises those phenomena that our actions can aim to *realize* – for example, the preparation of a dinner by hand, if the appropriate means are available. The *potentially possible* comprises those phenomena that our actions can aim to *make real-possible*, i.e. primarily technical inventive action – for example, the preparation of a meal via a «replicator»[2] (as in Star Trek), for which the development of the corresponding means («replicator» technology) represents an enabling condition and goal of inventive action.

The distinction between the two areas of possibility depends on the modal judgement by which the real or potential possibility of a phenomenon or event is assessed in the first place. Only with assumed *feasibility* (i.e. being able to bring something about) is a corresponding normative judgement of *desirability* or *imperative* due (i.e. being obliged to bring something about). Only the combination of feasibility and desirability demarcates the set of options that could be pursued. While the dimension of desirability must be considered relative to a given normative orientation as a question of ethics, the assessment of feasibility is an epistemological endeavour. Modal judgement must, therefore, consider two binary levels. On a first

1 The following terms are used interchangeably with no further intention of distinction for the modal structure: *area, world, realm* (as used by Nowotny / Schot 2018), *region* (as used by Cassirer 2012), *sphere* (predominantly used here). The modal sphere table is inspired by Hubig (2006: 166).

2 The «replicator», as known from the Sci-Fi series *Star Trek: The Next Generation*, is a sort of wall-mounted food and beverage dispenser that materializes every kind of meal including the respective crockery out of pure energy. The replicator is fictitious, but there are technological developments towards that ideal, such as a 3D printer that also cooks the printed food (Hertafeld et al. 2019).

MODAL SPHERES			SUPPOSEDLY	ACTUALLY
POSSIBLE	Receptive to being true	X is real-possible (X can be realised).		
		For oneself	X is supposedly real-possible for me.	X is actually real-possible for me.
		For others	X is supposedly real-possible for others.	X is actually real-possible for others.
	Receptive to being receptive to being true	X is potentially possible (X can become real-possible).		
		For oneself	X is supposedly potentially possible for me.	X is actually potentially possible for me.
		For others	X is supposedly potentially possible for others.	X is actually potentially possible for others.
NECESSARY	Not receptive to being false	X is necessary.		
		For oneself	X is supposedly necessary for me.	X is actually necessary for me.
		For others	X is supposedly necessary for others.	X is actually necessary for others.
IMPOSSIBLE	Not receptive to being true	X is impossible.		
		For oneself	X is supposedly impossible for me.	X is actually impossible for me.
		For others	X is supposedly impossible for others.	X is actually impossible for others.

Table 3.1 Modal spheres

level, thereis the difference between subjective and «objective» or epistemological and ontological dimensions of all modal spheres. This level shows that one can err in one's modal judgements and that what one conceived as possible, for example, turns out to be actually impossible or vice versa. The difference on this level can also be understood as *supposed* versus *«actual»* (see respective columns in Table 3.1).[3] On a second level, the plurality of the existential futures – future as a unique personal possibility space – must be taken into account: the relatedness of possibilities to a person, to their abilities and options in contrast to those of other persons. The difference at this level can be understood as *for oneself* versus *for others* (see respective rows in Table 3.1). What is possible for a specific individual is not inevitably possible for other individuals and vice versa. Correspondingly, one cannot easily conclude from the ability-to-X of a collective that an individual can be obliged to do X within that collective skillset. Both the oneself–another and the supposed–actual levels must be cross-classified for each of the modal spheres, resulting in the variety of modal judgements, as shown in Table 3.1, such as *X is supposedly real-possible for me*.

With the Stoa founder Zeno of Citium it can be formulated that: *Possible is what admits of being true or is receptive to being true* (Diogenes Laertius / Hicks [1925] 1972: 7.1 75–76). Accordingly (see second column from the left in Table 3.1), *necessary is what is not receptive to being false* and *impossible is what is not receptive to being true*. It follows that all phenomena within the realms of the necessary and the impossible – the *not receptive* spheres – cannot be changed, for only what can be different can be changed. Originally, the term *accidence*[4] goes back to the Greek term *symbebêkos*,[5] which literally means what *goes with* or what is *present with* something, but *not necessarily or as a rule* (Aristotle, *Metaphysics V*, 30, 1025a). Therefore, the accidence sphere is also, literally, the sphere of change, of action – what would action be if not change? – since *accidere* means to occur, to happen. It entails every event that can occur, every entity

3 «Objective» and «actual» are put in quotation marks in this context because they cannot refer to a metaphysically objective truth but to what is commonly considered or recognized as not falsified or «proven» (see also footnote 10).

4 For an in-depth discussion of *accidence* including its semantic and etymological field see Gransche (2015: 313–353).

5 For a discussion of the term in the Aristotelian sense see Liatsi (2003).

6 The corresponding principle, coming from Roman law, is: *ultra posse nemo obligatur* (beyond one's abilities no one is to be held responsible). This *ultra posse* dictum holds for first-level actions: no one is obliged to do something that they cannot. Second-level action orientation can circumvent this dictum because you can be obliged to become able to do something (learn new skills) that you are not able to do (yet). And if people do not change their skills – refuse to learn or practice – they can very well be considered responsible for not being able to do something that they should (be able to) do. But this is limited to learnable skills or potentially possible aspects, which introduces a modal constraint even on the second level. People cannot be held responsible for not talking French in a given situation if they cannot (first, *ultra posse* level), yet they can be held responsible for not learning French and then not speaking it in future situations (second level, potentially possible type). However, they can never be obliged, for example, to be younger or older than they actually are because they are not and they cannot possibly be (second level, impossible type).

that can be encountered. It is the sphere of praxis, thus the sphere of critique and design – and the *only* one where human action and decision-making is possible; it is, accordingly, the sphere of normative claims, of law and ethics – because obligation implies ability.[6] What you should do is always a subset of what you could do. With the accidence perspective, a special modal dynamic can be put into focus. Throughout the history of ideas – ontology, metaphysics, physics, etc. – a general tendency towards an *accidence expansion* – i.e. expansion of what could be otherwise – appears. This career of accidence shows that almost everything that has been deemed inalterable or necessary[7] at some point actually is differently possible, such as matter (e.g. $m=E/c^2$, radioactive decay), nature (e.g. evolution), social order (e.g. caste, class), etc. Thus, it is obvious that what is considered as necessary, possible, and impossible today will most likely change in the future as well; there is no reason to consider the modal dynamic terminated. The modal structure is not as solid as it seems to be: it could itself be otherwise, and the accidence sphere (including our modal beliefs) is particularly significant to us as the sphere of *future*; as Robert Musil quite famously put it: «this structure is not as solid as it pretends to be; no thing, no self, no form, no principle, is safe, everything is undergoing an invisible but ceaseless transformation, the unsolid holds more of the future than the solid, and the present is nothing but a hypothesis that has not yet been overcome» (Musil 2002: 250; my translation).

Modal design – modal critique

Against the backdrop of this cross-classification appears a specification of possible transformational acts as *modal critique* and *modal design*. Actions[8] that deliberately transform the modal spheres do not aim at a certain real structure, but at the structuring of a possibility space, at rearranging sets of options. Changes to this structure are indirect consequences of *any* action, but they can also be made the direct objective of an action. To give an extreme example: one can kill a person with the direct objective to end this person's life (first-level effect) – an extreme way to express one's critique or to design the social relations with that person. However, such a killing could be done as a means to a modal restructuring (second-level effect), so not primarily in order to end that person's life, but to ensure, for instance, that this person can no longer reveal sensitive information.

7 Note that the term *necessary* is used in a modal sense here, meaning *not possible not to be*. This is not the everyday language sense of needing something, as in: «In order to keep the office, an apology would be necessary.»

8 From a philosophical point of view, action includes doing nothing, like the act of omission or the act of nonfeasance.

9 The acronym stands for Clustered Regularly Interspaced Short Palindromic Repeats.

In the second case, one could be indifferent to the person's life, yet terminate it to ensure secrecy. The killing in the modally oriented action is a means to an end, whereas in the directly oriented action it is an end. As an indirect consequence in both cases, one has to deal with several other modal rearrangements besides the impossibility of this person talking, such as the impossibility of threatening to kill the person, which was possible before, etc. Therefore, the distinction between directly and modally oriented actions is heuristic: every action always has direct *and* modal effects. «Modal actions» would primarily focus on the modal second-level effects, directly intending modal restructuring, and indirectly accepting the corresponding first-level effects as means. First-level actions in turn directly intend the first-level effects and (indifferently) accept the possible modal second-level effects. The problem with modal actions is uncertainty, the second-level effects are largely unpredictable and potentially endless (butterfly effect). Killing a person radically ensures the end of all effects connected to them; it closes a possibility space, but you never know what effects would have been actualized within that possibility space.The fact that the actual results of the action tend to show greater and unforeseen diversity than the intended results means that actions of the modal design type are less certain and more surprising than actions of the artefact realization type. This is only logical because modal design addresses the medium of concrete options for action. However – and this complicates the matter considerably – we can never act modally, but always only concretely; though we can direct our action either towards concrete realization or towards the always evoked modal effects. The latter is an action that realizes a real objective in an instrumental or accepting way, so to speak, in order to restructure the space of possibility of action. Modal design is not a targeted concrete design but intentionally changes the possibilities, even if the effect of change is to some extent uncertain.

On a merely ontological level, the only entities that qualify as possible action goals are those inside the sphere of the real-possible; only real-possible entities can be brought about. But if action orientation were to stop there, there would be no deliberate progress, no enablement, no expansion of the accidence sphere. However, there is this other set of entities that can be objectives for enabling actions, which aim at a modal relocation. Enabling actions tackle potentially possible entities and develop suitable means, transform conditions, etc., thus moving them from the realm of the potentially possible to the realm of the real-possible. Research, as a classic enabling practice, has to deal with this uncertainty and special

enabling responsibility. Accidence phenomena tend to be normatively ambiguous. With a scientific discovery like CRISPR/Cas[9] – a revolutionary genome-editing method – you could potentially cure diseases or build sophisticated bioweapons. Which of these potential actions is going to be actualized cannot be foreseen, but can be taken care of in two different approaches corresponding to the two levels of action mentioned. Firstly, one could either allow the CRISPR-related phenomena to become real-possible, and then try to fight every actualization that is judged bad – with obvious problems like lack of enforcement or normative-ambiguity in relation to the judging position. Or, secondly, one could modally design the possibility space in such a way that CRISPR-related phenomena stay or become entities of the region of the «impossible», which modally correctly speaking means the «potentially possible» or «impossible to realize now». The enforcement problem would then be relocated on the level of enabling actions that aim at transferring entities from the realm of the potentially possible into the realm of the real-possible, which in scientific contexts is typically done with research moratoria. Of course, this can only be applied to the entirety of related phenomena, both «good» and «bad».

Considering the difference between the epistemological and ontological levels, entities of the impossible and the necessary can also be transformed into entities of the (initially potentially and then real) possible. With such a transformation, those very entities would then be revealed as merely *supposedly impossible* or *supposedly necessary* and as *actually (potentially or real) possible*. Therefore, this does not represent a transformation of the ontological boundaries of the modal spheres, but rather one of the epistemological, i.e. correction of erroneous modal judgements. This does not simply eliminate errors, but rather transforms specific structures of the spaces of possibility in the beliefs of the actors. Decision and action planning always take place within the medium of ideas and beliefs, i.e. depending on the structure of the individual modal judgements. Epistemic-ontological differences and thus revisions of modal judgements arise only from the difference between intended and actually realized phenomena or events. Only if one tries something «impossible» does one reveal – by succeeding – its supposed impossibility and actual real-possibility (for oneself); by failing, one does not prove the actual impossibility though, but only that one failed. Only on the basis of the difference between intended and actually realized outcome can it be concluded that there were and are errors in the assessment of possibilities, of the feasibility of purposes, of the suitability of means, of the role of external disturbances in the implementation attempt, etc.[10] The dimension of the time specificity mentioned above comes in

as another variational level, which was not included in Table 3.1 for complexity reasons. It means that for each time *t*, *t*+1, *t*+*n*, a separate set of modal judgements has to be compiled, just as each individual has to judge the oneself–another dichotomy differently. Another layer further complicates the picture: not only have modal judgements to be made for each time *t* and for or by each individual following the proposed classification, but the difference between *imaginable* vs. *not imaginable* can be applied (also not included in Table 3.1 for complexity reasons). Imagination is particularly important in relation to modal design. Not only are futures – future differentness – per se ideas or beliefs with regard to their ontological status, but the ability to imagine is a special force that constantly shifts what is considered possible in comparison to what is ontologically possible, i.e. clarifies errors of modal judgement or falsely changes actually adequate views. In principle, there are entities within all modal areas that are either imaginable or unimaginable. Supposedly impossible events, which are however imaginable, have the potential to motivate and orient intentional modal design in such a way that their supposed impossibility proves to be actually a potential possibility and can finally be transferred into the real-possible and, at will, even be realized. This process of traversing the modal spheres can be described as *modal migration* and figures such as the Minotaur or a unicorn experience an unprecedented modal drift against the background of dynamic tendencies such as genetic engineering and thus transgenic organisms; today, the Minotaur and a unicorn are not only hypothetically imaginable but also ontological modal migrants.

10 How do people determine that something is «actually» or only «supposedly» «possible/necessary/impossible»? Every actualization of an action purpose reveals its actual ex post possibility independently of any supposed modal judgements. Everything that is, was possible. If someone mixes charcoal, potassium nitrate and sulphur and it explodes, then that person knows it is a possible explosive, even if they did not intend to «design» gunpowder. In contrast to Popper's falsification thesis, due to the problem of induction, possibilities can be «proven to be receptive to being true» by actualization. This is no contradiction to Popper since it is not about the verification of hypotheses – which are simply not yet falsified – but a phenomenon is explained ex post causally. This always has theoretical bases (e.g. causality, explanation), which can never be «objectively» verified as such, but they are recognized by individuals and collectives as time-specifically valid (until falsifying events occur). In this respect, the actual ontological modal structure (even in a snapshot, since it actually changes diachronically) can never completely fall into line with the epistemic – supposed – one. Individual modal judgements, however, can be recognized as epistemically wrong – e.g. only supposedly impossible – if, for example, an actualization reveals it to be possible. So, if gunpowder explodes once, it is shown that it is possible for this mixture to form explosive power. On the other hand, if someone thinks it is possible, for example, to create a Christmas tree out of sausages and the insufficient statics of the sausages shows the impossibility of this undertaking during actualization attempts, then this does not yet prove that sausage Christmas trees are actually impossible – one could simply be incapable (for oneself vs. for others) or one would just have to use frozen sausages, put the dog on a leash, etc. This is a sort of experimental or life-world clarification of supposed modal judgements which can then be recognized as actual, depending on the scientific theoretical understanding that determines, say, what counts as an experiment or as falsification (e.g. sufficiently controlled boundary conditions, repeatability, «Did you see that too?» etc.). How a hypothetically objective, ideal world with ontological ultimate truth would relate to those levels of supposed and actual modal judgements is neither metaphysically interesting nor pragmatically a useful question.

As examples of modal migrants – across the spheres of the (supposedly) impossible to the potentially possible, real-possible, and finally actual – the mystical figures of the Minotaur and the unicorn might serve.

The Minotaur, the mythical figure of a mixed creature with a human body and a bull's head, is very well imaginable. It is present in Greek mythology and until today in many areas of cultural imagination (e.g. in many of Picasso's drawings). The possibility of actually encountering a Minotaur, however, would generally be denied, the figure thus regarded as an inhabitant of the sphere of the impossible – imaginable, but not even potentially possible.

So where does the modal drift come from? In its *Human Fertilisation and Embryology Act of 2008*, the United Kingdom Parliament made research on transgenic embryos legally possible.[11] Chapter 22 of the Act deals with human–animal hybrids, chimeras and human–bovine embryos. The fact that this is not a mythical narrative or a fairy tale, but a valid legal text regulating current research, and that in the United Kingdom research is carried out on human–bovine embryos – i.e. they actually exist – suggests that human–animal hybrids such as the Minotaur are about to leave the sphere of the impossible. Accordingly, this means that a Minotaur is or was only supposedly impossible, but actually potentially possible, and, depending on its desirability, it could even be made real-possible.[12]

The United Kingdom's coat of arms shows beside a crowned lion also a chained unicorn, another mythical creature and quite impossible. Mythologically, in contrast to today's toy industry, the unicorn is an evil and dangerous creature, which is why it is depicted in chains as a sign of the King's taming power.[13] Analogously to the Minotaur, to genetically create a unicorn seems not only imaginable now, but also potentially possible. Such a modal unleashing could succeed – in a genetically naïve perspective – via the transgenic combination of a horse and a narwhal, which seems far less fantastic if one recalls ANDi (Chan et al. 2001). ANDi – the name comes from the inversion of the acronym of «inserted DNA» – was a transgenic monkey into which the green fluorinating protein (GFP) of a jellyfish was inserted.

11 «These are defined as ‹human admixed embryos› and include: Cytoplasmic hybrids (Cybrids): embryos created by techniques used in cloning, using human gametes or cells and animal eggs. The embryos would be mostly human except for the presence of animal mitochondria ...; Human–animal hybrid embryos: any other embryo created using a human egg and the sperm of an animal, or an animal egg and a human sperm or by combining a pro-nucleus of an animal with a human pro-nucleus ...; Human transgenic embryos: embryos created by the introduction of animal DNA into one or more cells of the embryo ...; Human–animal chimeras: human embryos, altered by the addition of one or more cells from an animal» (UK Parliament, House of Commons 2008: 1).

12 NB: To adequately judge whether Minotaur actualization is actually or just presumably real-possible today or in the near future requires a much deeper expertise in genetic engineering than that of the author.

13 Besides, the unicorn is the national animal of Scotland with whose «taming» the United Kingdom struggled through time.

Almost two decades ago he was the first transgenic primate, with whom was demonstrated that «Genetic engineering creeps up the evolutionary ladder» (Adam 2001).

Along with which, transgenic hybrids of said evolutionary ladder creep up the modal ladder as well. Humans, too, are in the focus of attempts to make things possible that were previously considered impossible. For example, genetically engineered AIDS-resistant twins are said to have been born in China in 2018 (Cyranoski / Ledford 2018);[14] and there are people with three biological parents now (Hayden 2013). Those are examples in which technology appears as an enabling factor and Ernst Cassirer concisely described that relationship between technology and the possible:

> Technology does not initially ask what is but what can be. … In this sense, every truly original technological achievement has the character of both a discovering and an uncovering. A certain state of affairs is in a sense extracted from the region of the possible and transplanted into the actual. … Pure theoretical natural science can, of course, never know the actual without constantly reaching out into the realm of the possible, the purely ideal. … Technological work, however, never binds itself to this pure facticity, to the given face of objects; rather it obeys the law of a pure anticipation, a prospective view that foresees the future, leading up to a new future. (Cassirer 2012: 44–45)

However, technology is not the only force of accidence expansion or modal transformation; social, political, and cultural development are modal drivers as well. For example, for a long period of time it was considered de facto impossible for an actress to marry a prince, but Meghan, Duchess of Sussex, showed this real possibility in 2018.[15] The notions of women, barbarians, and slaves being able and entitled to equally participate in society and vote was similarly «impossible» for quite some time and women's suffrage or the Universal Declaration of Human Rights marks a significant yet ongoing success story of modal migration. These examples show that the epistemological-ontological difference is decisively historical. Yet it would be a cliché to automatically assume an ever closer matching of the supposedly and the actually possible; this is indeed the figure of thought of progress optimism. In addition to the propagated enabling (accidence expanding) effects of new technologies, the always accompanying impoverishing effects are often disregarded. Thus, the idea of literally

14 Once such a phenomenon is known as supposedly real-possible, the attempts to actualize the real-possible follow closely (Cyranoski 2019b, 2019a).

15 In 2018 the former actress Meghan Markle married Prince Harry and thus became Her Royal Highness Meghan, Duchess of Sussex.

«shaping one's future» might seem plausible, whereas complex modal influences are actually to be considered.

«Shaping one's future», and with it the idea of modal design, cannot mean shaping or designing something that *exists* in some way, but rather changing certain ideas (modal judgements) and changing the structures of what is possible (the modal structure in general). These ideas are far-reaching, but cannot be changed at will. They share the structural characteristics of the *objective spirit*, which means – as Hegel puts it – that they are *manmade*, so they are changeable, could be otherwise, and are thus part of the accidence sphere, but they appear to the individual as *necessity* (Hegel 1986).[16] Phenomena of the objective spirit (or changes thereof) are not possible first-level action objectives, but individuals can engage in modal transformation efforts that aim at enabling changes of the objective spirit: philosophy, science and art make up the triumvirate that liquefies ideas and constantly adjusts supposed modal judgements.[17] The consequences of this change are new possibilities. This is not a change of a fixed set of sphere inhabitants, but a change of the accidence sphere itself.

The dimension of *for oneself* versus *for others* introduced above has further and specifically ethically relevant effects. As shown above, possibilities are always *someone's*, i.e. person-related or related to the respective instance of action. However, every action generally affects the futures, the options, the modal structure of *others*, both as a (first-level) attempt to realize objectives as well as a (second-level) modal influence. From an ethical point of view, this means that there is a special kind of responsibility for enabling actions and their modal consequences. One is not only responsible for doing something but, particularly, for enabling something, for transferring events or entities from one modal sphere to another – or for failing to do so. This is far-reaching because it means that one is partly responsible even for every subsequent actualization within a possibility space one brought about. With regard to modal design, the task is not only to use one's own possibility space responsibly, which means to responsively realize real-possible ends while considering the actions of others. More importantly, the challenge is to structure one's own possibility space responsibly, which means to responsively transform one's modal structure while considering the transformation of the modal structure of others.

16 Other prominent parts of the objective spirit are language, history, custom, state, law, art, religion, science or economy: in other words, *culture*. Hegel defines the objective spirit as «a form of reality as a world that was created and has to be created by man, in which freedom is a present necessity» (Hegel 1986: 32; my translation). The phenomena of the objective spirit therefore fall between the modal spheres of possible and necessary depending on the collective or individual level and depending on usually large timescales.

17 With respect to the social sciences this was recently claimed by Nowotny and Schot: «One of the main – and decidedly normative – tasks of the social sciences is, as it has ever been, to open up towards the realm of possibilities: to show in scientifically plausible ways that *it could be otherwise*» (Nowotny / Schot 2018).

It means to accordingly include the effects not only on the actions but especially on the options of others into one's decision-making. This becomes rather complicated, for instance by the vagueness of the term «other».[18] When influencing the modal structure, it is important to ensure a certain balance between widening and narrowing the possibility spaces. Actual acting requires a finite set of options that one is cognitively able to consider and to choose from, while goal-setting and decision-making require a minimum degree of variety to be able to choose at all. The fact that the epistemological and ontological levels of the modal spheres are in constant movement enables phenomena such as the Minotaur or women's suffrage to migrate modally first and foremost.

18 Who exactly is that? All individuals that are present in a certain context of action – so, all who are actually there? All potential attendees – so, all who could have participated? All those living at the time of action (*morituri*)? Or all potentially living ones (*nascituri*)? Then among them how many generations: the next three in front of whom one could possibly have to justify oneself? Or ten, or ten thousand? This last aspect is an essential but so far unresolved and probably hardly conclusive question in the context of today's sustainability debates. Sustainability includes the possibility of decision and above all the possibility of re-deciding of «future generations», but how many? That would be crucial.

Conclusions

First, beware of the Minotaur and other modal migrants, because they challenge the coping strategies and skills that have been developed in orientation to the (supposed) real or to the (supposed) real-possible and can actually overstrain them. We generally do not prepare for what we assume to be impossible.

Second, not only primary (first-level) objectives of action, but also the (second-level) modal sphere of accidence itself can be the goal of intentional transformation efforts, albeit to varying degrees, with greater uncertainty, and with different detailed ideas of objectives.

Third, modal design requires modal criticism. In order to make something the objective of changing efforts, its changeability must be presupposed. This means that something that exists – including the modal judgements – has to be criticized as possibly different. This process of critique and design is an ongoing and indispensable effort to keep the supposedly ontological and time-specific epistemological levels dynamic. It is indispensable in order to enable normative evaluation, since normative evaluation is only reasonable within the realm of the possible. From an ethics of technology point of view, in addition to the question «What should I realize how?» or «Which options should I make technically possible in which ways?», the question arises of which structure or transformation of the accidence sphere should be imperative or prohibited. The modal dynamic is further indispensable for shaping change, i.e. either to prevent stagnation or to enable stability – depending on whether the development would

be normatively judged as progress or decline. The areas of law, politics, ethics, etc. are strongly dependent on the clarification of supposed necessities or supposed impossibilities in order to prevent dogmatism and fundamentalism, which both modally argue mostly in the spheres of necessity and impossibility. Eternal truth is receptive neither to being false nor to being true. True power belongs to those who can define and then dictate to others into which modal sphere a phenomenon falls. In contrast to the claim «You shall not change that!», the claim «This cannot be otherwise!» has an immunizing effect against critique and does not entail any normative obligations of justification in the mantle of factual compulsion. From a democratic, humanist perspective, this power is to be negotiated in its full breadth in the forums of accidence awareness like science, philosophy and art.[19] After all, the effort of modal critique is indispensable in order to enable normatively oriented transformations of the accidence sphere itself, since the mere unintended effect on the structure of the modal spheres, which every action always has, in contrast to the intended manipulation – despite all uncertainty and vagueness – cannot be subjected to any normative orientation.

Fourth, acting is mostly acting *with others* and modal manipulation, therefore, has to consider two opposing instances of orientation: on the one hand, we owe others the preservation of the possibility of action in general as well as a certain variety of options in order not to (recklessly) transform the modal structure in a way that the spheres of the necessary and impossible become hypertrophic in contrast to a shrinking sphere of the possible. Such an imbalance would force others (future generations) to merely react and be confined in short-term crisis-management instead of «shaping their futures». On the other hand, we do not want to leave every effect of action – normatively expressed: not every progress – open to possibly problematic revisions by others (in the future); in some cases, there are good reasons that some options were transferred from the region of the real-possible to the region of the only potentially possible or – at least to some or most – actually impossible. This means that some modal fluidity is owed to others, but some modal allocations have to be defended against possible relocations. To determine which ones are of which sort is a permanent challenge to society. With an adequate accidence awareness, those changes in question can be made subject to debate instead of just being unintentionally actualized (on a second level) while trying to pursue other first-level objectives. For example, in the sense of a legacy, most people today would

19 With respect to one part of the mentioned – the social sciences – again Nowotny and Schot: «To open up towards the realm of the possible [that would be a part of an accidence awareness, BG], the social sciences must stimulate public debate, making room for multiple perspectives and allowing for contestation [or critique]» (Nowotny / Schot 2018).

probably not want to – and no one should – open up to reversion the fact that all human beings possess untouchable human rights – «without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status» (hence *Universal* Declaration of Human Rights, Art. 2, UN). Against this backdrop, it seems necessary not only to design things, processes, relations, etc. on a first level but also modally on a second level. Especially designers or engineers, among others, have an extensive impact on both levels. They have to be aware of and made responsible for the second-level consequences. Therefore, explicit modal design is an obligation today, «firmly anchored in the normative belief that *it can be otherwise*» (Nowotny / Schot 2018). For modal design, however, modal critique and accidence awareness are imperative.

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