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RESEARCH ARTICLE

Why Not Phase Out Animal Experimentation? Considering Objections from Freedom of Inquiry and Cross-Border Displacement

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Abstract

Animal experimentation raises value conflicts between animal protection and other goods, such as freedom of inquiry or health and safety. If governments can phase out the practice by non-prohibitive incentive-setting, the *pro tanto* moral rationale for doing so is obvious. So why should they not? This article first sketches a fictional scenario in which a government adopts a phase-out plan for animal experimentation. It then considers two moral objections to this plan: First, the plan unduly restricts freedom of inquiry, and second, it merely displaces animal experimentation across borders and thus fails to reduce animal suffering. Both arguments are refined premise by premise to articulate their strongest versions. The two objections can help to narrow down desiderata for good phase-out plans. However, they do not provide a compelling case against phase-out planning as such because they miss its incremental and constructive nature. Unless better arguments can be provided, it appears that government inaction on phasing out animal experimentation lacks moral justification.

Keywords: animal experimentation; animal research; freedom of inquiry; phase-out; transition

Introduction

Whether it is *excusable* to harm animals for testing purposes is a hotly contested issue. That it is *regrettable* is not. A growing number of legislations around the world formally acknowledge that animals are worth protecting for their own sake,[1] including the European Union in Preamble 12 of Directive 2010/63/EU. But the same political bodies typically make other provisions—say, for free scientific inquiry and for health and safety testing—which can conflict with animal protection. This value conflict is typically resolved through balancing, as in animal experimentation committees. But as Brigid Brophy said, "the moral thing to do about a moral dilemma is circumvent it."[2] Thus, that we should work to avoid the value conflicts that arise through animal experimentation—the kind that harms animals, anyway (from here on called "AE")[3]—can be considered a moral consensus position.[4]

The moral consensus is reflected, for instance, in a 2021 resolution accepted by an overwhelming majority of the European Parliament that called for the creation of a phase-out strategy for all AE,[5] in the German government coalition's promise to present a "reduction strategy" for AE,[6] and in the Dutch authorities' requests for plans to lower reliance on AE.[7,8] However, governments so far have not followed suit—the European Commission has not actually developed a phase-out plan, the German government (as of the time of writing) has not published the promised reduction strategy, and the Dutch government has not implemented most of the advice it received. Meanwhile, in the USA, the UK, and Switzerland, political calls for phase-out planning were made but not followed so far.[9] Though various jurisdictions support research and development of alternatives to AE, they do so largely under the banner of "replace,

reduce, refine."[10] These "three Rs" represent a framework for continuous, open-ended improvement, but not for a clear reduction or phase-out strategy.[11]

The moral consensus should also be the moral default. The question to ask is not why governments *should* strategize for the phase-out of AE, but why they should *not*. Are there any good moral reasons for government inaction on phase-out planning for AE?[12] In the following, I will approach this question by first sketching a fictional phase-out scenario (section "What is the proposal?"). I will then discuss two arguments: first, that phase-out planning is morally bad because it violates freedom of inquiry (section "The argument from freedom of inquiry"); second, that phase-out planning is futile because it merely displaces AE across borders (section "The argument from displacement"). Each argument will be stated in a basic form, tested against potential objections, and refined to ensure it is not a strawman. However, even in their refined versions, the two arguments fail to be convincing. The article will conclude that, if there are any good moral reasons against phase-out planning, they cannot be these two. As long as no better arguments are presented, we can presume that governments have no good moral reasons to remain inactive on the strategic phase-out of AE.

What is the proposal?

Political demands for phase-out plans arose in the 2010s.[13] The term "phase-out plan" refers to a package of measures to be taken, milestones to be met along the way, and metrics to be monitored to track progress.[14] The basic idea is that government action on AE, just like on greenhouse gas emissions, should be strategic and transformative rather than merely regulative.

There is thus an important difference between a plan and a ban. Stricter regulation is one tool in the toolbox, but it may be optional and certainly does not constitute a full plan. By analogy, a smoker does not have a plan for how to quit smoking just because someone forbids them to do it. A plan should tell the smoker what to do, not just what to omit, in order to reach their ultimate goal. There should also be interim goals whose achievement can be reviewed, and failure should trigger adjustments. A mere smoking ban provides none of this. Likewise, a mere ban on AE does not constitute a plan for how to phase it out.

To put a more specific idea of phase-out planning on the table for further discussion, imagine the following.

Phase-out scenario

The government of country C is petitioned to create a phase-out plan for AE. C is an active research hub of international repute with a National Science Funding Agency that distributes considerable public resources to research projects. C also provides favorable conditions for private research, for example, in the pharmaceutical and chemical industries. Its neighbors D, E, and F are however similarly attractive research hubs. The government, struck by the force of the petitioners' arguments, instructs its administration to sketch a 30-year plan ("the Plan"), the timespan being roughly inspired by the duration of an academic working life (post-doctorate). The goal is to reach "zero-AE," meaning zero procedures on animals requested or funded by the government that crosses a specific threshold of harm defined in C's preexisting regulations.[15] The sketch undergoes a consultation process involving stakeholders and the public, is refined and presented to parliament. Parliament then approves a dedicated law, the AE Transition Act, to make the Plan binding. The Plan itself contains a range of different measures, the most important of which are the following[16]:

1) Creation of a Transition Fund that can be used, for example, to fund the provision of non-AE research infrastructure;
2) Creation of a Transition Committee that tracks progress and advises on adjustments;

3) Reallocation of existing research funding from AE to non-AE projects without reducing overall funding;
4) Mandatory courses on non-AE methodologies and systematic reviews[17] for all biomedical students and researchers;
5) Establishment of a "helpathon"[18] network, which advises researchers on how to revise their research ideas to make do without AE, and increases requirements to participate in helpathons before one can be granted an AE license;
6) A review of regulatory animal tests required by the regulator and a dedicated program to research-and-develop missing non-AE assays or the revision of toxicological endpoints;
7) Tax incentives for private companies to reduce their reliance on AE.

These measures are integrated into a cohesive plan, complete with associated build-up targets (such as the ratio of resources spent on AE versus non-AE projects; percentages of biomedical students reached with education programs; number of missing assays developed) and reduction targets (such as number of animals in AE; AE licenses requested). Associated figures are monitored. Failures to meet milestones trigger adjustments in measures. However, no ban on AE is instituted.

The question is: What moral mistake, if any, would the government of country C be committing? The objections that have been voiced against phase-out planning in the political arena are of limited relevance here, because they are not talking about phase-out planning in the same sense. One example is a press release by a Dutch pro-AE pressure group, which equated phase-out planning with an "abrupt ban"[19] on AE, quite contrary to the wording of the proposal at issue.[20] Another example is the European Commission's argument that phase-out planning is infeasible because one cannot know when alternatives to various animal procedures will become available.[21] The Commission seems not to have considered that accelerating the development of these alternatives could itself be the object of planning, and instead understood a phase-out plan as essentially a timed ban. Thus, explicit arguments against phase-out planning for AE have so far missed their target.

But one could articulate more robust objections on opponents' behalf. In the following, two will be discussed: The Plan would unduly restrict scientific freedom, and it would achieve little beyond displacing AE abroad. These are two classic issues in debates about restricting AE. Animal researchers since the 1980s have often defended their work in terms of freedom of inquiry[22,23] and today, it is not uncommon to see this freedom put on a par with animal protection. For example, Anna Olsson and colleagues assert that "academic freedom is an important value alongside animal welfare and an important part of the debate is concerned with which is most important."[24] The concern of cross-border displacement of AE is also common. Thus, Steffi Bressers and colleagues found that many Dutch animal researchers said they would move their research abroad if it was banned.[25] According to Swiss polling ahead of a popular vote on banning AE, cross-border displacement was the most important worry that swayed voters against the proposal.[26] That these two familiar concerns may also have bearing on phase-out planning for AE was acknowledged by a Dutch scientific committee in what is perhaps the most influential opinion paper on the topic to date.[27] In my experience directly talking with animal researchers and other involved people (including regulators and "three Rs" professionals), the two concerns are repeatedly voiced. So are they compelling?

My goal is to move the debate forward by putting the arguments in writing, refining them, and critically assessing them. According to the following discussion, the two objections are helpful in specifying criteria for *good* phase-out planning—the extent to which it needs to respect freedom of inquiry and mind the mobility incentives it sets for researchers. However, they do not make a compelling case against all phase-out planning because they miss its incremental and constructive nature. They essentially still confuse planning with banning.

Disparate as the two concerns of freedom of inquiry and cross-border displacement may seem at first, they actually have something in common. They match the tropes described by Albert Hirschman as the "rhetoric of reaction."[28] The concern that phase-out planning is a threat to freedom of inquiry is an instance of the "jeopardy" trope, which argues that a given challenge to the status quo threatens a fundamental good of society. The objection that phase-out planning would merely displace AE represents

the other two Hirschman tropes, "futility" and "perversity," according to which reforms are either pointless or counterproductive. Thus, the selection of arguments with which this article engages is not haphazard.

However, the fact that the objections match tropes of reactionary rhetoric does not show that they are not sound. A broken clock is right twice a day, and Hirschman tropes might sometimes get things right too. So, the arguments deserve scrutiny. In the following, consider the two arguments in turn.

The argument from freedom of inquiry

A critic of the Plan could argue that it constitutes government overreach. They might use broad terms such as "academic freedom" or "scientific freedom" to make their point, but at issue is the freedom to conduct research, not the freedom to teach or publish, thus, freedom of inquiry. Of course, this argument can only attack the parts of the Plan that target AE in scientific research, not the parts that target regulatory testing.[29] Still, the argument from freedom of inquiry argues against phase-out planning for a significant part of AE, and thus deserves attention.

In the following, consider first a basic and rather blunt way to state the argument. This basic argument will then be refined through a series of objections and revisions to develop its strongest version.

Argument from freedom of inquiry

1) *Definition*: Freedom of inquiry is the uninhibitedness of researchers in choosing the topics, questions, and methods of their own research.
2) *Do-not-restrict*: Freedom of inquiry must not be restricted.
3) *Undue-restriction*: The Plan unduly restricts freedom of inquiry.
4) *Conclusion*: Therefore, the Plan should not be implemented.

The argument thus stated is a helpful starting point for a discussion of the Plan's moral justification, but it needs some refinements. Consider the premises of the argument in turn.

Definition

The argument defines freedom of inquiry as "the uninhibitedness of researchers in choosing the topics, questions, and methods of their own research." It thus includes both what Torsten Wilholt has called the "freedom of ends" and the "freedom of means," meaning that researchers get to make decisions both about scientific objectives and methods.[30] The definition is ambiguous about whether it is *individual* researchers that enjoy freedom of inquiry or rather *groups* or whole *disciplines*, but this ambiguity is common in notions of scientific freedom.[31]

However, first, *Definition* is too sweeping in that it does not define *who* shall not interfere in researchers' choices and *who* owes them support. To be fully uninhibited in their choices, researchers would need unlimited resources and a license to violate everyone's rights. This cannot be what a critic of the Plan has in mind. And indeed, freedom of inquiry is traditionally understood as a freedom *vis à vis authorities*, most importantly the state,[32] that is, the choice of research topics, questions, and methods, shall not be inhibited *by contingent obstacles raised by the state.*[33] The paradigmatic restriction on freedom of inquiry would be a state-instituted ban on particular research topics.

Second, in its stated form, *Definition* seems too broad because, being purely negative, it does not specify any standards by which researchers should make their decisions. Freedom of inquiry is not the freedom to pursue one's passion whatever it may be, such as a sadist's passion for inflicting pain or an elitist's passion for the academic lifestyle. It is specifically a researcher's freedom to do what they, based on their best scientific opinion, deem to be in the interest of advancing collective knowledge.[34] So *Definition* should also be revised by specifying that researchers' decisions should be *free to be guided by their best scientific opinion.*

A third problem is that *Definition* does not specify who counts as a researcher. This is a problem especially when freedom of inquiry is tied to scientific opinion. For instance, a state that guarantees

freedom of inquiry does not have to allow children and ignoramuses to do whatever satisfies their curiosities based on their limited knowledge, and this is not just because their freedom is restricted by someone else's. Their curiosities are not covered by freedom of inquiry. So *Definition* should also refer to some *standard of scientific qualification.*

Based on these considerations, we can refine *Definition*:

> *Definition*$_2$: Freedom of inquiry is the uninhibitedness of qualified researchers by the state in choosing topics, questions, and methods based on their best scientific opinion.

This definition still raises a number of issues. One of them is whether a state can guarantee freedom of inquiry only if it provides public resources for research, and if so, how much it needs to provide. It does not seem plausible that freedom of inquiry could be truly guaranteed in a society where researchers' choices are restricted to what serves private funders' interests.[35] But how much the state needs to provide, and how freely, is an issue on which reasonable people might disagree,[36] and not obvious grounds for revision of *Definition*$_2$. For the moment, it seems like a charitable enough interpretation of what a critic of the Plan might have in mind.

Do not restrict

Do-not-restrict states that "freedom of inquiry must not be restricted." But absolutism about freedom of inquiry is clearly implausible.[37,38] Even if freedom of inquiry is worth protecting, it does not simply trump all countervailing considerations, such as human rights. The critic of the Plan should agree with this. What they mean, rather, is that freedom of inquiry has a high status as a good. It should be guaranteed by default and restricted only based on sufficient reasons.

What reasons can justify a restriction of freedom of inquiry? In many legislations, freedom of inquiry is a good protected at the highest, constitutional level. When it conflicts with equally protected goods, a balancing procedure is applied. For example, when freedom of inquiry conflicts with animal welfare, a committee is tasked with balancing the goods in the particular case. The committee members' verdict may be informed by some formalized procedure of harm-benefit analysis,[39] but deciding whether a study's benefits are likely and important enough to outweigh its harms is ultimately a judgment call, which is subjective in the sense that committee members cannot be wrong about their own personal balancing. But for this very reason, the balancing approach tells us nothing about the conditions under which citizens are *right* to restrict freedom of inquiry.

Another way to approach the question of when freedom of inquiry may be restricted is to consider the reasons *not* to restrict it. What makes freedom of inquiry valuable? As Kurt Bayertz has pointed out, different kinds of scientific freedom are valuable for different reasons, and each faces their own difficulties.[40] According to an Aristotelian tradition, freedom of inquiry is valuable because knowledge satisfies human curiosity, but this justifies very little unless we unduly exalt curiosity above other human needs.[41] A Kantian tradition rather views freedom of inquiry as a necessary condition of enlightenment, ultimately freeing people and societies from limitations imposed by superstitions and other intellectual errors, but the kind of critical and ideologically subversive science that this argument justifies is not the kind mostly pursued today.[42] Finally, a Baconian tradition views scientific freedom as valuable because it enables industrial application and thus increases human happiness, but this tends to discount the harms science can also help to create—think atomic bombs.[43]

In defense of freedom of inquiry along Baconian lines, one could argue that even if science always comes with risks, it makes its greatest contributions to human happiness when it is unconstrained by the state. Arguments to this effect were developed particularly by neoliberal thinkers around the middle of the 20th century.[44,45,46] As Michael Polanyi argued, science resembles a free-market economy in that it is a system of mutual adjustment.[47] Researchers are trying to make high-value contributions while taking into consideration what others are contributing. But scientific knowledge is constantly and rapidly changing,

as are the conditions under which it is produced. Making successful contributions also requires "tacit knowledge,"[48] that is, non-explicit knowledge, for example about what particular researchers are competent to do and who can fruitfully collaborate with whom. Individual researchers naturally collect and update this knowledge as it pertains to their own work, but no central authority could ever keep track of it all. So, centrally planning science is counterproductive. Better to let science be guided by its own "invisible hand."[49]

However, *pace* Polanyi, free-market economies also show that systems of mutual adjustment can fail to serve the public interest. For example, underregulated markets allow externalizing costs and internalizing profits, harming humans and animals and changing the planet for the worse. When it comes to science, the existence of neglected diseases[50,51] suggests that mutual adjustment under current conditions does not allocate scientific attention optimally for the (global) public interest.[52] Other examples of "undone science"—research that would be in the public interest, but is barely being done[53]—include environmental and community health studies that threaten private interests, for example, of pesticide producers,[54] studies that demonstrate the safety of environmentally desirable technologies against which unfounded health concerns are raised, for example, "smart meters" to track electricity usage,[55] and studies on areas that are neglected due to cultural biases, for example, male as opposed to female reproductive medicine.[56] In practice, the need for at least occasional state interventions to keep science aligned with the public interest is already acknowledged in vehicles for mission-oriented research and development,[57] such as Switzerland's National Research Programmes, which respond to issues of strong public interest that are unduly neglected.[58]

To defend freedom of inquiry further, one could argue that state non-interference in science should still be the rule, intervention the exception. Even if the state sometimes needs to intervene to realign science with the public interest, a full-on central planning of scientific priorities is not advisable. *By default*, then, we should let qualified researchers choose their topics, questions, and methods according to their best scientific opinion.

This status of freedom of inquiry as a strong default can also be codified as a fundamental right, as many jurisdictions do.[59] Taking a cue from Swiss constitutional law, one could then say that restrictions need to have a legal basis, must be justified by an overriding public interest, must be proportional (sufficient, necessary, reasonable), and must retain the essence of the fundamental right.[60] The aforementioned Swiss National Research Programmes plausibly pass this test, at least if they respond to issues that are truly in the public interest and their intervention—which primarily consists in the provision of extra research funds, thus in setting incentives and not directly foreclosing any choices made by researchers—is minimal.

A refined version of *Do-not-restrict* could thus read:

> *Do-not-restrict*$_2$: Freedom of inquiry should be unrestricted by the state, except if restrictions have a legal basis, are justified by the public interest, are proportional (sufficient, necessary, reasonable), and retain the essence of freedom of inquiry.

Of course, many terms in this premise call for clarification. But in contrast to the initial statement of *Do-not-restrict*, the revised *Do-not-restrict*$_2$ looks defensible. According to this version of the claim, freedom of inquiry is a very high good, worth protecting at the level of a fundamental right. However, weakening the original absolutism of *Do-not-restrict* in this way raises the question of whether the Plan really represents an undue restriction of freedom of inquiry, as *Undue-restriction* claims.

Undue restriction

The claim that the Plan unduly restricts freedom of inquiry can now be specified based on *Do-not-restrict*$_2$:

Undue-restriction$_2$: The plan unduly restricts freedom of inquiry by fulfilling at least one of the following criteria:

(a) it has no legal basis;
(b) it is not justified by the public interest;
(c) it is not proportional (thus insufficient, unnecessary, or unreasonable);
(d) it violates the core idea of freedom of inquiry.

Are any of these plausible to say of the Plan? As the parliament of C created the legal basis for the Plan, condition (a) is not a problem. For conditions (c) and (d), more clarification would be necessary to see if the Plan is truly in compliance. However, given that the Plan rests on wholly non-prohibitive measures and leaves freedom of inquiry untouched apart from setting certain financial and institutional incentives to transition away from AE, it seems likely that it would pass a charitable interpretation of these criteria (as much as current programs for mission-oriented research and development do). Anyway, if a critic of the Plan is in general a defender of AE, then the criterion of interest is (b), justification by the public interest.

Here, the notion of the "public interest" needs some scrutiny. Whose interest is this, exactly? *Undue-restriction*$_2$ would be trivially false if animals' interests figured in the public interest, as they arguably should if they have moral status. AE is one of the many areas of human practice that harm so many animals so deeply that, even on a hierarchical view of moral status,[61] it is difficult to justify morally. In defense of *Undue-restriction*$_2$, one could, however, argue that the "public interest" is not simply the aggregate interest of all affected, but rather the interest of the political *community*, thus also called the "common good." And the political community, they could argue, consists of citizens, not animals or all affected by the state's actions.[62] Thus, it is *citizens*, and not all affected, whose good publicly supported science should serve primarily.

The anthropocentrism inherent in this line of argument seems hard to reconcile with the commitment of many legislations to protecting animals for their own sake.[63] How can one claim to be recognizing animals as beings who matter, if one then excludes their good from the public interest? For the moment, however, we may concede that one *could* delineate the public interest in an exclusively anthropocentric way, and thus the claim is not obviously false.

The crucial question, then, is whether the Plan is justified by the citizens' public interest. A proponent can argue that given that AE raises a conflict between highly valued goods, moving away from it is in the public interest other things being equal. In the case of C, the polity as embodied in petitioners and parliament furthermore voiced its support. They could add that AE is expensive to the taxpayer,[64,65] a constant source of social conflict, and often inflicts moral distress on its own practitioners.[66] But the phrase "other things being equal" carries a lot of weight in the proponent's argument. Science cannot produce exactly the same output using a different set of methodologies. The question is whether a purposeful methodological shift would set the public interest back more than it advances it.

The obvious place to suspect detrimental consequences is in the Plan's defunding of AE. C would contribute less to progress on all the scientific fronts where reliance on AE is currently the norm. Although it would, on the other hand, contribute more on fronts where AE is not required, its overall pool of projects to choose from would be restricted. The likely result is that worse research would be funded on the whole. Thus, the Plan reduces the overall benefit generated from research in C.

Whether this worry is plausible depends on what research is available for funding. If the only possible reallocation moves resources from *more* beneficial areas of AE research to *less* beneficial non-AE research, less beneficial knowledge is generated with the same resource input. Likewise, if resources are moved from *well-designed* AE research to more *poorly designed* non-AE research, the public interest is advanced suboptimally. But more helpful reallocations may be possible. As mentioned previously, scientific resources are not currently being spent in the relative proportion justice would require.[67] So the Plan could aim to solve two problems at once, giving a particular boost to non-AE research in unduly neglected fields, thus moving resources from *less* beneficial to *more* beneficial areas. But this only works to the extent that such research is waiting to be funded in the first place. It might not work in what we can call a "poor research landscape," that is, a research landscape in which there

are not enough highly beneficial and well-designed non-AE research projects to exhaust the funding opportunities.

C may find itself in a poor research landscape to begin with. As a point of reference, in Switzerland in 2023, some 212 million in research funding was granted for basic biological and basic medical research (where a majority of Swiss AE is conducted),[68] while in the less AE-heavy areas of social and preventive medicine, only some 160 million were requested at all, and only some 27 million were deemed worth funding.[69] Thus, defunding AE might free up so many funds that it would be hard to find enough non-AE projects that are equally (or more) relevant and equally (or more) well-designed. Funding would need to be allocated according to looser filters. Thus, the quality of research would decline, and so would therefore societal benefits.

But at this point, the incremental and constructive nature of the Plan becomes crucial. If the current research landscape is too poor to allow for an immediate reallocation of research funds while retaining optimal social benefit, then the Plan can aim to "enrich" it, that is, to enable researchers to make highly beneficial and excellently designed non-AE contributions. The Plan's education, training, and "helpathon" measures, as well as its provision of funds for non-AE research infrastructure, can be understood in just this way.

While the decrease of AE in C is meant to result from its defunding, it can be predicated on a corresponding increase in the amount and quality of non-AE research in C. The idea is not to simply defund highly beneficial and well-designed AE research, but to create a landscape in which an increasing share of highly beneficial and well-designed research is non-AE-based. This can be built into the Plan by specifying that reallocation steps are only taken upon the success of corresponding enrichment steps. So a sufficiently cautious version of the Plan avoids the charge of jeopardizing the public interest through a hasty reallocation of resources. Because it also serves the public's interest in not having to trade off highly valued goods against each other, it is justified by the public interest. Therefore, it is plausible that there are versions of the Plan such that its soft, non-prohibitive restrictions on freedom of inquiry are justified.

In sum, on a charitable interpretation of freedom of inquiry and its value, it is very hard to argue that a phase-out plan as sketched in *phase-out scenario* would necessarily violate freedom of inquiry. This freedom may be considered a high good, but its protection is not absolute. Soft restrictions on researchers' selection of topics, questions, and methods are permissible if they fulfill certain criteria, including justification by the public interest. And provided that a phase-out plan is sufficiently cautious, achieving a defunding of AE only through a corresponding increase in non-AE research, it advances the public's strong interest in not having to choose between protecting animals and benefitting from science. So, a phase-out plan properly understood and cautiously implemented does not unduly restrict freedom of inquiry.

The argument from displacement

The Plan's critic could change tack. Regardless of whether phase-out planning is compatible with adequate protection of freedom of inquiry, the Plan would be futile. All it would achieve is that researchers would leave country C to conduct their AE in countries D, E, and F, who are similarly attractive research hubs but do not have phase-out plans. They could point to the case of Germany's ban on culling male chicks in the egg industry, which increased exports of live chicks to neighbors such as Poland, where most are presumably still killed off.[70] What is more, we can imagine the case such that C's animal welfare standards are superior to those of D, E, and F, so that displacement of research might in fact *increase* animal suffering on the whole.

Again, consider the argument in a basic form which can then be tested against objections and refined:

Argument from displacement

1) *Purpose:* The purpose of a phase-out plan is to decrease overall animal suffering in science.
2) *Displacement:* But the Plan merely displaces AE abroad.
3) *No-decrease:* If AE is merely displaced abroad, overall animal suffering in science is not decreased or is even increased.
4) *Conclusion:* Therefore, the Plan does not fulfill the purpose of a phase-out plan.

Clearly, the argument involves a great deal of speculation about matters of fact and hypothetical scenarios. Legal, management, and governance experts would presumably have something to say about the conditions under which *Displacement* is plausible. However, the speculations required for the argument also make some philosophical assumptions that deserve scrutiny. Consider the premises in turn.

Purpose

Purpose, which states that phase-out planning aims at decreasing overall animal suffering in science, gets at least part of the story right. Reducing animal suffering is usually a major motivation for political calls for phase-out planning.[71] The claim that this is *the* purpose, singular, might however understate the importance of other motivations. The Plan might pursue several purposes simultaneously—directly decreasing animal suffering, but also building up a leading research hub with a particular profile, fostering domestic innovation, and helping to overcome the scientific limitations of AE.

One can refine *Purpose* to account for this:

> *Purpose*$_2$: Decreasing overall animal suffering in science is one of the main purposes of phase-out planning.

This shift seems slight, but might undermine the whole argument, because it opens up the possibility that the Plan achieves the hoped-for decrease of animal suffering indirectly, by first aiming at some of its other goals. For example, the Plan might aim to decrease animal suffering by building up a leading non-AE research hub in C, which then creates non-AE breakthroughs that lead D, E, and F to put greater weight on non-AE research too. The argument from displacement is at its most convincing when we assume that phase-out planning tries to follow an exceedingly simple-minded logic of impact, where the phase-out of AE in C simply subtracts C's portion of animal suffering from the global tally. In reality, a phase-out plan might aim at impact in much more complex ways. The question, of course, is whether this is likely to work, and that is what the next premise, *Displacement*, denies.

Displacement

Displacement states that "the Plan merely displaces AE abroad." This can be true regardless of what complex purposes the Plan is meant to pursue. The broad idea behind *Displacement* is that committed animal researchers will simply relocate to another research hub where conditions are more favorable. It seems plausible that this would happen, though it might be mitigated by the degree to which conducting AE in D, E, and F requires local and tacit knowledge, for example, about regulations, collaborators, and institutions. But this is not an insurmountable hurdle.

A proponent of the Plan might have two responses: First, displacement can be purposely mitigated further. As stated in *phase-out scenario*, the Plan contains dedicated measures in education and training, so that new generations of researchers are equipped to create and continue the non-AE lines of research C has chosen to favor. More senior researchers in C are increasingly required to participate in "helpathon" events, in which they collaborate with other experts to reformulate their research questions so they can be answered with non-AE methods.[72] This can also help them to form new collaboration networks, making it more attractive for them to think of new non-AE projects to begin with and overcome "scientific inertia."[73] Once they do decide to work on highly beneficial and well-designed non-AE projects, funding is available to them.

Second, if executed well, the Plan should not just cause a one-sided "brain drain," but rather a switch-around. Excellent researchers strongly committed to AE might leave, but equally excellent researchers who use non-AE methods can take their place. For, while *researchers* are highly mobile, *funding* largely stays put. This switch-around may at first be limited by the poverty of the research landscape, but again, the Plan can make defunding contingent on the success of enrichment measures. This allows monitoring how well freed-up funding is being utilized by newly attracted non-AE researchers. So the

switch-around, like all intended outcomes of a phase-out plan, could happen in a piecemeal and controlled manner.

The critic might respond that this still shows the Plan to be pointless or even harmful. What it directly achieves, if only in a piecemeal and controlled way, is a segregation of AE and non-AE research along C's borders. Researchers looking to conduct highly relevant and well-designed AE projects will presumably find funding in D, E, or F. The critic might refine *Displacement* accordingly:

> *Displacement*$_2$: The Plan merely causes a relocation of AE and non-AE researchers across C's borders, but does not directly decrease overall AE.

The proponent of the Plan could argue that, while C has phased out its funding of AE, its neighbors do not have a converse strategy of *increasing* their funding of AE. The researchers who leave C to apply for funding abroad have to compete for the limited funding available there, which might in part have gone to AE anyway. So C has effectively reduced the total worldwide budget for AE somewhat.

However, the proponent could also concede *Displacement*$_2$. Returning to the point raised in the discussion of *Purpose*, the Plan might aim at its ultimate impact—an overall decrease of animal suffering in science—in more complex ways than simply subtracting C's share of animal suffering from the global tally. Even if all the Plan directly achieves in its 30-year runtime is a relocation of researchers, it might still reduce animal suffering in more indirect ways. This raises the question of whether the third premise, *No-decrease*, is plausible.

No-decrease

No-decrease claims: "If AE is merely displaced abroad, overall animal suffering in science is not decreased or is even increased." This now needs to be rephrased to stay in line with *Displacement*$_2$:

> *No-decrease*$_2$: If AE and non-AE researchers are merely relocated across C's borders, overall animal suffering in science is not decreased or is even increased.

In favor of this premise, the Plan's critic could argue that C's decision to no longer pursue AE does not change the fact that there are good scientific reasons to pursue AE. By phasing out its support for AE and increasing its support for non-AE research, C has effectively removed the *non-epistemic* incentives for AE, but it cannot change the *epistemic* incentives. Questions that are scientifically highly significant still call for answers, and D, E, and F will be happy to pursue them, and might in fact do so under a worse animal welfare regime. But this raises the philosophical question of whether, or to what extent, the epistemic incentives for choosing particular topics, questions, and methods are set in stone.

The critic of the Plan would be well advised to appeal to a realist view of scientific significance, according to which significance is bestowed on questions by the world and not the scientist or society. Science, they might argue, is fundamentally in the business of exploring the universe and uncovering basic facts and laws. By adopting the Plan, C has epistemically closed off certain corners of the universe, namely, all the issues one could investigate only using AE. This gives all the more reason to D, E, and F to investigate precisely those corners, since we want to uncover as much of the universe as we can.

A proponent of the Plan could make either of two moves in response. First, they could accept the critic's realist approach to scientific significance, but argue that "epistemic bubbles" need not be bad for scientific exploration. At small scale, the effect has been noted that having one doggedly closed-minded member can be epistemically fruitful for a team because it poses a helpful challenge.[74] A similar effect might obtain at large scale when one country in an international community doggedly focuses on non-AE research. It might also help to find answers that seem false at first, but turn out to be plausible upon further investigation, which can be overlooked when epistemic communities align their opinions too quickly.[75] As the latter is also called the "Zollman effect,"[76] one might say C is turning itself into a "Zollman oasis" by pursuing non-AE approaches for longer, even if they initially look less promising

than competing AE approaches. Thus, C may not so much be leaving corners of the universe to be explored only by its neighbors, but instead uncovers them with less obvious means.

Second and more robustly, however, the proponent of the Plan might contest the critic's view that science's purpose is well framed as finding basic facts or exploring the universe. They might instead appeal to a more pragmatic view of scientific significance such as Philip Kitcher's,[77,78] according to which issues and questions are scientifically significant to the extent that addressing them helps us solve practical problems. Scientific methods are then essentially understood as meta-technologies: They help us develop responses to practical problems—even if, in the case of basic research, it is not always clear what practical problem is being addressed. But there can be multiple solutions to a problem, and multiple ways of finding them. Thus, what C is doing by adopting the plan is to strongly favor certain styles of scientific problem-solving over others. Because the ultimate goal is to solve problems, not to uncover a given set of information, C's increasing reliance on non-AE research does not increase D, E, and F's incentive to conduct AE, just like eating with chopsticks does not increase others' incentive to eat with forks and knives.

This view of the scientific enterprise makes it even more plausible that it profits from the creation of bubbles in which less orthodox approaches can be pursued. Innovation often requires spaces in which ideas can be incubated before facing competition with incumbent technologies. Such niche spaces typically include specialized markets, government-funded research labs, or private innovation hubs.[79,80] By adopting the plan, C is incrementally turning itself into a nation-sized incubator, both for the innovation of non-AE methods and for the research that utilizes them. This can lead to novel solutions that can disrupt incumbent technologies and scientific methods, reducing the global need for AE and thus overall animal suffering in science.

For example, C might attract cutting-edge research in personalized medicine more than its neighbors because this research does not have to compete for funding with AE-based biomedical research. Breakthroughs in personalized medicine then increase scientific attention and shift the biomedical research agenda toward more non-AE approaches. Thus, by deliberately turning itself into a research bubble, C may after all affect the overall amount of animal suffering in science without jeopardizing the public interest. In scenarios of this type, *No-decrease*$_2$ is not true.

Of course, there is no guarantee that the bubbles created by the Plan are epistemically and technologically helpful ones. But a phase-out plan could be combined with a research strategy for C that is based on a review of the promise of different non-AE approaches. In other words, C might deliberately opt into emphasizing a particular research area like personalized medicine (or social medicine, epidemiology, clinical research, etc.) to give its research bubble a particular edge, rather than leaving it to chance what kinds of non-AE research are being pursued.

At this point, the critic might argue that such scenarios are unachievable. They could insist on their realist view while denying that Zollman oases are worth creating. Or they could argue that non-AE approaches fare so poorly from a scientific standpoint that they are unlikely to ever produce any breakthrough solutions that can affect biomedical research agenda-setting. But both lines seem excessively pessimistic, especially when we take seriously the stakes of avoiding conflicts between goods the public values highly. In sum, the argument from displacement fails to be convincing because it fails to appreciate both the piecemeal nature of phase-out planning and the advantages of well-utilized niches.

In sum, neither the argument from freedom of inquiry nor the argument from displacement is plausible against all phase-out plans. But they help to narrow down what a good phase-out plan would look like:

First, it needs to contain sufficient enrichment measures to ensure that enough beneficial and well-designed non-AE research is available for funding, so that the reallocation of funds does not cause a decrease in societal benefits from research. Second, incremental reallocation steps should be made conditional on the success of enrichment steps. In case of failure, enrichment steps should be adjusted. Third, a phase-out plan needs to be combined with a plausible research strategy that creates helpful rather than unhelpful scientific bubbles. Actually developing plans that meet these desiderata is a challenge, but governments could begin to tackle it today.

Conclusion

This article has articulated, refined, and critically discussed two objections to phase-out planning for AE: that it unduly restricts freedom of inquiry and that it merely displaces AE instead of reducing it overall. These arguments were set in the context of a fictional *phase-out scenario* to facilitate the discussion. On closer inspection, both arguments turn out to have considerable philosophical presuppositions—about the grounds and extent of freedom of inquiry as a good, and about how scientific priorities can and should be set. Although they can help to narrow down what makes for a *good* phase-out plan, both arguments fail as blanket objections to phase-out planning, especially because they miss its incremental and constructive nature. The moral default position—that we should work to avoid the value conflicts raised by AE as soon as possible—thus still stands. Unless better arguments against phase-out planning can be provided, governments lack a good moral justification to remain inactive on phase-out planning for AE.

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Notes

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3. Depending on a given legislation's definition of the terms, there can be animal experiments without harm. This does not create the value conflict at issue here. By "AE," this article always means animal experiments that involve some harm to animals.
4. The greater moral consideration is given to animals, the more obvious this consensus view becomes. For, if we assume that animal protection is currently undervalued and scientific freedom overvalued, such that most AE commits all-things-considered wrongs, then avoiding future AE means avoiding value conflicts *and* all-things-considered wrongs. The point here, however, is that no particularly strong view about the moral status of animals is required to justify preventive measures to avoid AE in the future. Viewing AE as a site of value conflict at all is enough.
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29. Indeed, AE in regulatory testing enjoys less political support than AE in scientific research. The European Commission has promised a phase-out plan for regulatory animal testing, see note 21, European Commission 2023. And though it dropped its plan subsequently, the US EPA at least tried to phase out its regulatory AE, see note 9, EPA 2020.
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