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Technology, knowledge, governance: The political relevance of Husserl's critique of the epistemic effects of formalization

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Abstract:

This paper explores the political import of Husserl's critical discussion of the epistemic effects of the formalization of rational thinking. More specifically, it argues that this discussion is of direct relevance to make sense of the pervasive processes of 'technization', that is, of a mechanistic and superficial generation and use of knowledge, to be observed in current contexts of governance. Building upon Husserl's understanding of formalization as a symbolic technique for abstraction

in the thinking with and about numbers, I argue that processes of technization, while being necessary and legitimate procedures for the reduction of complexities, also may give rise to politically unresponsive and ultimately dysfunctional 'economies of thinking.' This paper is structured in three parts. In the first part I outline Husserl's account of the formalization and technization of thought and knowledge. In the second part I make my case for the political import of this account, departing in this context from positions that a) regard Husserl's discussions of formalization and its effects as merely epistemological, or that b) try to mobilize Husserl for a one-sided critique of instrumental reason. In the final part I address a major shortcoming of Husserl's account, namely its neglect of the concrete and historically evolving technological infrastructures of processes of formalization/technization.

Keywords:

Formalization – Technization – Governance – Edmund Husserl – Knowledge – Symbolic Technology – Political Technology – Political Rationality

1 Introduction

This paper mobilizes Edmund Husserl's critical discussion of the effects of the formalization of rational thinking to make sense of the pervasive processes of 'technization' to be observed at play in current contexts of governance. Particular emphasis is given to the constitution and use of rational knowledge that is made in such contexts. To clarify, 'governance' is used here in a minimal sense as the umbrella term for the activity of governing, where governance comprises the specific array of (formal and informal) mechanisms through which authority is exercised, and which aim to achieve the effective coordination of activities and the generation of behavioral compliance. This definition aligns in some respects with Foucault's governmentality approach, which also emphasizes the 'how' of governing over the question of 'who' governs/is governed.

In Husserl's discussions, technization designates a, for the most part implicit, transformation of the practice of rational thinking, as a result of which such thinking attains an increasingly reliable and efficient, yet at the same time superficial and mechanical dimension. For Husserl, technization follows in the wake of, and is inseparable from, the use of the symbolic technique of formalization allowing for extended calculability in thinking. Building upon Husserl accounts of formalization and technization, I argue that processes of technization, while being indispensable for the reduction of complexities, also harbor the tendency to give rise to politically unresponsive and ultimately dysfunctional 'economies of thinking.' In regard to the constitution of such economies, two particular traits of technization Husserl refers to will be focused upon in my discussion. These traits are, first, the *stimulation of forgetfulness*, and second, the *mechanization* and *'superficialization'* of rational thinking.

In applying Husserl's insights concerning the technization of thought to contemporary issues and contexts of governance, this paper further argues for the direct, maybe in view of recent shifts in governance practices heightened, political relevance of crucial elements of Husserl's philosophy.[1] This relevance, I claim, exists in spite of the fact that Husserl does not engage in detail with the major traditional and fundamental questions of political philosophy. More specifically, I argue that Husserl's thought, and his critique of technization more narrowly, is relevant to the analysis of, and concerns regarding, the role and function of the political rationalities and political technologies that are associated with current governance practices. In this regard, I propose, Husserl's account of technization is particularly instructive in that it allows one to at least partially undermine, in the discussion of governance, the arguably too clear-cut distinction Miller and Rose make between such rationalities and technologies and their respective modes of operation.[2] This is because Husserl's account of technization ultimately makes it possible to recognize and describe the often unnoticed technological constitution and functioning of specific political rationalities.

In arguing for the political relevance of Husserl's thought in this specific sense, I further attempt to correct what I perceive to be some serious gaps and oversimplifications which continue to exist in the literature. In particular, I show in this context that the view in some of the literature

[1] The elephant in the room here is the nature of the relation, and of the grounds for distinction, between 'politics' and 'administration' – a subject of continuing debate in both the fields of political science and public administration (see for a recent overview Overeem, 2012). This paper is based on the assumption that, from a governance perspective, strictly separating politics and administration, most of all on the basis of instrumental 'ends-means' or hierarchical 'higher-lower' oppositions, remains problematic. This is mainly for the reason that in the political system, political ends cannot be determined independent of means, and even are often influenced by the availability of means from the very start, and for the reason that power is exercised also 'from below' (see Luhmann 1966, pp. 274-275; the latter point is of course also made by Foucault (see, e.g., Foucault 1978, p. 94)).

[2] Miller and Rose (2008) derive the concepts of 'political rationality' and 'political technology' from Foucault, in apparently quite liberal manner however. The former concept of 'political rationality', it is claimed by Miller and Rose, denotes an epistemological domain of political reason, that is, a field "in which conceptions of the proper ends and means of government are articulated" (p. 30). By comparison, the latter concept of 'political technology' is taken to denote a technological domain of mechanisms, processes and practices through which this reason is put into practice, that is, which "seek to translate thought into the domain of reality" (p. 32).

that Husserl's critique of technization is merely epistemologically motivated is unwarranted, and that the attempt that has been made by others to one-sidedly appropriate Husserl for a universal critique of instrumental reason is highly problematic.[3]

This paper is structured in three parts. In the first part I outline Husserl's accounts of the formalization and technization of rational knowledge and thinking. In the second part I make my case for the genuine and ongoing political import of Husserl's account of technization and of Husserl's philosophy more generally. This will be achieved through making this account critically bear on contemporary articulations of formalizing modes of governance. In the final part of this paper I briefly address what I hold to be a major shortcoming of Husserl's discussion, namely the neglect of the concrete, historically evolving, technological infrastructures of the processes of formalization/technization.

[3] I will develop on the reception of Husserl's phenomenological philosophy in political theory and philosophy in section 3.1.

2 Husserl's discussion of the epistemic effects of formalization: An overview

Husserl's philosophical critique of the epistemic effects of formalization is developed in the context of his much broader genetic-phenomenological project of an exploration of the genesis and development of the sense of modern rational thinking.[4] In this project, Husserl identifies two closely related critical developments pertaining to the formation of such thought, both of which, he claims, constitutively entail a specific form of forgetfulness.[5]

The first critical development consists in the modern accomplishment of the overarching mathematical *idealization* of the natural world, as a result of which such world is scientifically regarded as an objective entity that is inherently mathematical. According to Husserl, such modern understanding of the world as inherently mathematical is mainly problematic in that it takes "for *true being* what in truth is only a *method*"[6]; albeit, as Husserl does not cede to emphasize, a very powerful and constructive method.[7]

The second critical development consists in a process that Husserl refers to as '*technization*.' Put briefly, in Husserl's writings, 'technization' designates an, as it were, 'internal' transformation of modern rational thinking, through which such thinking "becomes a sort of technique."[8] This, Husserl notes, is mainly due to the fact that the method informing such thinking, as a result of various epistemic-historical shifts, has attained an increasingly technical character. Husserl sees the effects of such a process of technization as deeply ambivalent. While technization has transformed the rational method into a "machine" that is "reliable in accomplishing obviously

[4] Husserl (1970a; 1970b).
[5] See Rang (1989).
[6] Husserl (1970a, p. 51).
[7] One should note that this does not mean that Husserl in his later writings questions the objectivity of geometrical and mathematical concepts per se, which for him however is necessarily an "'ideal' objectivity" (Husserl 1970b, p. 356).
[8] Husserl (1970a, p. 46).

very useful things,"[9] it also has imposed, he argues, some serious and for the most part unnoticed cognitive restrictions.

Following Husserl's discussion one can distinguish at least two related manifestations of such a cognitive restriction. First, the use of such a technical method tends to induce a certain degree of passivity and mechanism in thinking. Second, and related to this, for Husserl technization induces, on part of the human agents routinely using the technical method, forgetfulness concerning the method's own constitution.

Both the mechanization of thinking as well as the stimulation of forgetfulness stem from the fact that a technical method can be operated easily and effectively by sufficiently skilled human agents, while not at all requiring that those very agents apprehend the sense of the accomplishments which make this method operative in the first place, and that of processes through which this method and the results produced by it originally gained their own sense of truth.[10] In this sense, what Husserl refers to as the technical method indeed appears to resemble in its functioning that of a 'real' machine of production. For such a machine can be effectively used by any trained human operator who does not have understanding of this machine's inner workings and construction. The upshot of all this is for Husserl that technization implies a potential loss of truly scientific thinking – scientific thinking understood here as a form of enquiry that persistently endeavors to have true understanding of its constitution, including that of its own methods, and that of their genesis and the sense of truth they bestow.

All this begs the question concerning the precise origin and nature of the technization of method Husserl refers to. As a matter of fact, Husserl's notion of technization is a rather specific one,

[9] Husserl (1970a, p. 52).
[10] See Husserl (1970a, p. 46).

and arguably somewhat limited in its scope (see for more detail my discussion in section 4). The particular type of technization that Husserl discusses in his writings is, from his point of view, closely associated with the use of the symbolic technique of formalization – without formalization and technization however being one and the same process. On a general level, what the technique of formalization does is enable the *formal* description of a wide range of processes, in rigid abstraction from any concrete referents and situations. Such formal description is first achieved through using a clearly defined set of material symbols to describe processes *schematically*, through a decontextualized procedure that is in principle repeatable indefinitely, with explicit and well-defined rules existing for the manipulation of these symbols.[11]

In his discussions of technization, Husserl departs from conventional views of formalization in that he considers formalization to be in its functioning something other than merely a powerful but ultimately epistemically neutral method. Rather, Husserl notes, the use of formal methods tends to induce a, for the most part unnoticed, and hence unreflected upon, transformation of rational thought itself, and of the knowledge that is produced on its basis. Precisely such transformation is the process of technization referred to above already, that is, the process whereby rational thought attains an increasingly mechanical and forgetful character. Such peculiar propensity of formalization to stimulate technization apparently is for Husserl the other side of the coin of formalization allowing for extended calculability and economy in rational thinking. [12]

[11] See Krämer (1988, pp. 1-3).
[12] See Husserl (1970a, p. 46-47).

What is first of all important in regard to this linking of technization to formalization is that for Husserl the use of the formal method unavoidably involves an "emptying" and "externalization of meaning."[13] The source of such externalization in formalized rational thinking is for Husserl that such thinking operates with semantically emptied, formal 'meanings.' What characterizes such meanings is that they are operative only within the strictly regulated context of games, in the case of mathematical formalisms that of games of calculation, that are guided by stringent rules: "One operates with letters and with signs for connections and relations (+, x, =, etc.), according to *rules of the game* for arranging them together in a way not essentially different, in fact, from a game of cards or chess."[14] This explains why, within the domain of formalized thought, one does not reflect upon what the symbols employed really stand for, and on the original context which first of all gave meaning to them.[15] Likewise, Husserl observes, what tends to be dispensed with in such modes of thought are any profound reflections on the (constitution of the) sense of truth formalized thought processes bestow.[16] This, one may argue, is because the truth or falsity of a formal statement does not depend on the interpretation of its content – the formal description of a simple addition through mathematical symbols (e.g., 6+4=10) is the one and the same regardless of whether one adds apples or pencils. Nor, for that matter, does it depend on the particular point of view of the symbol-manipulator. Rather, what matters is the correct use and manipulation of symbols, according to well-defined and explicit rules.

Husserl further links such process of the externalization of meaning to a more general "tendency" toward "externalization" that, he suggests, characterizes "the essence of all [natural-

[13] Husserl (1970a, p. 44, translation modification).
[14] Husserl (1970a, p. 46).
[15] See Husserl (1970a, p. 46).
[16] Husserl (1970a, p. 46).

scientific] method."[17] Such latter externalization manifests itself in the phenomenon that the scientific method itself tends to be too readily taken for granted as an objective fact – a risk that for obvious reasons increases the more reliable and effective, that is, the more technical the method in question is. Hence, one may argue, the particular propensity of formal methods to stimulate technization: In formalized thought processes running smoothly and reliably, Husserl notes, any more fundamental considerations concerning truth and genesis of this method and of the results it produces, tend to become – Husserl maybe not coincidentally uses a technical metaphor – "switched off [ausgeschaltet]."[18]

The discussion of formalization and its effects up to now has remained of a rather general nature. What has been ignored is what Husserl regards as the specific mathematical dimensions of the technization of rational thinking. It is these dimensions that I will focus on in the remainder of the discussion presented in this section.

The modern phenomenon of the reduction of rational thought to a mere technique, that is, to a procedure that operates mechanically and predictably like a machine, is according to Husserl the result of some decisive epistemic shifts in the thinking with and about numbers. The most important of those shifts is for Husserl the transition toward a *symbolic conception of number*, as a result of which the numbers employed in rational thinking attain a "displaced, 'symbolic' meaning."[19] Husserl refers to Descartes' algebraization of geometry as the paradigmatic case of such a displacement. This, Husserl notes, is because in formulae-based algebraic practice, numbers are no longer conceived of as expressions of geometrical shapes and bodies, but, qua

[17] Husserl (1970a, p. 48, my insertion, translation modification).
[18] Husserl (1970a, p. 46, my insertion, translation modification).
[19] Husserl (1970a, p. 45).

their symbolic form, as abstract multiplicities.[20] As such, they are displaced from their geometrical signification that originally gave them their meaning, and, in algebraic calculation, increasingly taken as an unquestioned part of the repertoire of rational thinking, where all that is remembered in the end is that "the numbers signify magnitudes."[21]

For reasons of clarity it is useful to consider Husserl's point concerning the transition toward a symbolic concept of number and its cognitive implications in light of the writings of historian of ideas and philosopher Jacob Klein. [22]

In his grand historical-philosophical study on *Greek Mathematical Thought and the Origin of Algebr*a,[23] Klein, in meticulous detail, explores the conceptual shifts that have led to the emergence of the influential type of modern rationalist thinking that is constituted through the use of what Klein refers to as "symbol-generated abstraction." According to Klein, the decisive shift in this regard is the departure from a conception of number that regards numbers as first order abstractions from concrete referents such as a definite number of material bodies. In its stead, an understanding emerges in which number, qua its symbolic expression, is conceived of as an abstract multiplicity. In this latter conceptual form, a number essentially is constituted in terms of its being a symbolic *abstraction from an abstraction*, where a number symbol signifies, as Klein puts in one of his later essays, "the *concept* of the number as a multitude of units."[24]

At the same time, Klein notes with particular reference to Descartes, the modern emergence of such a symbolic conception of number is however accompanied by a reification of such

[20] Husserl (1970a, p. 44).
[21] Husserl (1970a, p. 44).
[22] For a recent, both seminal and comprehensive discussion of the relationship between Klein's and Husserl's work see Hopkins (2012).
[23] Klein (1968).
[24] Klein (1985, pp. 62-63).

concepts.[25] This reification has its basis in a peculiar conceptual marriage between the notion of the world as extended substance and this world's abstract symbolic-mathematical representation: In the Cartesian system, one can find a direct identification of "the 'general' object of this *mathesis universalis* – which can be represented and conceived of only *symbolically* – with the 'substance' of the world, with corporeality as 'extensio.'"[26] As such, the substance of the world, qua extension, is in its essence conceived of as being reducible to the formal-symbolic language of algebra. This implies that the abstract, symbol-generated domain of formal mathematics is ultimately believed to directly and objectively 'represent' the world's innermost reality.

The ultimate result of all this, Klein's analysis suggests, is the birth of a peculiar, symbol-generated style of rationalist thinking that has proven to be immensely influential for modern science and culture alike. What characterizes this specific form of rationalist thinking is that it is constituted on the basis of a paradox. This paradox becomes clearly manifest when scrutinizing the ways in which such rationalism conceives of how its own concepts refer to the world. On the one hand, in modern, symbolic rationalism, the world is cognitively approached indirectly, through symbolic number concepts, and thus "by means of concepts which are abstractions of abstractions."[27] On the other hand, however, it is the very same concepts that are theoretically posited and subsequently taken for granted as being "in direct contact with the world."[28]

[25] Klein (1985, p. 63).
[26] Klein (1968, p. 197).
[27] Klein (1985, p. 64).
[28] Klein (1985, p. 65).

3 The political dimensions and relevance of Husserl's critique of formalization

In the previous section I have provided an overview of Husserl's theoretical account of the epistemic effects of the use of techniques of formalization in rational thinking. The aim of this section is to enquire into the political import of this account and of Husserl's philosophy more generally. My discussion in this regard will be divided into two parts.

In the first part I provide a succinct overview of some of the critical, at least indirectly politically relevant dimensions of Husserl's philosophy, first more generally, and then in particular regard to his theory of technization. In this context of my discussion, I also link Husserl's discussion of technization to the work of Max Weber on bureaucratic forms of governance, and further pay some attention to the ways in which Husserl's philosophy has been framed and received in political philosophy and theory.

In the second part I identify and discuss contemporary articulations of formalizing modes of governance that exhibit the tendency of technization. This is to demonstrate the direct relevance of Husserl's account of technization for understanding, and criticizing, contemporary developments in governance.

3.1 The political dimensions of Husserl's philosophy

On the face of it, the answer to the question concerning the general political import and contents of Husserl's phenomenological philosophy appears relatively straightforward. As a matter of fact, nowhere in his writings (even including the enormous body of posthumously manuscripts) did Husserl ever embark on systematically formulating a political philosophy, or address issues

that could be referred to as political, at least not in a comprehensive or explicit manner.[29] This however should not come as a big surprise, given that Husserl's explicit aims of developing a 'pure' phenomenology, and of re-establishing philosophy as a rigorous science,[30] apparently exclude any more political considerations that run the risk to turn philosophical thought into an ideological and particular *Weltanschauungsphilosophie.*

A more scrutinizing perspective reveals however that things are more intricate than they appear initially. It is true that Husserl indeed sets his own philosophical project apart from those modes of thinking that aim to express and reflect political, cultural and historical particularities. At the same time, however, he sees his own, more 'scientific' philosophical project as directly having cultural, and, one may argue, by extension political ramifications.[31] This is due to the fact that for Husserl, "the highest interests of human culture demand the development of a rigorous scientific philosophy."[32] The key to understanding Husserl's stance is his assessment of the link between science and culture: Husserl considers science and rationality more generally to constitute the foundation of modern culture, and regards science as the key to the cultural 'progress' in the mastery of both nature and men.[33] This explains why the Husserlian attempt of turning philosophy into a rigorous science, with sound theoretical foundations, at the same time

[29] See Schuhmann (1988, p. 18), who estimates that in the first twenty volumes of the *Husserliana*, the German word 'Politik' does not appear more than ten times. The lack of explicit and systematic considerations of political themes in Husserl's work may explain why there are, to the best of my knowledge, remarkably few more comprehensive publications that are explicitly devoted to the political dimensions of Husserl's philosophy. One notable exception to this, which is published in the German only, is Schuhmann's (1988) attempt of reconstructing Husserl's philosophy of the state (*Staatsphilosophie*). More sustained considerations of the political dimensions and implications of Husserl's thought can also be found in Schnell, which is likewise only available in the German (1995), and in Velkley (1987). What is missing in all these texts, however, is a profound consideration of and argument for the direct political relevance of Husserl's theory of technization.

[30] Husserl (1965).

[31] At the same time, and without being able to expand on this point in more detail here, Husserl also holds *Weltanschauungsphilosophie* to possess its own legitimacy and place, which is based on him linking *Weltanschauung* to wisdom (Husserl 1965, pp. 131-134; see on this point also Straus 1972, pp. 7-8).

[32] Husserl (1965, p. 78).

[33] Husserl (1970a, p. 66).

should be seen as a philosophical attempt of addressing the task of working with and repairing the foundations of a culture.[34]

Such repairing of the foundations of modern culture is the more imperative for Husserl due to the diagnosis presented in many of his later lectures and writings that such culture is in a state of fundamental crisis. Mirroring his earlier assessments, Husserl considers the crisis of culture to have its roots in a crisis of science and rationality. This is however not the place to rehearse Husserl's crisis diagnosis in its entirety.[35] I will also not develop in the current context of discussion on the notion of the life-world, which is central to both Husserl's diagnosis of crisis as well as to his rather immodest conviction that phenomenology constitutes the legitimate means of overcoming it.[36] Instead I want to focus in the following paragraphs on the particular role Husserl considers technization to play in the context of the alleged crisis of modern science and culture.

Generally speaking, for Husserl the modern crisis of culture has its roots in a tendency toward a peculiar kind of forgetfulness that he sees as closely linked to the formation and progress of modern science. As already shown, one of the various manifestations of, and catalysts for, such forgetfulness consists in the technization of modern rational thought. To recapitulate, along with its technization, Husserl holds modern rational thinking to regress to a technique that is applied routinely and mechanistically, with the effect that no proper insight into and reflection on its own constitution is aimed for and attained. Importantly, for Husserl such a technization affects not merely the sphere of scientific rationality, but human culture as whole. This is

[34] See Buckley (1992, p. 67).
[35] These issues are explored comprehensively in monographs by Dodd (2004) and Buckley (1992), to name only two relatively recent works among the vast literature on Husserl's *Crisis* text.
[36] For both sympathetic and insightful critiques of such views, both of which focus on tensions and contradictions in Husserl's conception of life-world, particularly as they pertain to Husserl's conception of the relation between life-world and technology, see Blumenberg (1981) and Claesges (1972).

mainly due to Husserl's aforementioned view that modern culture is grounded in science - where scientific thought in Husserl's later writings is however understood to ultimately have the universal human life-world as its "meaning-fundament."[37] At the same time, and following Buckley's reading, one may also regard Husserl's heightened awareness of the broader cultural implications of technization as directly reflecting the increased efficacy and shaping forces of science and technology in modern culture: "Only in an age dominated by technology, in what one might call a technological culture, is the type of forgetfulness found in technological science a true threat, for it implies that the entire culture is one of forgetting and lack of insight."[38]

There is some support for this latter interpretation, despite Husserl's tendency to conceive of the process of technization predominantly in immanent-theoretical terms.[39] As Buckley correctly points out, Husserl at one place indeed explicitly refers to the 20th century as the "'century of technology'," [40] and in the same context also draws attention to the broader, cultural and political dangers of the technization of thinking: If technization becomes the dominant epistemic paradigm, then, Husserl warns, not only is the possibility of a truly profound and rational thinking jeopardized, but also ultimately the freedom of natural beings and human beings. This is because in the 'century of technology', for Husserl knowledge tends to be degraded to what it is for the technicians, namely a mere, useful instrument for control and domination that is bereft of any reflexive element and truly epistemic motivation: "Knowledge [Erkenntnis] is for them [the technicians, P.W.] from the beginning nothing but an artful invention of thinking for purposes of

[37] Husserl (1970a, p. 49).
[38] Buckley (1992, p. 73).
[39] I will discuss this further in section 4.
[40] Husserl (1980, p. 82).

artful achievements in the practice of controlling nature and man."[41] If thus any more fundamental questioning and reflection is dispensed with, in the name of technized 'knowledge', then the same formal-symbolic "garb of ideas"' that makes it that we "take for *true being* what is only a *method*"[42] may indeed also turn out to be a straitjacket. In the end, Husserl's somewhat drastic verdict is that technization, despite all its usefulness, with respect to its own consequences, is also a "tragedy" and even a symptom of potential "decay."[43]

To get the whole picture, however, one should not forget that Husserl, despite this rather pessimist assessment, indeed acknowledges that some degree of technization, most of all in scientific thinking, is both "necessary" and "perfectly *legitimate*."[44] Indeed, it appears unavoidable that scientists, in order to make progress, must, at least occasionally, trust in certain established scientific procedures and accomplishments, thus 'forgetting' about their origin and their particular sense of truth.[45] As a matter of fact, any form of scientific practice incessantly questioning and reflecting upon its own methods and their limitations, would practically not go anywhere. Similarly, in science one must also forgo the possibility to constantly question the whole. This is because precisely such renunciation constitutes a condition necessary for the development of practically most capable methodological techniques that, Husserl notes, make possible the constitution of specialized scientific knowledge.[46] Such specialization is likewise considered by Husserl as being necessary for any scientific progress to

[41] Husserl (1980, p. 82, my insertions)
[42] Husserl (1970a, p. 51).
[43] Husserl (1989, p. 209, my translation).
[44] Husserl (1970a, p. 47; see similarly Husserl 1989, p. 209).
[45] See Buckley (1992, p. 71).
[46] See Husserl (1989, p. 209).

be made – and yet also as harboring a danger in that it may lead to a narrow, one-sided thinking based on a "[o]ne-sided rationality" that "can certainly become an evil."[47]

Considering the processes of formalization that underpin technization, these are also indispensable for another, related reason. One of the major advantages of formalization is that it allows, on an operational level, to detach thought processes from particular human agents and their 'subjective' dispositions, and in effect to standardize such processes. This ensures that the results produced on the basis of the rigid application of formal methods exhibit characteristics such as reliability, reproducibility, and, in case of mathematical formalisms, exactness.

At the same time, with regard to the domain of governance, systematized and rigid processes of abstraction, as applied to knowledge and its use, are of course also crucial for the establishment and stabilization of more complex and operationally efficient administrative systems. As pointed out by Max Weber and Jack Goody, among others, again crucial here is that that through the formalization, not only of knowledge, but also of rules and operations, administrative systems become functionally more independent from changing personnel, and from the 'subjective' orientations and motivations of individual human agents.[48] Among other things, this is because the expected professional behavior of individuals working in such systems is to a significant extent defined through the formalized role they occupy, and not through the actual characteristics of the concrete human individual.[49] Related to this,

[47] Husserl (1970a, p. 291).
[48] Weber (1978); Goody (1986).
[49] See Luhmann (1999, p. 30). As one could also say in reference to Weber, formalization implies and enables the separation of 'person' and 'office' (see Weber 1978, p. 957; p. 968). As has been correctly noted, such separation has itself at least in part a technical basis in that its accomplishment requires the systematized use of the technique of writing (see Goody 1986). The use of writing is crucial both for the purpose of establishing regulations concerning conduct that are of a formal and general character, as well as for the purpose of creating enduring and exact records of large stocks of information (e.g., of taxation records) (see Weber 1978, p. 957). Symbolic technologies such as writing systems are also a condition necessary for the use of the formal method in scientific thinking – see on this

formalization is also considered to be a crucial for "specializing administrative functions according to purely objective considerations," that is, "according to *calculable rules*" and, as already indicated, "'without regard to persons.'"[50] This is the more important since for Weber, such specialization, and the process of functional differentiation more generally, constitutes a crucial driving force in and for the development of modern culture and society.[51]

At the same time, and as is well known, Weber of course also warns of the price to pay for increasing formalization in administrative affairs and in political governance more generally. An ever more efficient formalizing form of governance, Weber famously warns, with and through its emphasis on rational calculation and control, reduces everyone's function to that of "a small cog"[52] in a quasi-mechanical apparatus that is administered by one-sided "[s]pecialists without spirit"[53] – to pick only two of Weber's strikingly bleak and arguably one-sided predictions. At least in regard to this characterization of the effects of formalization as deeply ambivalent, one can thus observe a striking parallel to Husserl's assessment of the role of the formal method in science. A crucial difference remains however as Weber, in contrast to Husserl, has apparently never taken due account in this context of the constitution of the symbolic number concepts that

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point comprehensively Krämer (1988). I will briefly develop upon the symbolic-technological dimensions of processes of formalization, and their link to technization, in my discussion in section 4.

[50] Weber (1978, p. 975). The link between formalization and (functional) differentiation in social systems is also stressed by Luhmann (1999, chapter 6). For Luhmann, the specific role of formalization in this context of system differentiation is that of a generalizing medium of orientation for all differentiated (sub-)systems. Luhmann considers such medium to be essential for facilitating these systems' overall integration – where such an integration, Luhmann clarifies in his later writings, can in turn be directly associated with the reduction of the degrees of freedom of such differentiated systems (e.g., Luhmann 1998, p. 603; p. 619).

[51] For Weber, this also applies and particularly applies, just as for Husserl, to the domain of science, to the point of him observing in his *Science as Vocation lecture* that "[a] really definitive and good accomplishment is today always a specialized accomplishment" (Weber 1948, p. 135).

[52] Weber (1978, p. 988).

[53] Weber (1930, p. 182).

are instrumental for the smooth functioning and the associated technization of both modern science and of modern administrative systems.[54]

Returning to Husserl, and before moving on to identify and discuss contexts and articulations of technization in contemporary forms of governance, I now finally briefly address another issue of importance. It concerns what I perceive to be a generally distorted view in the majority of the literature on the political dimensions and import of Husserl's work and of his discussion of technization more narrowly. Those authors who engage with Husserl's work and consider its political relevance and motivation seem to roughly fall into two camps: There are those who regard Husserl as an apolitical thinker, and those who attempt to appropriate Husserl for a fundamental critique of instrumental reason. If considered against the backdrop of the discussion provided above, both ways turn out to be too simplifying to do justice to the complexity of Husserl's account of technization and its critical impetus.

The first influential strand of thinking holds Husserl's discussion of technization/formalization to be almost exclusively concerned with, and motivated by, purely epistemological questions.[55] One more recent example of this is John O'Neill.[56] In his paper, O'Neill claims, among other things, that it is wrong to situate Husserl's discussion of technization in the context of critiques

[54] As a matter of fact, it overall appears as if the relation between the Weber's theory of rationalization and Husserl's theory of technization has remained comparatively little researched. Most available publications explicitly devoted to exploring the relationship between Weber and Husserl's thought rather seem to focus on exploring the extent to which Husserl's earlier work may have directly influenced Weber in developing and formulating his own methodology (e.g., Muse 2007).

[55] See exemplarily for this contention Jürgen Habermas, who in his *Knowledge and Human Interests* (1987) regards Husserl as a proponent of the "traditional concept of theory" (p. 305) who, in spite of his critique of scientific objectivism, falls prey to the "illusion of pure theory" (p. 315). Such characterization is not only problematic in that paints an overly simplistic picture of the critical impetus of Husserl's phenomenology, but also in that it ignores the fundamentally empirical basis and orientation of Husserl's phenomenology, as well as Husserl's understanding of theory *as a form of practice* (see, e.g., Husserl 1970a, p. 111).

[56] O'Neill (1988).

that directly link technization to political questions of (technological) control and domination.[57] Rather, O'Neill claims, this discussion is predominantly motivated, not by the aim to develop an overarching critique of modern science and its apparent technological dimensions as such, but by the aim "to examine the nature and basis for the formalization of the sciences."[58] O'Neill's critique has its merit in correctly pointing out that Husserl's critique of technization does neither amount to a universal critique of science and formalization per se, nor simply can be subsumed under the rubric of a radical critique of instrumental reason (more on this below). At the same time, however, O'Neill's critique is oblivious to Husserl's aforementioned view that science also constitutes the root of the crisis of modern culture – which explains why Husserl sees his own work on the foundations of science as always also being relevant beyond the domain of epistemological enquiry. Furthermore, O'Neill's reading ultimately also conflicts with the textual evidence provided above: As shown, Husserl, at least occasionally, cautions that the process of symbolic formalization, via the resulting technization of knowledge, may foster a culture without proper insight, where knowledge is reduced to, and effectively employed as, a mere instrument for control and domination.[59]

In the second strand of thinking, Husserl's discussion of formalization and his critique of technization is seen as ultimately amounting to, and consequently is appropriated for, a fundamental critique of modern science and technology per se. The arguably most prominent and radical proponent of such a view is Herbert Marcuse.[60] Marcuse refers to Husserl's discussion of the genesis and development of modern science to support his own claim that modern scientific rationality possesses an "internal instrumentalist character," which, Marcuse

[57] O'Neill (1988, pp. 330-331; p. 334).
[58] O'Neill (1988, p. 332).
[59] See Husserl (1980, p. 82).
[60] Marcuse (1964).

argues, makes it "a priori technology" for the domination and control of both nature and humans alike.[61] In this context, Marcuse, regards it as one of Husserl's particular achievements to having recognized that modern science, by virtue of the formal method and the use of quantification, brings about an "instrumental horizon of thought."[62]

There are a number of problems with Marcuse's critique of modern science and its apparently both technological and instrumental nature, and with the use of Husserl in particular that is made therein. I will focus here on the latter aspect only. First, Marcuse's discussion tends to conflate formalization and technology,[63] maybe because it does not take into account the small yet significant distinction Husserl makes between formalization and technization – where technization moreover indeed primarily (yet not exclusively) refers to the superficialization of scientific thinking rather than to the instrumentalization of science.[64] Second, in his discussion, Marcuse misses the intrinsic epistemic ambivalence that Husserl ascribes to modern formalizing scientific thinking. Nowhere is this more apparent than in Husserl referring to Galileo as being "at once a discovering and concealing genius"[65]: The more in Galilean science the directly experienced world disappears behind numbers and their symbolic representations, the more a new, idealized world opens up, with dramatically expanded epistemic possibilities of calculability and translatability.

It also needs to be ultimately stressed that Husserl did not have a problem with quantification and measurement per se – something which is clearly epitomized in Husserl's view that

[61] Marcuse (1964, p. 129; also p. 135).
[62] Marcuse (1964, p. 135).
[63] See, e.g., Marcuse (1964, p. 129).
[64] See O'Neill (1964, p. 331).
[65] Husserl (1970a, p. 52).

"[m]easuring belongs to every culture."[66] What concerned Husserl however was their blind and unconsidered application. To appropriate Husserl for a universal critique of quantitative measurement ultimately means associating him with that sort of naïve romanticism and ultimately irrationalism he was actually arguing against – while also blatantly ignoring Husserl's serious philosophical interest in and studies on the foundations of mathematics and mathematical objectivity.

[66] Husserl (1970b, p. 376).

3.2 Articulations of technization in contemporary forms of governance

In this section I make my case for the direct relevance of Husserl's critique of technization for the understanding and critique of current governance practices. The backdrop for this discussion is the institutionalization of apparently novel governance arrangements and mechanisms in many public and private administration systems over the last few decades.

One important feature of these changes is the transition from strictly hierarchical and centralized bureaucratic structures, to administrative structures that apparently facilitate the decentralization of authority and that provide greater autonomy for organizational subunits. Such a decentralization and autonomization is partially made possible through a shift from process-focused to output-based governance mechanisms which use metrics to set a specific performance goal for an organizational unit, and for determining whether this goal has been achieved or not. Such use of metrics constitutes a specific form of the mobilization of formalizing rational thought and formalized rational knowledge for governance purposes. In what follows I want to use such output-based governance mechanisms as an example to illustrate the political relevance and the topicality of Husserl's account and critique of technization.[67]

For the present discussion it is useful to draw on a distinction made by Michael Power between "*first-order measurement*" and "*second-order measurement.*"[68] According to Power, first-order measurement consists in the (often messy, cumbersome, and contested) institution of

[67] I do not have the space here to develop in detail on how technization articulates itself, in concrete policy developments and settings for instance, in the governance of specific societal subsystems. Complementing the more overarching discussion presented here, I am planning to develop on the specific articulations and effects of technization in one particular field of governance – the domain of science policy – in a paper that is currently in preparation.

[68] Power (2004, pp. 771-774).

classification systems that make the counting of entities possible. By comparison, second-order measurements are "'measures of measures.'"[69] These are generated on the basis of sophisticated manipulations of first-order measures to produce ratios and indices, for instance. According to Power, the relation between first and second-order measurement in policy and administrative systems tends to be of such a nature that the basis of second-order measurement in first-order measurement, as well as the latter's simplifications and limitations, are increasingly obscured. As a result, second-order measurement systems tend to develop "a life of their own as part of an institutionalized policy world," where they tend to be "mobilized in unqualified form."[70]

There obviously are striking parallels between Power's account and Husserl's discussion of technization. The former however does not endeavor to spell out the conceptual presuppositions for such a decoupling of second-order from first-order measurement. This is in contrast to Husserl, who as shown sees the roots of such a decoupling from concrete to abstract measures in the modern transition to a symbolic conception of number. To briefly recapitulate, symbolic number concepts are essentially constituted for Husserl, through a process of formalization, as 'abstractions of abstractions' (as Klein puts it), and as such attain a "displaced, 'symbolic' meaning."[71] This in turn, Husserl proposes, along with the development of ever more powerful and efficient formal methods, fosters technization – that is, the stimulation of forgetfulness as well as 'superficialization' in the thinking with and about numbers.

[69] Power (2004, p. 771).
[70] Power (2004, pp. 771-772). An obvious example is the recent trend, in some countries more pronounced than in others, toward the institutionalized use of rankings in various policy and governance domains such as research and education. Even if the rankings in question may themselves generally be constructed in a sophisticated manner, by experts who are aware of their limitations, specificities and complexities, one can observe that they nevertheless tend to be only too often mobilized uncritically and simplistically in the policy domain.
[71] Husserl (1970a, p. 45).

Precisely such tendency toward forgetfulness and superficialization also can be observed in the context of the institutionalized use of formalizing output-based governance mechanisms. This becomes particularly obvious if contrasting the notion of outputs with that of outcomes.[72] In simplified form, outcomes can be roughly defined as those broader, purposeful impacts and consequences of activities of organizational divisions. By contrast, outputs are those quantified units that are used to define and measure actual performances. The implementation of output-based governance techniques is usually legitimized on the basis of the notion that output measures can be methodologically constructed so that outputs can be taken as indicative of outcomes. However, one can often observe that once certain output measures are institutionalized, important questions concerning how those measures relate and continue to relate to outcomes, as well as more profound considerations concerning quality and purpose, are increasingly superimposed.[73] In addition, what also seems to be ignored, either unintentionally, or in order to guarantee the integrity of the whole of the governance system, are the unintended effects those measures may have. These unintended effects may include a lessening concern with quality, or their stimulation of strategic behaviors on part of the individual or institutional actors whose performances are measured.

As such, in administrative and ultimately also political systems the governance of which is strongly geared toward one-dimensional output measures, considerations and activities concerning outputs tend to increasingly detach themselves from the more difficult and profound reflections on outcomes.[74] This may be to the point that formalized output measures are no longer conceived of as abstracting proxies of outcomes, but are themselves taken as ultimate

[72] See Power (1997, p. 115).
[73] See for a related discussion Power (2005, pp. 333-334).
[74] See Power (1997, p. 115). I am following Luhmann here in conceiving of political systems as comprising both the functional domains, and subsystems, of politics and of administration (1966).

reality – in rough analogy to the process of the reification of symbolic mathematics in Cartesian physics as described by Klein (see the earlier discussion in section 2). This intended or unintended forgetfulness may prevent that the necessary effort is made to recontextualize output-related data, that is, to translate such data "back into the terms of the 'real-world.'"[75] This effort may include returning to, and undertake laborious corrections and readjustments at, the level of first-order measurement.

The likely result of all this is the formation and institutionalization of 'thought-economies', which while being efficient and reliably producing 'objective' results, are characterized by undue superficialization and simplification in the thinking with and about such abstracting measures, as well as by these measures' mechanical and inflexible application.[76] The obvious risk of this is that those administrative and political systems that rely in their deliberations and decision-making too strongly on 'thought-economies' become increasingly blind to any dysfunctionalities that arise from within and as result of output-based governance mechanisms, for example through actors 'gaming the system.'

This is again where Husserl's critical discussion of technization continues to be both perceptive and relevant. From a perspective taking seriously Husserl's insights concerning technization, the problem is not merely that "the extension of the quantifying spirit to the social and organizational world is at best ambivalent and at worst dysfunctional"[77] – even though it can be argued that from a Husserlian point of view, such potential problem likewise has to be taken

[75] Weingart, Sehringer, and Winterhager (1990, p. 481).
[76] Husserl critically discusses such 'thought-economies' already in his *Logical Investigations* (1970c, chapter 9), in a way that anticipates many of his later insights concerning technization. 'Thought-economies' are for Husserl constituted through the mechanical application of methods – which for Husserl are "devices that economize thought" – and in particular through the application of those (formal) methods "which are rendered secure because a *general* proof of the efficiency of the method has been once and for all guaranteed" (Husserl 1970c, p. 201).
[77] Power 2004, p. 774).

seriously.[78] Rather, the problem of technization in the domain of governance is that such dysfunctionality may remain unrecognized, and as such unaddressed, due to the apparently smooth functioning of formalizing governance mechanisms. This is of course not to say that technization in governance automatically leads to dysfunctionality. On the contrary, with respect to governance, what Buckley has to say about technization in the sciences seems to apply equally, namely that the 'crisis' of technization manifests itself for the most part not so much in the form of a "dramatic dysfunctioning," but in "a functioning that is taken for granted and thereby the mechanism and meaning of that functioning are forgotten."[79] But precisely this nexus between technization and functional routine also means that dysfunctionality can systemically occur in governance without it being easily recognized as such.

[78] See for discussion in this regard Hummel (2006).
[79] Buckley (1992, p. 82).

4 The technological dimensions of formalization and technization

In this final part I focus on addressing a major shortcoming of Husserl's discussions of formalization and technization: The neglect of the specific technological dimensions of these processes. In doing so I make a claim that may appear contradictory at first, namely this neglect is both fruitful and problematic at once. It is fruitful, I argue, in that it contributes to Husserl moving beyond an instrumental notion of technology, and related to this, in that it, at least implicitly, gestures toward an account that gives due to the intrinsically technological functioning of governance systems and their political rationalities more specifically. It is at the same time problematic, I contend, in that it is based upon a forgetfulness in regard to the specific, historically evolving, material infrastructures of formalization and technization, and these infrastructures' both epistemic and ultimately also political efficacy.

Let me begin with the latter point. That formalization is an epistemic *and* technical process, where knowledge-processes are at least initially inseparable from the regulated use and actual manipulation of external, material symbols, indeed is recognized by Husserl already in his earliest philosophical writings on mathematics.[80] However, in his later writings on formalization and its effects, such recognition of the crucial operative and epistemic function of symbolic technologies is by and large absent.[81] Here, the process of technization, with its various forms of externalization, tends to be framed predominantly in immanent-theoretical terms.[82] This ultimately means that Husserl himself submits to a form of idealization and ultimately

[80] Husserl (2003).
[81] This point is also made by Rang (1989, p. 120). The only exception to this apparent neglect of symbolic technologies and their epistemic dimensions in Husserl later writings can be found in Husserl's essay on the *Origin of geometry* (1970b). In this essay, the concept of 'sedimentation' is employed to refer to a process of a consolidation of meanings that unavoidably occurs with and through the use of symbolic media, most importantly, the media of writing. What is lacking however in these discussions is a reflection on the genuinely *constructive* and, one can claim, historically expanding epistemic function of symbolic technologies.
[82] Blumenberg (1981, p. 28).

forgetfulness, as the epistemic role of the concrete and historically evolving symbolic-technological concomitants of processes of technization remain by and large unreflected upon.[83] This is unfortunate, for it seems obvious that the peculiar tendency of formalization toward stimulating technization, which Husserl asserts, cannot be fully understood if considered apart from those actual technological procedures that facilitate and those technical habits that characterize the use of the formal method.[84]

Take as an example the two, related types of externalization that Husserl refers to in his discussions of formalization and technization, namely the externalization of meaning and that of method. In both contexts, Husserl seems to use the term 'externalization' in a rather metaphorical sense, that is, as denoting a process of superficialization as a result of which rational knowledge becomes less aware of its own constitution and of the conditions of its own production. What remains however unaddressed in this context are those material-concrete, technologically mediated processes of externalization that accompany, and, one may argue, operatively underpin the epistemic processes of externalization that Husserl focuses upon in his discussion of technization. These former processes include first of all the externalization of symbolic meanings, which is achieved through the use of "external symbolic storage" devices with visual-symbolic properties, all notation systems for example.[85] Then, of course, there is also the historically recent externalization of symbol-processing operations, which is accomplished with the development of modern computers.

[83] See on this point also Woelert (2012).
[84] Saying that all practices of formalization have a technical dimension is of course not the same as saying that there is a one-way street from actual symbolic technologies to practices of formalization. In some instances, practices of formalization, involving the actual manipulation of signs, may actually anticipate later technological developments, the most important of which is the construction of the modern computer (see for a comprehensive discussion Krämer 1988; a similar point is also made by Blumenberg 1981, pp. 41-42).
[85] Donald (1991).

This leads me to another critical issue that is underdeveloped in Husserl's account of technization that I want to touch upon here at least briefly. If technization is indeed at least partially linked to, and informed by, the use of specific symbolic technologies, as just argued, then, one would think, technization must itself manifest itself in historically changing forms, along with the changes in dominant technologies. Obviously Husserl's discussion of technization is however still informed by a rather mechanistic model of technology. Precisely such model appears however outdated in view of the more recent technological development of powerful symbol-processing devices and their even more recent integration in complex technological systems. This said, one can also not deny that on the face of it, Husserl's rather mechanistic account of technization continues to remain topical in many instances, regardless of the changes in actual technologies. For instance, and building upon the discussion presented in section 3.2, in the contemporary sphere of administrative governance systems, comparatively basic input-output models continue to hold sway. This is regardless of the complexity and sophistication of the symbolic technological systems that are used, in the same contexts, as both epistemic and governance tools alike. And more generally, in regard to contemporary manifestations of technization in rational thinking, Husserl's argumentation concerning the 'inner' logic of technization may likewise be reasonably extended. It is undeniable that those contemporary technological devices that are capable of complex symbol-processing operations facilitate a degree of calculability and economy in rational thinking formerly unthinkable, and yet can at the same time be relatively easily operated by human agents. Hence, one can argue, their use by such agents also stimulates an increase in technization, at least potentially.

This leads me to the second point raised above: There remains something enduringly instructive about Husserl's account of technization and the conception of technology implicit to it – despite,

or maybe rather precisely because of, his neglect of the concrete-material technological infrastructures of processes of formalization and technization. Arguably, this is because Husserl's focusing on the epistemic dimensions of technization rather than on concrete technological instantiations contributes to him moving beyond a narrowly instrumental understanding of technology being merely 'applied science.' Such an instrumental understanding, which is described as still being the "the dominant view of modern governments and the policy sciences on which they rely,"[86] entails that technology is considered to be 'neutral', that is, as a force that is epistemically and politically indifferent. By contrast, Husserl's account of technization, convincingly I think, argues that the ostensibly dominant form of modern rationality, which is a generalized, formal rationality, in and through its 'inner' functioning possesses a technological dimension.

Ultimately, one can reasonably say that this applies not merely to the formal rationality that is mobilized in the domain of scientific knowledge production, but also to the manifestation and mobilization of political rationalities in current contexts of governance. Precisely speaking, Husserl account of technization ultimately makes it possible to recognize the nature of the technological dimensions and force that characterizes many of the current political rationalities. This applies most of all to those political rationalities that attempt to directly derive their legitimacy from the use of formalized rational knowledge. It is precisely through such political rationalities that technology, in the form of processes of the technization of rational knowledge, itself becomes manifest as a politically efficacious force. And in line with the preceding discussions of technization and its current political manifestations, one can ultimately arrive at the following conclusion: What characterizes such a 'technized' political force, and makes it

[86] Feenberg (1991, p. 5).

difficult to grasp as such, is that its own political nature remains concealed for the most part, as are its generally ambivalent, at times however also deeply dysfunctional governance effects.

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