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## Tension In/Between Aesthetics, Politics, and Physics

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**ABSTRACT:** The article sketches a critical paradigm for interdisciplinary work that is centred on tension as a highly ambiguous and ultimately deeply paradoxical notion. It highlights that a unifying account of what tension is or a systematic classification of its diverse meanings would risk resolving tensions between different approaches and privileging a particular mode of doing so. Successively focussing on aesthetic, socio-political, and physical tensions, the essay articulates tension rather as a broad umbrella term that is stretched by multi-perspectival articulations, unified through its intensive surface tension, and at the same time full of transformative and generative potentials. In particular, it proposes that tensions between different cultural or disciplinary fields can be made productive by inducing tensions within each field so that different fields can be related to each other on the basis of tension rather than some substantial commonality.

# TENSION IN/BETWEEN AESTHETICS, POLITICS, AND PHYSICS

Christoph F. E. Holzhey

Tension abounds in moments of crisis, which form an important and crucial phase in a process, a stage where decisive change is imminent. As turning or critical points, such moments involve a precarious balance of conflicting forces or tendencies, whether it is a matter of life and death in the course of illness, of war and peace in politics, or – less dramatically – of solid, fluid and vapour in physics. The first impulse may be to achieve clarity, certainty. Even if the subsequent development is still undecided and can be for better or worse, uncertainty itself gives cause to an anguished feeling of suspense. Especially economic crises are generally already periods of misery just as a crisis in the course of an illness is usually associated with pain.

At the same time, the possibility both of a lasting recovery or improvement and of intervention in an instable situation grants critical tensions also a productive potential. The anguish of suspense can even turn into a paradoxical form of enjoyment if one thinks of the classical dramatic structure organized around a climax of maximal suspense. The contexts of crisis and tension are certainly very different here, and bringing them together is risky as it conjures up, for instance, the spectre of an aestheticization of politics, violence and suffering. It may seem advisable to dispel such interferences by beginning with clear and distinct definitions of tension that would help to delimit specific fields and disciplinary contexts. Yet, this would mean adopting the attitude that tension is something to be always avoided.

This article seeks instead to sketch out a critical paradigm centred on tension. ‘Critical’ refers here on the one hand to the context of ‘crisis’, where processes on the verge of decisive developments raise pressing questions and call for intervention. On the other hand, it also refers to a praxis of reflection that suspends the urge for quick resolution and understands ‘tension’ as a critical category that can provide a direction for analysis. Within this paradigm, ‘tension’ defines not only an object

of inquiry, but also a certain attitude, approach and method aimed at exploring and developing the possibilities and means, conditions and limits, of making tension productive. While manifold models of tension can form the starting point, tension becomes an object of inquiry foremost on the level of self-reflection. In other words, the object of inquiry is ultimately not determined from the start, but constituted through the process of identifying different models of tension, bringing them in tension with one another and reflecting on the possibilities and limits of achieving productive transformations in this manner.

Tension here may be understood as what Hans-Jörg Rheinberger calls an ‘epistemic thing’, that is, as an object paradoxically embodying unknown concepts in a research process.<sup>1</sup> What is more, tension actually goes to the very core of the notion of ‘epistemic things’, insofar as Rheinberger addresses an ‘essential tension of the research process’<sup>2</sup> and highlights the ‘ambivalence of what we like to call a “concept”’. This ambivalence is demonstrated by the ‘tension’ inherent in the precarious double movement of ““deriving” ideas from the material of observation and of “imposing” ideas upon that material’, and it is in this ‘game of deriving from/imposing upon’ that the ‘contours of what will, perhaps one day, constitute the basic concepts of a science emerge in a gradual fashion’.<sup>3</sup>

The slash (/) is an efficient way to symbolize tension and the conceptual openness it engenders through a circular dynamic without implying amorphous indeterminacy let alone conceptual vagueness.<sup>4</sup> Rather than propose a systematic, additive account of tension in aesthetics,

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1 Hans-Jörg Rheinberger, ‘Scripts and Scribbles’, *MLN*, 118 (2003), pp. 622-36, refers to ‘epistemic things’ as ‘noumenal-phenomenal entities, manipulated within experimental systems [...]. Epistemic things thus are shaped in and occupy an opaque intermediary space: they lie, so to speak, at the interface between the material and the conceptual side of science’ (p. 623). Rheinberger develops the notion of ‘epistemic things’ especially in *Toward a History of Epistemic Things: Synthesizing Proteins in the Test Tube* (Stanford, CA: Stanford University Press, 1997), where he specifies that epistemic things are not necessarily material objects in a narrow sense, but can also be structures, reactions, or functions (p. 28).

2 Rheinberger, *Toward a History of Epistemic Things*, p. 31.

3 *Ibid.*, p. 13.

4 It should be noted that circular dynamics do not imply irresolvable paradoxes or vicious circles that necessarily lead to complete indeterminacy. At least in physical systems, circular dynamics generally afford multiple self-consistent solutions, so-called eigenstates with corresponding eigenvalues, and therefore may lead

politics and physics as well as of tensions between these fields, my article will operate on several levels and explore the conceptual dynamic enabled through ‘tension in/between’ different domains. In particular, while tension tends to be understood in terms of an opposition between two or more forces or terms, I am interested in relating such an understanding to a conceptualization of tension as strictly internal. My article is informed by numerous discussions during the first three years of the inaugural core project at the ICI Berlin Institute for Cultural Inquiry. I shall explicate and conceptualize some of the ideas underlying the project, which probes tension as an emerging critical paradigm while reflecting upon its productive potential. The doubling in the title ‘Tension/Spannung’ echoes the deliberate conceptual openness with respect to the proper object of inquiry. It does not merely attest to a programmatic plurilingualism brought about by having projects from multiple disciplinary and cultural traditions engage with one another over an extended period at a German location. As I will indicate shortly, the terms are not simply translations of each other, nor is one necessarily more specific than the other. Instead, their juxtaposition with a slash is a shorthand for, and visualization of, the intended dynamization of the conceptual field under consideration, to be read neither as a simple addition nor a division but as establishing a generative relation of tension.

#### **TENSION / SUSPENSE**

Tension’s recursive generative potential is particularly palpable when considering political and aesthetic tensions. In many respects, they appear diametrically opposed, while physical tensions, on which I will focus later, seem to lie in some middle ground. Within the social and political field, tension appears to be as unavoidable as it is undesirable. Constant vigilance and effort is necessary in order to prevent tensions from arising, growing and escalating into violent conflict. In the arts, by contrast, tension needs to be carefully crafted and continuously renewed in order to attract and hold the interest and attention of recipients. These two phenomena would therefore seem to be so different that they

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to undecidability – sometimes between equivalent solutions – rather than some completely amorphous situation.

cannot be usefully considered together under the same rubric and that one should rather use different terms for them.

Given the different connotations of ‘tension’ and ‘Spannung’, one possibility would actually be to reserve the term ‘tension’ for the kinds of tension found predominantly in the socio-political field, and use the term ‘Spannung’ for those mainly found in the aesthetic field. Unless further specified to establish a different context, ‘Spannung’ is indeed more readily understood in an aesthetic and positive sense in German. The much-used adjective ‘spannend’ lies entirely in this semantic register and may be translated as ‘exciting’, ‘interesting’, ‘fascinating’, ‘thrilling’, or ‘full of suspense’. In comparison, the English term ‘tension’ has more negative connotations and is rather associated with something problematic in need of resolution. Of course, any of the listed translations for ‘spannend’ would offer alternative English terms for the kind of distinction now provisionally indicated in terms of ‘tension/Spannung’. Interest and attention are indeed elicited in particular through suspense, and this term is often borrowed in German in order to resolve the multiple meanings of ‘Spannung’ and used to determine the specific object for the study of ‘Spannung’ in literature. I will briefly discuss this delimitation of a particular form of aesthetic tension in a particular national, disciplinary context, as it offers an instructive example for my larger argument for using a more expansive but still critical category of tension.

There are certainly manifold ways of distinguishing different types of ‘Spannung’ in German. Composita such as ‘Rätselspannung’ vs ‘Konflikt- und Bedrohungsspannung’<sup>5</sup> or ‘Was-Spannung’, ‘Wie-Spannung’ and ‘Warum-Spannung’<sup>6</sup> are used to distinguish the tension/suspense

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5 Cf. Peter Wenzel, ‘Spannung in der Literatur: Grundformen, Ebenen, Phasen’, in *Spannung: Studien zur englischsprachigen Literatur; für Ulrich Suerbaum zum 75. Geburtstag*, ed. by Raimund Borgmeier, Peter Wenzel, and Ulrich Suerbaum (Trier: WVT Wissenschaftlicher Verlag Trier, 2001), pp. 22-33. For this distinction, Wenzel draws on an English-language publication, namely on the structural-affect theory of narrative suspense of William F. Brewer, ‘The Nature of Narrative Suspense and the Problem of Rereading’, in *Suspense: Conceptualizations, Theoretical Analyses, and Empirical Explorations*, ed. by Peter Vorderer, Hans Jürgen Wulff, and Mike Friedrichsen (Mahwah, NJ: Erlbaum, 1996), pp. 107-27 (pp. 110-14).

6 Cf. Ulrich Broich, ‘Bedrohung und Spannung: Pinters *comedies of menace* und das Drama der “Jungen Wilden”’, in *Spannung*, ed. by Borgmeier, Wenzel and

elicited by ‘mystery’, ‘conflict’, ‘fear or threat’, and/or by questions as to ‘what’ will happen next, ‘how’ it will happen and ‘why’. Nevertheless, scholars writing in German about literary tension often see and mark a fundamental distinction by means of the twofold English translation of ‘Spannung’ as ‘suspense’ and ‘tension’. The distinction is formulated in several ways that agree in making ‘suspense’ a more specific, one-dimensional and even singular notion in contrast to a notion of tension that is much broader even if suspense is subtracted from it.

The dimension of time – the action, plot or narrative – is said to play a constitutive role for ‘suspense’, while the predominant dimension for ‘tension’ is conceived as spatial. From this perspective, tension pertains not only to static oppositions in three-dimensional physical space, but also to structures in a more abstract space. It involves the import of events within a structure of meaning and signification,<sup>7</sup> but also, for example, tensions between opposite characters, between individual and society, or between different moral systems. Alternatively, the distinction is drawn between tensions as objectively existing oppositions and suspense as the subjective perception of them.<sup>8</sup> Consistent with either description is the observation that suspense – in contradistinction to tension – does not take the plural form, which also holds in German, where the plural ‘Spannungen’ induces a disambiguating categorical shift similar to, though less pronounced than, that from ‘Geist’ to ‘Geister’ (spirit

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Suerbaum, pp. 149-61 (p. 153). See also the review of the terminological multiplicity of ‘Spannung’ in Daniela Langer, ‘Literarische Spannung/en: Spannungsfornen in erzählenden Texten und Möglichkeiten ihrer Analyse’, in *Zwischen Text und Leser: Studien zu Begriff, Geschichte und Funktion literarischer Spannung*, ed. by Ingo Irsigler, Christoph Jürgensen, and Daniela Langer (München: edition text + kritik, 2008), pp. 12-32.

7 Cf. Walter A. Koch, “‘Spannung’: Fragments and Pieces for a Mosaic of Structures Common to Nature and Culture”, in *Spannung*, ed. by Borgmeier, Wenzel and Suerbaum, pp. 10-21: ‘*suspense* is more related to time, while *tension* is more related to space or structure’ (p. 10, italics in the original); Helmut Bonheim, ‘Spannung, Suspense, Tension – A Survey of Parameters and a Thesis’, in *Spannung*, ed. by Borgmeier, Wenzel, and Suerbaum, pp. 1-9: ‘*suspense* involves the question “What happened then?” and *tension* the question, “What is the import of this event?”’ (p. 8). See also Wenzel, p. 22, who notes that tension in a structural sense has been explored especially in poetry, showing the equilibrium of contrary values, an opposition in different patterns of meaning, or a tension (‘Spannung’) between two cognitive levels such as abstract and concrete.

8 Broich, p. 152.

vs ghosts).<sup>9</sup> Finally, also a distinction between form and content seems to be at stake when ‘Spannung’ is subdivided into tension and suspense: referring also to the level of content, tension can be virtually ubiquitous in narratives and will include, in particular, socio-political structures, whereas suspense appears limited to the aesthetic or narrative form.

Resolving ambiguities, clarifying confused notions, and striving for a set of clear and distinct concepts through careful distinction of different meanings in different contexts is certainly useful and meaningful. Yet, reflecting on one’s terminology as part of good scholarly practice becomes considerably more complicated when it includes reflection on how terminological differentiation as such can function in different ways. Most often, such differentiation participates in carving out clearly separated, distinct and disjoint fields of specialized research both between and within different disciplines. By sharpening the focus, this allows for an increased complexity in the description and understanding of the object under consideration. Within studies of literary ‘Spannung’, the distinction between ‘tension’ and ‘suspense’ as a categorical division within ‘Spannung’ thus establishes a narrower, more specific and supposedly ‘more interesting’ notion of ‘Spannung’ as a well-defined object of inquiry.<sup>10</sup> ‘Tension’, though considered as a subset of ‘Spannung’, tends to be excluded here – at least if it pertains to content rather than aesthetics – as it would overextend the notion of ‘Spannung’ and deprive it of its discriminatory power.<sup>11</sup> In return, defining ‘suspense’ in contradistinction to ‘tension’ on account of its temporal dimension allows for further differentiations: suspense in a more restricted sense is directed towards the future course of events and involves conflict and danger (‘Konflikt- und Bedrohungsspannung’), while ‘mystery’ or ‘curiosity’ are orientated towards uncovering an event in the past (*Rätselspannung*). A third option pertaining to the present is then also often added as part of the scheme: ‘surprise’.<sup>12</sup>

Yet, the categorical distinction between suspense and tension is threatened by the observation that a temporal component is also contained in mechanical (structural) tension insofar as it tends towards

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9 Christoph Deupmann, ‘Langeweile: Das Andere der Spannung’, in *Zwischen Text und Leser*, ed. by Irsigler, Jürgensen, and Langer, pp. 103-22 (p. 106).

10 Wenzel, p. 22.

11 Cf. Langer, p. 17.

12 Cf. Langer, pp. 14 and 17; Wenzel, pp. 27-28; Brewer, pp. 110-14.

relaxation,<sup>13</sup> as well as implicit in the distinction between objective tension and its subjective, suspenseful perception.<sup>14</sup> What is more, the distinction risks stifling the field itself and condemning it to stagnation and insignificance. Research of literary ‘Spannung’ often laments that it is neglected due to a tradition of literary criticism that would consider suspense as a device characteristic of trivial literature and low culture. In order to counter this image, it highlights the complexity of ‘Spannung’ not only through an internal differentiation but also by incorporating a dose of tension and considering the entanglement of ‘suspense’ and ‘tension’.<sup>15</sup>

What is indicated here, but so far seems to be only tentatively thought through and carried out, is the possibility of taking terminological differentiations as a way of establishing relations rather than imposing divisions. To explore and reflect upon this possibility appears particularly meaningful for a critical paradigm focused on tension, given that the relation between differentiated terms can be understood as one of tension. This leads to a paradoxical structure if the terms considered are themselves terms of tension (here: ‘tension’ and ‘suspense’ as two forms of ‘Spannung’), and doubly or triply so, as ‘paradox’ is not only itself a form of tension, but constituted through a static, structural opposition that demands being unfolded in time.

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13 Langer, p. 18.

14 Broich, p. 152.

15 A recent study on the notion, history, and function of literary tension, for instance, begins by noting the devaluation of suspense in literary studies and then programmatically proclaims, that the notion of ‘Spannung’ cannot be reduced to suspense or mystery, but is to include also “subtilere” Spannungstechniken – etwa statische Arten von Spannung, die von der angloamerikanischen Forschung unter dem Begriff *tension* subsumiert werden. Damit geraten komplexere Spannungsformen in den Blick, die gerade aus der Verschränkung eher dynamischer und eher statischer Spannungsmomente entstehen’ (*Zwischen Text und Leser*, p. 9).

The point of potentiating the inescapable paradoxes of self-reflexivity is neither simply to delight in it, nor to give cause for despair and reduce the notion of tension *ad absurdum*. Rather, I wish to indicate that conceiving of differentiations as relations of tension rather than as divisions opens the possibility for complex re-configurations in the tree of distinctions: not only does it re-connect neighbouring twigs, it also establishes relations between different levels of ramification, such as between bifurcations at the treetop and at the roots. This leads to the vision of turning a hierarchical tree of distinctions into a rhizomatic web where everything is related to everything else, or better: into a webbed web, that is, into a webbed network where a surface of tension connects any two intersecting lines like the skin joining the toes of some water-animals such as ducks or frogs.<sup>16</sup> The idea of this vision is not to create a sense of unity that may be as enchanting as it would be unproductive for analysis, seeing that it ultimately conjures up an amorphous, all-encompassing non-form or in-form without any communicable differentiation. While the use not only of distinctions but also of a hierarchical tree of distinctions may well be inescapable, the issue is rather to ask on what basis and to what effect such a tree is constructed, what may be gained or lost through alternative configurations, and how to mobilize other configurations, that is, how to turn a static structure into a productive dynamic.

In view of the discussion on literary tension one could try to apply the tension/suspense-distinction in order to describe the project of dynamizing static structures of hierarchical differentiations. However, it should be clear that this would mean taking the terms 'tension' and

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16 The *Oxford English Dictionary* gives as first meaning of 'webbed': '1. Furnished with a web or connecting membrane; esp. of the feet of certain birds' and includes in the meanings of 'web': '8. a. The membrane or fold of skin which connects the digits of an animal; esp. that which connects the toes of an aquatic bird or beast, forming a palmate foot'. Wikipedia speaks instead of 'interdigital webbing', which creates further intriguing interconnections with the digital (world wide) web, but also highlights an ambiguity in 'digital': whereas 'digital' tends to be identified with the uses of a binary code within a world of computers, an 'interdigital webbing' could also be extended to ramifications into three or more digits, in which case a three- or more-dimensional space would be spanned through differentiations.

‘suspense’ in a rather specific sense as defined within a specific discourse – namely as opposed according to static structure vs dynamic action – while at the same time displacing them into an entirely different context. More specifically, it would mean transferring an aesthetic distinction to methodological discourses and ultimately to epistemology, affecting not only the repartition of fields of knowledge but also the way we perceive reality and construct objects through a system of distinctions. No doubt, the terms would have to undergo considerable modifications in this passage, which may well involve replacing the aesthetic category of ‘suspense’ with a more suitable term. It could indeed be associated with ‘aesthetics’ *tout court*, if one thinks of the way in which aesthetics was introduced in the eighteenth century as a new science (*Wissenschaft*): against the exclusive privilege which rationalism accorded to ‘clear and distinct’ concepts of reason, aesthetics asserted the cognitive potential of sense experience and valued precisely the ‘confused’ ideas obtained from it.<sup>17</sup> The aesthetic category of ‘tension’ could then be associated with the rationalist approach of anaesthetic disciplines. What this would suggest is that seeking to eliminate or avoid (conceptual) tensions within a system of clear and distinct terms is not simply a demand of reason, but also the result of an aesthetic preference averse to the generation of suspense. Such a transfer of aesthetic distinctions to methodologies entails many questions, even paradoxes, that can be unfolded in different ways, but this is precisely why it may help in providing a productive perspective to reconsider epistemological questions related to paradigm shifts

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17 See in particular Alexander Gottlieb Baumgarten, *Theoretische Ästhetik: Die grundlegenden Abschnitte aus der ‘Aesthetica’ (1750/58)* (Hamburg: Meiner, 1988). Baumgarten answers the claim ‘Verworrenheit ist die Mutter des Irrtums’ by saying: ‘a) Aber sie ist eine unerlässliche Voraussetzung für die Entdeckung der Wahrheit, da die Natur keinen Sprung macht aus der Dunkelheit in die Klarheit des Denkens. Aus der Nacht führt der Weg nur über die Morgenröte zum Mittag [...]. c) Es wird nicht das verworrene Denken empfohlen, sondern es geht darum, die Erkenntnis überhaupt zu verbessern, soweit ihr notwendigerweise ein Rest verworrenen Denkens anhaftet’ (§7, p. 5). The vocabulary of ‘clear and distinct’ can be traced until at least Descartes and is prominent in Leibniz, who distinguishes it from ‘clear and confused’, which applies, for instance, to the satisfying or shocking *je ne sais quoi* that gives us knowledge beyond doubt about the quality of a poem or painting. Cf. *Die philosophischen Schriften von Gottfried Wilhelm Leibniz*, ed. by C. I. Gerhardt, 7 vols (Berlin: Weidmannsche Buchhandlung, 1875-90), IV (1880), p. 449.

or epistemic breaks as well as to the incommensurability and undecidability that they involve.<sup>18</sup>

These tentative suggestions are only meant as hints at the kind of reconfigurations, transpositions and questions across disciplinary jurisdictions that I envisage for a critical paradigm focused on tension. They may indicate, in particular, that it would be counter-productive to establish a narrow definition for tension to unfold its critical potential. Instead, I propose considering 'tension' as an umbrella term that encompasses manifold forms, such as 'suspense' as a special form of narrative or dramatic tension. Varying the image of a webbed web and focussing on the manifold forms of tension that web the web, I take 'tension' as an 'umbrella term' in a rather specific sense: not as an umbrella that collects disparate phenomena underneath it and protects them from bright, contrast-producing analytical light, but rather as a surface spanned through tension's manifold meanings in different contexts – meanings that modulate, expand and stretch the surface, which in turn keeps them together. 'Tension' as an umbrella term thus constitutes a surface of tension with its own surface tension, a surface that holds together as long as it is not stretched to the point of rupture, as long it does not burst into limp shreds. At the same time, distinctions are necessary for the umbrella not to collapse upon itself and the critical questions remain what kind of network of differentiations is most productive to what end.

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18 The appearance of aesthetics both on the level of distinction and on one of its sides would necessarily seem to lead to paradox. However, as Baumgarten's explicit statements indicate, extending science (*Wissenschaft*) to include aesthetic objects involving 'confused' ideas need not mean that aesthetics itself has to abandon the ideal of arriving at 'clear and distinct' ideas. Nevertheless, expanding the field of inquiry leads to new possibilities, and the valorization of 'confused' ideas paves the ground for other, competing methodological choices. The controversy between Herder and Kant may serve here as a specific historical example, as the title 'Aesthetic and Anaesthetic Science: Kant's Critique of Herder as Document of a Modern Paradigm Competition' of an essay by Hans Adler already succinctly indicates. Cf. Hans Adler, 'Ästhetische und anästhetische Wissenschaft: Kants Herder-Kritik als Dokument moderner Paradigmenkonkurrenz', *Deutsche Vierteljahrsschrift für Literaturwissenschaft und Geistesgeschichte*, 68.1 (1994), pp. 66-76.

## STRETCHING THE UMBRELLA OF AESTHETIC TENSION

The hierarchical tree of distinctions obtained from various disciplinary contexts provides a starting point. One can begin by distinguishing between political and aesthetic tension, then identify narrative tension as a specific form of aesthetic tension and furthermore suspense as a specific form of narrative tension, and finally differentiate between suspense proper and mystery (and surprise), and proceed in a similar fashion on the side of political tension, distinguishing for instance between conflict and dispute, antagonism and contradiction, crisis and escalation. In other words, one can unfold tension through a distinction of fields, disciplines and their proper objects. In this way, the increasingly fine-grained distinctions within specialized disciplines can be utilized to stretch the umbrella of tension.

As this tree of tension is isomorphic to the tree of disciplinary knowledge distribution, it risks participating in carving out disjoint fields both between and within different disciplines, but also allows for the possibility that reconfigurations in the tree of tension induce productive changes in the disciplinary tree. For this to happen, the tree of tension must emancipate itself, detach itself from the disciplinary tree and remain webbed, especially on the top level. For, as individual disciplines engage in ever growing internal ramifications, common features in larger branches move out of sight and risk solidifying into unquestioned assumptions that contribute to a separation of incommensurable, mutually indifferent fields. Considering the notorious resilience of hierarchical distinctions my hypothesis is that the greatest dynamic may be achieved by beginning at the highest level and establish tensions between common features of different fields in order to induce tensions within each field and then inquire about the possibilities of productive analogies, homologies and transfers between them. Out of such analyses a more appropriate tree of tension can be expected to emerge where the top-level distinctions follow not disciplinary lines, but more elementary forms, qualities, dimensions or modalities of tension that can be used to probe the productive potential of tension across different fields.

My initial observation of an apparent opposition between political and aesthetic tensions, for instance, indicated different attitudes and dynamics as common features in the respective fields. These broad, common features, which could easily pass unnoticed and appear self-evident within either field, emerge when the fields are considered together, and

they become significant by creating a conceptual tension that questions tacit assumptions. Abstracting them from the respective fields makes it possible to ask to what extent these features can also play a role in other contexts, and opens the possibility of productive transfers across fields. The aim in such transfers is thus not to aestheticize political tensions, nor even to politicize aesthetics, even if both movements play a role in the critical process; rather, the aim is to attain a multifaceted understanding of the transformative and generative potential of tension. In particular, I would define the aim as exploring the possibilities, conditions and limits of turning pernicious or potentially harmful tensions into something more desirable, meaningful, or beneficial. In relation to this aim, the deceptively simple opposition between positive and negative attitudes towards tension appears as a good candidate for a top-level distinction in the tree of distinctions, even if what I called above a more appropriate tree ultimately has to emerge and prove its productivity in the course of research.

The juxtaposition of a positive attitude towards tension within aesthetics and of a negative one within the socio-political field thus need not stop at a contrast but can also open a range of lines of inquiry. Conceiving the contrast as a tension between fields, tension within fields can be induced. To remain within the domain of aesthetics for now, one can ask, in particular, whether a negative attitude towards tension is entirely absent, precisely to what extent there is a positive attitude, and how exactly it is achieved. Much attention has, of course, been devoted to the striking fact that interpersonal, social or political tensions can become the source of enjoyment in fictional or staged settings while they are a source of unpleasurable anxiety in most other contexts.<sup>19</sup> However, the explanations offered apply to a much wider range of aesthetic phenomena than what is usually discussed in the context of suspense, and indicate a path for expanding the umbrella of aesthetic tension beyond simple addition of dissociated items underneath it.

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19 In addition to the references already cited see in particular Thomas Anz, 'Spannung durch Trennung: Über die literarische Stimulation von Unlust und Lust', in *Trennungen*, ed. by Johannes Cremerius and others, Freiburger literaturpsychologische Gespräche, 13 (Würzburg: Königshausen und Neumann, 1994), pp. 17-33 and Lothar Mikos, 'The Experience of Suspense: Between Fear and Pleasure', in *Suspense*, ed. by Vorderer, Wulff, and Friedrichsen, pp. 37-49.

It is often argued, for instance, that an important factor for enjoyable suspense is that despite all uncertainty, which is arguably constitutive for suspense,<sup>20</sup> a happy resolution is guaranteed from the start – if not necessarily for the characters with which viewers or readers are made to empathize, then certainly for the recipient him/herself. However, this also applies to tragedy, for example, and as the controversies over the Aristotelian determinations in terms of catharsis, fear and compassion demonstrate, the enjoyment of tragedy involves manifold tensions that cannot be reduced to dramatic or narrative tension. Compassion, pity, and/or empathy, in particular, are certainly important for the creation of suspense: suspense increases not only with uncertainty, but also with the degree to which one empathizes with a character facing a likely tragedy.<sup>21</sup> However, compassion, pity, and empathy also constitute a state of tension by themselves, even outside of a suspenseful plot line and beyond the genre of tragedy: the viewer or reader not only loses her/himself through identification, but s/he also seems to be capable of enjoying compassion or co-suffering in itself and quite independently of whether there is still hope for a happy ending or the certainty of a tragic conclusion is already established.

Expanding the purview of aesthetic tension beyond suspense need not lead to a simple addition of distinct forms of tension, such as adding compassion to suspense. Rather than dissolve differentiations, it helps increase complexity and provide a direction for exploration. In fact, it creates further tensions and thereby raises specific questions. In this case, one can for instance ask whether identification with characters not only helps the creation of suspense, but can also hinder it if compassion is enjoyed independently of the hope for resolution and if so, how this tension in the function of identification may be resolved both conceptually and in concrete works. In a similar vein, including other forms of aesthetic tension, such as the uncanny or the way in which a text leads,

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20 The premise that a cognitive state of uncertainty is a necessary condition for the experience of suspense underlies the much-discussed ‘paradox of suspense’ that suspense can be experienced upon repeated viewing or reading of the same work. For a discussion of this paradox and further references, see, for instance, Noël Carroll, ‘The Paradox of Suspense’, in *Suspense*, ed. by Vorderer, Wulff, and Friedrichsen, pp. 71-91 and Tilmann Köppe, ‘Kann man ein Buch spannend finden, obwohl man weiß, wie es endet? Überlegungen zum “Paradox Spannung”’, in *Zwischen Text und Leser*, ed. by Irsigler, Jürgensen, and Langer, pp. 68-81.

21 See, for example, Wenzel, p. 24 and Brewer.

guides and manipulates the reader, allows for further explorations of the complex ways in which tension can become enjoyable, meaningful and valuable within the field of aesthetics.

Starting from an initial opposition between political and aesthetic tensions thus helps expand the field of aesthetic tension without compromising its critical function. Instead, conceptual tensions between fields induce tensions within each field. Not only can one explore how specific forms of tension operate differently in different genres; one can also inquire about the politics of their partition and distribution, which implements a hierarchy of genres where ‘Spannung’ continues to appear as a sign for trivial literature quite divorced, for example from the sublime or the *je ne sais quoi* rarely discussed in the context of literary tension.<sup>22</sup> Furthermore, the much-debated social and political value of tragedy and compassion, for instance, is directly related to the question of whether or not compassion diminishes suspense. Interestingly enough, arguments questioning compassion’s ability to incite actions that would relieve suffering effectively privilege the paradigm of suspense as sketched above insofar as this paradigm highlights the temporal dimension of tension and traces enjoyment to the expected end of the protagonist’s suffering rather than to compassion itself. Most fundamentally, perhaps, the tension induced pertains to the question of whether tension is ultimately in some sense as undesired in aesthetics – both in the discipline and in the experience of its objects – as in the socio-political field, that is, whether it provides enjoyment, meaning, and value only through its expected resolution, or whether it has or can acquire a value in itself.

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22 A telling indication is that the index of the *Ästhetische Grundbegriffe*, ed. by Karlheinz Barck and others (Stuttgart: Metzler, 2005) has only one entry for ‘Spannung’ and, what is more, this entry refers to the view that reading novels dispossess us of our freedom by putting us in suspense: ‘Romanlektüre nimmt uns Freiheit indem sie uns “in Sp[annung] versetzt”’ (p. 619).

## SOCIAL TENSION BETWEEN CONFLICT AND HARMONIOUS INTEGRATION

A critical analysis of tension's value within aesthetics reflects back to the political field where the contrast with a predominantly positive attitude similarly induces further tensions and lines of inquiry. The fundamental question raised and highlighted in this manner is to what extent tension as such can be considered and made productive within the political field.

At first, one could observe that a state of social and political tension seems at least preferable to violent conflict. There is tension precisely to the extent that violent conflicts can begin at any moment and place, while the possibility of negotiations and of reaching an agreement is not excluded. From this view, conflict resolution would involve restoring a state of tension so that other ways of diffusing its violent potential may be found. However, as in the case of aesthetics, we immediately face terminological problems that generate manifold questions and create further tensions on the conceptual, and ultimately also political level. On the one hand, the distinction between conflict and tension is far from clear: when a situation of social or political tension escalates, tension is not so much discharged as increased until the conflict ends, be it through a return to a less violent situation or through victory, subjection or annihilation. On the other hand, harmonious integration as the apparent opposite of conflict can also be understood as a state of tension. Heraclitus is often cited not only for asserting the identity or unity of opposites, but, more specifically, for taking bow and lyre as model for the harmonious connection of opposites through tension. 'Attunement' or 'fitting together' in harmony does not presuppose identical or even similar elements; rather, the elements are at variance and can even be opposite as long as they are held together through some relationship, a 'back-stretching' or 'back-turning' connexion, which can be described in terms of tension even if it does not involve physical force.<sup>23</sup>

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23 John Burnet's translation of Heraclitus's much-discussed fragment on harmony reads: 'Men do not know how what is at variance agrees with itself. It is an attunement of opposite tensions, like that of the bow and the lyre' (John Burnet, *Early Greek Philosophy*, 4th edn (London: A. & C. Black, 1945), p. 136). There is considerable variation in translations, which is also due to an uncertainty over whether Heraclitus spoke of 'palintonos' or 'palintropos harmoniē', which might translate into a 'back-stretched' or 'back-turning' connexion or harmony. For

The social or political tension with which I started could thus be considered as a specific tension between two other forms of tension: between harmonious integration and violent conflict.<sup>24</sup> As such, it should be understood as a precarious, undecided state at the brink of a qualitative rather than quantitative change. The dynamic seems to transcend here a logic of intensification or relaxation and may indeed be consistent with a conservation of tension that merely changes its form. However, not only is it unclear how to determine a common measure that would allow adding intensities of qualitatively different forms of tension, but the intensity of the specific tension between harmony and conflict also seems hard to gauge when taken in isolation: is it, for instance, highest at the point when it is completely undecided whether it will turn to harmony rather than conflict, or when the feared outcome seems highly likely but there is still a slim chance that it will not occur? Furthermore, the same question reappears in the domain of conflict, where tension is likewise highest when the battle is tied, but also if much is at stake and the chances of winning are small but have not vanished. Not only does the tension between harmony and conflict therefore seem to spill over into the domain of conflict, but we also seem to have slid surreptitiously into the domain of aesthetic tension.

Indeed, we have already encountered this equivocation of whether tension increases with uncertainty or with fear as a characteristic of suspense. While this opens avenues for exploring the intersection of socio-political and aesthetic tensions, one may also worry that my whole discussion of socio-political tension has remained too close to an aesthetic register, that is, to the way in which these tensions affect observers and

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the present argument the possibility of understanding harmony in terms of tension is sufficient and it is irrelevant whether it agrees with the original meaning of Heraclitus's text. However, closer examination of the different modalities for how the unity of opposites is achieved – through physical tension, through a certain tuning that (at least in some traditions) is agreeable to the human ear, through a play of words, or geometrically in a curved space where the opposite ends of a straight line end up meeting – is very much the point of the critical paradigm outlined here. For such a differentiation with respect to Heraclitus, see Jane McIntosh Snyder, 'The Harmonia of Bow and Lyre in Heraclitus Fr. 51 (DK)', *Phronesis*, 29.1, pp. 91-95. For a modern example of opposites meeting in curved space, see Heinrich von Kleist's *On the Puppet Theater* discussed in this volume.

24 Cf. Luca Di Blasi, 'Spannung als Konflikt', presented at the workshop 'Spannung und Konflikt' on 26-27 November 2009 at the ICI Berlin.

touch upon their fears or hopes. The alternative is perhaps not so much to focus instead on the ‘actual’ participants – as they, too, observe both others and themselves – but rather to shift the site and framework for tension.

The proximity to aesthetics may seem unsurprising in disciplinary contexts where socio-political tension is understood in a specific sense as a public mood (*Stimmung*) and therefore related to theories of the social and the political that are opposed to, or at least sceptical of, Enlightenment’s faith in reason and the progressive rationality of ‘public opinion’ and ‘public debate’.<sup>25</sup> Once again, the critical paradigm I am outlining understands ‘tension’ in a broad sense that does not imply commitment to a specific tradition of socio-political discourse and does not aim at narrowing down the notion of ‘tension’ to a specific meaning within a particular context such as the socio-political field, let alone to an aesthetic meaning for all fields. Instead, it encompasses and seeks to relate within the umbrella of ‘tension’ also tension in public moods, violent conflict, reasoned disputes and harmonious integration, as well as other socio-political forms of tension such as power relations, antagonisms and contradictions.

While each of these tensions may be capable of eliciting an aesthetic response and can therefore be mobilized in various art forms, they can also be understood as forms of tensions in a more objective sense quite independently of whether they are feared or desired. In this sense, they are similar to electric tension or the tension of a string of which one can speak independently of whether one fears or looks forward to their power to illuminate or electrocute, to shoot a deadly arrow or to make music. My point here is not to re-instate a radical distinction between aesthetic and real or objective tensions, as aesthetic tensions are no less real and objective. Rather, my point is to note that the double perspective of objective existence and subjective perception or experience, which has been proposed as one way to distinguish tension and suspense within literary studies, applies also outside of the domain of art and is among the dimensions that allow for an exploration of tension’s logics and interrelations across different fields. Of these dimensions, we have seen the temporal and spatial ones to be particularly significant both within discussions of aesthetic tension and for transfers to other

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25 Cf. Wilhelm Berger, ‘Spannung als öffentliche Stimmung’, presented at the workshop ‘Spannung und Konflikt’ on 26-27 November 2009 at the ICI Berlin.

fields such as epistemology. They also provide a guide for pursuing further the questions induced in the socio-political field through the apparent contrast with aesthetics.

#### **TRANSFORMATIVE AND CONSTITUTIVE TENSIONS**

While valuing socio-political tension as preferable to escalation into conflict may be considered a conservative attitude, the same tension can also be embraced, on the contrary, as a necessary stage in a process of radical transformation. A positive attitude towards tension comes here from the perspective not of a feared conflict but of a fundamental antagonism or material contradiction contained and covered up by the idea of harmonious integration. Despite their opposite orientation, these alternatives have much in common: they view tension from a temporal perspective and value it only temporarily as they insert it into a narrative of ultimately decreasing tension. More precisely, the conservative alternative aims at the reduction of dynamic tension in favour of a stable structure of harmonious unity, while the progressive one highlights the tensions inhering in such a unity and aims rather at radically reconfiguring, and ultimately eliminating, the underlying antagonisms or material contradictions. While it is certainly instructive to explore the narrative and aesthetic elements of such discourses, tension here is not just a question of fear or desire, of what will happen next, or of how it all fits together. What is at stake are rather different conceptualizations of how tensions enter, structure, and animate the social and the political spheres.

One way to draw the distinction is along the lines of whether tension has a tendency to increase and feed upon itself, to regenerate itself continuously in much the same way as life, being due to human passions such as envy or ambition, a will to power or a constant, Darwinian struggle for existence and survival throughout the biosphere; or whether there is rather a tendency for tension to dissipate and arrive at an equilibrium or equalization, as thermodynamics would suggest for closed systems with its second law of increasing entropy. The latter should not lead to the expectation that systems settle in a state of no tension, but rather that they reach a local minimum separated from states of even less tension by a barrier of higher tension. It is therefore quite consistent not only that a temporary increase of tension should be embraced in order to reach a lower minimum; but also that one should

seek to accelerate the process, which may eventually occur naturally, by bringing to consciousness the fundamental contradiction underlying a state of harmonious unity.

In terms of this distinction and the initially proposed scheme, the attitude of embracing and actively pursuing tension appears somewhat surprisingly on the side of aesthetics. Yet, analogies to physical systems may help to indicate that insisting on the material reality and necessity of tension is not simply a matter of subjective experience, but also involves the question of how tension is constituted in time and space. Considering also the spatial dimension of tension and taking 'spatial' in a broad sense to include conceptual spaces, one can indeed identify significant differences on the level of what constitutes the relevant elements for tension: is it the individual, a social group, a class, the state, or some other, more abstract element? If one starts with individuals, one usually arrives at the vision that they aggregate based on similarities to form ever larger groups that increasingly stand in tension with each other: the family, communities, nations, coalitions of states, etc. According to quite a different perspective, the seemingly stable but always threatened unities of harmonious integration are not only held together by internal tensions, but are constituted through contradiction, antagonism or violence. This perspective may be associated in particular with a Marxist one, but can also be illustrated with the geopolitical conflict that has dominated the second half of the twentieth century.

The Cold War was a strong conflict that polarized the world and led to many tensions bringing the world to the edge of annihilation, but it also constituted a relatively stable situation in which the lines were clearly drawn. Not only did a strong external conflict help overcome internal tensions and constitute internal cohesion, unity and identity on either side; it could also be said to have constituted a global state of harmony in the sense of a 'back-stretching connexion'. With the end of this structuring conflict, internal tensions grew on either side and elsewhere, leading to increased fragmentation, conflicts and wars. Thus runs a plausible narrative that one need not accept in its historical validity in order to recognize not only that there can be very different spatial organizations of tension, but that tension can also participate in constituting the very entities between which it then establishes a relationship.

## TENSION BETWEEN, TENSION IN

The exploration of the temporal and spatial dimensions leads to a most fundamental issue concerning the critical and productive potential of tension. It may be asked to what extent a focus on tension implies a commitment to assuming the (onto)logical priority of entities between which relations of tension come about, that is, a commitment to a thinking in binary oppositions, dichotomies or some form of dualism. My wager in proposing a critical paradigm centred on tension is that a sufficiently broad notion of tension may help to address this very concern. While one indeed seems to think most commonly of a ‘tension between’, one can also speak of a ‘tension in’. We have already encountered this distinction in describing the general approach of starting with tensions between fields to induce tensions within them. While an internal tension is here methodologically posterior, the approach allows for the possibility of a logically anterior ‘tension in’, which in turn makes it possible to explore how this tension may be partially resolved through the constitution of distinct objects and the establishment of tension between them. This leads to another possibility for attributing a productive value to tension within the socio-political field. Insofar as one considers politics to involve in particular the constitution of objects, identities and their relations, tension may also be valued as opening up and sustaining the very field of the political in the sense of potentiality as the ground of politics. Making contact with approaches highlighting the productive potential of paradox and undecidability, tension thus conceived and specified acquires a more inherent and durable value than when embraced as a temporary state preferable to conflict or necessary for radical transformations.

At the same time, it should be noted that we have performed yet another move towards aesthetics, insofar as a positive sense of ‘tension in’ is most readily available – not only analytically, but especially on the level of experience – in that field. All attempts at thinking of ways to make tensions productive in the socio-political field indeed seemed to entail a certain proximity to aesthetic tensions. This is not too surprising, given the approach of using tensions between the aesthetic and socio-political field as a starting point to induce tensions within either fields. At the same time, there may be good reasons for considering an aestheticization of politics as more problematic than a politicization of aesthetics. Yet even if there is no symmetry between the two direc-

tions, one should not be kept from going both ways, especially if the goal is also to open up possibilities for intervention in the socio-political field. The category of tension, as I have outlined it as an umbrella term stretched by manifold distinctions, may be the right kind of notion to do this productively. Instead of succumbing to an anxiety of contact, I propose to engage in careful explorations with an awareness of the seductions of aesthetics as well as of abstraction, either of which all too easily end up in harmonizing solutions or seemingly irresolvable paradoxes. In particular, it should be clear that the exposition of the different ways in which socio-political tensions may be thought of as valuable and productive must not to be misunderstood as a narrative of progress. Rather, it forms but one way of organizing different models of tension that an initial tension between aesthetic and socio-political tensions brings to light, and of indicating the kinds of tension that are thereby induced within the field of socio-political conceptualization. The question of whether, on what grounds, and under which conditions these conceptual tensions can be resolved through differentiation and hierarchization of different models of tension, is precisely what is to be explored through careful analysis. As there is no reason to believe that a single model of tension should be applicable in all contexts, it is necessary to look closely at how specific models of tension work in specific cases. While this is what the various contributions in this volume explore with respect to some of the aesthetic and socio-political models that I have largely abstracted from them, I will now move to a more detailed exploration of physical models of tension that tend to stay in the background but help to illustrate the potential of a critical paradigm focused on tension.

#### **PHYSICAL MODELS**

Models from the domain of physics seem particularly helpful for thinking about tension. The reason is not that they have some higher validity and authority that would guarantee their applicability to other fields, nor simply that they occupy a neutral middle ground between desired and unwelcome tensions. Rather than as prototypes, as things to be emulated, I understand models as generators of analogies. The attractiveness and pervasiveness of physical models in discussions of tension in other fields seems to lie in their double status as objects that

are both concrete and abstract, both material and reduced to the minimal elements required to allow for the identification of abstract relations and conditions of the phenomenon under consideration. They are ‘instrument[s] of redescription’ belonging to the ‘logic of discovery’ rather than the ‘logic of justification or proof’.<sup>26</sup> Due to their simplicity they promise a better understanding of systems of relationships identifiable in other situations and contexts that may be much more complex and composed of quite different sensible features. Of course, one does not expect agreement in all details and there is always the danger of reducing the complexity of the phenomenon of interest to those features that are accounted for by the model. Nevertheless, simple, well-understood models can be useful even when they fail to explain important features. They provide a way for thinking through the phenomenon in its variety, making it possible to ask whether there are differences of degree or of kind, that is, whether a model simply needs to be expanded by some missing ingredients, or whether there is a more fundamental reason for its inapplicability requiring a radically different model.

In other words, I take the transfer of models across different fields to be productive when they are taken not as explanations – answers – but as a way of generating specific questions. This requires considerable work of translation and precision. The bow and the lyre, for instance, provide a seductive model for the generative function of tension. The bow as an elastic string stretched between two ends of a solid frame is perhaps the oldest and still most current model of tension. As mentioned before, the bow is moreover the model for harmony in a tradition traced to Heraclitus. Harmony reappears on another level in the lyre, where several strings are stretched to produce different yet harmonizing tones. As each tone is due to a different tension it is not incidental that the root for the word ‘tone’ is the Greek word for tension, *tónos*. Bow and lyre thus provide a model for generating (harmonizing) tensions out of (harmonizing) tensions. Repeating this procedure, one arrives at the vision of tension unfolding a harmonious universe where everything is held together, permeated and animated by tension (or *tónos* in the teachings of the Stoa). As an alternative to an atomistic world view, such a vision certainly continues to be instructive, but

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26 Cf. Paul Ricoeur, *The Rule of Metaphor: Multi-Disciplinary Studies of the Creation of Meaning in Language* (Toronto: University of Toronto Press, 1977), p. 240, who refers here to Max Black and Mary B. Hesse.

by explaining everything it risks not only to explain nothing, but also to justify everything without distinction and possibility of intervention, leaving only the option to delight, e.g. in the paradoxical or ironic unity of life (*bíos*) and death-bringing weapons (*biós*).<sup>27</sup>

However, already the first step of relating the lyre's harmony of tones to the bow's tension raises numerous questions. The bow provides a good model for mechanical tension understood as the result of two equal but opposite forces acting onto the string.<sup>28</sup> This is perhaps the most common and elementary understanding of tension and its transposition to a conflict between two social or political groups, for example, seems quite intuitive, especially if the groups fight each other with physical force. However, in what sense can one speak of a tension between two tones or even of one tone? In the case of a lyre, strings of different tension are put together and connected via the instrument's body. There is a more complex network of opposing forces acting together and one could speak of a different level of harmony here (if one string breaks, for instance, the tension in the other strings may also be affected and the instrument might be deformed under the influence of shear forces). However, this is not what one means by the harmonious interplay of tones: not only do the strings have to be carefully tuned while the 'harmony', the back-stretching connexion, is automatic in a bow,<sup>29</sup> but it also seems necessary that the instrument is both played and heard. The latter already indicates that while there is no doubt a relationship between the tension of a string and the tone obtained by striking it, it is certainly not a simple one. There is no tone unless the chord is struck and the pitch depends also on the length and diameter of the string: two strings with the same tension can produce quite different tones and the

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27 Cf. Heraclitus: 'The bow (*biós*) is called life (*bíos*), but its work is death' (Burnet, *Early Greek Philosophy*, p. 138).

28 The expression 'equal but opposite' is a common shorthand for 'equal in magnitude but opposite in direction', that is, it implies neither paradox nor logical contradiction.

29 As Sandrina Kahled points out, Ulysses strung his bow 'as easily as a skilled bard strings a new peg of his lyre' and trying out the result, the string 'sang sweetly under his touch like the twittering of a swallow' (Homer, *Odyssey*, Book 21; Sandrina Kahled, 'Tónos: Musikalische Spannung im Denken der Griechen', Paper presented at the ICI-Colloquium on 27 November 2007). However, the point of analogy is here the stretching of a single string and testing its tension by the sound it emits, not an attunement of several strings.

same stretched string can produce different tones without changing its tension. In fact, the harmony of tones should probably be thought of in terms of a relation of lengths rather than tensions: the third harmonic is obtained by shortening the length to one third of the original, and it will generally be present as second overtone when the chord is struck. This may help explain why certain combinations of tones sound more harmonious than others. Nevertheless, as historical and cultural differences also indicate, the generation of a new harmonious tension from the simple bow ultimately seems to be an aesthetic effect rather than a purely mechanical one. The mechanical model of the bow may be transferred to the relationship between recipient and the object that captures his or her attention by eliciting a sensation of attraction or repulsion, but it remains quite unclear how it may apply to the object itself and account for its effects. Tension in the sense of opposing forces no doubt plays a role in sound waves, but there is no physical tension between different sounds as there is no significant interaction, no force between them. They pass through each other through simple superposition and are held together only in the recipient's experience.

#### **MECHANICAL TENSION AND FORCE/POWER**

Upon closer inspection, therefore, the bow as a model for mechanical tension between opposing forces has a more limited scope than one was initially led to believe. Manifold tensions can be generated from the bow, but they are of a different kind and mechanical tension does not account for their generation. Instead of a model of mechanical tension, the bow is here rather a model for the coexistence of an object's multivalent uses: it can kill or make sounds, even both at the same time; it can be repeated in a simply additive manner – more killing, more sound – or with a difference that can be agreeable or not: well-tuned or untuned lyre. For this multivalence, the bow's mechanical tension is incidental even if it may be required to produce any effect at all: a broken bow would do none of the above, but an intact one could be replaced by a stone that can be thrown or that can sparkle, harmoniously or shrill.

Nevertheless, it is precisely when understood as having a more limited scope that the bow provides a powerful model worth exploring in more detail. In particular, the suggestions that the bow as a model for

mechanical tension can serve as model for social conflict while describing a situation in which opposite forces automatically balance deserve further consideration. Models from physics can certainly be transferred to the social field only with many qualifications, also because key terms often acquire rather different meanings. 'Force' and 'power', for instance, are differentiated from each other in both fields, but there is barely any agreement between the distinctions. In mechanics, force acquires a rather precise meaning through Newton's second law – as something acting upon bodies and putting them into motion – and power is directly related to it as the product with the body's velocity (which is also the work done per unit of time, where work is the product of force and distance over which the body is moved: if one does not succeed in moving anything, one does no work and there is no power, even when one applies a lot of force). In the social field, such a distinction between force and power does not seem to play a role, but power may still be differentiated from force in several other ways, depending on context. In German, the fields tend to be distinguished more clearly: 'power' in mechanics is 'Leistung' (performance), whereas power in the social context is 'Macht', which like 'violence' (Gewalt) and 'domination' (Herrschaft) has no counter-part in physics. Yet, whereas the socio-political vocabulary may be more nuanced, the physics terms mentioned can all be used with regards to socio-political conflict or tension, and reference to the bow as a model for mechanical tension may offer some instructive insights into some of its aspects.

In the socio-political field, usually only force acts directly on bodies. It is therefore tightly bound to physical violence, whereas power acts on the action of other subjects or is understood as the ability to exert force.<sup>30</sup> These two meanings of power can be related insofar as the threat of exerting physical force may ultimately underlie the possibility of acting upon the actions of others, even if only in an indirect manner. Power is, for instance, mediated through the monopoly of violence that the state claims for itself, that is, of the right to restrict movement (imprisonment, segregation or exclusion/expulsion) or physical survival (not only through capital punishment but also by means of economic sanctions). While one can speak of force also in a more

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30 Cf. Michel Foucault, 'Afterword: The Subject and Power', in *Michel Foucault: Beyond Structuralism and Hermeneutics*, ed. by Hubert L. Dreyfus and Paul Rabinow (Chicago: University of Chicago Press, 1982), pp. 208-26 (p. 220).

general sense to include, for instance, the force of the better argument, something of the order of a distinction between actual and potential force seems both central for an understanding of socio-political tension and hard to conceptualize. The difficulty is not merely that potential forces also have actual effects: the threat of force acts upon actions; it also lies in the question of how to reconcile the seemingly obvious existence of asymmetrical power relations with the intriguing and much-discussed Foucauldian insight that power relations not only permeate the whole social field, but also presuppose freedom and the possibility of resistance.<sup>31</sup> Such a dependence of power on the possibility of resistance would seem to suggest that power relations are fundamentally reciprocal and balanced, and that they could therefore be conceived of as tensions permeating the whole socio-political field.

#### **EQUAL BUT OPPOSITE FORCES: POTENTIAL FORCE, *ACTIO*/ *REACTIO*, AND TENSION**

In mechanical systems such as the bow, opposite forces are balanced in several senses. One way to describe the system is by saying that there is a tension between frame and string: the stretched string seeks to contract the more that it is stretched and the bent frame seeks to straighten the more it is bent. As they are connected in such a way that a contraction in the string leads to a further bending in the frame and vice versa, there is one point at which the opposing tendencies balance each other out and this is where the system settles.

Should the tension in the string increase due to other reasons than increasing the distance between its two endpoints – e.g. by drawing the string outward, but also, for example, by cooling it down or changing the air's humidity –, it will exert a greater force on the frame that will then bend a little more and thereby exert a greater counter-force.

Even if the forces are therefore always balanced, it makes sense to ask which is stronger: the string or the frame. What is meant here is which will break first if one keeps increasing the tension. The question

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31 Cf. Foucault, 'Afterword: The Subject and Power', p. 221 and Raúl F. Fornet-Betancourt and others, 'The Ethic of Care for the Self as a Practice of Freedom: An Interview with Michel Foucault on January 20, 1984', *Philosophy & Social Criticism*, 12 (1984), pp. 112-31 (p. 123).

is not which exerts a greater force, but which is *capable* of exerting a greater force. The forces remain balanced throughout: once the bow breaks, all parts will relax and the tension disappear, but at no point will the stronger part have exerted a greater force than the weaker one.

This account is idealized insofar as it does not take into account that the parts have a mass requiring a force in order to move them. While the effect is negligible when the string is drawn in a continuous fashion with little acceleration, this consideration draws attention to an important source of confusion. At the points where frame and string meet, the ‘balancing’ of forces is in fact not only exact but also universal according to classical mechanics. It has nothing to do with tension, but is rather the result of Newton’s third law, according to which ‘To every Action there is always opposed an equal Reaction: or the mutual actions of two bodies upon each other are always equal, and directed to contrary parts.’<sup>32</sup> The important point to realize here is that the equal but opposite forces act on different bodies: the frame can exert a force on the string only insofar as the string acts in an opposite direction onto the frame. This seems to provide a precise analogue to the claim that power implies the possibility of resistance, which can be made even stronger by saying that power can only be exerted insofar as there is resistance and vice versa.<sup>33</sup>

As discussed above, the co-existence of equal but opposite forces affirmed by Newton’s third law does not exclude that one body is stronger than the other, has a greater capability to exert force/power than the other. Also, it has no immediate bearing upon tension, which requires instead equal but opposite forces acting on the same body. In the bow, the relevant forces to consider are therefore the forces acting upon the two sides of the string (or the forces that the string exerts on the frame, which by Newton’s third law are equal but opposite to the first pair). Here, there is no general law imposing a balance of forces, which is rather due to the special configuration of the bow. If one just looks at the string and imagines unequal forces applied on either side, a net force would act on the string, which would accelerate the whole string without contributing to its tension. If the string remains attached

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32 Sir Isaac Newton, *The Mathematical Principles of Natural Philosophy*, transl. of the 3rd Latin edition from 1726 by Andrew Motte (London, 1729), p. 20.

33 Another, more intuitive example from mechanics would be that a car cannot accelerate on black ice, no matter how strong the engine.

to the bow, the forces will generally quickly change as a result of this movement, but if the net force persists, the whole bow would have to move. In this case, we basically have the situation of picking up the bow without changing its internal relation of tension. A more appropriate situation for unbalanced forces would be the shooting of an arrow. When the bow is drawn the string divides in two straight parts stretched between the frame and the hand pulling out at the place of the arrow. When the arrow is released, the tension in the string is at first unchanged, and the string exerts a net force on the arrow as the two straight parts of the string are not aligned. Following Newton's third law, the arrow exerts the same but opposite force onto the string, maintaining the tension in the string. However, the force acting on the arrow is not balanced and the arrow will therefore be accelerated forward. At the same time, there is an overall balance insofar as the shooter is pushed backward, but this does not necessarily involve a tension: in free space or on ice, the result would rather be arrow and shooter moving in opposite directions without further interaction.

The bow thus provides a model for mechanical tension that distinguishes between several modes of opposing forces: a force of body A acting on body B is matched by an equal but opposite force of body B acting on A. *Actio* equals *reactio* in an entirely symmetric manner so that one cannot even tell which body acts and which reacts. This does not mean that there cannot be an imbalance in potential force, that is, a difference in the maximal force (or power) a body can exert, nor is the situation itself necessarily balanced in any ordinary sense: it can also consist of two bodies accelerating away from each other without ever meeting again. Tension is quite independent of all this: it requires instead equal but opposite forces acting on the same body.

#### THE BOW AS MODEL FOR INTENSIVE TENSION

Given such a specification of mechanical tension, it seems misleading to speak of a tension between frame and string. If anything, the string is stretched between two ends of the frame and the frame is bent between two ends of the string. However, ultimately it does not seem accurate to speak of a 'tension between' at all. Rather, there is 'tension in' the body that is stretched or bent by opposing forces. While one could speak of a tension or conflict between the frame's tendency to straighten and the

string's tendency to contract, mechanical tension is a physical quantity. This means in particular that it has a value. This value may actually simply be identified with the magnitude of the equal but opposite force acting on the same body. It is not localized but present throughout the body, it has the same value no matter how small a sample of the body one chooses. In short, tension is an intensive quantity: a quantity like density or temperature that unlike extensive quantities such as mass or energy does not depend on the body's extension.

Opposite forces act on every part of the body and it would seem that they cancel each other out. For a bow in its equilibrium position, no force is indeed visible or sensible. Yet, the opposite forces are very much present in every part of the body, as can already be seen by the risk of rupture at any point. In order to determine the tension one indeed has to make a cut – at least virtually – and determine the forces required at the loose ends in order to keep the structure intact.<sup>34</sup>

Upon closer analysis, the bow as the perhaps most pervasive model of tension is a model for 'tension in' rather than 'tension between'. It is a model for tension as an intensive quantity that is independent of a body's extension. What is more, it allows for an understanding of why the idea of a 'tension between' imposes itself. While tension is present in the whole body, the opposite forces balance each other at every point except at the endpoints. The situation is similar to a magnet, which can be thought of being made up of an infinite number of mini-magnets or dipoles, which are all of the same strength but produce a magnetic field only at the endpoints. This is why tension always appears as a 'tension between', as if it presupposed a binary opposition between two distinct forces at two distinct points. Binary opposition is the result of an intervention, of making a cut. The joints between frame and string are perhaps privileged breaking points, but from a physical, material perspective everything is continuously connected in the bow.

#### **ELECTRICAL TENSION AS ENERGY AND FIELD**

Of course, the bow is not the only model for tension, and mechanical tension is not the only form of tension even within physics. There is also

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34 Alternatively, one can imagine putting an infinitesimal test-string at the place of the cut.

surface tension, for instance, and around the eighteenth century, electric tension begins to take on a leading role. In some sense, the electric circuit is the opposite of the bow: tension disappears when the circuit is closed – as in a short-circuit – and is sustained only through interruption. Indeed, electric tension can be thought of in terms of a separation of charges. Here, it seems quite appropriate to speak of a ‘tension between’, as electric tension is defined in terms of a potential difference: its value is determined in terms of the amount of work required or obtained when moving a charge across the gap.<sup>35</sup>

However, this implies a significant shift in the definition of tension, which also explains much of the difference in description. While mechanical tension was so far of the order of force in our discussion, electric tension is of the order of (potential) energy. And whereas force is an intensive quantity, energy is an extensive quantity: it depends on the dimensions of the object or situation under consideration, such as the distance over which charges are separated or by which a string is stretched.

One could also define a bow’s tension in terms of the work required to build it by bending the frame and stretching the string. Perhaps this is the way in which tension has often been understood, given that force and energy were not clearly differentiated until the establishment of the principle of conservation of energy in the nineteenth century. Thinking of tension in terms of the energy difference between a tensed and relaxed state would still not justify speaking of a tension between frame and string, but it adds some insights by underlining a temporal rather than structural dimension. In particular, it highlights not only the potential energy stored in the bow for later use – which in mechanics is ultimately always defined in terms of producing coherent motion – but also the direction of development, namely precisely towards a more relaxed state. For a drawn bow this would mean returning to its undrawn though still tense state, whereas for the bow itself it would mean ending up being disassembled or broken. In either case, the expected direction towards an equilibrium state with lower tension may be understood in terms of the second law of thermodynamics. Whereas the first law of thermodynamics states that energy is conserved, the second law

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35 Work as defined in mechanics is basically the product of force and distance (more precisely the integral over the scalar product of force and displacement), so that a distance between two points is constitutive for it.

asserts an irreversible arrow of time, which can be formulated in different ways: there is a universal tendency for usable, 'free' energy to be degraded, for states of order to become less ordered, and for entropy as a measure for disorder to increase in any process.

The laws of thermodynamics have far-reaching consequences and while especially the second law continues to be much debated, it also reflects deep intuitions such as that it is easier to destroy than to construct, and that things, when left to their own accord, will break, decay and disintegrate. In short, it proclaims the necessity of death – and therefore also the improbability of life. On a more technical level, it prohibits, for instance, the possibility of constructing a *perpetuum mobile* – a machine running forever without external help and working for free. This is not the place to elaborate on how Sigmund Freud transposed the laws of thermodynamics to define an 'economic perspective' on psychic processes and affirm the pleasure principle, nor on how he nonetheless felt compelled to posit something beyond the pleasure principle and insist on a fundamental antagonistic dualism, such as between life and death drives.<sup>36</sup> What I would like to highlight, however, is that tendencies apparently opposed to the law of increasing entropy – such as phenomena of life and culture that would seem to have become more complex throughout evolution and history – are by no means incompatible with known physical laws. In their simple form, the laws of thermodynamics only apply to closed systems nearing equilibrium, while open systems – fuelled by a constant influx of (free) energy – can very well exhibit a decrease of entropy, an emergence of order out of chaos. Chaos theory and theories of emergence and self-organization continue to fascinate as they promise an understanding of such processes and suggest that the order of life may spontaneously emerge and evolve towards increasing complexity without requiring anything in addition to the known laws of physics. Some have gone so far as to maintain that irreversible processes of self-organization are not only compatible with the second law of thermodynamics but a direct consequence of it.<sup>37</sup>

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36 Sigmund Freud, *Beyond the Pleasure Principle*, in *The Standard Edition of the Complete Psychological Works of Sigmund Freud*, ed. and trans. by James Strachey, 24 vols (London: Vintage, 2001), XVIII.

37 Cf. Christoph F. E. Holzhey, 'Selbstorganisation am Rande der Mystik', in *Jenseits der entzauberten Welt: Naturwissenschaft und Mystik in der Moderne*, ed. by Klaus Vondung and K. Ludwig Pfeiffer (München: W. Fink, 2006), which

While such claims are as striking as they remain controversial, theories of self-organization certainly challenge the assumption that tension as a form of ordered, usable potential energy necessarily decreases, and offer a promising angle for approaching and thinking through the opposite tendency of tension to feed upon itself and produce more tension.

Returning to the apparent break of electric tension with the paradigm of mechanical tension, one could also go the opposite way and, rather than understanding mechanical tension as potential energy, define electric tension in terms of the force acting on charges in the gap separating charges. The notion of an electric field appears indeed fundamental in modern physics, and actually more relevant than that of electric tension. Like the mechanical tension in a string, an electric field cannot be seen directly but requires an intervention. In this case, one must introduce a test charge or some neutral matter that the field polarizes and aligns, similar to iron cuttings in the presence of a magnetic field. Electric fields can be thought to be created by opposite charges and to permeate the space between them, but they can also be induced by a time-varying magnetic field. In this case, electric tension is generated from within empty space, as it were, and it keeps adding up until reaching some conducting surfaces where it is 'realized' and can be fed into an electric circuit. The situation is here quite similar to that of a stretched string in which the forces appear only at the ends.

The significance of induced electric fields cannot be overestimated, not only in practical terms – for example for the generation of electricity – but also conceptually: they are directly related, for instance, to age-long debates on the existence of an ether (which resurfaces in the question of quantum fluctuations even if the experimental demonstration of the ether's inexistence was crucial for Einstein's theory of relativity) and are part of the revolution that field theories have brought to physics by providing an alternative description of reality, based on continuous fields rather than on the point-like particles of classical mechanics.

While considerable work would be required to explore to what extent these different models, their relations and distinctions may be transferred between different domains of physics and from physics to socio-political fields, I have sought to suggest numerous possibilities of making contacts between them and thereby indicate on what level a

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refers in particular to Ilya Prigogine and Isabelle Stengers, *Order Out of Chaos: Man's New Dialogue with Nature* (London: Heinemann, 1984).

transfer may be productive. The point would not be to reduce social relations to mechanics but rather to explore to what extent distinctions and relations within and between physical models, which are simple enough to be quite well understood, can help to identify and think through analogous distinctions and relations in other fields. To what extent can the different ways in which forces are opposed in actuality or potentiality be related to social power relations, domination and tension? To what extent should one speak less of a tension between social subjects or groups than of a tension in the 'things' on which they act with equal force but in opposite directions, for instance, in the same thing that each subject or group wants to claim for itself? To what extent is there an analogue for the complementarity of understanding tension in terms of force and energy? And to what extent can field theories and phenomena of induction as an alternative description to particle mechanics help to think through social fields of tension as producing rather than presupposing distinct individuals and identities?

Similar questions could be raised in relation to aesthetic tensions and ultimately also to tensions between different disciplinary approaches to which I risk having returned after all by ending the discussion with models of tension in physics. Ultimately, there is no secure place to start or end, and the narrative of this essay is but one way to navigate the manifold forms, qualities and dimensions of tension with the aim of indicating avenues for productive reconfigurations. Seeking a unifying account of what tension is, or an extensive and systematic classification of its diverse notions and uses, would mean resolving tensions between different approaches and privileging a particular mode of doing so. What I have tried to suggest instead is that by taking tension as a broad umbrella term stretched by multi-perspectival articulations and unified through its intensive surface tension, a critical paradigm focused on tension affords a more paradoxical unity that allows tension to unfold its transformative and generative potential.