CHAPTER 16

Planetary Resilience: Codes, Climates and Cosmo-science in Copenhagen[1]

Martin Skrydstrup

Abstract

This chapter presents an ethnography of statements made by important actors at a major scientific congress on climate change in Copenhagen, March 2009, seen as a runner up to the climate summit in December 2009 (COP 15). The aim is to track an implicit notion of resilience of a planetary scale that parts company from the conventional usage in the social sciences. Zooming in on the actual debates and interactions at the congress and following the arguments back to their origin in scientific laboratories the chapter identifies an emergent paradox between science and politics: on the one hand they seem to be inextricably intertwined, while on the other they make claims to absolute purity.

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In the past few years, the notion of "social resilience" has emerged as a key concept to unlock local responses to climate change and environmental disasters. Tacitly responding to the influential geographer Jared Diamond's steadfast distinction between social and biological survival (Diamond 2005), the notion of resilience couples the

1. I would like to acknowledge my colleagues in the *Waterworlds* team at the Dept. of Anthropology, University of Copenhagen for valuable input and discussions. I owe a very special thank to Ph.D. Candidate Anders Blok, Dept. of Sociology, University of Copenhagen, who read and commented on a draft version of this paper.

social and the ecological in an integrative approach. This analytical interlocking promises to unpack the variability of adaptive responses found across social-ecological systems. Contrary to Diamond's comparative project of delineating input and output variables across such different societies as the Norse settlers in Greenland and the Anasazi of south-western North America – both exposed to the "input" of climate change and the "output" of environmental damage, according to Diamond – the notion of resilience brings home the point that pathways to sustainability are situated in social actualities embedded in specific localities, which are fairly incommensurable (Walker et al. 2006). Thus, studies of social resilience generally conceive the concept as linked to the small-scale (person, group or place) and being intrinsic to and a property of a particular sociability coupled with the environment (see e.g. Leach et al. 2007). Of late, resilience framings of sustainability and vulnerability have also entered managerial discourses and the disaster management programs of the IMF, the World Bank and USAID taking on normative implications, which also constitute an object of scholarly scrutiny (see Boyd et al. 2008). All these studies promise to provide substantial ethnographic insights to the flipsides and frictions of sweeping metanarratives like the "Anthropocene"[2] or "global warming" and in so doing advance the conceptualization of social resilience. Thus, through the concept of social resilience we can anticipate to learn a great deal about the vulnerability and sustainability of societies facing environmental disasters across the world.

That being said, I want to do something quite different with the concept of social resilience in this chapter. In fact, I shall suggest a

2. The term *Anthropocene* was coined in 2000 by P. Crutzen & Stoermer, who consider humanity's interference with the Earth's climate system of such an order of magnitude, as to constitute a new geological period. According to conventional geological chronology, we are currently on *Holocene* time; a period which began approx. 11700 years ago, characterized by an interglacial warming. The *Anthropocene* has no fixed beginning, but is generally regarded to catch on with the emergence of the industrial revolution in the late 18th century, specifically with James Watt's invention of the steam engine in 1784. See Crutzen, P. J. & E. F. Stoermer 2000; Zalasiewicz, J. et al. 2008.

slightly alternative analytical route to the concept by way of an ethnography of the current state of scientific knowledge about climate change crafted by an assembly in Copenhagen in March 2009.[3] Zooming in on the central podium of this significant event in the Bella Centre – cast as a forerunner to COP 15[4] to be convened in the same locality – I shall follow the world's leading climate scientists and see what sense these actors bring to bear on the notion of social resilience. By way of exposing social resilience to a quite different scaling exercise than what has been entertained in the standard social science literature, I shall show a radical different scope and coinage of the concept. I shall continue to follow these elite actors as they venture to the closing panel and see what happens when they encounter politics writ large, in the shape of the Prime Minister of Denmark. My key argument is that this encounter accentuates a paradox of some magnitude: On the one hand it stages an absolute hybridization and entanglement of science and politics; on the other it purifies and reinforces the absolute separation between science and politics.

My argument unfolds in three separate steps, linked by three fundamental questions. The first step revolves around how much the oceans will rise under the current conditions of global warming, where I attempt to follow the answer given by a leading climate scientist, back to his laboratory. The second step pivots on what we should do about global warming, where I capture a radical different scaling of the concept of social resilience than what is prevalent in the social science literature. The third step hinges on what the real

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3. March 10-12 2009, the University of Copenhagen hosted the conference *Climate Change: Global Risks, Challenges & Decisions*, in collaboration with IARU (International Alliance of Research Universities), which took place in *Bella Center*, Copenhagen – the exact same venue where the negotiations of COP 15 will unfold in December 2009. In the course of three days, more than 1400 scientific presentations from the world's leading climate scientists representing almost 80 countries provided an update to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC: 2007). I want to thank Prof. Hastrup, Director of the Research Centre *Waterworlds* for sponsoring my participation at the conference.

4. COP 15 is an acronym for the 15th Conference Of Parties to the United Nations Framework Convention on Climate Change (UNFCCC).

platform for politics is today, where I begin to unpack the grand paradox stated above. My hope is that this ethnographic itinerary may provide some directions *en route* for a possible destabilization and reassembling of the concept of social resilience.

In the laboratory of temperature

Just how much will the oceans rise under the current conditions of global warming? In the Bella Centre, this question was addressed by climate scientist Stefan Rahmstorf working at the renowned Potsdam Institute for Climate Impact Research (PIK). Trained in theoretical physics and physical oceanography in Germany and New Zealand, Rahmstorf raised to the public lime light, when he published a correlation between temperature and sea levels rise over the past 120 years, in the prestigious journal *Science* (Rahmstorf 2007). Entering the central podium in the wake of a popular video presentation by the Chairman of the IPCC, Rajendra Pachauri, Rahmstorf staged himself as a serious scientist: "My role here today is to lead over to the individual scientific themes of this conference. I will start by reminding you all that very big sea level changes have happened in the Earth's history. At the height of the last ice age, sea level was 120 meters lower than it is today and temperatures globally were only about four to seven degrees lower then,"[5] Rahmstorf said showing a slide of the planet illustrating what the globe looked like in the last ice age simulated by a model entitled "CLIMBER-2". After a serious engagement with the infamous sceptical environmentalist Bjørn Lomborg's interpretation of observable sea-level data as the "trick of fluctuations," Rahmstorf said with authority: "Let's get back to the real science." His scientific performance elaborated on the correlation between major sea level changes and climate change plotted on an absolute time line. The crux of his presentation revolved

5. All quotes from the participants are drawn verbatim from my own recording and transcript at the conference *Climate Change - Global Risks, Challenges & Decisions*; Copenhagen, March 12th, 2009. The recording and transcript is on file with the author. The panel sessions from which I quote are available at: http://climatecongress.ku.dk/presentations/congresspresentations/

around the gaps, or the minuscule discrepancies if you will, between physics-based model predictions and observable data. Basically, the physics-based modelling of IPCC's Fourth Assessment Report (2007) – to which Rahmstorf was a lead author – had predicted a 1.2mm rise per year. However, the factual observations showed 1.8mm rise (1961-2003), leading to an estimated total sea level rise between 18 and 59 centimetres over the next 100 years. Rahmstorf explained that this prediction only included the thermal expansion of the oceans and did not include the full effects of the melting glaciers and continental ice sheets, because "a scientific basis in the published literature is not there yet."

Rahmstorf proceeded by setting himself the task of explaining the gaps between scientific climate modelling and the observable out-there-ness: "I showed you that the sea level is rising much faster than the models, so we have to conclude that the physics based models are not yet up to the task of predicting sea level rise very well. So, there have been a number of approaches to try and look for alternatives to the physics based models. And the idea is basically to select an observable that the models can predict very well – for example the global mean temperature – and see whether we can find empirical links in the past data to the total sea level." This was exactly the avenue Rahmstorf opted for in his influential and widely cited paper in *Science* (2007) where he had found an observable empirical link between two variables, which could be correlated with the new equation: dH/dt = a (T-To).[6] This was in 2007. However, most recently there had been an extension to this approach proposed by a climate scientist in Helsinki, who suggested adding a "rapid response term"[7] to Rahmstorf's equation. The climate scientist at the podium then revealed that with this new equation, a number of successive experiments had been conducted, showing almost perfect correlation between model prediction and empirical observation:

6. In this equation, H is the global mean sea level; t is time; a is the proportionality constant; T is the global mean temperature; and To is the previous equilibrium temperature value.

7. The addendum proposed by Martin Vermeer looked like this: dH/dt = a (T-To) + **b dT/dt**. At the time of the conference, this new formula was yet to be published.

"you can see this simple new equation does an almost perfect match of the rate of sea level rise over the past 120 years as compared to the real observed data." Thus, the audience – and not to forget the global media coverage – was left with the impression that the golden formula for predicting planetary sea level rise with approx. 98% scientific certainty had been freshly established almost *en route* to Copenhagen.[8]

How would this actor retrospectively account for the move from uncertain scientific knowledge in 2007, to settled scientific fact in 2009? Rahmstorf did so by way of a short detour to belief: "Now, do I believe those results? When you look at my earlier paper from 2007, with this very simplistic approach, I did not conclude that we can reliably predict sea level rise with this. I merely concluded that the uncertainty about sea level rise is probably larger than we expected. Now, in the mean time, I find the statistical results to fit so good that I am afraid I am starting to believe this and the bad news is that even for a low emission scenario like the B1 scenario – the best estimate here is above one meter in 2100." Then, Rahmstorf tackled the question of scientific progress head on: "I want to answer the question: Why are these values higher than my paper in *Science* in 2007? ... The main reason is that we included an additional adjustment to the sea level data, namely accounting for the amount of water stored in reservoirs on land ... with this adjustment, the statistical fit to the simple temperature equation gets a lot better. That is reassuring because we know this is a physics based adjustment and you have to take that reservoir water out if you want to find the link to climate – that is the climate driven part of the sea level rise. And this adjustment leads to 2/3 of the increase in values[9] that we have over the earlier paper." Rahmstorf closed his performance with a heading, which made front page news in many major newspapers across the world: "Sea level rise may well exceed one meter by 2100 if emissions con-

8. At the time of Rahmstorf's performance in Copenhagen (March 11, 2009), this new formula was yet to be published.

9. By "values" Rahmstorf here refers to the numerical increase in sea-level projected in Copenhagen, vis-à-vis the rise predicted in the 2007 *Science* publication.

tinue unabated." The audience had just witnessed the reality of "real science" unfold as a kind of quest for the perfect correspondence between scientific modelling and the observable out-there-ness.

Now, I want to shift the ethnographic focal point from the central podium in the Bella Centre, to the practice of science, in order to make Rahmstorf's laboratory visible. To do that, I need to introduce the leading figure of science studies, the French anthropologist Bruno Latour. In October 1975, Latour ventured to the Salk Institute in San Diego to conduct a two-year long ethnographic study of endocrinologists. He arrived to explore the simple question of what a scientific fact is and how it is made. Through the ethnographic study of routine practices and the logistics of laboratory life in the Salk Institute, Latour found that: "the artificial reality, which participants describe in terms of an objective entity, has in fact been constructed by the use of inscription devices" (Latour & Woolgar 1986: 64). The implication was that scientific facts are made by such inscription devices (instruments, computer programs, notations, calibration codes, models, communication technologies, etc.) in the laboratory, which translates and mediates them. By tracking inscriptions they learned that these are distributed between laboratories, publications and new technologies in an ever increasing network that we call science. The original monograph entitled *Laboratory Life* (1986[1979]) that came out of this fieldwork shaped the interdisciplinary field today known as science studies. It marked an important shift in focus from the theory of science to the practice of science, or from the logic of epistemology to the logistics of the laboratory.

I now want to draw out the implications of *Laboratory Life* for the podium in the Bella Centre and like Rahmstorf did in Copenhagen, I also want to add an extension to Latour's original formula, namely the concept of "circulating reference" which shall enlighten us about the truth of climate science; but first things first. What did *Laboratory Life* demonstrate about the epistemological principle of correspondence, which Rahmstorf practised at the podium in the Bella Centre? Latour and Woolgar argued that: "the thing and the statement correspond for the simple reason that they come from the same source. Their separation is only the final stage in the process of their construction" (Latour & Woolgar 1986: 183). This line of reasoning

led to a constructivist argument setting out that scientific fact was an accomplishment, rather than reflective of an independent, anterior, definite and singular reality out there: "Our point is that the 'out-there-ness' is the *consequence* of scientific work rather than its *cause*" (ibid.:182). Ultimately, "scientific activity is not 'about nature,' it is a fierce fight to *construct* reality. The *laboratory* is the workplace and the set of productive forces, which makes construction possible" (ibid.: 243).

Why might this argument be unsettling to Rahmstorf and other natural scientists? Why might scientists in the business of physics-based climate modeling of the fact of global warming draw the worrying implication that Latour's program for the ethnographic study of science would somehow undermine their authority and claims to realism? How has Latour responded to the critique leveled at his argument in *Laboratory Life*? A critique asserting that Latour should be engaged in "social constructivism" and that his enterprise amounts to an imposturous reduction of science to specific contexts coupled with political agendas, obscured and mystified by post-modern relativism? A rather absurd critique constructing him to assert that there is no reality out there, that everything goes, that everything is political anyways and that scientific truth is a matter of allies. This grave misunderstanding and (mis-)construction partly rests on what Latour calls the "modernist settlement," developed in *We Have Never Been Modern* (1993) and brought home in *Pandora's Hope* (1999),[10] where he forcefully responds to his critics:

> Science studies does not say that facts are "socially constructed"; it does not spur the masses to smash their way through the laboratories; it does not claim that humans are forever cut off from the outside world and locked in the cells of their own viewpoints; it does not wish to go back to the rich, authentic, and humane premodern past. What is most bizarre to the eyes of the social scientists is that science studies is not even critical, debunking, or provocative. By shifting attention form the theory of science to its practice, it has simply happened, by chance, upon the frame that held together the modernist settlement. (Latour 1999: 293-4)

10. Significantly subtitled "Essays on the Reality of Science Studies".

Thus, the rationale for the ethnographic study of science was never to "deconstruct" science, rather science served as the window, or as Latour's laboratory if you will, to a much larger conceptual project about the modern constitution. Most of the critique of Latour's work rest on this modernist settlement, tacitly assuming that if something is fabricated it is false; or that if observable data are achieved rather than found, they do somehow not correspond to reality. Nothing could be further removed from the truth.

One might ask why Rahmstorf in a highly technical argument carried by algebra and theoretical physics projected in modeling, bothered to use a chunk of his brief time at the podium in the Bella Centre, to argue against media comments in *The Guardian* put forward by a locally embedded skeptical environmentalist. Surprisingly, there was apparently sufficiently reason for science to take climate change skeptics seriously enough to spend scientific time on them. The obvious reason for this seems to be the trajectory of climate science from a relative domestic life of predicting the weather to a top global policy issue with Babylonian stakes. Today, the projections and predictions of climate science intersect with debates about renewable energy vs. nuclear power, as well as the policy instruments of carbon trade, targets and timetables, which will be tabled during COP 15. In fact, the intent behind the whole event in the Bella Centre in March 2009 was to provide global decision makers at COP 15 with a scientific update on the IPCC Fourth Assessment Report. Where science directly feeds decision makers, the constructivism of Science and Technology Studies may easily be construed as a banal and mundane political question about "whose side are you on".

In such a climate, the anthropology of science needs to stick with the principle of symmetry, as not to end up with strange bedfellows. Moreover, the anthropology of science should stick with the ethnography of scientific practices and follow the achievements of scientific *sublata*[11] from the most inaccessible parts of our planetary system, be that the upper stratosphere, the abyss of oceans, or the drilling

11. Latour writes: "One should never speak of "data" - what is given - but rather of sublata, that is, of "achievements." (Latour 1999: 42)

of the deepest ice cores in Greenland, where purportedly no social facts exists. In our current climate, there is more reason than ever for the anthropology of science to pay heed to practitioners' modelling communities, be that MAGICC, CHAMMP, BUGS[12] or CLIMBER-2, which actors such as Rahmstorf practise. Finally, the anthropology of science should convince climatologists that there is neither correspondence nor gaps between physics based modeling and observable data; rather according to Latour the principle of "circulating reference" is operating, which will change "our understanding of the connections between a scientific discipline and the rest of its world" (Latour 1999: 80). The point is that the success of Rahmstorf's experiment rested on an alignment operator - the "black box"[13] of dH/dt = a (T-To) + b dT/dt) - which allowed for *passage* through a long chain of mediations and translations, reaching an indisputable, although equivocal, end point: "by 2100 sea level rise may well exceed one meter." The black box aligned what preceded it and what followed it in a long assembly line. The essential property of this long chain is that it must remain reversible: "The succession of stages must be traceable, allowing for travel in both directions. If the chain is interrupted at any point, it ceases to transport truth - ceases, that is, to produce, to construct, to trace, and to conduct it" (ibid.: 69).

Thus, scientific *sublata* about climate change circulate through long chains of intermediaries and mediations[14] in trans-local net-

12. These are acronyms for various climate models simulating and predicting the climate (e.g. BUGS is short for BeaUtiful General circulation modeling System). Such acronyms as CHAMMP and MAGICC makes one associate to the "profes - sional dreamers" depicted in Werner Herzog's Oscar nominated documentary *Encounters at the End of the World.* (2007).

13. Blackboxing is an expression from Latour's conceptual apparatus which refer to the way science and its technical formula are made invisible by its own success. The equation: dH/dt = a (T-To) + b dT/dt), proposed by Rahmstorf and Vermeer would qualify for candidacy here.

14. Importantly, Latour distinguishes between "intermediaries" and "mediators". An intermediary transports meaning or force without transformation (e.g. the equation dH/dt = a (T-To) + b dT/dt), whereas mediators transform, translate, distort and modify the meaning they are supposed to carry.

works distributed in wider assemblages of semiotic and material connections, which stabilize them and enable claims to universality. Rather than undermining the authority of climate science, this lateral insight could rightly understood operate in tandem with the work of climatologists contributing to a new division of academic labor. Through such a new social contract between science and anthropology, the latter discipline would be able to contribute a sense of realism to climate science, raising professional authority and integrity. After all, nobody can experience or directly observe the amount of CO_2 in the atmosphere, in the oceans or in ice cores. Only techno-science can mediate what we as a human collective can know about the fact of global warming.

In the parliament of cosmoscience

What should we then do about global warming? At the central podium in the Bella Centre, Professor John Schellnhuber took on this question about the relation between knowledge and action. Schellnhuber is the founding director of the renowned Potsdam Institute for Climate Impact Research, a colleague to Rahmstorf and possibly part of the same scientific modelling community. The Professor was dressed all in black at the grand podium and had deep wrinkles in his high forehead, which somehow radiated a profound concern about the state of the planet. Contrary to Rahmstorf, Schellnhuber seemed to carry a certain humbleness and detachment from the worldly, which gave him the aura of a Buddhist monk. In the 1980s, he worked in California with the best minds in the field of theoretical physics on fractal geometrics, chaos theory and complex systems. This knowledge came in handy when he began to model climate predictions under conditions of global warming from 1992 and onward in Potsdam. Today, he is one of the most recognized climatologists in the world and in that capacity he will serve as a Chief Advisor to the German Government during the COP 15 negotiations in Copenhagen.

Schellnhuber opened his performance by revealing that he wanted to "share in the intimacy of this small room" what was "too strong for the delicate nerves of the German *Kanzler* Angela Merkel, a few

weeks ago". Drawing on "hundred of thousands of scientific papers" he informed the audience that the latest news from science was that "the two degrees target is a fairly *faul* (lazy) compromise." Schellnhuber then asked the plus 2000 scientists in the audience: "who in this room knows what Russian roulette is, please raise your arm...[*a forest of arms appeared*]...Who has ever played Russian roulette, please raise your arm...[*every single arm was lowered*]...hmm...as a matter of fact, we all do!" Borrowing from Al Gore, he called his next slide for "the inconvenient truth" depicting what will happen if we stick to the EU target of two degrees: humanity will play Russian roulette with a 5/6 chance of surviving in the next century. Schellnhuber then proceeded to the imaginary of a five degree world in which we would release different tipping elements, such as the melting of the ice cap of Greenland and the melting of "the Achilles heel of this planet; the Tibetan plateau". These tipping points would reinforce each other, creating domino effects. The "good news of a five degrees world," Schellnhuber said, "is that science can predict the carrying capacity of planet Earth with certainty; what a triumph!" he exclaimed with a twist of irony.

Thinking at this planetary scale and order of magnitude about how to meet what he called the "MAD challenge,"[15] Schellnhuber urged the audience "to think the unthinkable." His critical argument was that to meet the challenge humanity had to transform the land-use pattern of the planet and turn the most fertile areas of the world into "global agricultural commons."[16] Moreover, he suggested that the allocation of climate refugees should be allocated according to a global distributional justice: "The United States is responsible for 25% of global CO_2 emissions; now isn't it fair that they take 25% of the refugees," Schellnhuber asked the audience. What stood in the way of such drastic and transformative measures was a form of "social resilience," which Schellnhuber understood as inertia and stamina. He likened this form of "social resilience" with the "lock-

15. An acronym for Mitigation-Adaptation-Development (MAD) and a subtle wink to the nuclear first strike scenarios during the Cold War.

16. Which by the way are located in central Europe and the eastern part of the United States.

in of technological cultures," illustrated by recourse to the so-called "QWERTY phenomenon." The point is that most commonly used strokes on a keyboard are not the most accessible ones (Q-W-E-R-T-Y), which implies as Schellnhuber said that "it is certainly not optimal, nevertheless we use it. Can we transform this? Probably not! This means that we remain deeply locked in a sub-optimal situation. The same is true of the land-use of this planet."

Thus, according to Schellnhuber, the greatest threat to the survival of humanity in the next century was "social resilience" in the form of the inertia and sub-optional techno-folkways of the Occident. Thus, Schellnhuber casted "social resilience" as the enemy of transformation and as the adversary of the necessary leaps of imagination, which it would take to meet the MAD challenge. At the scale of the planet, "social resilience" locked the imaginative potential for breaking out of existing socio-technical-cultures such as the contemporary carbon based fossil-fuel economy of the Occident, existing knowledge regimes and established national political orders. To put it bluntly; in Schellnhuber's mind game, the Occidental ways of living and thinking was conjured up as the boundary to be transgressed if survival at the planetary scale was to be secured in the next century. Here was a leading climate scientist with the charisma of a Buddhist monk playing "wild cards"[17] and in so doing explicitly addressing the "social resilience" of the Occident as the Achilles heel of the planet.

The crucial analytical point here is scaling: the concept of "social resilience" is here deployed in a radical different sense than in the standard social science literature by one of the world's leading and most influential climatologists. Schnellnhuber would agree with Diamond that societies collapse from suicide, rather than from murder, if they fail to break out of their persistent techno-folkways and meet the challenges of their times. Thus, if we follow the knowledge practices of actors in the Bella Centre, we learn that at the planetary level of scaling, "social resilience" represents inertia, stamina, con-

17. Schellnhuber called his last three slides in his podium performance for "wild cards".

servatism and a cognitive impasse, which threatens humanity to make it into the 21st century. Keeping this in mind, we shall continue to follow the concept and later see where it surfaces at the final session of the assembly.

What is then the relation between science and politics in this wild mind game? Surprisingly, here was a climate scientist who apparently did not confirm to the modernist distinction between scientific and political representations, between facts and norms, between nature and society. Schellnhuber seemed tacitly to recognize that the science conducted in Potsdam and society was part of the same constitution, which entailed a complex entanglement of nature, society, eco-systems, technologies and politics. In fact, the last term should be put in brackets, in so far Schellnhuber substituted politics with a form of optimal practice at the planetary level, which seemed to do away with the concept of the political as most moderns know it. By way of posing two fundamental questions, Schellnhuber directed and staged an alternative to the modernist settlement. The first question was "how many people can the planet carry in the Anthropocene?" The second question was "what transformative sacrifice does it take for people to live the good life together in the Anthropocene?" Building on the concept of "cosmopolitics" envisaged by Isabelle Stengers (1996), Latour argues that exactly these two questions collect us all in "the parliament of things". Latour further argues that these two questions have been posed by many brilliant minds, but "for *humans only* without the nonhumans that make them up" (Latour 1999: 297).

Extensively drawing on the QWERTY phenomena of Occidental techno-folkways, wind mills, solar thermal power plants, hydro, biomass and geothermal energy sources in trans-local power grids, earthquakes and tropical hurricanes, we might say that Schellnhuber came close to the parliament of things at the podium in the Bella Centre. He transcended the modernist settlement of science and politics, nature and society as separate domains and avoided to slide into the purifying practices of his modern colleague in Potsdam. He eliminated the distinction between nature and scientific representations of nature and by implication merged the mental compartments of nature and society – the bicameral political model – and stepped

forward as the saviour of public action and humanity. In his mind game, the sciences and the politics had ceased to be concerned with nature and interests, respectively. Schellnhuber's mind game seemed a "proposition" in Latour's sense of "engagement of a certain type of world in a certain kind of collective" (Latour 1997). He was basically concerned with installing a more realistic sense of possibility in the minds of the inhabitants of Planet Earth and in so doing he built what we may call "cosmoscience" at the podium. But did Schellnhuber arrive to the "parliament of things"? Well, he posed the critical two questions, but in answering them Schellnhuber's deferred to the optimal practice for humanity as a form of rational politics carried by omniscient knowledge about the planet, which is far away from Latour's "parliament of things" and Stengers' notion of "cosmopolitics," however that would take another chapter to develop.

A Sovereign in the modernist settlement

What is then the real platform for politics? At the final session of the conference in the Bella Centre, the Danish Prime Minister Anders Fogh Rasmussen – now former Prime Minister – told the two climate scientists from Potsdam and a packed Bella Centre: "You point to the political, economical and social constraints that prevent us from taking the right decisions. A global agreement in Copenhagen is not just about tackling climate change. It will constitute a new era in multilateral relations. It will be a unique occasion to construct a global solution based on mutual responsibility to act and to assist. People demand action. Government must realize that it is in their best interest to act. Government will fall if they fail. Politics must not be in the way of necessary solutions. The world needs better governance." Rasmussen then summed up the real platform for politics: "So in conclusion let me repeat the key messages: Urgency – we must come to an agreement here in Copenhagen in December; Direction – we must set a long term target; Action – we must commit to short term efforts; Fairness – the rich must assist the poor; Opportunity – green growth is the future; Governance – if we fail to act, we fall; Thank you!"

Swiftly and eloquently like a talk show hostess, the Chair of the

The keynote podium in Bella Center, Copenhagen, during the final session at the conference *Climate-Change: Global Risks, Challenges & Decisions* (March 10-12, 2009), organized by the University of Copenhagen in collaboration with IARU (International Alliance of Research Universities). From left to right: Conference Chair Prof. Katherine Richardson; Prof. Will Steffen; Prof. Stefan Rahmsdorf; Prof. Daniel M. Kammen; Lord Nicholas Stern, and Danish Prime Minister Anders Fogh Rasmussen. (Photograph by the author)

conference Katherine Richardson – herself a climatologist and like Rahmstorf professor in oceanography – picked up the seamless lead, provided by the Prime Minister: "Now we have the scientists and the politicians saying exactly the same thing – I think – here at the podium. Why don't we try to get a scientific response?" Rahmstorf picked up the microphone and directly addressed the Prime Minister: "I want to just express a concern that I have; that when politicians talk about the ambitions of two degrees – as you just did – that is considered an ambition and in the end if all goes reasonable well we actually end up with three degrees of warming. I want to emphasize that when we as scientists talk about two degrees that is an upper limit we really should not cross. Personally, as a climate scientist, I really could not go and tell the public that two degrees warming is safe. We are already seeing a lot of impact of the 0.7 degrees warm-

ing that we have had so far. So, I consider two degrees not safe. This morning John Schellnhuber asked the question: Is Russian roulette dangerous? In Russian roulette you have a one-in-a-sixth change of something terrible happening. I think, when we go to two degrees we probably have more than a one-in-sixth change of really bad impact occurring."

With a twinkle in his ice blue eyes picking up the color of the ice bergs behind him at the podium [see illustration on page 351], the Prime Minister responded to science with a certain sense of urgency and wit: "Well, I need some concrete advice now. Stefan Rahmstorf said two degrees; that the two degrees target is not safe. So now I need to know from the scientific panel: Can we as politicians still rely on the IPCC recommendations or not? Are you telling me that we should set the bar even higher? I need to know that. And I will tell you why - we have had a very hard battle within the EU and finally, finally we decided on the two degree target. It has been a real challenge to reach that point. And now you are telling me that it is not enough. Now I need to know, and I need to know today! Is it enough or...do we have to change this target, because it is fundamental. We have now nine months left before a very, very important meeting in this room. It will be a real challenge. And now I think it is time for the scientific world to come to an agreement with itself: what is the real platform for politicians?" Hard pressed for fixed degrees, certainties and expeditious yes-or-no answers Rahmstorf responded: "There is uncertainty in our science and the uncertainty often works in the direction that things turn out somewhat worse. We have underestimated climate effects in the past so the larger the safety margin we can build into this the better it is, in my view." With this response, science retreated and deployed what is commonly known as the "precautionary principle."[18] Not quite convinced by the precautionary principle, the Prime Minister shifted tactics and instead of cunningly asking science for certainties, he instead began to advise the scientific panel: "At the end of the day here in Copenhagen we have as politicians to make the final decision and to decide on exact figures, I hope. This is the reason why I would give you one piece of advice: not to provide us with too many moving targets. Because it is already a very, very complicated process and I need your

assistance to push this process in the right direction. And in that respect, I need fixed targets and certain figures and not too many considerations on uncertainties and risks and things like that."

By casting himself as the ultimate decisionist, the Prime Minister had forced the world's leading climate scientists to retreat to the precautionary principle, instead of the mind game of Russian roulette. This cunning decisionism reinstated and enforced the modern borders between science and politics, which Schellnhuber had unsettled in the morning by way of his wild cards of cosmoscience. This afternoon the actors staged themselves as belonging to separate worlds and realms of discourse. The scientific panel was trading in knowledge about nature; the Prime Minister was acting upon nature. The scientific panel construed the truth as out there and the task as the discovery of it. The Prime Minister construed truth as expedient to support the objective of two degrees. The scientific panel staged itself as being in the business of uncertainty. For the Prime Minister uncertainty was taken to mean that there was no problem at all. But there was a clear difference between science and politics. At the podium in the Bella Centre, the Prime Minister appeared as the Sovereign in Carl Schmitt's sense (Schmitt 2005); that is the one and only in a position to and capable of effectively responding to the challenges posed by a state of exception imposed by the Anthropocene. Performing as a Sovereign, who urgently needed to make decisions within hours, the Prime Minister shaped the grand paradox of purifying and hybridizing science and politics at the same time. His

18. The "precautionary principle" (*Vorsorgeprinzip*) emerged as a concept within environmental science in the 1970s, when German scientists and policy-makers attempted to tackle *Waldsterben* (forest death), before a heavy burden of scientific proof could be established relating the phenomenon to air pollution. This work culminated in the German Clean Air Act of 1974. The general rule of the precautionary principle is that in situations of potentially serious or irreversible threats to human health or the environment potential risks should be reduced *before* there is strong evidence or scientific proof of harm. Thus, the rationale for action should not be the preponderance of evidence, but rather foresight or precaution (*Vorsorge*). See Paul Harremoes, D. G., Malcolm MacGarvin et al. 2001. *Late lessons from early warnings: the precautionary principle 1896-2000*. Luxenbourg: European Environment Agency.

sovereign performance instated the modernist settlement of separate domains and at the same time he engaged a podium discourse, where science and politics folded into each other and became entangled in commonsense conversation.

To accommodate and guide the Prime Minister, the Chair handed a dossier over to Anders Fogh Rasmussen listing "six key messages" representing the cutting edge of scientific knowledge about planet Earth's climate in the face of global warming. In these six messages the scientific community had come to an agreement with itself about what could be said to constitute unequivocal scientific facts. The first message addressed the fact of global warming: "Temperature rises above 2C will be difficult for contemporary societies to cope with, and are likely to cause major societal and environmental disruptions through the rest of the century and beyond" (Richardson et al. 2009: 6). The sixth message was about what to do about it: "If the societal transformation required to meet the climate change challenge is to be achieved, then a number of significant constraints must be overcome and critical opportunities seized. These include reducing inertia in social and economic systems; building on a growing public desire for governments to act on climate change; reducing activities that increase greenhouse gas emissions and reduce *resilience* (e.g. subsidies)" (ibid. italics added). Here the notion of "social resilience" surfaces again; although its long chain of intermediaries and translations at the conference have not distorted its coinage. We may assert that for the world's leading climate scientists the concept of "social resilience" is cast negatively as inertia, stamina, and conservatism, which locks society in inaction and threatens a planet faced with the fact of global warming. Thus, we have a conceptualization by the key actors in Copenhagen, which runs against the grain of social science literature on "social resilience."

Upon receipt of the unambiguous six scientific messages, the Prime Minister said: "I think science should be the basis of decision making in this field. Politicians can only act on what we know and therefore your contribution is central. And you have given me the results from your hard work. I will carry your paper with me when I engage with other world leaders to let then know what science says. You have delivered the facts. Now it is up to others to carry it on."

With the paper dossier from science under his arm, the Prime Minister left the podium to standing audience ovations and applause. His podium performance was deemed victorious, boosting his legitimacy as a political leader. Anders Fogh Rasmussen had succeeded in staging himself as a true Sovereign and came across as a tough decisionist and a hard realist, compared with the scientific panel, who deferred to risks, uncertainties and the precautionary principle. But what was missing at the podium during this close encounter? Science had silenced what was obvious to all, who witnessed the transaction of the portfolio with the six key messages, namely that climate scientists performatively feed decision makers with facts that will shape the trajectory of the biosphere and planet Earth and thus feed back to the hybrid phenomenon of climate change, which scientists are modeling in their laboratories – and vice versa. Latour does not speak of "feed back loops," because this connotes a single system, but of "oscillations". Following the non-human actant in the shape of the dossier that was transacted between the scientific panel and the Prime Minister at the podium, we may ask: is the fact of 2C degrees the product of pure scientific practices? Why has it emerged as a magical number? Who came up with it in the first place? How is it carried on and what happens if we cannot meet it?

From a latourian perspective the two degree problem is a new hybrid. The project of the anthropology of science is to make these hybridizations explicit and in so doing legitimate, because they are hidden as long as we work under the aegis and separate compartments of the Modern Constitution. The anthropology of science is about the rethinking of the relationship between the two representations staged at the podium as radical different spheres and ontological separate parts of the world. The assembly in the Bella Centre in March and the next one in December 2009 bear witness of a new global imaginary of climate shaping new institutions, where actors from science and politics sit at the same table. In these new assemblies, climate scientists and politicians share what Latour calls "matters of concern," but with very different means and resources. The anthropology of science is about exploring the role of non-human actants in these new hybrid assemblies. Bringing such a project to conclusion here is far beyond the scope of this chapter. Rather, to

round up let us look at some of the analytical implications of such a project for the concept of "social resilience."

Revisiting resilience

My ethnographic itinerary shadowing the climate scientists at the Bella Centre brings home two analytical implications for the concept of "social resilience". The first has to do with "resilience," the latter with the "social." We may argue that resilience can be found at all levels of society in the knowledge practices of actors. At the level of the "person," our faculty for resilience may determine the degree of success and failure we experience in life. At the level of the "social," the capacity of societies to learn from the past and reinvent themselves in the present forging relationships anew to their world may determine their future existence. However, by following the framings and imaginations of leading climate scientists from the podium in the Bella Centre to the transactional dossier at the final session of the conference and letting their conceptual mappings be as strong as that of the anthropologist, we have arrived at a radical different understanding of "social resilience". We have come to see that in the knowledge practices of climate scientists "social resilience" is cast negatively as inertia, stamina, and the lock-in of Occidental techno-folkways, which threaten the survival of humanity in the Anthropocene. Thus, at the planetary level of climate scientists, "social resilience" amounts to a vehicle for a trenchant critique of the carbon fuelled economies and the socio-techno-folkways of Occidental heart lands.

What can be learned from such an exercise is that ethnographic surprises are not only to be found in the social actualities of remote places impressively exposed in this volume; they can also be achieved by following the scale jumps of climate scientists in more familiar places *en route* to their laboratories. Thus, if we let the actors do the job of mapping "social resilience," rather than applying the concept to any given coupled social-ecological niche, we might stumble upon – by pure accident – new registers and modern settlements. The point to take home here is that scale is what actors do by scaling and contextualizing each other.

The studies in this volume brilliantly exhume social resilience by way of focusing on the ways in which social-ecological systems are coupled and interlocked. Their authors advance the concept of "social resilience," by way of refining and reconfiguring our received modes of thinking about the first term in the compounded concept. These studies go beyond conceiving "social resilience" as an endogenous equilibrium exposed to exogenous forcing, such as climate change, environmental disaster, polluting, population pressure and globalization. However, with the French revisit of "social resilience" practised in this chapter, I hope to have shown that we do posses an alternative analytical route to the first term in the conceptual compound. If we shift our attention from "social resilience" to the three fundamental domains of inquiry delineated by Kirsten Hastrup (2007) in her recent chart for the anthropology of the 21st century – *realism, entanglement* and *measurement*[19] – we might find that there is no apparent reason to separate "social resilience" from other associations. Mapping how actors navigate these three fundamental domains with a little help from Latour, it might turn out that "social resilience" is largely a mediator in an assemblage of relations embedded in much larger networks. To regain some sense of order, we could then track the connections between controversies about resilience; that is mapping the many contradictory ways in which social aggregates are constantly evoked, erased, distributed, and reallocated at different scales. Or to put it in plain words: Social resilience is not necessarily endogenous; resilient societies are not alone and never have been. Today they are connected in new global imaginaries and collectives of climate change, which ultimately beg a re-conceptualization of both the "social" and "resilience."

19. My translation from the Danish: "realisme, sammenfiltring og måling".

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