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Chapter 3: Standards, Science and Scale: The Case of Tasmanian Atlantic Salmon

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If you are having fish for dinner tonight, it has quite likely been farmed. In less than thirty years, intensive aquaculture has revolutionized the way we consume marine resources, constituting what is known as the 'blue revolution'. Today, nearly half of all fish consumed globally has been raised on a fish farm, and aquaculture is among the fastest-growing food-producing sectors in the world (Food and Agriculture Organization of the United Nations [FAO], 2006). According to FAO estimates, [1] the global production of aquaculture was nearly fifty-two million tonnes in 2006, and an additional eighty million tonnes of aquatic food, or more, will be required in 2050 to maintain the current per capita consumption of fish. In order to meet this need, a continued increase in aquaculture is necessary (Food and Agriculture Organization of the United Nations, 2009). In other words, intensive fish farming has gone from being a peculiar and rare experiment to a food source we rely upon. This industrial-scale domestication of aquatic species has been spearheaded with Atlantic salmon, which is the most important species in aquaculture production in Northern Europe.

In this chapter I will tell the story of Atlantic salmon through the lens of globalization. It is not difficult to do. Farmed Atlantic salmon is an artefact that defies traditional dichotomies of the local and the global. Rather, it represents a food product which is systematically and simultaneously inscribed as a universal biogenetic artefact and a local brand commodity. The worldwide expansion of intensive aquaculture is made possible by global structures that facilitate the fl ow of capital, technology and science, while aquaculture poses challenges that require solutions on a global scale. In this way, salmon aquaculture is both shaped by, and intensifies, globalizing processes. It thus represents a case of globalization par excellence, constituting one of the most globalized fields of food production in the world today. But there are also other stories to be told. Seen through a historical lens, aquaculture represents the most recent turn in the human history of animal domestication. Like the agricultural revolution some ten thousand years ago, its importance can hardly be underestimated, yet its more specific consequences are difficult to predict.

The blue revolution has largely escaped the attention of the social sciences. As a revolution taking place literally under water, its material technicalities remain unnoticed or taken for granted by many. However, contemporary fish farming represents a unique empirical case for social sciences as it highlights current conditions in global food production in relation to transnational technologies, world trade regulations, environmental issues, technoscience and global capitalism. Furthermore, the field lends itself very well to analyses that seek to transcend the conceptual boundaries of technology and science, nature and society and

humans and animals. Salmon aquaculture may be seen both as an icon of the current state of food production and as an indication of things to come. I start with a brief account of the blue revolution as a history of domestication, and how farmed Atlantic salmon became a global artefact. In order to further problematize some paradoxes of globalizing processes, I then turn to a specific example of the implications of international trade regulations in Australian aquaculture before I conclude.

Newcomers to the Farm

This dramatic increase in aquaculture production is closely connected to the emergence of intensive systems of fish farming (Stead and Laird, 2002). While humans have shared space (*domus*) with terrestrial animals for thousands of years, salmon are still 'newcomers to the farm' (Lien, 2007a). The blue revolution thus represents a crucial moment in the history of human domestication, implying marine animal husbandry on a massive scale. It also represents a revolutionary moment in the world history of Atlantic salmon, whose genetic make-up is currently being intentionally and unintentionally modified as a result of massive salmon farming (Huntingford, 2004). But Atlantic salmon is only one among many marine species introduced to a regime of marine husbandry. A well-stocked supermarket in the UK, for example, will offer farmed trout, bram, cod, halibut, sea bass, catfish, tilapia, carp and barramundi, just to mention a few. In addition there are farmed shellfish, such as mussels, scallops and crayfish. Aquaculture thus implies the systematic enrolment of new marine species to regimes of domestication on an experimental basis. Some succeed and are subsequently produced on a commercial scale. Parallel to this expansion towards new marine species, a geographical expansion has taken place, and salmon may again serve as an example. The domestication of salmon has underpinned a geographical movement of Atlantic salmon that reaches far beyond its native north Atlantic rim. Atlantic salmon is now produced not only in Norway, Scotland and Canada but also in the southern oceans of Chile and Australia. More tropical regions accommodate other marine species, and intensive aquaculture has spread to most parts of the world. While species' requirements differ, some basic technologies remain similar, and thus allow one domesticated marine species to pave the way for another, often at a surprisingly rapid pace.

In the case of Atlantic salmon, it is domestication that made its geographical expansion possible. In the 1860s, so-called acclimatization societies encouraged biomigration on a massive scale, for example within the British Commonwealth (Lever, 1992). Australians were particularly active, and in Tasmania, [2] for example, local angling enthusiasts, mostly of British descent, pooled their resources to try to fill the Tasmanian rivers with Atlantic salmon (which was nonexistent in this part of the world). In spite of intensive efforts to bring live salmon over from Europe to Tasmania, [3] the acclimatisation experiment did not succeed. For reasons that are still debated, the fry that were released into the Derwent river and then migrated to the sea never returned to reproduce, and the salmon population disappeared after some years. Consequently, it was not until the 1980s, when local aquaculture interests introduced Atlantic salmon for commercial purposes, that salmon reappeared in Tasmanian estuaries. This time broodstock was sourced from a landlocked population of salmon in New South Wales that had been brought from Nova Scotia, Canada, to the Australian mainland in the 1960s. This

genetic strain constitutes the brood stock of Tasmanian salmon today (Lien, 2005). However, while the Atlantic salmon that escapes from fish farms can easily survive in estuaries for quite some time, it appears unable to establish a self-sustaining population in the wild, the same difficulty experienced by its predecessors in the 1860s. In other words, the geographical transfer of Atlantic salmon to the antipodes has come as a result of its domestication. This story of domestication as a precursor to global expansion parallels the history of many of our most familiar terrestrial farm animals, such as cows, pigs and chicken.

Beyond the Local and the Global

This book demonstrates how globalization can be understood through the topic of food, and conversely, how food may be analysed through the lens of globalization. But what exactly does that mean? Focusing on transnational movements, we may note the way food itself travels increasing distances from production to consumption and also how local commercial enterprises are upscaled through mergers and become branches of transnational business corporations. Processes of production also involve the movement of a wide range of other things: In the case of Atlantic salmon farming, we find that transnational fl ows involve not only the final product but also knowledge, people, technological equipment, feed, genetic strains and financial capital. [4] While some of these flows are encouraged, others are not, and the exact circuits and routes of movement that appear represent fruitful empirical entries for studies of globalizing processes. Looking more closely at transnational fl ows, it appears that as food and technology travel, they also change meaning, and their usages and modes of appropriation become different (e.g. Lien and Nerlich, 2004). A similar shift may be observed in transnational corporations, as various branches take on cultural expressions that are locally appropriate (e.g. Garsten, 1994). Chilean salmon farms, for example, differ significantly from Norwegian salmon farms with regard to organizational features, even when technologies, genetic stock, investors and even corporate ownership are more or less the same (Andaur, 2006). Such local variations are often ascribed to differences in culture, but a similar role can be played by what is commonly referred to as nature. In Tasmania, for example, where salmon farming was established by Norwegian investors and operators in the 1980s, the practical challenges are often distinctly local. Such challenges include, for example, native Australian fur seals (as they break through nets), amoebic gill disease (caused by an amoebae not present in the North Atlantic) or the relatively warm ocean temperatures (Lien, 2007b). Thus, in spite of fairly successful efforts to standardize the production of Atlantic salmon worldwide, locality becomes relevant to the process in a variety of ways, from production through processing and finally to consumption. These variations are sometimes ascribed to differences in (local) culture and other times to differences in (local) nature.

A Universal Biogenetic Artefact

Such observations have inspired a broad range of analyses that seek to understand the specific interactions between ‘the local’ and ‘the global’, juxtaposing the two as opposite phenomen. In spite of criticism, dualist approaches to globalizing processes inform social analyses in a number of ways. The persistence of such dualisms reflects an underlying epistemology in the social sciences in which culture and society are given as bounded entities, nestled in some

form of locality, such as community, region or nation (Nustad, 2003). Another reason why these terms are often used is that ‘local’ and ‘global’ are also often vernacular concepts that inform everyday discourse and refl ect people’s immediate experience of changes that they observe. [5] However, in order to better understand the processes that underlie such changes, we need to aim beyond such conceptual dualism towards a more processual understanding of what globalization entails.

First, we need to challenge what is often a rather simplistic ordering of the world through the attribution of local or global qualities to items that are in fact far more complex. Richard Wilk’s excellent analysis of Caribbean cooking is a case in point (Wilk, 2006). Tasmanian Atlantic salmon is another example. Simultaneously inscribed as a universal artefact and a local brand commodity, it resists any simple categorization as either ‘local’ or ‘global’. Instead, analyses indicate that both local and global dimensions of Tasmanian Atlantic salmon are made relevant and are purposefully incorporated at different stages of the salmon’s life from production through to consumption (Lien, 2005, 2007) . A Tasmanian Atlantic salmon that starts its life as a fertilized egg in a water tank in a Tasmanian hatchery will be treated in accordance with procedures that are highly standardized on a global scale, and there is hardly anything about this process that is highlighted as distinctly Tasmanian. Later, as it becomes smolt and is transferred to a marine grow-out site, and in this sense immersed in the microbiological and climatic features of the Tasmanian coastal waters, standardized procedures still characterize the way it is interpreted. Through inscription devices that are applied transnationally, the Tasmanian Atlantic salmon is known as ‘biomass’, and is compared to other instances of fish or salmon biomass produced elsewhere. As a visiting European expert once responded to a local marine farmer who speculated about the impact of specific Tasmanian challenges on salmon growth: ‘A fish does what a fish does, it does not know it is living in Tasmania’ (cited in Lien, 2007b: 180). However, as soon as the salmon is slaughtered, processed, packaged, and shipped to market destinations elsewhere, locality emerges for the first time as a signifying feature of the salmon itself. Through packaging, branding and marketing, the salmon becomes local, associated with the marine environment in which it is grown: On the Web site of Tassal, the major producer of Tasmanian Atlantic salmon, unique features of the local environment are presented as follows:

The cool, clean waters of southern Tasmania is the perfect environment for the cultivation of Atlantic Salmon. Here the open sea rolls in from the Southern Ocean and mixes with the clear, fresh waters from the nearby snow capped mountains. These unpolluted waters have naturally high oxygen content and provide reliable current movement essential for maintaining fish health. (Tassal, 2008) [6]

Emphasized on the Web site by the marketing label ‘pure Tasmania’, and further underpinned by the footer ‘from the great unspoiled Southern oceans of Australia’, iconic features of Tasmania are inscribed in what was hitherto universal salmon biomass, making the salmon product Tasmanian. Ironically, it is not until it is literally out of the water that Atlantic salmon becomes uniquely ‘Tasmanian’. In order to attain a better understanding of globalizing processes, we need to focus not only on the movement itself but also on structures that remain stable. This requires a certain sensitivity towards the dialectic and often rather subtle relation

between fixity and fl ow in globalizing processes (Lien and Melhuus, 2007). Simply put: in order for something to move, something else has to be kept in place. Too often in globalizing studies, the empirical attention drifts towards that which moves, at the expense of structures of immobility that, in fact, make movement possible. In relation to intensive aquaculture, natural science represents a form of knowledge which, in fact, allows the expansion and standardization of marine farming worldwide. Thus, when a foreign expert can claim that a 'fish does what a fish does', it is based, not on the observation of the specific salmon in question but on a generalized knowledge of salmon 'everywhere': a notion of salmon as a universal biogenetic entity the qualities of which may be known through a set of scientifically informed and standardized techniques. Through such techniques, a general understanding of salmon feeding behaviour, metabolism and growth may be attained, which in turn informs the interpretation of a specific problem encountered in a particular salmon pen on the southeast coast of Tasmania. If knowledge and competence in marine farming were conceived of as strictly local, and largely irrelevant for marine farmers operating elsewhere, the rapid global dissemination of aquaculture that we have witnessed during the last three decades could hardly have happened. Thus, I argue that it is precisely because it is so closely associated with science, and thus systematically standardized as a universal artefact, that intensive aquaculture has expanded so rapidly. In this way, the apparent stability of science involves a universalizing discourse that both facilitates and depends on transnational fl ows of concepts, people and things.

In what follows I will present a case in which science as universalizing discourse plays a particular role in directing the global fl ow of salmon. The case demonstrates how science as a standardizing tool, mediating between different levels of scale, is enrolled in negotiations to limit—or establish legitimate exceptions to—the overarching ideology of free trade. Yet, as we shall see, the universalizing potential of scientific discourse has its own limitations. The case also underscores how contexts are not given, but are instead conjured and made relevant through processes of social, economic and legal interaction.

Standards, Science and Scale: Australia versus the World Trade Organization (WTO)

On 19 July 1999, the Australian commonwealth quarantine authorities (AQIS), announced a dramatic change in their import policy regarding fresh salmon. Based on a new import risk analysis (IRA), they announced that the Australian ban from 1975 that had effectively prevented fresh salmon from entering the Australian continent for a quarter of a century, would be replaced by a policy which allowed the import of nonviable salmon (slaughtered but fresh) into Australia. The IRA had been conducted as a result of pressure from Canada through the WTO system and was presented as a response to the WTO decision that Australia's quarantine policies were not based on a proper scientific analysis. This change of policy marked the end of a dispute between Canada and Australia that had been going on in the WTO system for almost a decade. At the same time, it marked the beginning of an era of potentially 'free fl ow' of infectious salmon viruses between the rest of the world and Australia. Partly because it is geographically remote from other salmon producing areas, Tasmania's coastline is a remarkably healthy environment for salmon. Tasmanian salmon have few of the many salmon diseases that are rampant in the North Atlantic (e.g. sea-lice,

infectious salmon anaemia). Furthermore, there are no wild or native salmon that farmed salmon could spread diseases to (e.g. as is the case in Norway). The only endemic disease affecting Tasmanian Atlantic salmon is amoebic gill disease which is quite common but not as serious as many of the infectious diseases associated with salmon in the northern hemisphere and Chile. This nearly diseasefree situation has been ensured through a strict regime of quarantine, both in Australia and in Tasmania. In light of this, it hardly comes as a surprise that Tasmania strongly opposed the federal decision to allow free import of salmonids into Australia. The opposition was voiced through a number of channels, and includes sixty-six different submissions to the Federal Senate Legislation Committee regarding the importation of salmon products into Tasmania (Senate Rural and Regional Affairs and Transport Legislation Committee [SRRA] Submissions, 1999). These submissions range from marine biologists' worries about the threat that salmon impose on Tasmania's marine environment, to CEOs of the Tasmanian salmon industry who worry that fresh salmon from the North Atlantic might transfer microorganisms that would eventually destroy their businesses, to handwritten letters from trout anglers, describing the pleasure of recreational fishing and expressing fear that it may be wiped out. The submissions reveal how the imports issue stirred up a lot of political engagement in Tasmania and, to some extent, united public opinion, the industry and politicians in their shared opposition against the federal authorities and the WTO.

The opposition is not difficult to understand. A more interesting question is: why did the Australian federal government agree to open up its borders to salmon that may carry infectious salmon diseases? How could it happen? Let me briefl y summarize the background for this policy change. In 1975 Australia had formalized a strict regime of quarantine, banning the import of nonviable salmonids. [7] Consequently, ten years later, when experiments with farmed marine Atlantic salmon had proved successful, broodstock for the emerging Tasmanian salmon industry had to be sourced from within Australia. A landlocked population of Atlantic salmon (brought from Nova Scotia, Canada in 1964) was found in New South Wales, and broodstock from this population was brought to Tasmania. After a few years, the industry fl ourished, and offspring from Canadian brood stock has formed the genetic basis of Tasmanian Atlantic salmon ever since. In 1994, Canada, another salmon exporter, requested market access to Australia, and formal bilateral WTO consultations began. [8] In 1996, AQIS presented Australia's first IRA as an attempt to justify existing quarantine regulations. The IRA was conducted at the federal level and basically supported the interests of Tasmanian salmon farmers (practically all Australian salmon farming takes place in Tasmania). The Canadians, however, were not impressed, and brought the dispute to the WTO disputes settlement panel and appellate body. WTO panellists concluded that:

1. Australia's IRA did not fulfill the requirements of the so-called sanitary phystosanitary (SPS) agreement.

2. Arbitrary and unjustifiable distinctions in the level of protection in relation to salmon had been applied, constituting what the WTO panellists described as a 'disguised restriction on international trade' (SRRA, 2000: 59).

In other words, Australia lost the first battle. As a consequence, a revised document had to be produced, and in July 1999 AQIS presented Australia's second IRA. This time the IRA was written in strict accordance with the outline of the SPS agreement and Office International des Epitoozies (OIE). However, as it turned out, the second IRA came up with a different conclusion, as it *no longer* provided support for the existing quarantine regulations. Consequently, and as a result of this process, AQIS had to change its import policy accordingly. The WTO endorsed the second IRA, the dispute with Canada was settled and in 2000 Canadian farmed salmon gained access to the Australian market. What does this tell us about globalization? Is it yet another example of the power of free trade over environmental risk? On the surface, it may appear to be just that, but I want to argue that this conclusion is too simple. In the SPS agreement, it is made explicitly clear that a member state like Australia may define its own level of protection more strictly that the international standard defined by the WTO. In spite of this legal option, the second Australian IRA concluded that the risk involved in free import of nonviable salmonids was not sufficient to support existing quarantine policy. Why then did Australia produce an IRA that opened up the risk of irreversible damage to Tasmania's marine environment? I will not provide a full answer to this, but instead draw attention to the challenges of translation involved in standardization efforts on a global scale, and how these may produce outcomes that are sometimes counterintuitive and rather surprising.

Upscaling

WTO member states normally do not have to produce risk analyses. WTO defines international standards of quarantine, and when these are adopted one does not need an IRA. But for countries that decide to set out to define their own national standard, or, according to WTO terminology, determine their own appropriate level of protection (ALOP), an IRA is needed (SRRA, 2000: 81–2). More precisely, when a country wants to depart from international standards, the IRA 'provides the technical and scientific basis for quarantine measures that determine whether or not an import may be permitted' (SRRA, 2000: 100). In such cases, the higher standard must be applied consistently across various fields of import. For instance, the principle applied for Atlantic salmon (a finfish) would have to be applied for all other finfish, including, for instance, aquarium fish.

What is a standard? Bowker and Star (2000) approach standards as sets of agreedupon rules for the production of objects (textual or material) that have a certain spatial and temporal extension (spans communities, persists over time), and that are deployed in making things work together over distances and heterogeneous metrics (Bowker and Star, 2000: 13–14). Furthermore, standards are often enforced by some sort of legal body (state or private), have significant inertia and can be difficult to change. [9] The free trade agreement enforced by the WTO is an example of a standard that regulates trade-related transactions between member states. The IRA has a standardizing effect as well, but unlike the international standards of quarantine it is intended to serve a broader purpose, such as to protect a particular marine environment, and to accommodate particular interests. As such, the IRA may be analysed as a boundary object, defined as 'objects that both inhabit several communities of practice and satisfy the informational requirements of each of them' (Bowker and Star, 2000: 16). Tailored

to the needs of any one community, while also having common identities across different settings, boundary objects are, in principle, able to maintain some sort of coherence. Such coherence may be found, or produced, to transcend not only different communities or contexts but different levels of scale—thus it may extend both horizontally and vertically.

The SPS agreement provides the guidelines for justifying exceptions to the international standards of quarantine and may thus be analysed as a vehicle for standardizing that which is difficult to standardize. Let us have a look at how such standardizing principles are laid down in the SPS agreement, in articles two, three and five that relate to quarantine measures (cited from SRRA, 2000: 48, emphasis added):

§2.1 Gives member the right to 'take sanitary and phytosanitary measures necessary for the protection of human, animal or plant life or health'. This is the opening up for exceptions, but not just any kind of exceptions, as §2.2 places restrictions on the exercise of that right, when it states that 'measures must be based *on scientific principles and evidence* ' and must not 'arbitrarily or unjustifiably discriminate between members where identical or similar conditions prevail', or be applied 'in a manner which would constitute a disguised restriction on international trade'. [10]

§3 states that measures should be based upon *international standards*, guidelines or recommendations, but that a higher level or protection is permitted if 'there is *scientific justification* ' or 'if the member considers the appropriate level or protection should be set at a higher level ' . Simply put: you may define your own ALOP, but it must be justified scientifically. This is what the first IRA of 1996 failed to do.

Finally, §5 refers to the determination of the 'Appropriate level of Sanitary and phytosanitary protection' and the assessment of risk required, and states again that this assessment must be *justified scientifically* (SRRA, 2000: 49).

As this list indicates, standardization takes place at several levels. First, there are the *international standards for quarantine* laid down in the SPS agreement (not disputed in this case). Second, there are the exceptions to these standards, and the *standardization of these exceptions,* generally undertaken through the standardized format of an IRA. One important standardizing principle is the principle of consistency: you cannot be strict with salmon and lenient with trout, for example. This is why the second IRA (1999) did not only deal with salmon but had to include all other finfish, including ornamental fish for private aquariums. As a result, the second IRA became a rather complicated exercise, but what seemed to be unnecessary digressions from the sea into aquariums was significant because it helped achieve a format which complied with the standardizing principles laid down for such exceptional cases. Third, because exceptions are by definition difficult to standardize, another standardizing tool is enrolled, that of science. Science is called upon whenever the defined international standard appears insufficient to cover all possible cases. Science thus represents another level of standardization, the ultimate 'standardizer' of unstable standards. Put differently, it appears that when the WTO system cannot take responsibility for all the exceptions that could possibly be valid, the problem of standardization is delegated, so to speak, to the scientific community. [11]

Australia's change of policy may be seen as a move upwards or outwards, from the national level to the level of all WTO member states, and finally to the level of the general scientific community which, ideally, 'speaks for everything everywhere'. It is a process of upscaling through which larger and larger contexts for interpretation are evoked. The material dimension of this process consists of the production and management of the IRA that undertakes the necessary translation in an appropriate format. In this sense, the IRA is a potential boundary object, but it did not quite succeed. As the subsequent events demonstrated, the efforts failed, in so far as the first IRA (1996) failed to satisfy the standardizing principles of the WTO, while the second IRA (1999) failed to meet the needs of the Tasmanian community. What made it so difficult? Let us take a closer look at the art of assessing risk.

Downscaling

The OIE Animal Health Code provides a standard method for undertaking risk assessments, defined as 'The evaluation of the likelihood and the biological and economic consequences of entry, establishment or spread of a pathogenic agent within the territory of an importing country' (OIE agreement cited in SRRA, 2000: 106). In other words, the IRA must document in a scientific manner the likelihood of the entry of disease within a territory and the economic consequences of such an entry. In a standard IRA, members are allowed to take the following economic factors into account: the potential damage in terms of loss of sales, the cost of control or eradication, and the relative cost effectiveness of alternative approaches to limiting risk (SSRA, 2000: 106).

This is not an easy task. What would the entry of up to twenty different salmon diseases cost the Tasmanian salmon industry? How much money do they 'save' by not having them there? Even if they could estimate such figures, they would hardly show up as big numbers in relation to Australia's national economy. Although salmon farming is important for the state economy, the state of Tasmania makes up only 5 per cent of the Australian population and an even smaller share of the national economy. Even a complete environmental disaster on the Tasmanian coast would have a limited impact on the national Australian economy. [12] Risk assessments are, however, not only about economics: Not everything must be accounted for by its economic value. The SPS agreement, for example, allows an ALOP to be founded on what is called 'societal value judgment'. However, in order to be justified, such judgment must be applied to all areas of import, and standardized across different species, diseases and goods. In other words, in order to formulate unique ALOP based on 'societal value judgment', Australia must define some kind of generalized 'standard' that takes all relevant unique needs into account. This is where confusion set in. Evaluating the hybrid mixture of Australian value judgments, potential economic losses to the industry, the economic value of a disease-free marine environment, and the scientifically calculated risk of disease, is described by AQIS as a 'judgment which somebody [else] has to make' (SRRA, 2000: 85). AQIS would certainly not make that decision; its officers were scientists and bureaucrats, not politicians. 'Somebody else' could have been the federal government, but they did not intervene. Consequently, the legal option of formulating a unique level of protection was not applied and instead the federal authorities resorted to the more manageable IRA, in which the economic

loss to the Australian nation was the only feature that was relevant, but at the same time too insignificant to be taken into account.

Until 1999, Tasmanian industry and government had hoped that Tasmanian interests would be secured through the federal government, but the second IRA made it clear that this would not happen. As a result, Tasmania set its own course of action. Evoking constitutional legislation that gives Australian states the right and duty to take care of their own questions of quarantine, Tasmanian authorities simply—and very quickly—drafted, voted and passed a piece of legislation which banned the import of nonviable salmon to Tasmania. This was done by means of a new, Tasmanian IRA, which mimicked the federal one, but because the scale was now the island of Tasmania rather than the entire Australian continent, what was 'low' impact on the federal level, now became 'high' impact on the state level. Just as the salmon dispute between Australia and Canada was settled, it reappeared locally as a confl ict between the Australian nation and the Tasmanian state, as Tasmania challenged Australia's federal jurisdiction over state quarantine issues. Federal authorities formally opposed Tasmania's stricter regulatory practice, but no formal sanctions were implemented. What Tasmania did in the final run was a quick and dramatic act of downscaling: 'forget about the standard format for the IRAs, forget about economic impact on the national level—just consider the impact of diseases for the Tasmanian industry, marine environment and general public.' The conclusion is simple and clear: import must be banned.

'The Way Things Are'

I raised the question initially of why Australia changed its policy, or more precisely: Why did the second IRA actually recommend lifting the quarantine? One way of approaching this question is through Foucault's (1991) concept of governmentality and its application to economic practices. Inspired by Foucault's work on governmentality, Miller and Rose (1993) have addressed indirect forms of political power in advanced liberal democracies, and the role of knowledge, discourse and language as technical devices that render reality amenable to particular kinds of action, calculation or intervention. According to this perspective, 'knowing' an object (such as the risk of nonviable salmon import) in such a way that it can be governed requires certain ways of representing the object that are stable enough to travel and remain stable while the object moves across continents, institutions or fields of trade (see Bruno Latour's concept of an immutable mobile [Latour , 1987: 227]). The standard format of an IRA may be seen as an example of such a representation, and the reason why it allows mobility (and are themselves applied across continents) is that they are already thoroughly standardized. The WTO system (and the SPS agreement) may in itself be seen as a complex effort towards governmentality.. The stated purpose of the system is to ensure equality in international trade, and a level playing field for the actors involved. But because countries are *not equal*, the regulations must allow for exceptions. The WTO agreement thus requires that there are ways to ensure that exceptions that occur will be considered and treated fairly, hence the need for standardizing tools. As the Tasmanian example indicates, such standardizing tools also become disciplinary tools, or 'technologies of government' (Miller and Rose, 1993). In their first attempt at trying to play the WTO game (when they submitted the first IRA in 1996), Australia failed. They temporarily kept the salmon out and thus protected

Tasmanian interests, but they failed completely in rendering the object of the dispute (risk of nonviable salmon import) amenable to sympathetic evaluation within the WTO. This may be one reason why they, next time around, appear to be more eager to please the WTO than to protect Tasmanian industries. I asked one of the key participants from Tasmania, a former quarantine officer, whether the dispute was worth it. He replied:

Yes. If we regret anything it is that we didn't know more at the beginning of the process. But again, if you were talking to people in Canberra, and they were being honest I think they would say it has been a learning process for them. I think it was a learning process in Geneva for the panelists and appellate bodies and that sort of thing, all fumbling around in the fog. And we all now know a little more about the way things are.

Knowing 'the way things are' refers to a process of learning in which the ability to switch your argument according to the appropriate level of scale is a key competence. What the appropriate scale is at any given time depends, in turn, on the judgment of a few persons who struggle to compare what, in essence, remains incommensurate. Thus 'the way things are' also refers to ongoing processes of negotiation, in which contexts are systematically evoked, or discarded, in accordance with efforts to upscale or to downscale, to standardize or to make singular. It is significant to note that 'the way things are' has little to do with the specific features of the Tasmanian marine environment or with the propensity of, for example, infectious salmon anaemia to spread in salmon populations. These are relevant issues, but far from sufficient, to effect the kind of protection that was deemed necessary in Tasmania. In order to analyse this case, a more thorough understanding of the Tasmanian environmental context, the economy of salmon farming or Tasmanian culture would hardly be of any help. Instead, the case exemplifies how context is a product of interaction, and in a state of constant tension, interaction and conflict (Helmreich, 2005: 126). It is at this level, where contexts are systematically brought together and contested, that we, as well as my Tasmanian informant, can begin to understand 'the way things are'.

Where Economies and Ecologies Meet

Atlantic salmon farming is not only a good example of globalizing processes. It also exemplifies an arena where economies and ecologies meet; an arena where differentiating dualisms like society and nature, economy of society or local and global, fail to keep things apart. The object which Australian authorities failed to protect was neither entirely economic, environmental or social, but all of these at once. The success or failure of AQIS had little to do with 'the way things are' under water or in annual reports but relied instead on AQIS' ability to conjure an image of salmon through which all such potential connections were readily apparent, and even comparable, and to do so in a 'scientific' manner. In light of these requirements, it is hardly surprising that they failed. The Australian salmon dispute may be an extreme case. However, it indicates how foods are increasingly involved in complex processes of scale-making which render the distinction between the global and the local obsolete. Foods have travelled long distances for hundreds of years. But the implications of foods' potential mobility on natural environments, legal boundaries, economic outcomes and microbiological nexus form connections which we are only beginning to understand.

Notes

1. According to the FAO (2009), world aquaculture has grown from a production of less than 1 million tonnes in the early 1950s to 51.7 million tonnes by 2006.
2. References to Tasmanian aquaculture are informed by my ethnographic fieldwork in Tasmania in 2002, and subsequent revisits (see also Lien, 2005, 2007a, 2007b).
3. Four shiploads of fertilized salmon roe made respective three-month journeys on sailing ships from London to Melbourne, before the fourth one finally succeeded. In the three first attempts, the eggs did not survive (for a detailed account, see Lien, 2005).
4. To illustrate, a medium-sized Tasmanian hatchery sourced its oxygen from Britain, the oxygen transmitter from Canada, a recirculation filter from France, feed from Norway and Denmark, a grading machine from Italy, another grader from Germany, a high pressurizer from Scotland, an incubator from the United States, an ozone generator from Brisbane, Australia, a feeding system from Finland, counting equipment from Iceland and oxygen diffusers from Canada, while the hatchery manager himself had recently arrived from Scotland (Lien, 2007b).
5. In Tasmania, for example, this duality informs nature perceptions through the hierarchical distinction between species that are native and species that are introduced. According to this approach native is, by definition, a more valued species than the introduced. Farmed Atlantic salmon are typically introduced marine species, while Australian fur seals, for example, are native (see Lien, 2005, for details).
6. See <http://www.tassal.com.au/_aq_Aquaculture.aspx>.
7. Measures to avoid introduced species are justified, in part, by the dramatic ecological transformations that have occurred in Australia as a result of biomigration of so-called invasive species since the late eighteenth century.
8. Canada's motive seems to have little to do with market access, as Australia remained a marginal market for farmed salmon. Some Australians suggest that Canada sought WTO precedence for other issues and interests. The underlying Canadian interests are, however, not the concern of this analysis.
9. They also note that there is no natural law that the best standard shall win. Rather, there are numerous examples of standards that are installed for all kinds of social and conspiratory reasons (Bowker and Star, 2000).
10. The excerpts that follow are cited from the SRRA which in turn cites WTO, Report of the Panel 12 June 1998, p. 7.
11. To summarize, there are various tools of standardization: (1) the international standard itself, as defined by the WTO, (2) the standardized format for justifying exceptions to the WTO standard, defined as an IRA to justify exceptions, and (3) their justifications which, in turn, involves science itself.
12. Australia's reputation as a relatively disease-free continent might transfer to other primary industries and reduce what is currently often referred to in Australia as a competitive advantage. The potential economic impact of such a scenario is, however, very hard to predict.

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