

## Life, death, and dinner among the molluscs: human appetites and sustainable aquaculture

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# LIFE, DEATH, AND DINNER AMONG THE MOLLUSCS

## Human appetites and sustainable aquaculture

*L. Sasha Gora*

### Introduction

Not everyone eats oysters, or even shellfish for that matter. Religion, culture, science, and personal preference all inform which plants and animals we call food. Recently, because of the climate crisis, as well as growing concerns about the health of humans, plants, animals, and the planet at large, an awareness of environmental impacts also informs what ends up on the table. But whether you chew an oyster, swallow it in one slurp, or take a pass, eating is one of the most intimate ways humans interact with environments by literally digesting them. As sociologist Krishnendu Ray writes in dialogue with the work of the environmentalist Gary Snyder: “‘Food is the field in which we daily explore our “harming” of the world’—the world at large [...] the animal world, and the plant world” (Ray, 2016, p. xx). Hunger is, thus, an architect of the world on land and the world at sea. It is one of the main forces behind the Anthropocene, and any quest to live sustainably must consider the impact of human appetites. Narrowing in on seafood: How do human appetites transform, harm, but perhaps also heal watery environments? What is a sustainable diet if we look at the sea, animal mariculture, and at oysters?<sup>1</sup>

In human history, the coast is never far away. Around 80 percent of the global population live within 60 miles of a coast, be it freshwater or salt (Mentz, 2020). If eating, as Wendell Berry claims, is an agricultural act (2007, p. 552), then it is also increasingly an aquacultural act. For centuries humans have farmed water, a practice that is only growing (FAO, 2020). Fish features regularly in the diet of more than one billion people (Hamada & Wilk, 2019), and in 2017, fish “accounted for about 17 percent of total animal protein” (FAO, 2020, p. 67) consumed globally. Fittingly, Steve Mentz, a pioneering scholar in the blue humanities, titled one of his chapters in *Ocean* “Seafood before History.” “We’ve needed the sea since

prehistory,” he writes. “The bitter waves provide food and transportation” (Mentz, 2020, p. 11). The sea has shaped humans, their histories, and their appetites.

This chapter—“Life, death, and dinner among the molluscs”—proposes to think about water and shellfish from a culinary perspective that prioritises the pursuit of sustainable diets.

As a category, seafood is as endless as the sea itself, it includes everything from wild to farmed animals and plants and from fresh to saltwater. In response to how seafood might contribute to sustainable diets, which is to say, what is favourable to the people who produce and consume them as well as to their environments, this chapter zooms in on oysters. It addresses their cultural, culinary, and biological lives in order to discuss human appetites and contemporary aquaculture. In dialogue with the environmental humanities, it employs a multispecies perspective in its discussion of the impact of human appetites on marine life. This chapter studies oysters and mariculture as a reflection of human appetites and hunger as an ecological architect, and considers the waters we farm and eat. This chapter unfolds in two parts: The first discusses oysters, appetites, and how humans know these bivalves through eating them; the second addresses aquaculture and sustainable appetites, before concluding with further food for thought about eating as an encounter between life and death.

## The oyster, the world

Studying the history of food can reveal how everyday eating habits shape environments. In fact, “food systems account for over one-third of global greenhouse gas emissions” (Crippa et al., 2021). Although humans have farmed the sea for centuries, up until recently seafood has been one of the few wild foods—something that has been caught, hunted, or gathered rather than farmed—that many people eat.<sup>2</sup> But today, more and more seafood is farmed. Aquaculture now makes up nearly half of global fish production, including freshwater and oceans.<sup>3</sup> And some species, like Atlantic salmon, are almost all farmed (Lien, 2015). In 2018, shelled molluscs, including clams, mussels, and oysters made up around 56.3 percent of marine and coastal aquaculture production, around 17.3 million tonnes (FAO, 2020, p. 6).<sup>4</sup>

“Follow the chicken and find the world” (p. 274) writes Donna Haraway (2008). What happens if you follow the oyster? A type of mollusc—an animal with an outer shell but without a backbone—the oyster is a bivalve. Like the clam or the mussel, it has a shell with two parts that are held together by elastic ligament. Left alone, an oyster can spend a dozen years inhaling seawater, absorbing its nutrients, and then releasing it back into the water (Kurlansky, 2006, xvii). But when courted by human hunger, an oyster lives three or four years before becoming a snack eaten straight from the hand, from a platter, or a plate.

Members of the family Ostracidae, the “true oyster” includes a variety of genera, but two species dominate culinary discussions: The flat oyster with its rounder shell (*Ostrea*) and the Pacific oyster with its oval shell (*Crassostrea*). Because of diseases over the last century, oyster farms around the world have largely replaced flat oysters with Pacific ones (Stott, 2004). Returning to Haraway’s question, the oyster

is already entangled with popular imaginations of the world. As the English idiom goes, the world is your oyster, which is another way to say that you can achieve what you want and do as you please. The origin of this saying is Shakespeare's *The Merry Wives of Windsor* from circa 1600: "Why then the world's mine oyster," the character Pistol claims, "which I with sword will open" (Act 2, scene 2, 2–5). To open the world is no different, for Pistol, than to take a knife—or a sword—to shuck an oyster.

Continuing with common—even cliché—phrases, many enthusiastic eaters describe oysters as tasting like the sea: A mouth full of flesh seasoned by saltwater. As Elspeth Probyn (2016), a cultural studies scholar, writes, "Oysters are as close as most of us get to eating the sea" (p. 52). But what does it mean to eat the sea? How are human encounters with water mediated through food? Probyn (2016) considers oysters "a marvellous sustainable and hardworking marine entity that is also delicious to eat" (p. 11). Sustainable is an adjective that frequently appears in discussions about oysters—a food that has transformed over time from a working-class staple to a luxury, and has also been both simultaneously.

"Oysters are both on the tongue and beyond the power of the tongue," writes literary scholar Rebecca Stott (2004). "They are not only slippery: they are evasive, almost beyond knowing" (p. 10). It is for this reason she claims: "The history of the oyster-human encounter is a history characterised by intimacy and distance" (p. 10). This marriage between intimacy and distance also describes human relationships to the sea. To eat the sea is one way to attempt to know it. Rachel Carson, marine biologist and writer, began her 1937 essay "Undersea" with a question: "Who has known the ocean?." She then gives an answer: "Neither you nor I, with our earth-bound senses" (p. 233). What does it mean to know the ocean? Food cultural history, for example, approaches the question of how humans know animals and plants through culinary practices: Through eating them or not.

How do we know the oyster? The American food writer M. F. K. Fisher titled her 1941 collection of recipes *Consider the Oyster*. It begins with the chapter "Love and Death among the Molluscs," from which this chapter borrows its title, though instead of love, I write about life, and add dinner to the equation to meditate on how eating connects life and death. "Life is hard we say. An oyster's life is worse," writes Fisher (1988). "She lives motionless, soundless, her own cold ugly shape her only dissipation, and if she escapes the menace of duck-slipper-mussel-Black-Drum-leech-sponge-borer-starfish, it is for man to eat, because of man's own hunger" (p. 7). An oyster's life ends in order to please human hunger but also to sustain human life, an example of the messy multispecies relations that make up eating.

Today, nearly 95 percent of oysters are farmed, which requires no fertiliser, feed, or antibiotics. For these reasons some farmed shellfish, like clams, oysters, and mussels, are considered "environmentally pristine foods" (McWilliams, 2009, p. 177). This farming reflects human appetites and hunger as landscape architecture. In the words of writer Bill Buford (2008), "you should be able to taste the place [an oyster] came from; in this still-living creature you will find the water and the food it ate—these living, fragile, handmade creatures tasting wonderfully of the health



of the planet” (p. 272). Oysters work hard to filter water, but they, too, have limits. As historian Mark Kurlansky (2006) sums up, “If the water is not pure, that, too, can be tasted in the oyster” (p. 279). Oysters mirror the health of the waters they inhabit.

The oyster’s geography is as vast as it is specific. Just like the land-based term *terroir*, the word *merroir* recognises how the particularities of a body of water flavour its fish and fruits—from the water’s salinity and temperatures to the foods it hosts, and from the amount of space and degree of crowding to the seabed’s structure. It is worth reflecting, however, on how imaginations of food take different forms on land rather than in water. The term pescetarianism is one example. This type of vegetarianism distinguishes between land and water-based animals; it sees animals on land one way and those in water another. Reflecting on how food politics “has been overwhelmingly focused on terrestrial animal protein” (p. 25), Probyn (2016) argues that seafood of all kinds: “compels us to understand how entangled we are as consumers in the geopolitical, economic, cultural, and structural intricacies of the fishing industries” (p. 4). This is to say that “fish-as-food requires us to go beyond a simplistic food politics” (Probyn, 2016, p. 4). It is for this reason studies of sustainable diet should look beyond the shoreline and consider the role of water, as well as seafood’s “water footprints” (Farmery et al., 2016).

## Sustainable appetites

Any form of agriculture, be it on land or at sea, is cultural; the word even has culture inside of it. Environmental historian Donald Worster (1994) makes this clear by stating, “People invent agriculture; that is, they choose some plants to eat, cultivating and breeding them, while ignoring others” (p. 10). The same goes for aquaculture. Humans select plants and animals that live in, around, and under water, and it is this process of selection that transforms them into food. Aquaculture is a cultural construction and what one culture selects can differ from another. To borrow from terrestrial terms, fishing is a form of hunting and aquaculture is a form of farming.

However, farming at sea can also blur these distinctions. For example, in her summary of the development of mussel farming in the Venetian Lagoon, which started in the 1950s, anthropologist Rita Vianello (2018) writes: “The farmers stress the fact that their work is not real farming, but only guiding their natural growth, that packaged feed is never used and that the mussels are left to grow in their natural environment” (p. 47). These farmers imagine “real” farming to entail more pronounced interventions than what they do to “guide” the natural growth of bivalves. Farming at sea can raise questions about farming on land, as well as reveal how the two are connected, such as through water runoff.

As the chapters in this book make clear, sustainable diets are not just about food. They are about the world as a whole and shaping its future. Humans are literally eating the planet up. They are drinking it up too. At present, the global level of “food production accounts for the use of 48 percent and 70 percent of land and fresh water resources respectively” (FAO & WHO, 2019, p. 5). In addition to being

responsible for around one-third of greenhouse gas emissions, food systems have also been driving the loss of biodiversity, deforestation, and water pollution (FAO & WHO, 2019, p. 8). Therefore, there is an urgent need for sustainable diets that not only nourish people, but also heal, rather than harm, the environments on which they depend. For this reason, the FAO & WHO (2019) defines a sustainable diet, in part, as one that preserves “biodiversity, including [...] aquatic genetic resources” and avoids overfishing (p. 10). To eat is, thus, to shape the ecosystems of the world and to support or threaten their future. Water-based foods are essential in this process. However, not all seafood has a positive environmental record, and life cycle assessment (LCA) is a tool for employing an ecosystem approach to evaluate the sustainability of different animals (Ziegler et al., 2016).

The aquaculture and fisheries sector has a large role to play in advancing all the United Nation’s Sustainable Development Goals, but especially SDGs 2, “Zero Hunger,” and 14: “Conserve and sustainably use the oceans, seas and marine resources for sustainable development” (FAO, 2020, vi).<sup>5</sup> It is for this reason that the FAO (2020) recommends “blue growth” as it recognises fish and fishery products as not only some of the planet’s healthiest foods “but also as some of the less impactful on the natural environment” (vii). Since the 1970s, aquaculture production has been growing at 7.5 percent per year (FAO, 2020, p. vi). People are also eating more seafood. Surpassing any other animal protein, from 1961 to 2017, global fish consumption increased annually by 3.1 percent—more than double the population growth rate for this period (FAO, 2020, p. 3). The demand for shellfish has also increased—but why? One reason is rising incomes, but another is that consumers favour bivalves because of their positive environmental impacts coupled with their nutritional benefits (FAO, 2020, p. 88).

But what makes aquaculture sustainable? As marine social scientist and environmental policy scholar Kate Barclay and Alice Miller (2018) point out: “With seafood being the most highly traded food globally and per capita consumption increasing more rapidly than other animal proteins, wild capture fisheries face real and imminent environmental limits” (p. 1). The promotion of aquaculture has been one response to these limits. However, despite the rapid growth of aquaculture, there are many critiques that it is “growing the wrong way.” As environmental scientist Jennifer Jacquet (2017) writes: “Similar to factory farming, aquaculture is becoming an industrialised food system that is unsustainable and unnecessarily cruel.” To avoid repeating the same mistakes that were made on land, Jacquet suggests that government policies and stakeholders, including farmers and investors, should promote bivalves. She considers bivalves not only the best option in the ocean, but the best choice if one chooses to eat animals, period (2017).

Bren Smith seconds this opinion. He calls himself a restorative ocean farmer and recounts his journey toward developing his “blue thumb” in his 2019 memoir *Eat Like a Fish: My Adventures as a Fisherman Turned Restorative Ocean Farmer*. Once a commercial fisherman—a hunter of the seas—he now farms sea greens and shellfish in 20 acres of saltwater in Long Island Sound in the eastern United States. Smith makes it clear, however, that he is not a fish farmer and is critical of the direction the US has taken in its approach to ocean agriculture. “If the nation had

chosen to focus energies on growing restorative species such as seaweeds rather than jailing and feeding fish,” Smith (2019) argues, “we’d have a more sensible dinner plate today. We’d be feeding the planet while breathing life back into our seas, and protecting wild fish stocks while creating middle-class jobs” (p. 7). This, he believes, is the potential of sustainable water-based farming: It can combat climate change, create jobs, and “feed the planet” (2019, p. 11).

A turning point for Smith was the summer of 1992. He was fishing black cod in Alaska, and remembers hearing the dire news from Newfoundland: The Atlantic northwest cod fishery had collapsed. With over 30,000 people in Newfoundland out of work and the number of cod stock tragically low, this is an example of what marine biologist Daniel Pauly calls an “Aquacalypse” (2009). The news killed Smith’s appetite for pillage and sparked a “search for sustainability.” He found his answer in farming sea vegetables and shellfish.

The history of cultivating oysters is long, and the first to do so were the Chinese. Though few written records remain, a 475 BCE Chinese treatise archives the developed state of aquaculture at that time (Stott, 2004, p. 37). The Romans also left records documenting their work in cultivating oysters; by 95 BCE Baia, located in the Gulf of Naples, hosted human-made oyster beds (Stott, 2004, p. 210). Oyster cultivation was established in Italy, France, and Britain, as well as China and Japan by CE 600 (Stott, 2004, p. 211). But Kurlansky argues that a commercial interest in oyster farming only really developed in the nineteenth century when European and North American beds were clearly exhausted (2006, p. 115). To cultivate oysters is to attempt to regulate their supply. At this point, humans learned that they “could make a better oyster than nature” (p. 136–137) something that is unusual in the world of farming animals (Kurlansky, 2006). Just like a wild oyster, a farmed one takes in the same nutrients and filters its local waters.

Restorative ocean farming is one term Smith uses. He also calls it “regenerative ocean farming” or “3D ocean farming” (2019, p. 9). Interestingly, he dislikes the term aquaculture, although does not explain why. But he does detail what kind of cuisine mariculture can produce: Climate cuisine (2019, p. 12). This, for him, is a cuisine composed of underutilised ocean vegetables and shellfish. There are other names for and interpretations of what Smith calls “climate cuisine.” For example, in 2015, the *New York Times* listed “climatarian” as one of the year’s top ten new food words. This list defines climatarian (n.) as:

A diet whose primary goal is to reverse climate change. This includes eating locally produced food (to reduce energy spent in transportation), choosing pork and poultry instead of beef and lamb (to limit gas emissions), and using every part of ingredients (apple cores, cheese rinds, etc.) to limit food waste.

(Moskin, 2015)

In 2016, the following year, the Cambridge Dictionary added climatarian to its repertoire. However, what exactly a climatarian is remains open to interpretation. Generally, it advocates consuming local and organic foods, minimising drought-

prone crops and feedlot beef, cutting back on waste, and prioritising land- and water-efficient foods, the likes of sea vegetables and molluscs.

Cooking Sections—a duo of London-based cultural practitioners who focus on the systems that organise the world through food—use a similar word: *Climavore*. This name doubles as the title of a long-term project Cooking Sections initiated in 2015 with the aim of investigating how to eat as climate changes. In 2016 they launched a project on the Isle of Skye that promotes oysters and other regenerative seafoods while discouraging the consumption of farmed salmon, a practice that comes with ethical and environmental ills, such as escaped fish, viruses and parasites, and contaminated waters (Cooking Sections, 2019; Coates, 2006; Gora, 2020; Lien, 2015). The oyster is one food that *Climavore* champions.

Sustainability is about endurance, about long-term commitment, and so sustainable seafood must contribute to an ecosystem instead of just taking from it. One definition of sustainable seafood is: “seafood that is derived from either wild-capture or cultivated fisheries that can be maintained in the long term without detrimental effects to the structure or function of the wider ecosystem” (Koldewey et al., 2009, p. 71). The sustainable seafood movement emerged in the mid to late 1990s and prioritises environmentally sensitive production and consumption. In dialogue with the environmental movement at large, it focuses on promoting ecological stewardship and raising awareness of pressing issues in contemporary fishing practices and aquaculture, as well as the responsibility of all of those involved. It uses various methods and largely draws from market-based approaches (Barclay & Miller, 2018, p. 2.)

Navigating seafood markets and grocery store freezer aisles requires a great deal of what I call seafood fluency (Gora, 2021a, p. 90). Flesh alone reveals little about geographical and biological origins (Watson et al., 2015). Therefore, shoppers must rely on labels. However, around 30 percent of labels falsely identify fish, an example of fish fraud or even laundering (Barendse et al., 2019). This is of concern for sustainable diets because mislabelling obscures important information related to species stocks and environmental impacts. Compared to fish fillets or frozen fish sticks, shellfish, like oysters, are easier to identify.

There are also two market-based incentives that have become common aides in navigating fresh, frozen, or canned seafood: Certification and ecolabeling. Both have the aim of shifting “industry practises in commercial fisheries and aquaculture toward sustainability” (Cooke et al., 2011, p. 911). Examples of “social marketing,” these strategies emerged as part of the sustainable seafood movement, which resulted from “a collaboration between industry and environmental NGOs that recognised that informed choices made by consumers could contribute to the conservation of marine biodiversity” (Cooke et al., 2011, p. 912). However, practices like ecolabeling are not always consumer-oriented and, instead, function “as business strategic tools for conventional marketing to compete in large-scale retailing” (Prosperi et al., 2020, p. 12). There are also awareness campaigns, which take an educational approach to informing consumers about what is or is not sustainably caught and any additional environmental impacts. Nonetheless, this is still knowledge that a consumer requires to feel confident about shopping for



sustainable seafood. Additionally, there is a lack of evidence that initiatives like ecolabels have reduced overfishing (Barclay & Miller, 2018, p. 2).

Efforts to make the global seafood market more sensitive to environmental impacts are key. Because as much as 70 percent of seafood is consumed in restaurants, chefs play a crucial role in promoting sustainable practices (Koldewey et al., 2009). They set the bar for the industry and are also able to educate diners about what to eat and how. This is also why food writers and those working in food production need to be included in discussions around sustainable appetites and diets. Also, there is great potential in restaurants partnering with oyster farmers and recycling shells to return them to the sea or exploring their potential for other uses.

But discussions about sustainability also raise questions about limits. Kurlansky (2006) brings this up in his account of the history of New York—the world’s oyster-trading capital in the nineteenth century. A city that once sold oysters from street carts like it does hot dogs today. He writes that the history of New York oysters is, in fact, the history of the city itself, a history that ends with excessive waste and the killing of its grand estuary. “The reality is,” writes Kurlansky (2006), “that millions of people produce far too much sewage to coexist with millions of oysters” (p. 269). Oysters have great potential in terms of positively contributing to the waters they call home. A mighty keystone species, a single adult oyster can filter up to 50 gallons of water each day, removing nitrogen pollution—which is responsible for dead zones in the ocean—and gobbling up dirt and phytoplankton (Probyn, 2016, p. 53). An oyster can contribute to clearer water, which allows light to spread nutrients and nourish underwater habitats. But this assumes that the water is in good condition. After all, the hardworking oyster can only do so much. Humans must also keep the waters clean and take environmental responsibility for their voracious appetites.

## Conclusion

The language of seafood turns up in many English-language idioms. This chapter shared “The world is your oyster,” but there are many more: “A fish out of water”; “To be a shrimp”; “Fishing for compliments”; “Something’s fishy”; “A big fish in a small pond”; and, “To fish around.” Clams also make an appearance: “To clam up” references how this bivalve claps together its shell when disturbed; and “Happy as a clam” is the short version of “happy as a clam at high tide,” which is when a clam cannot be dug up and so is left alone and, therefore, content. This last expression circles back to Fisher’s (1988) description of an oyster surviving the hunger of other predators only to be gobbled up by humans. This leaves one to wonder just how happy is a clam, and how sustainable is an oyster?

Fisher opened *Consider the Oyster* with a quote—a “proverbial cliché” (Stott, 2004, p. 101)—from Jonathan Swift’s *Polite Conversation* from 1738: “He was a bold man that first ate an oyster” (1988, n.p.). What does this imply? Why bold? Eating an oyster is a confrontation between life and death, as dinner is in general. But an oyster is also an acquired taste. It is a polarising food: Either loved or loathed. When shucked with precision, “the diner is eating an animal with a working

brain, a stomach, intestines, liver, and a still-beating heart” (Kurlansky, 2006, p. 52). Although not about the oyster alone, there is even a word for the fear of shellfish: Ostrakonophobia. The oyster is one of the few foods that humans eat alive. As Probyn (2016) describes: “Oyster eating is a rare instance when live flesh meets live flesh” (p. 11–12). A living food and a sustainable one when farmed with care in healthy waters. Human concerns about sustainability may wax and wane, but sustainable food production must go beyond the water’s edge, an example the oyster provides if we, as Fisher writes, consider it.

## Notes

- 1 Some of the questions I raise here have emerged from an ongoing dialogue with the marine ecologist Camilla Bertolini about the history of oysters in Venice and their reintroduction to the Venetian Lagoon. I am grateful to her for further pushing my focus beyond cuisine and culture. This chapter also builds on “Self-Portrait, with Shellfish,” a text based on a talk I gave at Ocean Space, Venice, in 2020 (Gora, 2021a).
- 2 I also address this in Gora, 2021b.
- 3 In 2018 “Aquaculture accounted for 46 percent of the total production and 52 percent of fish for human consumption, up from 25.7 percent in 2000” (FAO, 2020, 2). Aquaculture in freshwater, as opposed to saltwater, produces most farmed fish, but here I largely focus on shellfish mariculture (FAO, 2020, p. 6).
- 4 This excludes freshwater aquaculture production.
- 5 For the role that aquaculture plays in achieving SDGs see Troell et al., 2021.

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