

# Venetian Lagoon Mussel Farming Between Tradition and Innovation

## An Example of Changes in Perception and Multispecies Relations

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**Abstract** In Venetian lagoon, mussels as a food, together with technical innovations and new knowledge for their exploitation, are a recent discovery. In the past, the lagoon's fishers considered them inedible. The first mussel farming was launched in 1939 and mussels began a new process of rehabilitation. It is the beginning of a new relationship. Mussels turn themselves into delicate animals that need care and fishers develop new interactions with the other non-human components of the environment. A mutual relationship (or *inter-agentivity*) is created between mussel farmers and mussels, and it brings undeniable advantages to both species.

**Keywords** Knowledge innovation. Local ecological knowledge. Mussel-farming. Venetian lagoon. Multispecies relations. Popular animal's classification. Environmental knowledge. Anthropomorphism. Food acculturation. Inter-agentivity.

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## 1 Introduction

This essay focuses on the changing of perception and relationship between the mussel farmers and the mussels in the Venetian lagoon. This subject emerged during my ongoing PhD research on the development of mussel-farming in the Venetian lagoon and in North Brittany, where I investigated local knowledge and particular conditions on the topic from 2010 to 2014. Later on, I also carried out new field research in the place (which is still ongoing).

In Venice, mussels (*Mytilus galloprovincialis*, Lamark 1819) are a recent discovery as a food, and they are responsible for the adoption of technical innovations and acquisition of new knowledge needed for their exploitation. In the past mussels were suspected to be indigestible and sometimes even toxic across Europe. The lagoon's fishers also considered them inedible and called them with the Venetian derogatory term, *peòci*, that is lice, and they are still called in this way today. It is thanks to the fisher Alfredo Gilebbi that mussel-farming was first launched in 1939 in the lagoon. This was the beginning of the 'rehabilitation' of this black mollusc from its ambiguous past. Today, mussels have become an important local commercial product. It is the becoming of a new source of economic well-being for the fishers of the Southern Lagoon. During my research, mussel farmers describe the mussels as delicate organisms during their growth process. Some mussel farmers equate young mussels to human babies. These words represented my starting point for investigating the mussel farmers' interpretations of the relationship and perceptions about this mollusc, and their transformations in time. Their accounts describe a big variation in the way this animal was perceived with respect to the past: once considered venomous and invasive, contemporary farmers perceive them to be a healthy and natural food. Moreover, their accounts describe young molluscs as a delicate organism to care for, to later on become 'stuff' for the market when they are fully grown.

The aim of this article is to retrace and describe the change in fishers' local knowledge and perception about this species. This process is developed by the fishers thanks to their interactions with the other human and non-human components of the environment. The research presented here is based on qualitative anthropological methodology, such as semi-structured interviews with residents, fishers and mussel farmers. All quotations from these sources in the text are translations by the Author. The article is also informed by the critical reading of various texts on the topic (including social media content, newspaper articles, blogs and video programmes). It is also an exam-

ple of auto-ethnography<sup>1</sup> – a recent approach to anthropological studies in which the experience of a scholar her/himself becomes an object and a part of the analysis – and in which my personal engagement with the local socio-cultural and political context is also analysed.

## 2 The Venetian lagoon: A Cultural Point of View

The Venetian lagoon is located between the sea and the mainland. Due to its location, it is unstable and, in many respects, it entirely embodies what has been identified as the “hybrid” nature of deltas (Lahiri-Dutt 2014). Over the centuries, many local communities have depended on the exploitation of aquatic resources developing appropriate fishing techniques and their own culture distinct from the farming one widespread in the Venetian hinterland.

Local fishing is characterised by the continuity of fishing techniques that seem to cross – albeit with small personal adaptations and innovations developed over time by fishermen – the modern and contemporary age up. Today, the small-scale fishing activities in the lagoon, also including mussel farming, have remained multi-specific and multi-instrumental, that is, directed towards various types of products and adopting multiple techniques. This type of fishing is commonly defined as ‘traditional’ because it still uses artisan techniques and tools of the past. By the term ‘tradition’ we mean something that maintains constant references to its past origins, and the prevalence of experience over innovation that is generally rejected as a potential source of risk. Folklore studies show us that a tradition is not something immutable over time, which always repeats itself in the same way. Actually, even a tradition is subjected to change, undergoing adaptations and contaminations when it comes into contact with other realities. Except that the innovations within the tradition of the past generally manifest themselves slowly (Sanga 2006, 453). The innovations within a tradition are long processes. This makes their observation and detection difficult, but that does not mean they do not exist.

Many of the characters locally defined as traditional are also found in other lagoon areas. This is the case, for example, of the San Gilla lagoon in Sardinia studied by Franco Lai (2020) and with which numerous elements of comparison can be encountered. This leads us to

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**1** Ellis, Adams and Bochner describe autoethnography as “an approach to research and writing that seeks to describe and systematically analyse (*graphy*) personal experience (*auto*) in order to understand cultural experience (*ethno*) [...] This approach challenges canonical ways of doing research and representing others [...] and treats research as a political, socially-just and socially-conscious act. A researcher uses tenets of *autobiography* and *ethnography* to *do* and *write* autoethnography. Thus, as a method, autoethnography is both process and product” (2010; italics in the original).

hypothesise the existence of a real 'culture of lagoon'. As we know, there are many cultural aspects that develop from the interaction between man and the environment in which he lives. As for the aquatic spaces among the islands, it is important to dispel the prejudice that water is a separating factor among communities and their cultures. Actually, it has been shown that aquatic spaces must not be interpreted as a separating factor, but rather they must be understood as a unifying factor and a source of cultural interaction between small social groups. The conceptual gap has been filled thanks to the concept of *aquapelago*, a recent interesting approach to Island Studies developed in the last decade by the Australian anthropologist Philip Hayward (2012a; 2012b). Hayward explains that an aquapelagic assemblage is:

a social unit existing in a location in which the aquatic spaces between and around a group of islands are utilised and navigated in a manner that is fundamentally interconnected with and essential to the social group's habitation of land and their senses of identity and belonging. (2012a, 4)

Based on the testimonies collected by fishermen, the waters of the Venice lagoon with the communities that its islands host can fall within this definition by right. The lagoon is in fact characterised by an essentially aquatic and insular type of life that develops in the terrestrial and aquatic dimensions. This implies a very close relationship - we can venture 'symbiotic' - between the inhabitants and the water, which becomes the privileged space for the daily practices of the islanders. According to geographer Cavallo, it is this intense relationship between humans and water that characterises the inhabitants of the lagoon at a cultural level. It is a symbiotic relationship that provides the inhabitants of the lagoon with a sense of identity and belonging by transforming a person into a 'Venetian' (Cavallo 2015).

A further interesting aspect that confirms the presence of a specific culture is given by the configuration of the lagoon, or rather of the lagoons, as a space domesticated by fishing by means of its tools (and in the past also for hunting and salt production). This is what Lai, referring to San Gilla, defines a historical ecosystem, taking up a work by the historian Caracciolo (1988). In fact, what we observe today in the lagoon is a landscape erroneously perceived as shaped by natural elements because actually it is largely shaped by man (Vianello 2021, 95). It should not be forgotten that in the centuries of the Serenissima Republic the respect of 'ecological' constraints was a fundamental aspect that had to be considered by the organisations of work and it was enforced by the government, in order to preserve

the delicate balance that characterised the wetlands.<sup>2</sup>

For the Venetian fishermen, the hybrid spaces of the lagoon are experienced as an extension of the emerged lands. Fishermen often associate the lagoon area with a rich and fruitful ‘countryside’, meaning by this term a place that is both safe, protected, and rich in resources. They also use the definition of countryside to emphasise its contrast with the open sea, which is experienced as the space of danger, and otherness, the place where the nuance between life and death is thinned. The sea is never conceived as a domestic entity, unlike the lagoon that is like a countryside.

Finally, the acquisition of knowledge about the environment seems to take place among fishers thanks to the network of interactions that they build with other human and non-human components (fish, plants, water, air, rocks, sand and so on) that coexist here. The Venice lagoon and its fishermen and mussel farmers represent a concrete example of the mutual relationship between humans and environment hypothesised by Ingold (the *inter-agentivity*), a perceptive requiring a direct involvement with the environment, where each organism perceives the other components belonging to that same world in a different way (Ingold 2000, 166). For a long time, anthropology has considered animals exclusively under the symbolic aspect, therefore from a purely human point of view. Animals are sentient creatures with which man has always interacted socially, just as we do among us humans. According to Ingold, it is necessary to develop a new anthropological approach that considers the social relations of animals and with animals, an anthropology that knows no divisions between man and organisms, between social and ecological relations, ceasing to consider humans as something distinct. What we humans need today is what Ingold calls “relational thinking”, that is, to consider organisms as places of growth and development within a continuous field of relationships. Only by accepting this new concept can we understand that we humans are part of the whole, we participate in a continuous organic life just like all other organisms (Ingold 2016, 79). According to him, this approach would make it possible to overcome the nature-culture dichotomy formulated by the father of structuralism, Claude

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**2** In past centuries, numerous interventions were carried out by the Serenissima Republic of Venice in order to maintain the equilibrium of this unstable place. This is a structural instability that local fishers are well aware of. Fishers have the proverb that roughly translates as “even a pole can create a swamp” (to highlight that any small change can have effect on the geomorphology of the lagoon), noting that the lagoon has its own very delicate balance that must never be altered, at risk of drastically transforming it. However in the last 150 years, human activities have contributed as never before to profoundly change the lagoon. The lagoon has been subjected to invasive series of anthropic interventions in the name of progress and modernity, the latest of which is the MOSE system. But this is another story (Vianello 2021).

Lévi-Strauss<sup>3</sup> - because the perception and relationships of mutualism are never immutable, and in some cases, they may totally change over time, as I will describe in the case of mussels.

### 3 The Classification Matter: The Mussels' Case-Study

In the second half of the Twentieth century a new theoretical perspective developed in anthropology: ethnoscience emerged as an approach to research that aims to investigate the ways in which local knowledge about the natural world is distinguished, classified and organised.<sup>4</sup> Local knowledge systems are no longer seen as irrational beliefs and collection of oddities, and anthropology promotes the recognition of their internal coherence and complexity. The anthropologists following the ethnoscience approach meticulously collected the terminologies with which the natives classify the different areas of their reality, and investigated the ways in which the different domains of knowledge about the natural world are formed, gathered, differentiated and organized. Distinct undercurrents arise from ethnoscience, such as ethnobotany (of which Brent Berlin and Paul Kay's 1969 research on colour perception is a classic example), ethnozoology, ethno-medicine. Ethnoscience was later criticised as starting from an ethnocentric assumption, because the data collected, often in very detailed and refined collections, used the models and classifying categories produced by Western science as a non-negotiable framework of reference (Bloch 2000, 340). After scholars' efforts in ethnoscience to build a great theory of cultural knowledge, researchers began to prefer to study comprehensive cultural models with the ambitious aim of describing the human organisation of the knowledge. In a later time, the ethnoscientific perspective was abandoned, and the studies on how humans perceive the different domains of the world in which they live moved towards more interdisciplinary approaches. It is the case with the theory of cultural schemes adopted by cognitive anthropologists and borrowed from psychology (Tassan 2020, 49-51). According to this theory, individuals who

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**3** Let us recall, summarising, what Lévi-Strauss (1908-2009) meant by the term "nature", the dimension of instinct and biological need, in opposition to the concept of "culture" by which he indicated the world of normativity, the set of rules, behaviours techniques, beliefs and institutions required to an individual in order to confirm the belonging to his own group (1969, 46).

**4** Later, starting from the 1990s and with the birth of environmental anthropology, this approach took on new contours and began to focus on the historical and political dimension of the relationship among humans, environment and resources. As Manuela Tassan observes, in the post-modern climate of the anthropological debate of that period, scholars begin to question the conflicts and power relations that arise from the appropriation of resources (Tassan 2020, 46-50).

recognise themselves as belonging to the same culture possess and share mental schemes in which to group sets of similar elements that can be traced back to a general idea (Bloch 2000). For example, there would be a scheme within which everything that can vaguely lead to the idea of 'home' is included: shelter, hut, apartment, castle, and so on. In practice, everything would be organised into distinct categories (or domains) that men use to classify and order their world. Another recent approach to the study of classifications comes from the so-called prototype theory. This theory assumes that the identification of a distinct cultural domain is based on a particularly representative prototype; prototypes are something highly exemplary, very typical, or as Bloch states the best examples of specific cases (Blount 2011, 15-20; Bloch 2000).

Among various undercurrents that arose from ethnoscience, studies on traditional ecological knowledge, TEK (also known as traditional environmental knowledge) emerged in the 1980s. Formerly, TEK studies were used in anthropology to describe the traditional knowledge on the cumulative indigenous body of knowledge, belief, and practice concerning the local resources (Madden 2015). The feature of this approach is that TEK lends itself to a large interdisciplinarity. For example, the TEK approach is also used today in natural resource management as a substitute for baseline environmental data or to complement Western scientific methods of ecological management, or to provide information about climate changes. Being that TEK studies the relationship of human-beings (and non-human too) with their environment, researchers from different scientific frameworks are using them as an alternative information source to study the emerging changes in biodiversity. However, their application in the field of ecological management and science is still controversial - because of the qualitative methods of acquiring and collecting knowledge and because it is reasonable that not all the subjects and episodes are equally retained by the actors. As argued by a study on fishing in the Mediterranean Sea, the capturing of 'new fish' is a special event that is easily remembered by the fishers (Azzurro, Moschella, Maynou 2011). This media property of species 'never seen before' may increase the potentialities of TEK in monitoring tools for unusual occurrences that are typically difficult to monitor. According to the authors, this possibility should be seriously taken into consideration due to the increasing need to approach large-scale patterns in the marine environment (such as species distribution shifts under climate change scenarios).<sup>5</sup>

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**5** Begossi writes that the management of local artisanal fisheries is a necessity because it provides an additional benefit, considering that decentralisation and the use of TEK in management have given better results than centralised top-down manage-

Given this brief theoretical synthesis on the main approaches to human classification systems of the world in which human-beings live, we will address the case study on the perception that fishers and mussel farmers have on their environment, resources and specifically on mussels.

The fishers of the Venice lagoon still maintain their own classification system distinct from that used by our scientific taxonomies (and no less complex). It has emerged from the interviews that this knowledge is partly transmitted by the elderly and partly based on empirical observations collected during daily work. It is noted from the first approach that the classificatory interest is mainly aimed at the species subject to commercial interest and has a utilitarian purpose. Consequently, even today, despite the higher education most of them received, it is not uncommon for fishers to include fish, molluscs and crustaceans in one large family: the fish.

Sometimes fishers express some doubts because they do not know if the molluscs with shells belong to the category of fish or to something not well identified; they live in the water but are unable to swim and move like fish. These shelled molluscs are considered crustaceans by fishers, just like crabs, lobsters, shrimps and anything else that has a rigid coating around the body. It seems precisely that this characteristic, namely the possession of a 'crust', as the fishers call it, is the factor that unites very different species.

Having said this, the distinction adopted by Venetian fishers for the classification of fauna appears to be mainly linked to its habitat. So, we find for example: bottom fish, divided in turn into sand fish and mud fish; stone fish, if they live in a rocky area, flying fish for fish that make seasonal migrations. These are permeable categories among which a species can move according to its seasonal habits or according to where they are captured.<sup>6</sup>

It is a habitat-based classification system that will be extended also to mussels from the moment they begin to have a commercial interest. To give a practical example, fishers and farmers distinguish those they call 'iron mussels', that is, those that grow attached to an iron support, from 'wood mussels', such as those that grow for exam-

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ment. She adds: "several examples illustrate the utility of applying TEK in these contexts, wider application of TEK - derived information remains elusive. In part, this is due to continued inertia in favor of established scientific practices and the need to describe TEK in Western scientific terms. In part, it is also due to the difficulty of accessing TEK, which is rarely written down and must in most cases be documented as a project on its own prior to its incorporation into another scientific undertaking. This formidable practical obstacle is exacerbated by the need to use social science methods to gather biological data, so that TEK research and application becomes a multidisciplinary undertaking" (Begossi 2008, 591-603).

<sup>6</sup> Interview with G.B., 19 June 2013.



ple on *briccole* (the wooden poles that mark the routes of the navigable channels). Based on this distinction, we find the ‘mud mussels’ and the ‘stone’ ones that live on the rocks. According to the judgment of the fishers, the place where the mussels live affects their taste and the quantity of meat developed, as well as their healthiness. In fact, there is a widespread belief that mussels that grow on iron supports can be bad for one’s health (Vianello 2018).

Within the local classification criteria, a further relevant distinctive criterion is linked to the measures of the prey, which often take on different names depending on the age. In turn even the mussels begin to take on names based on age. Replicating an already known pattern, they are divided into ‘sowing’ or ‘seed’ (in Italian *semina* or *seme*), when they are small in size (approximately 1.5 cm), *peòcio mešàn*, medium mussel (approximately 3-4 cm) and *peòcio maturo*, mature mussel, when it reaches the commercial size of five centimetres.

On the basis of this research and previous surveys, these age subclasses are found almost exclusively among edible species, in particular among those most fished or of greater economic value, to underline once again the predominantly economic-utilitarian purpose of the fishers’ knowledge on marine fauna. In actual fact, everything that lives in the sea that is not useful for the purposes of fishing or harvesting, even if only as a simple bait, does not seem to receive too much attention and even less care is placed into sub-categories on the basis of its habitat or age and measure, or even of the sex or the particular phase of life. They generally tend to dismiss anything that is not deserving of excessive commercial interest as ‘crazy stuff’ (*ro-ba matta*), in the sense of something that is not good to eat.<sup>7</sup>

#### 4 The Mussels: From Poisonous Food to Appreciated Food and Source of Well-Being

Since the 1950s the development of mussel-farming in the Venice lagoon has brought with it a new market and business, as well as a new socio-cultural dynamic. In the past, the inhabitants of Venice perceived mussels as an unhealthy food and mussels were considered inedible and sometimes poisonous. We have found historical reports about their unhealthiness in eighteenth century texts of Venetian naturalists Chiereghin and Olivi (Chiereghin 1778-1818; Olivi 1792).

<sup>7</sup> It is interesting to note that a sort of dual distinction is also widely practiced by the same scholars of natural sciences who use to distinguish in the catch the so-called *waste*, that is the species of no commercial value, and the *dirt*, that is what constitutes the garbage of a catch.

In Europe, mussels have also been historically perceived as an unhealthy food of minor importance and consumed by the poorer classes (de Roissy 1804-05; Molin 1865;<sup>8</sup> Carazzi 1893; Cerruti 1924).

The negative connotation of mussels has led fishers to associate them with human and animal parasites from land and the use of the same name seem to have been rooted in human cultures for centuries. The fact that, in the Venetian lagoon, the mussels are commonly called *peòci*, lice, among inhabitants is curious and deserves our attention. During the Roman era we note that Pliny the Elder (23-79 CE), the author of the *Naturalis Historia*, speaks of the mussels using the Latin word *pediculus*. The origin of this name is not clear. It could be a linguistic 'fossil' or could be an example of a well-known mechanism studied by linguists who explain that the colloquial names for marine animals appear to be drawn mainly from the vast repertoire of terrestrial names, which is what people knew best (Cortelazzo 1963-64, 159-64; Leroi Gourhan 1977, 364).

The Venetian rehabilitation of mussels can be attributed to the fisher Alfredo Gilebbi from the Region Marche, who, in 1939, was the first to establish a lagoon mussel-farm.

During a trip, Gilebbi had the opportunity to observe the mussel industry of Mar Piccolo of Taranto in the South of Italy. From that, he decided to introduce this practice in the Venetian lagoon (Vianello 2018). Over the years, the method has been successfully changed and adapted to the characteristics of the lagoon environment. More than twenty years had passed since the first harvest, and the fishers from Pellestrina island, attracted by the possibility of making a profit, began to take an interest in farming and trading in mussels. Before the Gilebbi's rehabilitation of mussels, lagoon fishers compared them to weeds that grow in cultivated fields. So much was the hatred towards these black molluscs that they remember that the fishers usually crushed them with their fingers to kill them when they occasionally got entangled in the nets. They would then throw it back into the water so that it would never reproduce. The farming and trading in mussels were a success and during the 1970s the island became the epicentre of mussel production in Italy, becoming the scene of a great economic and socio-cultural transformation. For the first time fishers of the southern lagoon could live an economic well-being never seen before.

Over time, this innovative market created a real 'myth of foundation' among fishers, concerning the pioneering Gilebbi's work in Venetian mussel-farming (Vianello 2018). It is interesting that we find a similar foundation myth case on Burano Island in the north-

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<sup>8</sup> Molin, R. (1865). "Rapporto sulla coltivazione delle ostriche e dei mitili nella porzione media e inferiore della laguna di Venezia". *Gazzetta di Venezia*, 5 gennaio.

ern lagoon, linked to the introduction of the *moéche* following Second World War. *Moéche* is the Venetian name for a soft-shelled crab which is in the process of moulting its carapace and becoming edible (Bonesso 2000).<sup>9</sup> Here innovation also brought great economic well-being.

The beliefs related to the danger of mussels continued to persist among the fishers of the lagoon for a long time after the emergence of mussel farming. Many of these are in fact the farmers who embarked on the new profitable job without finding the courage to taste a mussel until many years later. It is in this initial phase of mussel farming that special knowledge is developed to neutralise the potential poisonousness of these controversial molluscs. One of these systems was explained to me by the elderly Rino who notes:

When you eat *peòci*, you should never drink water. You have to drink some wine. Even if a person usually does not drink, he must still drink a glass of wine, he must drink half a glass of wine. Because with wine it's okay, but if you drink water the *peòci* can hurt you. Because of that, those who eat *peòci* have to have a glass of wine.<sup>10</sup>

This is a very interesting point, because we can find some suggestions to neutralize the mussels' toxicity in old French texts. De Roissy for example, at the beginning of the nineteenth century explained how to counteract the side effects associated with the ingestion of mussels (de Roissy 1804-05, 268-9). He explains their toxicity by the presence of a small crab that sometimes lives inside the valves and suggested eating this mollusc with vinegar and other acidic substances to neutralise the poisonous effects, just like the fisher Rino does.

The case of the domestication of lice-mussels reminds us that – as the comparative studies of cultural ecology stated<sup>11</sup> – the ways in which the different human groups take the resources from the ecozone in which they live show how the food needs are selective, that is mediated and determined by cultural influences (Schultz, Lavenada 2019, 218-36). To give an example, this means that we do not eat what is good but what we believe is good, or rather what we have

<sup>9</sup> We also find another analogous process of relationship changing between society and marine resources in the Mont Saint-Michel Bay, in North France. Even here, a profitable mussel-farming industry was developed after the Second World War by a small group of mussel farmers from the Baie D'Aiguillon (Charente-Maritime Region) and, within a few years, the village of Vivier-sur-Mer became the leading producer of mussels in all of France (Delacotte, Roellinger, Cornu 2011), similar to the lagoon of Venice for the Italian territory.

<sup>10</sup> Interview with Rino B., 24 October 2010.

<sup>11</sup> We recall that cultural ecology is characterised by the attempt to apply the principles of ecology to human beings, that is, the way in which the different living species relate to each other and to the physical environment.

learned to consider good. What is considered bad does not always correspond to the category of poisonous or unpleasant-tasting foods.<sup>12</sup>

Finally, from the mussels' perspective we know that they have their own agency and pursue clear biological aims even if without conscious thought or intention. Taking a cue from the actor network theory developed by Michel Callon and Bruno Latour (Callon 1986; Latour 2005) and from a recent article about the crab aquaculture in China by the scholar Halsey, we know that mussels share their biological goals with human mussel farmers and use human aquaculture strategies for their own ends (Halsey 2021). Mussel-farmers think they have found out how to control molluscs to ensure a reliable source of food. At the same time mussels – since they are no longer an invasive and venomous species to destroy held responsible for breaking the fishing-nets – enjoy these opportunities to expand their numbers. It is an entangled relationship history, where humans and animals engage in a “dance of agency”, as Halsey calls it, in which each one responds to the actions and interventions of the other.

## 5 Changes in Perception: Are Mussels a Pest, Animals to Care For, or ‘Stuff’ for the Market?

The mussel shell is not only a protective ‘crust’ for mussel farmers since a whole series of metaphors and similarities with the animal and plant world arise from it. These local experts recognise in it, similarly to the human being, a mouth, a lip, and even a beard. By mouth they mean the rounder side of the shell, the one that remains slightly open during immersion to allow the animal to feed. It is also the part that remains wide open when it dies. The mussel farmer Gianni-no – formerly a lagoon fisher like many of the first farmers – told me that “Once [early 1980s] I went home and told my wife ‘All my mussels have their mouths open!’. Farmers from the mainland distributed fertilizer on the countryside and my mussels died of heart disease”.<sup>13</sup> As can be seen, not only the characteristics of mammals are attributed to the *lice*, but also the common human diseases and causes of death are attributed to them. For this reason, according to farmers, poisoning due to chemicals used in agriculture would cause the mussels to have a fatal heart attack. Taking up the words of this fisherman, the mussel is like a heart that contracts and relaxes to pump blood, and carries nourishment and oxygen.

Mussels live in water and this vital element, perceived as the equivalent to blood, is considered essential by the farmers. For this

<sup>12</sup> For a perspective on the issue, I suggest Harris 2006.

<sup>13</sup> Interview with G.B., 19 June 2016.

reason, different water qualities affect the growth of mussels in different ways. Water is the vital element, but it can be harmful when its conditions are not ideal for the life of the species. The ideal water for the life of mussels is the *mestisa* water, a mixture of salty sea water and fresh water brought by rivers. Moreover, it must be clean and rich in nutrients as molluscs do not need any type of feed because they grow thanks to the plankton brought in by the tides. For the latter reason above all, mussels have been rehabilitated by transforming themselves from the indigestible and poisonous mollusc described by elderly fishers and by the texts of the past, into a synonymous of healthy and natural food for today's eaters.

Mussels are also equated to humans in their resistance to the hot summer temperatures of the lagoon. In such climatic conditions, mussels are taken by weakness like humans and lose the strength to cling to by their byssus. In this regard, a farmer explains to me that

with the hot weather the *stuff* becomes more tender and at a certain point it can no longer hold on, because the water heats up and they lose strength, like us who when hot are out of breath.<sup>14</sup>

In this case it is up to the mussel farmer's ability to look after them by taking mussels to deeper and cooler waters or to put them in nets that hold them back. Once again, the success of the breeding process depends on the knowledge possessed by the mussel farmer that allows to intervene to prevent the problem.

The similarities with the human body do not end here. The mouth attributed to mussels is a mouth with delicate lips to which close attention must be paid during the processing and cleaning phases so that it does not break. The byssus is instead called 'beard' due to its resemblance to a tuft of strong hair.<sup>15</sup> Fisher Antonio explains:

the 'beard' is the support, it is the strength that the *lice* have. They have a beard that looks like horse hair because it's very hard and resistant.<sup>16</sup>

For some of the mussel farmers interviewed, the byssus is identified in the 'umbilical cord' of the mussel; if it is removed, the mussel loses its vital force until it dies, as Vincenzo explained in his testimony: "[i]f you remove the umbilical cord, the *stuff* doesn't last much long-

<sup>14</sup> Interview with V.B., 23 September 2019.

<sup>15</sup> With respect to the byssus, we find an example of lexical reference borrowed from the vegetable and agricultural world because it is also called 'root', *raise* in Venetian dialect.

<sup>16</sup> Interview with Antonio S., 01 April 2013.

er, you have to eat it within twenty-four hours”.<sup>17</sup> An interesting passage emerges here: the mussels kept in farms known as ‘nurseries’ (*vivai*), are perceived to be delicate children with an umbilical cord, to be cared for and protected during their growth. Referring to the younger specimens, those that are equated with rice grains for their size, the same farmer adds that “the *seed* is delicate, it’s like a small child, it has less resistance than adults”. Regarding the need to protect the young specimens, an elderly mussel farmer, in his nineties at the time of the interview in 2016, explained to me that:

[t]he mussel opens and closes its mouth to drink the water. There are many sea-brems, and they go in search of food and find the small [mussel] in the nurseries, which are less intelligent than the big ones, and they find them with their mouths open to eat, to suck water, and they eat them.<sup>18</sup>

It is necessary to open a brief exploration of the perception of the predator. In the interview excerpt reported, in addition to the attribution of a form of intelligence to the mussels, there is also an implicit attribution of intelligence to the sea-brems, which in order to prey need to be more intelligent than their prey. A perception that projects the same relationship that is established in the affirmation of a presumed superiority of intellect between the human hunter and his prey. It is not a physical dominance, a game of strength, but it is above all an intellectual dominance, made up of that cunning and intelligence that come from knowing the animal’s habits. Only in this way does it become possible to stay a step ahead and succeed in its capture.<sup>19</sup>

Returning to the fascinating subject of similarities, we have seen that the young specimen of mussel described by Rino is inexperienced and consequently defenceless. It opens and closes its mouth to suck the water, unaware of the dangers that surround it, similar to a defenceless baby sucking milk. The repertoire to which reference is made is, once again, the well-known one of the mammalian biological cycle: at the beginning of their life, young *lice* suck their vital element, they are defenceless and inexperienced, and then they become ‘ripe’ individuals once grown up.<sup>20</sup>

<sup>17</sup> Interview with V.B., 23 August 2015.

<sup>18</sup> Interview with Rino B., 11 January 2016.

<sup>19</sup> For further information on the topic, see Vianello 2004.

<sup>20</sup> The references to maturation used as a metaphor for humans and animals (but not only) is a factor that appears to be present in many societies. Among the Huave (Mexico), for example, it is also applied to the stars and to the moon that matures when it is full (Cardona 1993, 180-2).

This is the moment in which their perception changes radically, that is when the mussels reach the commercial size for sale. This is the growth phase in which the mussel farmers begin to refer to them with the term 'stuff'. This aspect of the mussel farmer's work highlights the relationship of man with nature. It highlights the specificity of the relationship of transformation, appropriation and use of a resource that is also something alive.

In the case of mussel farming, it is possible to make this process fall into the category that Maurice Godelier called *disjunction*: "[m]en isolate from nature the dead or living things that they use in their natural, brute state, or after a series of transformations" (Angioni 1984, 12). Among lagoon mussel farmers, there is a clear distinction between the young and live animal, which must receive all the necessary care, and the adult animal ready for sale and to be transformed into food for humans. It is in this passage that it seems to lose its belonging to the living world to transform itself into a generic 'stuff'. What I found during my research coincides with the hypothesis formulated by Gianfranco Bonesso during his original and interesting survey on the production of *moéche* in Burano. Bonesso affirms that

with the potential prey a symbolic process of distancing oneself is carried out, of transforming animal to object, *natural product* to a foodstuff, which also has confirmation on the symbolic-linguistic level. It is possible to consider it like a process of objectification, from living matter to inanimate matter; such is functional to determine the human position in the process of exploitation of resources and, perhaps, to remove an excessive proximity between man and other living beings that can be preyed upon. (Bonesso 2000, 23; italics in the original; transl. by the Author)

In both cases studied, the symbolic aspect passes from the perception of a delicate animality, to be cared for and protected like children, to its transformation into a product that already has a strong material and detachment connotation: it becomes a product, a commodity, an economic good. It is *stuff*.

## 6 Anthropomorphic Visions and Metaphorical Constructions

In his ethnoscience essay the author Cardona finds that the anthropomorphic vision unites many hunting and gathering societies. It is a vision that creates linguistically oriented models both on the body schema and on human behaviour (Cardona 1993, 112-13). Regarding the specifics of the symbolic and lexical references referring to the body that are found among fishers and mussel farmers, once again

it is possible to start comparisons with the data collected in Burano from Bonesso. Fishers say that the production of soft crabs is an activity imported to the island after Second World War - its learning therefore is recent, just as it occurred for mussel farming. Here as well as in Pellestrina, a rich series of similarities drawn from the human body and partly from the plant world have developed among the employees. According to Bonesso's interpretation, "the impossibility of translating 'sensations' into a speech, with words that make sense exactly, means that many metaphorical and metonymic constructions are offered to the researcher" (2000, 7). Agreeing with this interpretation, however, we point out that metaphorical constructions are not used exclusively as a means of communicating with the 'ignorant' researcher about the profession but are also commonly used in current communication among fishers when they find themselves lacking a specific professional vocabulary following the introduction of a new profession. Since the two new types of farming were introduced, accepted and developed by fishermen, it was necessary to increase the jargon of fishermen with new words; they are new words that were not created *ex novo* but that have been borrowed from the well-known world to be adapted to new needs.

We have already encountered some practical examples of this process concerning mussels, and all the examples are borrowed from the better-known mainland world. The examples given allow us to hypothesise that, when an innovation occurs suddenly within a local context, it is rarely possible to compensate for the need for new names with already existing jargon. As a result, people are subconsciously inspired by words borrowed from other well-known vocabularies and other metaphorically evoked worlds.

## 7 The Mussels' Reproduction: A Mysterious Matter

An interesting aspect of local knowledge on mussels concerns the methods of their reproduction.

Based on local popular knowledge, mussels would be differentiated between males and females based on the colour of the animal: the red-orange colour would indicate the males, while the white, the females. Due to the recent introduction of mussel farming in the lagoon, the process of affirming and consolidating new ecological knowledge has not yet concluded. Therefore, we do not always encounter univocal interpretations among fishers and mussel farmers. We sometimes find, however, conflicting opinions, as in the case of the explanations concerning the diversity of mussels' colour. One of the first fishers from the southern lagoon who chose to become a mussel farmer explains that the different colour depends on the quality of the filtered water. He explains that when the water is pure, this characteristic



also affects the colour of the mussel, which cleans itself by filtering and becomes white, a colour that is culturally recognised as a symbol of purity, cleanliness, and healthiness: “It is the type of water that filters. When the water is purer, the ‘lice’ eat the same, but they eat stuff that is healthier”. In this case there is no gender correlation.<sup>21</sup>

For other informants, the different colour of the animal only affects their flavour. Molluscs that are not too dark, those indicated as between orange and yellow, would be the tastiest, but for some, the white ones are the best of all, those that, as we have already seen, filter the cleanest water.

Beyond the colour of the single mollusc, males and females reproduce and give life to the young specimens. When the period of reproduction comes, fishers often say that the fish have ‘milk’, which is nothing more than the emission of sexual products (that are dispersed in the water where fertilisation takes place). The fisher Antonio explains that mussels:

give up spores, practically there are times when it is said that the *peòcio* has the milk. They release these spores and thus give birth to other *peòci*. The sowing is born. They have periods that have milk.

The presence of the so-called ‘milk’ inside the shell during the reproductive period – once again we encounter a reference to the world of mammals – is not the prerogative of mussels alone. Fishers recognise that this characteristic also extends to other molluscs with shells such as clams, sea urchins or razor clams. The seasonality of the production of ‘milk’ is well known and expressed by the popular saying “when it is very hot and when it is very cold the mussels have the milk”. During these periods, the molluscs are judged by fishers to be difficult to digest and have a less pleasant taste, even if they admit that there are many people who eat them anyway.<sup>22</sup>

The reproduction of mussels is described as a mysterious and not clearly predictable process. Someone ventures that the secret would perhaps lie in the temperature of the water, but it is not sure. A young man from Chioggia told me: “*Seeds* are something I don’t understand, and even older fishers don’t understand. Two years ago, the mussels

<sup>21</sup> According to biologists, the colour is influenced by the amount of light to which they are exposed, which in the case of mussels often corresponds to the depth in which they live. For others, however, the orange colour is given by the presence of eggs.

<sup>22</sup> As biologists explain, ‘milk’ is nothing more than the sexual product of mussels, the gametes. In fact, it is during this period that they have the most meat and are particularly tasty. The presence of ‘milk’ provides about 60-70% of their taste, the remaining 30-40% depends on the diet, that is, on the quality of the water in which it is raised (from an interview with Stefano Gilebbi, biologist and mussel farmer).

were full of seeds to the point that they couldn't even be processed. The following year, no *seeds* were found, and the *seeds* had to be bought in other seaside locations".<sup>23</sup> When the conditions for reproduction are particularly favourable, an excessive amount of *seeds* develop and settle around the more grown individuals. This way, the already grown mussels find themselves in an internal position which is unfavourable because there is little nourishment. However, when *seeds* are not produced, the mussel farmers are forced to buy them in other locations, spending large amounts, if they wish to start production for the following year.<sup>24</sup> Almost a century after the creation of Alfredo Gilebbi's first breeding farm in the lagoon, his nephew Stefano, a mussel farmer himself, comments on the reproductive process: "the mussels do what they want, you really don't understand!".<sup>25</sup> The lack of in-depth knowledge about mussels and their reproduction partly brings farmers closer to fishers in terms of uncertainty which in this case seems to remain a constant feature of the trades that exploit the resources of the aquatic environment.

## 8 Conclusion

We have seen that in Venetian lagoon, we find a late appreciation of mussel resources and a late adoption of the technical innovations to exploit them. A novel use of this local resource was created in the twentieth century. Following this process, mussels change their status as food. They turn from poisonous to refined and natural food.

The new job, started by the pioneer Alfredo Gilebbi, is not a simply innovative business model, a source of well-being for the poor fishers. The result is a deep cultural revolution among fishers. In just a few decades the perception on mussels has changed: they are not a pest to be eradicated anymore. *Lice* turn themselves into delicate animals that need attention and care like babies. At the same time, a new and rich professional language is developed to support the new profession. It is a functional language for farming that is borrowed from the well-known terrestrial dimension, and that uses many anthropomorphisms and metaphors.

Therefore, these elements are not yet sufficient to start a profitable farming. Still missing the most important aspects, what allows the fishers to manage the growth of mussels: new knowledge and new skills. The fishers' knowledge is largely based on personal experimentation and direct observation of the different phases of work together

<sup>23</sup> Interview with Riccardo B., 23 November 2018.

<sup>24</sup> Interview with Maurizio P., 15 April 2019.

<sup>25</sup> Interview with Stefano G., 30 May 2017.

with the daily attendance of the places. Otherwise, the information was passed on from the older generations to the younger ones. It is the local ecological knowledge and technical skills that make a fisher capable and competitive. In the case of the nascent mussel farming, to meet the basic needs of the trade, the transmission of what was firstly observed begins to spread horizontally among fishers of the same generation. Since the boom in mussel farming arose between the 1960s and 1970s of the last century, the start of experimentation and observation by fishers is also recent. As I have tried to demonstrate, from this derives a variegated imaginary, sometimes contradictory and other times imaginative but no less interesting for what it communicates on the socio-cultural dimension of mussel farming and on the profound transformations that have affected the world of fishing.

By reconstructing the development of mussel farming and its subsequent rise to fame, it was possible to have a deeper understanding of how new knowledge is obtained and learnt. Among fishers, the learning of lagoon knowledge appears to also take place thanks to the interactions they build with the other human and non-human components that live here. The Venetian lagoon is confirmed as a concrete example of the relationship of mutualism between humans and environment hypothesised by Ingold and defined by him as *inter-agentivity*. As we have tried to demonstrate, the perception and relationships of mutualism are not something immutable and, under certain conditions, it can totally change over time, as in the case of mussels. In particular, the mutual relationship that is created between mussel farmers and mussels during the breeding process brings undeniable advantages to both species. From their relationship the mussels derive a biological advantage linked to growth and reproduction processes protected by humans that allow the molluscs to spread widely (so much so that many fishers define mussels as an invasive species due to the large number of mussel farms). For humans the advantage is economic and obtaining an easy food source. According to Ingold's studies on reindeer breeding, humans and animals share multiple goals and values, but both consider the advantage for the individual and the whole species (Ingold 2014, 20).

The phenomenon of mussel farming in the lagoon was not an isolated case. We mentioned the introduction of *moèche* breeding in Burano, but in more recent years other examples of innovations have also been presented locally. Suffice to think of the widespread harvesting of *vongole filippine* (*Tapes semidecussatus o philippinarum*, Adam, Reeve 1852), clams, in the 1980s (Pellizzato 2005). Thanks to the sudden great demand of the markets and the high earnings, almost all fishers chose to devote themselves to a previously unprofitable activity carried out by the poorest and oldest lagoon fishermen during the winter months. Today we can also draw attention to the appearance on our shores, and timidly in the fish markets, of 'blue

crabs'. All examples that confirm once more that the so-called 'tradition' is not something immutable, but something that re-proposes itself according to the same patterns and methods. I believe it is possible to affirm that every species, perceived as alien or local, if the favourable conditions arise, assumes the potential to transform itself in the eyes of fishers into a future technical and cultural innovation, in turn developing new professional jargons, perceptions, mutualisms, and imaginaries.

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