Casting the net: early Atlantic fisheries and colonial expansion, 15-16th centuries

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Resumo: Este artigo explora o papel desempenhado pela pesca comercial oceânica na expansão europeia na bacia atlântica ao longo dos séculos XV-XVI. Utiliza os exemplos da Islândia, Rio do Ouro e Terra Nova como representativos das novas operações de pesca, e explica como eles funcionaram como sistemas de exploração de recursos. Argumenta que essas pescarias serviram como centros cruciais de produção de alimentos, formas de ocupação colonial, fontes de combustível para expansão, e novas fronteiras para obtenção de recursos. O artigo sugere, finalmente, que as novas pescarias atlânticas foram cruciais para a construção de uma nova ecologia-mundo europeia no período inicial de ocupação do Atlântico e formaram parte vital dos novos sistemas coloniais.

Palavras-chave: Atividade pesqueira; História atlântica; Colonialismo.

Lançando a rede: início da atividade pesqueira no Atlântico e expansão colonial, séculos XV-XVI

Abstract: This article explores the role played by commercial, oceanic fisheries in European expansion into the Atlantic basin across the 15th-16th centuries. The article uses the examples of Iceland, Rio do Ouro and Terra Nova as representative of the new fishing operations, and explains how they functioned as resource extraction systems. In looking at this history, it argues that these fisheries served as crucial food production centers, forms of colonial occupation, fuel sources for expansion, and new resource frontiers. This article ultimately suggests that the new Atlantic fisheries were crucial to the construction of a new European world-ecology in the early period of Atlantic expansion, and formed a vital part of the new colonial systems.

Keywords: Fisheries; Atlantic history; Colonialism.

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Introduction

Between 1400 and 1550 European mariners conquered the Atlantic Ocean, seizing watery spaces much as their contemporaries were conquering islands and lands: by encountering, claiming, controlling, and exploiting new environments in the Atlantic basin. Through the creation of new commercial, oceanic fisheries in the fifteenth and sixteenth centuries, Europeans incorporated maritime space directly into their expanding world-ecology. Armed with fishing lines, salt and small boats, largely anonymous groups of multinational mariners imposed new techniques of food-production upon some of the most biomass-rich pockets on the planet.[1] Water was not merely a conduit for early European commerce and colonialism in the Atlantic basin, it was a site of active production.

As Liam Campling and Alejandro Colas have tried to address in their recent study *Capitalism and the sea*, scholars have long ignored or mischaracterized the place of the ocean in capitalist formation (Campling, Colás, 2021). It is treated as a space for commercial exchange and connection, the routes along which people, places and nature became bound by the webs of capitalism. Some scholars have drawn our attention to the proletarianization of mariners across the early modern period, through increasingly violent cycles of capitalist production and warfare (Frykman, 2020; Rediker, 1987), and others our attention to the crucial role of the sea in forming the trauma and dehumanization which was essential to the transatlantic slave trade (Mustakeem, 2016; Rediker, 2007). Much of this scholarship nonetheless treat the premodern ocean as a conduit first and foremost, a surface on which capitalism can play out, and as a site of production only in niche cases. In the fifteenth and sixteenth centuries the nature of exploitation, of control of the seas, and of commercial organization on the Atlantic fisheries was not yet the sophisticated systems which Campling and Colas (2021) take for granted in their book.[2] Despite this, fishworkers were capable of organizing robust, flexible and profitable institutions which were recognized by contemporaries as important sources of food security and opportunity.

Environmental histories of early European expansion in the Atlantic basin must take into account the commercially productive and biologically destabilizing role played not just by permanent state-backed settlements, but of commercial fisheries, in shaping the ecological, spatial and economic structure of the new colonial regimes. As such, I mean here to offer some general observations about the new European commercial fisheries of the fifteenth and sixteenth centuries, and how they fit into historical conceptions of colonization, capitalist development, and environmental upheaval. I draw together much of the

[1] On techniques see: Bolster (2014); Cushing (1988); Mollat (1987).

[2] Cf. p. 165-212 on 'Appropriation' is primarily concerned with the twentieth century (Campling, Colás, 2021).

recent and increasingly innovative work on Atlantic fisheries histories, but offer a broader perspective and framework for integrating this research into imperial, social, economic and environmental histories of the early Atlantic world.[3] Using the examples of Iceland, Terra Nova[4] and the Rio do Ouro, I aim to argue that the commercial fisheries of the fifteenth and sixteenth centuries served four important functions. First, they allowed some European communities to alleviate regional food insecurity during the tumultuous fifteenth and sixteenth centuries. Second, they served as informal, low-cost but permanent presences along overseas coasts. Third, these fisheries fueled and fed other colonial projects, serving as essential provisioning stations. Finally, these fisheries formed the leading edge of a new resource frontier for European metropoles.

If fisheries were sites where different strands of Atlantic history intersect – food production, occupation, colonial-commercial expansion – then we must ask what exists at that point of intersection. The logic which underlay the new fisheries expansion, the drive to transfer energy from ocean to metropole, flowed from the need to secure, exploit, and integrate new biological and energy resources which was the impetus for European settlement in general. This was a process which was at once social, economic and ecological.[5] I follow Jason Moore in seeing capitalism as a fundamental ecological, rather than an exclusively socio-economic, process (Moore, 2005, 2003, 2009, 2017). His conception of the "world-ecology" captures something of the geographical, ecological, economic and social reordering which underlay the rise of overseas fisheries. Together, the four functions outlined above point to the key role of Europe's new Atlantic fisheries: they served to expand Europe's world-ecology outward decisively during the fifteenth and sixteenth centuries, putting the biological energy of Africa, North America and the Arctic on the tables of Europe. This new energy flow did not merely benefit the metropole, but directly fueled and encouraged colonial schemes in the Atlantic basin. As such, European fisheries could simultaneously contribute to histories of capital formation, subsistence strategies and environmental change in the premodern world.

[3] Most of the historical and archaeological research on fisheries remains focused on the far north Atlantic, but nonetheless has benefited from the excellent quantitative and economic work of the Norfish project (Holm et al., 2019; Nicholls, Allaire, Holm, 2021). See too ongoing work on the Hanse, Baltic and Icelandic fisheries (Barret, Orton, 2016; Mehler, Gardiner, Elvestad, 2019).

[4] I use Terra Nova in lieu of Newfoundland to describe the sixteenth-century fishery in the northwest Atlantic. This term better reflects the terminology used by mariners during this century, and encompasses all the waters of what is today eastern Canada, rather than just those around the island of Newfoundland itself. On the name used in the sixteenth century, see: Bouchard (2018, p.71-115). See too Egaña Goya (1992) and Turgeon (2019).

[5] Here I am generally following Moore (2015, 2017) and Wallerstein (2011) in thinking of overseas territories as sites of resource exploitation. Neither, however, take sufficient account of the sea itself.

The Atlantic fisheries

At the heart of fifteenth and sixteenth century European expansion was a problem of energy. Each ship which departed a European port required dozens if not hundreds of mariners to operate; urban growth in coastal cities produced thousands of new mouths to feed; agriculture expansion was made possible by human and animal labour; and the ecological transformation which underlay the new colonies required human and animal labour (typically unwilling) to effect new kinds of terraforming. The energy to fuel this work had to be provided by fragile European agricultural systems and the weak states they sustained. This was made considerably harder by increased cycles of political upheaval and violence, and the climate catastrophe of the Spörer Minimum (Camenisch et al., 2016; Campbell, 2016; Ogurtsov, 2019). This problem would be solved, in part, by turning to the watery depths of the Ocean Sea which seemed to hold limitless potential as a source of food and fuel – *pisciuminex haustacopia*, an inexhaustible supply of fish, as one visitor to Terra Nova put it (Parmenius, 1981). Europeans had always fished, but the fifteenth century saw a turn to much more intensive, systematic and widespread commercial fishing operations which some scholars have begun to treat as a major revolution in European interactions with the Atlantic basin. Many previously existing commercial coastal and oceanic fisheries were fished more intensively by more ships than ever before, and in some cases entirely new fisheries were created.[6] Although operations off the American coasts have attracted considerable attention, the majority of this expansion took place in the eastern Atlantic. From the edges of the Arctic to the deserts of Africa, the sea became a patchwork of floating fishing stations, batteries which provided energy for the great transformations of the fifteenth and sixteenth centuries.

Three commercial fishing operations are worth considering as representative of this process: the German-English fisheries off the coast of Iceland; the Portuguese-Andalusian fishery on the coast of Saharan Africa, centered on the Rio do Ouro; and the transnational fisheries at Terra Nova (Newfoundland) in the northwest Atlantic. These three fisheries were all in different corners of the North Atlantic, but show considerable parallels in how they functioned: more intensive fishing by more ships; a focus on pelagic species; a focus on preserving fish for export over long distances; and the use of increasingly sophisticated financial and organizational techniques. These three operations overlapped and lived par-

[6] For a general overview of these new approaches and findings see Holm et al. (2019); Sicking, Abreu-Ferreira (2009). A recent quantitative approach by the Norfish team has given us a much better picture of the north Atlantic fisheries, though it excludes more southerly operations (Holm et al., 2021).

allel lives, and constituted the three corners of a huge fisheries triangle Europeans imposed on the premodern Atlantic.

One of the first fisheries to undergo expansion in the early fifteenth century, the waters around Iceland were the site of an intensive, commercial operation intent on extracting cod and ling from the subarctic.[7] References appear as early as the 1410s to English fishing off Iceland coast.[8] Under pressure from Anglo-German fishworkers and given the precarious position of the island in the middle of the north Atlantic, the Danish crown fought a losing battle to preserve exclusive right to control access to Iceland's codfish-rich waters and preserve the old system. The concessions made to the English in 1490 encouraged the Hanse towns to send their own ships directly to Iceland as well. At some point in the sixteenth century they would be joined by Flemish, Dutch and Scottish fishermen. Fish was clearly the export *par excellence* of Iceland, and more and more outsiders came to take advantage of this fact. By the early 1520s English sources make reference to an "Iceland fleet" which returned each year, which in 1528 was numbered at 150 ships from East Anglia alone.[9] In Hanse towns one could find merchant houses grown rich on the stockfish trade, and fish acted as a currency in some business transactions. Iceland's early-fifteenth century expansion set a pattern which was soon copied elsewhere.

One place where this took place was where the desert met the sea far to the south. In the mid-fifteenth century Portuguese mariners established a new fishery on the coast of Saharan Africa, centered on a bay known as the Rio do Ouro.[10] Here the cool Canary Current encouraged abundant fish, seals, and whales which drew Europeans in the premodern period. The first navigators passed Cape Bojador in the mid-1430s, and by the 1450s the fishery was already established according to observers. As early as 1455 the Venetian navigator Alvise Cadamosto, in his description of the west coast of Africa, painted a vibrant picture of the Saharan fisheries: "Along the whole of this coast one finds a great fishery (*grandissima pescaria)* and no end of diverse and goodly fish, large ones similar to our own which we have in Venice, and others of different kinds. At this Gulf of Arguim there is little water for everything, and everything is very dry, some being of sand and some of stone" (Ramusio, 1556,

[7] On the Iceland fishery see: Barrett, Orton (2016); Childs (1995); Gardiner; Mehler (2007); Janzen (2012); Jones (2000); Ogilvie (1997).

[8] Cf. "Cotton MS Nero B III No.29. A Privy Seal, for Orders to Prohibit English Ships from Sailing towards Iceland. (Lat.) Nov. 28, 1415." (n.d.), British Library. For some context, see the discussion of English fishing in Iceland in Prowse (1896, p. 24-29).

[9] For instance: On June 2, 1523 a letter between two English royal officials noted that "Hears that the Scots are going to set forth six or seven ships to the Islands, to intercept the Iceland fleet on their way home." Letter Papers Henry VIII. 3071. On 1528, see: Letters and Papers, Foreign and Domestic, Henry VIII, v. IV, no 5101. "Shipping."

[10] On the Rio do Ouro and Saharan fisheries in general see: Bello León (2008); De Avilez Rocha (2019); Godinho (1981); Pérez (1995); Santana Pérez (2012); Santana Pérez, Santana Pérez (2014).

p. 107). A century later the navigator and geographer Jean Alfonse advised his readers that along the Saharan coast "And all this coast is low-lying, sandy, and along it there is a great fishery for all sorts of fish. And here come ships out of Andalusia and Portugal to the fishery" (Fonteneau, Musset, 1904). In the 1550s an English traveler stated that "Seuen or eight leagues off from the riuer del Oro or Cape de las Barbas, there vse many Spaniardes and Portugals to trade for fishing, during the moneth of Nouember."[11] It was, as this author suggests, a fishing *trade* – a commercial fishery plugged into European exchange networks – not just a place to provision passing ships.

In the first half of the sixteenth century, European mariners developed a major commercial fishery in the northwest Atlantic, what has long been referred to as the Newfoundland fishery.[12] Sixteenth-century mariners preferred to describe it as *Terra Nova*, a deliberately broad and terraqueous term which described the waters where fishwork took place, encompassing much of what is today eastern Canada. This transoceanic enterprise attracted mariners from across Europe: Bretons, Normans, Basque, Portuguese, Galicians, Asturians, West Country English and Saintongeois French all sailed there regularly. The actions of these early voyagers formed a permanent European presence in the region, establishing a vector for European colonization of North America and for the exploitation of its resources. In time, the Terra Nova fisheries would be the most robust commercial fishery in the Atlantic world. In the early sixteenth century, however, they were merely one of many long-distance commercial fisheries.

The success of the new commercial fisheries was based on the integrated networking of different kinds of labour and organization. Men and women acting as shipowners provided the actual ships; men and women acting as financiers provided capital in the forms of loan and charter agreements; men and women acting as bakers, sail-makers, rope-makers, tailors, coopers, wine-merchants, salt-merchants and other roles provided the provisions, clothing, equipment and supplies necessary for the voyage; men hired for the voyage acted as mariners-cum-fishers to sail the vessels, and to catch and process the fish; men and women acting as porters and fish merchants were hired to offload the catch, to take it to market and to negotiate prices; women sold the catch in marketplace, to women who cooked it at home.[13] No one role was possible without the others, and it was the integration

[11] Hakluyt, Goldsmid, 1885, v.XI: Africa. "The second voyage to Guinea set out by Sir George Barne, Sir Iohn Yorke, Thomas Lok, Anthonie Hickman and Edward Castelin, in the yere 1554. The Captaine whereof was M. Iohn Lok."

[12] On the early fishery at Terra Nova and its origins see: Bouchard (2018); Innis (1940); Pope (2009); Turgeon (1998). In the past decade much of the work on Newfoundland has been undertaken by archaeologists, who remain the most active in expanding our knowledge of the early fisheries. See for instance the excellent essays in: Loewen, Chapdelaine (2016).

[13] For examples of a woman investing in the sixteenth-century Terra Nova fishery, see Archives départmentales Charente-Maritime 3E 2149 fol.7; Archives municipales de Rouen, B1, fol.11. See too Abreu-Ferreira (2000); De Wit (2008).

of these different social and economic roles into a single web which made the scale of fifteenth and sixteenth century fisheries possible. More than just individuals who fished local waters for a combination of subsistence and market, this was a kind of labour which combined the act of fishing with long-distance sailing and industrial processing. At sea, while catching fish, and while processing them, fishing crews worked communally, dividing labour according to skill and experience. They became assembly lines of food production, and the work certainly resembled later maritime wage-labour and early industrial production.[14]

There were nonetheless certain important differences between the new fisheries. The Rio do Ouro and Terra Nova were true long-distance fisheries in a way that Iceland never was, and by the 1590s one French observer explicitly compared the two: "In Galicia...they have Caravels and sail as far as Cap Blanc in Africa to fish for dogfish and mullet and other fish which they salt and dry in the sun, just as one makes saltcod at Terra Nova" (Nicolay, 1582). Iceland was closely bound to the Baltic and North Sea economies, while the Rio do Ouro contributed most directly to adjacent colonial ventures. Between these three fisheries, fortunes fluctuated over time as they competed with one another. The Rio do Ouro was likely much more important around the turn of the sixteenth century than at the end, when references become far scarcer. Iceland appears to have been a major destination for English and Hanse ships in the late fifteenth and early sixteenth century, and then again at the end of the century. Terra Nova grew in importance and scale steadily over time, from humble beginnings around 1505 to a rising juggernaut of fish production after mid-century. Yet in these variations we can see strength, for they indicate the capacity of European mariners to shift focus and capacity between different pockets of the Atlantic Ocean as economic conditions changed.

Whether the fisheries themselves were capitalist industries, especially at this early stage, is highly debatable. Voyages to Iceland, Rio do Ouro and Terra Nova created vast enterprises but were typically organized locally and haphazardly.[15] Funding came from small merchants or groups of well-off bourgeoisie and petty lords who pooled their resources for a ship. Crews were often recruited within kinship networks, rather than from emerging Atlantic maritime labour pools.[16] Surviving data on wages suggests that the hierarchy on board most ships was relatively flat: the master and a few specialists received higher pay rates, but the majority of the crew were equally paid as fishworkers.[17] Yet elsewhere we see

[14] On industrialization and the fisheries see Peter E. Pope (2005).

[15] Pope, "The 16th-century fishing voyage", in Candow, Corbin (1997).

[16] For a contrast, see: Perez-Mallaina Bueno, Phillips (1998).

[17] Cf. The list of shares given to crewmembers on an Iceland fishing voyage in Webb (1962). French historians have noted that by the turn of the seventeenth century more fishworkers at Terra Nova were being paid in smaller wages, and more were in debt. Cf. Turgeon (2019). For a late-seventeenth century example see: ADSM 216 BP Amirauté de Honfleur no. 343.

records which clearly indicate that share-payments were widely used across the sixteenth century.[18] One 1559 record suggests that some fishworkers on Terra Nova ships were in debt to the merchant who had hired them for a voyage, but other contracts suggest most Terra Nova fishworkers were paid in shares.[19] In 1545 the *James* sailed for Iceland to catch cod and trade with locals.[20] The ship was captained by a man from Dunwich, a small fishing port, and the crew appear to have been recruited locally. The surviving financial record gives no indication of shares, but rather carefully tallies the wages due to each mariner, and the amount leftover for a London investor. There is little difference in wages: some 2/3 of the 38 crewmembers were paid between 40 and 53 s. for their work, with only the seven officers making over a pound sterling for their efforts. The ship returned to port with several thousand fish int its hold, which were fetched just enough at markets in East Anglia and London to net the investor a tiny profit. Here we see some basic patterns of the early fisheries: wage workers, local recruitment and organization, investors with small claims to profits, the production of thousands of saleable fish over several months. This is the great irony which lies at the heart of the fisheries, and which has confounded historians for centuries since: the contrast between the scale and sophistication of the new Atlantic fisheries with the relatively simplistic tools used to make them possible. The diffuse and simplified financial structures of fisheries like those at Iceland and Terra Nova were a source of strength which imparted flexibility and allowed for the broad base of participation that made them possible. But they were also fundamentally extractive regimes which fueled population, commercial and colonial growth elsewhere in the Atlantic world.

The many roles of Atlantic fisheries

The primary purpose of the early Atlantic fisheries was to provide bulk food for people in Europe. A single fishing ship (of c.60-120 tons burthen) could carry several tens of thousand of dried cod, or dozens of barrels of sardines and other preserved fish.[21] Fishworkers produced for specific markets, often those from their own home regions, and supplied them

"Comptes particuliers des hommes qui ont fait voyages avec Abraham Bellager les annees 1680-81." The account records list several sailors who were under debt obligations to M. Bellager to work on his fishing ships.

[18] In 1523 a Breton crew bound from La Rochelle was promised by their master "their third part of the fish, oils, wages and profits which they will gain by their voyage to Terra Nova." ADCM Notaire Hémon, fol. 118. 22 Oct. 1523.

[19] Archives départementales Côtes-d'Armor 1E2783. Fol. 35.

[20] Folger Shakespeare Library, L.b. 240. For a partial transcript, see Cooper (1939).

[21] Cf. the case of the John in 1573, which carried some 70,000 "new found land fish" directly to market in Exmouth. HCA File 45, no 301. See too the recent work in Holm et al. (2021).

with a steady stream of dead and salted sea life. This took the form of many different pelagic species of fish, including cod, hake, ling, sardine, anchovy, dogfish, tuna, salmon and porgy. The types of fish produced in the eastern and northwest Atlantic were valued for their caloric density, high protein content and durability after taking a salt cure.[22] These were export-oriented operations, shipping preserved fish from the sites of production to port cities across the European littoral.

In the fifteenth and sixteenth centuries, the main market for fish produced in the Atlantic fisheries were northwest and southwest European coastal regions. Port cities, both along the coast and on rivers, were the key distribution nodes and often major consumers. Ships from Terra Nova, for instance, offloaded their catch in cities like Rouen, La Rochelle, San Sebastian, Porto and Saint Malo. Fish from the Rio do Ouro was likely consumed mainly in the cities of southern Portugal and Andalusia. Iceland stockfish was traded through Hamburg, Bremen, Lubeck, London, Hull and Bristol (Mehler, Gardiner, Elvestad, 2019). It also means that the coastal maritime populations and the major port cities which organized fishing voyages were often also the primary markets – Rouen or Hamburg were both outfitters and consumers.

Sea-fish was especially important to coastal, urban communities caught in the numerous and intractable cycles of war in sixteenth-century Europe and the Atlantic basin. Conflict drove up prices for preserved fish, and made food insecurity acute rather than merely endemic. Dried or pickled cod could be purchased by military contractors in bulk, or by desperate burghers in the wake of ravaging armies. Over the course of the many wars which marked the early sixteenth century fledgling European states consumed massive amounts of fish in the pursuit of their military goals. As a result, short-term changes in patterns of fishing at places like Terra Nova or Iceland correspond chronologically to periods of major naval conflict between European states.[23] The growth of fisheries was therefore tied to the food crises caused by interstate conflict in the eastern Atlantic. As inter-imperial rivalry spread across the Atlantic, this would only intensify.[24]

Though they provided much-needed calories and energy, the new Atlantic fisheries have gone overlooked by historians largely because their impact was conditional and complex. Fisheries were limited by problem of seasonality and climate, which created narrow win-

[22] For a discussion of the nutritional properties of salted see fish see: Dawson (2009); Hutchinson et al. (2015); Magra (2012). For the role of fisheries in urban Europe in general see: Michell (1977); Orton et al. (2015).

[23] There are, for instance, a cluster of records which point to Norman and Biscayan towns becoming involved in the Terra Nova fishery during the years 1520-1526, in the middle of one of the sharpest periods of war between the Habsburg and Valois. In 1542 desperate Norman merchants in the port of Dieppe had to turn to Dutch herring to alleviate the serious food shortages during wartime. Zeeuws Archief. 243 AdmiraliteitteVeere, 1460-1562. No 7.

[24] On 16th century imperial maritime rivalries see Andrews (1984); Ducéré (1895); Hoffman (1996) and Lane (1998).

dows for intensive production which might be shortened due to temperature fluctuations. Codfish, for instance, entered the market in vast quantities only in the autumn. Though a single fishery like Iceland might produce huge quantities of fish in a season, because the fishworkers came from many different communities and regions, in practice the catch tended to be scattered and diffused in small boatloads across coastal Europe. Further, sea-fish caught in the vast Atlantic fisheries of the fifteenth and sixteenth century were not always cheap, putting them out of reach of many urban consumers.[25] Without sufficiently high prices the costs of a major multi-month, transoceanic voyage in search of fish would hardly be worth the undertaking. Though price information is woefully insufficient before the seventeenth century, what survives suggests that Terra Nova fish was relatively expensive compared to other protein sources. Icelandic stockfish might have been much cheaper in northern Europe, where it was treated as a food of the poor earlier in the sixteenth century, but it grew more expensive the further one moved south. The greatest quantities of sea-fish were likely consumed by the urban bourgeoisie, religious institutions and military contractors who could afford the higher prices. Only towards the end of the sixteenth century did conditions change enough for imported fish to become available up and down the social ladder. By then English sources referred to Terra Nova fish as 'poor john,' and Miguel de Cervantes describes *bacalao* as a cheap Friday fair in Spanish inns in chapter two of his *Don Quijote* (Cervantes, 2015, Book I, Chap. II). It took time for Europeans to render sea-fish cheap, but once the process began it would be hard to reverse. Scholars with the *Norfish* project have termed this a "Fish Revolution," and while I see the timing as taking place later than they acknowledge we are right in following their thinking and seeing this as a significant moment in the long-term history of Europeans harvesting and consuming marine biomass (Holm et al., 2019, 2021). The long-term exploitation of marine life rested on this need to cheapen seafood, even if in its earliest years prices remained higher.

If a fishery was a source of food (cheap or expensive as it may be), it was also a social, economic and legal entity. Early Atlantic fisheries were institutions, even if they were often unorganized and diffuse operations. As institutions, fisheries occupied space and constituted important forms of social organization. They operated according to consistent logics, and mariners followed regular patterns of behavior year after year. Most fisheries were geographically bounded (the coast of Africa between Cape Bojador and Arguim Bay, for instance) and followed internal rules of custom which were shaped by whichever mariners participated in that particular fishery. Contemporaries recognized a fishery like that at Iceland or at the

[25] This is clearest in the case of fish from Terra Nova. According to Earl Hamilton's price series from southern Castile, dried cod commanded a higher cost by weight than other fish (Hamilton, 1965; Vickers, 1996). This has also been noted in Abreu-Ferreira (1995).

Rio do Ouro as something distinct, as something which was both a place and a system of work. That after all was the very meaning of the word *fishery* (or *pescaria*, *pescherie*, etc.), an organized and enduring economic institution centered on fish production. Such floating instituttions formed a striking contrast to the permanent settlements which Europeans were establishing across the Atlantic basin in the fifteenth and sixteenth centuries.

Yet, on a fundamental level, the new fisheries served a similar purpose to these colonial settlements. The confounding thing about the early fisheries at Iceland, Terra Nova and the Rio do Ouro is how much they resemble colonies without any of the social, legal or political structures we see elsewhere in the Atlantic basin. Fisheries, like settlements, allowed Europeans to control space and to exploit localized resources. When European mariners arrived *en masse* for harvesting, they were perfectly capable of exerting control over a fishing ground and nearby coasts. More importantly, they allowed that control and exploitation to continue across time as well as space. By creating regular sites of European economic activity, fisheries acted as a form of occupation. Even if Terra Nova was not a settlement, one could reliably expect that Europeans would be living in Terra Nova for half a year every year across the sixteenth century. By the 1540s the waters of Terra Nova were attracting hundreds of ships and thousands of European mariners every year.[26] At Iceland, the offshore community of fishworkers each summer was probably not much smaller than the number of inhabitants of the island proper. These seasonal arrivals made for a sizable European presence in its own right, and one dedicated entirely to working the waves. Fisheries were colonies without settlement, forms of occupation without plantations.

The floating colonies should be seen as more than a curiosity, but as an overlooked part of Europe's ecological and imperial expansion in the 15th-16th centuries. In treating fisheries as economic institutions rather than colonial projects, we've underestimated three important things. First, we have underestimated the scale of European activity in the Atlantic basin in this earliest period by neglecting the investment of human labour, capital and resources in commercial fisheries. Second, we have overlooked the impact these fisheries had in shaping the energy, food, and ecological history of the Atlantic, and in creating points of permanent European occupation. Finally, in *under*-estimating the scale and scope of fishing we have *over*-estimated the importance of states and imperial structures in guiding European activity in the early Atlantic. These problems can only be mitigated if we treat fisheries as a kind of colony-without-settlement that was employed across the Atlantic basin.

In addition to being a kind of occupation in their own right, the new Atlantic fisheries were vital to wider European colonial projects. As fisheries grew and became more sophis-

[26] Estimates for the sixteenth-century fishery are difficult, but a range of 300-500 ships a year is common. See: Bouchard (2018); Pope (1995, 2004) and Turgeon (1998, 2019).

ticated, they formed part of the food infrastructure which supported and encouraged colonial expansion elsewhere.[27] Many of the commercial fisheries of the 15th-16th centuries were proximally close to colonial settlements. The Iceland fishery took place off the coast of the old Norse settlements, while the Rio do Ouro fisheries were not far from the Portuguese *feitoria* at Arguim Bay. The southern coast of Ireland and the Irish Sea were thoroughly fished by boats from England, Basque Country, southwest France, Galicia and the Irish themselves. In such cases, fisheries merely supported existing settlements. Yet a more substantive impact came from the use of fish to feed settlers and mariners sailing to new, long-distance colonies and trade posts in the Atlantic. Saltfish fed mariners, warlords, enslaved peoples, indigenous workers, port merchants and missionaries in the numerous Iberian, English and French settlements established in the fifteenth and sixteenth centuries.

The fisheries aided colonial expansion in a more indirect way from the sixteenth century onward, provided a key preserved food source which fueled the oceanic voyages that underlay emerging European empires and commercial power. Seaborne commerce was the engine which drove and supported colonial growth in the fifteenth and sixteenth centuries, moving humans and commodities between settlements and metropoles in the accelerating redistribution of energy, biology and wealth around the Atlantic basin. Those ships were filled with mariners who needed food, and the fisheries of the eastern and northwest Atlantic provided the preserved biomass that made voyages possible. Into the holds of ships sailing from Lisbon went salted sardines and tuna from the Rio do Ouro; into the Norman ship which voyages to the Americas was saltcod from Terra Nova; English rovers and traders alike fed their far-ranging crews with stockfish from Iceland. Many merchant and naval ships even enforced fish days, which required ample supplies of preserved marine protein be made available to hungry crews.

The Rio do Ouro is emblematic of the role these fisheries played in supporting colonial empires. In addition to attracting commercial fishworkers, ships bound to the Guinea Coast, to the Cape of Good Hope, to the Caribbean or to Brazil would all pass by the Rio do Ouro where they stopped to catch and salt fish before heading to the trade posts, slave-labour camps, port cities and coastal settlements of the emerging European colonial world. Sailing south from Lisbon in 1501, the ship carrying the famed navigator Amerigo Vespucci to the Americas passed close by the coast of Africa. Before picking up the trade winds, Vespucci's crew worked their way along a barren stretch of coast where the white sands of the Sahara met the open expanse of the Atlantic Ocean. It was here, as he remarked in a later letter, "in which coast we made our fishery, for a sort of fish which is called *pargos*, staying there three days" (Ramusio, 1556, p. 334). A half century-later an anonymous Por-

[27] On food infrastructure in the early Atlantic, see: Bouchard (2020); De Avilez Rocha (2017) and Fuente García (2011).

tuguese mariner described stopping at the same spot *en route* to the *feitoria* on São Tomé. Like Vespucci he found plentiful fish, stating "And near this coast, if it seems good and the sea is calm, in the span of four hours, with net or with only long, thin lines with all manner of hooks attached, which are dropped into the sea, they catch as many fish as they have need" (Ramusio, 1556, p. 301). Avelino Teixeira da Mota has suggested that, by 1526 and the voyage of the ship *Santiago* from Lisbon to Sierra Leone, it was common practice to stop at the Saharan African fisheries as part of the outward voyage (Mota, 1969, p. 536, 539-540). The *Santiago* left Lisbon on January 20th, stopped the fisheries, and was at Cabo Verde by the first week of February. In short, Portuguese exploration and regular trade routes to and from Africa relied on the Rio do Ouro for provisioning. Bulk marine foods like saltfish provided the energy which allowed for the ecological, social, and economic transformations of the fifteenth and sixteenth centuries. They were the glue which held together the emerging Atlantic system, and no environmental history of the region makes sense without them. The fisheries provided both reliable sources of preserved protein to carry on board circulating ships, and reliable provisioning stations for passing vessels.

Final considerations: Floating frontiers

The early Atlantic fisheries were outposts of a new European system of resource exploitation in the Atlantic basin which decisively pushed Europe's food and energy frontier outward in the fifteenth and sixteenth centuries, much as the contemporaneous seizure of mid-Atlantic and Caribbean archipelagos put agricultural and mineral resources at the mercy of European settlers.Every ounce of cod or sardines caught in Terra Nova and Rio do Ouro was an ounce of protein that didn't have to be raised within Europe, and every ounce of oil rendered from fish fat across the sea was an ounce of oil that didn't have to be made from plants grown on limited European soils. In providing this new food frontier, fishworkers ensured that Europe's world-ecology by the early sixteenth century was very much an aquatic one, or at most a heavily terraqueous one.

Maritime frontiers are markedly different from terrestrial frontiers. They are, by their very nature, fluid. The Atlantic fisheries, as we have seen, were typically multinational, diffuse and open operations. These fisheries looked far more like the commons than an enclosure, a vast floating operation which was not subjected to state oversight or central direction. That they were so intensively fished despite this fact is a remarkable feature of their bottom-up construction, and a reminder of the key difference between terrestrial and aquatic colonization. It was also an expansive one. Paying attention to early Atlantic fisheries asks us to think about the space of ecological and economic change in the fifteenth and sixteenth centuries. As the diverse cases in this essay suggest, this was a process which

guided expansion in the north as much as the south, in Africa as much as in Iceland or Terra Nova. This may help us address the persistent splits in Atlantic historiography, which tend to separate Iberian expansion from that of northern Europeans.[28] Preserved Atlantic fish was widely consumed, bringing the Atlantic into the heart of Europe. Stockfish from Norway was eaten in Italy, North Sea herring in southern France, Terra Nova cod in England and Portugal simultaneously. Europe's new world-ecology was truly vast, and the energy and commercial networks they forged through exploiting the Ocean Sea pervaded every corner of that world.

This long-term importance makes clear one final point which should change how we think about the role of fisheries in expanding Europe's resource frontiers in the early Atlantic. In the long run the efforts of European fishworkers in the fifteenth and sixteenth centuries pioneered an approach to ocean resources which would increasingly be expanded upon in following eras. Mariners at the Rio do Ouro, Terra Nova and Iceland proved that long-distance seasonal fisheries worked, that they were profitable, and that they could provide bulk calories. The seventeenth century was marked by a major expansion in the scale and intensity of fishing, particularly around the North Sea and at Terra Nova, concentrating activity. This at last made fish *cheap*, as Moore and Raj Patel would have it, the essential step in integrating an industry with capitalism (Patel, Moore, 2017). The modern maritime food system, with its industrialized and destructive national and multinational fisheries, would ultimately be built upon these foundations. Christopher Otter has recently argued for the transformative decision by British producers and consumers in the nineteenth century to seek a "big planet" solution to food shortages (Otter, 2020). Otter's argument further elaborates on Kenneth Pomeranz's famous contention that the rise of industrial capitalism in northwest Europe was contingent upon their ability to outsource the ecological burden of industrialization and population growth (Pomeranz, 2000). What I am suggesting here is that this process began both much earlier than Otter and Pomeranz have acknowledged, and also that it was a maritime as well as a terrestrial process. To put it another way, instead of Pomeranz' famous "ghost acres" we might better speak of "ghost fathoms." Those fathoms were found and claimed in the fifteenth century, worked in the sixteenth, and by the seventeenth had become entrenched as major sites of European food production, and essential cogs in their new transatlantic imperial machines.

Colonization can take many forms, including modes of occupation and harvesting which look radically different from the terrestrial settlements we are used to. The new Atlantic fisheries at places like Terra Nova and Rio do Ouro were both necessary (as a source of energy) and valuable (as a business venture) to contemporary European mariners and mer-

[28] Cf. Bouchard (2020).

chants, who invested considerable human, financial and physical capital in their production. Taken together, the many different lines of thought I have laid out above – the scale of marine food production, the role of fish in energy and commercial histories, the pan-Atlantic nature of fishing – moves water from a medium to a site of production, and mariners from agents of movement to agents of exploitation. If we ignore the growth of the new Atlantic fisheries, we lose sight of the degree to which European expansion in the fifteenth and sixteenth centuries was about food and water.

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