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Jean-Claude Hocquet

The salt pans of Chioggia, which flourished in 1200, disappeared in 1553?

In answering this question, the historian encounters four difficulties:

1. He does not know the exact number of saltworks in 1200. Until this date and around 1300, he had access to a single preserved source, the monastic charters, so that a *fondamento* owned by lay people who had not made any donation to a convent in the lagoon, escaped his investigation altogether.

2. When the Genoese seized Chioggia, which was in turn besieged and then retaken by the Venetians, the two enemy armies and their siege equipment trampled the dikes of the saltworks to get close to the occupied town. The damaged dykes had to be rebuilt, and the Venetian podestate set about this task with the financial and human help of the local population. We know the extent of the dykes that had to be rebuilt. Problem: did the repairs did not cover the entire perimeter of the *fondamento*'s dykes but only those that had been used for the approach of the troops and spared those that had remained intact ¹.

3. Around 1300, the tenants of the salt works opted for a new form of tenancy, sharecropping, which brought three people face to

1 The podestà Dandolo had repaired the damage to the *fondamento* of the salt pans. The intact parts therefore escape the historian, who is unaware of the dimensions of the *fondamenti* and knows only the size of the parts to be rebuilt.

face: the owner, who received the rent, the «bourgeois» or *locator*, who bore the cost of restoring/consolidating the dykes in exchange for receiving a third of the salt harvest, and the worker, who cultivated the salt works and paid rent and a third of the salt harvest. Had all the tenants adopted the status of saltworker? Those who had remained faithful to the old status, which had been tacitly renewed, remained silent and the documentation does not mention them.

4. Finally, before the 15th century, nothing is said about the free market in salt, its expansion, or its impoverishment. We do not know how much salt was sold in Chioggia or to whom.

With the help of the only surviving documentation, the historian set about tracing the history of the Chioggia salt works.

What are fondamento of salines?

How many were there around 1200?

The oldest, dating from before the year 1000, comprised between 20 and 30 salt pans, while the most recent, built in the 12th century, were larger, with fifty or more salt pans. The *fondamento* was enclosed and protected on all four sides by a powerful dike, the *virga madrigale*, into which a gate called the *callium* opened to let in the salty sea water. One of the sides of this dike formed the *scannum*, where the salt worker stored his harvest for draining and drying. This *scanno* was bordered by a canal through which the salt worker's boat loaded the harvest to take it to the warehouse in Chioggia. The salt-maker worked on the small dikes that divided the salt works into 25 to 30 areas, known as *cavedini* or *capitini*, as they were at the head (*caput*) of the salt works. The salt crystallised only in these *cavedini*. To do this, a considerable amount of water had to be evaporated, a task assigned to successive evaporation basins that went by various names: the *morario*, where the seawater settled and began to be transformed into brine (*mora*), the *corbuli* and the servants (*servidori*). These evaporation and crystallisation basins were connected by small channels that transferred the brine by gravity. The first basins were separated from those that followed by a dike, the *seconda*, which protected the cry-

stallisers and their “servants”. Chioggia’s lagoon territory extended as far as a vanished “port” (an opening in the *lido*) in Pellestrina, which was entirely transformed into *fondamenti*, of which there were 69, not counting those in Malamocco. We can conclude that Chioggia, which had even transformed the 2,000 square metres of cultivated fields and wet meadows to the north-west, in the Fogolane area, into salt works, had devoted its entire territory to the monoculture of salt. The average surface area of a *fondamento* was 30 to 35 hectares (the surface area of Chioggia in 2000 was 33 ha). The salt works and the canals used to feed and transport the crops occupied an area of around 2,500 hectares. To build the main dyke, 6 staggered piles were needed at each pace (1 Venetian linear pace = 6 feet of 347.735 mm = 2.08 m). A bundle of rushes and wicker was woven between the piles driven into the seabed to form a palisade, which was covered with earth, i.e. impermeable clay and sand. One earth bark was needed for every 2 paces of dike².

The *virga madrigale*, which surrounded and protected the *fondamento*, was the work of everyone, landowners and salt workers alike. If any of them could not contribute their labour, they had to pay their share of the capital to the *fondamento* company. This collective work concerned only three sides of the dyke; the fourth was the responsibility of each farmer, who used it for his own personal use. The section of the *scanno* maintained by the salt worker was the size of a family farm, measuring between 12 and 14 metres in length. The saltworks were bordered on two sides by the canal that brought the salt water to the *morario* via the *callio*, while opposite, the canal running alongside the *scanno* allowed barks, the salt worker and the harvest to circulate.

The history of the salt pans, with their attendant restrictions, is well known, but the history of salt and its distribution remains unknown prior to 1200. However, the Chioggia salt trade affected a vast area south of the Alps, stretching from Lombardy and perhaps the upper Rhone valley to the Apennines and the Ljubljana region, with the Po and Adige rivers as its main transport routes.

2 JEAN-CLAUDE HOCQUET, *Le saline*, in *Storia di Venezia*, vol. I, *Origini, Età ducale*, a cura di Giorgio CRACCO and Gherardo ORTALLI, Roma, Enciclopedia Italiana, 1992, 961 pp 515-548, in part. pp. 525-527

Introduction of the salt tax and crisis measures

The widespread distribution of salt from Chioggia attracted the attention of the Venetian authorities, who were looking for money to finance military operations. Salt was put at the service of public finances. In November 1179, a tax on salt already existed, but the date of its creation is unknown. Doge Orio Mastropiero released Enrico Gradenigo from all the goods and revenues of the Commune that he had managed for matters relating to salt. The treasurers or chamberlains of the Commune confirmed that Gradenigo had paid what he owed. In 1184, the *Gastaldo* of Chioggia, surrounded by all his people, promised the Doge and the Commune of Venice not to export salt to anyone who was not able to present a licence bearing the ducal seal. Clearly, the exporter paid a tax to obtain the licence. In 1187, to finance the military expenses imposed by the siege of Zara, Venice issued two loans, as ordinary taxes were not enough. These loans brought in the considerable sum of 56,220 pounds of money. The salt tax for the next twelve years was mainly earmarked for the quarterly repayment of this debt. The Commune hoped to receive 1,171 pounds $\frac{1}{4}$ each quarter from salt. In 1192 a treaty imposed in Verona tells us that the “factum salis”³ consisted of two different and juxtaposed taxes, the *quintum* and the *datium*.

However, the expansion seen in Chioggia had also had beneficial effects elsewhere, particularly in Cervia, which, in Romagna, was in a symmetrical position to Chioggia in relation to the Po. In 1178, Ravenna imposed a tax (*datium*) on sales of Romagna salt. Salt had become a fiscal instrument in the hands of the States, and war broke out between Ravenna and its neighbour Ferrara, which, after long hostilities, imposed a humiliating peace treaty on its defeated enemy, obliging it to pay a heavy tribute of 200,000 baskets of salt (one Ravenna basket = 31 kg $\frac{1}{3}$). Ferrara occupied a remarkable position on the river, being the last city downstream before the Po dispersed into a vast

3 JEAN-CLAUDE HOCQUET, *La politica del sale, Storia di Venezia*, II, *L'età del comune*, a cura di GIORGIO CRACCO e GHERARDO ORTALLI, Roma, Enciclopedia Italiana, 1995, pp 713-736. The Italian translation erroneously states an annual income from salt of 1,350 pounds.

delta. It controlled river navigation to Mantua and Lombardy, to the tributaries of the great river and to Modena. Ravenna was linked to the Po by a canal dug in Roman times, the *fossa Augusta*, which mirrored the *fossa Claudia* linking Chioggia to the rivers. On the river, the two salts, from Chioggia and Cervia, were in fierce competition with each other, and Venice could fear for the outlets for Chioggia salt in Lombardy and beyond, and for the drop in its tax revenues. As Ravenna and Cervia were also seaports capable of launching vessels filled with salt, competition would also spread to the rivers of the Lagoon, Friuli, and Istria. Venice, in the early 13th century, had become a great power, with a colonial maritime empire conquered at the expense of Byzantium following the Crusade of 1204⁴.

Did the growth of Cervia's saltworks have harmful consequences for Chioggia's markets and saltworks? Over the course of the century, from 1232 to 1279, Chioggia lost 18 *fondamenti* of salines, or more than a quarter (27.7%) of its production capacity. The crisis was particularly severe from 1232 to 1240 and in 1279. Of course, it would be foolhardy to blame the crisis solely on Cervia's salt, but other factors include poor management and disputes between monasteries, the need for salt workers to leave their back-breaking work to seek their fortune in the colonial empire, and the deliberate abandonment of the salt works furthest from the urban centre where the population lived and where the warehouses housing the harvests were built. All these factors may have played a part, but of the 18 abandoned *fondamenti*, 13 were in the Fogolane⁵. Venice reacted harshly: on 3 December 1234, putting an end to fifteen years of skirmishes, it imposed a treaty (enshrined in the statutes and therefore perpetual) on Ravenna that prohibited anyone from transporting salt from Cervia northwards beyond Ravenna's ports and, to ensure that this provision was respected, Ravenna would henceforth house Venetian vessels. Ravenna was not prohibited from importing goods, but it sold them exclusively to the Venetians. As Ravenna lost all

4 Id., *Monopole et concurrence: Venise et le sel de Cervia du XIIe au XVIe siècle*, «Studi Veneziani», XV (1973), pp. 21-133, in part. pp. 25 and 59.

5 Id., *Chioggia, capitale del sale nel Medioevo*, Sottomarina di Chioggia 1991, pp. 92-93.

independence, Venice pushed its advantages even further and, taking advantage of the weakness and division of the lords who shared Romagna, it also seized Cervia in 1243, from where it was driven out in 1248 by a coalition of forces from Bologna and the Pope. What mattered was that Venice, having been driven out of Cervia, then imposed a new treaty on Ravenna that prevented the city from importing salt from Cervia and only authorised the sale of stocks from its warehouses to the population. Was it hoped that this would force Cervia into a period of poor sales, crisis, and discontent among a population ready to welcome the Venetians as saviours? The Venetians returned to Cervia but were driven out again by Bolognese troops in 1253 or 1254⁶. All that remained was for them to strengthen their hold on Ravenna, from whom they promised to buy 25,000 baskets (*corbe*) of good quality old salt every year. In exchange, the people from Ravenna could sell 50,000 baskets of salt from Cervia to their customers in Emilia, but only by land. They could not use Ravenna's ports and river traffic. Moreover, Venice, which knew how to be generous, promised them salt from Chioggia if the salt from Cervia ran out. As a good deed calls for recognition and reward, the Venetians obtained the right to permanently install the guards who watched over the river in a fortress built on the Po di Primaro. Purchases of salt from Cervia did not cease; they continued in October 1281 and provided Venice with "non modicam pecuniae quantitatem", as Pope Martin IV deplored. Venice therefore bought salt from Cervia, monopolising Romagna's production, reducing the quantities left to the people of Cervia and restricting the geographical area in which they sold their salt. It was not afraid to harm the salt and saltworks of Chioggia, and we are less surprised by the disappearance of so many *fondamenti* in the southern Lagoon. In 1293, for example, she limited production in Cervia to 203,000 baskets; when this quota was reached, the saltworks were flooded; she defined the markets where this salt would be sold, 100,000 baskets were reserved for her and she would pay 3 *ravennate pounds* one cent for them; 100,000 baskets would be sold freely in Romagna and in the Marche of Ancone. The rest (3,000 baskets) would go to the bishop of Cervia. However, old salt (from previous harvests) was discovered on 25 May 1293, and Venice insisted that this stock of 150,000 baskets should be sold before the saltworkers harvested the year's salt.

This leonine pact was then regularly renewed, Romagna's boatmen were unable to navigate the Po and reach Lombardy with salt.

6 HOCQUET, *Monopole et concurrence*, pp. 70-73.

Even Bologna was monitored, and the Venetians saw no other solution than to reduce the share available to the population, which was forced to abandon its traditional markets. On 10 April 1336, with the papacy now established in Avignon, Venice succeeded in imposing what it believed to be a definitive pact on Cervia: the small town would temporarily give up making salt and then, once it had eliminated its stocks from 1338 onwards, limit its production to 36 thousand baskets. If this quantity proved insufficient for the population and Romagna, Venice would deliver salt from Pago or Pola or, failing that, from Chioggia, at a price of 6 soldi di grossi (= 3 ducati) per Venetian *moggio*⁷.

Was this policy beneficial for Chioggia in the first half of the 14th century? From 1280 to 1322, i.e. in around forty years, the lagoon city suffered no losses. Subsequently, around ten *fondamenti* were abandoned in the two Chioggia⁸. Cervia's decline was reflected in the absence of any positive results, and the reduced production in Romagna did not prevent a crisis in Chioggia. Other reasons must be sought for the loss of markets to Chioggia salt.

The creation of saltworks in Istria and the delivery of Mediterranean salts to Lombardy

Istria, with its small valleys and deep indentations in the coastline, preceded by islands (the Brioni archipelago), lent itself well to salt cultivation, and the Venetians paid close attention to the saltworks at Pola. Other, smaller salt works met the needs of the local population, but Istria was first and foremost a privileged access route to the Danube market⁹. The first irrefutable records of salt production in Pi-

7 *Ibidem*, pp. 79-86.

8 HOCQUET, *Chioggia, capitale del sale*, p. 93.

9 VESNA GIRARDI-JURKIĆ, *Istria on the crossroads of the economic and trading routes in the north Adriatic area*, «Histria Antiqua», 12 (2004), pp. 11-23. FERDO GESTRIN, *Trgovina slovenskega zaledja s primorskimi mesti od 13. do konca 16.*, Ljubljana 1965, The author has provided a summary in French, pp. 247-272: *Le trafic commercial entre les contrées slovènes de l'intérieur et les villes du littoral de l'Adriatique, du 13e au 16e siècle*.

ran in the north of the peninsula point to the presence of saltworks in Strugnan in 1258, and in 1278 the construction of new saltworks in Fasano is said to have begun, but the most numerous saltworks were in Sicciol¹⁰. Capodistria's saltworks came into use later, but by the mid-14th century they were being cultivated in the marshy areas surrounding the port¹¹. The provinces to the rear, towards Ljubljana, now had access to a regular supply that escaped the chioggiotti. At the beginning of the 14th century, there is documented evidence of salt being supplied from Chioggia to these distant provinces, not those merchants from Chioggia went that far or that Slav merchants came to the Lagoon, but salt was passed from hand to hand, barges brought it to the ports of Istria from where caravaners left with the salt. But here's something even stranger: in April 1182, Doge Orio Mastropiero, responding to requests from the town, established Capodistria as a salt port and prohibited any ship from unloading salt between Grado and Pola other than in this port. All unloaded salt would then bear the ducal seal and the proceeds from the sale to the muleteers who came down from the mountains would be shared equally between Venice and Capodistria, which would maintain the access roads to the port. Venetian ships loaded with salt and calling at this port could refuse to unload the salt and return to Venice¹².

The import trade in so-called "sea salt", imported by sea to distinguish it from salt from Chioggia born in the Lagoon, would therefore have begun before the end of the 12th century. The commercial treaties signed with the communes of the Po and Lombardy, with Ferrara or Mantua, obliged Venice to deliver salt from Siponte and Cannes in Apulia (1251) or, with Mantua and Milan, salt from Apulia or "an equivalent salt of identical price", i.e. coarse-grained salt (*sal grosso*) at Apulian prices. In 1274, the Great Council examined the case of those who had imported salt "from Alexandria and from so many different countries"; at the time, this was a merchants' initiative, but the Council soon saw the advantage it could draw from it. In June 1281, it obliged the merchants to return from their journey with a load of salt (1281).

10 JEAN-CLAUDE HOCQUET, *Venise et le monopole du sel. Production, commerce et finance d'une République marchande*, 2 vol., Istituto Veneto di Scienze, Lettere ed Arti - Venice and Les Belles-Lettres - Paris 2012, 1205 pp., in part. pp. 36-38.

11 PIETRO KANDLER, *Codice Diplomatico Istriano*, Trieste 1862 - 1865, V, 1 giugno 1327.

12 HOCQUET, *Venise et le monopole du sel*, p. 22.

From then on, salt from Romania, Athens, Klarencia, Modon, Cyprus, Alexandria, Sardinia, Ibiza and Ras el-Makhbaz would enter Venetian warehouses¹³. This was a measure in favour of merchants. All that remained was to sell this salt, which was destined to take the place of salt from Chioggia.

Did salt from Chioggia reach Lombardy? In 1277, Venice allowed all merchants to come to Chioggia to buy any salt they wanted, on condition that they paid the *quintum* (20% of the price) and the *datum* of 9 pounds *ad grossos* per hundred measures. The pact was renewed every three years until 1290. In the first quarter of the Trecento, salt from Chioggia penetrated to the north of the Chiusa, the narrow rocky cluse that closed off the territory of Verona, and entered Vallagarina and beyond, towards Rovereto and Riva to the north of Lake Garda¹⁴. In 1252, Brescia's salt came exclusively from Chioggia, but by 1325 this had been eliminated in favour of the large Mediterranean salts¹⁵. From 1268, Milan and the Lombard cities to the west received only coarse-grained salt, and from that time onwards the people of Milan preferred this quality of salt. They were forbidden to sell salt to the Lombard cities of Crema, Cremona, Lodi, Pavia, Brescia and Bergamo to the east towards Venice, but they could sell it to *Mediolano supra versus montes*. In 1317, the new pact confirmed that Milan would only receive sea salt.

To compensate for the loss of the Lombard market west of Lake Garda, Venice tried to direct salt from Chioggia southwards. In November 1316, the Doge Giovanni Soranzo signed an agreement with a merchant from Bologna, Bertolino, *mercator publicus*, and his company to export from Chioggia to Tuscany, Florence, Prato and Pistoia, 40,000 measures of salt (400 cents), 100,000 as an option, at the price of 8 pounds of *piccoli*, plus *quinto* of the taxed price (25%), and a *datio* of 8 pounds as well, for a total of 18 pounds. Bertolino was unable to honour the contract, and a rider was signed on 28 March: the salt

13 HOCQUET, *Le saline*, pp. 717-718.

14 JEAN-CLAUDE HOCQUET, *Stratégies de marché et géographie des ventes de sel vénétien (1200-1350)*, in *Vom rechten Maß der Dinge. Beiträge zur Wirtschafts- und Sozialgeschichte. Festschrift für Harald Witthöft zum 65. Geburtstag*, ed. RAINER S. ELKAR, CORNELIUS NEUTSCH, KARL JÜRGEN ROTH, JÜRGEN H SCHAWACHT, Gutenberg, Scripta Mercaturae Verlag 1996, II, pp. 226-256, in part. p. 233; JEAN-CLAUDE HOCQUET, *Il Trentino all'incrocio dei sali tirolese e veneziano tra il XIII e il XV secolo, Il Trentino in età veneziana*, «Atti dell'Accademia roveretana degli Agiati», 238 (1988), pp. 387-402.

15 HOCQUET, *Stratégies de marché*, p. 234.

from Chioggia would no longer be sent to Tuscany, but to Bologna. It is not known what happened to this contract, the option was not exercised and in 1317 Venice tried to clear the stocks that were clogging up the Chioggia warehouses and authorised the transport to Ferrara of 34,000 measures of salt and a very heavy *datio* of 20 pounds¹⁶.

In the Marquisate of Mantua, during the first half of 1314, 75 ships loaded with 2,231.5 *moggia* of sea salt passed through. The absence of salt from Chioggia is not significant; this six-month period from January to June could mean that Chioggia had used up its last harvest during the previous quarter or, as 1313 was part of the period of crises that ushered in the 14th century, that due to prolonged bad weather, the salt-makers of Chioggia had not harvested any salt during the summer of 1313. In 1339-1340, two years in fact, the salt recorded at the Serravalle toll station was destined for Mantua and its district (26%), the towns of the Oglio (17%), Reggio (4%) and above all the towns on the Po upstream (53%). During these two years, the toll of Serravalle taxed 12,062 *moggia* of sea salt and 370 cents of salt from Chioggia, to which we can add 50 *moggia* (Ferrara measure)¹⁷. However, while the volume of sea salt was stable from one year to the next (6,201 *moggia* in 1339 and 5,861 *moggia* the following year), the transport of salt from Chioggia was uneven: 80% was shipped in 1339, while only 73.25 cents of lagoon salt passed through in 1340¹⁸.

16 *Ivi*.

17 FRANCESCO BALDUCCI PEGOLOTTI, *La Pratica della Mercatura*, ed by ALAN EVANS, Cambridge Mass. 1936, does not say much about Ferrara's measurements (p. 145): 1 *moggio* of wheat = 20 *staia* and 22 *staia* = 6.8 *staia* of Venice, while the Venetian *staio* measured 83.31 litres, the Ferrara *staio* contained 25.75 litres and the *moggio* 515 litres.

18 JEAN-CLAUDE HOCQUET, *Navigazione padana et discrimination fiscale au Trecento*, in *Milieux naturels, espaces sociaux, Etudes offertes à Robert Delort*, Paris, Publications de la Sorbonne 1997, ed by Élisabeth MORNET and Franco MORENZINI, pp. 521-542, in part. pp. 525-529. The sub-multiple of Chioggia salt, wrote the Mantua employee, who was unfamiliar with the exact measurements used in Chioggia and confused them with those of his own country, is the *staio*, used in Serravalle's account, for example 78 cents and 75 *staia*. The Chioggia measures were reformed between 1315 and 1322. The 'cent' must then be understood as 100 *mozetti* and measure $41,64 \times 100 = 4,164$ litres, and as Chioggia salt is light, the cent of Chioggia measures would have weighed 3 tonnes.

The misfortunes of Chioggia: plague, war and smuggling

The Black Death had a catastrophic effect on the population, and on 1 August 1348, the Podestà of Chioggia wrote to the Great Council:

for the reform of our city of Chioggia, which, due to the plague and mortality, is very depopulated, pardon and remission be granted to all those condemned and banished from Chioggia so that they may return to the city, which has been bled dry [...] and that they restore and cultivate the saltworks.

The Council agreed to this request “for the good of the land of Chioggia”¹⁹. The podestà’s opinion had been heard and by 1350 only two *fondamenti* in Chioggia Minor (Sottomarina) had been abandoned. The same could not be said of the war rightly known as the “Chioggia War”. In fact, the Genoese enemy had taken advantage of the saltworks dykes to approach the city, take the Venetian defences in reverse and capture the city, after which the Venetians also used the dykes to lay siege to the Genoese entrenched in the city. When peace was signed, Venice adopted two political measures: she forbade the reconstruction of all the *fondamenti* which, from the port, would have facilitated the routing of hostile forces to the city, and she favoured the reconstruction of the others. A total of 11 *fondamenti* were lost between 1379 and 1382, while 24 were actively rebuilt on the initiative of podestà Saraceno Dandolo²⁰. Three *fondamenti* were lost again before the end of the century, and by 1400, 21 *fondamenti* had been rebuilt. Chioggia did not escape any calamities in the 15th century: 1411 was a year of plague, which in 1414 caused great damage; in 1428 the plague returned and was followed by a serious flood that recurred in 1443 and 1444, then came the “great plague” of 1448, followed from 1456 to 1458 by a new epidemic that “caused two thirds of the population to perish”; the plague raged again in 1477, 1485 and 1491; famine combined its effects with the fatal plague, as in 1528-1529²¹.

The surviving chioggiotti sought to escape their misfortunes. As the only commercial resource they had left was salt, the price of which was set by the Venetian monopoly, this fiscal price encoura-

19 HOCQUET, *Stratégies de marché*, p. 252.

20 HOCQUET, *Chioggia, capitale del sale*, p. 93-94.

21 VENEZIA, Biblioteca del Museo Correr, *Cod. Cic. 2469*, PIETRO MORARI, *Historia della città di Chioggia*, 1568.

ged smuggling. Smuggling was, of course, clandestine and has left no trace in the documentation, except when it was punished by the courts. The smuggler could be caught red-handed, denounced by a jealous neighbour attracted by the promised reward, arrested following a patient investigation, and so on. Venice, whose tax revenues were dwindling because of smuggling, and whose needs were increasing to face wars with any chance of success, saw no other solution to curb fraud than to prohibit the suspect from cultivating its salt marshes and therefore from maintaining the *scanni*. Similarly, he forbade the neighbours of the suspected and punished salt producer, whose saltworks were threatened by the ruin of the neighbouring *scanno*, to take charge of the saltworks and the culprit's section of dyke. Admittedly, the smuggler's, or supposed smuggler's, couple of salt pans risked being quickly flooded, but the water rushed in through the open breaches, threatening the neighbouring salt pans and it was the whole *fondamento* that was invaded, not just the suspect's salt pan.

There was also a serious problem: in the 15th century, the salt producers and owners were obliged to hand over their harvest to the monopoly and the tax farmers, who paid when they received the price of the salt. The harvest was unpredictable: in 1410, no salt was made; in 1411 the harvest picked up again, but Chioggia was running out of old salt. At the end of 1413, there were only 14 *milliaires* (14,000 measures) of salt in Chioggia, which was not enough to provide the lands supplied with salt from Chioggia. The cycle of poor harvests continued for five years, after which the situation improved: in 1415 and 1416, there were around 60,000 measures, and in 1417 the year was better and the harvest reached 94 *milliaires*. Venice then estimated the monopoly's needs at 75,000 and then 70,000 measures. During the wars with the Visconti, many chioggiotti were mobilised in the patrols that travelled the rivers and lakes, and they offered to buy all the salt that would be collected in the future. This was a dangerous move, as the Salt Office had to respond to the most pressing needs, such as military expenditure to protect the main points of navigation in the Levant, which was coveted and threatened by the Ottomans. In 1461, the Office owed them 6,000 ducats (arrears from

the wars against Milan, which had been over since 1454), in 1461, a year after the start of hostilities with the Turks, 13,000 ducats and the following year 14,000 ducats. In addition to impoverishing the salt workers and their families (what was the point of working in the salt works if the salt didn't provide enough to feed them?), many were thinking of getting rid of assets that weren't making much money. In the 15th century, 515 salt works in 17 *fondamenti* changed hands. No saltworker (*laborator*) ever sold a saltworks, and the workers were excluded from the market.

Sales were low at the beginning of the century, then peaked (77.5 saltworks between 1410 and 1419), before falling sharply, then remaining at a high level (around 60 saltworks) and returning to the level of 40 saltworks per decade between 1470 and 1489. *Gradenigo's* salines followed this trend: from 1 ducat in 1409, when reconstruction had not yet been completed, to 12 ducats in 1410, 20 ducats in 1411 and 101 ducats in 1412, but the price of a saltworks fell back to 10 ducats in 1417. Prices were 2 to 2.5 times higher for saltworks close to the market towns than for those further away. In the *fondamento Codevigo* built at the head of the borough (*vicus*) of Chioggia, the numerous transactions (112 purchases and sales in 120 years) confirm that the high prices until 1439 (between 35 and 45 ducats) then fell sharply (10 to 15 ducats). People sold to settle their children, build up a dowry, build their house, buy public debt securities from which they expected to earn interest, or because they could no longer afford to pay for spring work to restore the dykes or the direct taxes levied by the State; they bought to round out their property and because the sale price was low, a case of seizure for debt²².

Were the saltworkers responsible?

Since it existed a written documentation, Chioggia's assets have been threatened by the sea, by rising waters that threatened to engulf them. These properties, capable of being cultivated and producing cereals, vegetables, vineyards and olive trees, were in short supply. Some people would steal land from their neighbours to protect their small

22 Jean-Claude HOCQUET, *Solidarités familiales et solidarités marchandes à Venise au XIVe siècle*, p. 227-255, *Les élites urbaines au Moyen Âge* (XXVIII Congrès de la SHMES, Rome, 23-27 May 1996), Paris-Rome 1997, 461 pp.

fields or take sand from the dunes. To increase the area under cultivation, others were encouraged to flatten the dunes along the shore so that they could plant vines and give part of the produce to their master. The hunger for land was such that nothing was neglected, except the preservation of the coastline²³. Did the salt producers have a share in this export of sand from the dunes?

In 1375, for example, two saltworks rented for 5 years required 16 small boats of sand each year; in 1377, three saltworks required 30 boats of sand for two years; in 1400, an owner on the eve of renting 3 saltworks inserted the clause: “on condition, if necessary, that you have 60 boats of sand transported”. Why was so much sand needed to produce a harvest the following summer? In winter, with the *calio* destroyed, the salt pans were submerged in water, which offered resistance to the external pressure exerted by the winter storms and by the water on the dykes, and this internal water was also expected to dissolve the highly soluble magnesium salts that would have burnt the harvests to come. In early spring, this water was expelled. The need to bring in earth and sand to raise the bottom of the Chioggia saltworks was due to the subsidence of the lagoon, whose rivers, having been diverted, no longer brought in the alluvial deposits that were essential to the equilibrium of the lagoon and the relative rise in sea level. After dumping the mud deposited by the settling of winter water on the dykes, the salt workers had to raise the salt works to continue to benefit from the amplitude of the tides. They fetched the sand as close as possible, wherever it was most convenient, and turned the coastal dunes into quarries. In this way, they weakened this natural protection and reinforced the marine erosion that attacked the lido, especially during storms, between Pellestrina and Chioggia minor²⁴.

Things got worse when the Venetian podestà Saraceno Dandolo set about restoring the saltworks damaged by the war. He asked experts chosen from among the “locatores” for estimates, which he received between December 1380 and November 1381.

23 Jean-Claude HOCQUET, *Les monastères vénitiens et l'argent*, Rome 2020, p. 198-199.

24 JEAN-CLAUDE HOCQUET, *Ambiente lagunare, cultura salinara a Chioggia e variazioni del livello marino alla fine del Medioevo*, «Archivio Veneto», VI-8 (2014), pp. 7-27, in part. pp. 10-13.

Submission of quotation	XII/1380	XI/1381	XI/1381	21/XI/1381	total
Fondamento	Vescovo/ Arzelpozo	Laguna	Sabloncello	Conadacorio	
Perimeter to be rebuilt (passi)	1 220	900	485	703	3 308
Salines	90	48,5	-	-	
Piles	7 320	5 400	3 916	3 300	19 936
Wicker, 1.5 bundles per pace	11 000	8 000	5428	8 100	21 528
Earthen boats	600	450	397	390	1 837

Table : materials used to rebuild the saltworks after the siege

These were extraordinary, one-off expenses to repair the damage caused by the war, but bringing in 15, 20 or 25 barges of earth²⁵ and sand each year to raise the floor of 2 or 3 saltworks met the need to raise the bottom of the saltworks to keep them at a level slightly higher than that of low tides and thus evacuate the fresh water from rain or bad weather. In 1374, a salt-maker considered the case where

there would be so much water in the canal (of the *fondamento*) that, without scooping, it would have passed into the reserves without using the conduit.

On 15 July 1323, according to the testimony of three inhabitants of Chioggia to the petitioner's office,

at Pellestrina, in the place called Solesedo, there used to be 41 salt pans, today only 34 remain, since seven have been destroyed by the sea, which came in bringing sand.

After this flood, the tenants poured two days' worth of salt into San Zaccaria. These salt pans bordered the vineyards of San Luca to the east (in the morning, on the seaside), which were also destroyed by

²⁵ VENEZIA, *Archivio di Stato* (ASVe), Notai di Chioggia, Giovanni Pasquali, quad. 1, 2 27, 6 ott. 1394. The saltworker had to introduce 60 barks of sand and 3 of çapas, clods of grassy soil, into 3 saltworks. The clay soil was essential to create an impermeable base.

the same phenomenon, “and now there are only sand dunes”²⁶. Half a century earlier, such a cataclysm had already been observed. In 1286, the Great Council of Chioggia authorised the podestà and his minor council to reduce the fee of the horticulturists who cultivated the gardens

beyond the port of Chioggia, since they say they can no longer work the vineyards *propter fluctuationem et impetum aquarum*

The vineyards belonged to the municipality, and this justified the intervention of the Venetian podestà

[...] as some men from Chioggia cultivate vineyards belonging to the municipality beyond the harbour, towards Venice, vineyards which due to flooding and the impetuosity of the waters are destroyed and disappear day after day²⁷.

The monastery of Brondolo, dangerously exposed to the Brenta ditches, complained in 1308 about the destruction of the lido caused by the sea²⁸. Podestà Sarraceno Dandolo wrote to the Great Council of Venice on 21 May 1391 to lament the loss of the island of Cà Manzo²⁹. In the spring of 1389, sea erosion was considered by the Senate to be the main cause of the destruction of the lido³⁰: on 26 March 1392, the Great Council, noting that the Pellestrina Lido and the ditches (*cavate*) were in a very bad and dangerous condition “et omne die vadant de malo in peius”, decided to take emergency measures³¹, without, however,

26 ASVe, San Zaccaria, b. 3, *Catastico Nachi*. Cfr. FRANCESCA BOSCOLO CEGION, *Dune costiere e processi eolici lungo il littorale di Pellestrina*, «Chioggia. Rivista di studi e ricerche», 18 (2001), p. 247-270.

27 CHIOGGIA, *Archivio Antico Clodiensi, Consigli* 24, c. 128; cfr. VINCENZO BELLEMO, *Il Territorio di Chioggia*, Chioggia, Tipografia di Ludovico Duse, 1893, p. 115.

28 BARTOLOMEO CECCHETTI, *La Vita dei veneziani nel 1300*, Bologna 1980, p. 135.

29 «Ducatus Veneciarum habet in districtu Clugie quoddam terrenum vocatum Cha Manço quod solitum erat laborari per aliquos Clugienses. Et a novitate Clugie citra ipsum terrenum pro maiori parte iverit in desolationem [...] et de die in diem diminuitur ipsum terrenum, quia aqua maris ascendit super eo et ducit ipsum in canalia et dannificat portum Clugie», ASVe, *Maggior Consiglio, Leona*, 47r.

30 «Litora nostra que ex inundationibus aquarum et maximis tempestatibus preteritis destructa sunt», ASVe, *Senato Misti*, 41, c. 7r.

31 ASVe, *Maggior Consiglio, Leona*, c. 54v, «Cum litus Pelestrine et cavata sint in pessima conditione et periculosa et omni die vadant de malo in peius (...) quod laboreria oportuna fiant estate proxima, nam si superveniret hyems et laboreria facta non essent, pro uno ducato qui expenditur nunc, expenderentur postea decem».

prohibiting the export of sand³². In 1389, the Senate had increased the Marches wine tax in order to provide the credits necessary to pay for the consolidation work on the shores³³. On 3 July 1462, just at the time when the first salts could be hoped for, the Senate, at the suggestion of the Doge and his councillors, became aware of

the misfortune that was befalling the poor people of Chioggia, whose salt pans in the destroyed *fondamenti* were totally submerged and ruined. If immediate action was not taken, they risked being annihilated forever, to the great displeasure of the State³⁴.

On 9 January 1481, the podestà of Chioggia

demonstrated and declared many eruptions caused by the sea at the time of the storms, by the force of the winds that in recent days have carried away the palisades and about 1,000 steps of dykes, causing great damage to property owners, salt pans and the valleys of Chioggia. We must fear even worse flooding and more serious damage if things remain in this state and if new sea storms occur³⁵.

Venice and the organisation of sales

By the middle of the 15th century, sales of Venetian salt had already undergone an initial change. The salt from Chioggia was destined for the tax districts or *dazi* that made up Veneto, from Belluno in the north to Verona in the west and Venice. Chioggia salt was also sold to Rovigo and Ferrara, ruled by the House of Este. To the west of Lake Garda, Brescia and Bergamo received large Mediterranean salts brought to Venice by ship. Salt from Chioggia suffered another loss

32 1373, 5 ottobre, parte del Maggior Consiglio che proibiva l'asportazione di sabbia dai littorali, GIOVANNI CANIATO, *L'organismo delicato: il governo idraulico e ambientale*, EUGENIO TURRI, GIOVANNI CANIATO, MICHELE ZANETTI, *La Laguna di Venezia*, Verona, Cierre, 1995, pp. 227-247; *Atlante della Laguna. Venezia tra terra e mare*, ed. STEFANO GUERZONI e DAVIDE TAGLIAPIETRA, Venezia, Marsilio, 2006.

33 ASVe, Senato Misti, reg. 41, 7r.

34 ASVe, Senato Mar, reg. 7, c. 69v: «infortunium occursum pauperibus fidelibus nostris Clugiensibus quorum saline fractis fundamentis submerse et vastate penitus sunt et nisi aliquialiter subveniantur remansuri sunt omnio consumpti cum notabili damno nostri dominii».

35 ASVe, Senato Mar, reg. 11, 97r.

when it was replaced by salt from Piran in Friuli. As early as 1406, the Venetian Senate had authorised its subjects from Piran to transport their salt exclusively from Duino to Caorle. Friuli was then independent under the authority of the Patriarch of Aquileia, who resided in Udine and only surrendered to Venice in 1420.

Venice also had access to salt from Corfu when, after the long Turkish invasion and the Peace of Istanbul (1479), the Venetians abandoned their possessions in Albania. Corfu salt, which had previously been distributed in Albania, lost its nearest outlets and became available for the markets supplied by Venice, which directed it towards Friuli. Friuli, a poor farming area, was an important market for salt. In 1478-1480, the Friulian *dazio* absorbed 1,200 *moggia* of Venetian salt, and in 1525, 2,170 *moggia*. The monopolised salt from Pago reached Umbria, the Marche, southern Romagna and, mixed with that from Corfu, the Emilian regions of Modena and Reggio. By the end of the century, the Venetian monopoly had reached its greatest extent. The regions west of Lake Garda consumed coarse salt either by *dazio*, if they were part of the Venetian state, or through freely concluded contracts. Salt from Chioggia was supplied to Venice and Vicenza. With the salt from Piran and Pago, on the other shore, it supplied Verona, Padua and Treviso, but as it imposed low prices on local producers, it allowed them to sell on the market in Mantua, Ferrara and Rovigo³⁶.

The victorious wars in Italy had raised high hopes in Chioggia and the conquest seemed to be the way to monopolise the market and eventually sell the surplus to Ferrara, which had remained independent. Venice authorised the sale and the Chioggiotti obtained excellent prices in that city, which Venice saw and hastened to lower the price of the monopolised salt. Ferrara thus served as an outlet for salt production in the Lagoon, compensating for the low prices offered by the monopoly. However, wars and the plague cut into the population, and many widows and orphans were forced to give up ruined, unused salt works because their men were mobilised in the naval army. It was perilous to direct Chioggia's salt towards a single outlet, as Venice in the early 1480s rashly set its sights on Ferrara, making it impossible for the Chioggiotti to reach the enemy city to sell their salt there.

Bologna was supplied with salt from Cervia in the middle of the century, but on 5 May 1463, Venice bought from Novello Malatesta, ruler of Romagna and threatened by his enemies, notably the Papacy,

all the rights that Malatesta held in Cervia, over its territory and saltworks. Venice promised him a perpetual annuity of 4,000 ducats and 2,000 sacks of salt (weight per sack: 360 pounds). The rent would be paid in two instalments each year. Ten years later, before the year's summer harvest, on 18 June 1473, the Senate was alarmed:

After Cervia came under our domination, a multitude of salt pans were built and are still being built, and an incredible quantity of salt is harvested from these salt pans,

which was later estimated at 70,000 sacks. So who had encouraged the expansion of the Cervia saltworks and created new salt marshes? It will come as no surprise to find Corner, Zuan and his brother Francesco at the top of the list, owners of sixty salt pans and favourable sites for building more, which already provided them with an average annual income of 1,000 ducats, with the salt pans estimated to be worth 5,000 ducats, i.e. a profitability of 20%. Other Venetian patricians also rushed to buy the saltworks from their former owners or to acquire land on which to build new ones, including Marco Tron, Alvise Ferro, the Duodo brothers, Moro and Alvise Caravello, Girolamo Tagliapietra, Anzolo Lolin and the da Cumani family. In all, these Venetian noblemen owned 63 pairs of saltworks worth 7,570 ducats. The value of Venetian land and property in Romagna reached 135,210 ducats, mainly in the north of the country, in Ravenna, Cervia and Cesenatico, not including the property of the Venier and Zorzi families “which is worth a lot”³⁷. The noble merchants had turned away from the saltworks in Chioggia, which were too exposed to the wrath of the sea and marine flooding, since the salt workers and inhabitants of the lagoon community had destroyed the dunes of the lido³⁸ to take away the sand used to build the dykes and had developed the cultivation of vines on the land thus gained³⁹. Venetian merchants showed a great appetite for the landed property of Terraferma, and in Cervia they had rediscovered their ancestral taste for owning saltworks and the income from them. The appropriation of the saltworks in Cervia and the monopolisation of salt were the final blow to the salt and saltworks of Chioggia.

37 HOCQUET, *Monopole et concurrence*, pp. 110-112.

38 HOCQUET, *Ambiente lagunare, cultura salinara*, pp. 14-19.

39 HOCQUET, *Les monastères vénitiens et l'argent*.

Does nature have any responsibility?

The devastation caused to the lido by levies, of wood or sand, made without discernment was as evident as the damage caused by the action of the sea. In 1308, a very elderly lady was invited to testify about what had happened to a section of Murano Lido, better known by the name of Lido di Sant'Erasmo, where a ditch had taken the place of 3 saline and the Umbraria marsh, an ancient *fondamento* used as pasture for livestock and as hunting and fishing grounds; she stated that

the lido was much more extensive than it is today, at least 50 paces and remembered that the lido was annihilated (*dissipatum*) by bad weather.

In 1286, the Major Council of Chioggia authorised the podestà and his minor council to reduce the fee of the horticulturists who cultivated the gardens. The salt workers were not the only ones to upset the fragile balance of the lagoon. To combat salt smuggling, the authorities had decided to close all the small waterways that flowed from Padovano into the Fogolane sector with dams, and these small dams blocked flooding. Another factor played an even more important role in Venetian politics: the need to preserve the navigability of the lagoon canals and the access of ships to all the port facilities scattered throughout the city and lagoon. Now, in Venice, the invasion of the *canetum*, of the rushes that sprouted on the alluvium (the *velme*), was feared, and this was attributed to the flooding of the rivers, so much so that no other solution was seen than diverting the waterways out of the lagoon. This hydraulic policy had started very early and continued at the end of the 14th century with the repair of the dam once built from Botenigo to Lama and the closure of all the river mouths in the San Giorgio in Alga sector *ne caneta acserent et venirent ad atterandum canalía et aquas nostras*. There was therefore a great conflict of interests between the preservation of the salt marshes, whose protection rested on a permanent supply of floods, and the safeguarding of lagoon navigation, which needed vast spaces traversed by tidal currents and accessible channels free of floods.

The chronology of the crises that destroyed the *fondamenti* of salt marshes has long been traced. In 1413, the Monastery of San Cipriano lamented that

some salt pans of the Laguna *fondamento*, currently barren, give the abbot and the monks more bills and damages than profits, since maintenance expenses must continue to be made, but if they have to be kept in a state of production, the expenses will exceed the income and the product received each year.

A few scattered salt marshes abandoned here and there caused a minor annoyance: it was all the *consortes* who bore the brunt, as the circuit of the dams was not reduced by this, and therefore they were fewer in number to contribute to the company's constant *donico* expenses.

The transformation of former salt works into fisheries

In January 1447, a notable rented his seven salt pans of the Brombedo *fondamento* for five years and authorised the tenant to hunt and fish, without demanding more than a couple of beautiful birds at Christmas. In 1471, the Rizocoso *fondamento* was reduced to a mere expanse of water, and the curator of San Giorgio recorded the salt pans of the San Pietro, Strosen and Conadacorio *fondamenti* as 'lost'. In 1472, the owners sold at public auction what they owned olim *fundamenti* Gradonici, which had now disappeared. In 1486-1487, the monastery of San Cipriano noted that it had gained nothing from the Laguna *fondamento*, «per esser andato el ditto fondamento a mar», and the fund became free for the monastery. The tenants and sharecroppers had lost everything, the salt and the investments they had made: they could no longer find their salt pans, sunk in the water, submerged. The monastery recovered the property, now free of all obligations. On 19 September 1490, «Monsignor the Abbot rented the Laguna *fondamento* to Ser Giacomo Ingrotheo of Murano for three years in exchange for an annual income of eels and birds». The ancient salt pans were thus transformed into fishing valleys with the construction

of reed walls called *cogolere*, which were used to lead the fish into traps and nets.

The rapid subsidence at that time, lowering the seabed, raised the relative water level in the old *fondamenti* whose name was preserved by memory. In 1460, while boundary demarcation was taking place,

a stone boundary in the water and mud was discovered at the beginning of a cogolera whose wall is close to the cogolera of Petadibò, a boundary that marked an old boundary of Petadibò.

Not for this reason did the disputes cease. Before, there were disputes between companies of neighbouring *fondamenti*, especially if they were contiguous and enclosed in a single circuit of dykes. This was the case with the two *fondamenti* Vescovo and Agger Podii, a vast complex of 90 salt ponds, where two reasons for disputes could arise: the maintenance of the *donico* and the division of the water being concentrated. A dispute was brought before the Great Council of Chioggia, which appointed three arbitrators in charge of issuing a ruling that would be valid for all. In 1374, a conflict pitted the procurators of San Zaccaria, San Giovanni Battista of Chioggia and the Bishop of Castello (Venice), together with all the *consortes* of the *fondamento Lagucerno*, against a common opponent, the company of the *fondamento Ciole*. The two parties appointed lawyers to defend them in the podestà's court. In 1488, soon after the disappearance of the *Lagucerno*, a trial pitted the two powerful Benedictine monasteries of San Giorgio and San Cipriano against each other. The abbot of San Cipriano had to specify the boundaries of his fishing valley that occupied the space between four canals. San Giorgio replied that the abbot did not know his lagoon geography, as he did not know that the Popolare canal designated the Palusella canal, i.e. Pellestrina, which was one mile to the north, and that there had never been salt pans on this canal; it was therefore useless to present deeds of donation of *fondamenti* dating back more than three centuries. The contested property remained in San Cipriano, who, on 29 May 1540, in a delimitation of the valley of San Marco Nuovo, between Pellestrina and Pettadibò, recalled with nostalgia, «the hillock of the ruined church of San Marco Nuovo and

the Laguna fondamento», both of which were held as leases by a Venetian nobleman, Baldisera Balbi di Sant'Agnese .

Human activity and its consequences

To counter the harmful effects of the swamp and the bad air, already by the end of the 15th century the Venetians were attempting to divert the rivers, starting with the Brenta, which was initially diverted from Dolo to Conche in the Chioggia lagoon (Brenta nuova, 1488-1507), before being moved further south and made to flow directly into the sea at Brondolo through a common mouth with the Bacchiglione. Since the new river bed had too shallow a gradient, during flood periods the waters opened breaches in the dams, so much so that in 1560 a new canal, called Nuovissimo, was dug to collect the waters of the lower plain after Mira without overloading the Brenta and still allow them to reach Brondolo. The same was done with the other rivers. In the lagoon, sea water thus replaced river water and, through complex physico-chemical mechanisms in which salt played an important role in compacting the peat, favoured the consolidation of clay and silt deposits and the sinking of areas once subject to the withdrawal of river water. The Millecampi valley is a significant example of these changes - correctly analysed from the beginning of the 19th century onwards - which, by accelerating subsidence, opened the ancient agricultural lands to the intrusion of sea water that flooded them. In 1965, L. Cisotto compared the state of the lagoon, as it was recorded at the time on the maps of the IGM (scale 1/25000), with the map drawn in 1534 by one of the best known and most qualified Venetian land surveyors, Nicolò dal Cortivo. Cisotto superimposed the two maps, to highlight «the great enlargement of the lagoon basin that had occurred over four centuries» between the ports of Chioggia and Malamocco; «it appears to be of the order of 120%»: the sandbanks, which in 1534 were at +30 cm above mean sea level, were at a depth of -218 cm in 1931.

The Pellestrina Lido, deteriorated by more than five centuries of salt cultivation and the removal of its sand, destroyed, had disappeared altogether. In the 15th century, Venice undertook a colossal work

that lasted for three or four centuries: the construction of reefs and then of walls of *pozzolane*. At the end of this great human and financial effort, a barrier had been rebuilt against the sea, north of the port of Chioggia, reduced to a wall and its base of rocks brought from Istria by the *marani* di Chioggia. The sea shore is still today reduced to this stretch of wall for approximately 10 km.

The documentation does not confirm the hypothesis of a lowering of the sea level «to levels more than a metre lower than today» in the 15th century, but rather a simultaneous flooding of the lagoon and the sea, to which the destruction of the lido gave way in the lagoon. To keep the salt marshes sheltered from the sea inundation, the workers, by raising the ground of the *fondamenti*, aggravated the danger that threatened the lido. But the stronger sea submerged all the *fondamenti* behind the disappeared lido of Pellestrina. By the early 16th century, salt marsh cultivation had retreated to the lagoon area closer to Chioggia. The Fairbridge curve, so dear to Wladimiro Dorigo, does not explain the historical evolution of Chioggia's salt pans from the 13th century onwards. The salt marshes were abandoned not for reasons of drying up - the sea would have receded - but because of brady-sism, which had the effect of subjecting the *fondamenti* to the growing marine and river threat. Water was not absent, it was overabundant. And for political, demographic, economic and pecuniary reasons, by the end of the Middle Ages, the people of Chioggia no longer had the means to fight effectively for the preservation of the salt pans⁴⁰.

The ultimate end of the Chioggia saltworks

In 1481, when the Venetian podestà of Chioggia reported to the senate that storms had washed away 1,000 steps of dyke on the lido had washed away the properties, saltworks and fisheries of the Chioggian people, he was no longer content to denounce the ruin of the saltworks: As early as 1454 the Cona da Corio was declining and disappearing under the waters, then it was the turn of the *fondamenti* San Pietro and Strausione from 1471, the Vescovo in 1473, the immense Gradenigo with its 70 saltworks was no longer to be found in the spring of 1474; shortly afterwards in January 1486 came the Agger Poggio, then in 1488 the Laguna and in 1491 the Ridello.

In the 1530s, the Seignory sent a few hundred ducats every year in the spring to help restore the salt works, thus 500 ducats on 2 April 1531, 340 ducats on 8 March 1533, and the same amount on 27 March 1534, in cash, 12 pounds per salt works. There were 175 salt pans around Chioggia at that time, i.e. 5 or 6 *fondamenti*. In Venice, the *Collegio*, the true government of the Serenissima, after listening to the podestà of Chioggia who gave a gloomy picture of the situation, accused the share croppers of deserting work in the salt pans because of their meagre incomes due in part to the plurality of owners on the same salt pans; the *Collegio* consequently blamed the onerousness of the land rent and decided to follow the opinion of the expert, Matio Tinto, «el qual circa i sali ha ogni pratica». From 1536 to 1539, 160 ducats were sent every year, in 1540 only 50.

On 27 February 1547 the Council of Chioggia regretted the time when 200,000 mozetti and even more were harvested in Chioggia every year, today the work no longer pays off due to the great expense of timber and land. The Minor Council adopted the advice of some thirty notables who recommended that the Codevigo *fondamento*, the largest of all, should be walled in, so that it would no longer be restored every year, everyone would work fervently, Chioggia would no longer be deprived of its precious salt, the Lombardy canal near the salt pans would no longer be silted up with the floods wrested from the *fondamento* by the current coming in from the port. Two months later, an order from Venice forbade cutting motes of arable land (*tagliar lotte over lame*) to throw them into the lagoon, which would damage the *fondamenti*. Clay was therefore needed to build the dykes and it was decided to subsidise the work by increasing the milling tax. In April 1548, it was realised that the expense would be greater than expected as it would be difficult to keep the *fondamenti* too exposed in the mouth of the port. It was then decided

to enclose with walls Pietro Ziani located towards the sea in a safe place and where there are excellent salt pans.

The obsession of the people of Chioggia is, if not to lack salt, to

have to buy it in *quartarolo* as it is done in Venice, i.e. in small quantities and at a high price. Well, all the old *fondamenti* are now destroyed, poverty is general and the municipality cannot assume the construction costs. A procurator of St. Mark's, Antonio Cappello, a benefactor of the city, offered to contribute half of the expense in order to collect half of the profit, rich people from Chioggia also lent: one 380 ducats, the other 300, a third 250, demanding an interest rate of which the rate was set, a sign of new times, at 4 and 5 per cent per year. Towards the end of the work, the procurator was asked to pay the promised sum, and half of the salt pans were remitted to him. On 24 October 1549, the accounts were made, the expenditure was 13,638 pounds 5 soldi (= 2,200 ducats). In April, orators had to be sent to Venice to justify keeping these salt pans surrounded by a stone wall. The excitement was great in the capital, the fortress Superintendents and the Sages on the lagoon had warned the *Council of Ten* of the construction of a massive wall between San Domenigo and the lido. The *Ten* entrusted the matter to the Magistrate of Water. A week later, he ruled: the wall was to be torn down, its *fondamenti* were to disappear, the lagoon was to remain free of all obstacles, and in future it would be forbidden to set up salt pans there. The skill lay in entrusting the decision to a technical magistrature already in charge of the ecological protection of the lagoon. The negotiations between Chioggia and Venice occupied the next two years, the former not wanting to be «deprived of the benefit of making salt», which was not a primary concern for Venice.

Authorisation was given on 14 August 1553. It was a year earned by Venice that allowed the construction of a *fondamento* at Codevigo to produce enough salt for the community's needs, with the prohibition to sell salt at more than 10 *soldi* a *mozetto* and the obligation to pay the scribe and the vardians. The Council, having been instructed, calculated an expenditure of 2,000 ducats, financed to the tune of 200 ducats with the stones recovered from the first construction, the rest with increased rent from the fishing valleys. The history of salt in Chioggia was completed and ended with a *fondamento* of two salt pans and no more than 30 or 70 salt pans.

ABSTRACT

Why did the salt marshes of the Venetian Lagoon, so numerous and flourishing in 1200, disappear completely in the mid-16th century? The crises of the 13th century, the change in the status of workers (from feudal tenants to sharecroppers in the capitalist system), the investments made by the bourgeoisie of Chioggia, the heavy taxes levied by Venice, the shrinking of markets conquered by competition, the indebtedness of the salt workers that the Venetian Office could no longer pay, and the deterioration of the salt pans, which were being devoured by the sea and could no longer be protected by the dunes weakened by human activity, were all causes of the ruin that accelerated at the end of the 15th century.

Perché le saline della Laguna Veneta, così numerose e fiorenti nel 1200, scomparvero completamente a metà del XVI secolo? Le crisi del XIII secolo, il cambiamento dello status dei lavoratori (da livellari feudali a mezzadri nel sistema capitalistico), gli investimenti effettuati dalla borghesia di Chioggia, le pesanti tasse imposte da Venezia, il restringimento dei mercati conquistati dalla concorrenza, l'indebitamento dei lavoratori del sale che le magistrature veneziane non era più in grado di pagare e il deterioramento delle saline, che venivano divorate dal mare e non potevano più essere protette dalle dune indebolite dall'attività umana, furono tutte cause della rovina che si accelerò alla fine del XV secolo.