# HISTORICAL SALT PRODUCTION IN EAST SUSSEX

## Introduction

The importance of salt has been appreciated for a long time and we are familiar with descriptive phrases in the Bible extolling its virtues, such as the 'Salt of the Earth' and 'Not to be worth one's salt'. But why was salt so important and how and where was it obtained? The 'why' is fairly straightforward to answer but the 'how' and the 'where' are more complex and form the subject of this article. In particular there will be a focus on salt production in Sussex, as many may not appreciate that this region was, in former times, the centre of an important and flourishing salt production industry.

Early human hunters obtained their salt from eating animal meat. As they turned to agriculture and their diet changed, they must have found that additional salt gave vegetables the same salty flavour they were accustomed to with meat. So they looked for salt as a food additive. But perhaps more importantly, its preservative qualities helped end the dependance on the seasonal availability of food, and foodstuffs could be stored and even transported and traded. But salt was relatively difficult to obtain, so it became one of the world's principal trading commodities and was even considered a form of currency by certain communities. Subsequently, salt became such a vital commodity that governments all around the world (including that of England) would often incorporate the salt trade as a state enterprise or gain revenue through taxation.

The prime importance of salt was in food preservation and cooking. At a time when there was neither refrigeration nor chemical preservatives, salt was needed for preserving meat and fish, at least during the winter months. Large amounts were also used for making butter[1], bread and cheese. Other uses were numerous and diverse: medicine, curing leather, soldering metal joints, glazing ceramics, healing wounds and also in religious ceremonies. And in more recent times it has become the basis of many of our chemical industries.

In Britain, there is evidence that salt has been extracted and used since at least the Bronze Age, 1200BC. But it was the Romans who developed and practised salt extraction here on a large scale and our use of the words such as 'salary' and 'salad' (which are linked to the Latin word for salt - *sal*[2]) are indications of their widespread use of this commodity.

There are no written records of the methods of early salt extraction in Sussex, so to find out more we have to rely on descriptions of salt works in other areas of Britain and Europe. However, all of these historical accounts tend to refer to later periods of salt working, in post-Medieval times (1500s onwards). For instance, information on the methodology involved can be gleaned from Agricola[3] and Brownrigg[4], and in descriptions by travel writers such as Celia Fiennes[5] in the 1690s and Daniel Defoe[6] in the early 1700s. Further documents of this period are figured by Lewis[7] and Greenwood[8]. But, although all of this information relates to a more recent period, the methods of salt extraction had probably remained essentially unchanged throughout history and it is unlikely that they were much different in earlier times.

## Sources of salt

The ultimate source of almost all salt is the sea, either the current oceans or the relics of ancient seas that have undergone evaporation and dried up. In the latter case, the extreme evaporation resulted in bedded layers of salt and other related minerals incorporated into the sedimentary rocks. These deposits are abundant and important in several parts of Britain, especially in the counties of Cheshire-Worcestershire-Staffordshire and in Teeside. The salt deposits there have been exploited since pre-historic times, and this continues on a large scale today. Besides furnishing an adequate supply of salt for domestic use, these deposits are particularly important for road de-icing and for supplying the associated chemical industries.

Initially this salt was simply derived from natural, salt-rich springs which issued from these deposits. Later the salt was obtained by pumping up natural brines from deeper in the ground and letting new, fresh groundwater flow in to dissolve more salt (and often causing major subsidence problems). Underground mining for salt started in the late 1600s and this continues in the present day, together with controlled brine pumping.

The evaporation of seawater, whether it be natural or artificial, progresses through *fractional crystallization*[9]*,* whereby different chemicals are sequentially precipitated out of solution as water evaporates and the salinity of the remaining water increases.

In East Sussex there are geological horizons which were formed by evaporating seawater (known as 'evaporites'). However, in general, the degree of evaporation at the time was not sufficient to produce sodium chloride (the mineral halite). But thick beds of hydrated calcium sulphate (the mineral gypsum) were formed by the initiation of sea water evaporation and these are of economic importance and mined in the Mountfield-Brightling area.

But of course there is also the present-day oceans and it is this rich source of salt that has figured so strongly in the local salt industry. And this source, being in a coastal location, had the advantage of easy transport by boat from the local ports.

## Seawater salt extraction

In theory, the extraction of salt from seawater is straightforward. A large volume of seawater is collected, it is allowed to evaporate and then the salt residue is collected.

This method has been carried out throughout history and is still widely practised worldwide, especially where the ambient temperature is high and there is a lot of sunshine (for example in the Mediterranean and India; see Figure 1). Although there is some evidence that evaporation solely carried out by the sun was used in Britain (in 'sun pans'), due to the vagaries of our weather, this was probably uncommon. The later stages of evaporation usually had to involve the boiling of the brine (in 'salt pans') to achieve high enough salinities to enable the salt to crystallise out. The methods used in the past (albeit in other regions and at different times) are described here in some detail so that the evidence of salt working in Sussex can be put into some sort of context.

**Figure 1. Modern salt pan at Marakkanam, Tamil Nadu, India. Photo by Sandip Dey and licensed under the Creative Commons Attribution-Share Alike 4.0 International license.**

The ideal location for sea salt extraction would be near the coast, in a wide area where the sea regularly has an influx. This area should be flat and low-lying so that seawater can be channelled in and allowed to evaporate. Large estuaries would be suitable candidates.

Lewis[7] quotes from 16th Century correspondence that gives an insight into the type of location needed:

> *"….the worke must be set upon A salt marshe or flatte neare the deepest Sea you canne fynd, and distant fromm all fresshe springs or fresshe Rivers twoo myles if it maye be or A myle and A haulf at the least. The marshe must be so chosen as the Sea maye be taken into it at everye hye tyde….."*

There were two approaches. One simply involved letting seawater flow in to a series of shallow excavations and trenches. Water was allowed to evaporate and increase in salinity through the sun's action and then it was passed in to other, progressively shallower troughs, the final recommended depth for a sun pan being about 4cm. Agricola[3] and Brownrigg[4] show how solar evaporation of seawater might have taken place in the 16th and 18th centuries (Figures 2 and 3) and it is likely that this method had been in use for at least hundreds of years prior to that time. It would have been important to know when to pass one batch of brine to the next pan and this fact, coupled with our inconsistent and unpredictable weather, indicates that those engaged in this activity (the 'salters') had to have a certain amount of skill and experience.

Solar evaporation obviously saved on the use of fuel but of course it could not always be

guaranteed and so, after as much concentration by the sun as possible, the brine was heated in pans above a fire in a salthouse, which would probably consist of a small building with a roof to offer protection from the elements.

The second method involved scraping off surface silt and sand which had been exposed to the sea. The ideal material was that located between ordinary and spring high tide levels, following the spring tides. The high spring tides would have covered the shore for 3 or 4 days before and after the full new moon and thus the sand and silt would be impregnated with salt. This material was excavated and transported (possibly by horses) to trenches or wooden troughs lined with clay and sometimes sods were placed at the base to act as a filter. The salt was washed off with fresh or sea water and the resulting brine treated in the same way as above.

An enhancement of this latter method involved putting sand in a trench, letting in seawater, and then leaving the water to naturally evaporate. When this was completed more seawater was allowed in and evaporation achieved a second time, and so on. After a series of seawater influxes and evaporation the salt encrusted sand could be washed as above.

In the Netherlands, peat was commonly utilised in place of sand. This had the advantage that, once impregnated with salt, it could be burned and the ashes leached with water, thus dealing with much smaller volumes of solid material.

These methods were all in use in Britain and Ireland, but obviously the sun is needed, at least for the initial concentration, and abundant rain would have been detrimental. So the southern and eastern parts of Britain were favourable and most work just took place in the summer months when there was more sunshine and less rain and mist to dilute the brine. This is supported by the times when Medieval saltwork rentals were paid - St Botolphs Day, 17 June and Michaelmas day, September 29th. As noted by Fiennes[5], writing about 1695:

*"Their Season for makeing Salt is not above 4 or 5 Months in y$^{e}$ year and y$^{t}$ only in a dry Summer"*

The work was probably carried out on a part-time basis, for instance by farmers. They would have leased the salt works and would have to pay 'renders' to tennants-in-chief in salt in kind or money. However, even though they may have also been farmers, as outlined below the process required a certain degree of skill and experience.


A—Sea. B—Pool. C—Gate. D—Trenches. E—Salt basins. F—Rake. G—Shovel.

**Figure 2. 16th Century sun pans figured by Agricola[3].**

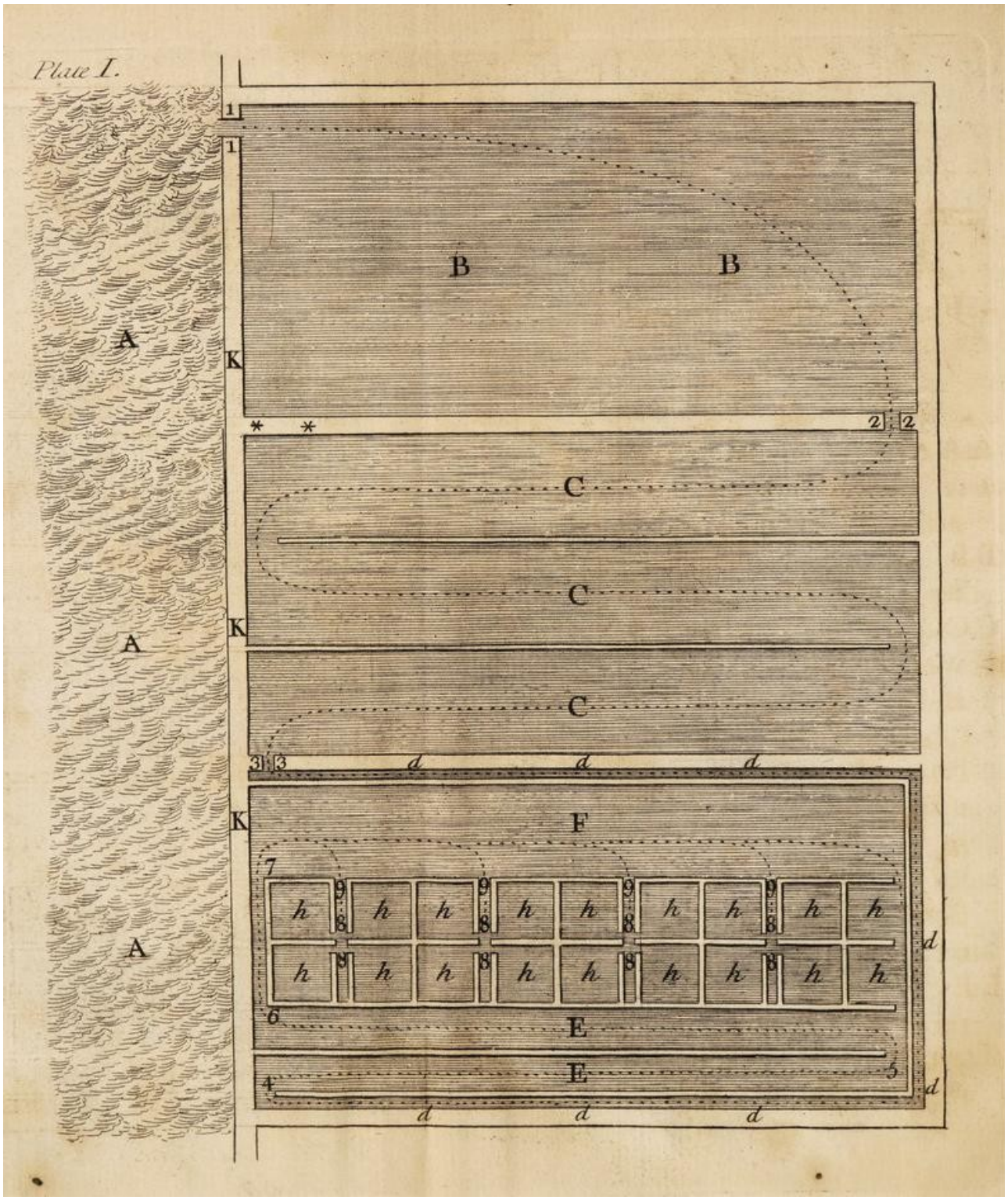


**Figure 3. Plan of sun pans as used in France in the early 1700s by Brownrigg[4]. A=sea; B= first receptacle, 20 inches deep; C= second receptacle, 10 inches deep; h=salt crystallisation chambers, each 15 by 14 feet and no more than 1½ inches deep.**

Boiling of the brine ('pickling') was achieved over fires fuelled (at first) with peat or wood. The Sussex Weald could have provided ample supplies of wood but even so it would have been a potentially expensive resource, not least because of competition from the iron smelting industry and its value as an important Sussex export. It is hardly surprising that grants were made specifically for fuel resources (both wood and peat). It was only later (and in suitable parts of the country) that coal could be used as a fuel. Some of the coastal areas of NE England, Cumberland and Scotland had a particular advantage because there coal seams outcropped on the coast. Other areas had to purchase and import coal, adding to production costs.

In the Bronze and Iron Ages the brine seems to have been boiled in coarse, earthenware pottery containers. These were of low quality and broke easily, and the abundant scattered remains ('briquette' or 'briquetage') are a characteristic feature of early salt workings in Essex (forming the 'Red Hills'[10]) and have also been found in areas adjoining East Sussex, such as the Romano-British saltworks in Romney Marsh[11,12] and those in the Adur valley[13].

With the arrival of the Romans, the introduction of lead pans for heating the brine progressively occurred. Iron pans probably started to be used from the 1500s. In addition, some copper pans were noted by Fiennes[5] at Lymington.

There could be many pans in one establishment and they could have variable sizes: for example, Lewis[7] quotes 10 pans in one works in Wales, each 10 feet by 12 feet. Agricola[3] quotes dimensions of 8 by 7 by ½ a foot and Brownrigg[4] mentions that some of the pans in use in Europe were up to 3 feet in depth and 40 feet (12 metres) in diameter!

The change from lead to iron pans was not without its disadvantages. Lead pans did not corrode and were easy to make, and moreover the old pans were readily recycled into new pans. Riveted wrought iron pans on the other hand were expensive to fabricate, they were easily corroded by the brine and the rust could discolour the salt. They were also not recyclable, whereas the lead pans were. On the other hand, with the introduction of coal as a fuel, it was found that the boiling of brine in lead pans frequently melted the lead.

There is no doubt that the environment in which the brine was boiled was not a pleasant one. As an example, Agricola[3] noted:

> "*He, on account of the great heat of the workshop, wears a straw cap on his head and a breech cloth, being otherwise quite naked*."

Because the sodium chloride salt crystallises after the calcium salts but before the magnesium and potassium salts, the salters had use their skill to ensure the product was pure, with no contamination. Calcium carbonate and gypsum would crystallise first and form a scale to the sides of the pan (the 'scratch' of the salters). Then halite (sodium chloride) crystals form once about 90% of the seawater has evaporated and these would be ladled out so that remaining impurities ('bitterns') would not contaminate the salt. The salt crystals were then put in baskets to allow the bitterns to drain away (Figure 4).

Fiennes[5] described how the crystallising salt was removed at Lymington:

*"….and as it Candy's about y^e^ Edges or bottom so they Shovell it up and fill it in great Basketsand so the thinner part runns through on Moulds they set to Catch it, w^ch^ they Call Salt Cakes."*

The salinity of the brine was tested with a newly-laid egg or an amber bead as these would float when the density of the brine was high enough:

*"….to be boyled, till it will either bear A newe lady egg or an amber beade…"*[7]

By the 1700s more refined measuring devices were in use, including artificial eggs of various densities made of lead, silver or glass[8].

Bitterns have an unpleasant taste and make the salt deliquescent ('melts', i.e. absorbs water). Bitterns were later used for producing magnesium and potassium salts (e.g. Epsom salts, Mg sulphate, for medicinal use). However, this process is quite complex and all sorts of other salts can form during the later stages of evaporation after halite formation, so it was unlikely to have been a widespread practice.

Various protein-rich substances were often added to the brine to clarify it and remove turbidity. These included blood, egg whites or ale and they formed a froth in which the fine suspended solid matter could be collected and skimmed off. Similarly, a large number of rather obscure substances (alum, butter, even 'dog fat'!) were often added to improve the crystallisation and affect the grain size, although Brownrigg[4] does comment that many were never fully tested and seem more used because of custom.

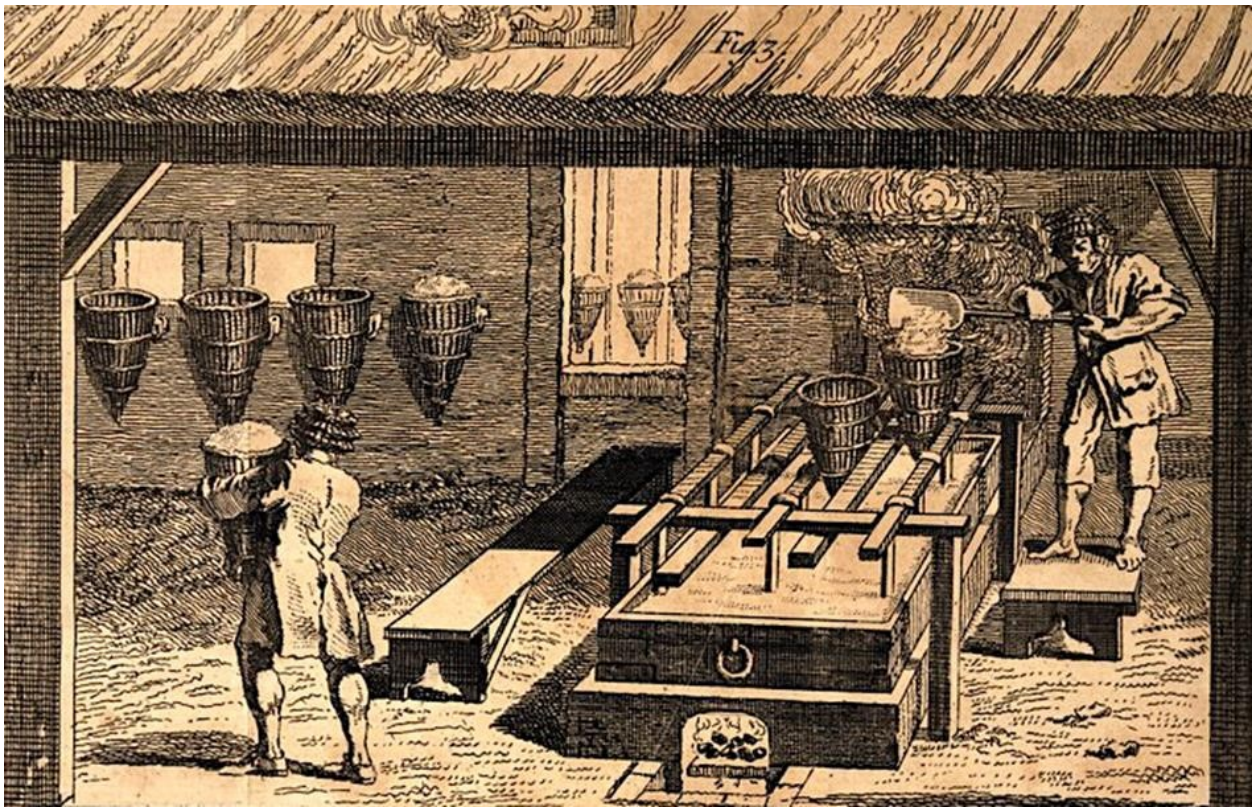


**Figure 4. A 16th Century saltworks (from Brownrigg[4]). This image shows the brine being heated and a worker scooping out the crystallising salt and placing it in wicker baskets to drain.**

The rate of heating affected the final grain size of the salt crystals - coarser salt was produced by slow evaporation (e.g. sun drying) and this was favoured for fish curing. Finer salt was generated by more rapid boiling and was used for table salt and other domestic uses. Thus, in the accounts of Battle Abbey during the 13th to early 16th centuries, we see numerous purchases of both 'lump' salt and 'white' (or 'fine') salt[14], each presumably being for different end uses.

After sand/silt washing the exhausted material was discarded in piles and often these are the only indication that salt working has in the past taken place (see below). These raised the ground level and had the unconscious effect of reclaiming the land and pushing new salt works nearer the sea. The reclaimed ground could then be used for pasture and/or settlement.

## Salt extraction in the local area

Two areas near Battle were worked extensively for salt - Pevensey Levels and the 'Rye Camber' or 'Camera Romaneo'[18], the large area surrounding the town of Rye, both to the west at Winchelsea and Pett Level, and to the east in Walland and Romney Marshes. The evidence for former salt working in these areas is derived both from historic documents and visible remains.

## Documentary evidence

In the historical documentation regarding the extraction of salt there are several terms which often do not have consistent usage. The Latin term used for a salt working site in both Anglo-Saxon charters and the Domesday Book is '*salina*' ('*salinis*'). The Old English equivalent of this term is '*sealtœrn*' (=saltern). The terms 'salt pan' and 'saltern' are often used interchangeably in Medieval and later records, but the former should describe the receptacle in which the water is evaporated or boiled whilst the latter can also be the (broader) term for the whole enterprise.

The terms salthouse ('*domo salina*'), salt sheds ('*tuguriis salinariis'*), salt works, and saltcote also sometimes appear but these could refer not only to salt extraction works but also to places where salt was prepared or sold. Similarly, a salter could be anyone who worked with salt. Note that the words 'salting' or 'salts' relate to estuarine regions which are regularly covered by tides, with no implication of a salt industry.

Some local place names provide evidence for the historical salt industry. For instance at Rye we see (present day) Saltcote Lane, Saltcote Place, and Saltbarn Farm, and at Pevensey formerly there was Saltcote - arable land northwest of Pevensey and also at Hooe (see below).

Salterns were probably present in the Pevensey Levels during Anglo-Saxon times as there are charters during the 8th to 10th Centuries gifting land containing them to the Abbey of St. Denis in France[15,16]. (There have been doubts expressed regarding the authenticity of these charters, but this would probably still not discount the presence of salterns here at the time; see for example Foord[18]). The Domesday Book of 1086 confirms that salterns existed before the Conquest and informs us who those Saxon owners were and who the new Norman owners were after 1066[17,18]. It is of interest to note from the Domesday records that Sussex had the most salt workings of any English county. Of these, Count Robert of Mortain held the largest number by one individual (just slightly more than King William) and the largest number in one place (100) were held by the Abbey of Fécamp, both before and after the Conquest.

The locations of salt workings mentioned in the Domesday Book can be confusing. For instance

'*Rameslie*', where the Fécamp Abbey's holdings were, probably refers to the greater Rye area. And '*Medehei*' was probably between Ninfield and Hooe, but has otherwise not been located. A further problem with locations mentioned in the Domesday Book relates to holdings associated with locations such as Netherfield, well away from the coast. By analogy with some other entries, it is likely that these locations relate to the parent manor rather than the actual sites of extraction. (There are natural springs depositing calcium salts in the Netherfield area, but it seems unlikely that these could furnish enough of a useful product for 8 saltpans).

At the time of the Domesday Book, Battle Abbey held no salt workings. However, this changed and there was a trend amongst wealthy families to endow salt works to local monastic houses[19] (including those at Battle, Canterbury and Chichester). For example, in the Battle Abbey chronicles, written in the mid-1100s, there is a reference to William de Briouze giving to Battle Abbey one hundred *ambrae*[20] of salt annually in the late 11th century. Also one of his knights, Ralph, son of Theodore, gave 100 *ambrae* from his holding at Cookham (Cokeham, near Shoreham). And Osbern, son of Isilia, gave Battle church two salt pans and land for making a third at Rye.

This patronage must have continued, as around 1280 there is a record of a 'quit claim' for 10 shillings by Richard, son and heir of Stephen de Saltcote deceased to the abbot and convent of Battle all the tenement at the Saltcotes in Hooe[21]. Along with these gifts, the early abbots of the Abbey undertook a major programme of acquisitions of land and property, and this certainly included some salterns.

The Battle Abbey accounts also give numerous examples of salt purchases but it is unfortunate that they rarely state where this salt came from. One exception is in 1369-70 when lump salt was bought at *Schorham* (presumably Shoreham).

The records of salt production in the Pevensey Levels are intermittent but demonstrate that salt production continued during the 12th and 13th Centuries. For instance, the records for 1230-1231 demonstrate that William de Monte Acuto, who held land at *Bestenover* (area southeast of Pevensey Bridge), was receiving 18 ambers of salt from part of his land[22]. But by the end of the 1200s there are no more references to salt production here and it seems reasonable to conclude that the industry did not continue much after this time.

However, in the Rye area, salt extraction seems to have continued for longer, although progressively much reduced in scale. Winchelsea was certainly making salt in the 13th century because Matthew Paris recorded the destruction of salt sheds/huts in the great storm of 1250[23,24]. And there were still (Dutch) saltworkers in Winchelsea in the 15th Century[25]. Salt extraction east of Rye continued until at least the late 1300s in Walland and Romney marshes[26] and at New Romney, salt workings owned by the Archbishop of Canterbury managed to continue until at least the mid 16th Century[27]. Finally there is even an ambiguous and enigmatic reference to a Hampshire saltmaker taking out a 99-year lease on some marshland near Rye in 1718[28], although it is not entirely clear if this was specifically for salt extraction.

## Physical evidence

Only a minimal amount of archaeological evidence has been discovered to elucidate the nature of these historic Sussex salt workings. In any case, it is unlikely that many physical remains would

be found because of the primitive superstructure needed for operation.

The best examples are located east of Rye where, on the basis of briquetage, extensive Romano- British salt works have been postulated at Dymchurch, Ruckinge and Scotney Court near Camber[11,12].

However, there is some physical evidence of old salt working at both Pevensey Levels and the Rye area. And this evidence suggests that different extraction methods may have been used at these two locations.

Some possible **sun** pans were briefly exposed on the foreshore at Pett Level in the mid 1960s, when beach shingle had been washed away[24,29] (Figure 5). These were situated below high tide level and were exposed over an area of about 18m by 365m along the shoreline. Individual excavations had a rectilinear shape and took the form of shallow pits c.5m by 5m, with flat floors in clay. Some were mere 'scratchings', one had a depth of 50cm. It was suggested that, because these basins were at different levels and were interconnected, they could have been constructed to allow brine to move from one to another as the salinity increased, just as described by Agricola. In any case, their position supports the proposal that the *relative* sea level in this area was previously at least one metre lower than at present. They could be pre-Medieval in age; for instance the Romans were active in the area[18]. But perhaps more likely they are of Medieval age and, if so, could represent some tantalising evidence of industry associated with Old Winchelsea.

On Pevensey Levels, Dulley[30] recorded a series of small mounds which were thought to be the possible remains of silt washing. (It is interesting to note that earlier editions of Ordnance Survey maps do not figure these but the most recent versions do, possibly prompted by Dulley's observations.) Although they are unremarkable and easily missed, they can be viewed today on the ground as small mounds with an oval shape, 1-2m high and average 15m in diameter (Figure 6). Their dimensions have presumably been much reduced by erosion and ploughing, but they can just about be discerned from satellite images where the slightly raised ground is better drained and is covered by more succulent grass growth (Figure 7).

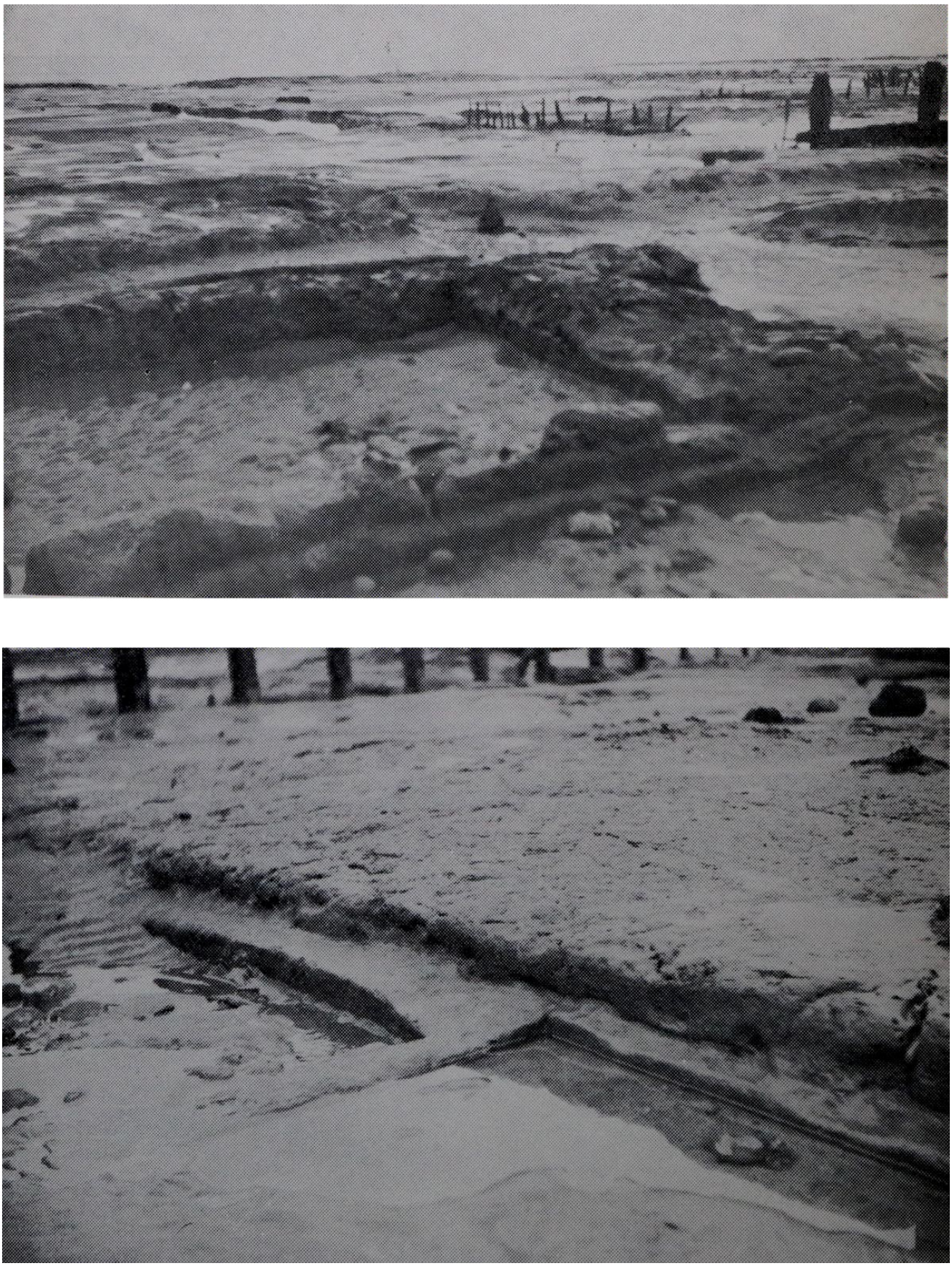

**Figure 5. Possible sun pans at Pett Level observed by Lovegrove[29]. (Images produced with permission from Sussex Archaeological Society).**

**Figure 6. Photographs of postulated salt waste mounds in the Pevensey Levels.**

**Upper image: Mound just north of Horseye Farm. Looking NW, with Hailsham on the horizon. Also see Figure 8c.**

**Lower image: Area adjacent to Waller's Haven looking NW. (The white spire in the distance is that of Wartling Church). Also see Figures 7 and 8a.**

They are however picked out quite readily by Lidar[31], a technique which also seems to be able to pick out other similar mounds which have not been mapped before (Figure 8). Dulley noted that these mounds were mostly made of 'clay'. Only one appeared to contain some burnt material and so it is interesting to speculate what methods were used when there appears to be so little briquetage remains. More recently, various pottery, metal and other artefacts have been found close to a possible salt washing mound just north of Pevensey[32]; their ages spanned the 13th to 17th Centuries, but it is not clear how closely they were associated with the perceived, nearby salt workings.

These mounds are now quite distant from the present day shoreline and have been left stranded due to forward progress of the land by reclamation and natural silting. This observation would support the notion that they are at least Medieval in age.

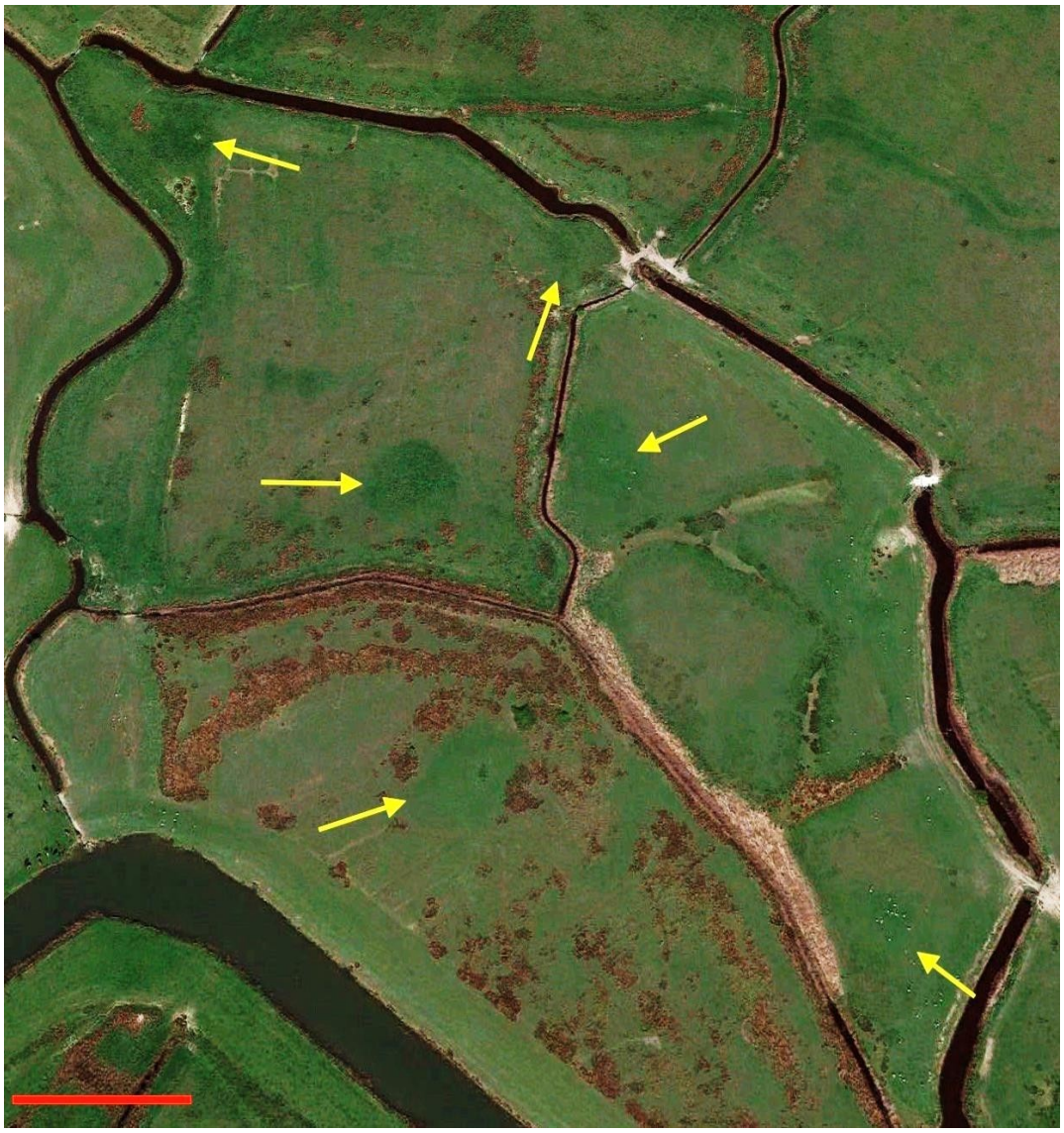

**Figure 7. Satellite image of part of Pevensey Levels with positions of postulated salt waste mounds indicated by arrows. Note the slight variation in vegetation (sometimes favoured by the grazing sheep!).**

**For reference, the centre of the image is at approximate Ordnance Survey grid reference TQ676065. Scale bar = 75m. Google Earth Image. See image 6a for comparison.**

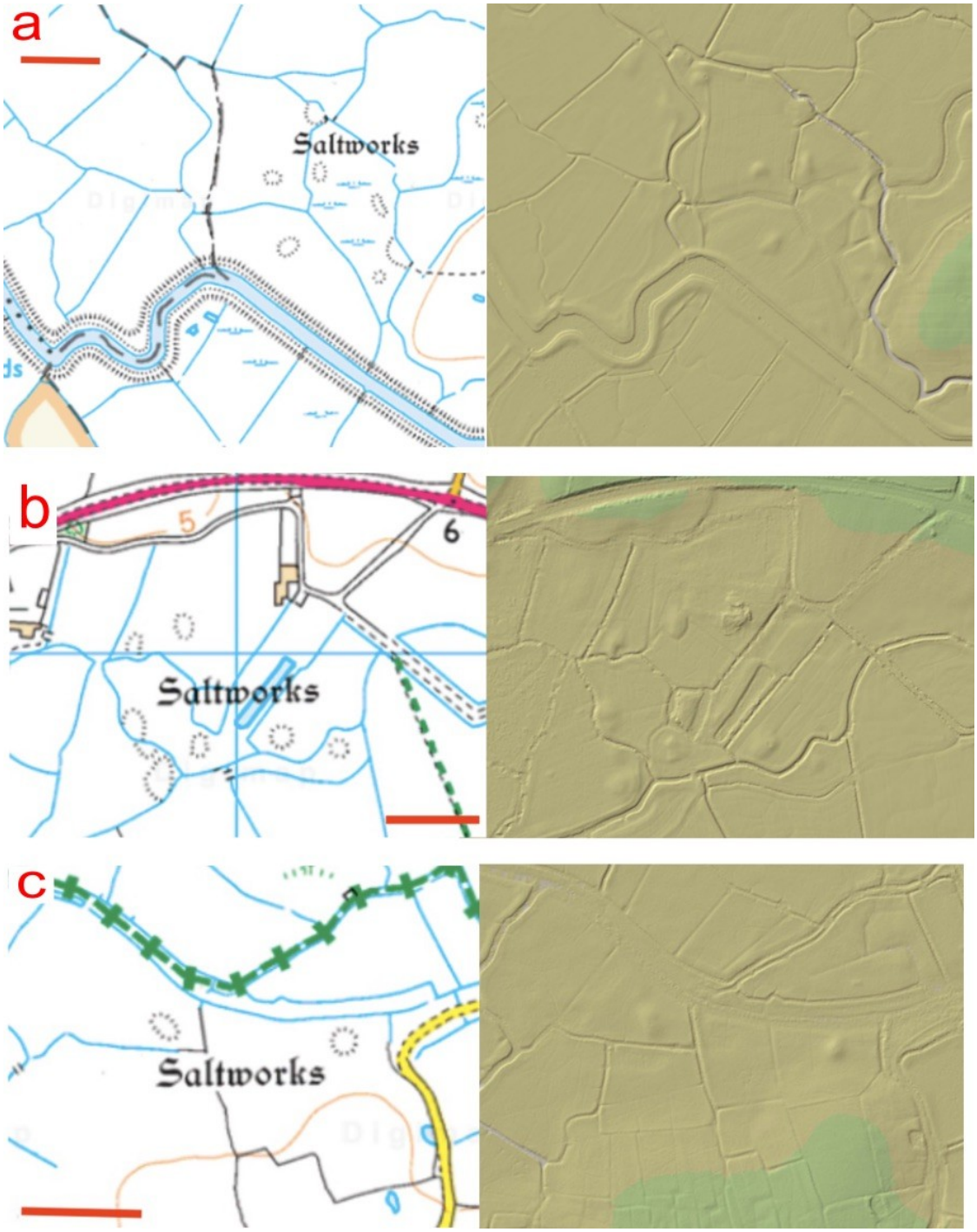


**Figure 8. Digital Terrain Model (DTM) Lidar images and corresponding Ordnance Survey maps (at the same scale) of postulated salt washing waste mounds on selected parts of Pevensey Levels. The scale bars on the Ordnance Survey maps represent approximately 130m. Lidar colour coding represents elevation differences (vertical resolution ±15cm).**

**a) Centred on Ordnance Survey grid reference TQ675065.**
**b) Centred on Ordnance Survey grid reference TQ680080.**
**c) Centred on Ordnance Survey grid reference TQ626086.**

*Lidar images obtained from Department for Environment, Food and Rural Affairs (https://environment.data.gov.uk). Open Government licence v3.0 Crown Copyright. Topographic maps obtained using Digimap Ordnance Survey Collection (https://digimap.edina.ac.uk), created 10 November 2020. Crown Copyright.*

## Why was the extraction of Sussex salt discontinued?

Initially, salt from Sussex and other coastal areas would have had the advantage of easy transport from local marine ports, especially to the important market of London. In the early days the inland salt industry of Droitwich and Cheshire remained only of local importance as land carriage costs were such that any salt reaching London by this means would only be affordable to the rich. However, salt from the La Baie de Bourgneuf on the Biscay coast was also imported into Britain in large amounts, presumably because the reliable climate meant that it could be made at a much cheaper price. In addition, during the Hundred Years War, ships carrying arms out of ports such as Rye to Gascony could profitably make the return voyage laden with French salt.

By the mid 14th century English salt production had reached a low point (partly because of famine and the Black Death) and from that time onwards the country became more reliant on imported salt from western France. A large supply of salt was necessary for the important fish trade in Medieval Rye (especially for salting herring) and Draper[27] has stressed the importance of salt as a major trading commodity. Apparently though it was also a commodity that was being smuggled **out** of the county in the 14th Century, presumably to avoid customs duties[33].

Subsequent conflicts with France from the 16th Century onwards meant that supplies of foreign salt again were often disrupted. Therefore, there was a constant search for new sites for home production and several new sea salt ventures were set up along the south and east coasts of England, and a considerable quantity of salt also came from Scotland, where cheap coastal coal was used to evaporate seawater in iron pans.

No doubt the supply of wood for fuel was always an issue. When supplies of wood diminished in the Cheshire and Staffordshire areas in the early 1600s the salt makers were forced to change to cheaper coal, then readily obtainable from the nearby mines in Lancashire, East Cheshire and North Staffordshire. This would not have been possible in the Sussex area as resources of coal were not easily available as a replacement.

Brownrigg in 1748 noted how foreign salt production was more efficient in other countries and put forward improvements so that:

*"….large sums of money might be saved in the nation, which are now annually paid to the French and other foreigners; its fisheries might be greatly improved; and its navies and commerce, and many of its richest colonies would no longer depend on its enemies for one of those necessaries……"*[4]

In spite of this drive, there appears to be only limited evidence for some salt working in East Sussex after the 1300s (in contrast to the situation in areas such as East Anglia, Hampshire, Cheshire, and Worcestershire). In any case, seawater salt extraction throughout Britain started to decline greatly in the 1700s and rock salt production in Cheshire started to become dominant as underground mining developed and inland transport became easier. Various seawater salt works did continue into the 19th Century and indeed some 'artisan' salt is still being produced today in the traditional manner from seawater on the British and Irish coastlines (albeit in relatively small quantities).

As mentioned above, there seems to be several reasons for the decline in the national seasalt industry. But why did the East Sussex salt industry end relatively early compared to the situation at other coastal British locations? The most likely explanation seems to relate to the changing nature of the East Sussex coastline over the last 1000 years.

In Pevensey Levels there was silting up of the lagoonal area and sea retreat, but much of this was promoted by human activity. Reclamation ('innings') of these marshes for farming started at least in the 12th century and was partly responsible for the demise of the salt industry. It appears that the salt workings had all but gone by the end of the 1200s as the Pevensey lagoon was reclaimed for farming. Ironically the reclamation to allow arable farming was not entirely successful and this, combined with the effects of the ensuing climatic conditions, meant that the land was only suitable for pasture, a use that has continued to the present day. The demise of these salterns on Pevensey Levels no doubt contributed to the abandoning of Medieval villages such as Barnhorne, Northeye, Horseye, and Manxey, and was coupled with the diminishing importance of Pevensey as a port.

Rye and Winchelsea's importance as ports and commercial centres flourished after the 1200s (both for fishing and transport) and so the important salt extraction industry continued for a while longer. But here too a marked change occurred when the sea started to retreat and the estuaries silted up. The silting of the River Brede at (New) Winchelsea led to its earlier decline but the River Rother also changed its course and sites such as Saltcote were fed by fresh, rather than salt, water. And here, as at Pevensey, the local marshes were drained and reclaimed for farming. Coupled with the changing coastline was the occurrence of large storms, flooding and generally adverse weather conditions at various times during the period 1250-1330; these combined to destroy places such as Old Winchelsea and would also have inundated and destroyed any salt working areas and associated infrastructure.

**David Alderton**



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## NOTES

1. One pound of salt for every 10 pounds of butter (see Keen, reference 17).

2. The exact link is not very clear, but more modern sources maintain that Roman soldiers were not actually paid in salt. Instead it is thought that they were typically paid in coin, but at some point their salary may have included an allowance for the purchase of salt.

3. Agricola, Georgius (1556) *De Re Metallica* (in Latin). English translation by Herbert and Lou Henry Hoover, 1912.

4. Brownrigg, W. (1748) *The art of making common salt, as now practised in most parts of the world; with several improvements proposed in that art, for the use of the British dominions.* London. (available online at https://wellcomecollection.org/works/t62rksz9)

5. Fiennes, C. (1888) *Through England on a side saddle.* Field & Tuer, The Leadenhall Press (available online at http://digital.library.upenn.edu/women/fiennes/saddle/saddle.html)

6. Defoe, D. (1753) *A tour thro' the whole island of Great Britain*. 5th edition (available online at https://archive.org)

7. Lewis, W.J. (1953) A Welsh salt-making venture of the sixteenth century. *National Library of Wales Journal,* 8, 419-425.

8. Greenwood, J. (2012) The changing technology of post Medieval salt production in Hampshire. *Proceedings Hampshire Field Club Archaeology Society*, 67 (part II), 366-378.

9. As the salt concentration (salinity) increases through loss of water, the solubility limits of various chemicals dissolved in the water are exceeded and they start to crystallise as solids. In an enclosed body of seawater this sequence is: calcium carbonate (limestone), hydrated calcium sulphate (gypsum), sodium chloride (halite, common salt) and then a complex series of chlorides and sulphates containing magnesium and potassium.

10. Fawn, A.J. (1990) *The Red Hills of Essex: Salt-making in antiquity*. Colchester Archaeological Group.

11. Barber, L (1998) An early Romano-British salt-working site at Scotney Court. *Archaeologia Cantiana*, 118, 327-354 (available on line at http://kentarchaeology.org.uk/research/archaeologia-cantiana/)

12. Cunliffe, B. (1988) Romney Marsh in the Roman period. (In) *Romney Marsh: evolution, occupation, reclamation* (eds. J.Eddison and C.Green), Oxford University Committee for Archaeology, Monograph 24, 83-87.

13. Holden, E. and Hudson, T.P. (1981) Salt-making in the Adur Valley, Sussex. *Sussex Archaeological Collections,* 119, 117-148.

14. Searle, E. and Ross, B. (1967) *Accounts of the cellarers of Battle Abbey 1275-1513*. Sydney University Press.

15. Gifts of land (including 'saltpans') around Hastings and Pevensey to the Abbey of St Denis, France. Barker, E.E. (1948) Sussex Anglo-Saxon charters (part II). *Sussex Archaeological Collections*,

87, 112-163. Barker, E.E. (1949) Sussex Anglo-Saxon charters (part III). *Sussex Archaeological Collections,* 88, 51-113.

16. These charters can also be viewed online at 'The electronic Sawyer', an online catalogue of Anglo-Saxon charters. https://esawyer.lib.cam.ac.uk/about/index.html. This is a revised, updated, and expanded version of Peter Sawyer's *Anglo-Saxon Charters: an Annotated List and Bibliography*, published by the Royal Historical Society in 1968.

17. Keen, L. (1989) Coastal salt production in Norman England. *Proceedings of the Battle Conference 1988, Anglo-Norman studies XI* (ed. R. A. Brown), The Boydell Press, Woodbridge, 133-179.

18. Foord, K. (2020) *BC to 1066*. Battle and District Historical Society.

19. Searle, E. (1980) (editor and translator) *The Chronicle of Battle Abbey*. Clarendon Press, Oxford.

20. Ambra (amber) - vessel with one handle (pail, cask, pitcher, tankard) or (more usually) a dry or liquid measure of four bushels. The measure of a bushel was introduced by the Normans and was probably equivalent to 8 dry gallons, but at first not standardised.

21. Quit claim. A legal instrument used to transfer interest in a property. The owner 'quits' any claim to the property. This document is in the East Sussex Record Office (HEH/BA/BOX7/627).

22. Salzmann, L.F. (editor) (1903) An Abstract of Feet of Fines For the County of Sussex. *Sussex Record Society,* Vol. 2, 1190-1248, no. 264 (available online at British History Online http://www.british-history.ac.uk/feet-of-fines-sussex/vol1).

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24. Holden, E.W. (1968) Possible Medieval salt pans at Pett Level. *Sussex Notes and Queries* (1967), 16, 301-304.

25. Personal communication from Vollans in Tooley, M. (1995) Romney Marsh: the debatable ground. (In) *Romney Marsh: the debatable ground* (ed. J.Eddison), Oxford University Committee for Archaeology, Monograph 41, 1-7.

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28. Dell (1962) *The records of Rye Corporation*. East Sussex County Council, Lewes.

29. Lovegrove, H. (1968) Possible Medieval salt pans at Pett Level, Sussex. *Sussex Notes and Queries (*1966), 16, 253-255.

30. Dulley, A.J.F. (1966) The Level and Port of Pevensey in the Middle Ages. *Sussex Archaeological Collections*, 104, 26-455.

31. Lidar. ‘Light Detection and Ranging’. Very rapid laser pulses (thousands of times per second) are fired at the ground from an aircraft and the time taken for each pulse to return to a detector gives a measure of the relative height. These points are then converted into a highly detailed terrain model of the surface of the earth, with a resolution of a few centimetres.

32. A Medieval salt working site at Pevensey. *Eastbourne Natural History and Archaeological Society* (2004) This document is in the East Sussex Record Office (R/R/36/13981).

33. Searle, E. (1974) *Lordship and community.* Pontifical Institute of Mediaeval Studies, Toronto, Canada.

## USEFUL WEB SITES

Agricola’s De Re Metallica (Project Gutenberg ebook, translated into English from the Latin)
https://www.gutenberg.org/files/38015/38015-h/38015-h.htm

Historic England article on early salterns
https://historicengland.org.uk/images-books/publications/iha-preindustrial-salterns/

Online searchable Domesday Book
https://opendomesday.org/

A good summary of the development of the salt industry in the UK
https://saltassociation.co.uk/education/salt-history/