The Marl Pits of West Sussex

By

Emma Jeffery

This study of West Sussex Marl Pits was carried out by Emma Jeffery in 2008 as part of her work experience with the West Sussex Record Office Tithes Maps Project.

Due to the limited period available for the study, only a proportion of the Tithe Maps and Apportionments were looked at. These are listed in Appendix ix.

Contents

Marl Pits in West Sussex

What is marl and what was it used for?

Marl is a mixture of clay and limestone that is often formed by the erosion of other rocks. The quantities of these different components vary, as is seen in Appendix i. with the term 'marl' often being used to cover a miscellany of soils. There are, however, two main types of marl: shell marl which is often found in maritime locations and which consists of dissolved animal shells; and earth marl which is more common and sometimes contains fossils (Appendix i).

Marl was used as a form of fertiliser to revive the soil. This was achieved in a number of ways. For instance, it improved the water-holding capacity of the soil, helped to make nutrients more readily available to plants, caused the soil to have a more open and friable structure and acidified the soil. This is why it was often spread on sandy soils and chalks. The effect of this marl on the soil was, however, slower than that of lime. It would often last for around 30 years and is recorded to have increased the agricultural output of land on which it was used. For example, the records of the Christ Church Estates in 1309 show that on a non-marled land there was an average of 22.22 bushels of oats an acre and an average of 34.58 bushels of oats an acre on marled land.[1]

The practice of marling

Marling was not a regular practice, because the effects of it lasted for such a long time (around 30 years) which meant that it only needed to be carried out every generation or so. When it was used, however, it required thorough mixing with the earth and to be distributed on an extensive scale in order for it to be effective. Ideally it was spread in winter or autumn to achieve optimum effect, although it would appear that in practice it was often spread in the summer or spring. It required a relatively large amount of labour, with five to six men typically working for a fortnight under the supervision of the 'Lord of the Pit'.[2] The importance of this marl to agriculture and for the estates is reflected in the fact that landowners would actively search for marl, as is recorded in the Marchmont Estate in Berwickshire,[3] and in the fact that some estates, such as the Roxburghshire Estate, conserved their marl resources by restricting its sale and use to farms on their estate.[4]

The practice of marling appears to have been known about and undertaken to some extent since before the Roman occupation of Britain. Pliny records that the Celtic inhabitants of Britain, Gaul and Megara used marl in the 1st Century. There then appears to be a gap in the evidence until reference is made to the practice of marling during the 13th Century, when leases refer to the provisions made for the digging of

[1] Mate, 'Medieval Agrarian Practices: The Determining Factors?', www.bahs.org.uk/33n1a2.pdf
[2] Marl Pits around Upton Area' (www.historyofuptonbychester.org.uk/marlpits.html)
[3] Dodgina, 'Land Improvement in Scottish Farming: Marl and Lime in Roxburghshire and Berwickshire in the 18th Century', www.bahs.org.uk/26n1a1.pdf
[4] Dodgina, 'Land Improvement in Scottish Farming: Marl and Lime in Roxburghshire and Berwickshire in the 18th Century', www.bahs.org.uk/26n1a1.pdf

marlpits. This practice did not, however, fully take off until approximately the 16th Century. The 16th, 17th and early 18th Centuries, were characterised by an increase in the number of marlpits and the practice of marling, partly because of the agricultural revolution which was taking place, along with population pressures and an increase in food prices which necessitated a growth in agricultural output. This continued until the late 18th Century, when lime began to supplant marl because of its greater convenience, its more rapid effect on the soil, its greater availability commercially and the shortage of labour for marling, along with the improved transport networks which enabled lime to become the more dominant fertiliser. Lime was later supplanted by artificial fertilisers in the mid-19th Century.

Marlpits

Marlpits varied in size depending on a number of factors, most typically the amount of marl available. On average, however, they tended to be 30-50 feet across and more than 20 feet deep. The pits tended to have a square-edged gentle slope at one end, where carts full of marl would be hauled over, and a steep rounded edge at the other.[5] They were often situated in the middle of agricultural fields in order to make the spreading of the marl easier, but it has been suggested that they could alternatively have lined access-baulks or been situated where two furlongs met.[6]

The remains of marlpits often seem to have been filled with water so that they sometimes have the appearance of ponds. They also sometimes become bowl-shaped and about 30 yards wide at the time they were abandoned (Appendix ii).

Historical Evidence for Marling and Marlpits

There is a variety of documentary and historical references to and evidence for the practice of marling and marlpits. These references fall come under a number of different categories, including didactic literature, legal documents relating to marlpits and writers referring coincidentally to marl for no specific reason.

Didactic literature from the 17th Century advises the use of marl because of the benefits it brings to the soil. For example, Gervase Markham was an early 17th Century enthusiast for the use of marl because the effects of it lasted for a long period of time.[7] It was not, however, just in this period that marling was encouraged through literature, as Walter of Henley was an advocator of the use of marl from the early 13th Century.[8]

Official and legal documents appear to refer to marl and the importance that was attached to it throughout a number of different time periods. For example, a 1095 Cartulary of the Lewes Priory of St Pancras refers to marl[9] and an early 14th Century

[5] 'Marl Pits around Upton Area' (www.historyofuptonbychester.org.uk/marlpits.html)
[6] Beresford, 'Revisions in Economic History: XI. Ridge and Furrow and the Open Fields', *The Economic History Review* (1948, V.1, No.1, pp.34-45)
[7] Fussell, 'Marl: An Ancient Manure' in *Nature* (Jan 24/59, V.183)
[8] Fussell, 'Marl: An Ancient Manure' in *Nature* (Jan 24/59, V.183)
[9] 'Marl-Harting' (127A/5)

ordinance from the Canterbury Cathedral Priory states that lots of land should be marled.[10]

Other references to marling occur throughout the ages from Greek mythology and by Pliny[11] to James Grieve's 1796 diary that describes the process of marling.[12] These sources can help give insight into the dating of the practice of marling. For example, A. Beatson's 1821 'New System of Cultivation' records the fact that marling ceased about 40-50 years before[13] with many late 18th Century writers believing that lime supplanted marl.[14] An idea of when the practice of marling became widespread is gained from the fact that, for instance, Pococke records seeing his first marlpits in Beaulieu around 1750.[15] Individual writers can also provide more technical information about the process of marling, such as A. Low's account from Berwickshire which records that the cost of marling was approximately £35 per ten acres.[16]

Specific documentary/archaeological/other evidence for marlpits in West Sussex

Documentary evidence for the practice of marling and marlpits within West Sussex is sparse and often coincidental. For example, the records of Ashdown Forest record the granting of a marlpit to Vincent in 1688[17] with a 1757 Harting deed transferring land including the right to dig and carry away marl. However, there are some examples of more thorough references to marling such as the 18th Century book on husbandry which calculated that the white marl near Duncton contained 7510 calcium carbonate.[18] Also the letter from de Senliz to Ralph de Nevill (the Bishop of Chichester) about the occurrence of marling at Watersfield and the fact that the marl at Selsey was said to be the best.[19] Similarly, P.J. Martin records in 1855 that marlpits in the North part of Siddlesham and Hounston were abandoned because more pure marl was discovered at the foot of the Downs and a letter from John Pay to the lord of the manor in West Harting asks for the right to dig for marl in his neighbour's hedge.[20] An interesting reference is found in the 1645 Slaugham Parish Registers, where John Peacocke is recorded to have drowned in a marlpit.[21]

---

[10] Mate, 'Medieval Agrarian Practices: The Determining Factors?', www.bahs.org.uk/33n1a2.pdf
[11] Fussell, 'Marl: An Ancient Manure' in *Nature* (Jan 24/59, V.183)
[12] Dodgina, 'Land Improvement in Scottish Farming: Marl and Lime in Roxburghshire and Berwickshire in the 18th Century', www.bahs.org.uk/26n1a1.pdf
[13] Brandon, *The Sussex Landscape*, p.191
[14] Dodgina, 'Land Improvement in Scottish Farming: Marl and Lime in Roxburghshire and Berwickshire in the 18th Century', www.bahs.org.uk/26n1a1.pdf
[15] Fussell, 'English Countryside and Population in the 18th Century', *Economic Geography* (1936, V12, No.3, pp.294-310)
[16] Dodgina, 'Land Improvement in Scottish Farming: Marl and Lime in Roxburghshire and Berwickshire in the 18th Century', www.bahs.org.uk/26n1a1.pdf
[17] *Sussex Archaeological Collections*, V.81, p.131 (Ashdown Forest and its Inclosures)
[18] *Sussex Industrial Archaeological Society*, Newsletter SIASG3 (www.snowing.co.uk/sias/newsletters_siasg/newsletter_siasg_3.htm)
[19] *Sussex Archaeological Collections*, V.3, p.62 (Letters to Ralph de Nevill, Bishop of Chichester)
[20] 'Marl-Harting' (127A/5)
[21] *Sussex Industrial Archaeological Society*, Newsletter SIASG3 (www.snowing.co.uk/sias/newsletters_siasg/newsletter_siasg_3.htm)

There have been very few archaeological excavations or surveys of possible marlpits, with the exception of the detailed earthwork survey undertaken by Cotswold Archaeological Trust in November 2001 at Sharpthorne. This revealed a number of different phases of activity in the area, including a marlpit.

Very little information is available in West Sussex County Council records about the possible existence and location of marlpits with the exception of the earthwork survey at Sharpthorne, documentary evidence of a 'Marl Pit wood' in Crawley and the earthworks of two marlpits at Singleton.

Looking at the modern Ordnance Survey Street Atlas of West Sussex, some indications of the possible location of marlpits occur. There is, for example, 'Marl Pit Shaw' and 'Marl Pit Road' in Sharpthorne, 'Marlpit Lane' in Chichester, 'Marlpit Close' in East Grinstead, 'Marlpit Land' in Woodmancote, and 'Marlpost Road' and 'Marlpost Wood' in Southwater.

Some information is available about marlpits in Chidham through the Local Heritage Initiative. A restoration project has been carried out in of parts of Chidham with particular focus on Calloways Lane and Cullimers Pond. Marl pits here were cleared of brambles and other debris and then restored (Appendix iii).

Maps from other dates, such as Estate Maps and Enclosure Maps, do not appear to have any direct references to marl. For example, neither the 1628 Selham Estate Map, the 1650 Kirdford Estate Map, the 1694 Harting Estate Map, now the 1735 Worth Estate Map, have any direct references to marl. Similarly, the 1777 Aldingbourne Enclosure Map and the 1812-1813 Horsham Enclosure Map also do not mention marl or marlpits. It is important to remember, however, that this does not necessarily mean that marlpits and the practice of marling did not exist. They may simply not have been noted on these maps, or may have been depicted as ponds or other pits rather than specific marlpits. More thorough investigation of these maps is therefore required in order to fully cross-reference the locations of the marlpits on the tithe maps with these other maps.

West Sussex Place Name Evidence[22]

The linguistic derivatives of the word 'marl' appear to refer to approximately five main categories. These include the process of 'marling' itself, as in, for example, 'Marles' in Ridgwick which refers to a place where marl was dug and 'Marland Bridge' in Hailsham which refers to land which has been manured with marl. It is important to note the possible differences between land is referred to as 'Marlpits' (Maresfield) where marl is found, 'Marles' (Ridgwick) and land where marl was used as a fertiliser (as at Hailsham). It should be noted that the term 'marrol' also refers to marlpits and that both 'marn' and 'marrol' are extensions of the Sussex dialect referring to marlpits. The term 'marl' was often used to cover a wide range of

[22] Mawer and Stenton, *Place Names of Sussex*

miscellaneous soils, as Hartlib records when he states that men in Essex would call the scourings in their ditches 'marl'.[23]

'Marl' and associated words are also related to other ideas and care must therefore be taken when identifying land which may be related to the practice of marling. For example, the personal names of owners may coincidentally make apparent connections to the practice of marling, as with 'Mareland Farm' at Nuthurst which gets its name from its occupier John atte Mere. The term 'marl' also appears to have some French connections and it has been suggested that it corresponds to the French pronoun 'Maurepas' which was a term of reproach. This theory has been suggested to account for the name 'Marlpost Wood' in Horsham. Alternatively, there appear to be connections between the word 'marl' and 'mere', which is a Sussex word referring to a shallow lake or pool. This is apparent in 'Marlands' in Itchingfield that might have obtained its name as a result of two pools situated to the South of it. A final connection to the term 'marl' concerns the idea that it is derived from the term 'gemaere', an Anglo-Saxon word which refers to places on the parish boundary, as at Marley in Peasmarsh.

The link between marl pits and their underlying geology

The basic geology of West Sussex is relatively complex and is made up of both surface and bedrock geology. An understanding of this is important when evaluating the location of marl pits in relation to the underlying geology. The geological map in Appendix iv illustrates the overall location of the bedrock geological deposits of West Sussex. It is important to note that there appear to have been two main geological periods during which this bedrock was formed. These are the Eocene Epoch (from approximately 55 Mya to 34 Mya) when the Bracklesham Beds, London Clay and Reading Beds were deposited, and the Cretaceous Period (approximately 144 Mya to 65 Mya) when the Chalk, Upper Greensand, Gault Clay, Lower Greensand, Weald Clay and Tunbridge Wells Sandstones were deposited.

Because marl is a mixture of clay and limestone it is to be expected that marlpits would be found on the clay and limestone within West Sussex. It could therefore be suggested that marl, and consequently marlpits, would be found in areas which are positioned on the Weald Clay; Tunbridge Wells Sandstones and Clays; Bracklesham and Reading Beds and London Clay; and the Upper Greensand and Gault Clay (Appendix v).

Weald Clay is a lower Cretaceous sedimentary rock that was primarily a river flood plain deposit. It is found predominantly found in the 'Weald' area of Sussex. The Tunbridge Wells rocks were also river flood plain deposits and separated into an upper and lower division by the Grinstead Clay. The Bracklesham Beds were formed under shallow sea at depths of approximately 100-400feet, and often consist of clays and marls. The London Clay was also formed under shallow sea and is a stiff bluish type of clay sometimes used for manufacturing cement and bricks. Similarly, the Upper Greensand can be found under shallow sea. Gault Clay was formed under

[23] Fussell, 'Marl: An Ancient Manure' in *Nature* (Jan 24/59, V.183)

moderately deep sea, can be found in a similar location to the Upper Greensand and also used to make bricks (Appendix vi).

Other geological deposits underlying West Sussex that would not be expected to have marlpits positioned on them include the Lower Greensand, and Chalk. This Lower Greensand was formed under shallow seas and consists of four main groups, the Folkestone Beds, the Sandgate Beds, the Hythe Beds and the Atherfield Clay (where it is possible that marlpits could be found). Chalk is the main geological deposit where marlpits would definitely not be found because it is a limestone compound formed under deep marine conditions from the skeletal elements of planktonic green alga along with ammonites and shells of plankton.

Underlying Geology

Geological Deposit	Tithe Map
Tunbridge Wells Sandstones & Clays	Lower Beeding
	Slaugham
	Horsham
	Balcombe
	West Hoathley
	Worth
	Ifield (possibly)
	East Grinstead
	Cuckfield
Weald Clay	Rusper
	Kirdford
	Henfield (possibly)
	Clayton (possibly)
	Wisborough Green
	West Grinstead
	Itchingfield
	Rudgwick
	Hurstppierpoint (possibly)
	Ifield (possibly
	Petworth (possibly)
Chalk (verification needed)	Barlavington
	Didling
	Woolavington
	Pyecombe
	Harting
	Chidham
	Poynings
	Donnington
	Storrington
	Newtimber
	Funtington
	Fishbourne
Bracklesham Beds, Reading Beds & London Clay (verification needed)	Aldingbourne
	Barnham
	Merston
	Chidham
	Donnington
	Funtington
	Pagham

	Fishbourne
Folkestone Sand (verification needed)	Pyecombe
	Hurspierpoint
	Newtimber
	Storrington
	Poynings
	Hardham
	Clayton
	Henfield
Lower Greensand (verification needed)	Selham
	Pyecombe
	Henfield
	Clayton
	Poynings
	Hurstpierpoint
	Newtimber
	Petworth
Upper Greensand and Gault Clay (verification needed)	Barlavington
	Didling
	Woolavington
	Pyecombe
	Henfield
	Clayton
	Harting
	Hardham
	Poynings
	Storrington
	Hurstpierpoint
	Newtimber
	Petworth

Using Tithe Maps to locate marl pits

Tithe Maps and their accompanying Apportionments are a useful resource for identifying the location of previously existing marl pits. The Apportionments list the names of fields and properties that existed at the time the maps were created and include, for example, 'marlpit field' and 'marl field'. As a result it is often possible to identify where marl pits were sited, particularly if pits or ponds still remain.

Identifying previously existing marl pits

In order to gain as large an understanding as possible about marlpits in West Sussex from the Tithe Maps and, hopefully, identify the current locations of these marlpits, a number of steps will need to be taken. Any field on a Tithe Map or in an Apportionment that is labelled as 'marlpit field' or something relating to marl should be noted. The accumulated information can then be compared to gain an understanding of possible characteristic features of marlpits, such as the names of the fields and proximity to transport links.

Summary of names related to Marl Pits found in the West Sussex Tithe Maps

Name	Tithe Map	Plot Number(s)
Marl pit	Barnham	179
Marl pit	Slaugham	1034
Marl pit	Merston	131 (Seven)
Marl pit	Rudgwick	977, 2150, 2151, 2152, 2295, 1476, 1477
Marl pit	Newtimber	72, 148
Marl pit	East Grinstead	2207, 1344
Marl pit	Cuckfield	991
Marl pit laying	Pyecombe	126
Hop Field by Marl pit	Harting	560
Hop Garden Marl pit and Row	Harting	561
Marl pit and Rough	Barnham	181, 166, 87 (road)
	Storrington	20
Marl pit and Orchard	Barnham	183
Marl pit Piece	Funtington	132

Marl pit field	Barlavington	161
	Didling	119, 125, 124, 117
	Lower Beeding	138, 138a
	Aldingbourne	105
	Rusper	27
	Horsham	1695, 1698
	Balcombe	280, 399
	Clayton	362
	Harting	603
	West Hoathley	424, 675, 991
	Worth	775, 297, 916
	West Grinstead	1130
	Donnington	15
	Storrington	22, 23, 24, 25, 26
	Newtimber	73
	East Grinstead	2198, 1927, 1017, 320, 24, 25, 327, 2227, 347, 2068, 2524, 2069, 746, 1343
	Cuckfield	294, 2099, 2101, 1318, 1073
	Pagham	16
Great Marl Hole/ Marl Hole	Aldingbourne	104, 38
Old Marl Hole and Waste	Chidham	212
Marl Pit Wood	West Hoathley	682
	Worth	716
	East Grinstead	2070
Marl Pit Plat	West Hoathley	817, 831
Marl Pit Lag	Worth	296, 302
Marl Pit Shaw	Worth	301a
	East Grinstead	745
	Cuckfield	1795, 1630, 2103, 1491
Marlpit Plot	Cuckfield	1622, 1625, 1630
Marlpit Meadow	Cuckfield	1629, 1629a
Marl field	Selham	152
	Woolavington	76, 77
	Aldingbourne	107

	Kirdford	1910, 1908
	Henfield	1253
	Balcombe	541, 210
	Harting	44
	West Hoathley	1072
	Wisborough Green	836
	Poynings	11, 147
	Ifield	512
	Petworth	525
	Cuckfield	1093
Marl Croft	Selham	174
Marldale Coppice	Hardham	94
Pond in Marl Field	Wisborough Green	837
	East Grinstead	24 (681 – 'swamps')
Coppice in Marl Field	Poynings	11a
Marland Coppice	Itchingfield	225a
Marl/Marlpit Mead	Hurstpierpoint	1191, 612
	East Grinstead	1998
	Cuckfield	990, 1026
Marlings/Marles	East Grinstead	1001
	Cuckfield	1263, 2374

Characteristic Features of Marl Pits

Feature	Tithe Map	Plot Number(s)
Pond	Selham	152
	Henfield	1253
	Slaugham	1034
	Balcombe	280, 399
	Clayton	362
	West Hoathley	424, 675, 1072, 990
	Worth	916
	Wisborough Green	836, 837
	Barlavington	161(?)
	Chidham	212 (Cullimer's, The Dell)
	West Grinstead	1130
	Donnington	15 (16+18)
	Ifield	512 (in 515)
	Pagham	16
	Cuckfield	1026
Pits	Aldingbourne	181, 183
	Barnham	181, 183, 166
	Rusper	27
	Horsham	1698
	Cuckfield	1625, 1629a
Woodland	Harting	561
	West Hoathley	682, 817, 831
	Hardham	94
	West Grinstead	1130
	Poynings	11a
	Hurspierpoint	612
	Newtimber	72, 148
	Cuckfield	1622, 2101

Other significant features related to Marl Pits

Feature	Tithe Map	Plot Number(s)
Road located nearby	Didling	119, 125, 117
	Selham	152, 174
	Aldingbourne	104, 38, 105, 107
	Barnham	181, 183, 87, 179, 166
	Pyecombe	126
	Slaugham	1034
	Balcombe	541, 210
	Clayton	362
	Harting	44, 561
	West Hoathley	675, 682, 990
	Worth	775, 302
	Wisborough Green	836, 837
	Chidham	212
	Poynings	11, 147
	Donnington	15
	Hurstpierpoint	1191
	Rudgwick	977, 2151, 2295, 1476, 1477
	Storrington	20, 22, 24, 25, 26
	Newtimber	72, 73, 148
	Funtington	132
	Pagham	16
	Cuckfield	• 990, 991, 1026,1093, 1622, 1625, 1629, 1629a, 1630, 2101, 2103, 1263, 1318, 1073
Other Transport Links		
Railway	Lower Beeding	138+138a
River	West Hoathley	831

The location of these possible marlpits should then be cross-referenced with modern Ordnance Survey Maps in order to determine whether remnants of them still exist, possibly in the form of ponds or ditches and to whether the name 'marlpit field' indicates that a marl pit was actually once sited there (Appendix vii).

Field Visit to Marl Pits

Visits were carried out to three locations where marlpits had been identified on Tithe Maps. These were Barnham, Pagham and Chidham.

Barnham (Plot 166)

The marlpit is now a pond surrounded by dense vegetation, including mature willow trees. It is located in the middle of a cultivated field.

Pagham (Plot 16)

The description for this marlpit is as above, but also with a stream running into it.

Chidham (Plots 212)

Several early marlpits are known to exist in Chidham. One is known as Cullimer's Pond and can be described in the same way as the above two marlpits, although has been carefully managed so that there is no existing dense overgrowth. Plot 212 is located at the end of an existing ditch, is relatively circular, shallow and dry.

Conclusions

Geology

There appears to be a degree of correlation between the location of the majority of West Sussex marl pits and underlying clay deposits, ie the Weald Clay, Tunbridge Wells Sandstones and Clays, the Bracklesham Beds, Reading Beds and London Clay. A few can be found on more chalky deposits. The geology of an area will determine the general location of a marlpit, while its precise location will depend on other factors.

Transport Links

A relatively large number of the fields identified as being possible locations for marlpits or related to the process of marling in some way appear to be connected to transport networks. The majority of the fields having a transport link appear to be described as 'Marl *Pit* fields' in some description, i.e. not just 'marl fields', with the exception of Wisborough Green 836 and 837, Hurstpierpoint 1191, Poynings 11 and 147, and Cuckfield 1093 and 1263. The name 'Marl Pit' clearly indicates that marl was extracted from this location. It is suggested that the name 'Marl Field' describes a field where the marling was carried out, though further research would need to be carried out to confirm this. What is certain is that a Marl Pit is likely to be located near to a road or track so that the marl can be taken to several locations.

Marl Pit fields also seem to be located near railways or rivers that might also be used to transport the marl away.

Marl Pits were often located in the centre of a field at some distance away from the nearest road. It is suggested that the marl from these pits was used for spreading on the surrounding fields. This idea is supported by the fact that many marlpits appear to have been situated in the middle of fields (an idea which is gained both from the depictions of marlpits on the tithe maps within the centre of the fields, and from the marlpits that were visited in Barnham and Pagham which were situated in the centre of the fields). This theory is supported by documentary evidence which suggests that estates, such as the Roxburgshire Estate, would conserve their own resources of marl.

It is possible that the deliberate location of marl pits near roads, rivers or railways is merely coincidence. This is supported by evidence that the practice of liming did not become established until the improved transport links of the 18th Century, when the lime could be transported from the South Downs into West Sussex. This suggests that marl, also, is not likely to have been transported any great distance on any extensive scale.

Ponds

The fact that some of the fields with marl-related names are depicted with ponds in may be because the marlpits were abandoned by the time the tithe maps were created. Deserted marlpits are likely to have collected water in to become shallow ponds, as in the Marl Pits that can still be seen in Chidham Barnham and Pagham. The mid-19th Century dating of the tithe maps indicate that some of these marlpits may have been abandoned because of the supplanting of marl by lime.

Some of the ponds depicted on the tithe maps also appear on the modern OS maps, such as Slaugham 1034, Balcombe 280, West Hoathley 424 and 990, Clayton 362, Worth 916 and Pagham 16. However, it must be noted that there are also a number of ponds which are depicted on the tithe maps but do not appear on the OS maps, suggesting that they may have been filled in over the years. There are also a number of ponds which do not appear on the tithe maps but which are described in the Apportionments as fields relating to marlpits and which have ponds in the same location on the OS maps. This suggests that there may be marlpits which have been abandoned and turned into ponds since the time of the tithe maps.

Most of the Marl Pits visited in Barnham, Pagham and Chidham were depicted as ponds in up-to-date OS maps and possessed similar characteristics, i.e. the pond was surrounded and almost hidden by overgrown vegetation that included willow trees in particular. Further Marl Pit ponds need to be visited to confirm these characteristics as typical of early Marl Pits.

Woodland

A few of the fields connected to marling appear to have been wooded, or at least contain wooded patches or copses nearby, but it is not possible at this stage to determine whether there is any relationship between woodland and the existence of a marl pit. There is a possibility that wooded areas exist around the marlpits because after the abandonment of a disturbed area of ground, process of vegetation succession took place.

Some of the marlpits on the OS maps appear to be characterised by wooded areas or copses. These occasionally correspond to the wooded areas depicted on the tithe maps, as with Newtimber 72, West Hoathley 682, 831, and Harting 561. The fact that, however, a number of wooded areas on the tithe maps no-longer appear to exist on the OS maps, sometimes because of deforestation for building developments, suggests that the presence of marlpits should not be viewed as the only factor accounting for the presence or lack of woodland. However, the fact that some areas of woodland appear to have come into being since the tithe maps suggests that these areas of woodland may have arisen because of the abandonment of marlpits, which may have led to trees growing around these marlpits.

Remains of pits

The possible remains of Marl Pits are often depicted on OS maps either by the words 'Disused pit' or the markings of a slope. These correspond with fields that make reference to the existence of a Marl *Pit* rather than another marl-related name.

Further Work

A more extensive study of early maps and documents should be undertaken to date the origin and use of Marl Pits in West Sussex.

Further research should look at the origin of the Marl-related names to determine whether there is a link between the names and the various stages of the marling process. A wider study would also identify local corruptions of marl-related names.

Due to time constraints and the availability of only a proportion of fully-transcribed Apportionments, not all Tithe Maps have been studied to identify marl-related names and features. As list of maps that need further investigation will be added below as they become available, along with a list of maps that show no links with the process of marling.

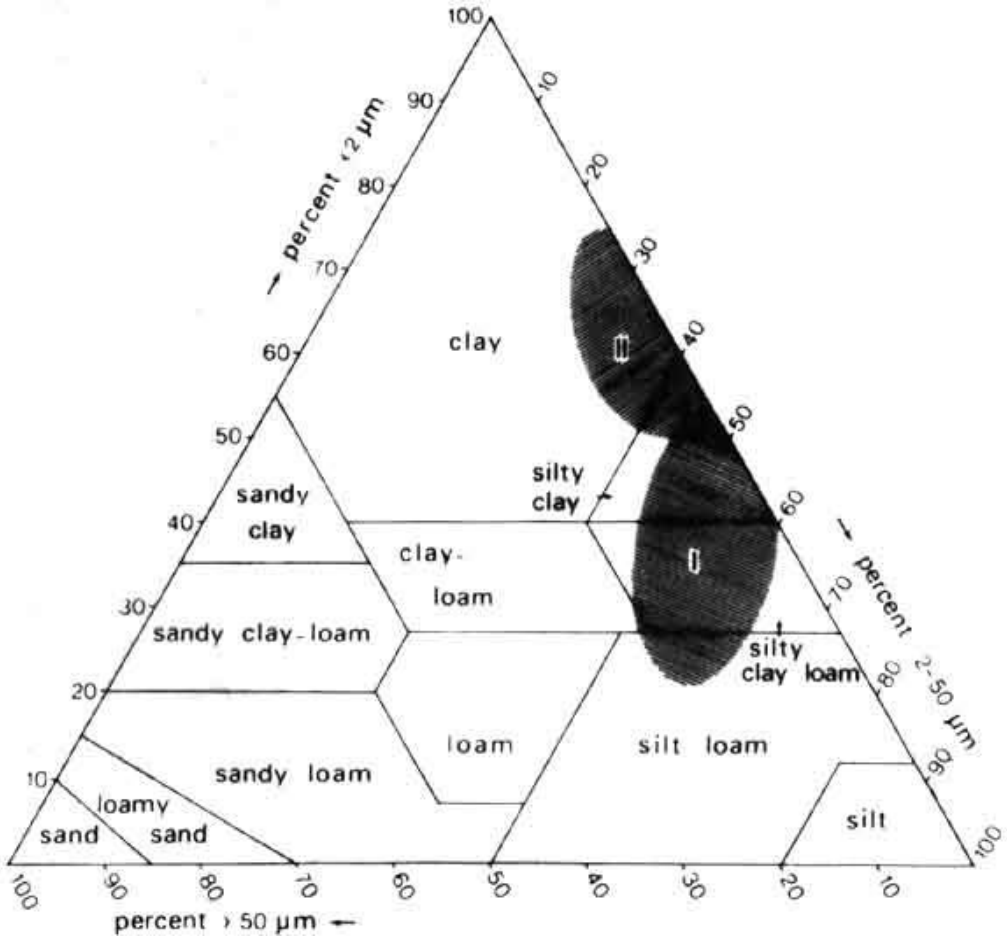
Bibliography

- Beresford, 'Revisions in Economic History: XI Ridge and Furrow and the Open Fields', The *Economic History Review* (1948, V1 No.1, pp34-45)
- Beswick, *Brickmaking in Sussex*
- Brandon, *The Sussex Landscape*
- Campbell and Overton, 'A New Perspective on Medieval and Early Modern Agriculture: Six Centuries of Norfolk Farming c.1250-1850', *Past and Present* (1993, No.141, pp38-105)
- Fussell, 'English Countryside and Population in the 18th Century', *Economic Geography* (1936, V12 No.3, pp294-310
- Fussell, 'Marl: An Ancient Manure', *Nature* (Jan 1959, V183)
- Hall, *Sussex Dialect Dictionary*
- Harvey, 'The Industrial Archaeology of Farming in England and Wales', *Batsford Lts* (1980)
- Jackson, 'A Roman Lime Kiln at Weekley, Northants', *Society for the Promotion of Roman Studies* (1973, V4, pp128-140)
- Klingelhofer, 'Settlement and Land Use in Micheldever Hundred, Hampshire, 700-1100', *Transactions of the American Philosophical Society* (1991, V81 No.3, pp1-156)
- 'Marl-Harting' (127A/5)
- Mawer and Stenton, *Place Names of Sussex*
- Sussex Archaeological Collections (V3, V8 and V81)
- Thick, 'Sir Hugh Plat and the Chemistry of Marling', *Agrarian History Review* (V42 No.2)
- Young, *General View of the Agriculture of the County of Sussex* (1808)

- 'Darwinian Evolution: Surface Geology of Sussex' (www.lifesci.sussex.ac.uk/teaching/C1010/geo%20sus.htm)
- British Geological Survey (www.bgs.ac.uk/education/geology_of_britain/home.html)
- www.wikepedia.co.uk
- Sussex Industrial Archaeological Society Newsletter, SIASG3 (www.snowing.co.uk/sias/newsletters_siasg_newsletter_siasg_3.htm)
- Household Cyclopedia of General Information (www.piblicbookhelf.com/public.html/The_Household_Cyclopedia_Of_General_Information/whatisma_be.html)
- Ask A Scientist (www.newton.dep.anl.gov/askasci/gen99/gen99125.htm)
- Marl Pits Around Upton Area (www.historyofuptonbychester.org.uk/marlpits.html)
- Mate, 'Medieval Agrarian Practices: The Determining Factors?' (www.bahs.org.uk/33n1a2.pdf)
- Dodgina, 'Land Improvement in Scottish Farming: Marl and Lime in Roxburghshire and Berwickshire in the 18th Century' (www.bahs.org.uk/26n1a1.pdf)

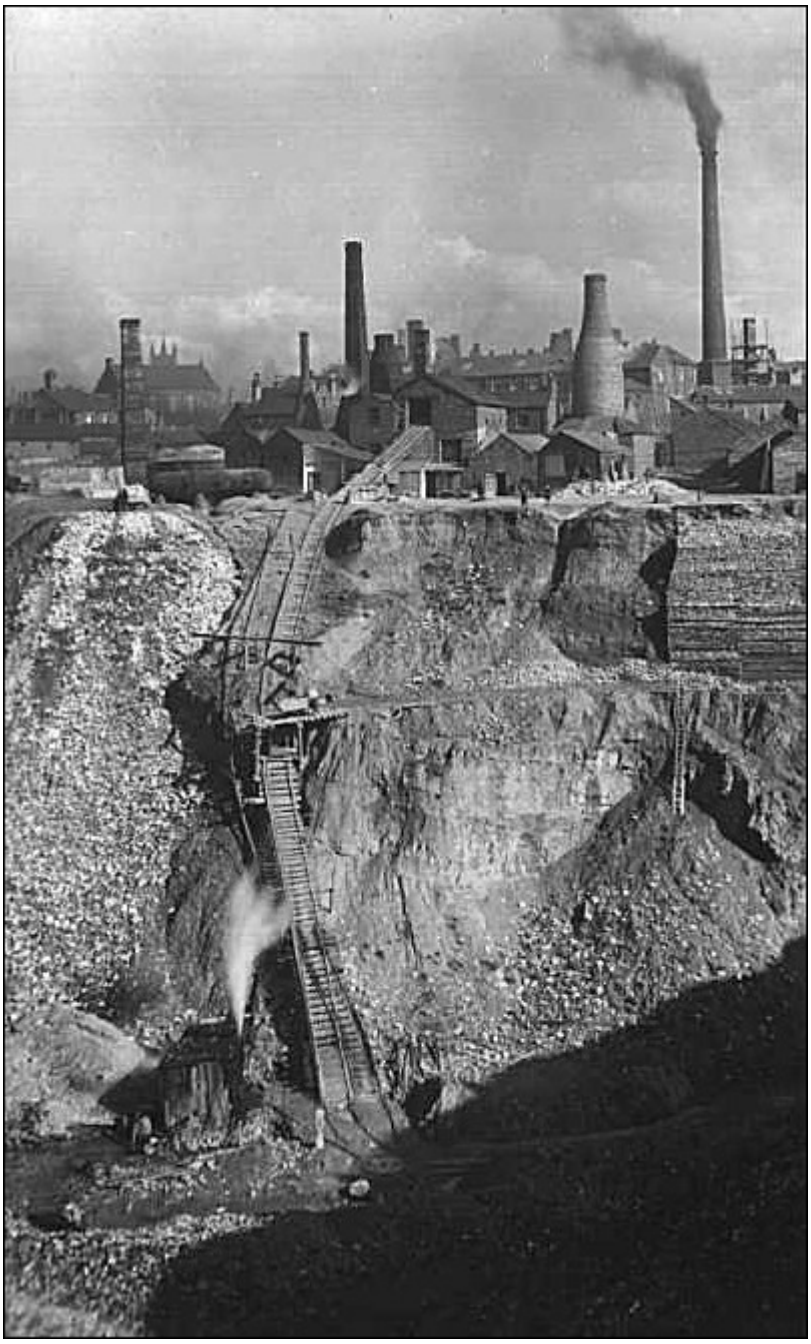
Appendix i

Composition of Marl



Appendix ii

Image of Working Marl Pit



Appendix iii

Appendix iv

(See attached document)

Appendix v

Marl from the Reading Beds, Dell Quay

Appendix vi

Marl from the Weald Clay, near Horsham

Appendix vii and Appendix viii

(See attached documents)