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PAST LAND USE SURVEY
of
THE COASTAL AREA SOUTH EAST OF LLANELLI

Commissioned by the Countryside Council for Wales

from

Dyfed Archaeological Trust

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Report prepared by Heather James,
Principal Archaeological Officer (Curatorial),
Dyfed Archaeological Trust.

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Introduction

The first and most important question is to whom belongs the surface of the lands and the minerals under them which lye between the high and low water mark and those tracts which have been or may hereafter be left free of the sea by the deposit of alluvial soil . . . this is a question of very great value to Earl Cawdor more particularly as the coal sale in that neighbourhood is rapidly increasing . . .

(Extract from a legal brief establishing Earl Cawdor's title to manorial rights c. 1810 CRO Cawdor Clln III ACC 5941)

The history of winning land from the sea over the marshes south east of Llanelli is a complicated one. Like other coastal areas in south Carmarthenshire land was won for arable and pasture and extensive saltmarshes provided good grazing for sheep and cattle. But Llanelli's marshes have seen a much more intensive industrial exploitation than other, similar, areas in the county because of the existence of coal below them. This has left its mark on the landscape not so much in the sites of former collieries but in their associated transport systems of tracks, roads, canals, tramways and railways, leading to landing places, creeks and docks. The whole process of winning land from the sea was much accelerated by the demand for coal, which in the 17th and 18th centuries could be more easily exported from these lowlying areas, so close to navigable waterways. In the 19th and early 20th century Llanelli was a major industrial centre for metal manufacture as well as coal production. A new transport system of tramways and railways moved bulk materials to and from newly created docks. In the post war period a large new Tinplate Works (Trostre Works) was built on a 'green field' site east of Llanelli on an area of early settlement and enclosure. The whole industrial infrastructure around the docks has declined and Machynys is now being remodelled by extensive landscaping and new road systems for new industrial, residential and leisure interests. A wholly new retail and light industrial development - Parc Trostre - west of Trostre Works has further obliterated almost all early traces of settlement, landuse and enclosure. Conservation concerns have led to the conscious setting aside of areas for wildlife that can also involve major changes in the landform.

Historical sources for these changes are voluminous from the later 17th century onwards. The developments outlined above mean that for large areas the historic landscape has to be almost totally reconstructed from documentary, cartographic and photographic sources. Yet the primary source for documenting the evolution of the coastline, the processes of land reclamation and the diverse uses of the area, is the landscape itself. This places a greater value on what remains relatively unaltered since the 19th century. Regrettably little recording of the historic landscape in advance of its obliteration has been carried out to date.

The Brief

This preliminary survey was commissioned by the Countryside Council for Wales from Dyfed Archaeological Trust in December 1992. The brief prepared by I. K. Morgan was as follows:

The low lying coastal area south east of Llanelli holds areas of high wildlife conservation interest, including remnant areas of reed bed and other fens. Several sites will be assessed shortly (in terms of their invertebrate content, etc) by a South Carmarthenshire Fenland Survey. To supplement the above background, data is required, i.e., on examination of documents, maps and other 'historical' sources held in local reference libraries. Information is required outline past landuse patterns, including past position of sea defences, areas of common land, fens and marshes, agricultural use of land, including dates of enclosure (including information on any trees planted, etc.) together with any other relevant information.

The area to be covered is east of the Machynys Peninsula to Loughor Bridge. In addition any information regarding the existence of fens and marshes in the Llangennech area is required.

Methodology

The relatively limited resources of time and money available for this project and the specific requirements of the brief have forced a not unwelcome concentration on the key stages and processes of land reclamation and on the most comprehensive sources of information.

This study is centred on two sets of maps and aerial photographs:

1. The first edition Ordnance Survey 6 inches to the mile map of 1877-78 and RAF vertical air photographs taken in 1946. The first edition 6 inch map shows almost the totality of physical evidence of old river courses, drains, banks and the industrial landscape features of the coal era. It can be used as a base map to work backwards and plot the information given in the Enclosure Awards of 1810 and earlier Estate maps. At the same time it can still be precisely related to the modern 1:10,000 map which allows us to see what remains of the historic landscape beneath or adjacent to the major changes of the second half of the 20th century. Despite the changes between 1878 (the first edition 6 inch OS map) and 1946, black and white vertical photographs can be used to extend the 19th century map information on earlier stream and river channels, estuarine features and on drainage banks and ditches. These photographs are of remarkable clarity and were taken as part of a nation wide survey by the RAF in 1946 immediately after the Second World War.
- 2: The 1973 edition of the OS 1:10,000 map has been annotated to give up to date information on the vast new road building programme of the last decade. This is supplemented by colour vertical colour air photographs at 1:2500 scale taken by Geonex in October 1992. These have been made available as colour photocopies on loan from I. K. Morgan and have proved invaluable. Selective ground survey in March 1993 indicates that even the 1992 air photographs are now out of date so rapid are the changes in certain areas. This makes rapid field work very difficult and much more intensive survey is required in winter conditions for an adequate 'audit' of extant features to be carried out.

A sequence of enclosure and reclamation was postulated on the basis of relationships visible from the map and photographic evidence. It is possible to use the principles of archaeological stratigraphy to good effect in proposing sequences of enclosure from the relationships between banks and causewayed routes. Furthermore the fact that ancient drainage channels terminating in pills and creeks remain visible on the ground and on air photographs long after the shoreline has advanced complements the evidence of enclosure banks. Channels in saltmarshes have a characteristic dendritic pattern and sinuous shape, and only deep ploughing and modern drainage, or landfill activities, will destroy or at least mask these remarkable relict landscape traces. The sequences thus deduced have been selectively tested by reference to historic cartographic, documentary and secondary sources. A preliminary attempt has been made, on the basis of placename and documentary evidence to establish changes in landuse principally over the last 300 years. It is clear however that there is the potential for a much more detailed and extensive study and what has been produced for this Report must serve only as a provisional and introductory study.

The Natural Inheritance

This report draws heavily on the work of D. Q. Bowen (1980) and of M. Symons (1979) for the geological and geomorphological history of the study area. As Symons has shown in his study of the Llanelli Coalfield up to 1830 the early development of the coal industry is closely bound up with that of the marshlands. Lack of geological knowledge and technological constraints meant that early working was concentrated on seam outcrops or seams with little superficial deposits. These had to be 'de-watered', so early workings were also concentrated on localised high ground so that adits could be driven out from the base of the shafts to drain water out onto adjacent lowlying ground. Finally early workings needed easy access to shipping places. The dramatic expansion of the industry in the 1790s was made possible by better geological knowledge, steam pumps to help drain the workings and developments in transport systems: canals and tramways and finally railways. It is important to realise that the reclamation and drainage of the marshlands was virtually complete by the time the railway era began in the 1840s and 1850s.

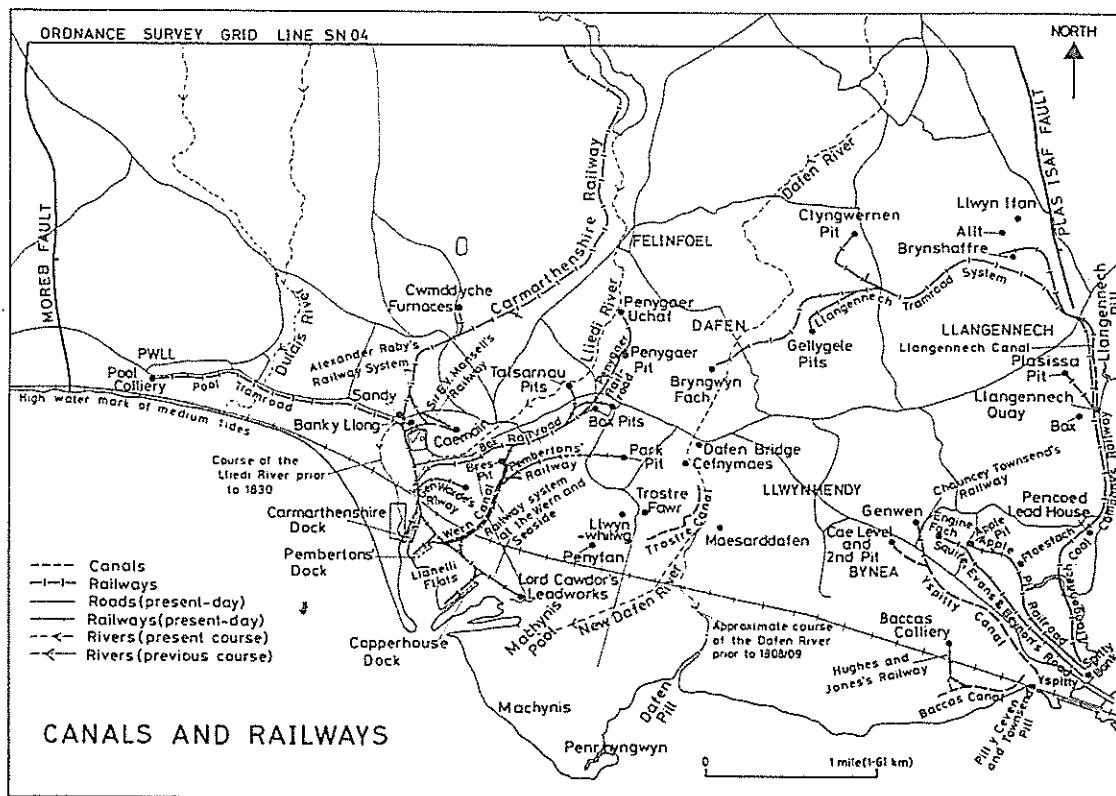
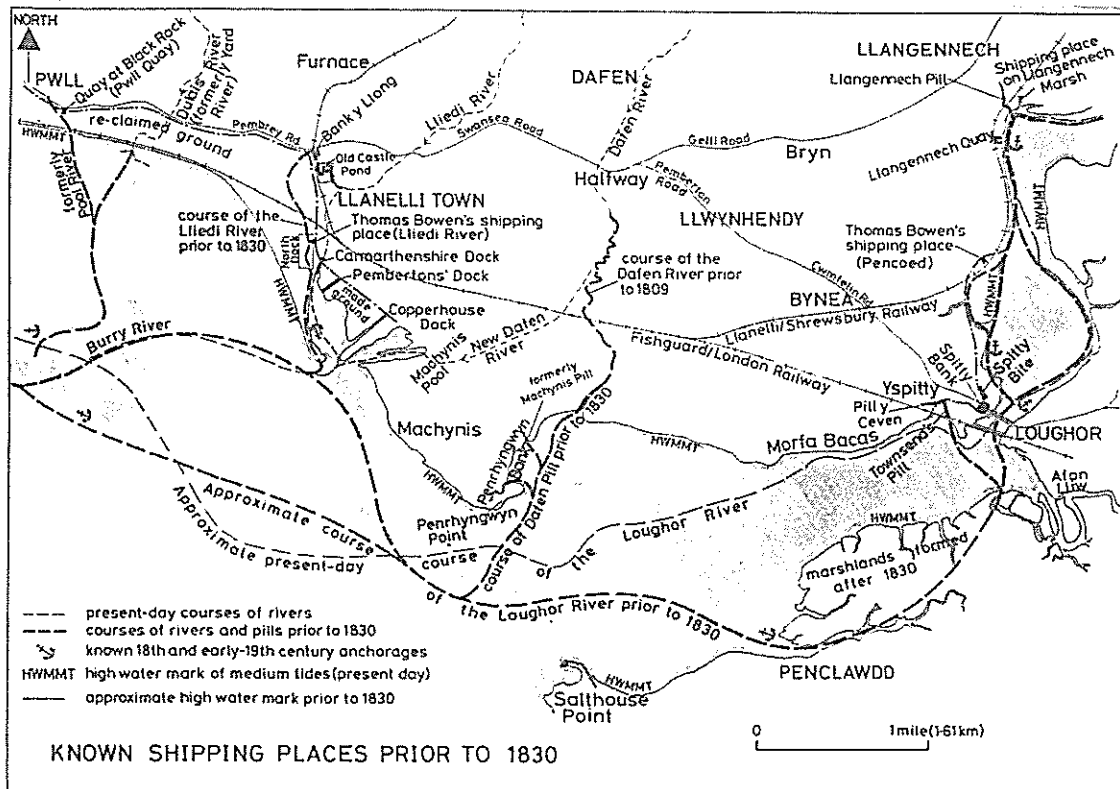


Fig. 2: Reproduced from Malcolm Symons *Coal Mining in the Llanelli Area*
Volume 1: 16th century to 1829 Llanelli Borough Council 1979

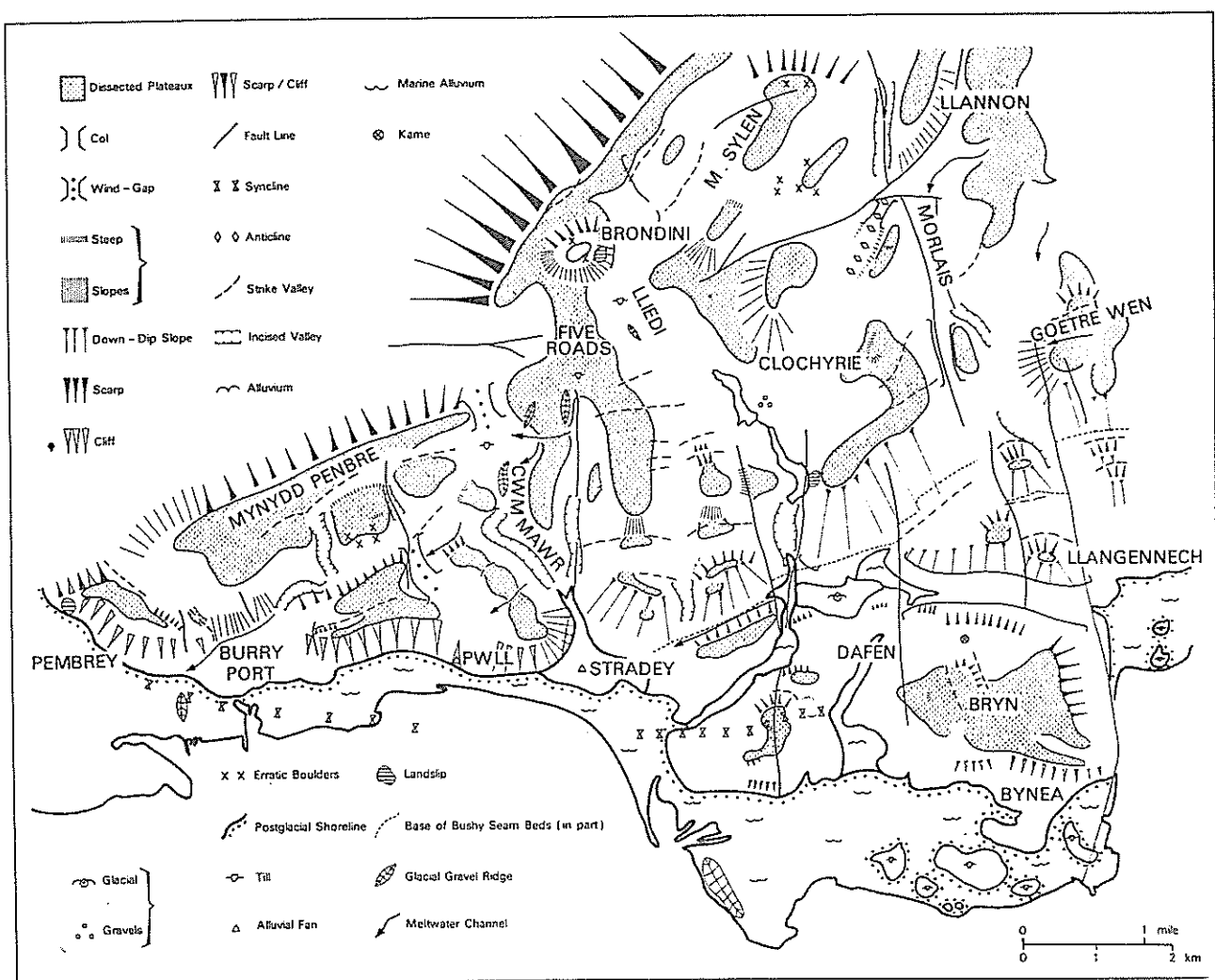


Fig. 3: Geomorphological Map of the Llanelli area, reproduced from D. Q. Bowen, *The Llanelli landscape* Llanelli Borough Council 1980, p. 60.

The marsh land east and south east of Llanelli is bounded to the north by a crescent shaped rim of high ground breached by the Dafen river valley. These bluffs are the degraded remains of sea cliffs with raised beaches at their base from the coast line of the Last Interglacial. South of these former sea cliffs". . . a steep coastal slope meets the coastal plain. Both are mantled with the glacial and periglacial (below) deposits of the Last Glaciation. Beneath these deposits lies the greatly degraded and mutilated shoreline of the last Interglacial sea of 125,000 years ago." (Bowen 1980 p.134)

The extent of the ice sheet was reduced by the final stage of glaciation (the Machynys stage, between 15000 and 10000 years ago) from an ice margin which extended obliquely across the Burry Estuary from Machynys to Salthouse (Penclawdd, Gower). The moraine deposits which created Machynys itself were deposited at the margin of the Ice sheet. As the ice sheet retreated further other, smaller, glacial moraines formed low hillocks across the low-lying area at the foot of the ancient sea cliffs. Periglacial conditions (the alternate freezing and thawing between winters and summers) broke up and weathered these deposits, spread by solifluction. River action accounted for the deposition and spread of alluvial gravels and silts.

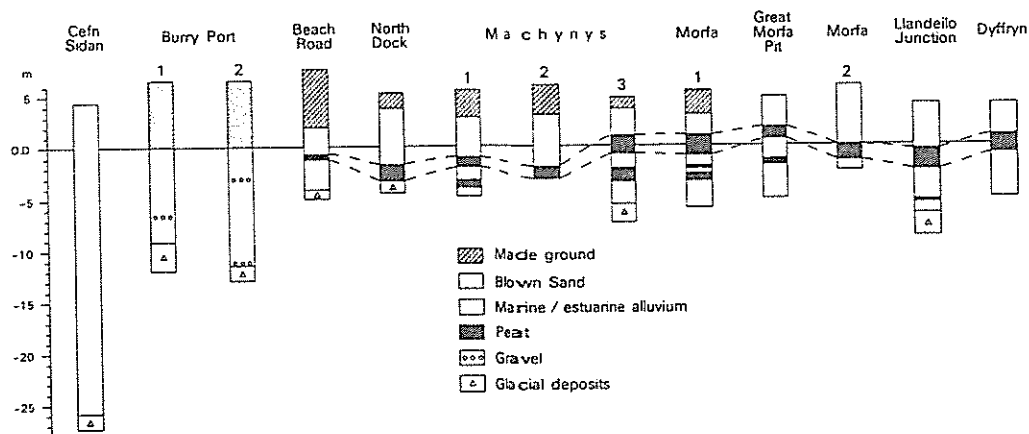


Fig. 4: Borehole records through the superficial deposits of the Llanelli coastal plain. Note that none of these reach bedrock (rock-head) - reproduced from D. Q. Bowen 1980, p. 154.

There was a rapid improvement of climate c 10,000 years ago. This is traceable in pollen samples as a progression from birch and pine woods through to the mixed oak forests of the climatic optimum between 7000 and 5000 years ago. There was a rise in sea level c. 6000 years ago returning the shoreline to the base of the much earlier Interglacial sea cliffs. But, as D. Q. Bowen explains, plotting the precise position of shoreline changes is a complex process. Peat levels in borehole profiles prove the existence at that location at a certain time of marine free vegetation. But the presence of marine alluvium may indicate wholly marine conditions, or predominantly estuarine environments and may be formed of different kinds of sediments, beach gravels, silty clays or peaty clays. There are two views on the interpretation to be placed on the interleaving of peat and marine alluvium in borehole profiles taken across Llanelli marshes. The first is that there was a sequence of numerous small marine transgressions and regressions, the other is that they simply reflect the rate of sedimentation in a continuous sea level rise. Complicating factors are the likelihood of sand dunes along the coast which might protect against marine transgressions until breached and the extreme tidal ranges of the Bristol Channel. When high tides are combined with storm surges, floods can produce the same sedimentary traces as rises in sea level. Detailed studies of the levels and the dating of the highest levels of marine alluvium on both sides of the Bristol Channel suggests that the maximum height of the postglacial or holocene sea level rise was c. 5000 years ago and that it then returned to approximately the present day levels. D. Q. Bowen's map of the geomorphology of the Llanelli area shows that even at the height of the marine transgression the hillocks of high ground east of Llanelli and south of Llwynhendy (formed as we have seen of glacially deposited gravels) remained as islands.

The shoreline has advanced southwards since c.3000 BC by a combination of natural forces and human action. But there have also been losses through changes in river channels. Until this century the River Loughor flowed on the south (Gower) side of the Burry Estuary but now runs on the north side. Land has been lost over Morfa Bacas and huge saltmarshes have built up off Penclawdd.

The natural processes of sedimentation by rivers and their tributaries like the Lliedi and the Dafen and of course the Loughor, as well as smaller streams, account for the predominance of superficial alluvial deposits over the marshland area. There was not the same extensive formation of sand dunes as further west along the Carmarthenshire coastline, which created a barrier to tidal inundation. But the processes of longshore drift have led to the development of a spit tailing off south eastwards from the southern end of Machynys, sheltering the area inland and providing opportunities for reclaiming land from the sea. Centuries of human action in embanking and drainage have accelerated and extended these natural processes to win back large tracts of land from the sea.

The processes of drainage and embankment

Spring and exceptionally high flood tides can build up banks of silt and sand. These are then colonized and thus consolidated by coastal and estuarine plants leading to the formation of salt marshes in the tidal reaches of rivers, in estuaries and along coastal flats. These saltmarshes can develop outwards across mud flats left exposed between tides. Unimproved saltmarshes were used for wildfowling; estuarine mud flats and sands for fish weirs. It was a relatively simple process to build earth and turf banks, perhaps strengthened by fences, to cut off areas of marshland from all but high spring tides. These areas were already dissected by the sinuous courses of numerous creeks and pills. Improved salt marshes were used for grazing and fattening sheep, cattle and horses. In many areas of the South Wales coast the *morfa* was common land, used by the freeholders and tenants of various manors and lordships. The archaeological evidence described in detail below of these relict banks shows a piecemeal and small scale extension of embankment extending outwards from the 'islands' or glacially deposited hillocks of high ground on which medieval settlement was concentrated.

Heightening, strengthening and facing the banks in stone could prevent the sea, even at spring tides, from overflowing the land and would accelerate the formation of saltmarsh on the seaward side of the banks. Such walls shut out the tide, but also of course denied egress for numerous streams and tributaries draining the coastal plain. It was necessary to channel these streams to one or more points where sluices could be constructed in gaps along the sea walls. The salt marsh thus became fresh marsh and new straight drainage cuts could improve the ground to allow cultivation as well as grazing in hay meadows.

Efficient drainage depended on 'new cuts' - straight lines and interconnected systems - which naturally required capital and were mainly undertaken by the landed gentry on a fairly large scale. Such expenditure needed to be rewarded by more intensive cultivation and grazing regimes.

It is however important to realise that reclaimed land needs maintenance if it is to be used productively. For various reasons which have not been researched for this report some enclosed land has regressed to marsh and fen. Nature conservation management regimes might well encourage and accelerate such 'regression'. In a word, present-day landuse and vegetation is not always a reliable indicator of past usage. Some attempt therefore has been made to indicate past land use (whether arable or meadow or rough grazing) from field and place names and from Estate and Tithe Map schedules.

The study area has been broken down into sub areas for ease of presentation. The detailed sections are followed by a Conclusion giving a summary of the main stages of enclosure and coastal change.

1. Morva Mawr or Llanelly Marsh (Figs. 6 & 7)

The bounds of this Common, undoubtedly of medieval origin, whose use was reserved to the burgesses of the tiny planted borough of Llanelli, are given in a 1609 *Survey* (see Fig. 5). Not all the place names given there can be now located but later plans of the Marsh indicate its extent. However the medieval, 16th and 17th century southern bounds of the saltmarsh did not extend as far south as shown on the later maps, for Machynys was then an Island. There is a clear distinction between the *morfa* and the *wern* (Gwern Gorsoddy). The latter generally indicates rough pasture and perhaps, when low-lying, alder beds. But the former is definitely saltmarsh. This holds good throughout the subsequent history of the low-lying coastal plain. The *pwll* elements in the placenames suggest very wet areas of saltmarsh. By contrast the *blackelande* suggests peat bog. However there is little note in any of the records consulted so far of extensive peat deposits and turbaries in the marshes. Although not precisely located, the names *Owen's ditch* and *Haen Dan y Kloddye* (*Llain dan y clawdd?*) indicates 16th century or earlier enclosure from the marsh with ditches and banks.

Fig 5: extracts relating to
Llanelly Marsh from :
*A Survey of the Duchy of
Lancaster Lordships in
Wales, 1609-1613*
ed. William Rees, Cardiff
1953

Item to the xith Artickle they saye that there is within the Burrowghe or Englishery of Llanelly aforesayd, certaine Marshe grownd over fflowen with the sea uppon many springes and calld by the name of Morva Mawre, contayninge by estymacion [] acres or thereabowts extendinge from a brooke called Daven aboute the Marshe called Morva Maes ar Ddaven to a poole by West Ynis Ystū and from thence alongst Daven to Pemrhuwe on the easte, Pwll Kerin Langhwue and Penn yr Irland on the south, Pwll pen Rhys y Blackeland ar Heol vawre on the weste parte, Owens Ditch to Ffymor y herwyn and from thence to Gweddol y Gilvach, from thence to the Haen Dan y Kloddye, from thence to Pwll Penn y Van, from thence alongst Dan Penn y Vann yr Rhyd Ycha whilwgg and from thence alongst whilwgg to Penn Heol y Deosdre on the north within the which all the inhabitants and tenaunts of the sayd Borrowgh or Englishrie tyme owte of mynde have hadd and used to have of right Common for all manner of Beasts without any manner of stint. Alsoe they saye and presente one parcell of pasture called Morva bach contayninge by estymacion [] lyinge there betweene Clawdd Parke yr Ythine y Cladd Parke Du on the easte, Llyedy on the south, Holebrooke on the west, Clawdd Parke y Bado and Clawdd Gweyn Whittle on the north, within the which all the inhabitants and tenaunts of the Borrowghe or Englishrye have had and used to have of right, tyme owte of mynd, Common of pasture within the sayd parcell of pasture grownd for all manner of beasts without any manner of stint. Alsoe they saye that there is within the sayd Burrowgh or Englishry one parcell of pasture grownd called and knowen by the name of Gwerne gosoddy contayninge by estymacion [] acres or there abowts, lyinge there betweene the Bwysva and Parke yr Ythinne on the easte, yr Heol Vawr and Parke Pilpum on the south, Parke Tir Castell on the west, Y Bres Vawr and the lands of Ffraunces Mores on the north, in the which laste recited grownd the tenaunts and ffreeholders within the sayd Borrowghe or Englyshry tyme out of mynd have had Common of pasture for all manner of beasts without any manner of stint, and hath byne so used by the tenaunts and ffreeholders tyme out of mynd. Alsoe they saye that the Commons called y Brine bache hath byne enclosed in and by one Willim Davie, late deceased. What Rente he payd for the same they knowe not, neyther doe they knowe if he payd any, and that the sayd enclosure hath bynne made. Alsoe they saye that the Commons called Kymmyn Bache contayninge by estymacion halfe an acre hath byne enclosed this tenn yeares laste paste by one John Gwynn Jenkine and that he payd yearly of rente for the same xiid. to one Anthony Morgan, gent. Alsoe they saie that there is within the sayd Borrowgh one other parcell of pasture grownd, contayninge by estymacion three rodde, Lochor on the south, Klist yr Ydlan on the weste, the lands of John Hunt on the north, commonly called Morva Dee, with the which parcell of pasture grownd all the tenaunts and ffreeholders, tyme out of mynd, have had and used to have of righte, Common for all manner of beasts without any manner of stint.

Incroachment
of a Common

Alsoe they doe presente divers parcells of the Marshe grownd within the parish of Llanellye extendinge from Penkoed to a brooke called Daven wherein the inhabitants of the Mannor of Burwicke have had Common of pasture for all manner of beasts and cattell sance number tyme out of mynd to be Commons.

The boundary then almost doubles back to *Rhyd Ycha whilwgg* and along *whilwgg*. The name may be that of a stream leading to a former inlet or pill traversed by a ford or crossing point at the head of which was *Penn Heol y Deosdre*. The name was perpetuated in the former farms of *Llwyn-y-Whilwg fawr & fach*. It is suggested below that Trostre is of medieval origin. The general location of *Gwern Gorsoddy* is perpetuated in the Wern district of modern Llanelli. *Gorsoddy* is *Cae-Swddy*, shown as a farm on the 1877 map, now built over. Even as late as 1733, when the Duke of Bolton leased *common called Gwern Caswthi near the town of Llanelly adjoining Caswthi Hill* and its adjacent waste (i.e. saltmarsh) this latter was described as being *overflowed by the sea tides lying westward of Gwern Caswthi*. This was *Morfa Bach*.

Early enclosure north of Morva Mawr (Figs 8 & 9)

North of Morva Mawr the Dafen flowed out through its valley into low-lying marshland. Its course was altered by a 'new cut' in 1808 which is described below. But until then the lowest bridging point remained at Halfway, formerly Dafen Bridge. The ancient *Heol Fawr*, a road of at least medieval origins, skirted the edge of the low-lying coastal plain and proceeded south eastwards to the fording and ferry point across the Loughor at *Spitty Bank*. This was not replaced by a bridge until 1833. In the early middle ages, perhaps even in the Roman period, before the formation of Morva Mawr it is probable that the Dafen was a tidal pill almost up to the Halfway bridging point. It is likely that the settlement and fields of Trostre on the west banks of the Dafen and of *Maes-ar-Dafen* on the east are of medieval origins. This area of historic landscape can only be reconstructed however from historical sources. Altered by coal workings, tramways and railways in the late 18th and 19th centuries it has been totally cleared in the late 20th century. The Trostre Works now occupies the site of Maes ar Dafen, Parc Trostre the whole of Trostre Fawr and to the north of both, new roads cross the area replacing the old *Heol Fawr*.

It is nevertheless worth attempting for this Report to suggest how this now massively altered landscape evolved. First the later processes of enclosure cannot be fully understood without reference to the earlier; second, small, discontinuous blocks of old fields remain between modern development. These are now reed and willow filled fens due to interruption of their former drainage and lack of any viable farming use. Any future management strategies, whether for development or to create new wildlife habitats, should be aware of their history.

Trostre Fawr and Trostre Canal

An Estate Map of 1765 of *Trawstre* shows a central block of fields with *Cae* names which might have originated as a single open field. These are marked in red on the 1877 First edition 6 inch map used as a base map in Fig 8. The south-west side of the farm's fields is protected from *Morfa Mawr Common* by an embankment. On the south is a watercourse labelled *canal* with *coal pit* marked at one end. The history of what could be Wales' earliest canal is covered by Malcolm Symons. (*op. cit.* pp 183-186). What is relevant here is that it utilised an old meander loop of the Dafen which was bordered by meadows. The medieval origin of these meadows is suggested by the fact that they were originally divided into strips or *llainiau* one of which was glebe land.

The embankment could well be of early origins. It was finally formed the western end of what became known as the Maesardaven Sea Bank which cut across the river valley to join the Maes-ar-Dafen and Trostre banks. This may have been constructed by 1851 since the eastern end of a bank, springing from the Maes-ar-Dafen system is marked *Bulwark* on William Jones' Map of that date.

Maes-ar-Dafen

The former administrative boundary between Llanelli Borough and District (revsed in 199?) was an ancient one between the anglicized medieval borough of Llanelli and its subsidiary manor of Berwick. It has been extended southwards as more land has been reclaimed from the sea and now follows the course of the Great Embankment. The Estate map surveyed by William Jones in 1751 shows that the irregular course taken by the boundary between Pemberton and Cefncaeau marks 'the division between the hamlet of Westva and the Borough'. The 'gwestfa' was a native Welsh food render, taken over by the Normans in the 'welshries' of their new lordships. The 'manors' of Berwick, and Hengoed, like others within the commote of Carnwallon, were in origin Welsh 'maenors'. They became divided into Englishries and Welshries but it is likely that their boundaries perpetuate ancient, pre-Norman, administrative and territorial divisions. Another indication of pre-Norman settlement are the existence of two chapels - Capel Dewi and Capel Gwynllo - which survived into modern times and were perhaps in origin subordinate churches within the 'paruchia' of a 'mother church', possibly at Llanelli. All this suggests that the area of Maes y Dafen, now almost wholly occupied by the Trostre Works, was already settled and farmed before the 12th century.

Maes ar Dafen Fawr and Fach farms were sited on slightly raised ground. The term *maes* has a range of meanings. Taken together with the irregular shape of the fields, defined, as we shall see, on their southern side by 'bulwarks' or sea defences, it suggests enclosed lands reclaimed from salt marshes but perhaps used mainly for pasture. To the north are fields which in 1751 were still divided up into strips or shares with the common name of *Ca' Cefen*, originally a medieval open field mainly in arable cultivation. The name is perpetuated as a suburb of Llanelli. In 1877 the present day Cwmcarnhywel was still open farmland and the OS map together with the Tithe Map of the 1840s and the 1751 Jones map show clearly the relict traces of medieval open fields on the north side of 'Heol Fawr.'

The suggestively named *Heol Hen* (old road) survives today only as a short stretch leading down to the Trostre Works although it still marks the administrative boundary. The 1877 OS map shows its now vanished southern course. The name, but most especially the fact that it defined a boundary of medieval origin, suggests that it originally served as a track leading down from the main road, on the eastern boundary of a medieval open field through enclosed (? hedged) fields (*meysydd*) down to saltmarshes and common grazing land. The 1751 field names of *Bulwark*, the shape of the fields and of course the physical survival of banks until the area was levelled for the new Trostre Works immediately after the War, show an early phase of embankment which could be of medieval origin.

The north west side of the Maes-ar-Dafen lands still survive on the eastern banks of the old and new Dafen river. Again there is evidence for early enclosure. The angular shape and irregular course suggests an early origin. Some of the 1751 field names contain the *clawdd* (bank/ditch) element. The administrative boundary, shown to be of medieval origin also follows the course of part of the embankments. The field names are equally conclusive: *Waungoch* and *Waun allt* (*gwaun*: meadow, but also low lying marshy ground) for fields 13 and 14 on the 1751 map and also *morfa bychan* (little marsh) for field 16, all between the embankments and the river

It is possible that the construction of the cut for the new course of the Dafen caused some of these fields to revert reedy fen conditions. Former river channels are everywhere and the course of the new Dafen appears to have everything to do with constructing an efficient watercourse to Machynys Pool and little to do with improving drainage of the land between Trostre and Maes ar Dafen.

Machynys (Figs 6,7 & 10)

Machynys is depicted as an island in Speed and Saxton's early 17th century maps (described as *Bachinnis Insula*). It is probable that there was a late medieval gentry residence, a 'capital messuage', on Machynys. Duchy of Lancaster accounts for 1313 (quoted in an early 19th century legal brief for Lord Cawdor) record a tenant's payment of the substantial sum of £7 10s. for 'the rent and farms of all the demesne lands, meadows and pastures of Maghenes'. This was purchased by Walter Vaughan in 1627. By the time Emmanuel Bowen's Map of 1740 was printed a fine double pile house belonging to Sir Thomas Stepney crowned the high ground of 'Machynys Bluff' and was used as a landmark for shipping. The first detailed marine chart of the Mackenzie in 1774. Although not as accurate as the Admiralty Charts of 50 years later it nevertheless gives a lot of information.

It remained an island, albeit one accessible other than at high tides, until the late 18th century. The former *Machynys Pool* to the north east and a stream and tidal pill on the south east (Machynys Pill) were all that then remained of the former sea channel. The embankments of 1808-9 which finally enclosed Llanelly Marsh forced the stream through a sluice, although a small pill remains on the seaward side of the bank. Machynys Pool was now supplied by the River Dafen which had been diverted from its old course. Subsequently New Dock was built was built in the area with a scouring reservoir on its south side. The changes to the northern end of Machynys island are outside the scope of this report; they involved harbour and dock works, changing the course of the R. Lledi, and the eventual development of a large industrial complex, now in turn almost wholly cleared away.

An Estate map of 1761 shows that two phases of embankment and reclamation of saltmarsh at the southern end of the island had already taken place. They were helped by the development of a sand spit through the natural processes of longshore drift at the southern end of the island. In the lee of this spit were salt marshes drained by a small stream. And as in many similar locations in the sand bar strewn Burry Estuary and Carmarthen Bay there was a deep pool at the seaward end of the spit giving a protected anchorage for ships. It was also used as a shipping place from the 17th century through until the late 18th century. Here ships could lie and coal be loaded from barges coming down Dafen Pill. The southern end of the spit was and is known as Penrhyngwyn Point, and this has undoubtedly moved southwards over the last 3 centuries.

Even after Enclosure in 1809 the anchorage was preserved due to the extension of the spit but it was no longer used as a shipping place. Undoubtedly the deeper water was now further east and north and the physical location therefore of the anchorage had shifted. There is interesting evidence to this effect in a very lengthy legal 'brief' prepared for Lord Cawdor, soon after the Enclosure of Llanelly marsh exhaustively justifying his rights of title to land and dues within the whole commote of Carnowllan. This was to safeguard his position when he surrendered many of these rights to the burgesses of Llanelli in return for a share in the newly enclosed lands (600 acres) created in Llanelli Marsh by the Enclosure Act of 1807. The document discusses the dues of 'keelage' levied on ships at Machynys and whether those dues translate into 'a right to the soil where the vessels lye' after enclosure. (see Symons p 274)

The 1761 Estate Map shows the innermost, Phase 1 bank. This may be of early 17th century date, built by Walter Vaughan. The large field to the west is described as *Inside the Bulwarke*. Only a small length at the southern end of this bank remains. It is impossible now to establish the relationship between this bank and the Great Embankment, since the latter has been virtually rebuilt with steel coffering and concrete. However it is unlikely that the Phase 1 bank extended any further south than its junction point with the Great Embankment. Also shown on the 1761 Map is another bank to the east (Phase 2) and the field within it is simply described as *Banke*. The superb detail of the 1946 air photographs can extend the cartographic information of this and the 19th and 20th century OS maps. A curving bank is shown which was quite clearly constructed on the western side of the stream and pill from Machynys Pool, the bed of the old sea channel in fact. The northern end of this as yet undated (but pre 1761) Phase has not been established.

Little remains even of the mid 20th century landform, since the area has been remodelled over the last few years in an ambitious programme of landscaping for new residential, industrial, leisure and wildlife developments. The current situation is mapped from a variety of sources in Fig 7.

The enclosure of Llanelli Marsh and the new Dafen River

The most extensive piece of Enclosure and engineering was the Enclosure of 1808-9. This totally enclosed the saltmarshes of Llanelli Marsh. The support of John Campbell, Earl of Cawdor was essential for the Burgesses of Llanelly to get their Enclosure Act through parliament in 1807. Two major engineering works were proposed and undertaken in 1808-9. First the Dafen was canalised from below the Halfway Bridge and from just north of Morfa'r Ynys was diverted along a completely new curving cut into Machynys Pool, leaving a reduced Dafen Pill. Secondly a 'Great Embankment' was built from Machynys Point to Maesardafen. The whole of the former Morva Mawr or Llanelly marsh (600 acres) was reclaimed from saltmarsh and estuarine flats. An advertisement in *The Cambrian* newspaper of 7th June 1908 announced that the Enclosure Commissioners would, on 18th May, at the Falcon Inn, Llanelli receive:

" . . proposals for ERECTING a SEA BANK or BULWARK from the south-east side of MORVA MAUR, extending from Machynys Sea Bank to Maesardaven Sea Bank . . "

The New Dafen River was intended to facilitate transport of barges to the new Docks (Pemberton Docks and Copperworks Dock). But its potential for supplying a new floating Dock was soon being canvassed. The large scale Enclosure of Llanelly marsh was one of a number of similar schemes in south west Wales as elsewhere (e.g. Castlemartin Corse, Laugharne Marsh, Pembrey marsh, smaller schemes by the Morris banking family of Carmarthen in the Taf and Towy rivers) to gain new land. Such schemes had been advocated by agricultural improvers like Charles Hassall since the 1790s but the boom conditions of wartime demands for foodstuffs during these long years of the Napoleonic Wars brought sufficient return for the investors and their tenant farmers to justify the large capital expenditure required.

Detailed maps of the area accompany the Enclosure Award. The characteristic straight boundaries and rectangular blocks of fields survive. One of the Enclosure Commissioners was the agricultural improver Charles Hassall. In his *General View of the Agriculture of the County of Carmarthen* published in 1794, he describes the husbandry of the newly enclosed Laugharne Marsh where 'the Land is ridged up in ridges of about twenty feet wide, and as high as the soil will bear; so as to let the water fall into the Reans, and thence to the adjacent Drains . . . the singular fertility of this Soil makes it an object of much concern to the proprietors, that the Drains should be well attended to, by regular annual cleansing . . ' He also recommends a broad-share 'Dutch' plough for such newly reclaimed land. The 1946 air photograph (Fig. 11) shows broad and narrow ridges in many of the enclosed fields. This agricultural activity however did not obliterate the underlying traces of the sinuous courses and dendritic structure of the former stream courses and pills which prove the pre-embankment status of the land as salt marshes. It is possible to trace the courses of the streams within the reclaimed area of the Phase 1 enclosure beyond the Phase 1 bank as they widen and deepen into tidal pills. In the intake of the Phase 2 enclosure some of these were too substantial to be incorporated within the fields and therefore formed the field boundaries.

By the 1850s large areas of the new land were taken up by the South Wales (later the Great Western) railway and the Llandeilo and Llanelli line. The expansion of industry out onto what was still known as the Morfa took more land and late 20th century developments have affected other areas. Nevertheless a substantial area remains to the south of the still active and disused railway lines. Again the field pattern is one of large straight edged rectangular fields, many with traces of ploughing ridges although these are narrower than those within the earlier enclosed fields to the south west. Many of the pills remained open and continued to drain the newly enclosed area down to a lateral drain along the inside of the Great Embankment which issued through a large sluice. This flows out to wind its way southwards and around the sand and shingle point of Penrhyngwyn down the relict channel of the former sea bed between Machynys and the mainland.

Although the photocopies available in the National Library of Wales of the Surveyors drawings at 2 inches to the mile for the First Edition OS one inch are not of good quality they do differentiate land use. Part of the map is reproduced here, traced off a poor photocopy. However these drawings are worth close study because they show contemporary detail which was changed by the time of the engraved and printed first edition OS one inch maps of 1831. They seem to indicate that most of the newly enclosed Llanelly marsh in 1813 was yet to be laid out in the fields apportioned by the Enclosure Commissioners. A priority for any further research should be to examine the originals of these preliminary 2 inch to the mile Surveyors' drawings of 1813, since I understand that the originals in London are colour coded for land use. The only new Farm on the marsh, not shown on the Surveyors' drawings but present by the 1840s, was Morfa'r yr Ynys Farm. One effect of the new bank was to stimulate the formation of saltmarsh on their seaward side. However the first edition 6 inch of 1877-8 shows these to be fairly restricted and most of the area exposed at low water on the east of the bank is marked mud and sand. This area was not resurveyed by the Ordnance Survey until the 1970s by which time the High Water mark of ordinary tides had receded southwards and former mudflats have become saltmarsh, although it remains deeply fissured with numerous pills.

Fig. 12: photocopy of part of the First Edition OS one inch map of 1831.

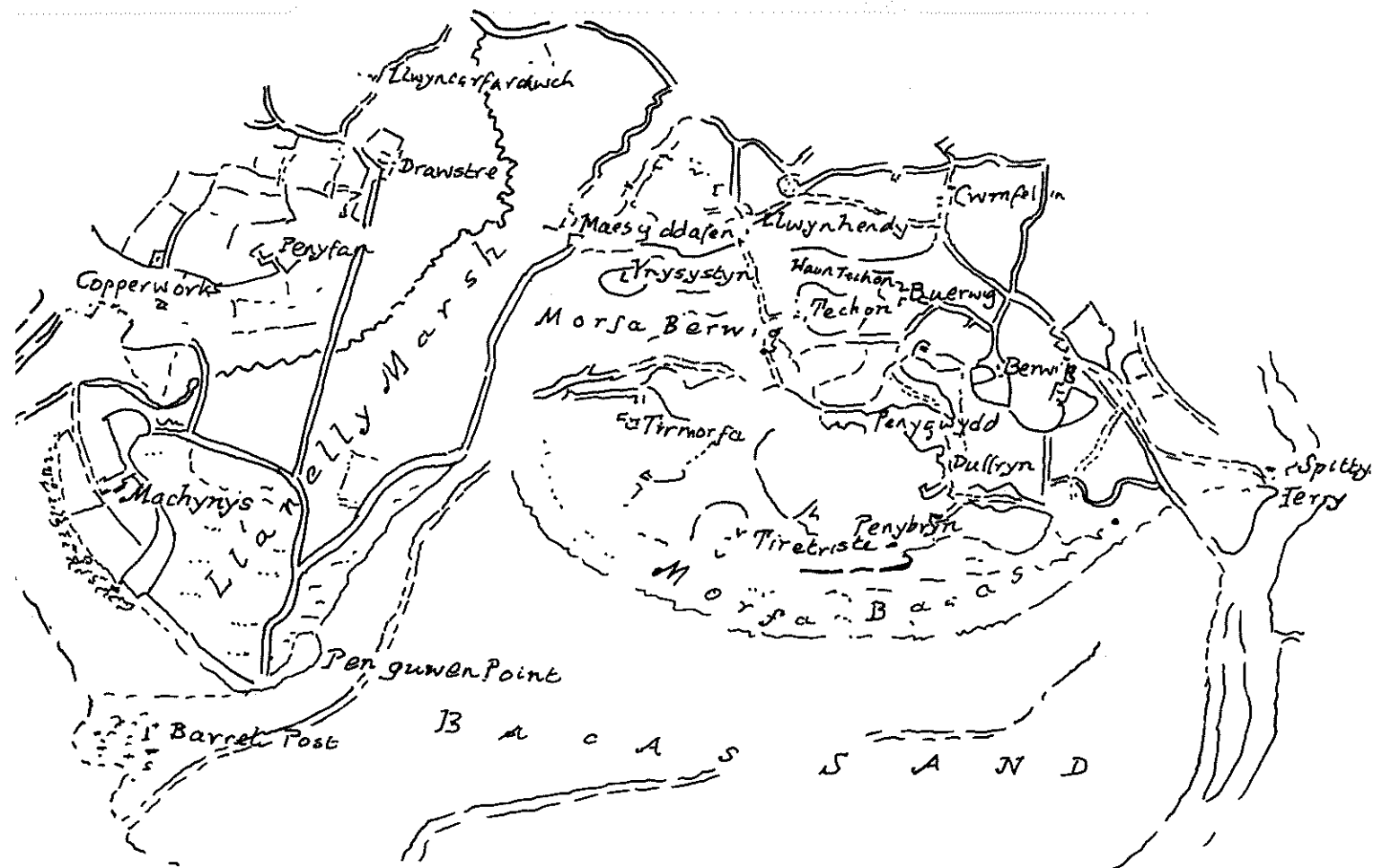


Fig. 13: Tracing of part of the Surveyors' preliminary 2 inch to the mile drawings for the first edition OS one inch map.

2. East of the Dafen: the Enclosure of Berwick Hamlet

Introduction

Although the name Llwynhendy was evidently current in the 16th century the name Berwick was still generally applied to the whole area. William Jones mapped *Lands near or about Berwick chapel* in 1751 and it is clearly the ruined chapel of St Gwynllo in Llwynhendy to which he refers. It is probably the Llwynhendy area rather than the present day 'Berwick' farms of Berwick and Cefn Berwick which is being referred in Sir Edward Mansell's lease of 1750 of coal under his lands in the hamlet of Berwick. The saltmarshes to the south - common pasture for the tenants of the manor - were known as collectively as Berwig Marsh. This is shown as a large tract in Emmanuel Bowen's Map of 1740. (Fig. 10)

South of Llwynhendy, the glacially deposited hillocks of Tychon Fawr, Tir Morfa, Bryn Carnarfon and Spitty bank were the natural sites for early settlement. The former existence of open fields, of medieval origin is attested at Bryn Carnarfon by the existence of multiple ownership of former strips, shown on 18th century Estate Maps. It has not been possible within the constraints of this report to sufficiently research all the holdings in Berwick to be certain when they were established. The settlement and landuse therefore at the time of the Enclosure Award (1810) forms a useful starting point. The areas of common land apportioned in the Enclosure Award are shown superimposed in red onto the 1877 First edition 6 inch map (Fig. 14). The Award also states that:

" . tide embankments have been made and formed along the said Commons, Waste and Marsh lands . . for the purpose of protecting the same from the tide and encroachments of the Sea". The Commissioners ordered that existing and future landowners were to jointly bear the costs of maintaining the banks or drains.

Although the detail is poor, the Surveyors' drawing of 1813 shows an area of islands of settlement surrounded by waste or common ground and criss-crossed by paths and tracks. As a result of the existence of hillocks of high ground in the coastal plain south of Llwynhendy, the common land, other than the large expanse on the seaward side was broken up into small units. The *Commings Bach* of the 1609 Survey (see Fig. 5) can be identified with a commons of the same name owned by the Vaughans as Lords of the Manor and shown on 18th century Estate Maps (see Fig. 14). Similarly *Morfa Dee* is approximately located in 1609 by having the Loughor river as a boundary. Later Estate maps locate it more precisely on the south west side of Spitty Bank. This was certainly saltmarsh bounded by sands labelled *Carreg Ddu* in Jones' 1751 Map. The area labelled *Morfa Berwig* on the Surveyors' drawings of 1813 is named as *Morfa'r Ynys* on an 18th century Map. North east of Dyffryn was *Morvaidd Dyffryn* on a 1761 Map. The variations in nomenclature are generally fairly easily resolved. What they indicate in general terms is that, partly through topographical constraints, partly through early enclosure, *Morfa Berwick* was divided into commons which tended to take the name of their adjacent holding.

Enclosure south of Llwynhendy

As discussed in the section above on Maes-ar-Dafen the early system of embanking evidenced now only from cartographic sources may have been medieval in date. Extending eastwards to Llwynhendy, the 1751 field names of *Ca'r Mynydd* and *Ca lloyn hendy* to fields south of the Heol Fawr, comprised of strips in individual ownership indicate medieval fields. To the south are other field names suggestive of communal ownership *rhandir ca cenol* (shareland in the middle field). The relatively small size of these divided shares and the *rhandir* element suggests land in *rhandiroedd* - a native welsh system less extensive than the large open fields of the Anglo-Norman areas.

The possible boundary of medieval arable land is marked on the map (Fig. 14). To the south on the 1751 map are two fields called *fforest*. This is not a common field name, but does occur in other locations within the study area. It is likely to mean scrub or waste rather than indicate the presence of mature trees. South of that is an area known as *Ddol fawr* (Great Meadow) in 18th century estate maps. This was enclosed in a large intake, clearly secondary to the Maes-ar-Dafen enclosure to the west. A bank was constructed south eastwards from the raised ground of Ynys (the Ynys Ystum of the 1609 Survey Bounds). It did not however proceed eastwards to link to the raised ground of Techon Fawr but turned back northwards to high ground. Much of this area still remains as fields now on the north side of the new A484's causeway. The area outside to the east was poorly drained and marshy. On the 2 inch to the mile Surveyors' Drawings it is marked as *Waun Techon*, which suggests meadow not saltmarsh. The date of the enclosure of Ddol fawr is probably late 18th century. The lands were by then in the ownership of a Mr William Morris. The name of the area was transferred to that of the farm and it is likely that this had not been saltmarsh, although still common, for some time. A manuscript history of Llwynhendy in Llanelli public Library records that the Bank enclosing Ddol Fawr was traditionally known as 'Morris's Bank' although the author did not know who the Morris was.

The construction of this embankment to Ynys and thence to the older Maes-ar-Dafen enclosures was extended further west again by an embankment which extended straight across the Dafen thence to Trostre. This, as noted above, is shown on a 1785 Estate map of Trostre Farm (see Fig 8) and possibly on William Jones' Map of 1751. It may have predated 'Morris's Bank'. The resulting composite long stretch made up the Maesardaven Sea Bank referred to in the *Cambrian* advertisement of 1808 quoted above.

Tyr Morfa

The area marked *Morfa Berwig* on the Surveyors Drawings was bisected by a deep pill into which small streams drained west of Techon fawr. This joined the Dafen Pill. To the south lay the raised glacially deposited moraine of Tirmorfa, formerly occupied by two farms, and now considerably landscaped by the Wildfowl and Wetland Trust to form their Penclacwydd Reserve. It is not known how early farms were established on this high ground originally surrounded by saltmarshes and bounded by estuarine mud flats to the south and west. The

Tithe Map of 1840 shows some narrow strip fields, relicts of a system of communal cultivation. These had been established sufficiently early to be assessed for tithes. The field was called *Cae Ysgubor* (Barn field) on the Tithe. Denham's Chart of the Burry or Llanelly Inlet of 1830 (Fig. 16) shows an embankment immediately on the south side of the Later South Wales Railway line. This must post date the Great Embankment which it abuts. He also shows another system of 'bulwarks' on the south side of the dog-leg shaped tidal inlet which was sited on the east side of the Dafen estuary. These are still visible as earthworks on the 1946 air photographs and form the sea defences of *Cae Scybor*. They may therefore be of 17th or 18th century date and earlier than the Great Embankment. They are overlain by a short but substantial bank which, on map evidence must be late 19th or 20th century, across the mouth of the former tidal inlet. The 1992 Geonex colour vertical air photograph (10/10/92: 149 92 089) shows how the large ponds of the Penclacwydd Wildfowl centre have been dug within the former tidal inlet and how some earlier embanked fields on the edge of the saltmarsh have now reverted to that condition. To the east of Tir Morfa, the first edition OS 6 inch map of 1877 marks what are two phases of embanking and these banks are still visible on the 1992 colour vertical air photograph and were detected on the ground in March 1993 during brief fieldwork for this report.

Fig. 16: Detail from Lieutenant H. M. Denham's *Chart of the Burry or Llanelly Inlet*, 1830.

The present day lane which extends southwards to Tir Morfa fawr and thence to the seawall footpath is undoubtedly an old track. Although the detail is not clear the 1813 Surveyors' drawings seem to show an access track connecting to this coming from Techon Fawr on the south (Penbryn) side of the Commons. North of the Farm the Enclosure Commissioners ordered the construction of a new straight length of road across the newly enclosed Commons to Maes-ar Dafen. This was obliterated when Trostre Works was built. But by that stage alterations to most of the new cross-commons roads of the Enclosure Award had taken place due to the construction of the Llanelli - Llangennech railroad and the South Wales Railway in 1852. But there is no doubt that the embankment on the south east side of 'Llandeilo Junction' which proceeds eastward to the Great Embankment was already constructed by the time the Enclosure Award Map was drawn in 1812.

Pen-Bryn, Bryn Carnarvon and Morfa Bacas

Eastwards of Tirmorfa is the largest of the glacially deposited hillocks on the Marsh, occupied by three settlements: Penbryn, Bryn-Carnarvon and Dyffryn. A stream today flows south westwards between the hill and Tir Morfa and issues through a sluice in the seawalls. Before a continuous stretch of sea defences was built, the stream was probably a small tidal pill. Eastwards again is a low mound, an *ynys* which had a settlement *Tir-Cil-Rees* on it in 1877. The southern edge of this mound lies beyond the modern sea defences, its raised height made a bank unnecessary. It is scoured by high tides and field inspection in June 1993 showed blue clay and darker horizons, with evidence of a marine incursion, visible in exposed sections. Another slightly raised area, possibly of alluvium like that just described lies to the south east. This now extends out into the channel of the River Loughor as a scar scoured by tides and recent sea defence works have been necessary to prevent fresh erosion. It is defended by a curve of sea wall which is marked as 'bulwark' on a 1761 Estate Map. To the west the 1761 Map shows a considerable sized tidal pill. This was probably accessible to coasting vessels, for an old lime kiln is marked on the 1877 Map (slight traces of which were identified in March 1993) and limestone was probably off loaded for burning by farmers as in many other coastal locations in south and west Wales. The Enclosure Commissioners *Plan D* of 1810 actually shows a small *public bank for burning lime* close to Pen-y-Bryn, although this was probably accessible from Pill y Ceven. The Pen-y-Bryn Pill was cut off by the continuous Bulwark evident on the first edition OS one inch map of 1831 and on Denham's Chart of 1830. The stream now issues through a sluice. It is interesting to note that the most raised field of this low mound (see Figs 15 & 16) is named *Llan fawr* on a 1761 estate Map and was in arable cultivation with pasture fields to the north and east.

Pen-y-Bryn, Bryn-Carnarfon and Dyffryn.

The Enclosure Award Map C showing the apportionment of common land in 1810, depicts a complex braided pattern of stream channels in the upper reaches of what had been streams draining into tidal pills draining south westwards into Dafen Pill or out between the coastal glacial hillocks of Tyr Morfa etc described above. Penbryn Farm may have been an early settlement and there are traces on the 1877 map, on the 1946 air photographs and in the surviving landscape which indicate embankments extending its fields northward towards the high ground of Techon Fawr. The angular changes of the track leading down to the now abandoned site (scheduled for redevelopment as a major new Sewage Treatment Works) suggest a track along a causeway or bank.

If so, such a system must predate the establishment of what is today Penclacwydd farm, but Pen-ceiliogwydd in 1877 and Pengwidd in 1761. Traces of a Phase 2 embankment protecting the northward sides of this settlement and its fields was certainly in place at the time of the enclosure award in 1810. Detailed documentary searches of early deeds, leases and rentals would be necessary to push back the dates of settlement of these farms.

Dyffryn was the third settlement on the Bryn Carnarvon hill. The early common land of *Commis Bach* and *Morvaidd Dyffryn*, shown on mid 18th century Estate Maps, have already been noted. By 1751 this latter area was owned by Sir Edward Mansell. They suggest saltmarshes in the upper reaches of Pill-y-Cefen below Dyffryn.

Pill y Ceven/Townsend's Pill, Yspitty and Bacas canals and Morfa Bacas

Fig. 17: The course of the Yspitty Canal, from Malcolm Symons, 1979, p.181

Murdoch Mackenzie's chart of 1775 (Fig. 10) shows a pill or creek on the west side of *Spitty Point*. Like Penrhynwgwyn Point this was an important early anchorage and shipping place. It was finally made redundant for shipping coal from early coal pits in the Bynea area by the construction of the Llanelly Railway and its associated tramways. The Pill was known as Pill y Cefn with Cefn Berwick at its navigable head. The extent of marshy ground around the Pill is still apparent on the 1877 First Edition 6 inch map. It was termed *Morfa Berwig* on the 1831 First Edition OS one inch map. Malcolm Symons' map shows the route of an early canal built by 1770 by Chauncey Townsend to convey coal from his pits at Genwen to the Pill which late 18th century maps and charts often term Townsend's Pill. South of Pont-y-Cefen the canal was built through four parcels of lands separated by sinuous pills shown on Jones's 1751 Map. They bear the common name of *Ddol fawr* (Great Meadow). This suggests some early embanking on the of the low lying land adjacent to the ancient *Heol Fawr* leading to the Spitty bank and the Loughor Ferry. All traces of this have vanished. The Canal and Pill were later known as General Warde's Canal and General Warde's shipping place after their early 19th century operator. What survived (or survives) on the ground was photographed by Symons in 1979. Made ground infills the landward side of Spitty Bank on the north eastern side of Pill y Ceven which was part of the construction work necessary for the South Wales (later the Great Western) Railway of 1852. The newly built A484 Swansea to Llanelli road is but the latest in a series of structures and engineering works to totally alter the late 18th century landform.

In 1794 John Vaughan leased coal under *Morfa Bacas* to two local landowners who were also empowered to construct a canal to convey the coal to the R. Loughor. The Bacas canal can still be traced on the ground today although it was abandoned by 1824. The early coal workings at Bryn Carnarvon were not successful. It was reopened and worked at different times in the 19th century and finally abandoned in 1927. But by this time a tramway (see 1877 6 inch Map) carried the coal to rail links and docks.

As mentioned above, the change in the course of the Loughor has resulted in loss of saltmarsh over Morfa Bacas and a tremendous expansion of marsh off Penclawdd. The Enclosure Award of 1810 apportioned allotments in the former Common and the Tithe Map of 1840 shows these shares and existing lands - now eroded away by the River Loughor. The marsh evidently extended south from a settlement called *Tir Teneu*. This and its fields were sited on land now occupied by a Sewage Treatment Works north of the railway line which cuts across what was the estuarine mouth of Pill y Ceven.

The name *Tenne* and also the site of the now abandoned *Tir-Bacas* suggest two low mounds perhaps of alluvium on which farms were sited close to the edge of the saltmarsh. There still are clear traces of two phases of sea walls south west of the former Tir-Bacas. The inner line is shown on an Estate Map of 1761. It abutted an area of slightly higher ground; as noted above this had a small pill on its western side. The evidence of relict channels shown on the 1877 Map suggests a pill on the eastern side as well. The present day sea wall is shown on Denham's chart and on the first edition OS one inch map. It was probably constructed around 1808-9. A wide straight channel on its inner, landward, side is still clearly visible today. During field work in March 1993, it seemed possible that this was the remains of a *westward* extension of the Baccas Canal predating the Phase 2 sea bank. The main purpose of the Canal was to move coal down to Pill y Ceven - but a westward extension would have allowed access to a landing place for limestone. The existence of a kiln and a public bank for burning lime has already been noted for this stretch of coastline. We must imagine it therefore, before the late 18th century as being still indented with pills and creeks, all accessible to small vessels on high tides despite the extensive wastes of Morfa Bacas to the south.

Llangennech Marsh

It has not been possible within the time and budget allocated to this project to carry out the same amount of research on Llangennech Marsh as for the Llanelli Coastal Plain. It is evident from D. Q. Bowen's map of the geomorphology of the Llanelli District (see Fig. 3, p. 5) that the same physical conditions prevail. The marsh is bounded by high ground, the relict traces of former sea cliffs. On the present marsh area of marine alluvium deposits are two small hillocks or islands of glacial till on which early settlement was concentrated. The Marsh is bisected by the River Morlais. There is evidence for embankments extending the enclosed land around the base of the areas of high ground. The first edition one inch map of 1831 shows these to be in place by that date and they are probably at least 18th century in date.

There were three early shipping places off Llangennech Marsh. Firstly Llangennech Pill itself, the outlet of the R. Mwrwg, also known as Sir John's Pill. M. Symons suggests that it may have been used for shipping coal from the 17th century onwards. It was finally cut off by the extension of rail links to Morlais colliery, which also served to block off the inner area of the marsh from the sea.

Less is known of a second shipping place mentioned in 1790 *Mr Jones of Duffryn has erected a Shipping Bank on Llangennech Common from whence he ships his coal* (Symons, p. 276).

Finally there was a shipping place south of the Pill opposite Box tenement where a quay and dock were erected by the late 18th century. The early waggon ways and railways were able to move the coal south to better shipping places and finally docks which probably had the effect of 'fossilizing' the earlier arrangements on the common lands of the Llangennech saltmarshes.

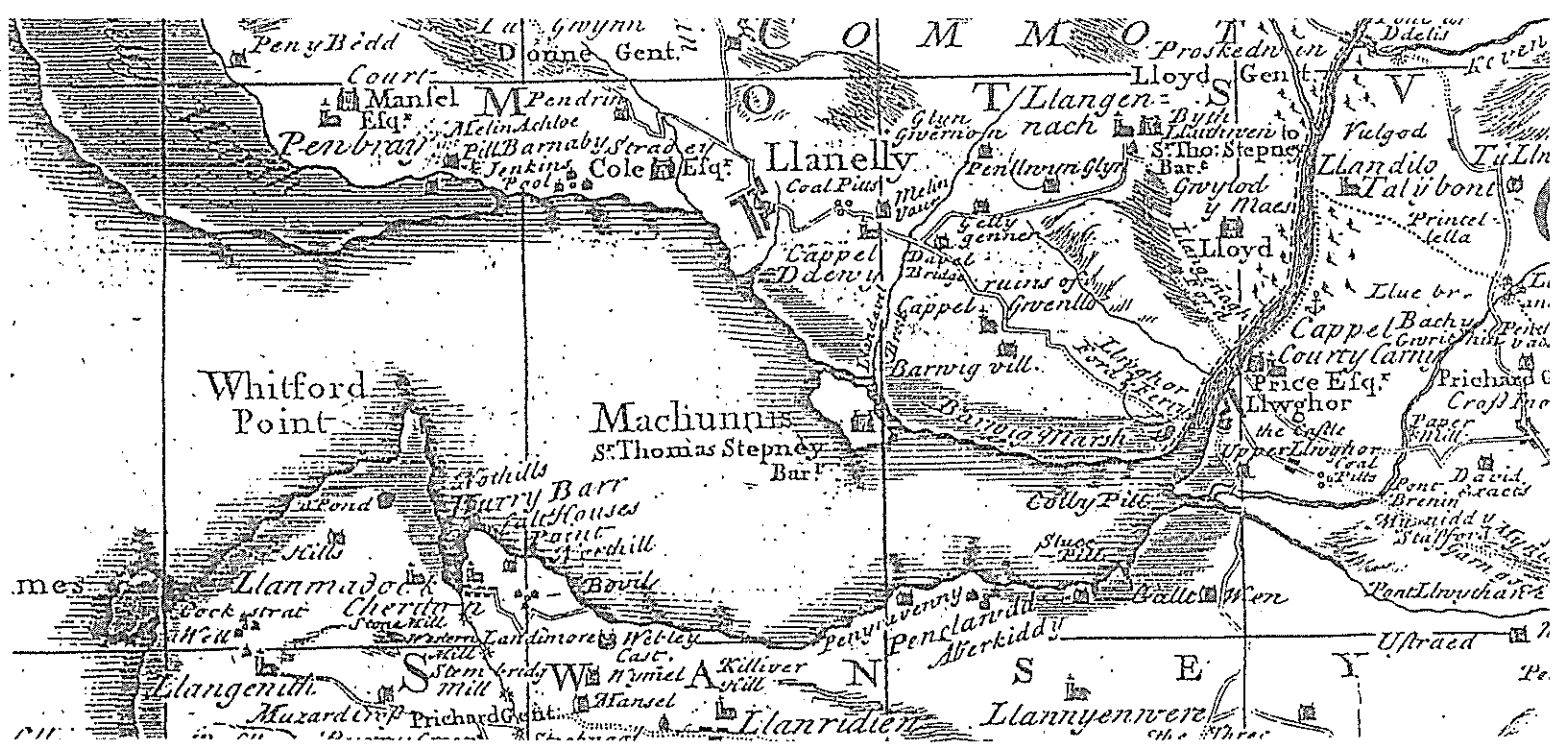
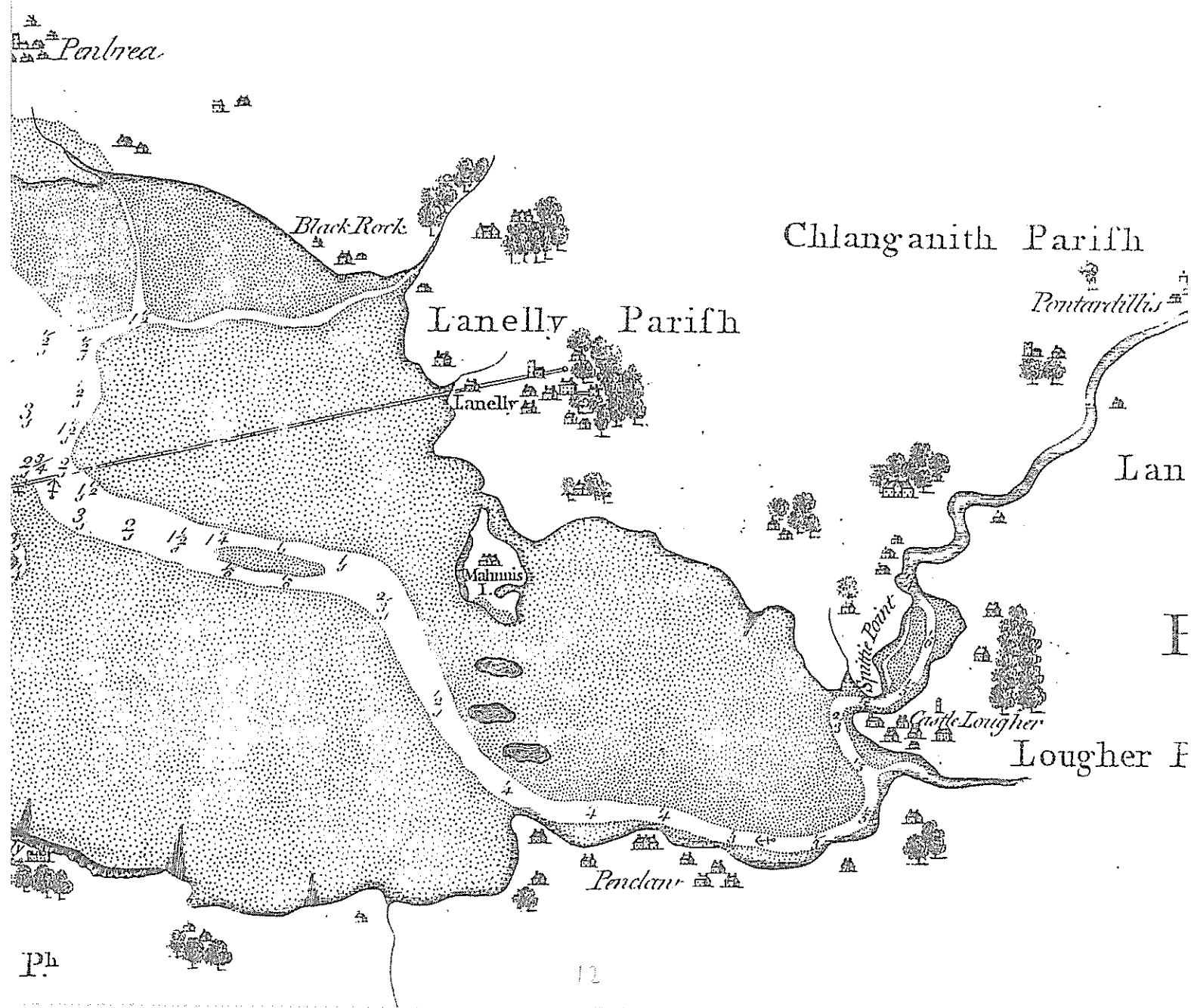


Fig. 10: Top: detail from Emmanuel Bowen's *Map of South Wales*, 1740, bottom: detail from Murdock Mackenzie's *Chart of 1775*.



Conclusion

This study has attempted to outline the main phases of reclamation of land from the sea and the consequent changes in land use. Undoubtedly the medieval settlements on the edges of the marshes made use of the resources of fishing, fowling and rough grazing that these large tracts of land offered. Extension of arable land and of hay meadows from the higher ground was made possible by embanking. Improvement in land use was undoubtedly gained in the 17th and 18th centuries by reclaiming saltmarshes fringing the 'core' settlements. However, as the Enclosure Awards make clear considerable areas of saltmarsh, (*morfa*) remained and was considered common land. In practice much of this land had evidently passed into private ownership which was recognized by the Enclosure Commissioners' allotments. The pre-Enclosure system was thus one of piecemeal enclosure which retained the use of tidal mills, so vital as shipping places and large expanses of saltmarsh. The Enclosure Acts for Llanelly and Berwick Marshes (1810-1812) led to the construction of an integrated system of sea defences which ultimately led to the reclamation of the saltmarshes, the blocking off of tidal mills and a new system of straight cut drains and sluices. Exploitation of coal on the marshes undoubtedly fostered enclosure but it is important to recognize that it was also productive farmland and that must remain the main historic motivation for land reclamation and improvement. The modern uses of the marshes, from the mid 19th century onwards have been dominated by transport systems. First the area was crossed by two main railway systems, and secondly, in the late 20th century by new road networks. Large areas have and are being used for factories, workshops and public utilities like sewage treatment works and landfill areas. Modern construction techniques allow the area to be seen as a landform which can be shaped and used for any purpose thought desirable: industrial, landfill, retail, residential and leisure. No longer is the area valued as farm land. At the same time the wildlife value of the marshes and fens is seen as a resource equally worthy of protection, management and enhancement. What has and continues to be lacking is any recognition of the value, interest and unique character of the historic landscape itself. This study has shown how little of that remains. Future work on the historic landscape should be directed to analysis of land use from documentary sources like deeds and rentals. Undoubtedly much could be gained from the systematic collection and analysis of field names. The history of farming on the marshes needs also to be researched. It is undoubtedly from the documentary sources, rather than the cartographic on which this study has concentrated, that the information requested in the Brief on tree planting can be gained. It is evident from the detailed botanical mapping undertaken by staff of the National Museum of Wales and the Countryside Council (kindly made available by I.K. Morgan) that there is, for example, a correlation between the distribution of *ulmus procera* and trackways of suggested medieval origin. The historic landscape is of interest and value in its own right. But it is also relevant to the present day botanical structure of the marshlands.

Levéé or bank to prevent all but high tides from flooding meadows

Landior on 1830 chart

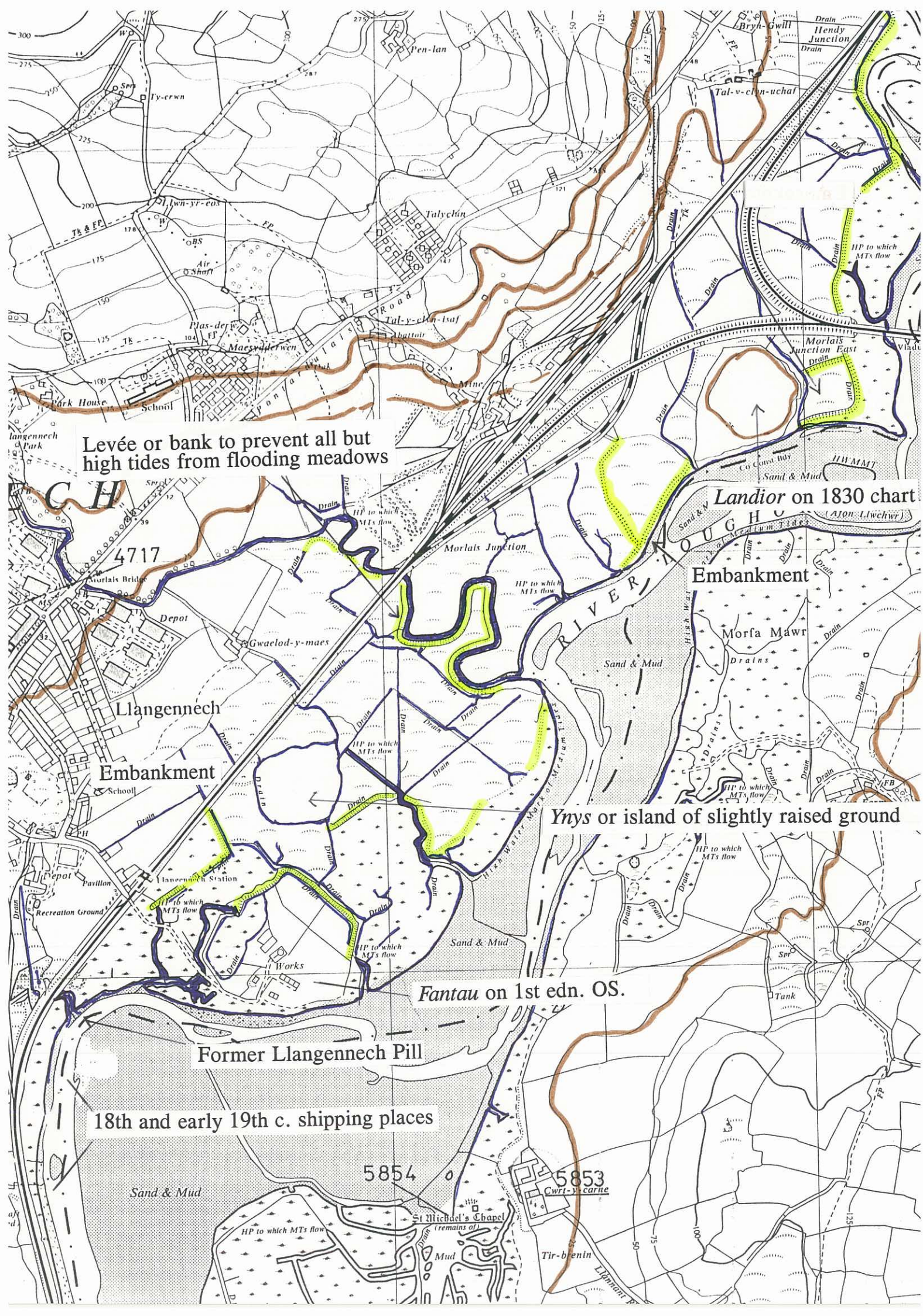
Embankment

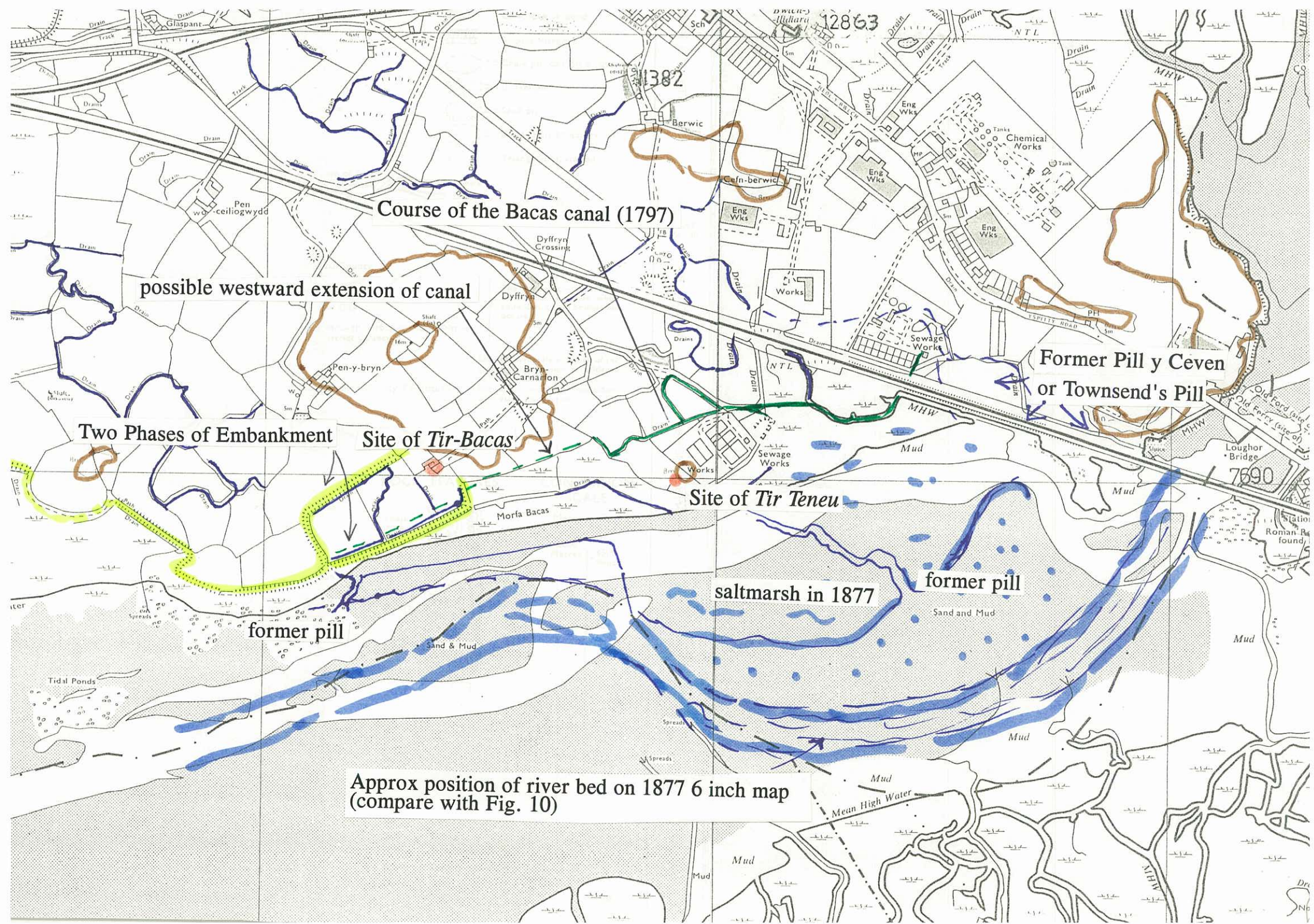
Ynys or island of slightly raised ground

Fantau on 1st edn. OS.

Former Llangennech Pill

18th and early 19th c. shipping places

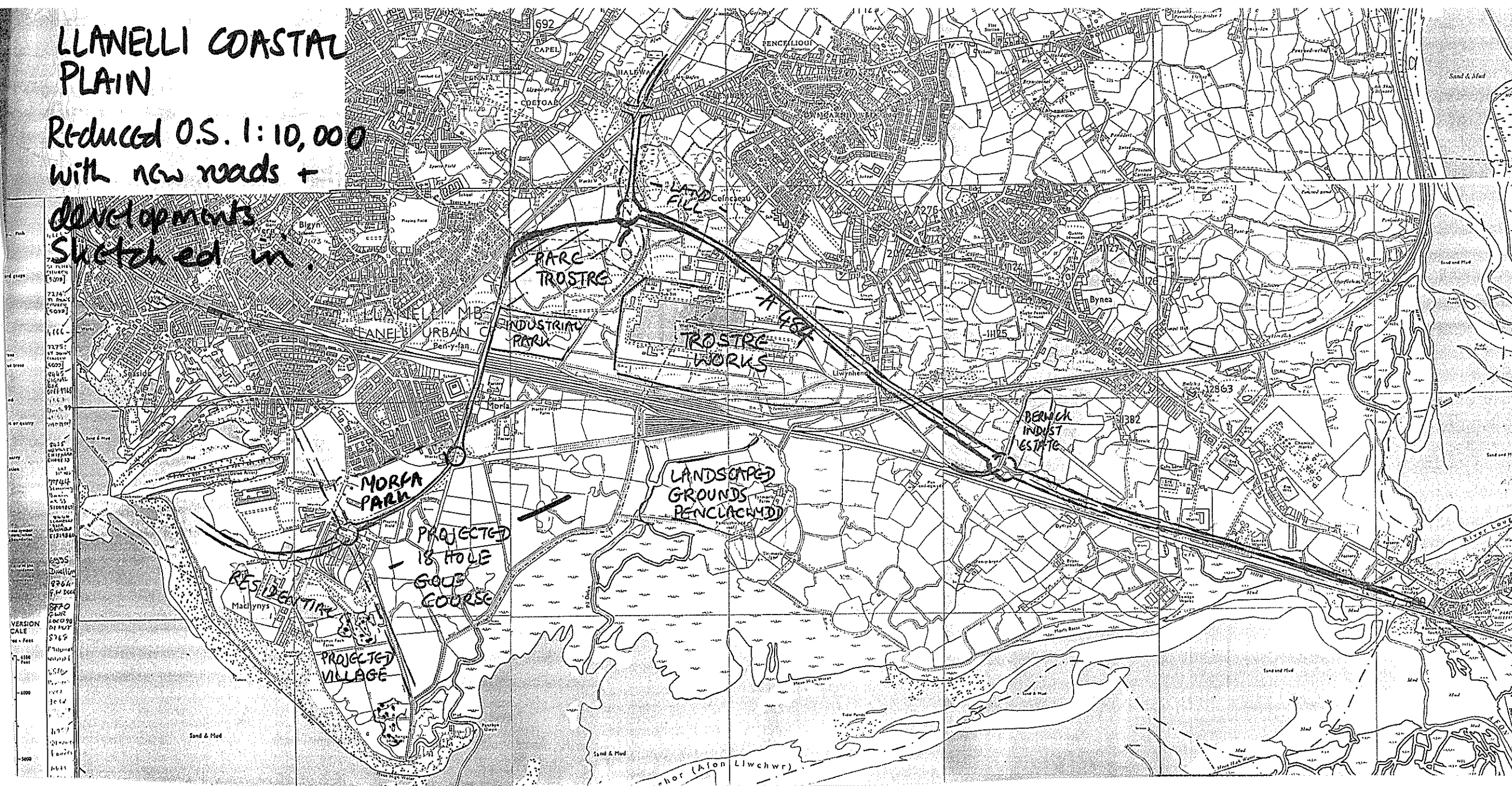




LLANELLI COASTAL PLAIN

Reduced O.S. 1:10,000
with new roads +

developments
sketch ed in.





5284

CPE/UK/2419.PART 4

NOV '47. F/12"//4,800' 58. SQD

