

A STONE AND WATTLE FISH WEIR COMPLEX IN SWANSEA BAY

by Nigel Nayling

During a recent survey of the intertidal zone of Swansea Bay, commissioned by Cadw: Welsh Historic Monuments, which had aimed primarily to map peat exposures on the foreshore, a complex of large V-shaped fish weirs was noted and subsequently researched. This paper summarises the evidence for the use of this system of weirs to complement papers published in this journal which have documented the use of fishing structures in the Severn Estuary proper.

The results of this research are presented here within sub-sections on aerial photographic study and field observations, followed by documentary and cartographic evidence. It should be stressed that no accurate field survey of this system has been possible within the confines of this study, and no sampling or excavation of any of these structures has been carried out.

Introduction

Swansea Bay forms a major embayment of the northern shore of the Bristol Channel running from Mumbles Head in the west to Sker Point in the east (Figure 1). The recorded weirs are located on the extensive foreshore between Brynmill and the mouth of the River Tawe where, although sand and shingle often obscures the underlying Flandrian deposits of clays and peats, the remains of this complex of fish weirs is readily observed (Figure 2). Whilst the weirs were known from documentary observations (Jenkins 1991, 117), prior to this survey they had not been recorded in the field. The first clear evidence for their survival came during examination of aerial photographs in advance of field survey.

Aerial Photographs

Plots of selected sorties, which showed this system of weirs most clearly, form the basis of the overall plan (Figure 2). Even on relatively small-scale aerial plates, many of the weirs could be identified as long as the state of the tide was sufficiently low when the photographs were taken. The weirs have generally been plotted from 1:6000 plates derived from Meridian sorties carried out in 1966 and 1979. The accuracy of the mapping is likely to be poorer towards the west, where reference points are few on the relevant plates.

Field observations

The sites of the weirs were visited on a number of occasions, photographs taken of selected, particularly well-preserved examples, brief notes made on the form of construction, and GPS (global positioning system) readings taken, usually at the apices of the weirs, to check the accuracy of the plots derived from the aerial photographs. Many of those seen on the sortie plates were obscured by sand or shingle, and observation of those situated near to the low water mark was compounded by being visible only at the lowest state of spring tides.

The walls of the arms characteristically consisted of rubble 1-2 m wide with small, usually roundwood, posts running along the inner edge. Often further lines of posts could be seen several metres in from these walls, which may mark the former location of stop-nets which replaced the original weirs. The more complete walls were generally 120-170 m in length with the enclosed angle between them ranging from 70° to 100° (Figure 3). At the apex of the weirs, where the mouths were better preserved, the walls became progressively more parallel to one another and the wooden posts continued beyond the walls to form a gradually narrowing 'snout' traceable for up to 20 m (Figure 4).

The visible weirs can be divided into four main groups. South of County Hall, an inter-linked group of at least six weirs can be traced with their apices some 550-650 m from the present high water mark (Figure 2). Further to the west, separated by a distance of c 300 m, a second group of at least six weirs is located 850-900 m out from the sea wall, south east of Brynmill and Swansea University. Some 350 m inshore of this group, two adjoining weirs, with walls 150-200 m long and enclosed angles of 90-100° could be later rebuilds (implied in the 'somewhat garbled') court proceedings of 1869; see below). A fourth, possible group, noted on aerial photographs and only briefly glimpsed before a retreat from the incoming tide proved judicious, is located considerably further to the south west near to Oystermouth (centred on SS 6259 8883, not illustrated).

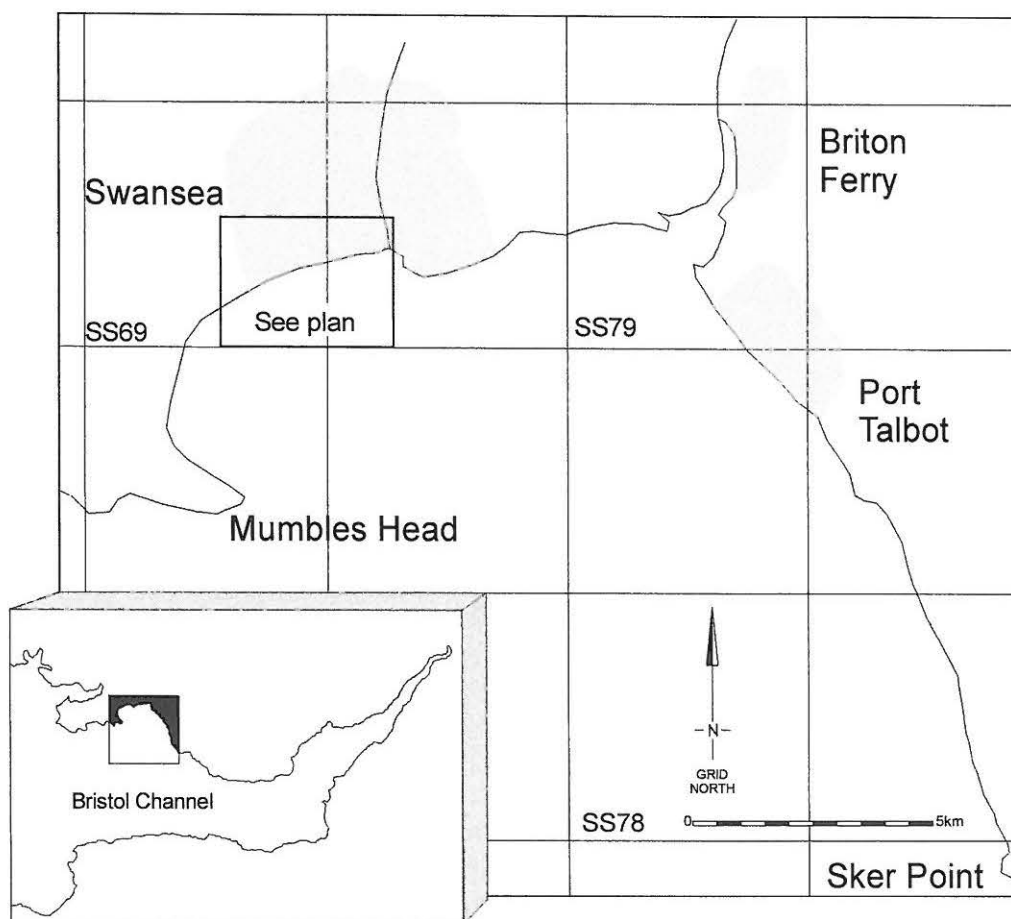


Figure 1: Swansea bay in relation to the Bristol Channel (inset) and the location of the main survey area. Co-ordinates relate to the Ordnance Survey National Grid.

In addition to the more common stone weirs, a substantial weir made solely from wooden posts was also recorded south of the first group of stone weirs (Figure 2). Located close to the low water mark, this large V-shaped trap is similar in scale and configuration to the stone weirs. The western arm exceeds 150 m in length, whereas the eastern arm can be traced for no more than 90 m, the angle between them being $c 65^\circ$. Surprisingly, given the absence of any stone, this structure was noted on one of the aerial photographs with the separate lines of posts discernible. Generally the posts are small, either roundwood or split (Figure 5). Further rows of posts ran perpendicular to and across the western arm, and a short stretch of another, separate NW-SE oriented arm, also probably wooden, was plotted from the aerial photograph but not seen in the field.

The documentary evidence

Evaluation of documentary references to fishing in Swansea Bay can at times be problematic. Different references, even when contemporary, can be contradictory. In part this may be a function of the

different interest groups involved, along with genuine confusion over the status and rights of the fishery. Repeated references to declines in fish catches may be real or motivated by parties wishing to either close the fishery or engage the sympathy of the owner and hence reduce rentals. Early references are on occasion unclear about the location of weirs particularly as to whether they were situated in the River Tawe or on the foreshore.

In his extensive study of the history of Swansea, Jones (1992, 25 and 56-7) noted 15th century references to named weirs in the River Tawe (cf Rogers 1946, 106 and 113-4). These are taken to be seasonal salmon (and possibly eel?) weirs and will not have survived industrialisation of the lower Tawe.

Late 16th and 17th century surveys provide the earliest written evidence identified to date for the presence of fish weirs on the foreshore of the western portion of Swansea Bay (Baker and Francis 1870). A 1583 survey of Gower Anglicana, the eastern boundary of which was the River Tawe, includes a paragraph, which implies the presence of some form

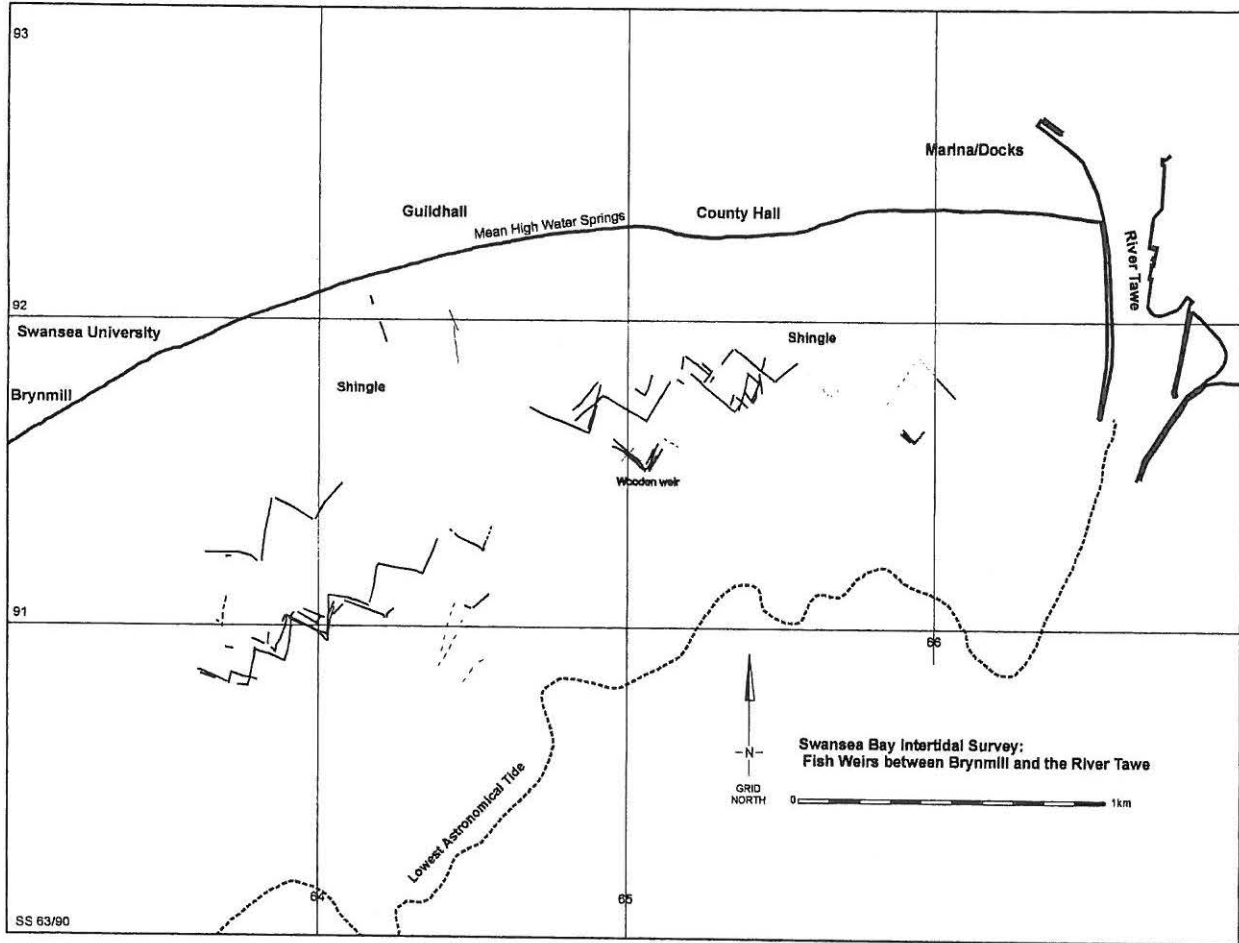


Figure 2: Fish weirs located on the foreshore west of the river Tawe. Transcribed from aerial photographs.



Figure 3: Stone fish weir in Swansea Bay. Taken from the apex of the weir looking landward. Inm addition to the stone remnants of this weir, parts of other weirs can be seen crossing it. Scale 0.5 m.



Figure 4: Detail of the apex of the above weir. Wooden pegs and stone delineate the former location of the basket trap. Scale 0.5 m.

of fishery in this part of the bay:

“To the Tenth article we say that there are certaine fishings in several of y^e members of this Lo^{pp}, for y^e which the Lord hath a certaine rent, and that

the tenants and inhabitants have liberty to fish freely tyme out of minde, in any other places than such as are allready under rent, as farre as we know” (Baker and Francis 1870, 117).

Unequivocal evidence for the presence of weirs on the foreshore occurs in the Cromellian survey of the manor of Oystermouth dated 1650. In addition to mentioning a David Griffith as the holder of ‘halfe the fishinge of a wear’, numerous weirs are mentioned in rental lists for freeholders and tenants (Table 1). The total number of weirs listed approximates to thirteen, a figure that recurs in later accounts and in the only undated map giving the supposed location of the original weirs (see Figure 7 below). It would seem common for the two arms of a single weir to be held by different individuals. How this situation came into being is not clear, nor the advantages, if any, of such an arrangement. It may be that during the division of property upon inheritance, that ownership was divided between heirs. Presumably, anyone wishing to fish a weir would need to secure leases from the owners of both arms.

In the Title Deeds of Ty Gwyn, 1735-1825 (Rogers 1946, 376-9) two references to weirs, are recorded:

28th Sept. 1779 *Catherine Williams releases Gabriel Powell Esquire for £3.20 a moiety or western arm of a fishing wear in the sand on the east of and adjoining to Blackpill river called Y Gored Vawr, in*

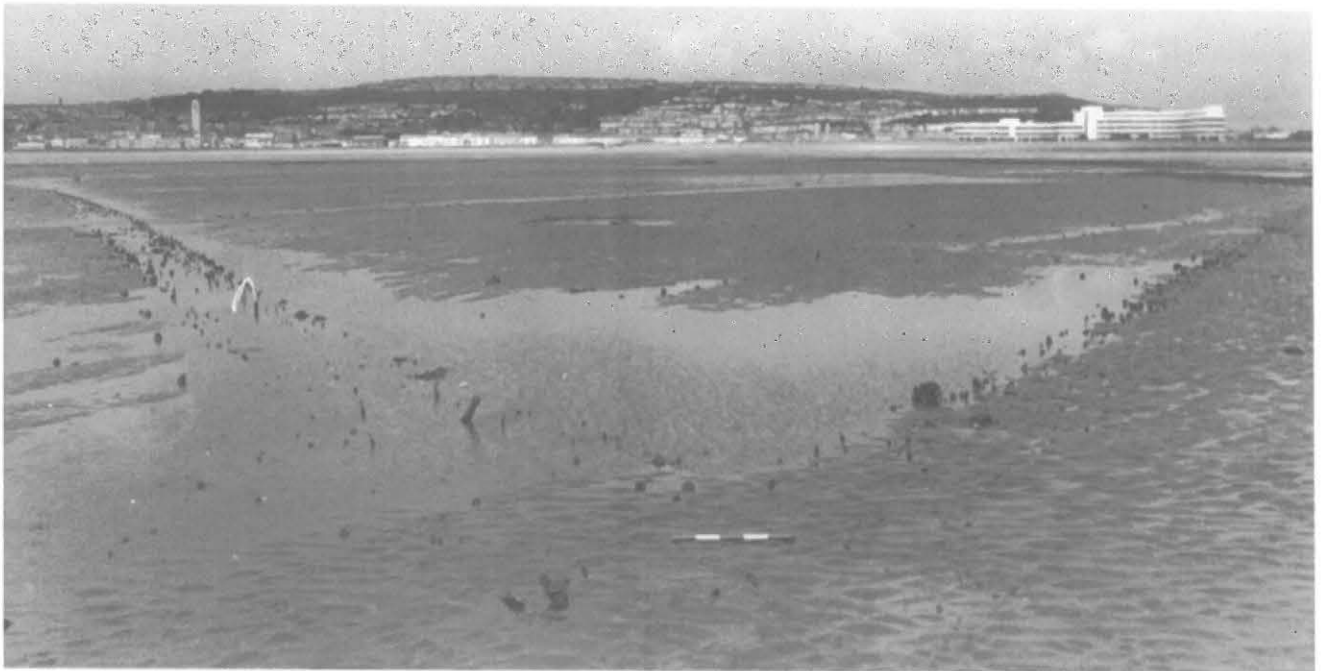


Figure 5: Wooden weir, taken from the apex of the weir looking landward. The new County Hall is visible in the background. Scale 0.5 m.

Table 1: Mentions of weirs and associated reentals in the 1690 Survey of Oystermouth
(after Baker and Francis 1870)

The Freeholders of the said Manor with the Rents they pay.					
I conceive all these areas following are Welsh acres					
	area		value		
	acres	rods	£	s	d
<i>DUNNES</i>					
William Robin for lands and halfe a wear	01	0	00	00	01
<i>NORTON</i>					
David Mathew for a fishing wear	00	0	00	00	06
The customary houlders of the said Mannor with the rents they pay					
<i>NOTTAGE</i>					
Co ^{ll} Phillip Jones for a messuage and lands and one fishing wear at Nottage	23	00	00	06	09½
<i>MAYALLS</i>					
Edward Mansell Gent. for a messuage and lands at Mayalls and half a wear	09	0	00	05	00½
<i>BLACKEPILL</i>					
Evans Seys Esq ^r for half a wear	00	0	00	00	02
<i>NORTON</i>					
The same [Henry Bragg] for lands at Norton and halfe a wear	05	0	00	13	11
<i>NEWTON</i>					
Rees Russell for lands and halfe a wear there	00	2	00	00	06
John Robin for a messuage and lands and a quarter of a wear at Newton	08	2	00	07	04
<i>COULT'S HILL</i>					
Charles Lloyd and Robert Bydder for a messuage and lands and half a wear at Coult's Hill	18	0	00	12	11
<i>NORTON</i>					
George Robin for a messuage and lands and half a wear at Norton	17	0	00	16	08
John William for two messuages and lands and half a wear there	27	0	01	04	00½
<i>BOARSPITT</i>					
John Thomas Rees for a messuage and lands and a wear and a halfe at Boarspitt	25	0	00	14	06
Richard Hamon for a wear	00	0	00	00	04
<i>WHITSTONE</i>					
Morgan Lloyd for a fishing wear					
<i>DUNNES</i>					
William Madocke for a messuage and lands and halfe a wear at Dunnes	02	2	00	02	06
<i>FFISTLEBOON</i>					
George Robin for a messuage and lands there and a quarter of a wear	06	0	00	05	08
John William for a messuage and lands at Ffistleboon & halfe a wear & a quarter of a wear	09	0	00	08	04
<i>DUNNES</i>					
Griffith Rosser for lands and a wear	02	0	00	02	08
John Woolcocke for a messuage and lands there and halfe a wear	02	2	00	01	08

possession of Richard Rosser, the eastern arm being the property of the said G.P.

3rd Sept 1828 *The fishery or Wear known as Y Gored Fawr (formerly in possession of Richard Rosser) and lying between the Fishery called Rees Harry's Wear on the west and the Fishery or wear called Pumade formerly in Simon Jones's occupation on the east, and situate in Swanzey Bay*

A copy of part of the Singleton Deeds held in the Graham Vivian Collection (UWS, GV A.18) reads:

24th June 1784 *Matthew Virley of Sketty aged 87 years has this day declared before us that about 30 years ago or upwards, he rented a Wear for fishing of Robert Thomas (which wear was and is situate between the two Wears of Simon Simons of*

Sketty [Isha?] and Roger Rogers of Gwern [Avith?] at the yearly rent of 6 shillings or 3 shillings per side. John Rosser of Ty Gwyn was partner with the above Matthew Virley in the Wear.

Early attempts to establish a deep-sea fishery at Swansea in 1775 (UWS, GF Bb,) were promoted through the distribution of broadsheets. One of these mentions the weirs in passing, arguing for the benefits of superior, and more consistent catches from deep-sea fisheries: "...and particularly Soles of a much larger fize than ufually caught in the Wears upon the fhore".

Advertisements in the Cambrian News (CN) give some record of changes in ownership. The first reference identified includes the offer of sale of 'a FISHING WEAR on the Mumble Sands' along with

a dwelling house (CN, 27/04/1805). One of a number of lots offered for auction in 1808 (CN, 19/03/1808) comprised 'a copyhold house and garden, situate at the Mumbles; and also a fishing weir, on Mumbles Sands, lately occupied by David Lloyd'. It is unclear whether the named individual was the former occupant of the house, or worked the weir, but it would appear that weirs were often attached/associated with particular landholdings. Several lots near Newton, in the parish of Oystermouth, offered for sale at auction including a 'fishing weir, next the Mumbles, in hand' were described in an advertisement as 'held by Tenants from year to year' (CN 01/08/1840). If this can be taken literally, it suggests that weirs were not owned by those who worked them, but rented by the fisherman from the owner. An advertisement for the sale of one arm of a fishing weir at Oystermouth Bay (CN 14/6/1850) again indicates the practice of separate ownership of individual weir arms.

A short article recounting the visit of a Royal Commission on Deep Sea Fisheries to Swansea in 1864 (CN 14/10/1864) is dominated by complaints by a number of parties concerning the damaging effects of the weirs on fish stocks. It would appear that oyster fishermen in particular considered the weirs a nuisance, although their views may have been coloured by the fact that many of the same fishermen long-lined for fish during the oyster close season, and may have considered the weirs as competition. One oyster fisherman, in linking the existence of the weirs to a decline in fish stocks, mentioned that this mode of fishing had been in use for 'upwards of thirty years'. The only witness to defend the weirs was

William Benson who described himself as the proprietor of two weirs and claimed never to have observed any dead fish during visits to the weirs to collect the small catch. He claimed to pay £1 rent to the Duke of Beaufort for each weir, and that the building of the weirs cost £30 each.

One of a number of fine seascapes of Swansea and Gower painted by Edward Duncan and dated to 1847 takes the collection of fish from one of the Swansea Bay weirs as its subject (Figure 6). The picture depicts a scene at low tide viewed towards the east with Kilvey Hill in the background. The right foreground is dominated by a group of three men and a boy apparently checking a woven basket located at the apex of a weir. To the right of the figures, the construction of the weir arm is clear: a combination of wattled wooden uprights bound on the outside by rocks and wooden stakes. The basket itself is secured by a similar edging of stone and stakes, and weighted down with at least one stone. One of the figures leaning over the basket, and another sitting in the left foreground, have some form of push net with a long handle and shallowly curved 'blade'. Another carries baskets and sacks, presumably to carry the catch. This is the only contemporary illustration of these weirs yet identified.

Further light (but also some confusion!) is shed on ownership and rights by two court actions involving Mr Graham Vivian who purchased the Clyne (formerly Woodland) Castle estate in 1859. In the first case, a Mr Ashford, who had placed a stop net on the shore, having paid rental to the agent of the Duke of Beaufort, sought damages from Mr

Figure 6: Detail from *Fishing the Weir* by Edward Duncan RWS, signed 1847. From Howell 1987.



Vivian who had had the net removed, claiming ownership of a (disused) weir seaward of the location of the new net (CN 7/5/1869 and 11/6/1869). The convoluted claims and counter claims of various parties indicate a high degree of confusion and the judgement of Judge Falconer does little to clarify matters. It would appear that some parties paid rent for the right to fish some of the sites to the agent of the Duke. Some of the weirs appeared to have been rebuilt some 25 years previously, approximately 300 yards closer to the shore compared with their original location, and that many of the weirs had fallen into disuse or been replaced by stop nets. In a second case, brought in 1885, Vivian sought to 'recover the sum of £3 for use and occupation of a weir situated at Blackpill' from a Samuel Britton who had placed a net in front of the said weir (UWS, GV A.18). A hand-written transcript of the proceedings, largely consisting of interviews with fishermen, indicates that the original wattle and stone weir had fallen into disuse some 40 years previously and that only two stone and wattle weirs were still in use (belonging to Singleton). Thereafter, the site had been fished by a stop net 'much in the shape of the weir located approximately 10 yards forward of it', with the fisherman paying rent to the owner of the Woodland Castle Estate.

Matheson (1929, 63), refers to the Report of the Royal Commission on Sea Fisheries of 1863, describing the weirs as:

'about six feet high,composed of stakes driven into the sand, and wattled so as to constitute a fence. Through such a fence the water readily passes, and the tide, flowing around the weir and finally submerging it, leaves the fish, which, unless they escape again before the ebb, cannot pass through the meshes. The arms of the weir formed an angle of approximately ninety degrees, and each measured up to about 200 yards in length. At the junction of the arms, near low water mark, was a closely woven conical basket, with its entrance facing the inner side of the weir. In order to retain some water when during spring tides the tide ebbed beyond the limit of the weir, a layer of bushes and matting extended, close to the ground, along each arm of the weir, to a distance of about fifty yards from the basket. Sometimes a continuous trap of two or three miles in length would be formed by a line of these weirs, the inner ends of the adjacent arms being in some cases united. Complaints about the destruction of young fish by these engines

were frequent, and in some cases nets were substituted for the wattle fence, this being said to result in the capture of fewer small fish.'

A rare, early documentary reference to the use of net weirs is given by a brief appeal on behalf of one Thomas Owen, a fisherman who 'had saved sufficient to purchase nets and material for the formation of two weirs has been a heavy loser his weirs and nets having been nearly destroyed by the gale' (CN 28/10/1870)

In an essay submitted to the 1884 National Eisteddfod, some indication of the staple fish caught in the weirs is given (Davies, 1885):

Between the Mumbles and Swansea a good deal of fishing goes on, but chiefly by means of weirs and fixed nets. Of the former there are thirteen, and of the latter three, or sixteen altogether; and the owners are very tenacious of their ancient rights. The bottom of the bay outside of these weirs is, naturally, a clean sand with patches of mud. Cod, conger, bass mullet, whiting, soles and plaice are taken here with a few brill, turbot, and salmon. Inside the bay there has of late years been a decrease in the quantity of fish taken which is by some attributed chiefly to the destruction of small fish inside the weirs and fixed nets; also to the pollution of the water owing to the dredging operations going on in connection with the harbour works in course of construction; and also, and chiefly, to the great increase of copper, iron, tin-plate and other works during the last forty years.

Whatever the causes of the decline in catches, there appears to have been a shift from the use of wattled weirs to stake nets at the end of the 19th century. By 1904, the most characteristic form of fishing was "the setting of stake-nets for cod, whiting, flat fish and some other kinds. Those who travel to the Mumbles Pier by the light railway have an opportunity of seeing miles of these nets along the shore" (Aflalo 1904, 338).

During the 1930's, the Swansea Borough Corporation sought to gain control of the foreshore in order either to police more closely the fishery or, in the face of various complaints, to close it down. Documents relating to the South Wales Sea Fisheries District Committee include notes to the effect that of the 13 original weir sites, four now belonged to the Corporation and some to Admiral Walker Heneage Vivian C.B. with rents being payable to both the Corporation and Clyne Castle Estate (claimed under ancient manorial rights). A separate document indicates that the trustees of Sketty Isha Estate were leasing parts of the foreshore (including the right to use stake nets) to a Mr F. Scrines.

Another letter documents failed attempts to intercept fisherman returning from the nets with carts of under-sized fish (WGRO, D/D SWSF 19/2).

An enquiry, undertaken by the South Wales Sea Fisheries District Committee in 1935, noted that these nets caught only half the quantity of fish that had been taken 30 years earlier and that species such as cod, skate, hake, ling and sole were no longer caught. The nets were said to take approximately 1½ cwt of fish each to a total value of £5 on each tide. Evidence given by one Jack Davies, who had worked the nets for 60 years and his family for over 200 years claimed to catch whiting, herring, mackerel and flukes. He described the nets as requiring 10 x 100 yards of nets 'per weir' plus 50 yards for the 'cage', hung on 300 poles (WGRO, D/D SWSF 19/2).

Morris (pers comm) recalls seeing these nets

'on tall stakes, set in V patterns on the foreshore, still there in c1948-50', and believes that this last manifestation of the local fishing weir tradition fell into disuse because people used to steal the fish before the last fisherman who worked them could recover his catch.

Davis' account of fishing gear in use in England and Wales in the middle of this century makes clear that the use of wattle and stone leaders had been superseded by large V-shaped nets apparently with similar dimensions and location to the original weirs (Davis 1958, 30):

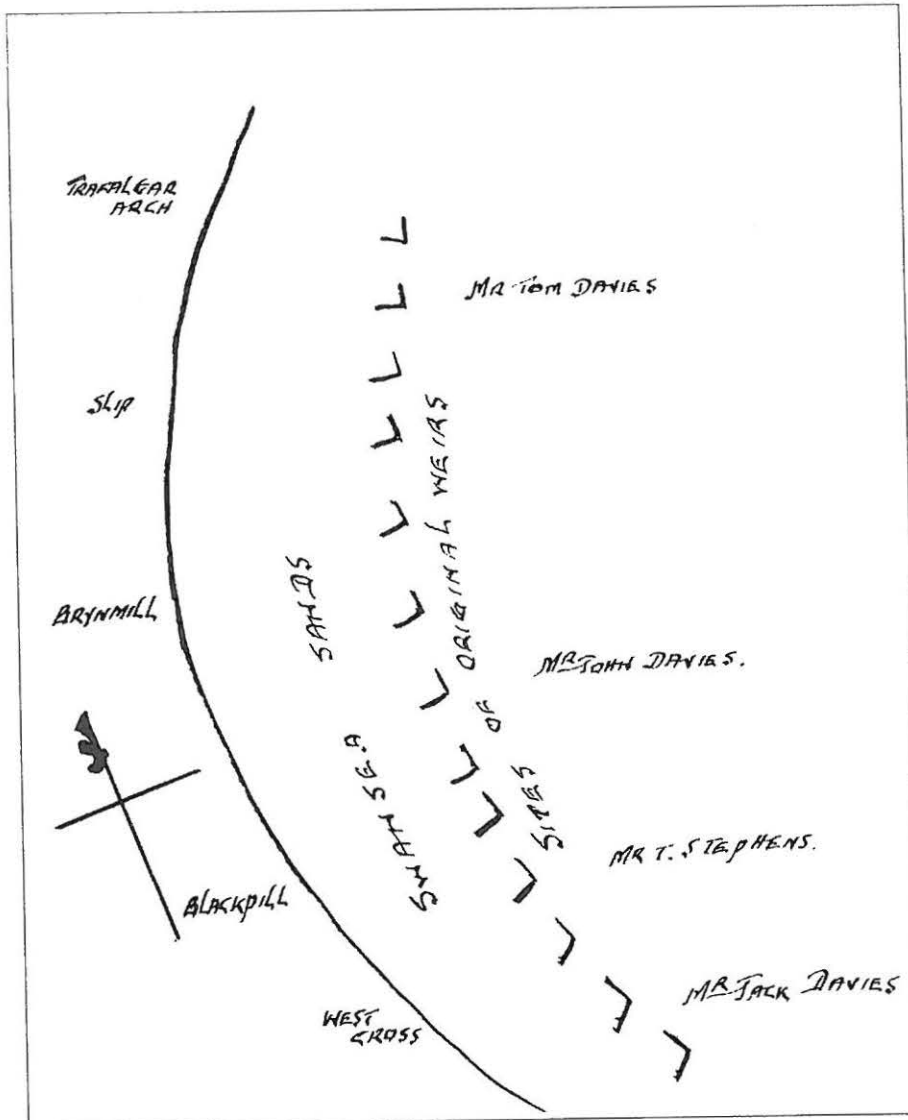
In Swansea Bay there are several large V-shaped stake nets, locally known as 'Stop Nets' or 'Kettle Nets'. They are the largest nets of the type found in the country, the total length of the two arms of each net amounting to about 700 yards. They are usually set in series with the tips of the arms of adjacent nets almost meeting, and with the axis of the net almost at right angles to the foreshore, the tips of the arms not reaching high-

water mark. The net is about 7 feet high, set on stakes, and of 1-inch bar mesh. At the apex there is a circular, roofed cage about 12 yards in circumference, prolongations of the arms into which form the usual type of non-return trap. Local byelaws require the cage to be in such a position that a pool is left in it at low water.

Cartographic Evidence

The tithe map for the parish of Swansea (1843) shows nothing on the foreshore apart from "sand hills". That for Oystermouth describes the main foreshore (numbered 1217) as 1,008 acres of wastes (mud and sands below high water mark at spring tides) owned by the Duke of Beaufort and occupied by the "Lord of the

Figure 7: Undated map of original sites of Swansea Bay weirs (GWRO D/D SWSF 19/2), probably relating to enquiries made in 1935



Manor". No tithes are listed for these areas.

The first edition OS maps (25 inch, 1878) for the Blackpill/Brynmill and Oystermouth Road areas below high water mark indicate only stippling (areas of stones?) and "targets", but no fish weirs. The extent of foreshore included would have encompassed the areas where the weirs were located so their absence would seem to be a consequence of selective mapping.

An undated map forming part of a bundle of documents relating to the South Wales Sea Fisheries District Committee (WGRO, D/D SWSF 19/2), probably relating to enquiries made in 1935 (Figure 7) indicates the former location of the original weirs. By this time, only five or six of the sites were being worked and then with nets.

The Admiralty Chart for Swansea Bay (sheet 1161), mapped in 1949, marks eight possible weir sites. Those in the east, seaward of Brynmill, can be equated with weirs identified during this study from aerial photographs and field evaluation. On the other hand, a large weir marked off Oystermouth, and also remnants of two off Blackpill can not be so readily correlated. Although shingle/gravel expanses off Brynmill and County Hall are shown on both this map and the recent chart published in 1994, there

are no indications of weirs on the current Admiralty Chart.

Parallels

The form and location of these weirs is strikingly similar to those illustrated by Duhamel du Monceau (1769), who described gear and fisheries in France in the 18th century. The illustration shown in Figure 8 was reproduced by Cushing (1988) in a review of pre-industrial fisheries. The substantial arms of wattle and stone run from close to the high water mark down to an apex where a conical net (rather than basket) is attached to collect the catch.

Similar systems of large V-shaped stone weirs have been observed in the Bristol Channel at Minehead (McDonnell 1980), large wooden systems in Bridgewater Bay (McDonnell 1995), and smaller stone weirs in Porlock Bay (Canti *et al* 1996). Whilst substantial stone weirs have been identified in a number of locations, e.g. Menai Straits, these large V-shaped structures are only likely to occur in major embayments where the distance between high and low water mark is considerable and there is sufficient space to allow their placement without hampering navigation. A classic Welsh example is the famous timber and stone weir Cored Rhos Fynach at Rhos-on-Sea (Evans 1995). It should be stressed however,

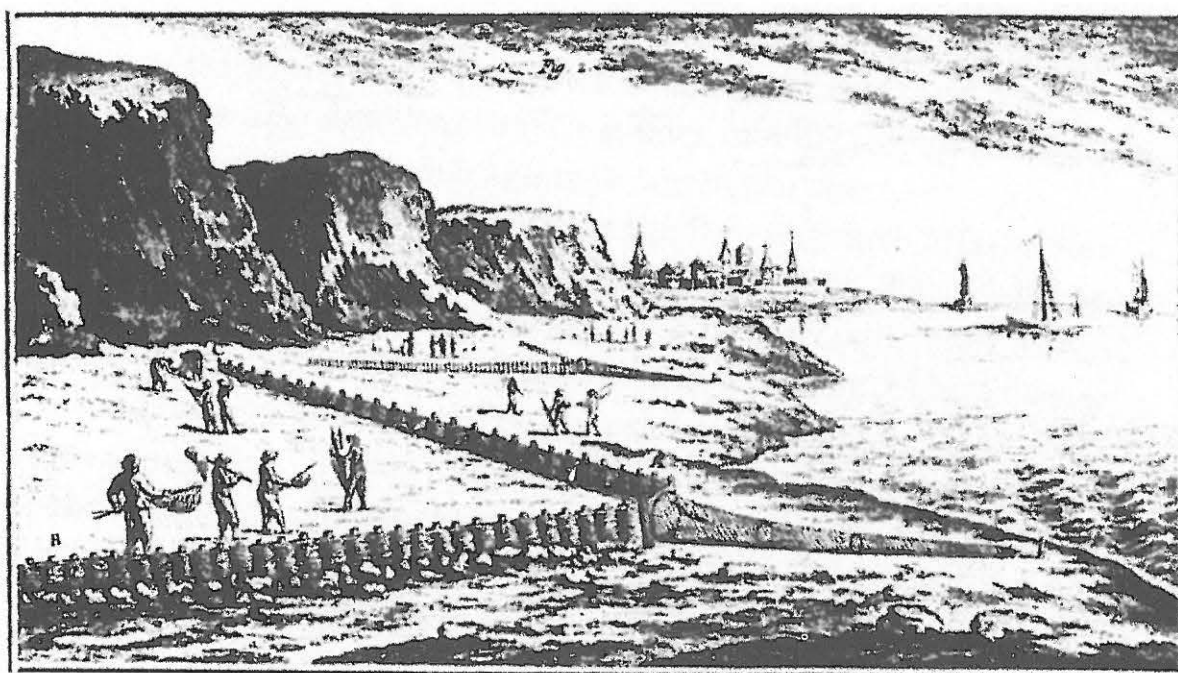


Figure 8: 18th century line drawing illustrating intertidal fish traps in use on the French Coast (after Duhamel du Monceau 1769)

that no system of weirs in Wales can be considered to have been as extensive as that in Swansea Bay.

Conclusion

This study demonstrates the value of pre-existing aerial photographs, maps and documentary evidence, particularly estate surveys and accounts of disputes, in the elucidation of surviving remains of intertidal fish weir complexes of the type found in large embayments. Detailed field survey and sampling of these structures could lead to a greater understanding of their chronology and development, possibly extending the date of their usage back into the medieval period for which no clear documentary evidence exists.

Acknowledgements

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List of Abbreviations

- CN: Cambrian News. An index and microfiche of the originals are accessible at Swansea Reference Library.
 WGRO: West Glamorgan Record Office.
 D/D SWSF: South Wales Sea Fisheries District Committee
 UWS: University of Wales Swansea Library, Rare Books Section.
 GF Bb: Grant Francis Collection: broadsheets relating to Swansea and Glamorgan
 GV A.18: Graham Vivian Collection: documents relating to disputes regarding a fish weir at Blackpill (1869-86)

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