NATIONAL COLLEGE OF ART AND DESIGN

Forgotten Structures; *an exploration and examination of the structures of The Ballyconnell and Ballinamre Canal.*

A THESIS SUBMITTED TO THE FACULTY OF HISTORY OF ART AND DESIGN AND COMPLIMENTARY STUDIES IN CANDIDACY FOR BACHELOR OF DESIGN IN VISUAL COMMUNICATIONS.

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INTRODUCTION

The mystery of the past as viewed from the present: my initial sentiments, which I would consider to be similar to anybody else's, on exploring the long forgotten and relatively unknown structures of the Ballyconnell and Ballinamore Canal.

Constructed between 1849 and 1860 the canal had an operational life of about 10 years before it fell into disuse. For just over 120 years now, the canal has been lying dormant. Surprisingly the majority of its physical features remain in overall good condition, which is a testimony in itself to its designers. Present day exploration of the canal and its structures, offers an endearing insight into a long lost way of life.

In the modern day 20th century, the most efficient way of transporting goods to widespread locations countrywide, which was the canal's primary purpose, is nowadays more efficiently executed by the much improved networks of both road and rail, and to a lesser extent air. On account of these facts it would seem as though the canal is doomed to continued disuse.

At present this is not the case, as the possibility of its restoration, which as caused a lot of controversy throughout the years, has been accepted into practice. The possibility of increasing tourism is now to serve as the primary purpose of the canal. Restoration of the navigable link between the Shannon and Lough Erne will enable Ireland to once again boast of the longest inland navigation system in Europe. So what will restoration entail for the existing canal structures such as the locks, bridges, and wharves ? It's obvious from the evidence and environmental impact statements which I have obtained from those directly involved with the restoration, that the majority of the structures will either have to be pulled down and reconstructed or else relocated.

Because of these facts and also on account of what I consider to be unusual lack of both written and visual material with

regard to the Ballyconnell and Ballinamore canal (and indeed Irish Canals in general), I decided to explore and research the canal and its structures. To highlight their beauty and discover their unique features, motivated me to what I consider is a very worthwhile and extremely interesting subject to research.

Once having commenced the literary research, it was actually my first visit to one of the canal's locks, which not only personally reinforced my choice of subject, but greatly increased my enthusiasm for it. I felt that just like researching a painting by discussing, and even looking at photographs of it, one can only gain a true and almost complete appreciation of it through viewing and examining it in the flesh so to speak. I consider it like trying to research impressionist paintings from black and white photographs. Nevertheless this is a thesis and not a trip on the canal, at least not in the physical sense!

In general I found what I consider a similar enthusiasm about and interest in the canal and its structures, amongst the relevent people I spoke with. From the people directly involved with its restoration to the local residents, there was generally a tremendous and obvious interest in the subject. I received an extremely gratifying amount of help, especially from the local residents when asking directions. I received encouragement and whatever piece of beneficial information these people considered may be of help to me, even though some if it may have been conflicting, but this was usually only minor (such as the actual number of boats which officially passed through it during its operational life). I also heard peoples hopes and fears, from increased revenue for the area, to concern about flooding.

I discovered while conducting my research, highly intriguing facts which I actually would have considered to be commonplace knowledge. For instance the matter of Leonardo da Vinci's (1452-1519) important association with the history of canals in general, especially the canal locks. We will always remember him on account of the Mona Lisa, but will any of us remember him on

account of his association with canals? Indeed how many of us would guess that of all the canals in existence today, it is the Panama Canal which bears the closest resemblance to the Ballyconnell and Ballinamore canal, the latter appearing miniature in comparison. This is mainly on account of the fact that both canals which are partly stillwater (manmade canals) and partly canalised river, are also unique in that they both have a summit which flows in two opposite directions.

Considering that the canal has been lying dormant for 120 years one can obviously imagine that it, and its structures, (apart from bridges), which have been in disuse for so long would probably be in a serious state of dilapidation.

The present situation with regard to the structures condition is that many of them are still in a good state of repair. I believe the reason for this is that unlike other structures such as buildings, monuments and so on, all canal structures have a very close relationship with the surrounding topography. Locks, weirs, and wharves for instance, were designed once the characteristics of the environs in which they would be situated, had been carefully scrutinised. Although unchecked flooding and the natural elements over many years, are bound to affect the structures (constant dripping wears the stone) one can still form a very clear picture of what the structures must have looked like in their original condition. On travelling to various locations along the canal I found that there wasn't one structure which through possible lack of interesting features, did not merit examination.

Sitting down in the tranquil surroundings of one of the locks, I found myself thinking of the thousands of hard working men who, through the years of the great potato famine were involved in the canal's construction. To quote the sentiments of a resident living in close proximity to one of the locks, "It must have seemed a terrible insult [the amount of money actually spent on the canal] to the people when they were dying through starvation".

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There was none of the powerful hydraulic machinery of today which will be used in its reconstruction. Instead shovel, pick, wheelbarrow, hand and chisel were the order of the day. Steam dredgers, however, were used during various stages of the canal's construction.

I feel that if so many of the canals' structures weren't as hidden by the surrounding countryside and were more accessible, then there would be a tremendous increase of interest in these structures. The benefit of this would lead to an appreciation of these beautiful and fascinating testimonies from a bygone era. That is something which I feel no one can dispute.

Chapter 1

Canal's History

Many years ago there was a Ballinamore canal .... it was the finest canal in Britain up to that time.
Major Harry Lefroy, 1923.[1]

In the 18th century long before railways or adequate road facilities had been established in Ireland, the use of waterway navigations was regarded as the most efficient way of transporting large quantities of goods. Although canal building as such had long since been initiated in parts of Europe, in both Ireland and Britain the case was quite different. However, things were soon to change, and as as far as inland navigationable transportation was concerned, things would never be the same again.[2]

The early 18th century saw the expansion both in terms of wealth and actual size, of many of the cities throughout Britain and Ireland. This factor obviously lead to increased demands for consumer goods. In the case of Dublin, it was its growing appetite for coal, which was to be the keystone for canal building in Ireland. Coal seams had been discovered in Tyrone in the late 18th century, nevertheless, on account of high inland transportation costs, it was actually cheaper for Dublin to import its coal. It soon became quite obvious that if the upper Bann river could be connected to the Newry river then a direct link with Dublin, by water, could be forged.[3]

In 1730 Edward Lovett Pearce, the surveyor general, being responsible for civil works, commenced a scheme whereby the Newry canal was to be built. The canal, which was 18.5 miles in length and comprised 13 locks was completed in 1741 at a cost of Stg£ 48,000. Although it did not officially open until 1742, Ireland's first canal was born.[4]

A new era with regard to canal building in Ireland was now being heralded. Two of Ireland's most famous canals were soon to

appear. The Grand canal and the Royal canal both having their termini in Dublin. The canal schemes which were taking place throughout the country were continually being regarded as eventually leading to a complete inland navigation system. An ambitious notion, but at the same time, one within the realms of possibility.

It seemed natural that at some stage, Ireland's two greatest inland waterways the Shannon and the Erne would be linked, and by the 1770's events were really coming to a head. In 1778 a canal engineer by the name of Richard Evans, was commissioned to establish the best route between the two waterways for a canal.[5] He decided on a route from the Erne to Ballyconnell from where he envisaged a link between Ballinamore and eventually the Shannon.

Work commenced under Evans in 1780. Excavation began taking place along many areas of the Woodford river. The first major obstacle to boats having left the Erne, would have occurred at Caroul just along the Cavan/Fermanagh Border, and it was here that Evans commenced work on the first lock and lockhouse. Having received a parliamentary grant of £1,000, Evans soon encountered a problem which would become quite common in the later bearings of the canal construction - lack of money. So by 1786, the Ballyconnell and Ballinamore canal had part of its first lock house, and some excavation completed.[6]

Some years later in 1793, another canal engineer by the name of William Chapman was also asked to make a feasibility study of the canal. Having surveyed the Woodford river he estimated a navigation could be made from Erne to Garadice for £5,000 - from where he reckoned an extension could be made to the Shannon.[7]

In 1801 Richard Evans , was again asked by the Directors general for an estimate. However, once again no action was taken. It was to be almost 40 years before it was considered again.[8]

In 1838 the newly appointed Commissioners of Public Works, investigating schemes to produce employment, asked William

Mulvany, a young engineer who had been engaged in survey work on the Shannon to investigate possible routes for a navigation, from the Erne to the Shannon.[9]

Effectively it was believed that on account of the canal, a link between Belfast in the north east and Limerick in the south west could be achieved. Having been given wider powers to implement schemes and under pressure from the Ulster canal company, a decision was made in 1842 to proceed with the scheme.[10]

Many local farmers had been complaining about flooding, John McMahon - one of the Board of Works engineers, was instructed to draw up plans for drainage and navigation works. It was to be another unique feature of the canal in that it was to serve a dual purpose, namely it was both a canal and a drainage scheme. Having produced an estimate of just over £100,000, work commenced in 1846.[11]

From an engineering point of view it definitely would have been more practical to construct a still water canal over the entire distance and to establish an independent drainage scheme on the Erne and Woodford area. Since funds for both projects had to be allocated and accounted for independently, this caused serious delays. There were also problems with millers over their water rights and owners of eel fishery rights.

During the 1850's work continued. Initially over 4,000 were employed but this number dramatically fell to 2,500 and obviously this manpower problem caused delays. Steam dredgers were used to deepen the channels in six lakes along the navigation. Costly weirs had to be constructed on each of the locks along the canalised river section.

A revised estimate in 1852 of £127,276 was actually exceeded by £40,000. Naturally the Board of Works came under scrutiny for exceeding costs. Since someone would have to take the blame, Mulvany was made scapegoat. Soon severe stringencies began

to creep in. The original dept of 6' was revised to 4'6" and this depth was not even reached in places. [12]

In 1858 history was made, when the first official trip took place. However, the following year, a dispute arose to to who was responsible for £150,000, by which the estimates had been exceeded. The final total came to £276,992 more than double the estimate, with about 1/6 going to drainage costs.[13]

It was decided that the landowners, who would benefit on account of the drainage works, would be responsible for a percentage of the costs, and the balance was to be paid by the adjoining counties. The latter objected their liability. Their claim was sympathetically heard at a public enquiry and eventually they paid £30,000, with the government paying the balance, while stating,

> **..the prospects of advancement, however, and of a renumerative return which the project was originally considered to hold out, have we believe been materially interfered with and lessened by the altered circumstances of the country at large and the general extension of the railways.**[14]

However, at that point in time there were no railways in the areas. The real reason would have been, an actual lack of commerce along the canal route.

On 4th July, 1860 the navigation was officially handed over to the 12 navigation trustees. Within 5 months Leitrim county surveyor J.B. Pratt(who had been appointed secretary and engineer to the trustees) prepared a report listing deficiencies in the actual work. There had been problems with the depths, and caving in of some bank sections.[15] This would appear to have been the final nail in the coffin, as far as the then practical use of the canal was concerned.

In the nine years that it was officially open 1860 - 69, official records show that only eight boats passed through the navigation paying, a total of £18.[16] Some return for £276,992 investment.

CHAPTER 2

The Locks

The pent waters, now freed, roar and rush joyous in their new found freedom; then all is still and at peace.[1]

Amongst the various types of structures which comprise the Ballinamore and Ballyconnell Canal, it is the locks which I believe provide the foundational character. They are the steps by which the boats pass from one level to another, and are the most common structures which are brought to mind when one thinks of canals.

With regard to their inventor, there are those who believe that some form of locks may have existed on an Egyptian canal built during the 18th Dynasty (1335-1289 B.C)[2]. It is also believed that some form of locks may have been built on a 600 mile canal linking the Yangste river with the north of the country in China, built in 222 B.C. under Emperor Shih-Huang-Ti or possibly on some of the many stillwater navigations which the Romans built in Britain.[3]

Basically a lock consists of a watertight entrance with two sets of gates - one at either end. When shut these gates should, as a rule, meet at an obtuse angle, facing the direction of the higher water level.

Altogether there are 16 locks along the canal, of which 8 are situated along the canalised river section, and the remaining 8 are to be found situated on the stillwater section. At this moment in time, the majority of them are still in remarkably good condition, although for the most part, some have deteriorated quite badly.

To encounter some of the more intact locks which are mostly situated deep in the countryside, and to view these awesome structures which have been lying dormant for over 120 years, is an almost haunting experience. Fitting in beautifully and in almost perfect harmony with the natural environs, they provide a wealth of

information with regard to their original use. Since the locks design would have been governed by the constraints of the immediate surrounding countryside, no two locks are exactly identical.

The first lock located on the canal is situated at Caroul and is unique in that it was actually the foundation stone, so to speak, as far as construction of the canal is concerned. Almost 70 years beforehand during the early 1770s canal engineer Richard Evans, having already completed a lock house, had this lock half complete when his initial grant of £1,000 ran out.[4] It wasn't until 1849 that the lock was completely constructed although the gates weren't attached until 1852.[5]

Unlike the bridges, the design of the locks, called for mainly huge slabs of cut stone, some weighing anything up to one ton. One must take into account the effort which must have been involved in the construction of the locks. Unlike the majority of canals in England at this time, which were built using red brick, the stone used in the Ballyconnell and Ballinamore canal was actually limestone. It would have been quarried locally, from where it would have been transported by horse, to the lock, where the stonemasons would cut it to the shape which they required, on site.

On account of their huge weight, the cut stone would simply be placed on top of each other, using very scant portions of mortar. Originally they tried to get away without using any fixative, hoping to rely on the huge pressure of each stone bearing down on each other, to hold them in place. This idea was abandoned due to problems with leaking water. Although limestone is normally quite porous, and would not have seemed like an obvious choice for building a canal, the problem was surmounted by putting up to two feet thick of "puddle clay" between the stone work and the actual land which resulted in extremely watertight locks.

Situated about 3 miles upstream from the Caroul lock, is the Ballyconnell lock. Situated near a mill, it is the lock with which I am most personally familiar. Built in 1849 it had its gates fitted in

Figure
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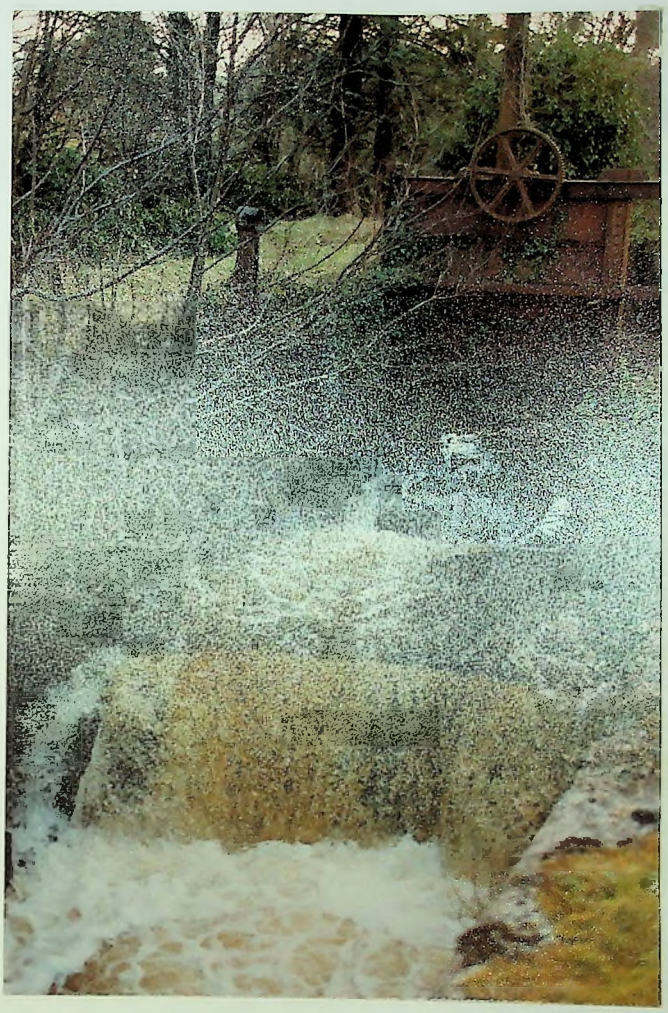

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Figure
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1852.[6] Pleasing to view, at this stage it has been totally submerged into the landscape. It even has trees growing out of its lock walls.

A very important design feature to be found on this lock and which not only makes it unique with regard to the other Ballyconnell and Ballinamore canal locks, but also to the various other locks countrywide, is its land sluice (fig.1). Designed by William Chapman, it basically involved a pipe from the upstream into the downstream as opposed to the normal procedure of sluices being attached simply to the lockgates, which is believed to have been the case with most of the canals' other lockgates. Situated at the upper end, just in front of where the lock gates would have originally been, they would mainly have been used during times of flooding. Two rather quaint iron lifting gears (photo on front cover) which would have been used for releasing the sluice can still be seen situated on either side of the lock. There are records to show that the lock gates would have been made in the nearby town of Belturbet.[7] There is nothing to relate where their iron sluices would have been manufactured. However, it is commonly believed that they actually were made in an English foundry.

One of the most spectacular features to be seen on this lock, is the large tail-head sluice gate, the only one of its kind to be found on this canal (fig.2). This structure was actually erected on behalf of the mill, in order that they could maintain adequate water levels. The very fact that it was erected would seem to indicate that the lockgates had been removed almost as soon as the canal fell into disuse.

The only remnants of the actual lock gates to be found on the Ballyconnell lock are the iron land ties(fig.3). These strong iron loops were employed to keep the heel post of the lock gate in position. When compared to the painted land ties used on the grand canals' locks(fig.4), its obvious that the Ballyconnell and Ballinamore lock gates would have been much larger in comparison.

Originally there would have been four land ties situated on

Figure
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Figure
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Figure 7

Figure
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Figure
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Figure
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every lock, just above the hollow quoins(fig5). The latter being large vertical concave grooves, where the gates heel posts would have simply slotted in and they also are very obvious examples of the precise stone cutting capabilities of some of the stone masons.

I found this lock to be one of the lowest in height as this can clearly be seen when it's hollow quoin is compared to one of the more standard sizes such as the one on lock no.9 at Kilclare (fig.6). An obvious difference can be seen in the colour of the limestone of both locks - an interesting factor which I have found throughout all the structures - however, this would have been on account of different quarries being used rather than one overall.

In comparison to the Grand Canal, it is evident that a lot more wrought iron was used on the Ballyconnell and Ballinamore canal. This can especially be seen by comparing the sluice lifting gear's from both canals. I would say the Ballyconnell and Ballinamore canal sluice design (Fig.7) is much better than its counterpart on the Grand Canal (Fig.8). This is due to what I believe would have been better protection offered to their user since the dangerous moving gears were completely encased as opposed to the exposed gear's of the Grand Canals' sluices, which were simply attached to wooden beams.

Wrought iron was also incorporated in the making of the sluice gates although on most of the locks, the actual gate itself has gone missing such as at lock no.7 located at Ballyduff (Fig.9). Situated immediately upstream of the lock gates they permitted the controlled flow of water from the upper to the lower lock where it would have simply been discharged through a tunnel like opening, such as that situated on Lock no.12 at Lisconor (Fig.10)

The Lisconor Lock (Fig.11), is also very unique in that it is the only lock which incorporates a skew bridge at it's lower end as part of its design. The skilled incorporation of this bridge, undoubtedly makes this lock one of the more interesting to visit.

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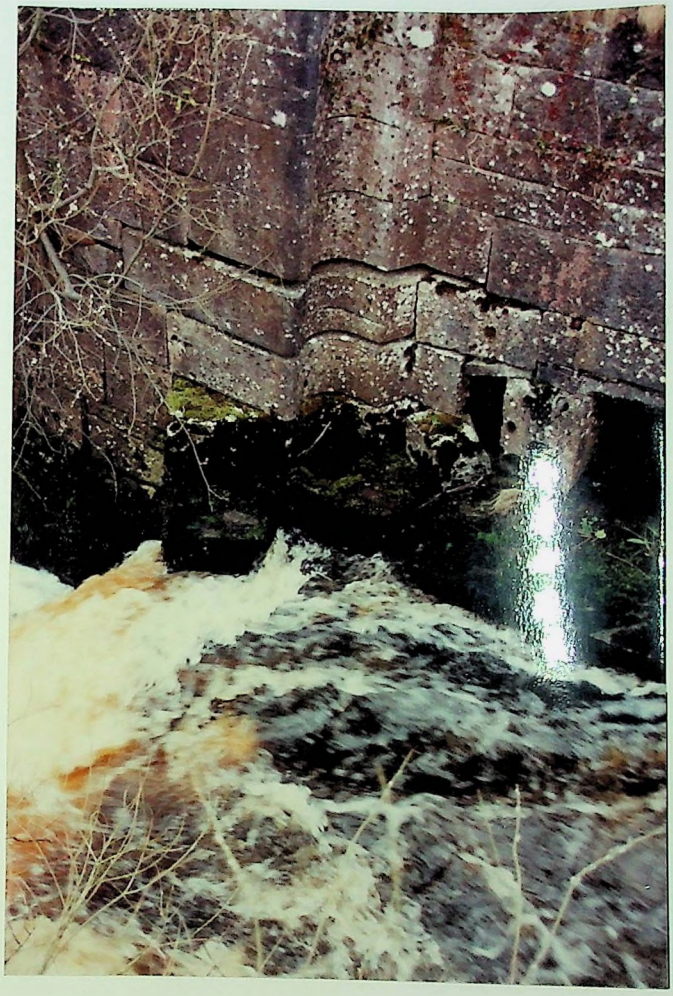

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Figure
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The possible need to clean out and repair sluices of the lock and the lock gates, meant the incorporation into the lock walls of a narrow grove(Fig.12). One on either side both above and below the locks' gates, it would have meant extra work for the stone masons. Basically, wooden planks would have been lowered into them to successfully cut off the water flow and act as a dam. This would have allowed easy and unhindered access to whatever part of the lock required attention.

A curious fact which I came across on some of the locks was the difference between some of the land ties. At Lock no.13 at Newbrook the land tie (Fig.13) appears to have been pulled to its capacity. It is hard to know whether this was caused by water pressure on the gates, or as a result of removing the gates. The land tie at Lock no.10 at Kilclare has two comparatively large strengtheners which run deep into the limestone.(fig.14). Obviously it would have held a much larger gate which naturally meaning a deeper lock, would also have meant a more increased water pressure on the gate. This pressure in turn would have been passed onto the land ties.

Lock no.8 at Castlefore was the only lock which I had visited, that had part of its floor showing. This allowed viewing of part of the stone masons work, which would otherwise have been covered in water. The hollow quoins' base stones on either side of the upper lock can not only be seen easily but they also reveal the circular cut outs where the lock gates' heelposts would have slotted in(Fig.15,16).

It was the very high walls of Lock No.9 at Kilclare that first drew my attention to a feature which I thought was a result of deterioration. It was a gradual sloping curve of the lock wall as it reached down to the water(Fig.17). Another fine example of the stone masons skill, I was to realise that it appeared on all the locks although on some it was less obvious. I can only reason that since this curved sloping did not continue on the lock walls past where the gates would have been situated, that they served to protect the base of the gates (when open), from the full force of the water current.

Directly opposite the hollow quoin, I noticed a large

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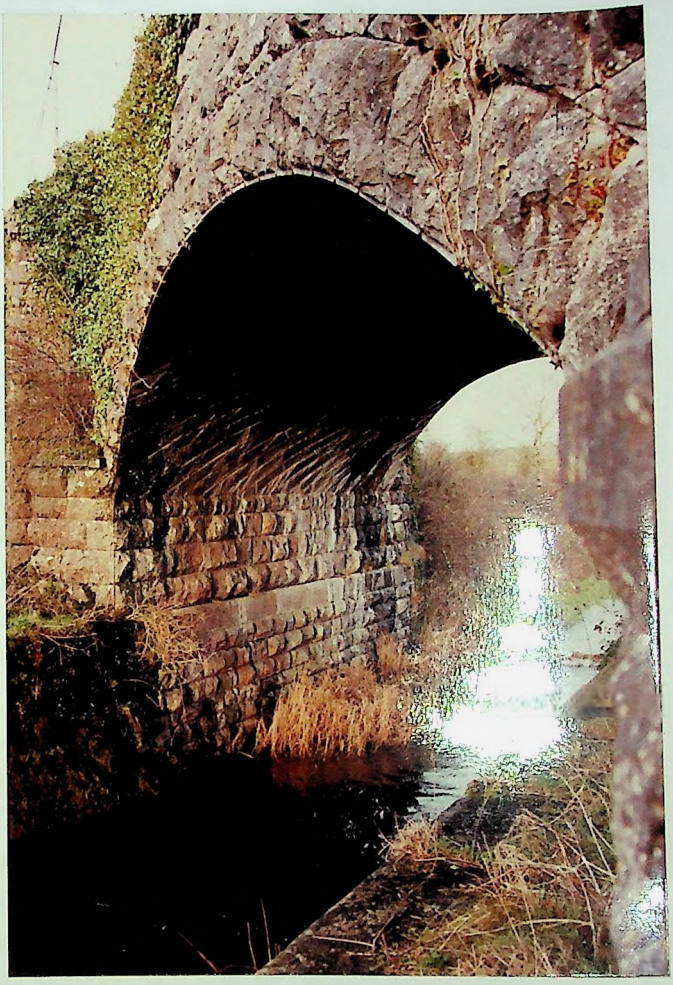
protruding slab which I discovered on all the locks (Fig.18). Although I found no similar counterpart for it on the locks of the Grand Canal, I can only conclude that it was designed either as a sort of shock absorber for the gates when they would be opened, or simply as a gate rest.

One of the nicest features which I found on some of the locks, such as that at Lock no.10 at Kilclare (Fig.19) was the skilled and beautiful way in which the beginning of the lock was incorporated into the surrounding countryside. The use of a gentle rather than a sharp perpendicular angle could almost convince one that the lock wall was a natural protrusion of a rock layer.

When one of the more intact locks such as Lock no.13 at Newbrook (Fig.20), is compared to one of the less intact, such as lock no. 4 at Aghoo (Fig.21) the difference in condition becomes very obvious. So to does the need for restoration which when complete, will hopefully mean the common pristine appearance of all the Ballyconnell and Ballinamore canals' locks.



CHAPTER 3

The Bridges

Bridges should be commodious beautiful and lasting.
Palladio.[1]

There are an estimated 30,000 bridges in Ireland of which no fewer than 34 are situated along the Ballyconnell and Ballinamore canal. With the possible exception of the wharves these are the canal structures with which most people would be familiar. Obviously this would be due to the fact that at present they are still fulfilling their original purpose.

Today the traffic which crosses these bridges is of a much more numerous and heavier scale, than that for which they were originally designed. This would be a testament to their extremely sound and functional design, Their beauty being profoundly obvious as they settle in so snugly with their surrounding landscape, I believe it is fair to say Palladio himself would be very pleased with them.

At present the majority of the bridges are still in excellent condition. However, a few of the smaller bridges, having fallen into a bad state, have been totally rebuilt and bear no resemblance whatsoever to their original counterparts. Also, a small number of the bridges situated along the canal had already existed before the canals construction, and some were added at a much later stage and for different reasons, such as the advent of the railways and with different purposes such as the railway bridges.

On commencement of the canals' construction, the bridges were placed into one of three categories. There were the new main road bridges which would have to be built. Then there were the accommodation bridges which although much smaller, and serving smaller needs, were actually more numerous. Lastly, there were the already existing bridges which having to serve a new purpose, needed some alteration.

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Figure
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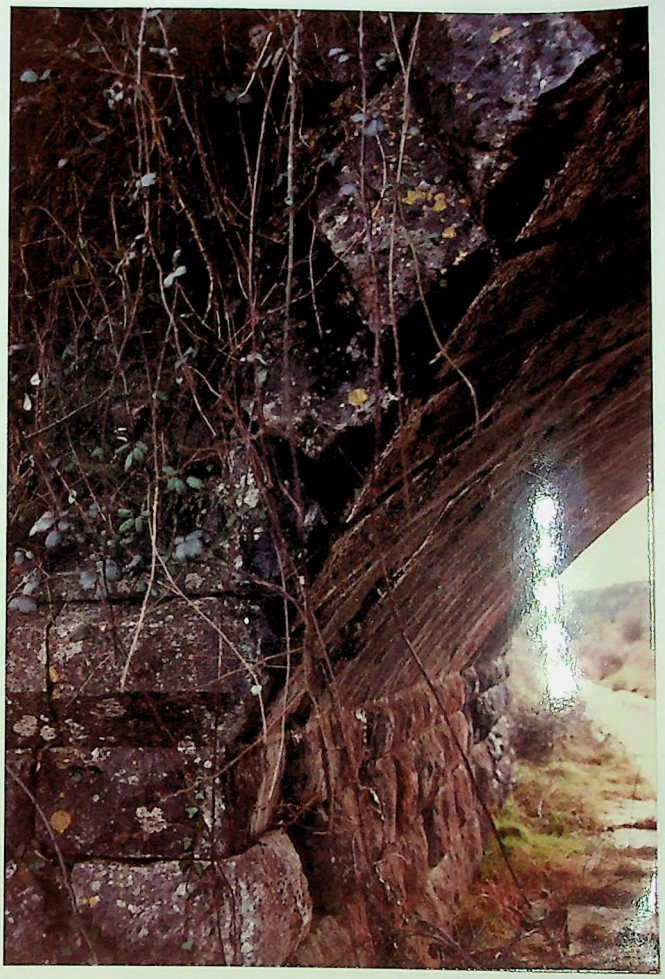
Naturally since there are too many bridges to examine individually, for the sake of this discussion, I will look at a cross section of those which merit interest on account of their uniqueness and features.

Having viewed the majority of the canal's bridges, those which in my opinion are the most unique and visually stunning, are undoubtedly, the skew bridges. In total, there are three of these type of bridges along the canal , and they are to be found at Castlefore, Kilclare and at Newbrook. It was actually the same person who introduced the land sluice, namely William Chapman, who was responsible for introducing the skew bridges.

Basically a Skew bridge crosses in an oblique direction, rather than other bridges which cross at a perpendicular angle to the rivers course. The skew bridge walls on either side of the road, are composed of solid masonry, just like all the other stone bridges along the canal. This would obviously prevent motorists passing over the bridge from observing the oblique direction of the river. Also since the canal's skew bridges appear similar to the other bridges on approach(fig. 22), then the only means by which one would realise it was a skew bridge, would either be to observe it from the canal or surrounding landscape where possible, or by viewing from over the bridges walls. For these reasons there is little opportunity for most people to be aware of and indeed appreciate, that these are skew bridges. One of the finest examples of skew bridges to be seen along the canal, is at Newbrook(fig. 23). Built in 1849 - 50, it is still in excellent condition. For any person who has never experienced a skew bridge at first hand before, then this bridge definitely warrants an examination. On walking around and exploring it, one would almost think that they were witnessing an optical illusion as the bridge appears to rotate.

Technically this bridge would have called for a much more intrinsic design in comparison to its perpendicular counterparts. Obviously this is on account of the complicated skew angles. Indeed



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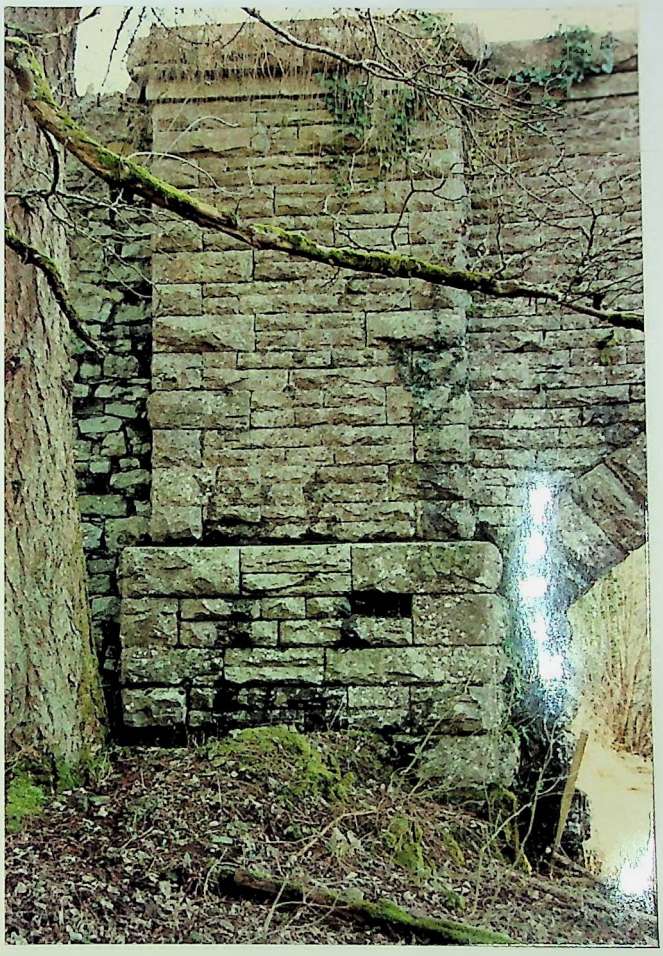
this must have presented a greater challenge to the stone masons since each and everyone of the voussoirs incorporated in the bridge's archring would thus have to be individually cut at different angles(fig. 24 and 25).

Another interesting feature to be found on this bridge, is the towpath which is still in very good condition. Specifically designed for the purpose of allowing the horses and people easy access to the other side, they were one of the Board of Works more curious recommendations. Curious on account of the fact that since quite a length of the canal was to run through large lakes, obviously horses could not be used to provide locomotion for the boats, throughout the entire route.

One of the remaining skew bridges which is located at Lisconor, is very unique not just due to the fact that it is skewed, but namely because it is actually built across the lower end of Lisconor lock No 12 (fig. 26). On account of this unique relationship it would make lock No 12 the most easily accessible to the public.

Although this bridge is not as skewed as that at Newbrook, the cutting of the voussoirs would have presented equal difficulties to the stonemasons. Since the lock walls would serve as the bridges' abutments, this would make the bridge much simpler in looking in appearance to its other counterparts. Nevertheless its beauty is much more emphasized when compared to the plain concrete accommodation bridge which spans lock no. 10, at Kilclare(fig.27).

Apart from the bridge at Ballinamore which already existed before the canal scheme, there is only one other three arched bridge, which is located at Aghalane(fig.28). Sadly the centre arch was maliciously blown up in the early 1970's. The bridge has remained in disuse to this day,nevertheless, its' remnaints are still very beautiful. Unlike the stonework of the spandrels and voussoirs of the skew bridges, those of Aghalane bridge possess a much smoother finish(fig.29). This is normally referred to as Ashlar masonry, which means not only were the stones cut with a finer joint, but they would



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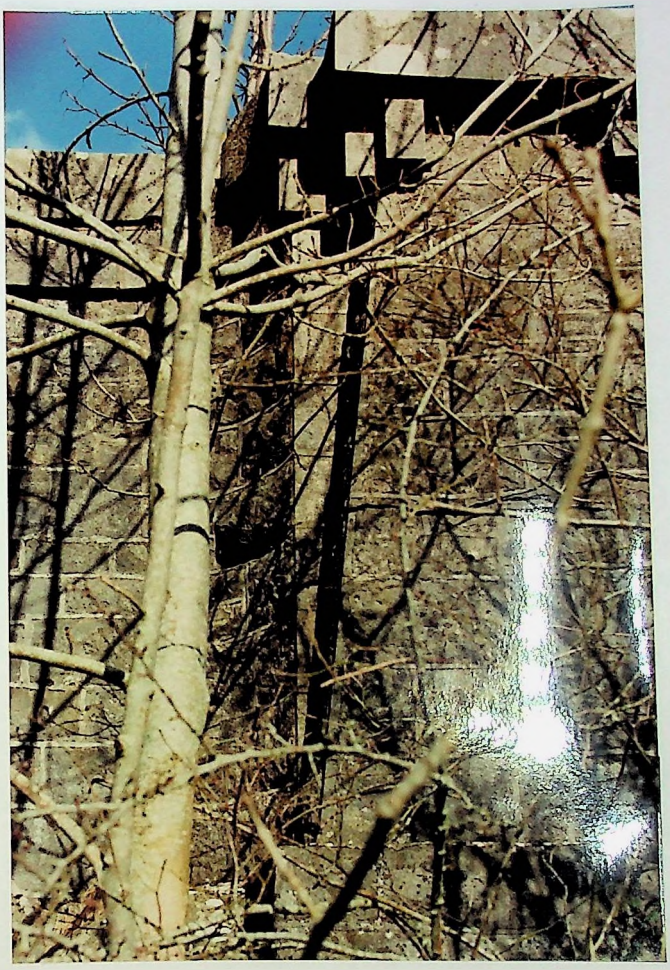

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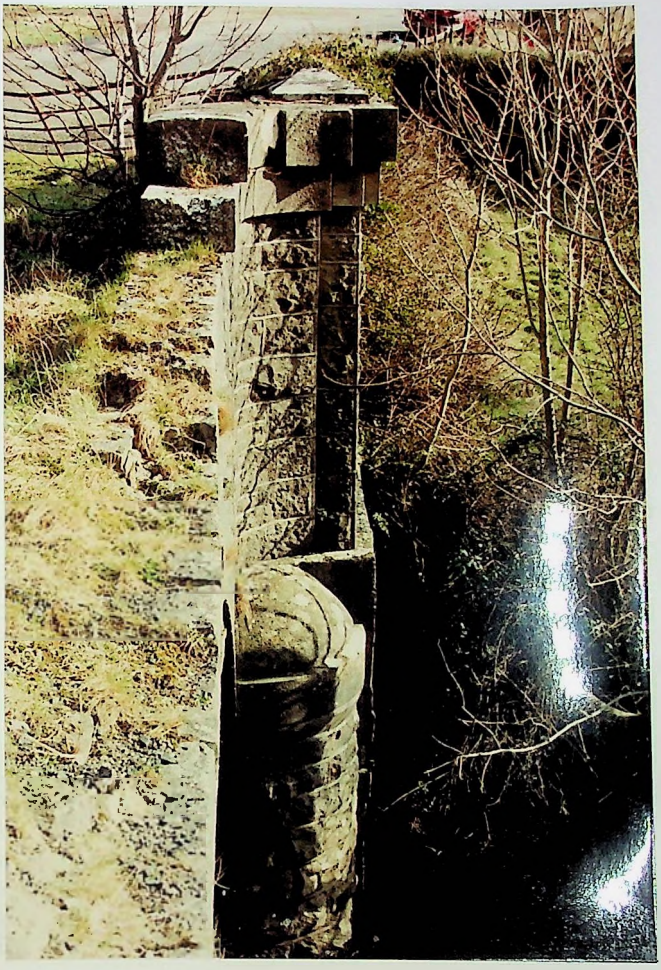

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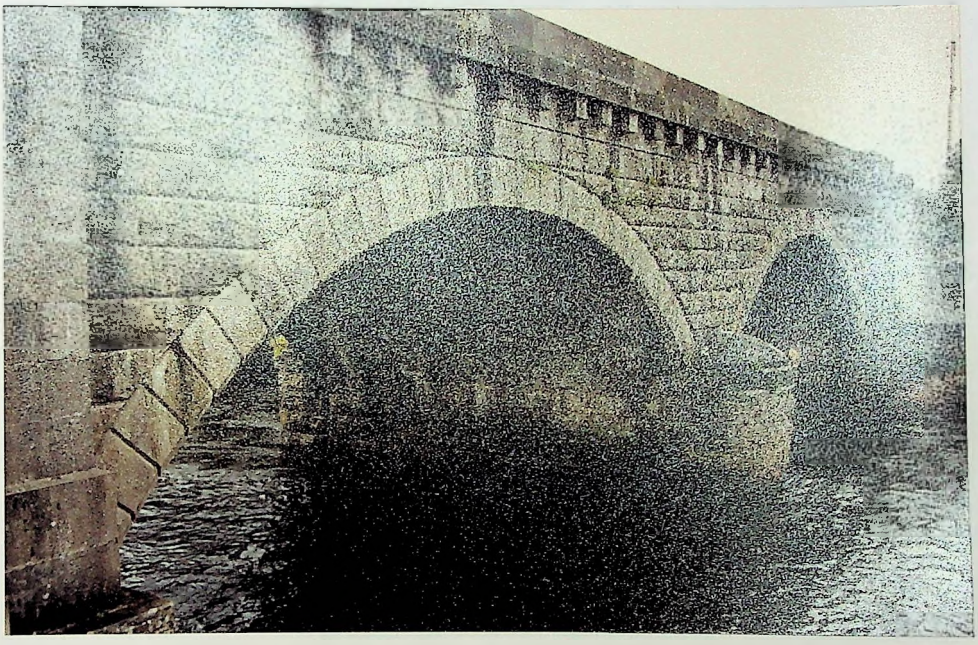

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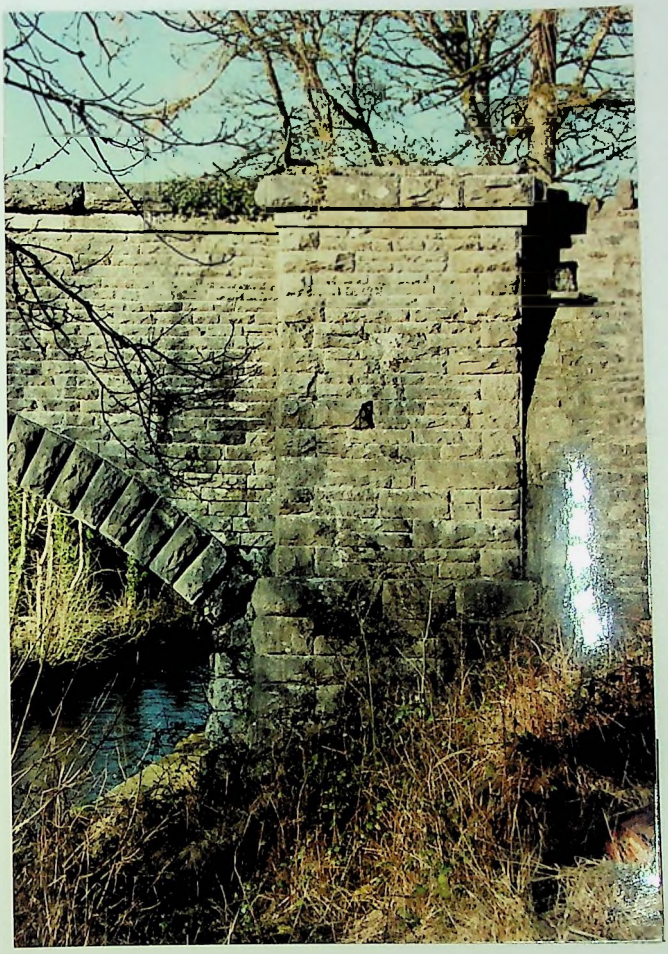

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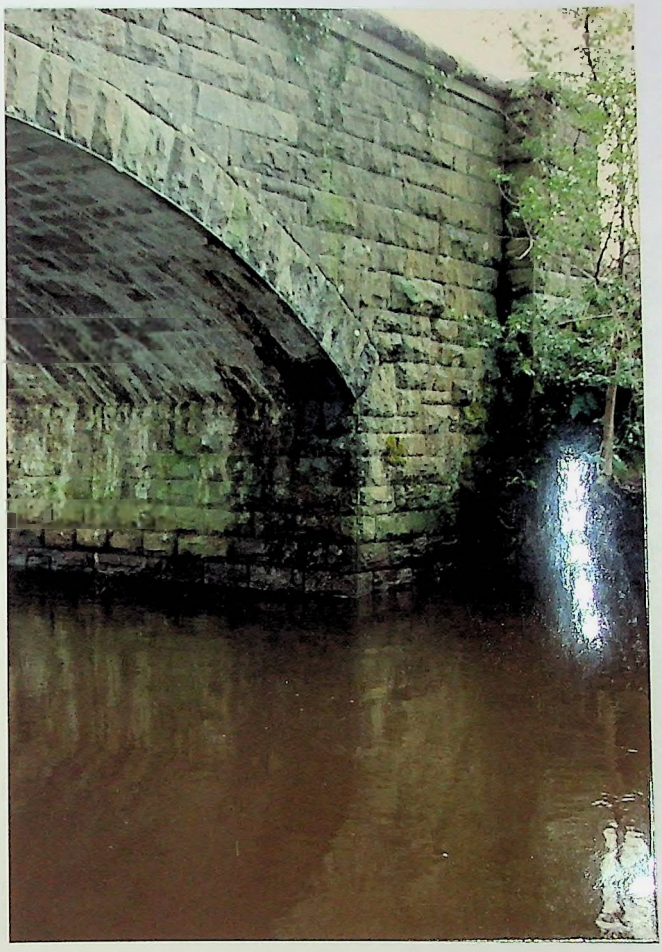

Figure
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Figure
36

obviously have required less mortar.

When compared to the relatively plain abutment of Aghoo bridge (fig. 30), it can be seen that the abutments of Aghalane bridge were given a more decorative design (fig. 31 & 32). This design is not repeated on any of the canal's other bridges. This factor would easily have enabled it to command respect as the most noble bridge along the canal.

Situated about 5 miles upstream from Aghalane is the next largest bridge, which is at Ballyconnell. It is the only two arched bridge built during the canal's construction. The stonework of the abutments and voussoirs is similar to that on Aghalane bridge, being very smooth in appearance. Both arches meet at a pier which is also quite similar to that on Aghalane bridge. This was the only bridge which had springing voussoirs (stones cut at the beginning of the curving archring) that had their perpendicular angles smoothened off, a subtle enhancement to the arch. It is the only bridge which possesses a unique row of box like corbels, which I believe offers a nice break in continuity to the side of the bridge.

The beautiful bridge at Ballyduff stood out from its counterparts on account of two main reasons. Firstly, the majority of the stonework apart from the voussoirs and capping, was very small in size (fig. 34). This can be clearly seen when it is compared to a quite similar counterpart namely the bridge at Aghoo. (fig. 35).

Secondly there was its wing wall which was the largest and most noticeable of any of the canal bridges (fig. 36). The reason for this is because the bridge is situated between two steep sloping hills. This in turn meant larger wingwalls, since it is there function to act as a fill between the abutment and the surrounding land. Two small road drainage openings can be seen situated near the top of the wingwall.

An interesting fact which I learnt from a resident near Ballyduff bridge, was the reason for the missing stonework from most of the bridges' abutments and from under many of the arches (fig.

Figure
37

Figure
38

30). This caused me some puzzlement until I learnt that they were actually removed by the Army during World War II. Apparently the possibility of a Nazi invasion of Ireland caused much concern, that rather than allow travel unhindered in the area, the precaution of removing these stones to enable fast laying of explosives was undertaken. Luckily the invasion never became reality. If it had, then the canal's bridges would now be only a memory to some.

The bridge at Leitrim (fig. 37) which is the canal's first bridge to be encountered on travelling from the Shannon is a beautiful simple arch span. This bridge is unique in that its design incorporates two dummy piers on either side of the bridge, just between the springing voussoirs and the abutments (fig. 38). I would guess that these dummy piers were built to reflect the design of the bridges at Ballyconnell and Aghalane. These bridges were amongst the canal's most prominently used, Leitrim and Aghalane being the first and last bridge respectively situated on the canal. The narrower river width at Leitrim as opposed to Aghalane, would naturally have deleted the need for a bridge comprising more than one arch. I believe the dummy piers on the Leitrim bridge definitely succeeded in giving it a more prominent appearance than the other one arched bridges.

Restoration of the canal's structures as a whole will involve relatively small changes for the bridges, Although some of the plain concrete bridges such as that situated over Lock No. 10 at Kilclare (fig. 27) are to be removed, the same will not apply to the arched bridges. Some will need underpinning and slight restoration but hopefully when completed, their beauty will be as visible as at present.

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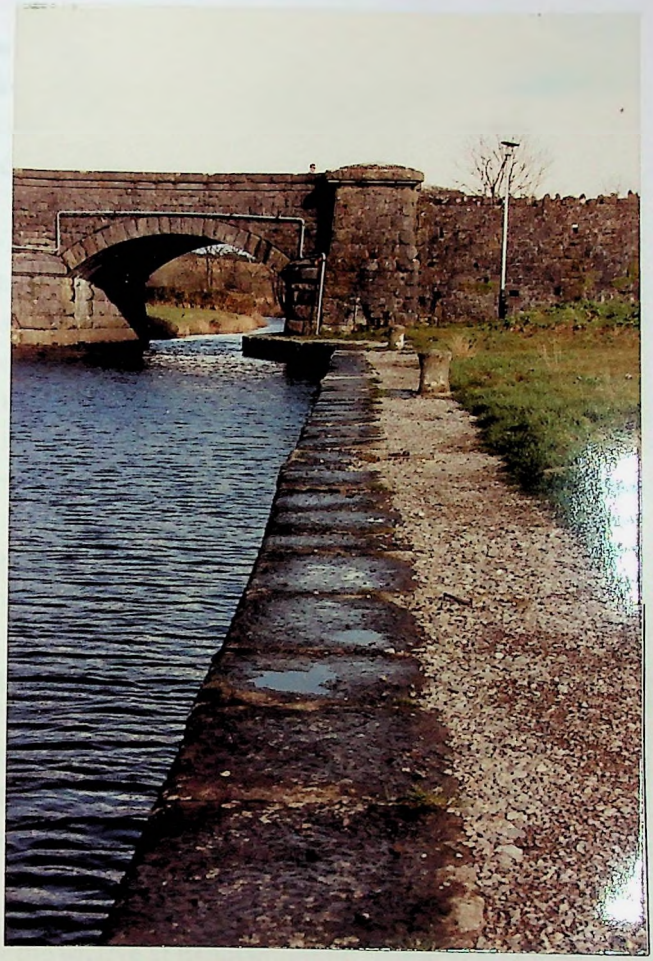

Figure
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Chapter 4

Other structures

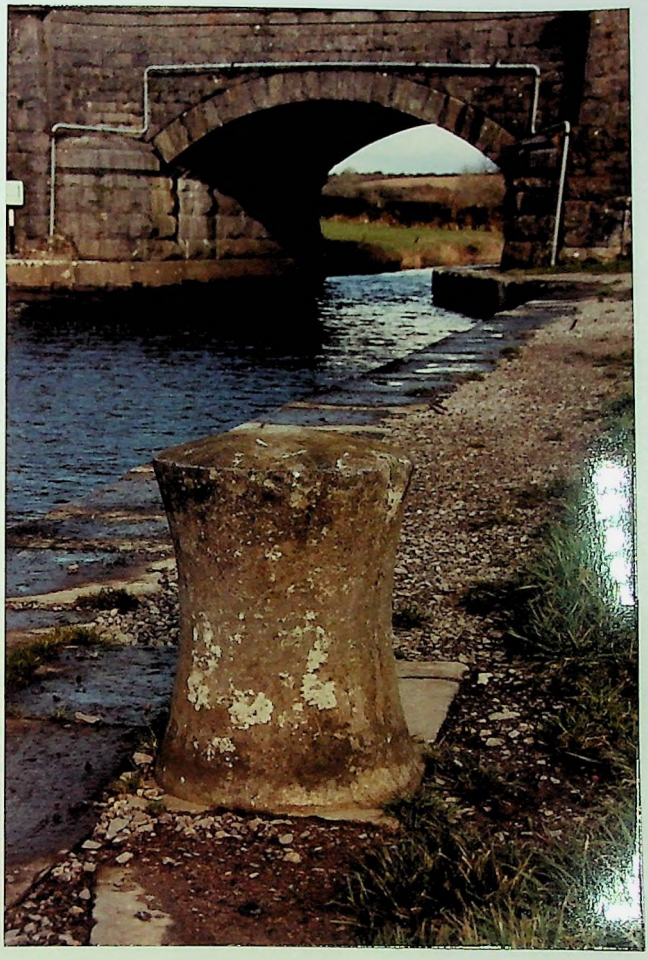
Apart from the Ballyconnell and Ballinamore canals' familiar locks and bridges, there are a variety of other structures and features which merit attention and interest. Although not as plentiful as the locks and bridges they are just as beautiful.

The canal runs through three towns which are Ballyconnell, Ballinamore and Leitrim (more commonly referred to as a village). Naturally most of the passing boats would wish to berth at these locations and so wharves were built on each of them, early on during the canals construction. The wharve at Ballyconnell (Fig.39) which is 120ft. in length, was built in 1850. Friendly in appearance, it consists of huge limestone slabs which are very similar to those incorporated in the locks. As can be seen from Fig.39, no mortar appears to have been used. Instead the weight of each stone exerting on each other, would have been relied on, to hold them in place.

Originally, mooring posts would have been incorporated on the wharve. Sadly none remain, nevertheless there is a beautiful (freshly painted) old iron water pump to be found on the wharve (Fig.40).Although it is the only one of its kind to be found on the canal, it is doubtful if it was actually erected during the canals construction.

Sadly the wharve at Ballinamore no longer exists. It was built by the Cavan and Leitrim Railway in 1887. Four blind arches now exist in its place (Fig.41). Their joining with the Ballinamore bridge, gives the location (known as the basin) a unique sense of interest.

The third and final wharve which is located at Leitrim village (Fig.42) is similar to the one at Ballyconnell except that it continues as a towpath underneath the bridge's arch., where as the wharve at Ballyconnell passed through a towpath arch. Two mooring



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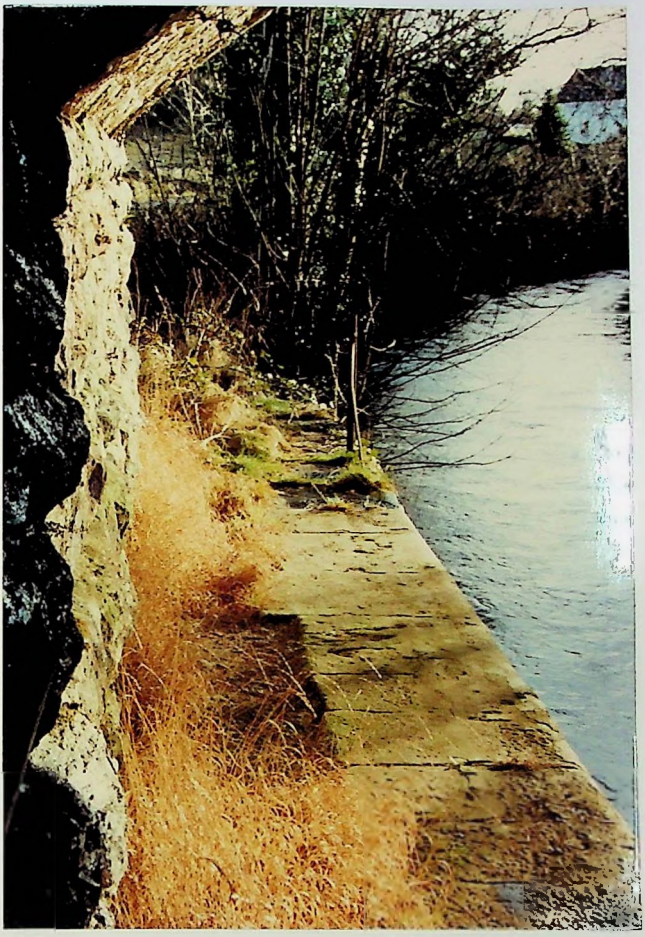

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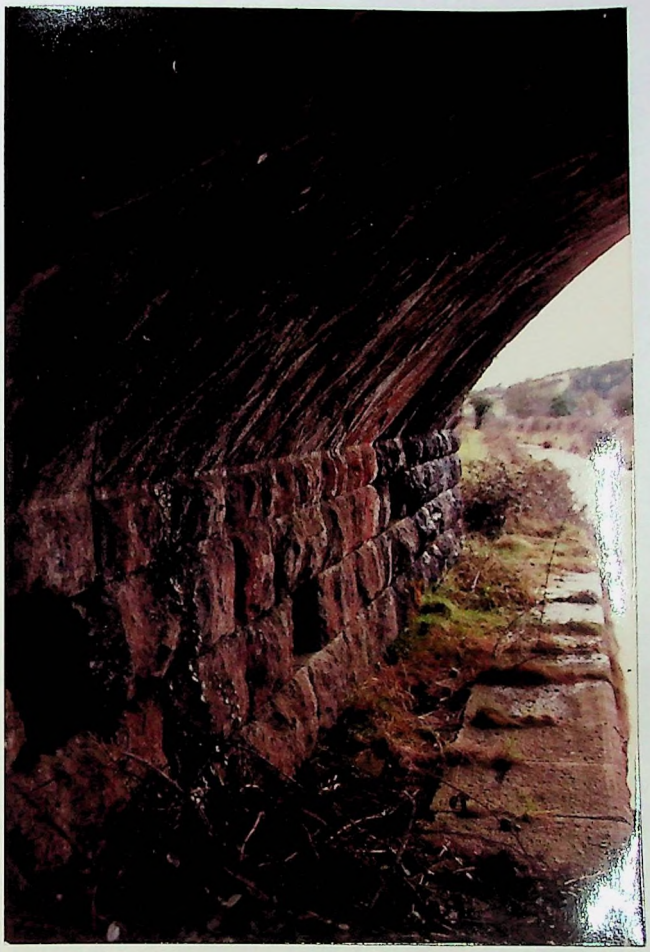

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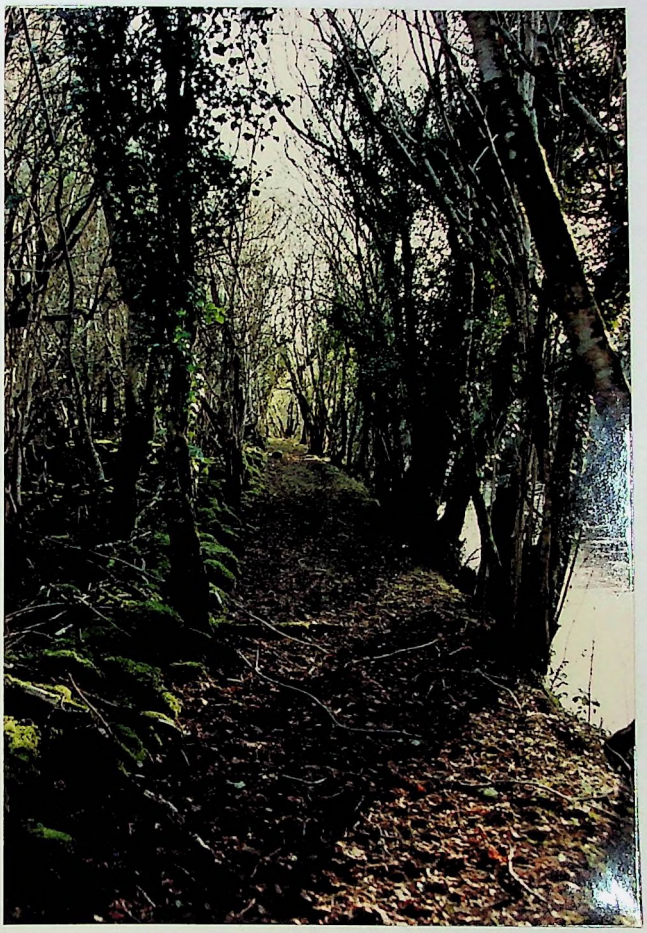

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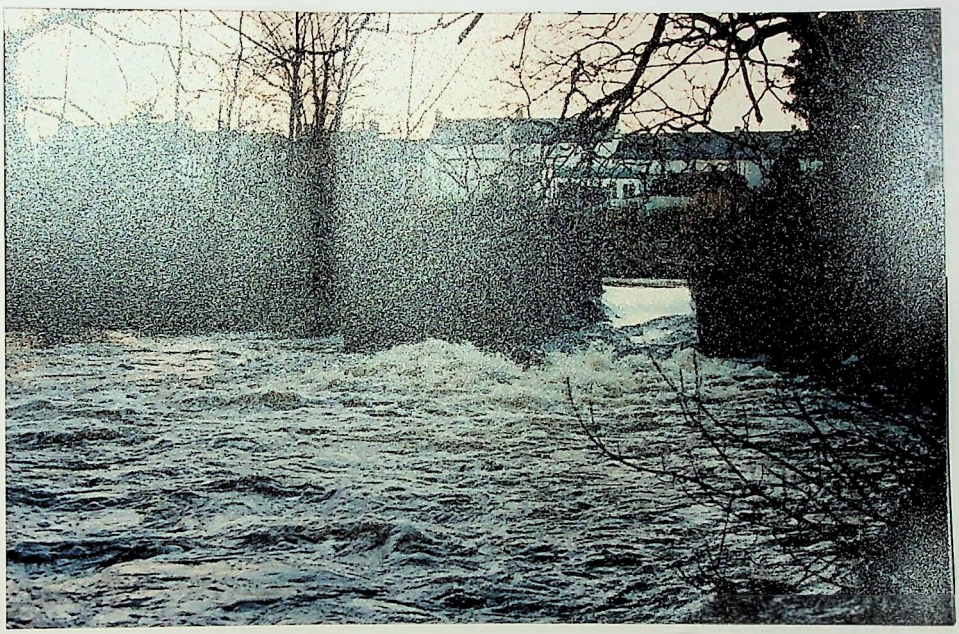

Figure
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posts (Fig.43), sturdy in appearance and simple in design are located on this wharve. They are probably very similar to those which would have existed at the Ballyconnell and Ballinamore wharves. More commonly used as anglers; seats these days, they too will see a new lease of life with the restoration of the canal.

As I have previously mentioned, during the canal's construction, the Board of Works placed a strange emphasis on constructing a towpath along the canal whenever possible. This gave a sense of variety to the structures (mostly the bridges) wherever it occurred.

At the bridges where it did occur such as those at Ballyduff and Newbrook (Figs.44,45), it usually meant a pathway which was similar in design (although much smaller) to the wharves at Ballyconnell and Leitrim. The only bridge incorporating a towpath where the above case did not apply, was the Ballyconnell Bridge (Fig.46). Here instead, the only existing tunnel arch to be found on the canal, was constructed. Now blocked off at one end, it must have required much more effort during the bridge design than the other towpath bridges. The smoothened voussoirs of its arch ring appear to be an intended reflection of the bridges two arch rings.

Between the Ballyduff bridge and lock there is a very fine example of what the towpath appears like as it crosses the countryside (Fig.47). On the immediate left of the path, can be seen the remnants of a limestone wall which was constructed at the same time as the towpath. Nowadays the towpath serves as a beautiful yet haunting passage along the canal.

The weirs to be found along the canal are now unfortunately redundant and overgrown. The majority of these structures were situated alongside the locks. One weir which didn't follow this rule, is the one situated at Ballyconnell (Fig.48). Located further upstream from the lock, the abutments of its sluice are still in evidence. A feature to be seen immediately to the left of the sluice abutments (and something which shows man cared just as much about wildlife during the late 19th century) is a fishpass. This offered

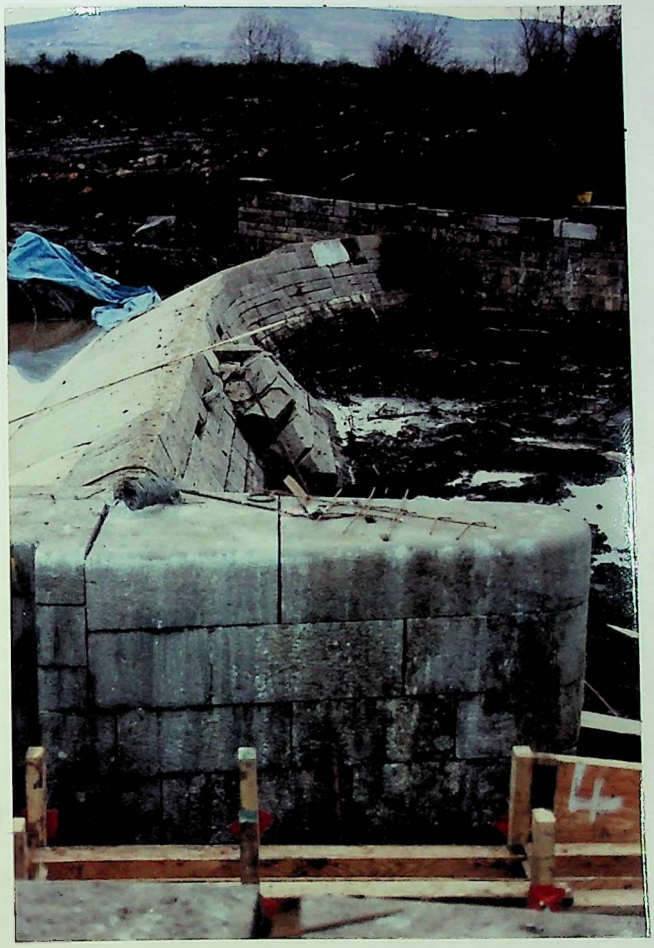
Figure
49

Figure
50

an easy pass for fish, from the downstream to the upstream.

Still on the subject of fish, there was an eel fishery built as part of the canal's scheme, just upstream from Ballyconnell lock, on the old navigation route. Basically consisting of a vet of regulating sluices, all that remains of it to date are two dilapidated piers (Fig.49). The stone work appears similar in design to that of the lock, although there seems to have been little or no mortar used in its construction. Unfortunately this fishery is to be totally demolished and removed as part of the canals restoration plans.

Finally a feature which seems very relevant at this time, and which is the only one of its kind, is the gate post situated on the towpath underneath Ballyduff bridge (Fig.50). It suggests that there must have originally been some sort of a check or toll on crossing the bridge. Nowadays it suggests to me a reminder. A reminder of the possible opening of new gates to new horizons and a better way of life for it and the other canal structures. Hopefully restoration will make this an inevitable reality.



CHAPTER 5

Restoration

At present a joint project is being undertaken by both the Irish and British governments to restore the Ballyconnell and Ballinamore canal. Basically the venture is being undertaken, primarily to attract more tourism to the area. The banner being flown for the project is that the full restoration of the link between the Shannon and the Erne will give Ireland the longest inland navigational waterway in Europe.

The question now being asked is what is the position regarding the canal structures' future? Will their age and lack of use, lead to their demolition and will the latest in modern canal structures appear? On the other hand , is it possible that their aesthetic values will be so appreciated, that restoration work will include saving as much of these structures as is possible?

Having spoken with the relevant parties who are concerned with the actual reconstruction and having read their reports and feasibility studies, it appears as though the latter is to become a reality. Fortunately for the canal, they seem to realise that its character is a feature which no amount of money can buy. I would consider it the same as reconstructing a Victorian mansion; first by totally razing it to the ground, then to rebuild it incorporating totally modern features such as aluminium double glazing. You may eventually have a mansion , which from a distance appears similar to the original. However, its most important feature- that is its character, would no longer exist.

The locks, being the canal's backbone, will probably require the most attention. Of these 16 locks, the eight which are located along the still-water section, from Lough Scur to Leitrim village, are in much better condition than the remaining eight located along the canalised river section. According to an environmental impact statement, compiled by the main parties associated with the restoration,

> **The masonry in the eight lock chambers on the still-water canal requires grouting and minor replacement, but otherwise it appears sound. The furniture such as lock gates and sluices are missing.**

The story is quite different regarding the eight remaining locks in the canal from Lough Scur to the Upper Lough Erne. In the same environmental impact statement as above , it states 'eight locks will be reconstructed between Lough Scur and Upper Lough Erne.'

In another report entitled "Ballinamore and Ballyconnell Canal- Feasibility of Restoration" compiled by The Institution of Engineers in Ireland, a better insight is offered. It states

> **...three locks and two weirs are to be relocated. Lock No. 1 at Caroul and its weir is to be moved upstream 600 metres for ease of access and construction..... Lock No. 2 at Ballyconnell is to be relocated at a more accessible site upstream but its weir,..... will be retained..." It also goes on to state 'The most beneficial relocation is to be at Ballinamore (Lock No. 6) where both lock and weir are to be moved to a site 750 metres upstream.**

It appears as though relocation of these three locks, obviously giving them new surroundings, is to be the only main difference in physical appearance to the 16 locks as a whole. They will have new furniture such as gates and sluices but apart from this and the fact of relocation it is hoped that their distinctive appearance, which give the locks so much character, will not change. This should be achieved mostly through the preservation of the existing stonework. 'The locks will be of reinforced portal frame construction. Double pairs of steel lock gates will be provided with sluices incorporated in the side walls. The pristine appearance will be maintained by incorporating the existing stonework in copings and hollow quoins.' I believe nothing would be more damaging to the canal's future, than the omission of this beautiful limestone stonework, to make way for more modernday materials.

The bridges built over the canal will also be affected by the restoration, albeit to a somewhat lesser extent than the locks. Basically

Figure
51

the bridges between Lough Scur and Upper Lough Erne will require "underpinning and repair." Of these bridges it is stated that, '.....three viz. Cloncoohy (B 31), Burren (B 27) and Lisnatullagh (B 23) will have to be replaced.'

However in the more recent Environmental Impact Statement by the main parties associated with the restoration, bridges at 'Cloncoohy (B 31), and Burren (B 27)...[and bridges] at Dernafore (B 32) and Corroquill (B 33) [are to be replaced]." I honestly doubt if too many tears will be lost over these bridges, since they were added at a later stage because the canal's original bridges at these locations had deteriorated. Whether or not these new bridges will be constructed in a style, which is in fitting with the original canal bridges, is a fact which I do not know. However, since it is known that so much emphasis is being put on preserving the appearance of the locks, then hopefully the same will be true for the bridges.

It is with regard to the remaining structures, namely the weirs, that the first obvious signs of reconstruction are apparent. At Castlefore where there is also a very fine skew bridge and lock, advanced reconstruction of the weir has taken place (fig.51). One can gain quite an accurate picture of how the weir will appear when completed. It will be very much in keeping with the original structures. This is due mainly to the emphasis which seems to be put on assembling the stonework.

The three wharves situated at Ballyconnell, Ballinamore and Leitrim village are in very good condition and because of this they will require very little reconstruction. Two new moorings are to be located at Lough Garadice and Lough Scur. Hopefully they will be designed and built, bearing as much resemblance as possible to the other wharves.

These wharves will probably be the first contact which the potential users of the canal will have with it. There should naturally be great emphasis put on their appearance. First impressions last and it is they which will provide a first taste of what is to come.

It is hoped that this restoration will be completed by 1993. I believe that it's not only in the canal's best interest but indeed it's in everybody else's interest, that restoration should take place. If it didn't then the time would surely come when the structures would have deteriorated so badly that they would probably have to be totally demolished. If they were allowed to remain unchecked, then obviously at a later stage they could pose dangers to people who may encounter them such as anglers.

Hopefully when the restoration of the canal is complete, its structures will not only have been given a new lease of life, but will also retain their existing charm. Obviously this appears to be the intention of those involved with their restoration. I think this is something with which we should be well pleased.

Chapter 6

Conclusion

The Ballyconnell and Ballinamore Canal is in my opinion a tremendous source of intrigue and historical importance.Its outstanding features namely the structures and features which I have looked at such as the locks, bridges, wharves and so on, are not only fascinating to behold, but are living testimonies to a time of wonderful engineering achievements, in this field.

These long forgotten and hidden structures have remained with us in overall good condition, for over 125 years.Nevertheless, time ages everything. Even in their present condition, their exploration will provide a beautiful and very interesting insight into a way of life, which unlike the structures, has long since faded into obscurity.

As somebody who has lived most of their life in very close proximity to the canal, it wasn't until I commenced this thesis that I first became aware of this unburied treasure,so to speak. While visiting the locks and exploring the skew bridges, and other structures, I have found myself being amazed not only by them, but by the fact that I had passed them totally unaware for so many years. It was my loss, but now I feel I have gained.

The two canals which have their termini in Dublin, namely the Royal and the Grand Canal, have been beautifully immortalised by our famous poets and writers such as Yeats and Kavanagh. They wrote about the canals during a time, when I believe not only was it easier to appreciate them, but it was a time when they were still a way of life.They were appreciated more than they are today.

The canals' structures are now about to enter a phase of restoration. Obviously they are also about to enter a new way of life. The structures should appear very similar to their original condition.

However their new way of life will be much different to it's original. They will now serve as tourist attractions. The main positive benefit of this will hopefully be a greater appreciation of, and interest in the structures of the Ballyconnell and Ballinamore Canal, by more and more people.

In general I believe that these beautiful canal structures led a neglected, and lonely existence through no fault of their own. Their future now heralds hope of a better existence for them, and the opportunity for us to acknowledge them.

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Notes to Chapters

Chapter 1

1, *through* 16. Flangan, P.

Chapter 2

1. Gladwin, pg 56.
2. " " "
3. " " "
4. Flanagan pg 17
5. " " " "
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1. Overman pg 28

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