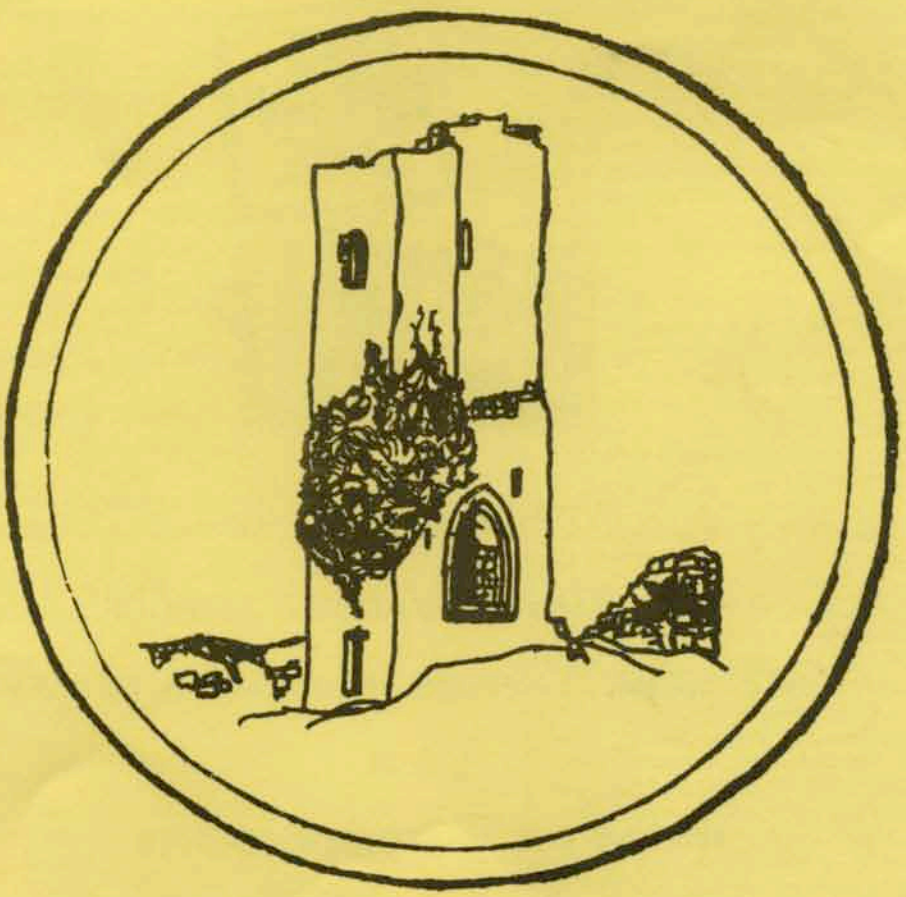
Journal Of The

Ballincollig Community School

Local History Society

1986



Journal Of The Ballincollig Community School Local History Society

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THE POWDER MILLS – OUR PLACE?

The Powder Mills had a very significant impact on the development of Ballincollig in the nineteenth century. The mills lands (now renamed The Regional Park and The Powder Mills) can have an equally important impact on the future development of this area.

The rich history of the Powder Mills has yet to be fully explored. But already its unique character is clear. It was one of the largest gunpowder mills in Britain and Ireland, its workers possessed a wide range of skills and its rise and fall mirrors the importance of gunpowder in the history of the nineteenth century. Yet it is ignored by both national and regional histories, even though at its peak it employed 500 men and boys.

In its present state, in spite of the run down nature of many of its buildings and its canal system, it is the envy of those who have far less than we have and who appreciate what we have far more than we do. Those who are involved in restoration work in other countries recognise the valuable asset which is available to Ballincollig.

Two points, therefore, are clear. First, the history of the Powder Mills has to be researched more thoroughly and broadcast far and wide, so that many more people will come to recognise all of its fascinating aspects.

The second point is that the important part which the Powder Mills lands can play in the future development of this locality needs to be studied more closely. Based on the experience of other countries, the potential for development is enormous. But that potential will only be realised if local people have a vision of its future – a vision that will inspire action. That vision must draw on the history and heritage of the mills and it is on the basis of that history and heritage that the proper development of the mills will proceed.

It is for that reason that this year's Journal – the third – concentrates on many aspects of the Powder Mills. Several new facets of its history are developed here. They provide a firm foundation of knowledge which should be of help in the restoration of the Mills to something like their nineteenth century splendour and their development as a valuable tourist resource.

THANKS

All the contributors to this Journal are students of Ballincollig Community School, except Tim Cadogan, Colman O'Mahony, and Colin Rynne.

We would like to thank the following for the help which they gave to these students: Tim Cadogan and David O'Brien, Cork County Library· Kieran Burke and John Mullins, Cork City Library; Patricia McCarthy, Cork Archives Institute; Ken Hannigan, Public Record Office of Ireland; Neville Carrick, Liverpool City Library; Colin Rynne, University College Cork; Freddie Alcock, Agnes Earley and J. J. Murphy, Ballincollig Community School; Sean O Croinin, Scoil Eoin, Ballincollig; Bean Ui hAodha, Scoil Mhuire, Ballincollig; Colman O'Mahony, Jim Twomey and Nora Lynch for additional references; William Lee, Master Cooper, and the coopers of Cork Distilleries; Ricky Lucey and Eleanor O'Donovan, artwork; Liam Wall, Model Farm Road; and Arthur Percival, Faversham, Kent.

We would also like to thank the teachers in the Community School for their co-operation. Finally, we would like to thank our advertisers.

Dermot Lucey
Editor

The Constitution:
OR, CORK ADVERTISER.
XV.—No. 5,361. THURSDAY MORNING, MAY 15, 1856. [illegible] 1d.

ROYAL GUNPOWDER MILLS BALLINCOLLIG

The best contemporary account of the Gunpowder Mills in Ballincollig was written in the Cork Constitution, 15 May, 1856. It is reproduced in full below, with paragraph headings added.

The village of Ballincollig is distant between five and six miles from Cork, picturesquely and healthfully situated on the south bank of the Lee. The principal point of attraction which Ballincollig possesses for the tourist, apart from the inherent beauty of the surrounding scenery and the abundant fertility of the well-watered and varied landscape, is the extensive establishment entitled the Royal Gunpowder Mills, one of the largest manufactories of the kind in the kingdom. These concerns have been in possession of an English Company for upwards of twenty years; and were purchased by them from Government. Originally the works were of small extent, but have been during their possession enlarged from time to time. New buildings have been added, an extensive canal has been cut for the convenience of transit from one part of the works to another, and at the present moment additional accommodation is in progress of construction, to keep pace with the advance of manufacturing science, and the requirements of an already great and increasing traffic.

SIZE

The first peculiarity which strikes the eye in this, or any other manufactory of gunpowder is the isolated and scattered position of the various portions of the works. Gunpowder cannot, like other articles of commerce, be manufactured in one large concern – such as the cotton mills of Manchester or the chemical works of Glasgow and Newcastle. Each process of the manufacture, from the first purification of the rough ingredients, to the packing and storage of the finished article is conducted in a separate building, totally detached from the rest. This circumstance is occasioned by the nature of the processes, and by the highly inflammable and explosive qualities of the substances employed, which are liable at any time to ignite and blow up the walls and roofs of the various buildings in which they are contained. Hence the purification, grinding, mixing, granulating, glazing, drying, finishing, & co., are carried on in separate buildings, so that if any explosion should occur the damage may be confined to the building where it originated. If a manufacturer were as rich as Rothschild he would inevitably lose his entire fortune if he concentrated his buildings under one roof since at any moment he would be liable to have his entire concerns demolished by accidents which no precaution or foresight can entirely prevent. The Ballincollig Gunpowder Mills are, therefore, spread over a tract of ground of over 400 acres, communication from one portion of the concerns to another being kept up by a canal over a mile and a half in length, by 40, 50, and in some places 60 feet wide, constructed at great expense, and considerably enlarged within the past few years. This canal is continually enlivened by the passage to and fro of numbers of large boats, by which sulphur saltpetre, charcoal, and gunpowder in various stages of completion, are transferred from one place to another as the exigencies of the manufactory require.

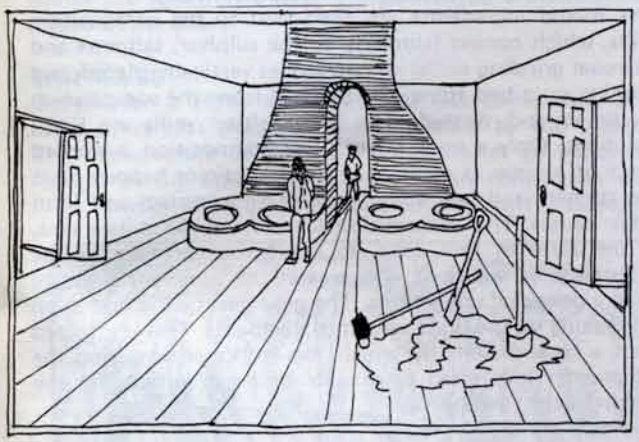
SULPHUR FROM SICILY

Everyone is familiar with the ingredients which enter into the composition of gunpowder – saltpetre, sulphur and charcoal mixed together in certain proportions. Here the experience and judgment of the manufacturer are brought into operation. He has to determine the proportions in which these ingredients are to be combined, according to the peculiar quality of gunpowder which he wishes to produce. It is not improbable that each eminent firm has a recipe peculiar to itself as is known often to be the case in the glass manufacture, and many other manufacture in which several ingredients are employed. Sulphur is an article which enters very largely into various manufactures; and although an enormous quantity of the article is produced in our mining districts for home consumption, yet so great is the demand for it that forty or fifty thousand tons are annually imported from Sicily The principal seat of the mining operations in Sicily is near Catolica. The sulphur appears in veins of various colours, mixed with clay and gypsum. The general appearance is that of shining red colour but large pieces are found which are red and transparent, and are called by the workmen 'virgin sulphur' Black patches also appear consisting of a chemical combination of clay and sulphur Large masses of this sulphur stone (as it is called) are piled up over cauldrons sunk in the earth; a quantity of straw is then spread over the heap and ignited. The sulphur as it melts, flows down into the cauldron, and is subsequently received into wooden moulds. In about a quarter of an hour it becomes solid, and is fit for exportation. The number of persons employed in the extraction of ore and the exportation of sulphur is computed at 8,000.

SULPHUR REFINING

Half of the entire quantity produced is exported to Great Britain. For the manufacture of gunpowder the sulphur has to undergo a variety of processes to render it pure. In an apartment about twelve feet square is a large cauldron and boiler about five feet in diameter filled with melted sulphur. The native article as received from Girgenti, is heated in the cauldron and fused. The lighter impurities float on the surface, and are skimmed off with a ladle; the earthy and heavier impurities sink to the bottom, leaving

the pure sulphur in the centre, which is then drawn off into moulds containing about one cwt, and left to cool. The rejected portions are then subjected to a second and third boiling in order to extract any sulphur contained in them. The residue consists of hard sulphur stone, which is sold to various chemical manufactories. A stranger entering the sulphur melting house perceives at once the strong smell of the burning brimstone, but it is affirmed that the process is so far from being deleterious to the workmen engaged in it, that they are among the healthiest and most long-lived of the labouring community. The sulphur thus purified, is removed to the sulphur grinding mill. This consists of a pair of mill stones, running vertically on their edges. The sulphur is laid in the large basin, within which the stones revolve, and by which it is reduced to an almost impalpable powder



Refining sulphur *

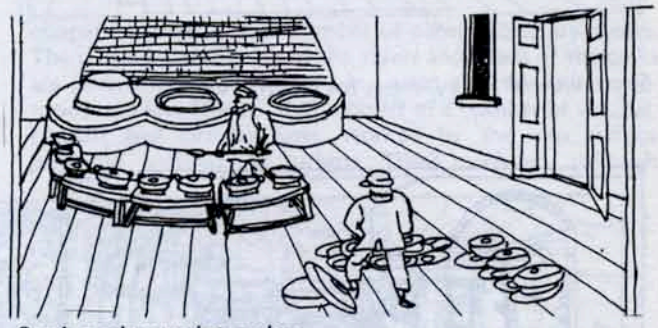
SALTPETRE REFINING

The saltpetre used in the manufactory is that which has been imported from the East Indies. It is sent over to this country in bags containing about 11 cwt, but is mixed with earths and salts, which by deliquescing would render the gunpowder liable to injury by attracting moisture. To remove these impurities the saltpetre is melted in a large copper vessel; the solution is then drawn off and crystallised, which is one of the most striking features in the operation. In a very large and cool building are numerous shallow copper vessels. In these the liquor is placed after having been freed from its solid impurities, and here it remains until all that will crystalise has done so. It is a beautiful sight to see the large crystals radiating from the sides of the vessel towards the centre, and absorbing as it were into their substance more and more of the liquor, until only a little of the latter remains. After a few days, the crystals are broken out from the vessels to undergo the next operation, which is called calcining. The residue and other solid impurities consist chiefly of common salt of a coarse and impure description, which is sold for agricultural purposes.

**These are illustrations of the gunpowder mills in Faversham, Kent, in the 1790's. Redrawn by Ricky Lucey. There are no drawings available at present of the processes in the Ballincollig Mills.*

Cooling and crystallising house for saltpetre.

The next operation is the calcining. This is effected in a large and lofty building with a galvanised iron roof, as a



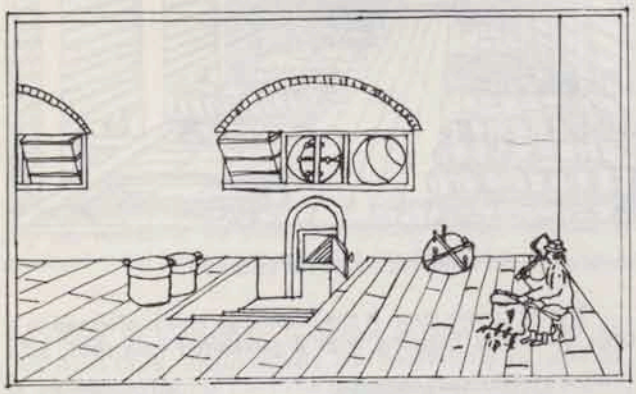
Casting saltpetre into cakes.

precaution against fire, for such is the inflammable nature of saltpetre that it frequently ignites. The crystals, as removed from the crystallising-pans, are again dissolved and subjected to the heat of a furnace, by which the superfluous water of crystallisation is driven off, and, the remaining liquid being evaporated, the saltpetre is received into flat cake-shaped moulds. Thus prepared it is of a beautiful whiteness, of great density and free from moisture. It is then removed to the saltpetre mill and ground by a process similar to that for the grinding of sulphur

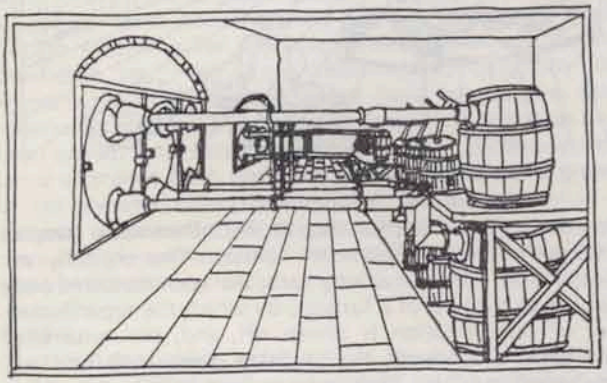
CHARCOAL

The charcoal used in the manufacture of gunpowder is produced from the alder, willow, hazel, and other soft descriptions of wood. The usual mode of manufacture is called charring in pits. It consists in the wood being cut into lengths of about three feet, and then piled on the ground in a circular form and covered with straw, & co., kept on by earth or sand to keep in the fire, giving it air by ventholes as may be found necessary When the charcoal is completely made, which the men judge by the smoke and other appearances, the fire is quenched and the charcoal removed. For the finer qualities of gunpowder dog-wood is cut into lengths of about 24 inches and put into iron cylinders, placed horizontally over a large fire. The front opening of the cylinder is then closely stopped, and the pyroligneous acid and gaseous products being allowed to escape, the fire is kept up until no more gas or liquor comes over, and

the carbon remains in the cylinder The wood before charring has the bark taken off It is brought from various parts of the country



Front view of the cylinders for charring wood.



Back view of the cylinders.

On one occasion the proprietor of a large quantity of timber being desirous to dispose of it for the manufacture of gunpowder conceived he would realise a large profit by making it into charcoal himself and selling it in that form. Accordingly he had the wood cut into lengths, pitted, and set fire to, but the men employed for this purpose, being unskilled in the manufacture, allowed the burning to continue too long, and when the owner came to examine the wood, it had been converted into a heap of ashes. Prepared by one or other of the methods mentioned above, the charcoal is removed to the charcoal grinding mill, which is worked in a precisely similar manner to that of the sulphur-mill by mill stones, running vertically in a deep circular trough.

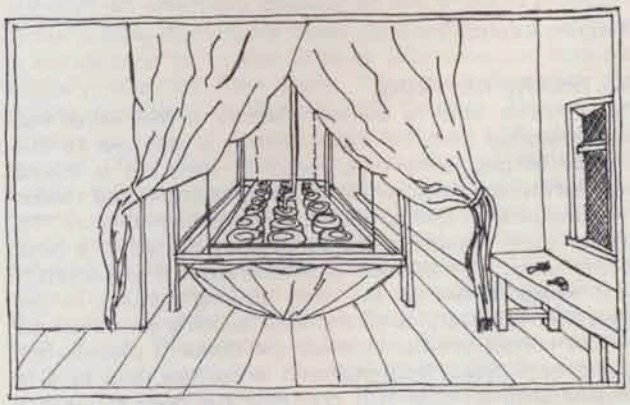
MIXING HOUSE

The three ingredients sulphur saltpetre and charcoal – are now removed to the mixing house. The precise proportions which are employed is one of those secrets which are religiously preserved in the several manufactories, and never divulged, even to strangers. The usual proportions given by chemists are 75 of saltpetre, 15 of charcoal, and 10 of sulphur but it is stated that an eminent firm in the sister country prefers the following: 100 of saltpetre, 15 of sulphur and 18 of charcoal. Macquer in his Dictionary of Chemistry recommends 75 of saltpetre, 15½ of charcoal and 9½ of sulphur By analyses of the gunpowders manufactured in the undermentioned establishments, the proportions are found to be as follows:

	Nitre.	Charcoal	Sulphur
Waltham Abbey	74½	14½	11
Hall, Dartford,	76	14½	9½
Pigou and Wilks,	78	13	9
Curtis and Harvey	77	13	10

COMPOSITION OR INCORPORATING MILLS

The mixed ingredients are then sent to the composition mills, which consist (similarly to the sulphur saltpetre and charcoal grinding mills) of two stones vertically placed, and running on a bed stone. On this bed stone the composition is spread and wetted. The composition mills are slight buildings. Only a small quantity of composition is worked there at a time as explosions will sometimes happen from the runners and bed stone coming into contact and from other causes. The composition taken from the mills is sent, in the form of mill cake, to another department of the manufactory where it is subjected to a violent pressure from a powerful screw-press. The next part of the operation is breaking up the press-cake into fragments. This is effected with a large mallet, by which the workmen break up the gunpowder into small pieces, to render it suitable for the action of the corning mill.



Front view of the corning sieves and frame.

CORNING HOUSE

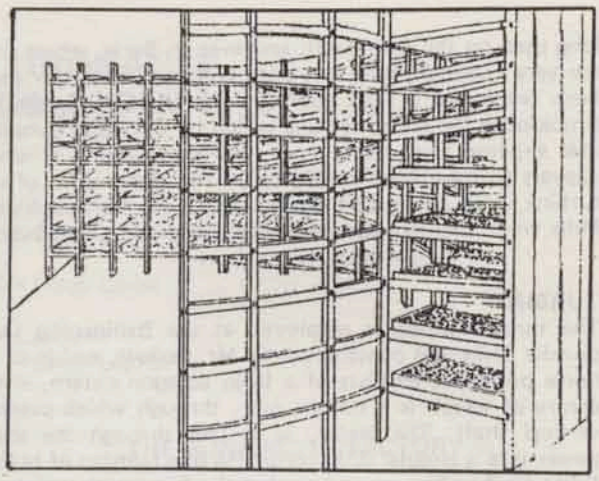
The gunpowder thus reduced into fragments, is transferred to the corning house to be corned or grained. The corning mill consists of a number of circular sieves, in each of which are two flat circular pieces of lignum vitae. The sieves are made of parchment-skins, having round holes punched through them. Several of these sieves are fixed in a frame, which by machinery has such a motion given to it as to make the lignum vitae runner in each sieve strike

against the powder with a quick velocity breaking the lumps of powder and forcing them through the sieves, forming grains of several sizes.

GLAZING AND DRYING

The next operation is called glazing. It consists in putting a small degree of gloss on the powder rendering it less liable to be affected by moisture. For this purpose the powder is placed in a reel. The reel is kept slowly revolving for some time, by which the grains of gunpowder are brought into contact with each other producing a slight gloss.

The next process is stoving or drying. The stoving house consists of a securely closed chamber heated by steam passing through large steam-tight tubes. The powder is spread on cases placed on shelves, rising tier above tier round the room. The heat is regulated by a thermometer placed at the door



Inside of the stove for drying powder

SAW MILLS

Gunpowder is either stored in bags (for home use), or in casks of various sizes, containing from 5 to 100 pounds. The manufacture of these casks constitutes an important feature of the operations carried on in connection with these Powder Mills, and furnishes employment to about 50 coopers, besides a large number of other subsidiary trades. The cutting and shaping of the staves and heads of the casks are performed by machinery in a most effective and expeditious manner The saw mills consist of a number of vertical, straight and circular saws, worked by the new motive principle, entitled the turbine. These machines, although

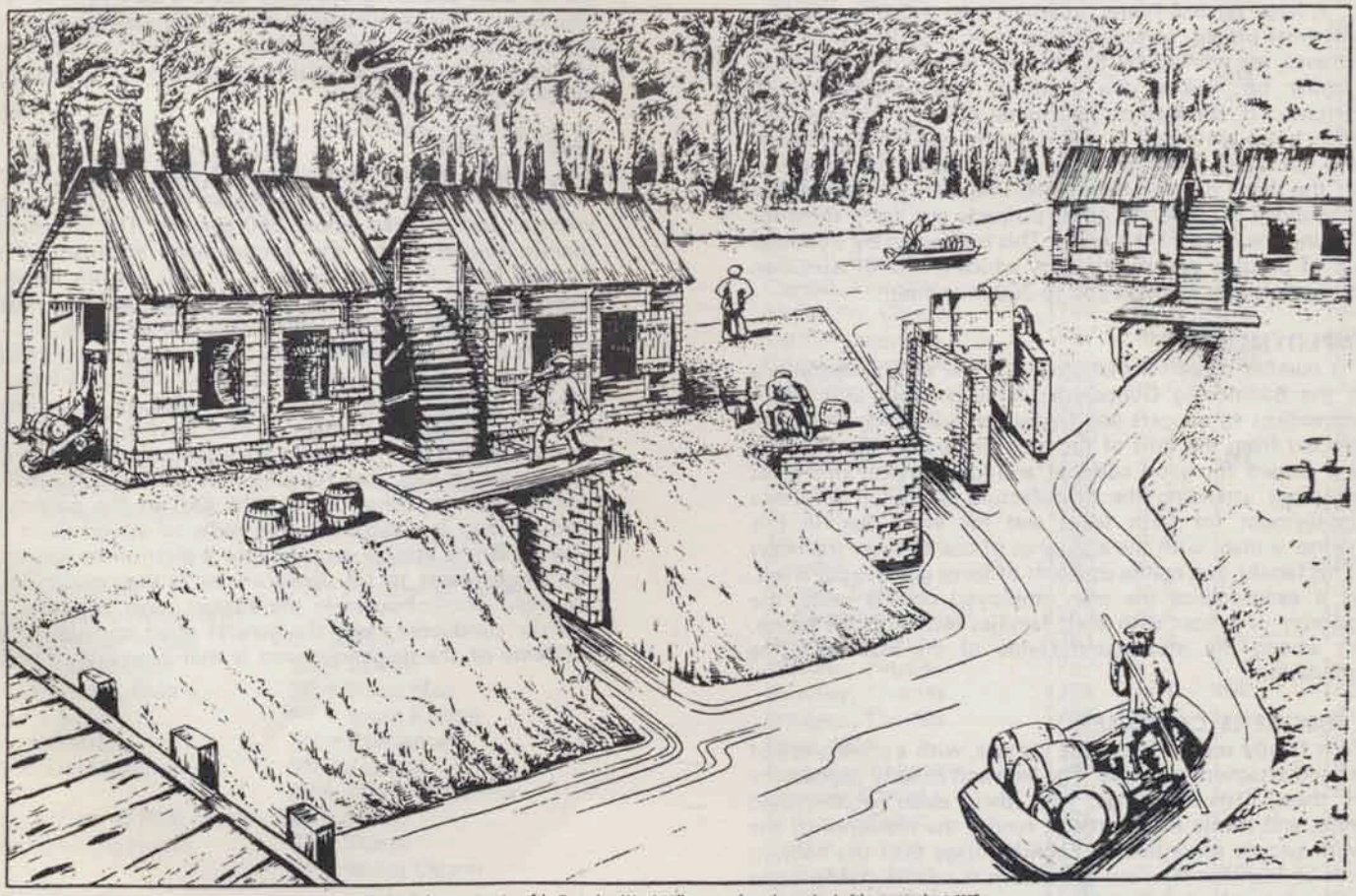


Fig. 6 Artist's reconstruction of the Central and North Mills, as seen from the east bank of the river in about 1880.
Each mill consisted of a pair of mill-houses, which contained the milling machinery and stones, which were worked in tandem by the great water-wheel placed between them.
(Drawn by Wendy Williams)

An artist's impression of an Incorporating Mills in the 1800's. Note Powder Boats

long used on the Continent, and even in Syria, where they are very common, have not until within the last few years been employed in this country Mr N. M. Cummins, of Brooklodge Oil Mills, has one which he put up at considerable expense some years since, and the working of which appears to have been satisfactory The dimensions of this turbine, with other particulars relative to the Brooklodge Mills, were described about two years ago in the *Constitution.*

TURBINE

The turbine which is employed at the Ballincollig Gunpowder Mills was constructed by Mr Perrott, and is of 16 horse power It consists of a large octagon cistern, in the centre of which is a hollow pipe, through which passes a vertical shaft. The water as it falls through the shaft, passes into a circular disk, consisting of a number of hollow tubes or chambers curved so that the force with which the water is expelled from them causes the disk to revolve with great volocity carrying with it the shaft, which is connected with the other portions of the machinery The fall of water is eight feet; and the number of revolutions of the shaft produced per minute is 100. Turbines have the advantages of great economy of water as well as of space, for all the works being underground, the space above is left free for the other parts of the machinery

A large vertical frame, in which over a dozen saws are sometimes placed, several circular saws, cross-cut saws, and a cleaver are worked by this turbine of 16 horse power A machine for making the heads of casks displays great ingenuity It consists of two metal drills or punches, by which holes are made in the ridges of the timbers which form the head. They are then firmly combined together but the shape of the pieces being irregular they require to be rounded off and the edges properly cut, to fit them for forming the head of the casks. This is effected by a circular saw of peculiar construction, by which a skillful workman can complete as many as 250 to 300 in an hour

EMPLOYMENT

The number of persons employed in the several operations of the Ballincollig Gunpowder Mills is about 500. When apprentices to coopers and tradesmen are wanted they are selected from the sons of the men employed on the works, as a reward for good conduct and long service. One great advantage attending the manufacture is, that it furnishes employment for both sexes and for every age. In this manner a man, with the assistance of one or more members of his family can realise upwards of three guineas per week. As a conseuqence the men employed on the mills, the majority of whom with their families reside on the estate, are among the most comfortable of the manufacturing population.

LABOURERS' COTTAGES

Each family resides in a little cottage, with a small piece of ground attached, rent-free. The neat and orderly appearance of these little dwellings, with their clean whitewashed walls, and trimly kept gardens, render the residence of the work people more like an English village than the habitations of Irish families; but apart from the comfortable wages enjoyed by the inmates (much as that circumstance tends to civilise and improve) the neatness and cleanliness of the cottages is secured by the periodical inspection of an officer employed for the purpose, who examines the interiors of the houses, and any defect is at once commented on and remedied. The walls are whitewashed every month. When a workman, either from illness, or accident or old age, is incapacitated, temporarily or permanently for further usefulness, he is favourably considered according to his previous character and the duration of his services. The order completeness, and perfection which reign through the entire establishment reflect the highest credit on Sir Thomas Tobin, who, in the management of the concern, is assisted by Mr Somerville, the superintendent of the works, and to whose constant supervision much of the regularity and efficiency of the works are to be attributed, and the comfort and happiness of all employed.

EDUCATION

The peculiar advantage of the manufactory in furnishing employment for girls and boys of all ages, is attended with one evil, which is, that parents, in their anxiety to turn the labour of their children to account as early as possible, desire to send them to the manufactory so young that their subsequent employment is almost a complete bar to their acquiring anything but the bare rudiments of education. This disadvantage is partially remedied by the establishment of a night school, at which some of the children attend, but not with that constancy and regularity which might be wished.

THE VILLAGE

The eastern and western villages of Ballincollig contain a population of about 800, and the Barracks, including men, women, and children, about 550 persons. The villagers are mainly supported by the employment afforded by the Powder Mills, in which upwards of 500 persons are daily engaged. Every description of trade is carried on – shoemakers, copper smiths, carpenters, coopers, & co. Of coopers there are upwards of 50 tradesmen and apprentices, who earn very good wages. Boys who might, perhaps, be growing up in idleness, are taught trades, to be a support to their parents and families. These boys are the sons of men employed in the Powder Mills, who are taken apprentices to learn trades, thus forming an inducement for orderly and industrious behaviour on the part of the parents. A medical man is attached to the mills to attend those employed. Where eligible a preference is given those longest in the employment to fill up vacancies as they occur There are eight public-houses in the villages most regularly and orderly conducted, and the general good conduct of the residents of the neighbourhood is well deserving of praise.

EMPLOYEES AT BOARD OF ORDNANCE ESTABLISHMENTS IN BALLINCOLLIG IN 1815

The Board of Ordnance had its origins in the 14th century and preceded the introduction of firearms. It was re-organised in 1543 by Henry VIII and in 1683 assumed the form which remained unaltered into the 19th century The Board was engaged in the province of guns, wagons, ammunition and military stores of all kinds. It designed and constructed fortifications and harbours, such as at Cork, and built gunpowder factories and barracks. The Board was a civil establishment employing local people as skilled tradesmen and labourers. However the frequent wars of the 18th century, ending in the conclusion of the wars in 1815, increased the influence of the Military and by 1855 the Board of Ordnance was abolished and its duties merged with those of the War Office.

The following is a list of employees at Board of Ordnance establishments in Ballincollig in 1815. The first list refers to employees in the Gunpowder Factory and the second list to employees in the Engineers Department.

Column references are as follows:

(a) Name.

(b) Year of birth.

(c) Single 's' married 'm' widower 'w', followed by number of children in 1815 ('ch' = children, number not stated).

(d) Occupation, trade or profession (see Table 1).

(e) Date joined Ordnance.

The place of residence of most of the men is given as Ballincollig.

Table 1: Ordnance Board Trades and Professions in 1815.

A = Assistant
AP = Apprentice

BA = Barrack Master
BM = Boatman
BR = Brimstone (Sulphur) Refiner
BS = Barrack Sergeant

C = Clerk
CA = Carpenter
CG = Corning House Man
CH = Cylinder House
CL = Charcoal Mill
CN = Captain, Ship's
CO = Cooper
CP = Chaplain
CS = Coal Measurer

DB = Driver of Boat Horse
DH = Dusting House

F = Foreman
FY = Factory

M = Mason
ME = Messenger
MM = Master Mixer
MR = Master Worker
MW = Millwright

OC = Officer Cleaner/keeper

PB = Powder Boat
PH = Press House
PS = Puncher of Sieves

S = Smith
SA = Sawyer
SE = Stone Man
SK = Store Keeper
SM = Stableman
SN = Seaman
SP = Saltpetre Refiner
SS = Slater
ST = Stores
SV = Shave Clearer

W = Wheeler and Framer

G = Gunsmith
GH = Glazing House

HC = Hoop Coiler

L = Labourer
LL = Lamp Lighter

WA = Warden
WG = Wagonner
WM = Watchman
WN = Woodman

THE GUNPOWDER FACTORY

(A)	(B)	(C)	(D)	(E)
Ahern, David	1778	m.9	BM-PB	1811
Ahern, James	1789	s	MM	1808
Ahern, John	1795	s	MM	1813
Ahern, John	1795	s	L	1812
Ahern, Thomas	1785	m.5	MM	1809
Barrett, Edward	1775	m.5	L-ST	1805
Barrett, Maurice	1780	m.7	MM	1805
Barrett, William	1792	s	MM	1812
Barrett, Charles	1775	s	WA	1805
Bryan, Daniel	1791	s	L	1810
Bryan, Daniel	1794	s	MM	1810
Bryan, James	1789	s	MM	1810
Bryan, Timothy	1787	m.1	L	1811
Callaghan, Daniel	1784	m.2	SV	1807
Callaghan, William	1765	m.5	F-CO	1806
Carroll, Daniel	1784	m.4	PS	1810
Carroll, Dennis	1778	m.4	L	1810
Carroll, Patrick	1787	s	L	1810
Carroll, Timothy	1790	s	DB	1810
McCarthy Charles	1785	m.2	L	1809
Coffee, Jeremiah	1767	m.1	L	1814
Coghlan, Jeremiah	1784	m.5	F-WG	1810
Coghlan, John	1773	m.4	L	1811
Coghlan, Thomas	1791	s	L	1808
Connell, Francis	1780	m.2	L	1809
Connor Cornelius	1790	m.1	MM	1812
Connor Patrick	1788	m.1	L	1810
Corbett, John	1785	m.2	L	1810
McCavity, Daniel	1786	m.0	L	1805
Creedon, John	1793	s	L	1810
Cronin, Daniel	1775	m.5	C	1805
Cunningham, Daniel	1783	m.4	L	1805
Desmond, John	1781	m.3	WA	1809
Dinneen, Patrick	1787	s	L	1812
Droomy Thomas	1785	m.1	WA	1808
Droomy, Thomas	1785	m.2	L	1810
Egan, John	1796	s	L	1815
Flyn, Bartholomew	1789	s	L	1805
Gleeson, Daniel	1789	m.2	L	1808
Griffin, Edward	1785	m.2	CO	1807
Griffin, Robert	1793	s	L	1808
Grihan (?), John	1767	m.10	WA	1807
Hallahan, Cornelius	1778	m.4	L	1809
Hallicy John	1792	s	F-GH	1808

(A)	(B)	(C)	(D)	(E)
Hallicy Timothy	1795	s	L	1811
Hallicy William	1772	m.4	CG	1810
Hallicy William	1783	m.5	F-PH	1809
Harrigan, Edward	1787	m.2	F-DH	1809
Harrigan, Jeremiah	1755	m.6	F-WN	1805
Harrigan, Thomas	1767	m.4	WA	1807
Hayes, Daniel	1770	m.5	F-SM	1811
Healy Daniel	1786	m.1	MM	1808
Healy John	1777	m.7	L	1810
Healy Timothy	1778	m.5	F-WG	1810
Healy William	1791	s	L	1810
Hegarty Lancelot	1763	m.3	L	1809
Hegarty Timothy	1791	s	MM	1812
Keating, Dennis	1793	s	SM	1812
Keating, John	1787	m.3	L	1810
Keeffe, Dennis	1787	m.2	L	1808
Kelly Cornelius	1782	m.4	MM	1812
Kelly John	1778	m.3	WM	1808
Kennedy Cornelius	1777	m.6	F-CH	1805
Kennedy Timothy	1779	m.6	L	1808
Kennedy William	1771	m.0	HM	1788
Leahy John	1770	m.7	L	1811
Leary Barry	1772	m.5	MM	1808
Leary John	1787	s	ME	1813
Leary Timothy	1778	w.3	L	1810
Long, Jeremiah	1760	m.9	SM	1805
Long, John	1781	m.3	F-CL	1805
Lynch, James	1765	m.4	HC	1813
Lyons, Jeremiah	1778	m.4	MM	1805
Madden, David	1785	m.3	L	1810
Madden, Dennis	1785	m.4	MM	1805
Madden, John	1767	m.5	MR	1805
Mahony Jeremiah	1786	m.2	L	1810
Mahony Timothy	1778	m.4	BM-PB	1805
Mahony Timothy	1785	m.4	MM	1805
Meskill, David	1783	m.1	L	1807
Mulcahy David	1782	m.3	F-FY	1805
Mulcahy Jeremiah	1780	m.0	SP	1805
Murphy Jeremiah	1780	m.5	BR	1805
Murphy John	1765	m.1	L	1805
Murphy Patrick	1779	m.4	WA	1808
Murphy Richard	1791	s	L	1810
Neal, David	1780	m.4	L	1805
Nehane, Daniel	1779	m.4	WA	1808
Reed, Felix	1756	m.4	F-L	1813
Reed, John	1774	m.7	SE	1808
Riordan, Thomas	1787	m.1	L	1809
Ruby Philip	1779	m.2	L-ST	1809
Sexton, Thomas	1780	m.3	L	1815
Sheehan, Dennis	1753	w.6	WA	1811
Stanton, William	1785	m.6	L	1808
Stewart, Charles	1748	m.0	L	1774
Sullivan, Bartholomew	1787	m.1	L	1810
Sullivan, Cornelius	1783	m.3	BM-PB	1814
Sullivan, Jeremiah	1783	m.3	BM-PB	1808
Sullivan, John	1781	m.6	L	1810
Sullivan, John	1785	m.1	L	1810
Sullivan, Patrick	1782	m.2	F-PH	1810
Sweeney Francis	1787	m.2	L	1810
Tobin, David	1775	m.4	CG	1805
Tobin, Edward	1793	m.0	L	1810
Vaughan, Charles	1785	m.3	L	1808
Walsh, Peter	1785	m.3	L	1808
Wray John	1790	s	L	1814

THE ENGINEERS DEPARTMENT

(A)	(B)	(C)	(D)	(E)
Ballantine, James	1769	m.6	BS	1791
Barrett, Richard	1781	m.2	S	1811
Barry William	1793	s	A-S	1815
Blackwell, William	1781	m.0	C	1803
Blake, John	1786	m.3	SA	1806
Blake, Phillip	1790	m.2	SA	1811
Brayon, John	1791	s	M	1814
Buckley Dennis	1795	s	L	1812
Cantillon, Dennis	1765	m.3	L	1805
McCarthy Daniel	1779	m.3	F-MW	1805
Chard, Jeremiah	1792	s	SN	1812
Connell, Patrick	1785	m.2	W	1815
Dennis, John	1790	s	C	1806
Dinney Edmond	1787	m.1	L	1812
Dinney James	1779	m.1	F-S	1805
Dynan, John	1767	m.8	F-L	1806
Dynan, William	1794	s	AP-MW	1812
Evans, James	1775	m.7	F-M	1808
Fitzgerald, John	1763	m.4	CN	1812
Fitzgerald, Thomas	1784	m.2	CA	1805
Fitzgerald, Thomas	1792	s	SN	1812
Grant, John	1789	s	CA	1805
Grant, William	1765	m.4	F-CA	1805
McGrath, John	1775	m.3	L	1806
Halsted, John	1792	s	C	1806
Henecy, Richard	1775	s	L	1806
Irwin, Henry	1773	w.3	CP	1810
Jones, Henry	1790	s	BA	1811
Kearns, Richard	1792	s	SN	1812
Keeffe, Daniel	1781	s	L	1813
Leary John	1785	m.1	L	1814
Lewis, Martin	1775	m.2	C	1805
Lynch, Daniel	1773	m.5	LL	1805
Lynch, Edward	1772	m.1	L	1806
Madden, Terence	1795	s	AP-CA	1810
Madden, Thomas	1794	m.2	S	1813
Murley Michael	1775	m.3	L	1805
Murphy, Gerald	1785	m.2	L	1807
Murray, William	1784	m.2	CA	1813
Oldfield, William	1780	s	A-C	1805
Ormond, Robert	1765	m.5	SS	1813
Scarth, John	1799	s	C	1814
Scarth, Jonathan	1773	m.10	SK	1811
Snedding, James	1788	m.3	CS	1806
Sweeny Miles	1785	m.2	OC	1814
Toomy Dennis	1795	s	L	1815
Walsh, Michael	1785	s	L	1815

MAIN OCCUPATIONS			
GUNPOWDER FACTORY		**ENGINEERS DEPT**	
Labourer	51	Labourer	12
Master Mixer	15	Clerk	5
Warden	8	Carpenter	3
Boatman Powder Boat	4	Seaman	3
Labourer Stores	2	Sawyer	2
Foreman Press House	2	Smith	2
Foreman Wagonner	2	Other Occupations	1
Stableman	2		
Other Occupations	1 ea.		
AGES			
Average Age	27	Average Age	27
Range	15 57	Range	15 49

DATE JOINED ORDNANCE			
1774	1	1791	1
1788	1	1803	1
1805	22	1805	10
1806	1	1806	8
1807	5	1807	1
1808	16	1808	1
1809	10	1810	2
1810	27	1811	4
1811	7	1812	7
1812	7	1813	4
1813	4	1814	4
1814	3	1815	4
1815	2		

This list has been extracted from "Employees at Board of Ordnance Establishments in Ireland in 1815" in The Irish Genealogist (1985) by kind permission of the Editor of the journal and Mr John A. Acton, who compiled the full list from Ordnance Report.

The reference for Irish Ordnance reports of 1815 is WO 54-517 (Public Record Office, Kew).

Edited by
Noelle Corcoran and Eleanor Murphy

THE HAZARDS OF GUNPOWDER MANUFACTURE AT BALLINCOLLIG

During the nineteenth century the manufacture of gunpowder at Ballincollig, and its transportation through Cork City caused much concern and some fatal accidents. From the opening years of the century the hazards associated with transporting such a volatile substance through busy streets are evident.

A number of accidents occurred in the mills early in the century On 10th November 1803, two barrels of gunpowder exploded in the processing shed and five men perished in the blast.[4] Five years later on 25th August, 1808, a "dreadful explosion" at the mill claimed further lives.[5] The shock waves from both of these blasts were clearly felt in Cork. But the city itself also experienced the dangers associated with gunpowder

DANGERS IN THE CITY

As a number of gunpowder-wagons made their way along George's Street (present-day Washington Street) in August 1803, vibration disturbed one barrel and, unnoticed by the car men, the contents flowed along the ground in a steady trickle. A stumble by one of the car men produced a spark, and without warning, the escaped gunpowder exploded. Though many bystanders were shaken by the blast no injuries were noted. A far different tale would have been told if the powder casks had become engulfed in the explosion. A local newspaper reported the incident and urged that caution be exercised in the future:

> "As we know not of any similar case having occurred in this city we need not, through apprehension of its being repeated, enjoin any lesson of caution; but upon the whole, the transportation of so formidable an article of destruction, subject to so many accidents, should be in all cases the object of incessant vigilance."[1]

Two years later the same newspaper returned to the subject of gunpowder when it warned of the dangers of storing large quantities in city retail premises. It suggested that powder be stored in a detached depot and that retailers only stock limited quantities. On 15 October 1805, the Mayor of Cork was complimented for drawing attention to the fact that a Main Street grocer was stocking far more powder than his licence allowed.[2] The gunpowder was seized and lodged in the ordnance store. A couple of days later the powder stock of a South Main Street grocer was also seized and confiscated.[3] Early in 1806 further precautions were taken and it was ordered that gunpowder be shipped from Blackrock and not from the city quays as was the current practice.

In November 1810, Ballincollig gunpowder was again associated with a major disaster in the city itself.At about 10 o'clock on the evening of Saturday 3 November a violent explosion rocked the St. Barry's area of the city and in Brandy Lane, the centre of the blast, three houses were demolished and a number of others were set on fire. Crowds of people converged on the area, some to satisfy their curiosity others to offer assistance. A scene of utter chaos awaited them; dismembered bodies, clothing, household furniture and ware, plus other debris, were strewn all around. Parties were organised to comfort survivors, fight fires and carry out other tasks. Rescuers worked through the night and by morning 19 bodies had been taken from the ruins. The deaths of three survivors in hospital brought the number of fatalities to 22. The cause of the tragedy was ascribed to the pilfering of gunpowder from the Ballincollig mill. A worker had found a ready market for the powder in quarries near the city and each evening he brought small quantities to his home in Brandy Lane. It was surmised that carelessness while drying the powder with candles was the cause of the explosion. The greed of one Ballincollig mill worker had sent over 20 people to premature graves.[6]

MILLS CLOSED

The Ballincollig powder mills fell into disuse a few years later and the Duke of Wellington ordered "the whole of the wooden part of the manufactory to be taken down, (and) the foundations to be preserved." The machinery ws painted, oiled and maintained.[7] Some of the equipment was put up for auction in 1831[8] and soon many of the buildings were in a dilapidated state. In 1833 it became known that the concern had been taken over by Sir John Tobin and Company of Liverpool, and it was planned to have it operating in the near future.[9]

MILLS RE-OPENED

Within a few months the complex was being renovated and workers were employed at clearing out the disused waterways.[10] By mid 1835 the Ballincollig mills, trading as the Royal Gunpowder Mills Company had commenced the manufacture of gunpowder and the weekly wage bill was almost £200.[11] Before the end of the 1830's there were about 200 people employed at the mills and the annual production of gunpowder was in the region of 16,000 barrels. To reduce the danger of accidents the various departments were placed at some distance from each other· materials were transported on small canals which eliminated the hazard of sparks from horses' hooves.[12]

The quantities of gunpowder exported between 1836 and 1842 were: 1836 7,517 casks; 1837 6,267 casks; 1838 9,835 casks; 1839 16,045 casks; 1840 - 13,914 casks; 1841 16,489 casks; 1842 17,738 casks.[13] Having such quantities of gunpowder passing through the city gave cause for alarm and in June 1842 the matter was discussed by the Harbour Board. It was agreed that great caution should be exercised while shipping the material and it was suggested that the shipping point be moved from the Navigation Wall downriver to Rochestown. It was later suggested that a new road be constructed to transport the gunpowder from Ballincollig to Cork,[14] and a plan to build a canal was also suggested.[15]

CORNING HOUSE EXPLOSION

A fatal accident occurred at the Ballincollig Powder Mills on 25 June, 1841 when two men were killed by an explosion in the corning house.[16] Little is known about this incident, but two years later another fatal accident took place.

Shortly after reporting for work on Saturday 29 July 1843, John Carroll and Jeremiah Long donned their working clothes and special shoes and went to their place of work at the granulating (corning) mill. In the building at the time were 21 barrels, each containing 100 lbs of gunpowder One of the men put the machinery in motion and two minutes later a massive explosion rocked Ballincollig. "Slates, timber lead and stones were thrown to a great distance; not a stone of the mill was left standing; even its foundations were torn up and scattered; and the only part of the machinery standing is a large metal wheel used in the process of granulating. Carroll and Long were killed instantly their bodies were cast a considerable distance, and in quite different directions. They were wholly denuded of clothes and presented a shocking appearance – mutilated and scarcely recognisable."

Prior to the accident three troops of the 2nd Dragoon Guards had been inspected by General Sir Octavius Carey in a field near the mill, they had moved to the far end of the parade area just a few minutes before the explosion, otherwise the casualty list could have been far greater At an inquest on the following day a verdict of death by accident was returned.[17]

Just three years later two men were injured when another mill exploded. One man had his clothing burned, the other received a severe back injury when he was hit by flying timber[18] On 15 April, 1847 the military were called in to help contain a fire at the cooperage in the mill complex. Their efforts to prevent the fire spreading to the neighbouring powder store were successful, but the cooperage itself was reduced to ashes.[19] Again, in June 1858, an explosion demolished a small mill at Ballincollig, but no injuries were reported.[20]

Fire engine in gunpowder mills (Irish Tourist Association, 1946).

SERIOUS EXPLOSIONS

Between 1859 and 1862 three explosions claimed a dozen lives at the Ballincollig mills. The first of these explosions took place in the dusting house on a Saturday in August 1859. In this building dust was removed from the gunpowder Early in the morning the pure gunpowder was removed and between 30 and 40 barrels were brought alongside in a barge, for unloading and processing. Timothy Burns, a married man with 9 children, was in charge of the boat and 20 year old John Corcoran looked after the bargehorse. The dusting house workers were William Looney the foreman; Timothy Lyons and James Merrick. As the unloading proceeded, a sudden explosion demolished the dusting house and an adjoining press house; a buttress wall of stone and earth which separated the two timber buildings was also levelled. The five men were killed instantly and the huge crater left by the explosion was soon filled with the canal water Three of the bodies were recovered and brought to a nearby shed; a search commenced for the others.

> "A more melancholy sight than this could not be imagined, surrounded as it was by relatives of the deceased, bewailing their fate with loud and incessant lamentations; but it was horrible in the extreme to see from time to time persons coming in, bringing, wrapped up in grass or cloth, a blackened cinder that was once a hand; a foot or other portion of one of the dead men. Those awful relics were scattered far and wide, some of them having been found far away over the brow of the hill on the opposite side of the river nearly half a mile away from the scene of the catastrophe."

Nearly two miles away at Lisheen House young Morgan O'Connell was knocked unconscious by a window which was displaced by the blast. The cause of the explosion was a mystery and it was surmised that friction between barrels or a spark from a pebble was to blame. A verdict of accidental death was returned by a jury[21]

The tragedy was soon forgotten and a new 'pressing mill' was constructed on the site. The hydraulic equipment for working the machinery was situated under the floor and, as an added safety precaution, the floor itself was covered in leather Shortly before noon on 23 October 1861 the building was cleared and eight barrels of powder and eight barrels of dust were brought in for processing. Twenty minutes later an explosion was heard and when workers arrived at the scene little of the building or its contents remained. Five men who had been working in the mill died in the explosion; they were: Owen Begley the foreman; Thomas Long, George Davidson, Thomas Haily and Timothy Merrick. A verdict of death by accident was also returned in this case.[22] But a couple of days later it emerged that one of the men who was retiring because of ill health had decided to treat his companions. He had crossed the river and purchased drink which he brought to the mill. The *Cork Examiner* noted: "It is a fearful warning as to the consequences of yielding to a momentary temptation, while on the other hand it is in a certain degree satisfactory for the sake of those engaged in similar operations, to know that the catastrophe arose

from causes which are avoidable and that it would probably never have occurred had the unhappy victims but adhered to the rules of the establishment."[23]

The third fatal accident occurred in the drying house, or 'west stove', almost exactly twelve months later, on 25 October, 1862. Thirty barrels of gunpowder exploded and the small building "was blown utterly to pieces, leaving not a trace of its existance save some beams, sticks, and stones on the ground". John Hallissy and David Leahy were killed by falling rubble.[24]

MORE EXPLOSIONS

During the next few years further explosions took place. On 22 January 1864, a blast at one of the composition (or incorporating) mills (i.e. mills for mixing the ingredients) caused a chain reaction which blew up three other mills. About 220 lbs of powder was involved; little serious damage was caused and three of the mills were expected to be operational within a few days.[25] Again, on 8 October 1869, three compounding sheds were destroyed in an explosion; the material was in an unfinished state and little damage resulted.[26] Two more sheds at the 'Black Mills' were demolished in an explosion in June 1870; only "a few fragments of timber and debris of stone work discoloured by the powder remaining to mark that they had existed"[27] Following an explosion at the Black Mills in April 1872 a man named John Corcoran died. His companion, 70 year old William Dinan, was severely injured in the blast.[28] Three months later an explosion demolished another shed at the Black Mills. In March 1877 an explosion occurred at the incorporating mill and Thade Connell received severe burns. In this mill rollers driven by water power moved around a trough and crushed certain ingredients; as a safety precaution workers were not permitted to remain in the building while the machinery was in motion. The equipment was stopped before workers entered and it was thought that Connell may have been scraping encrusted powder from the roller when the blast took place.[29] Though hopes were entertained for his recovery Connell died a few days later

CONCERN IN THE CITY

Gunpowder explosions at Ballincollig, or elsewhere, realerted the public to the dangers associated with transporting the material. The 1870's saw renewed criticism of transporting the gunpowder through Cork, and the dangers of having it shipped from quays near the city also caused alarm. One citizen expressed the view that "we are all sleeping on a volcano, and the inhabitants of the City of Cork have to thank a superintending Providence (certainly not the authorities of Cork, whoever they are) that themselves and their properties are not – the former dead and the latter in ruins"[30] It was suggested that a new track be laid to connect the Bandon and Passage railway terminals in the city, and that the gunpowder be transported from Ballincollig to the former station and then taken down river on the Passage line. The powder could then be safely shipped from Rochestown.[31] It was later alleged that the Cork to Bandon railway authorities failed to co-operate with such a scheme.[32]

Around the late 1880's the company began to manufacture fine powder for military and sporting use. The company's R.P (Royal Premier) and E.T.S. (Extra Tremble Strong) brands received favourable comment in the London sporting papers and the Ballincollig company claimed that their powders had the advantages of reduced recoil, reduced smoke and reduced fouling. In 1892 it was noted that "the company at the present time, with their magnificent and extended premises, plant and machinery directed by scientific and intellectual management, are in a position to supply the entire gunpowder trade of Ireland"[33]

The growth in popularity and eventual domination of the market by smokeless powder led to the closure of the Ballincollig mills which still produced the out-dated 'black powder' Operations ceased at the mills on 1 July, 1903. Some weeks later a group of former employees wrote:

> "We can hardly believe that a firm which has been enterprising and successful will not, if they find it necessary get more up-to-date and improved methods of making explosives, which they say other mills have adopted, and which have forced them to close the factory in which we have been employed. We believe that sooner or later the Ballincollig Powder Mills will be re-opened."[34]

Unfortunately this wish was not realised.

NOTES

Abbreviations:
C.C. *Cork Constitution*
C.E. *Cork Examiner*
C.M.C. *Cork Mercantile Chronicle*

1. C.M.C. 10/8/1803.
2. C.M.C. 16/10/1805.
3. C.M.C. 21/10/1805.
4. C.M.C. 11/11/1803.
5. C.M.C. 26/8/1808.
6. C.M.C. 5/11/1810, *Cork Weekly Examiner* 28/7/1960. The man blamed for the blast was T. Ellard, who, along with his wife Mary, perished in the blast. Others who died were: Florence O'Sullivan, his wife Charlotte, and their son Edward, Mary Egan and her daughter Mary, Daniel D– and his wife Mary, John Twomey and his wife Ellen and their daughter Hanora, Denis Twomey, Ellinor Daly, John McCarthy and Mary Cun–.
7. C.C. 5/7/1828.
8. C.C. 22/11/1831.
9. C.M.C. 25/10/1833.
10. C.M.C. 16/4/1834.
11. C.M.C. 5/6/1835.
12. C. Lewis, Topographical Dictionary of Ireland, 1839, p. 111.
13. C.E. 11/9/1843.
14. C.E. 24/6/1842.
15. C.E. 20/9 and 11/9/1843; 24/4/1846.
16. C.C. 26/6/1841.
17. C.E. 31/7/1843.
18. C.E. 17/7/1846.
19. C.E. 16/4/1847.
20. C.E. 9/6/1858.
21. C.E. 8/8/1859.
22. C.E. 23/10/1861.
23. C.E. 26/10/1861.
24. C.E. 25/10 and 27/10/1862.
25. C.E. 23/1/1864.
26. C.E. 9/10/1869.
27. C.E. 23 and 24/6/1870.
28. C.E. 25/4/1872.
29. C.E. 12/3/1877; C.C. 15/3/1877.
30. C.E. 21/10/1874.
31. C.C. 21/8/1875.
32. C.C. 17/2/1876.
33. C.E. 29/10/1892. Two timber powder sheds were destroyed in an explosion at Ballincollig in April 1902 (C.C. 22/4/1902).
34. C.E. 24/7/1903; see also C.E. 14/5/1903 and 3/7/1903.

Colman O'Mahony
(Council Member, Cork Historical & Archaeological Society, Author of forthcoming "History of Passage & Monkstown)

AN EARLY TURBINE AT BALLINCOLLIG GUNPOWDER WORKS

Introduction: Early Water Turbine Development in Ireland

Apart from specialised works by H. D. Gribbon[1] and W. A. McCutcheon[2] on the development and application of water turbines in Ulster little, if any work has been done on similar developments in southern Ireland. And while there can be no doubt that nineteenth century Ulster hydro-engineers such as James Thomson (see below) were in the mainstream of the newly developing technology of the water turbine, the current emphasis on such developments has tended to obscure the fact that at least three contemporary industrial enterprises in Co. Cork – a flax scutching mill at Ballineen, a linseed oil mill at Riverstown and a sawmill at Ballincollig – were all powered by water turbines in the early 1850's. Indeed, in view of these developments the fact that no British-made turbines were on display at the Great Exhibition of 1851[3], and the general scarcity of turbines in British industry before 1850, demonstrates the initiative of certain entrepreneurs in the south of Ireland in adapting more efficient water-motors for use in their establishments. The installations at Riverstown, Ballineen and Ballincollig were, therefore, very much in the forefront of innovative uses of water power in Britain, particularly Ballincollig, which is the earliest recorded use of a turbine in a sawmill, in either Britain or Ireland.

FRENCH INFLUENCE

The main design elements of water turbines used in the British Isles and in the developing industries of both the United States and Europe in the first half of the nineteenth century were developed in France[4] though both British and American engineers made substantial improvements to the pre-existing designs and greatly extended their range[5] In this latter regard the contributions of Irish engineers were not inconsiderable, the impetus being provided by Sir Robert Kane's book **The Industrial Resources of Ireland** (Dublin, 1844). Therein, Kane referred to Moritz Ruhlmann's treatise on turbines **Allgemeine maschinenlehre** (vol. 1 Berlin, c.1842)[6] which Kane himself had translated into English[7] and gave a good general account of the installations designed by the contemporary French engineer Benoit Fourneyron[8] (1882 1867), whose turbine design was to greatly influence turbine development throughout the nineteenth century industrialised world. Kane's summary was to have a lasting effect on three Ulstermen: William Kirk, the proprietor of several flax-spinning and linen-bleaching works; Samuel Gardner owner of the Armagh Foundry Dobbin Street, Armagh; and a millwright, William Cullen. Kirk and Gardner appear to have formed an association which culminated in the installation of a Fourneyron-type turbine at one of Kirk's establishments in 1850[9] At least one of these men had actually travelled to France, between 1844 and 1848, to meet Fourneyron with a view to manufacturing his patent in Ireland. But, as the Rev. T D. Robinson (who ran some Ponv Brake tests on the Fournevron turbine installed by Gardner) explained, Fourneyron was less than forthcoming with the results of his work[10] William Cullen, by his own account, also found the Frenchman unco-operative, while his own attempts to acquire information on Fourneyron's turbines in France were mostly thwarted. He was, nevertheless, able to construct a model of one of Fourneyron's turbines when he returned to Ireland and later in association with Robert MacAdam of the Soho Foundry Belfast, a Fourneyron turbine built to Cullen's specifications was installed in Barklie's Bleach Mill at Mullaghmore, near Coleraine, Co. Antrim, in 1850[11] But at least one contemporary Ulster engineer James Thomson (1822 92), who was to become Professor of Engineering at Queen's College Belfast (and later at Glasgow University) was not content with the mere dissemination of Fourneyron's ideas. For as early as 1846 Thomson had developed what he termed a "vortex" turbine which, in terms of its design characteristics, effectively superceeded existing turbines; for which he secured British patent no. 13,156 in December 1850[12]

TURBINE TYPES

All water turbines, past and present, fall into two categories, which are loosely based on the hydrodynamic principles which govern their motion. In the early period of their development the term "horizontal waterwheel" (which refers to their plane of rotation, and served to distinguish them from the vertical waterwheels, then in current use) was applied to all turbines, but as designs improved and methods of water delivery were modified, the terms "impulse" and "reaction" were introduced to distinguish between turbines using one or other of the two basic modes of fluid energy "Impulse" turbines utilise fluid energy in its kinetic form, where the potential energy of the water in the reservoir is converted into kinetic energy as it falls towards the waterwheel. A penstock or guiding apparatus developed a water jet which was discharged against the rotor the vanes or buckets of which yielded against its impinging force[13] In "reaction" turbines the vanes of the rotor are completely submerged when it is in operation and no water jet is formed. Only part of the potential (pressure) energy of the head is converted into kinetic energy (which is a gradual process, and can only occur if all the water passages are completely enclosed and filled with water) as the water passes **through** the turbine. Reaction turbines may be further sub-divided in accordance with the direction of the waterflow which passes through them. In "radial-flow" turbines the direction of the incoming water is at right-angles to its axis of rotation, whilst "axial-flow" turbines are characterised by a water flow parallel to the axis of rotation. In radial-flow turbines the flow can be either "outward" (as in Fourneyron's turbines) or "inward" (as in Thomson's "vortex" design). Axial flow turbines, on the other hand, such as those developed by Jonval (see below) and Girard, utilised both "upward" and "downward" axial flows.

THE BALLINCOLLIG TURBINE

The sawmill in the Ballincollig Gunpowder Mills complex was built to replace an earlier installation, in or around 1854. Both the shell of the "New Sawmill" and the mill-leat of the earlier sawmill are still in evidence; and a survey of the Powder Mills, undertaken immediately after the purchase of the complex by Sir Thomas Tobin from the British Army in 1834, depicts both the earlier mill-leat (the latter running parallel to the actual mill building, which suggests that a vertical waterwheel was employed) and the outline of the mill building; the foundations of which can still be seen. The earliest description of the sawmill turbine is provided by an unknown correspondent in the *Cork Constitution*, 15th May 1856.

> "The turbine which is employed at the Ballincollig Gunpowder Mills was constructed by Mr Perrott and is of 16-horse power It consists of a large octagon cistern in the centre of which passes a vertical shaft. The water as it passes through the shaft (sic.) passes into a circular disk-consisting of a number of hollow tubes or chambers curved so that the force with which the water is expelled from them causes the disk to revolve with great velocity carrying with it the shaft which is connected with the other portions of the machinery The fall of the water is 8ft; and the number of revolutions of the shaft produced per minute is 100 "

Water turbine in sawmills, courtesy Dave McLeod

With the closure of the Gunpowder Mills in 1903 the site was left undeveloped, although the greater part of the original plant has long since been removed. The sawmill turbine, however, still survives, as its removal would doubtless have necessitated the partial demolition of the mill building. The water supply for the turbine was led off from the adjacent navigation canal by means of a narrow leat, 7.5m long, c.2m wide, and around 1m deep. Inflowing water was controlled by a sluice gate, the emplacements for which can still be seen at the juncture of the head-race channel with the navigation canal. The fall of the head-race channel from the main canal to the emplacement for the rear end of the penstock is neglible, and the greater part of the 8ft head referred to in the *Constitution* must be accounted for in the drop from the fore-end of the penstock to the western extremity of the tail-race. The emplacements for the penstock consists of two brick ledges stepped outwards from each of the turbine pit's brick retaining walls, 1.54m long and 12cm wide, and two substantial timber joists (of c.14 x 12cm scantling). The penstock, which has not survived, is likely to have been built of cast-iron plates, its original length being perhaps in the region of 2.5m with a cross-sectional area of around 1.5m^2

The sides of the octagonal masonry pit formed at the western end of the penstock emplacements were also built in brick, each side measuring 0.72 1 12m and extending downwards for a distance of perhaps 2.70m. The lower section of the turbine pit is built with large limestone blocks, into the second course of which are keyed four substantial limestone blocks (g. in fig. 1 average dimensions 50 x 41 x 29cm) upon which the corners of the cistern's base-plate (c. in fig. 1) are secured. The base-plate is 1.75m square and around 10cm thick, and provides a firm base for the vertical, cast-iron plate sections of the inner octagonal cistern. In the centre of the base-plate is a circular opening, through which water falling through the cistern was admitted into the upper guide vanes (k. in fig. 1). Extending upwards from the base-plate are eight cast-iron plates, each around 10cm thick and firmly bolted together at their seams. The forward sections of the cistern (f in fig. 1), which accommodated the fore-end of the penstock are 1.41m high and around 53cm wide, while the taller sections at the rear are 2.40m high and 59cm wide. Investigation of the lower part of the turbine was impeded by a combination of two factors: water backing up from the tail-race and debris which had accumulated in the turbine pit subsequent to the site's abandonment. Despite these setbacks it was possible to take some basic dimensions of both the runner and the pintle of its footstep bearing (m. in fig. 1). The runner (e. in fig. 1) has a cast-iron shroud 1.31m in diameter while the pintle of the bearing is 12cm long and 9cm wide; a proper examination of its vanes was not possible because of the confined space, though it was possible to establish that these were badly corroded owing to their periodic submersion. The three-dimensional cross-section of the runner given in fig. 1 will, however give the reader a good general idea of their configuration.

The shrouded guide vanes immediately above the runner on the other hand, are generally in a good state of preservation. There are 28 of these, each 33cm long from the inner hub section of the axle-casing (i. in fig. 1) to the

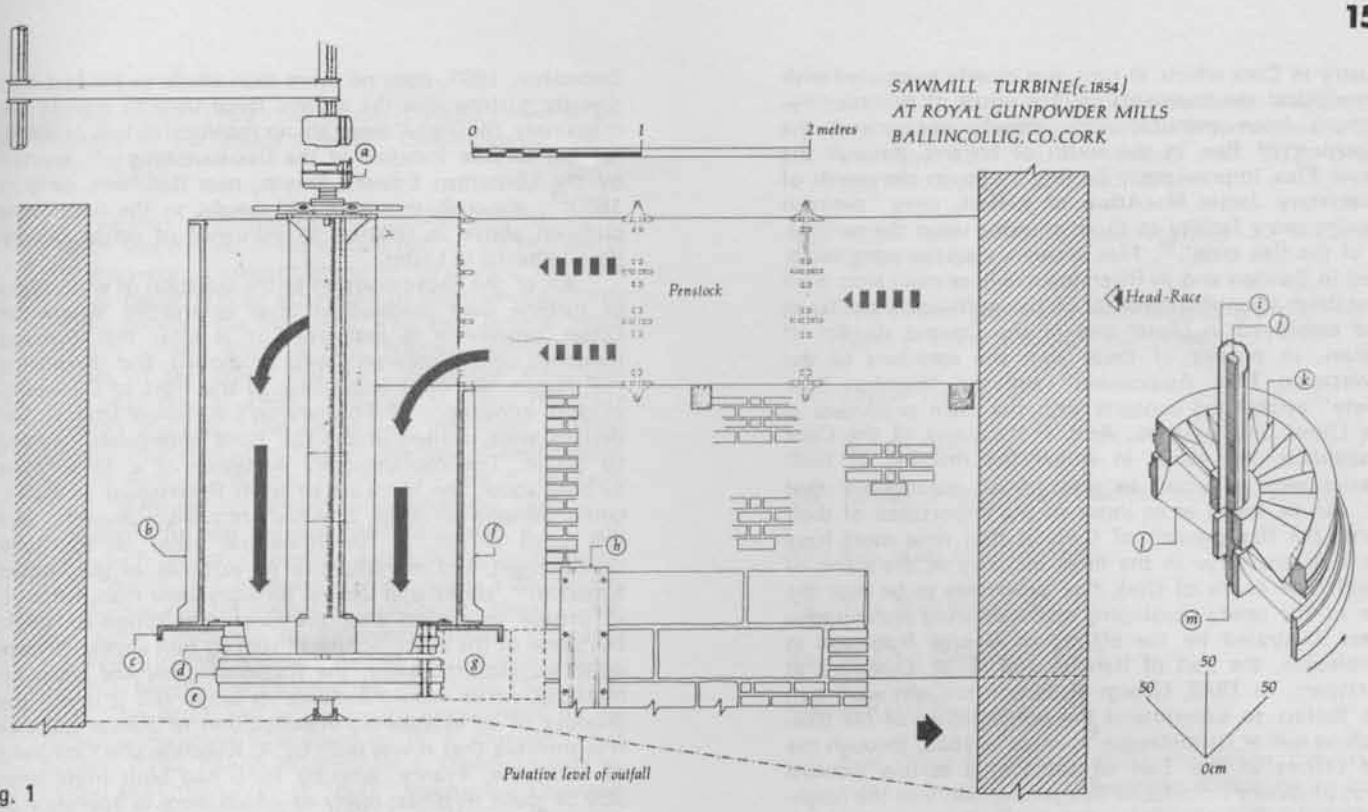


Fig. 1

inner rim of the shroud: all of the latter are steeply curved (k. in fig. 1). Extending upwards from the hub section of the guide vanes is an axle-casing, 2.12m high and 24cm in diameter built in three sections, each apparently welded together· at whose upper extremity is a cast-iron plate 50 x 35 x 2.5cm in extent, which may or may not, be part of the same casting. A full examination of the driveshaft contained within the casing could not have been undertaken without dismantling the casing itself which, under the prevailing circumstances, had to be ruled out. Its only visible section, which had been affixed to the clutch (a. in fig. 1) had been crudely threaded.

The Ballincollig turbine is of the Jonval variety a downward axial flow turbine developed in 1841 by the French engineer whose name it bears. Incoming water was allowed into the cistern (as indicated by the arrows in fig. 1) and on to the fixed guide vanes in the upper section of the turbine. The latter imparted a whirlpool effect to the water passing through them which was, in turn, communicated to the vanes of the rotor In view of this the need for an axle-casing will be readily understook, in terms of the need to prevent the action of the downward moving fluid from impeding the motion of the driveshaft.

Ideally a circular cistern would have been preferable, but a cistern of this shape could not have been feasible as a one-piece casting with the foundry techniques then in use. Fourneyron's installation at Fraisan in France, for example, was also built in sections because of his concern that a solid casting could not have been achieved[14] At Ballincollig an octagonal cistern appears to have been chosen so as to present as many tangents to the rim of the upper guide vanes, and thus narrow the tolerances between the latter and the base of the cistern. Indeed, as a geometrical shape, the octagon was perhaps the most practical means of achieving this, because it allowed the cast-iron plate sections to be cast in reasonable sizes without resorting to complex foundry techniques. For millwrights in America, at least, the main advantage of the Jonval turbine was the ease of maintenance, the latter being positioned above the level of the tail-race and thus rarely submerged when the water was shut off.[15] Similar considerations appear to have outer octagonal masonry pit and the central octagonal cistern would have allowed a man to clamber around the base of the turbine pit with ease. The sluice gate emplacements (k. in fig. 1) set into the main retaining walls may well have been intended to prevent water backing up from the tail-race channel from impeding maintenance works, although it is equally possible that they were a means of building up water pressure within the cistern.

The outflow from the turbine pit was clearly the most difficult engineering problem encountered by those involved in its construction. As the turbine had been set into the pit in order to maximise the available head, water led away from it had to make its exit beneath the actual head-race channel, and could not, therefore, be re-admitted into the navigation channel. To obviate this the builders made the tail-race a subterannean feature by constructing an arched brick conduit, which was led away from the mill building beneath both the head-race channel and the main navigation channel, to discharge directly into the River Lee. The outlet for this conduit into the river can still be seen some 23m to the north-east of the sawmill.

EARLY WATER TURBINES IN COUNTY CORK

The influences behind at least two of the early turbine installations within the county, those at Riverstown and near Ballineen, can be linked with the then expanding linen

industry in Cork which, in turn, was closely associated with technological developments in the north of the country Northern linen manufacturers actively encouraged the cultivation of flax in the south of Ireland through the "Royal Flax Improvement Society" who, in the words of its secretary James MacAdam of Belfast, were "desirous of giving every facility to those entering upon the cultivation of the flax crop"[16] Flax growers societies were established in Bandon and in Riverstown, whose main aims were to establish scientific methods of flax cultivation similar to those employed in Ulster and in the Coutrai district of Belgium. In pursuit of these aims the members of the "Riverstown Flax Association" and the "Bandon Flax Society" established contacts with the main producers in both Ulster and Belgium. And, if the pages of the *Cork Constitution* for 1853, in which the meeting of both societies were reported in great detail throughout that year can be taken as an index of the importance of their efforts, the flax growers of Cork at that time must have been a potent force in the linen industry of the south of Ireland. The desire of Cork flax producers to be near the pulse of the newly developing manufacturing technologies is best illustrated by the efforts of George Robinson at Drimoleague, the Earl of Bandon and N. M. Cummins at Riverstown. In 1848, George Robinson brought workmen from Belfast to superintend the construction of his flax-scutching mill at Drimoleague[17], while in 1852, through the good offices of the Earl of Bandon, a certain Edward Smyth of Newry introduced flax production into the neighbourhood of Ballineen, near Bandon[18] Cummins, indeed, went a step further by importing two Flemish workers to supervise a process conducted in his linseed oil mill[19]

As has already been seen, the early turbines used in Ulster were all installed to power processes associated with the manufacture of linen, and it is perhaps reasonable to assume that this provided the impetus for similar developments in contemporary Cork. The Hon. Secretary of the "Riverstown Flax Association" N. M. Cummins, was probably influenced by Kane's book in his choice of water motor for the Brooklodge mills. Early in 1853, when the Brooklodge mills were still under construction, a report on the meeting of the Riverstown Association, held on 22nd February (which was published in the *Constitution* two days later), stated that "certain improvements on the existing constructions of these mills were intended by Mr Cummins, particularly the application of the principle of the turbine, which had received such strong commendation from the pen of Sir Robert Kane in his "Industrial Resources of Ireland " From the latter we may conclude that the reporter is paraphrasing comments made at the meeting by Cummins himself The Brooklodge mills went into production on Monday 28th November 1853[20] with its newly installed turbine powering both the edge-runner stones and the wedge-press used to pulverise the flax seed and extract the oil. The correspondent of the *Constitution* of 15th May 1856, who made a brief reference to the Brooklodge turbine in his description of that employed in the Ballincollig sawmill, remarked that its operation "appears to have been satisfactory" but despite his claim that "the dimensions of this turbine were described about two years ago in the "Constitution" " this is clearly not the case. For the account of the Brooklodge mills which appeared in the *Constitution* on 1st December 1853, does no more than allude to the fact that a water turbine was the motive force used to actuate the machinery Similarly there are no technical details available for the turbine installed at the flax-scutching mill erected by the Ulsterman Edward Smyth, near Ballineen, early in 1853[21], although this does add weight to the hypothesis outlined above in relation to influence of contemporary developments in Ulster

All of the above leads on to the question of what types of turbine were involved in these enterprises. Where the Ulster experience is concerned it is clear that turbines modelled on Fourneyron's were employed, and there is no real reason to doubt (especially in the light of Cummins' evident knowledge of Fourneyron's turbines) that similar designs were utilised in the Co. Cork enterprises referred to above. The contemporary existence of a Jonval-type turbine about ten miles or so from Riverstown at Ballincollig Gunpowder Mills, however remains a mystery The late Lord Wilson, in his influential paper on the early development and manufacture of turbines in the United Kingdom[22] states that Jonval turbines were manufactured in Britain very soon after the Great Exhibition of 1851 but none of the manufacturers listed by him appear to have done so. Unfortunately the Ballincollig turbine bears no markings which would indicate its origin but if it was the product of an established manufacturer of Jonval turbines it is possible that it was built by A. Koechlin and Company of Mulhouse, France, who by 1850 had built more than 300 of these turbines; many of which were in operation in Europe[23] On the other hand, it is equally possible that the Mr Perrott who is credited with its construction/installation was influenced by designs he had observed in either France or the United States.

The Ballincollig turbine is clearly the earliest example of a Jonval-type turbine used in Ireland, and is perhaps the earliest surviving example of any turbine design in either Britain or Ireland. Furthermore, it is the earliest recorded use of a turbine in a sawmill in either Britain or Ireland; and in all respects is clearly of prime importance for the study of water-driven prime movers in these islands. The turbine is currently on lands owned by the Department of Defence, and it is hoped that future negotiations with the latter will result in its continued preservation and possible restoration.

NOTES:

1 "The History of Water Power in Ulster" Newton Abbot, 1969.

2. "The Industrial Archaeology of Northern Ireland" H.M.S.O., London, 1900.

3. Paul N. Wilson. "Early Water Turbines in the United Kingdom" **Transactions of the Newcomen Society** 31 (1957-59), p.232.

4. The reknowned British millwright, William Fairbairn, who designed the large millwheel in Midleton Distillery declared: "we owe the development of turbines chiefly to Continental Mathematicians", quoted by Louis C. Hunter in "A History of Industrial Power in the

United States, 1700 1930; vol. 1 Water Power in the Century of the Steam Engine" Charlottesville, Virg., 1979, p.319.

5. The various developments in turbine engineering in France and Britain in the second half of the eighteenth and the early nineteenth centuries, lie beyond the score of this paper Those interested in these developments should consult the following. The best general introduction to this topic is Prof Norman Smith's "The Origins of the Water Turbine" **Scientific American**, vol. 242, no. 1 1983, 114-120; see also his more detailed analysis "The Origins of the Water Turbine and the Invention of its Name" **History of Technology** second Annual Volume, 1977 215 259. F M. Feldhaus' "Beitrage zur alteren Geschichte der Turbinen" **Zeitschrift fur das gesamte Turbinenwesen**, v. (1908), 569 571 though somewhat dated, is also quite useful, as is Chapter XV of Abbot Payson Usher's "A History of Mechanical Inventions" Cambridge, Mass., 1954. For early nineteenth century developments in France see Frederick W Keator "Benoit Fourneyron (1802 1867)" **Mechanical Engineering"** 61 April 1939, 295 301 The early and subsequent development of the Pelton waterwheel is outlined by W F Durand in two papers: "The Pelton Waterwheel I Developments by Pelton and Others Prior to 1800" **Mechanical Engineering**, 61 April 1939, 447 454; and "II Developments by Doble and Others, 1800 to Date" ibid. 61 July 1939, 511 518. Turbine engineering in nineteenth century America, including the contributions made by Francis and Boyden, has been soundly dealt with by Louis C. Hunter ibid. Ch.7 Paul N. Wilson's "Early Water Turbines " is still the best account of early turbine development in Britain.

6. Kane ibid. 94 (Second Edition, Dublin, 1852).

7 "On Horizontal Waterwheels, especially Turbines or Whirlwheels: Their Historical Construction and Theory" trans., edited with introduction and notes by Sir Robert Kane, Dublin, 1846.

8. Kane "Industrial Resources " ibid. 93ff

9. Wilson ibid. 232. Gribbon ibid. 30.

10. Letter published in the Proceedings of the Royal Irish Academy vol. IV 1850, 210 218. Wilson (ibid. 232) is of the opinion that the turbine built for Kirk was designed by William Cullen, though he does concede that Cullen made no claim to having done so; while McCutcheon (ibid. 280, n. 69) has also intimated as much. However, in view of the evidence presented by Gribbon (ibid. 29 30) in relation to either Kirk or Gardner's ill-fated liaison with Fourneyron (without Cullen as an intermediary) and Cullen's own account (see above) of his own unsuccessful negotiations with Fourneyron (in which no mention is made of either Kirk or Gardner), it would appear that Kirk and Gardner developed their own turbine, without Cullen's assistance.

11 William Cullen. "A Practical Treatise on the Construction of Horizontal and Vertical Waterwheels.", Spon., London, 1871 p.15; Wilson, ibid. 232, Gribbon, ibid. 30; McCutcheon, ibid. 261

12. Wilson ibid. 229ff., Gribbon ibid. 32 33, McCutcheon ibid. 260 261

13. The Pelton and Turgo waterwheels are the two main types of impulse turbine still in use.

14. Keaton ibid. 239.

15. Hunter ibid. 325.

16. Notice in the *Cork Constitution*, 18th January 1853.

17 Ibid. 20th January 1853.

18. Ibid. 20th November 1853.

19. Ibid. 1st December 1853.

20. Ibid. 1st December

21 Ibid. 20th November, 1853: "Between five and six miles from the town of Ballineen is situated the scutching mill established about eight months since by Mr Smyth. It is worked by water power acting upon a wheel constructed after the turbine principle"

22. Wilson ibid. 233.

23. Hunter ibid. 325 326.

COLIN RYNNE
(Dept. of Archaeology U.C.C.)

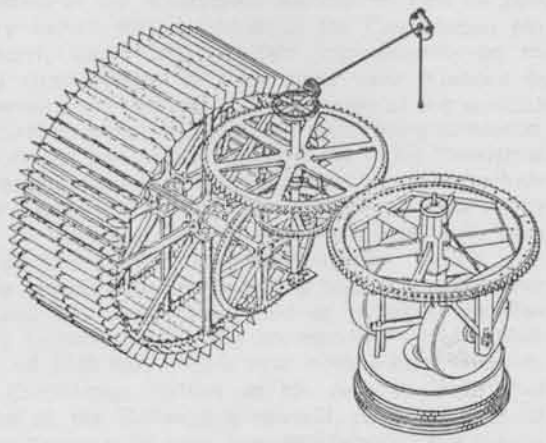
TRADES IN THE POWDER MILLS

The manufacture of gunpowder involved many skills. The trades mentioned in the Board of Ordnance list (1815) include the following: carpenter cooper, millwright, master mixer refiners of brimstone (sulphur), charcoal, and saltpetre, press-house, corning house, glazing house, dusting house men, sawyer shave cleaver While a great deal has been written about the process of manufacturing gunpowder in many parts of the world, very little has been written about the work of the different trades in gunpowder mills. This is a brief look at the work of some of these trades.

MILLWRIGHT

One of the most important trades in 19th century mills was that of the millwright. The millwright was responsible for the construction and maintenance of the waterwheels and gearing which came off them to run the machinery At its peak in Ballincollig in the middle of the 1850's, there was over 20 waterwheels – 12 in the composition or incorporating mills, and wheels in the charcoal, sulphur and saltpetre refineries, and also in the corning houses and the press houses.

As much of the millwright's work was done on site, one of his most important tasks was to ensure that the gears which transferred power from the waterwheels to the millstones engaged properly. To achieve this the gears were all driven in before the teeth were cut to shape. "Had the shaping been done beforehand the teeth would have been damaged by the blows . then there could be trouble from the outset, starting with a faulty engagement which worsened until it set up a train of damaged gears" [1]



Reproduced from Windmills and Watermills by John Reynolds.

Millwrights perferred to have engaging teeth of iron and wood. In this way almost all the wear of the engaging gears was taken up by the wooden ones and these had to be periodically replaced. As well as this, it was felt that iron and wood engaged better than iron and iron and that quieter and smoother running resulted.

Millwrights were held in high regard because of the many skills which they possessed. Throughout the nineteenth century the millwright's craft became more mathematical and the foremost millwrights, particularly in England and the Continent, established "rules" in relation to the supply of water and the energy which was created by the different types of waterwheels. The millwrights were forerunners of the engineers of the present day and many millwright firms developed into mechanical engineering firms as water power declined in importance and the steam engine took over [2]

GUNPOWDER MEN

The charcoal men and the sulphur and saltpetre refiners played a very important part in the manufacture of gunpowder Gunpowder had to be uniformly good and this depended on pure ingredients being produced by these men.

The mixer's job was to mix the three ingredients in the gunpowder The mixture – now called 'green charge' – was next taken to the incorporating or composition mills. This was the most important process because here gunpowder was produced. For the men involved this was a difficult and dangerous task. As the large millstone ground the mixture on a bedstone, the millmen remained outside, entering only to moisten the charge with distilled water and to ensure that none of the charge stuck to the millwheels.[3]

The press house and the corning house men also had important jobs in their own way In pressing the moisture from the gunpowder the press house men had to ensure a uniform quality in the powder and doing this depended on obtaining 'press cake' of equal density and hardness. When the press cake went to the corning mill, grains of various sizes were produced, but there had to be consistency amongst the different grain sizes. This was the task of the corning house men. Due to the large quantities of dust produced in the process, these men had a very dangerous job.[4]

These were the most important skills directly involved in the manufacture of gunpowder But because of the large quantity of powder produced, the coopers were numerically the strongest section of the workforce.

COOPERS

Coopering involved the making of barrels or casks of staves that were bound together by hoops of copper or wood. They were fitted with a head and bottom. The barrels were made of oak and had to be fitted extra tight so that dampness would not seep into the powder when it was stored.[5]

In the late 1830's there was about 16,000 barrels of gunpowder being produced each year in Ballincollig. By 1856 there were about 50 coopers and apprentices employed in the mills.[6]

TRAINING

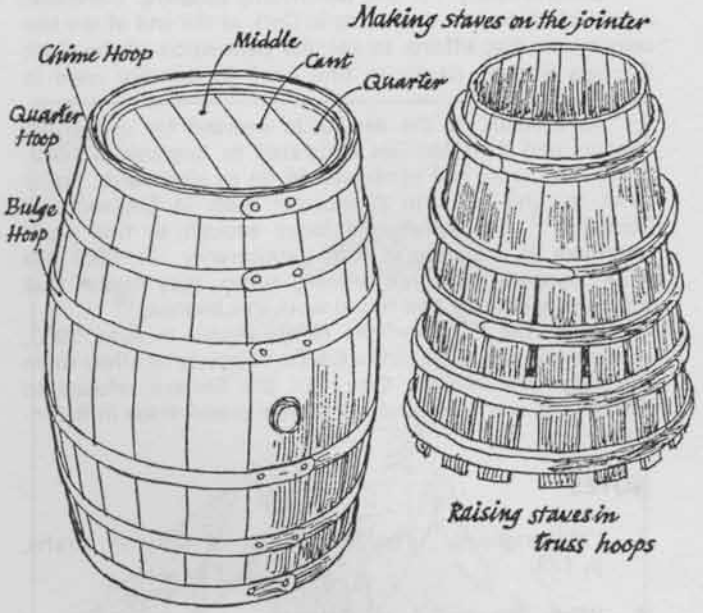
Coopers had to undergo a five-year apprenticeship. The apprentices had to be at least fourteen years of age and to be able to read and write. Their training was governed by the rules of the Cork Coopers Society They usually worked from 6 a.m. to 6 p.m. in summer and from light to dark in winter In 1887 all boys in the Society in the second year of their time had to pay 2d (1p) per week until the end of their apprenticeship. Many of the Ballincollig coopers had sons in the trade with them.[7]

CRAFT OF COOPERING

The sequence of operations in coopering may be grouped as Dressing, Raising, Heading and Gathering. Making casks was 'heavy' work from beginning to end, so all the coopers tools were strong. There was a considerable range and almost every one of the tools were peculiar to the trade though some had a 'family' likeness to those of other trades.

Dressing was the preparation and shaping of the staves from the butt. According to the size of the cask, the staves are cut and dressed, the outer face with a backing knife and the inner with a hollowing knife. The stave containing the bung hole was made a little wider than the others. Work on the staves was done on a showing-horse; this 'animal' was to be found in the equipment of a number of woodcrafts.

Assembling the staves in the trusses to form the cask was known as raising. Heading was the making of the heads which fitted into the ends of a cask. The heads were made in four or five sections of oak according to the size of the cask. These sections are joined by means of dowelling. When the heads have been prepared with bevels in top and underside to engage with the cask grooves they were put in the casks.



Gathering was the completion of the hooping to produce the finished cask. Copper rather than iron, hoops were used for powder barrels because of the danger of a spark from the iron hoops. When the hoops had been driven home, the cask was said to have been gathered, and the hoops were secured by a number of tenter hooks.[8]

DECLINE

From the 1870's the number of coopers in the Powder Mills declined. Some of this was due to the decline of production in the Ballincollig mills, but some was due to the use of metal canisters to hold powder as the mills changed their production to sporting powders. Some of the decline was also due to the importation of barrels from Woolwich Arsenal, as machine cut staves were cheaper than those produced by the Ballincollig coopers.[9]

After a temporary problem in the summer of 1886, when the mills were closed down due to the lack of water,[10] there was a general distress in 1889 amongst the powder mill workers, but the coopers were particularly hard hit. "All the coopers are idle for a considerable period; several have gone to England the remainder are watching every chance that may turn up to give them employment but they cannot succeed."[11]

The difficulties the coopers experienced led to industrial trouble. In 1892, the coopers were in dispute with the management over the importation of powder barrels which meant that for the previous 3 months coopers were only able to earn 12 shillings a week.[12]

In 1896 the coopers were again in dispute over the introduction of new machinery which would cut their "already low wages" by 33 per cent. When they refused to accept the manager's terms they went out on strike. Eventually the manager agreed to take back all but three who were regarded as ringleaders, who should be suspended for some time at least as "an example" The company threatened the closure of the cooperage and the use of machine made casks.[13]

Unfortunately for the Ballincollig coopers, there was a general decline in coopering in Cork at the end of the last century so that efforts to get the permission of the Cork Coopers Society to try to find work in the city were in vain.[14]

As a result of the decline in demand for coopering, coopers and their families emigrated to England in 1889, as we have seen, and continued to do so afterwards. Some went to find work in gunpowder mills in England and Scotland.[15] But some were lucky enough to find work elsewhere in Ireland, at least temporarily. In 1886 the Cork Coopers were not pleased when they heard that Ballincollig coopers had found work in Limerick.[16]

When the Powder Mills finally closed in June 1903, coopers still appealed to the Coopers Society to allow them to find work in Cork City but the Society refused to listen.[17] It was a sad end for a once proud trade in Ballincollig.

NOTES

1 "Millwrighting" The Shell Book of Country Crafts, p. 173.

2. W. F Greaves, J. H. Carpenter A Short History of Mechanical Engineering, p. 100-1

3. Quarterly Review, 1868, p. 108-113. Robert A. Howard, "Black Powder Manufacture" Industrial Archaeology p. 17-19.

4. Quarterly Review 1868, p. 114-118.

5. J. C. Coleman, "The Craft of Coopering" Journal of the Cork Historical and Archaeological Society July December 1944.

6. *Cork Constitution*, 15 May 1856.

7 Rules, Cork Coopers Society p. 4-8, U218, Cork Archives Institute.

8. "Coopering", The Shell Book of Country Crafts, p. 289-297

9. *Cork Examiner* 11 March, 1892; 29 October, 1892; 5 June, 1896.

10. Minutes, Cork Coopers Society 21 June, 1886, U218/A/4.

11. *Cork Examiner* 13 April, 1889.

12. *Cork Examiner* 11 March, 1892.

13. *Cork Examiner* 8, 15 May 1896; 5, 19 June, 1896.

14. Minutes, Cork Coopers Society 25 November 1896; 7 July 1897 U218/A/5.

15. "A Story of Emigration" Journal of Ballincollig Community School Local History Society 1985, p. 21.

16. Minutes, Cork Coopers Society 3, 10, 15 June, 1886, U216/A/3.

17 Minutes, Cork Coopers Society, 3, 9, 23, 30 June; 7 14, 28 July; 5 August, 1903, U218/A/6.

Margaret Barry Gillian Desmond
Michelle Drinan, Claire Mulroy

SIR THOMAS TOBIN (1807 - 1881)

Thomas Tobin was born in Bold Street, Liverpool in 1807 He moved to Ballincollig in 1836 to become managing director of Ballincollig Royal Gunpowder Mills. He played an active part in the social and industrial life of Ballincollig and Cork until his death in 1881

TOBINS OF LIVERPOOL

The Tobins were an important merchant family in Liverpool at a time when the city was rapidly expanding at the end of the 18th and beginning of the 19th centuries.[1]

Thomas' grandfather Patrick, was a native of Ireland and lived in the Isle of Man.[2] Two of Patrick's sons, John and Thomas, became apprentice seamen and later master mariners.[3] They both built their prosperity on the African trade, especially palm oil and ivory but also slavery They had estates in Africa which employed many black people. After the emancipation many of these slaves came to England, and it was not uncommon to see coloured people in Liverpool who bore a mark identifying them as having once been on the servitude of the Tobins.[4]

John became Mayor of Liverpool in 1819 and was knighted on the ascension of George IV to the throne.[5] On 19th July 1821, George IV's Coronation Day, Prince's Dock was opened, and the Tobins ship, "May" was the first ship which entered and in honour of the occasion she was exempted from paying Town or Dock Dues.[6]

THOMAS' FATHER AND FAMILY

On 6th June, 1806, John's brother, Thomas, married Esther Watson, daughter of Richard Watson of Preston in Preston Church.[7] They took up residence in Bold Street in Liverpool.

At that time Bold Street had not become a shopping street but consisted of dwelling houses of well-to-do merchants, many of whom had their counting houses at the back. About half-way up the street Thomas Tobin, senior lived in a fine house with a counting house behind.[8]

Thomas Tobin, senior had a large family – six boys and six girls.[9] The eldest of these was also called Thomas after his father and he was born on 22nd March, 1807, and was baptised in St. Peter's Church, Church Street, on 26th June, 1807 [10] Very little is known about the young Thomas' upbringing, except, as the oldest son, he naturally became involved in his father's business.

THE POWDER MILLS

In 1833-34, Tobin and Company of Liverpool purchased the dilapidated powder mills in Ballincollig from the British Board of Ordnance.[11] Thomas junior was involved in inspecting the buildings before the purchase was concluded for £15,000.[12]

With the renovation and opening of the mills, Thomas junior was sent to Ballincollig by his father to become managing director of the mills. It seems unusual that Thomas, as the oldest son, was not kept in Liverpool to inherit the family business. But in the mid 1830's Thomas was the only son available to go to Ballincollig. One son had

Sir Thomas Tobin.

died at six months, a second was in the Army, a third was not yet twenty, while a fourth, James Aspinall, who later took over the Liverpool business, was only seventeen.[13]

It is clear Thomas took an active interest in the running of the mills which grew rapidly.[14] He is credited with making Ballincollig "almost a model village" [15] In March 1860, on his retirement from his position as managing director he was presented with "a magnificent piece of plate" by the supervisors and workmen, "a small token of their deep regret . and of their gratitude for the kindness and humanity with which he always exercised his authority" [16]

FAMILY

Shortly after taking up his position as managing director in 1835, Thomas married Catherine Ellis, daughter of Lister Ellis of Crofthead, Northumberland, on 12th September 1835.[17]

They had one child, a son, Arthur Lionel, who was born in Ballincollig on 7th August, 1837 [18] Arthur became

a lieutenant in the 23rd Royal Welsh Fusiliers with whom he served in the Crimean War and in the Indian Mutiny He was wounded in the thigh while fighting at the capture of Kaiserbogh, Lucknow (16th March, 1858) and died on 12th October 1858. He was buried near Lucknow.[19]

Thomas and Catherine were very saddened by the death of their only son and child at 21 years of age. Thomas presented a stained glass window to St. Peter's Church, Carrigohane, to commemorate his son.[20] He also presented a memorial to the Royal Welsh Fusiliers.[21] Thomas also endowed a boat in his son's name with the Royal National Lifeboat Institution of which Thomas himself was the local represenetative.[22]

MEMORIAL OF LIEUT. TOBIN.

ORIEL HOUSE

Thomas and Catherine lived in Oriel House, Ballincollig, from 1835. But in the early 1850's he rented the castle in Ballincollig and intended to have it "repaired and protected from further decay" He also intended to have the grounds around it "tastefully planted" [23] Instead, in the mid 1850's he seemed to live for a while in Bridepark, Ovens.[24] However after that he lived in Oriel House until his death in 1881

TRAVEL AND ANTIQUITIES

Thomas and Catherine had a common interest in travel and in the antiquities of the Middle and Near East. Thomas was an elected member of the Royal Society of Northern Antiquaries, Copenhagen (1849) a fellow of the Society of Antiquaries of London (1853), and a member of the Royal Irish Academy (1869).[25]

Thomas and Catherine travelled to North Africa, the Levant and Palestine. In February 1856, he lectured in the Athenium (Opera House) on "Egypt, Past and Present" an account of a visit to Cairo and a journey along the Nile. He concluded that the Turkish empire was doomed and speculated on Egypt's future.[26]

George Kelleher has suggested, however that while Thomas Tobin was an "antiquarian and curio collector in the spirit of the Victorian age" his wife, Catherine, "was a far more considerable cultural figure" [27] Her interest in antiquaries led her to write two books, "Shadows of the East" (Longmans, 1855) and "The Land of Inheritance" (Quaritch, London, 1863) and to translate a third – "Illustrations of Discoveries at Ninevth" (Longmans, 1859) by P E. Botta.[28]

SOCIAL AND COMMERCIAL

Thomas was very involved in many aspects of the social and commercial life of the Cork area. He was patron of Carrigrohane Church of Ireland Primary School. He was also a Justice of the Peace as well as being Deputy Lieutenant of the county of the City of Cork. Like his father who was a member of the Dock Committee in Liverpool, Thomas was a member of Cork Harbour Board.[29]

He had greatest influence during the 1850's when he was "one of the most active members" of the Executive Committee which organised the Cork Exhibition of 1852. He was also Secretary of the Police Committee which organised security for the Exhibition.[30] His carriage was one of the fifty which rode in the parade at the opening of the Exhibition.[31]

KNIGHTHOOD

The profits of the Cork Exhibition were used to build the Atheneum (Opera House). Thomas was President of the Atheneum and at its opening on 22nd May, 1855, he was knighted by the Lord Lieutenant. His Excellency the Earl of Carlisle, said "In recognition of the services he has rendered for the institution, of the great esteem in which he was held by the citizens of Cork but particularly in reference for the vast goods and great benefits he has dispensed to the public in the conduct of the large manufactory at Ballincollig and especially for his kindness and humanity to the numerous workers over whom he has charge" [32]

HOSPITALS

Thomas took an active interest in the management of a number of the city hospitals. Two of these were the Erinville Hospital and the Eglinton District Lunatic Asylum along the Lee Road. In 1874, he presided over a public meeting which was called to organise a new hospital for Cork. This was "The County and City of Cork Hospital for Women and Children" which later became the Victoria Hospital.[33] Thomas was elected to the permanent Comm-

ittee of Management in 1877 He was appointed Honorary Treasurer and Secretary in 1878 and served in this capacity until his death in 1881 His wife, Lady Catherine, was a patroness of the hospital for many years.[34]

DEATH

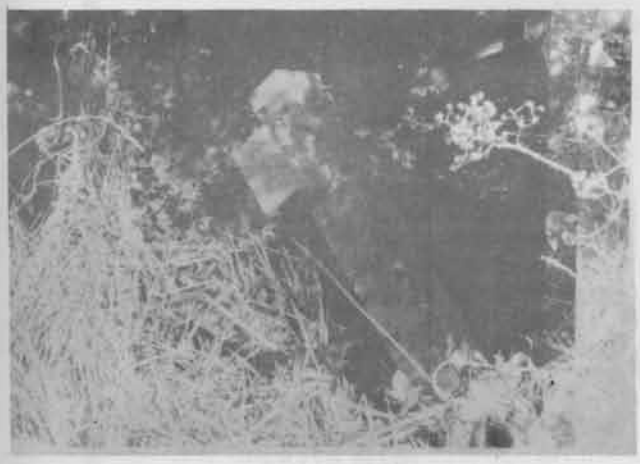
Thomas died on 9th January, 1881 He had been sick for ten weeks with a gastric ulcer and his brother, James Aspinall, was present at his death.[35] He was buried at Inniscarra Cemetery on 11th January.[36]

The Cork Examiner said on his death: "Much regret was felt at the announcement of the death of the courteous and popular gentleman, Sir Thomas Tobin. He was not a native of this city but for a long time had identified himself with it. By political conviction he was a Conservative but his opinions were always maintained in the courteous and least obtrusive manner and they detracted nothing from the esteem which his urbane manners and general kindness of disposition had won for him" [37] (In his will he left effects in Ireland valued at £5,305.7s.2d.[38])

After his death his wife, Lady Catherine, moved back to England, first to London and then to Eastham in Cheshire where James Aspinall lived. She died there on 23rd April, 1903, and was buried in Eastham.[39]

CONCLUSION

The memory of Sir Thomas Tobin is largely forgotten in Ballincollig today Yet he played a very important part in the development of the town in the middle of the last century He was for many years the managing director of one of the largest manufactories in the south of Ireland. He also played a very important part in the cultural life of Cork City at that time. But as a mark of our recognition of that part, his grave lies hidden and in decay at the end of Inniscarra Graveyard. Surely it deserves to be restored.



Sir Thomas Tobin's grave, Inniscarra.

NOTES:

1 J. A. Picton, Memorials of Liverpool (1875), Vol. I.
2. Patrick married Helen Breakhill (1758) and they had 15 children. B. G. Orchard, Liverpool's Legion of Honour (1894), p. 676-677
3. Orchard, p. 677· R. C. Reid, Annals of the Tobin Family of Liverpool and the Isle of Man (1940), p. 31.
4. Orchard, p. 677
5. Ibid.
6. Ibid.
7 Reid, p. 31
8. Picton, Vol. II, p. 235; Reid, p. 32.
9. Reid, p. 35-43.
10. Reid, p. 35; Baptismal Register St. Peter's Church, Liverpool.
11 Orchard, p. 677
12. Microfilm, Cork County Library W.O. 44/102.
13. Reid, p. 35-43.
14. The mills employed about 200 in the late 1830's (Lewis' Topographical Dictionary) and about 500 in the mid-1850's (*Cork Constitution*, 15 May, 1856).
15. Reid, p. 35; *Cork Examiner* 11 January 1881
16. *Cork Constitution*, 23 May 1860.
17 Reid, p. 36-7
18. Reid, p. 37 The relevant pages from the Baptismal Register in St. Peter's Church in Carrigrohane are missing.
19. Illustrated London News, 24 September 1859, p. 299. Arthur Lionel was commissioned ensign, 23rd Foot, 13 February 1855; Lieutenant, by purchase, 22 July 1855. He was not thoroughly recovered from his wound when he returned to duty in September 1858. He was on the march from Karjowlee to Jubrowlie when he fell sick of fever and dysentry and died. Correspondence, Regimental H.Q, Royal Welsh Fusiliers.
20. Sanctuary window behind the altar
21 Illustrated London News, 24 September, 1859. "The silver centre piece was held by the 1st Battalion, the Royal Welsh Fusiliers, until the early 1950's. During one of the Battalion's moves the piece was very badly damaged, and it was decided that it could not be adequately repaired. However the three figures which stood on top of the plinth were recovered and have each been mounted separately on wooden bases. These three figures are still held by the 1st Battalion and are on display in the Officers' Mess." Correspondence, Regimental H.Q., Royal Welsh Fusiliers.

The memorial centrepiece was three feet high, and weighed about 500ozs. The base was triangular and supported on three sphinxes. The stem was a palm-tree (the emblem of victory) from which sprang six branches for lights, and in the centre the frame holding a glass bowl. The figures were a private of the 23rd, with the goat belonging to the regiment; a female figure holding a fan representing India, and dressed in the native costume; a male figure representing a Crimean Tartar The two latter figures, with the sphinxes (intended to represent Egypt), commemorated the parts of the globe in which the regime distinguished itself. Manufactured by Edward Barnard and Sons, London; supplied by Edward Hawkesworth, Silversmith, Cork.

22. G. Kelleher Typed notes on Sir Thomas Tobin. Cork County Library *Cork Examiner* 11 January 1881
23. *Cork Constitution*, 20 November 1851
24. Slater's Directory 1856, p. 174.
25. Guy's Directory 1875-76, p. 139; Thom's Irish Directory 1879, p. 458; Corr Royal Irish Academy.
26. *Cork Constitution*, 23 February 1856.
27 G. Kelleher ibid.
28. G. Kelleher ibid. English Catalogue of Books, 1835 1863, Compiled by Samson Low (London, 1864) "Shadows" concerned a visit to Egypt; "Inheritance" revisited Bible scenes.
29. *Cork Examiner* 11 January 1881 Reid, p. 36.
30. J. F Maguire, The Industrial Movement in Ireland as illustrated by the National Exhibition of 1852, (Cork, 1853) p. 428-429.
31 *Cork Constitution*, June 1852.
32. *Cork Constitution*, May 1855.
33. N. M. Cummins, Some Chapters of Cork Medical History p. 54.
34. Corr Secretary/Manager Victoria Hospital, Cork, S. L. Horne, Victoria Hospital, Cork – A History
35. Death Certificate, Registrar of Births and Deaths, Cork.
36. Register of Burials, Parish of Inniscarra.
37 *Cork Examiner* 11 January 1881
38. Abstract of Wills and Administration, in O'Casey O'Kief, Coshe, Mange, Vol. 14, No. 1080. Thomas Tobin's collection of objects d'art were auctioned after his death by Marsh's, *Cork Constitution*, February/ March 1881
39. Reid, p. 37 St. Mary's Parish Church, Eastham, has two memorials dedicated to members of the Tobin family including James Aspinall Tobin who died on 16 April, 1891 Corr R. H. Thompson, Bromborough, Wirral.

Linda King, Susan Kinsella

RENOVATING THE POWDER MILLS CANAL SYSTEM

INTRODUCTION

The main canal in the Powder Mills stretches for about 1½ miles with mill races running off from it. During the nineteenth century the canal system was used as a safe means of transporting gunpowder within the powder mills complex. Its water was also used to turn the mill wheels, especially those in the incorporating mills. (See M Chan, The Canal System and Water Power in the Powder Mills, Ballincollig, Journal, 1984.)

The aim of this study is to suggest ways of renovating the canals to the standards of the last century so that they could be used for many activities such as boating, canoeing and swimming. The routes along the canal could also be used for history and nature trails. Another of the reasons for renovating the canal would be to provide enough water to turn mill wheels in restored incorporating mills.

OTHER POWDER MILLS

There are a number of examples of restored powder mills around the world. One of these is in Faversham, Kent. There much of the powder mills lands was built over but an incorporating mill was restored through the efforts of a local society Even though only one mill is restored and Faversham is off the beaten tourist track, the mill attracts more than 10,000 tourists each year

There is a much larger complex in Wilmington, Delaware, U.S.A., where a considerable amount of money was spent on a mills, similar in size to that of Ballincollig, by Du Pont, a major corporation. The mills are now enjoying great success and they are maintained through the entrance fee received from the thousands who visit them throughout the year

The great attraction of gunpowder mills can also be seen in Penny Royal, Tasmania. There *wooden replica* water wheels and gearing are the central feature in a very popular recreational park. There is every reason why Ballincollig should use its historic resources to their capacity as has been done in the above cases.

PRESENT POSITION

We, first of all, investigated the canal system to determine its present state. In the nineteenth century two sluice gates controlled the flow of water into the canal. One is now missing, while the other one is in a bad condition, with the timbers either rotten or missing and much of the cranking system for opening the gate lost.

Along the canal, trees are obstructing the flow of water in many places – either growing on the edge of the canal or leaning in from the sides. There are a number of former mill races along the canal, as well as breaches in the banks, through which water is being lost. Considerable areas of wetland vegetation have developed in some parts because of this. But the loss of water also means that, even in the winter the water only flows over about three-quarters of the main canal and it does not reach the incorporating mills at the end.

Sluice Gate

SOLUTIONS?

The main problem is to maintain an adequate level of water in the canals throughout its length. All solutions to this will involve a number of tasks. One is that the sluice gates at the entrance to the canals will have to be repaired or replaced. Secondly the banks and bed of the main canal have to be restored to contain the flow of water and to prevent seepage. Finally a number of outlets through which water is now being lost from the main canal will have to be blocked off, but this must be done without doing damage to the wetland areas which have developed.

One of the solutions to maintaining the water level would be to position two additional sluice gates at selected points along the canal, thus providing three different water levels. However this would hinder boating and canoeing and it would involve the expense of extra sluice gates.

Copper Store

Another solution would be to allow the present flow of water remain as it is, but to use two pumps, one above the incorporating mills, to pump water into the canal from the river and leave it flow through the mills. Then, use a second pump to pump it back into the river. The problem would be to provide an adequate supply of water by this means to turn the wheels.

A further solution relies on the assumption that if a number of existing outlets were closed off there would be sufficient water at all times for recreational use and for operating a restored incorporating mill — at least at different times during the day

CONCLUSION

The greatest problem with the above solutions is that they all would cost a great deal of *money*. The cost, however could be spread over stages, provided an overall plan was followed.

But the cost can be justified by the great benefits that the gunpowder mills would bring to the Ballincollig area and to Cork City Among those benefits would, of course, be the attraction of many tourists to the area who would certainly come to see a unique complex.

Cormac MacCarthy Justin O'Doherty

Children watch a sluice-gate demonstration

The Hagley Museum
Wilmington, Delaware,

A HISTORY OF THE CARRIGROHANE STRAIGHT

INTRODUCTION

The Carrigrohane Straight stretches for 2¾ miles west from the edge of Cork City to Carrigrohane. It is just over 140 years old and in its varied history it has caught the imagination of many

CONSTRUCTION

The Carrigrohane Straight was built around the late 1830's and early 1840's. Earlier maps such as Taylor & Skinner's "Maps of the Roads of Ireland" (1776) or a map of Cork Parliamentary Borough in 1832 do now show any track or path in this area. However the First Edition of the Ordnance Survey Map (1841-42) shows that work was in progress on a new road linking the city with Carrigrohane and Leemount Cross.

Before the building of the Straight few houses were to be seen in this area. An osiary lay at the city side and this consisted of a swamp where willow trees grew. An expanse of green could be seen as fields stretched for miles around. The tradition that the road was a "Famine Road" may be partly true. Even though the Straight itself was built by 1842, the section as far as Leemount Cross (including Leemount Bridge) may not have been completed until during the Famine (1845-50).[1]

The building of the Straight and its extension onto Leemount Cross, which necessitated the building of two bridges – one over the tail race of Carrigrohane Flour Mills, the second over the Lee – changed the traffic pattern to the west of the city Before the Straight and Leemount Bridge were built, the Model Farm Road took traffic to Ballincollig and Macroom while the Lee Road led to Blarney Coachford and Inniscarra. After the construction of the Straight and Leemount Bridge, a straighter and flatter route reduced the importance of these roads and the Coachford or Inniscarra traffic could now merge with the Macroom traffic by crossing Leemount Bridge.

TRAMWAY

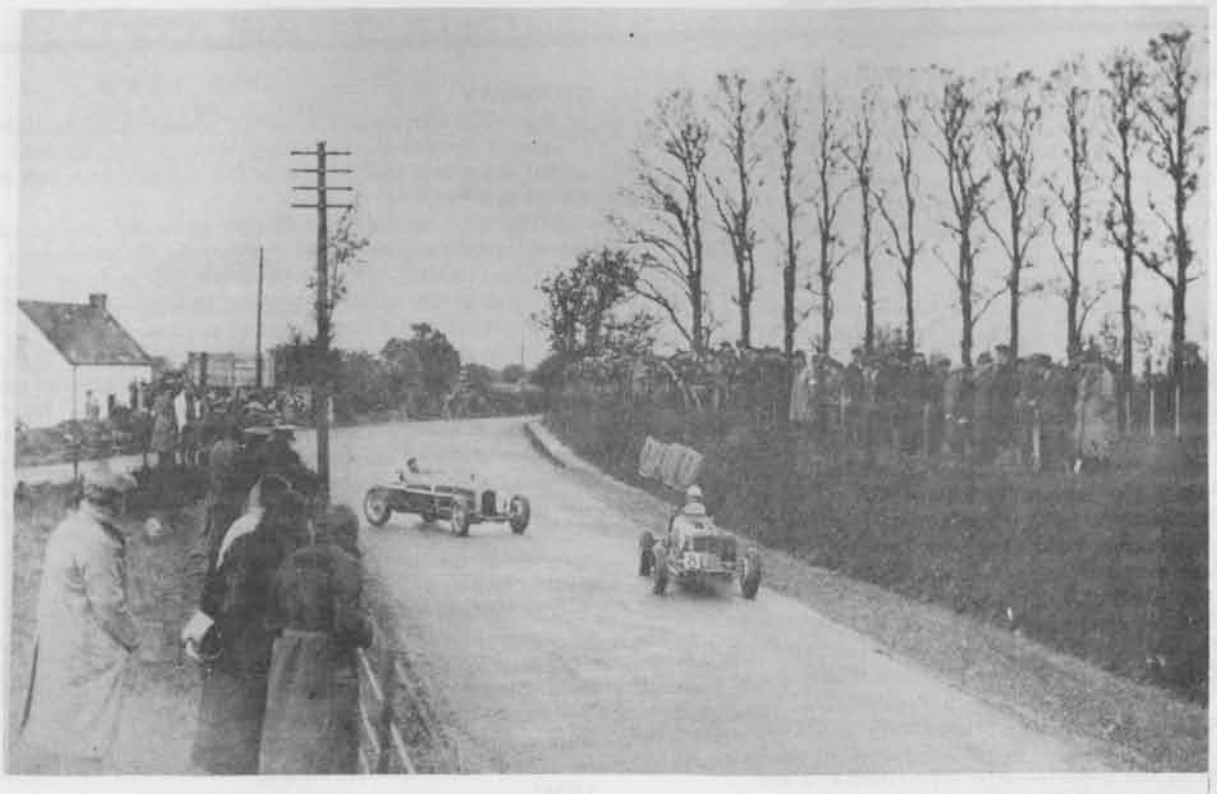
In the 1880's the building of the Muskerry Light Railway ("Tram") increased the importance of the Straight and added noise and excitement as the coaches trundled along six times a day

The city terminus was on the present site of Jury's Hotel while the line ended at Blarney, Donoughmore and Coachford. Along its route there were 21 stations – one of these was at Carrigrohane just at the western end of the Straight Road and a second one at Leemount Cross.

Many people have fond memories of the Muskerry Tram or the "Hook and Eye" as it was sometimes called. It used to be said that you could pick blackberries from the carriages as the train was rolling along, such was its speed. The operations of the ticket collector were always exciting. Tickets had to be checked in one carriage and then while the train was still moving the ticket collector had to move to the next carriage along the outside. This procedure was very dangerous because of the rocking and swaying of the carriages.

One of the most unusual incidents of the history of the Muskerry Tram was the crach with the steamroller in 1927 The steamroller was involved in resurfacing the Carrigrohane Straight when both tram and steamroller collided. The tram was derailed, a few people fainted and a few dozen eggs were broken but nobody was hurt. The Muskerry Tram was eventually closed down in December 1934[2]

The Muskerry Tram. Courtesy Cork Examiner



Car Racing on the Carrigrohane Road. Courtesy Cork Examiner

FLOODING

One of the hazards of travelling on the Straight Road was the flooding. The Straight is very flat and subject to both tidal and river flooding. It occurred regularly in winter when the swollen rivers burst their banks due to heavy rains, and it was also affected by spring tides. A contributary factor is the junction of two rivers with the Lee at Carrigrohane. The Shournagh joins the Lee at Crubeen Bridge on the Lee Road. A smaller river known as the Carrig, joins the Lee at the junction under the Carrigrohane Castle and is forded by what was known as Cromwell's Bridge.

The most dramatic floods occurred in the years 1870, 1916 and 1962. The flood of 1916 was the largest, reaching Inchigaggin Lane and having a height of 28 feet O.D. (sea level). The flood which occurred in 1962 was a Cork tidal flood which flooded the city centre and the Court House. The city was covered in water – its height was 19 feet O.D.

The worst affected area of the Straight is the centre (near Inchigaggin Lane) so, that residential and commercial development has been confined to the eastern and western ends of the Straight. But the building of the Carrigadrohid and Inniscarra Dams has enabled some control to be put on the flooding so that it is not now as severe[3]

THE CORK EXHIBITION (1932)

The Straight became the site of the Cork Industrial and Agricultural Fair in 1932. After considerable local controversy agreement was reached to hold the Exhibition at the eastern end of the Straight. Tim Corcoran, chairman of the County Council at this time, supervised the erection of the necessary buildings.

The building commenced on Monday 10th August, 1931. The initial operations consisted of the erection of advertising posters on the front of the site along the Straight. These posters created a colourful and artistic effect along the road. The fair was opened on Wednesday 11th May 1932, and continued until Sunday 2nd October

There were 13 acres of amusements, a car park which held 3,000 vehicles, flower beds and shrubberies, a bandstand in the centre, demonstration plots for agricultural and horticultural sections and a miniature railway running around the grounds[4]

SURFACE

The original surface of the Carrigrohane Straight was limestone. In 1927 reinforced concrete was laid by the County Council and Corporation, who both controlled sections of the Straight. The Straight was one of the first concrete road surfaces in Ireland, or even Great Britain. In the early days concrete surfaces were laid in slabs, with expansion joints of bitumen to take up expansion and contraction as the temperature affected them. The reinforced concrete consisted of a layer of mesh steel, covered with concrete in sections of 20 to 30 feet (approx.), and 10 inches in thickness.

Concrete was used because it was thought to be suitable for boggy roads. In the late '20's and early '30's, a number of concrete roads were constructed in Northern Ireland, in Co. Antrim, over bog areas, e.g. Ballymena to Ballymoney, and in Co. Tyrone and Co. Armagh. Also the Kinsale road was concreted and sections of roads in Kildare. The South of Ireland Asphalt Company (S.I.A.C.) were engaged in the surfacing of the Straight and the concrete was hand laid.

After the closure of the Muskerry Tram, the tracks were removed in 1935, and the area they occupied was then concreted – thus adding about 10 feet to the width of the road.

In recent years, Cork Corporation has covered this section with tarmacadam but the section in the county still has the original concrete, and the extra width of concrete laid after the tram tracks were removed. This can be seen on the south side of the road[5]

RACING

Due to the flat surface of the Straight, it proved very suitable for speed trials. Also, the Straight Road, together with the Model Farm Road, joined a circle which proved very suitable for racing.

The 1920's and 1930's saw the beginning of great excitement for the racing world. Both motorbikes such as the Yamaha 750c.c. and cars such as an Ingersoll-Rand Formula One Shadow featured prominently in the speed trials and racing competitions. Drivers in these competitions came from England, Northern Ireland and various other places in Europe. Crowds flocked from places all over Cork and Munster to see these fine spectacles of racing. In more recent years the Straight has been used only for speed trials – land speed records for motorbikes and cars are eagerly contested[6]

CONCLUSION

The Carrigrohane Straight still holds the imagination of many people. It featured prominently in Cork's 800 festivities, with the culmination of the Great Race and Steeplejack. Other uses of the Straight include the new rugby fields, and nature walks. Hopefully, a continuous riverside walk from the Carrigrohane Straight and the Lee Fields to Ballincollig will shortly open up this area even more to the public.

NOTES

1. Taylor and Skinner "Maps of the Roads of Ireland" (1776) Map of County of the City of Cork, Henry Martin, London (1832) First Edition Ordnance Survey Map, six inches to one mile (1842).
2. *Cork Examiner* 23 November 1934; 26 January 1935; McGrath, W., Blarney Annual, 1952; *Evening Echo*, 29 December 1984; Newham, A. J., The Cork and Muskerry Light Railway Tram, (Oakwood Press).
3. Interview Liam Wall (Model Farm Road).
4. *Evening Echo*, 1 September, 6 September 1976.
5. *Evening Echo*, 4 July 1980; Correspondence, T M. Riddell (Scotland) Interview Liam Wall.
6. *Cork Examiner* 16 May 18 May 1936; *Evening Echo*, 20 June, 1978; 4 July 13 July 1980, 28, 29 March, 1978; *Cork Holly Bough*, December 1985.

Pamela Byrne, Caroline Flavin

BRIDGE BUILDING AND THE GROWTH OF CORK

GEOLOGY AND CORK CITY

Cork City Centre occupies a lowland island site on the banks of the River Lee between steep sandstone ridges, which rise to the north and south of it.

These ridges were formed about 250 million years ago, as the surface layers of shale, limestone and sandstone rock were folded into parallel ridges and valleys. Since this folding has taken place denudation has removed the shale and limestone from the ridges exposing the red sandstone. The floor of the valley still contains a surface of shale and limestone.

The River Lee flows through this valley and becomes tidal at the point of the city This has resulted in the checking of the velocity of the river and the deposition of silt which led to the formation of a series of islands. These islands force the Lee to split into distributaries as it rounds the city It is these marshy lowlying islands which gives Cork its name, Corcach meaning marsh.

The islands gave great protection to the city's early inhabitants. But the existence of the islands meant that as the city grew covering in the river channels and building bridges became necessary in order to allow the city to grow and to link up the different parts of the city

THE VIKINGS

It is difficult to make a decision as to who was responsible for the founding of the first Urban Settlement in Cork, but, since the Vikings were the first to build an Urban Settlement on the present City's lowlying location, we trace the development of Cork from this period.

The first Viking raid on Ireland occurred in 795 and by 830, Viking raids had become intense around the entire Irish coast. By 840 the Vikings had begun to settle around the coast. The earliest evidence of Viking settlement in Cork is 846, when the King of Munster attacked their fortress at Cork. Cork would have been an attractive location for these Vikings, it resembled Viking sites at Denmark, their homeland. For example, Trelleborg was "built in a defensive position between two navigable streams"! Cork offered a rich agricultural hinterland to trade with, and Cork's location in the South of Ireland gave it close proximity to the various Viking trading routes thus the Vikings laid the foundations of continental trade with Ireland. Their trading spanned Britain and France. They exported wool-hides, cloth, meat, fish, livestock and timber

No evidence exists as to the exact location of the Viking settlement in Cork. It is likely however that the Vikings avoided the marshes. Recent opinion seems to favour Viking settlements on the higher ground to the north and south of the Lee. It may be assumed to aid communications between the Viking settlements to the north and south, wooden bridges were constructed linking up the intervening marshland. The earliest reference to bridges in Cork is in the Annals of 1163. They report "A young prince who, being intoxicated, fell from the bridge and drowned" This is the period just before the Normans came to Cork in 1172, and descriptions of Cork City at this time show that a small urban settlement had built up in the central marshes, around the road which linked the north channel of the Lee to the south channel. Under Norman control the central marshes were walled and trade continued with continental Europe and its hinterland. Thus Cork remained restricted behind its medieval walls into the 17th century

NORTH GATE AND SOUTH GATE BRIDGES

During the above period the North Gate and South Gate bridges were the only bridges to lead out of the city They are included in every known map of Cork. The earlier bridges would all have been of wooden construction. By 1630 the bridges which were wooden had fallen into decay and in 1637 the North Gate Bridge was carried away in a flood. The bridge was rebuilt on a number of occasions before the first stone bridge was built in 1713. Two years later a gaol was added to the bridge for city criminals. This bridge was replaced by a steel bridge in 1863 which in turn was replaced in the 1950's by the concrete Griffith Bridge.

The South Gate Bridge was constructed of stone as well in the early 18th century and also contained a gaol, but in this case for county criminals.

The position of the North Gate and South Gate bridges controlled the early suburban development of Cork and its transport links. Cork's suburbs of the 16th and 17th century developed north of North Gate Bridge up Shandon Street and out to Blackpool, on the south side suburbs developed along Barrack Street south of the South Gate. The roads followed the same pattern either entering the city by the north or south.

EIGHTEENTH CENTURY PROSPERITY

After the victory of William of Orange in 1690 at the battle of the Boyne, political and economic stability had been achieved in Ireland after centuries of military conflict. This stability resulted in urban expansion throughout the country and this was reflected in the growth of Cork at the end of the 17th and in the early 18th centuries. During this period the island City of Cork began to expand beyond its medieval walls, onto the marshes to the east and west of the city.

In 1719, the Mardyke walk was laid out running westwards across marshland. This treelined path became a fashionable promenade on Sunday mornings as the city citizens strolled out with their families on the Lord's day.

In 1740, a new cornmarket was built on Cornmarket Street as the city began to expand eastwards onto the eastern marshes. By 1740 the foundation of an era of prosperity and expansion has been firmly laid. The basis for this prosperity lay in the growing importance of the provision of food trade in Cork.

Food and other agricultural products were shipped direct from the port of Cork to the West Indies, North America and the Continent throughout the 18th century. The amount of hide, butter beef candle, tallow pork and herring exported from Cork over a period of nineteen years (ending 1773) was £675,195. An average of 872 ships, from

all over the world entered the port each year

The provision trade dominated Cork so much in the 18th century it made all other enterprises secondary. Cork along with Dublin was one of the only cities or towns where banking of any size and continuity was conducted, the provision trade making foreign exchange essential.

At the beginning of the 18th century Cork City had a population of 25,000 people and by the end of the century it had grown to 80,000. This growth is reflected in the reclamation of marshland during this period, to provide housing for the expanding population. Yet up to the middle of the 18th century Cork City was still only served by the North Gate and South Gate bridges. These bridges which could barely accommodate one carriage became the day-to-day location for angry scenes between cattle, sheep and pig drovers, horse-drawn carriages and frustrated citizens as each fought for right of way To deal with this problem the City corporation embarked on the phase of bridge building from the middle of the 18th century.

CLARKE'S BRIDGE

Clarke's Bridge was one of the first bridges built in the 18th century It was constructed in 1766 and linked the western part of the city to Clarke's Marsh across the south channel of the Lee. This bridge gave a more direct link from St. Finbarre's Cathedral to the city It also took pressure off the South Gate Bridge, which up to that point was the main entrance to the city for traffic to the south and south-west. It is a single span bridge, spanning 68 feet and is 29½ feet wide. The main arch is built of limestone and the rest in red clay slate.

ST. PATRICK'S BRIDGE

Patrick's Bridge was constructed in 1789 and linked the eastern city across the north channel of the Lee. This marked the recognition by the city corporation of the movement of the city trade and commercial life to the east of the old medieval centre.

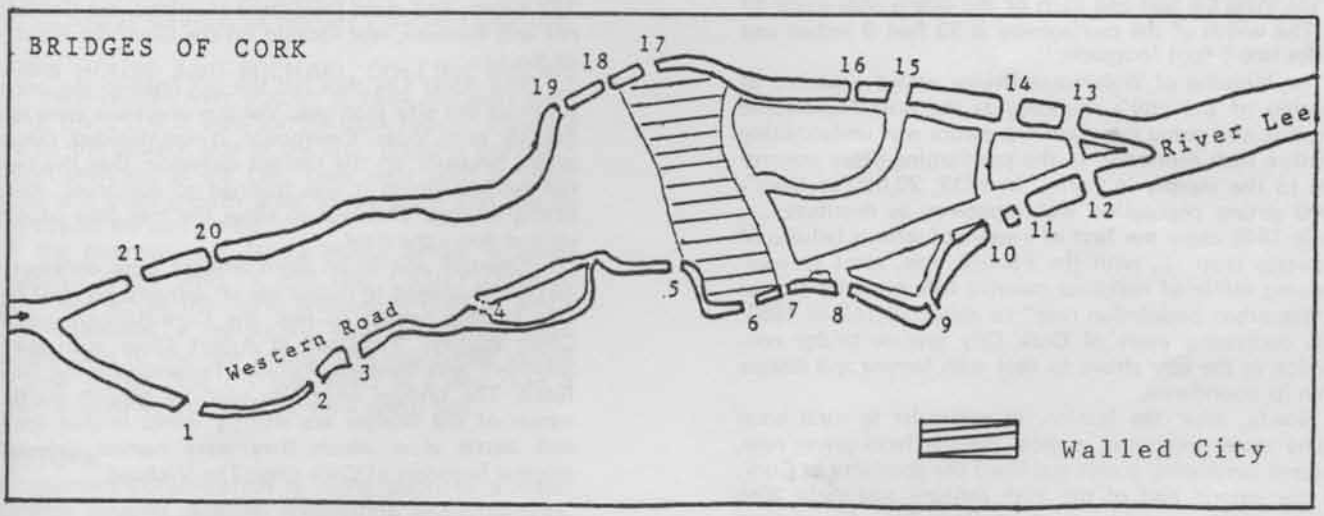
Patrick's Bridge was swept away in the great flood of 1853, but the corporation set about building a new Patrick's Bridge, which was opened in 1861 Built of limestone rock this bridge still remains the principal link between the north side and the city centre.

GAOL BRIDGE

The Gaol Bridge, which links the old city gaol to the Western Road, was built in 1790. This marked the growing importance of the western part of the city as a route way out of the city It also served as an entry into Queen's College, Cork, opened in 1849. Students objected to sharing a bridge with convicts and eventually had constructed a College Bridge on its north-eastern corner at the junction of Western Road and O'Donovan's Road.

PARLIAMENT BRIDGE

Parliament Bridge was constructed in 1806 replacing an earlier bridge which had been built in 1761 This bridge link joined recently reclaimed marsh along the South Mall and Morrisons Island, across the south channel to other parts of the city which were extending southwards from the Lee. Parliament Bridge cost £4,000 to construct, has a single arch and is made of limestone. It spans 65½ feet and is 44 feet in width.



KEY TO BRIDGES:

1 O'Neill-Crowley Bridge
2. Gaol Bridge
3. O'Donovan's Bridge
4. Muskerry/Jury's Bridge
5. Clarke's Bridge
6. South Gate Bridge
7 Nano Nagle Bridge
8. Parliament Bridge
9. Trinity Bridge
10. Parnell Bridge
11 Clontarf Bridge
12. Customs House Bridge
13. Collins Bridge
14. Brian Boru Bridge
15. Patrick's Bridge
16. Opera House Bridge
17 North Gate Bridge
18. Bailey's Bridge
19. St. Vincent's Bridge
20. Daly's Bridge
21 Thomas Davis Bridge

The growth achieved by Cork City in the 18th century continued in the early 19th century. As a result of the Napoleonic War boom years between 1792 and 1815 the volume of exports from Ireland increased by 40 per cent. Cork shared in this major prosperity and town growth was rapid in this period. Cork was, in fact, one of the major ports of the entire Atlantic economy in this period. The city was at the peak of its commercial prosperity at this time, its population around 1810 (80,000) was probably not exceeded until well into the 20th century This prosperity was reflected in the continued bridge construction in the early 19th century.

GEORGE IV/O'NEILL-CROWLEY BRIDGE

George IV later renamed O'Neill-Crowley Bridge was constructed in 1820 and linked the Western Road to Victoria Cross. It is a three-arched structure made of limestone. The centre span is 32 feet and the two side arches span 29 feet. The bridge is almost 52 feet wide. The building of this bridge marked a significant change in routes into Cork. In future the principal roads from the west (Macroom) and the south-west (Bandon) would enter Cork via George IV Bridge and the Western Road. This bridge greatly reduced the importance of South Gate Bridge, which had for centuries served as the principal entrance for traffic from the west and south-west.

WELLINGTON/THOMAS DAVIS BRIDGE

Wellington Bridge, later renamed Thomas Davis Bridge, was constructed in 1830. This bridge linked the wealthy suburb of Sunday's Well to the Mardyke across the north channel of the Lee. Wellington Bridge has three arches. "The centre arch spanning 59 feet and each of the side arches spans 33 feet. The width of the carriageway is 33 feet 9 inches and includes two 6 foot footpaths."

The building of Wellington Bridge ended a period of expansion of the city's economy as the post Napoleonic depression and rising population pressure was undermining the entire Irish economy. In the pre-Famine years poverty began to rise steeply in Cork. "In 1832, 20,000 of Cork's 80,000 strong population was registered as destitute then in 1845 came the first of a series of serious failures of the potato crop with the Famine, too, came an ever-increasing influx of destitute country folk into the city so that the urban population rose" to about 85,752 in 1851 These depressing years of Cork City saw no bridge construction as the city strove to deal with famine and disease within its boundaries.

Slowly after the famine, in particular as rural areas became more posperous, as post-Famine farm prices rose, increased purchasing power stabilised the economy of Cork, and the second half of the 19th century and early 20th century saw a renewed growth of Cork City These years saw a rapid growth of the retailing industry and the traditional dominance of the provision trade, breweing and distilling industries.

LATE NINETEENTH CENTURY

St. Vincent's Bridge was constructed in 1875 linking the west city with Wyse's Hill, Sunday's Well, across the north channel of the Lee. It replaced an earlier wooden one built in 1850. St. Vincent's Bridge is constructed from steel and is a footbridge of three spans.

Anglesea Bridge was constructed in linking the eastern section of the South Mall to Anglesea Street on the southern side of the south channel of the Lee. The development of Douglas and Blackrock suburbs date from this time. When the bridge was found to be defective it was replaced by a new bridge, Parnell Bridge.

Parnell Bridge was constructed in 1882. It was decided by the city corporation to name the new bridge after Charles Stewart Parnell, Cork City's Member of Parliament. However Parnell excused himself and failed to turn up at the opening ceremony. Parnell Bridge itself was being replaced by a modern concrete structure in the 1970's.

O'Donovan's Bridge was built in 1902 and linked the Western Road to O'Donovan's Road, allowing the development of this area. O'Donovan's Bridge is a single span limestone arch 29 feet wide and spanning 66 feet.

RAILWAY BRIDGE

One of the outstanding developments of transport in the mid and late 19th century was the railway The first rail line in Ireland was opened in 1834, the six mile long Dublin-Kingstown Line. By 1845,, 65 miles had been opened; by 1849, 428 miles. It had reached 2,000 miles by 1866 and by 1880 almost 2,500 miles.

The first major line from Dublin to Cork was opened in 1849 and by the end of the 19th century Cork had four Railway Terminus Stations. The Muskerry Terminus was located in the present site of Jury's Hotel. A bridge linked it to Lancaster Quay and another bridge, now disappeared, linked the rail line to the Western Road. The Bandon and South Coast Terminus and the Blackrock and Passage Terminus were located on Albert Quay and Albert Road. The largest and most important terminus, the Great Southern and Western, was located on the Glanmire Road, north of the Lee.

The River Lee thus cut the rail links in the north and south of the city into two. Various proposals were made to link up both sides. Eventually it was decided, due to the severe pressure on the limited quayside, that the two new rail bridges which it was planned to construct, would be lifting bridges. This was to allow the free flow of shipping up and down the river

Clontarf and Brian Boru Bridges were constructed in 1911 and opened to public use on January 1st, 1912. These two bridges helped to link the Cork-Bandon and South Coast Railway Terminus at Albert Quay with the Great Southern and Western Railway Terminus on the Glanmire Road. The bridges were also used by general traffic. The names of the bridges are slightly ironic in that the leader and battle after which they were named defeated the original founders of Cork City. The Vikings!

DALY'S BRIDGE

Daly's Bridge, constructed in 1926 linking Sunday's Well to the Mardyke, was presented to the city by one of its most important industrialists, James Daly. A pedestrian bridge, suspension supported, a span of 160 feet and 4½ feet wide, it is one of the city's most attractive bridges.

PRESENT DAY

The late 19th and early 20th centuries was a period of prosperity for the Irish economy as agricultural exports soared in particular in the years after World War I. These

optimistic results were short-lived as the Irish economy was hit by a series of crises, starting with the world great depression of 1929, the economic war and the failure of Government protectionism policy in the 1950's. However, a major change in Government policy after the General Election of 1957 saw a movement away from protectionism towards free trade and the development of an export-orientated manufacturing sector The Industrial Development Authority was given the specific task of encouraging foreign industry to come to Ireland.

Cork City and its harbour greatly benefited from these new economic policies due to its nearness to the continent, the fact that it was the only major port in the south and its good port facilities. Ireland's entry to the E.E.C. in 1973 gave a further advantage to foreign industrialists seeking entry to this large market. Thus in the 60's and 70's Cork City's economy boomed, as industrial estates prospered on the outskirts of the city and in the harbour This increased prosperity resulted in a dramatic increase in privately-owned motor cars and commercial vehicles in Cork City and County

The increased volume of road traffic placed immense strain on the city's road and bridge networks, resulting in severe traffic congestion. To overcome the problems in the entire Cork region a number of studies were undertaken. As a result, a multi-million pound plan, the Land Use and Transportation Study (L.U.T.S.) was produced. This plan envisages that growth will continue to take place in Cork City and the surrounding area up to 1991 and central to the plan is the improvement of transport within the city A number of proposals were made towards achieving this goal, new parking facilities, improved traffic controls, new roads and bridges. These various proposals were to be integrated to find an overall solution to the city's traffic congestion.

CUSTOMS HOUSE AND MICHAEL COLLINS BRIDGE

Both of these bridges were opened in 1984 and were built as part of the L.U.T.S. plan for the Cork region. They are located on the eastern side of the city bridging the north and south channels of the Lee. They were built to allow traffic to and from growth areas in the south and east of Cork to bypass the city centre.

At the moment, the Opera House bridge is under construction. When built, it will link Lavitt's Quay to Camden Place across the north channel of the Lee. While under construction a temporary steel bridge has been erected adjacent to this new bridge. This new bridge should greatly ease traffic flow off the island as a new road is being constructed to link with it on the north side.

THE FUTURE

At the moment consideration is being given to a major downstream crossing between Ringmahon and Dunkettle. It has not yet been decided if this should be a tunnel or bridge. The importance of such a crossing and the development of other crossings was underlined by Mr T C. Linehan, I.D.A. Manager of Planning and Services at a recently held Public Enquiry on the Lee crossing. He told the enquiry that the Cork region would be more attractive for industrialists if such a crossing was constructed. He said, "It should be mentioned that visiting industrialists consider the road approaches to Dublin and Limerick as being of higher standard than the approaches to Cork and this factor must to some degree mitigate against the successful marketing of the Cork area" If Cork is to prosper, continued improvements in the transport networks, of which bridge building forms a major part, is essential.

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THE NATIONAL SCHOOL SYSTEM IN BALLINCOLLIG AND CARRIGROHANE 1831 - 1921

INTRODUCTION

In 1831 Lord Stanley the Irish Chief Secretary proposed a system of national elementary education. For its time it was one of the most advanced in the world and it was established forty years before a similar system was set up in England.

Lord Stanley set up a National Board of Education to run the system which he hoped would provide "combined moral and literary and separate religious education" thereby bringing Protestants and Catholics into the same school. The Commissioners of National Education had control of government grants to fund local schools and it was hoped that a uniform system of education would replace the different types of schools existing up to then.[1]

PRE-1831

Prior to 1831 in Ireland elementary schools were mainly either supported by voluntary societies such as the Kildare Place Society or were day schools or 'pay' schools. Day schools were run by parish priests and supported by parish contributions, while 'pay' schools were started and maintained by private individuals. Ballincollig and Carrigrohane followed this overall pattern.[2]

In the mid-1820's there were 7 schools in Ballincollig and Carrigrohane: 2 Protestant, 4 Catholic and 1 mixed religious school in the Barracks. The 2 largest schools were Catholic and the next largest school was in the Barracks. The Established Church (Church of Ireland) school was very small. There were 2 schools free and these were supported by the Kildare Place Society – one was the Church of Ireland parish school and the second was the mixed school in the Barracks. The main Catholic school was managed by a committee of which the parish priest was the chairman and it was supported by parish contributions as well as payment by pupils. The other Catholic schools were 'pay' schools run by masters or mistresses, while the final two schools (one Catholic, one Protestant) also appear to have been 'pay' schools. Only two of the schools were located in proper school buildings.

Scripture was read – without note or comment in the Kildare Place Society schools as this was a condition of receiving support. But there was no scripture reading in the Catholic schools. In 1826, 23.5% of the 342 children attending the schools were of the Established Church, while 76.5% were Roman Catholics. In the same year, 66.4% of the pupils were male, while 33.6% were female, but over the next two decades, girls' numbers increased more rapidly than boys. Even before 1831 therefore, there were many children going to school in Ballincollig, but it is difficult to say how good the schools were.[3]

THE FIRST NATIONAL SCHOOL

After the National Board of Education was set up in 1831, existing or proposed schools could apply for aid for building, salaries and books. Only one of the existing Ballincollig schools applied for aid.[4] This school was built in 1821-22 in the Roman Catholic chapel grounds of lime and mortar with a slated roof The school was in excellent repair and in 1833 had been re-slated, re-furnished and extended. Its dimensions were 44½ feet long by 18 feet wide by 13 feet high. Inside, it was divided into two rooms, a boys room which was 30 feet by 18 feet and a girls room which was 13 feet by 18 feet. The school house contained 12 desks and seats and about 140 children could find accommodation there. It had been erected by the parishioners from funds received from a collection within the parish and other donations.

The school was run under the direction of a committee, the treasurer/secretary of which was Augustus McSwinny of Carrigrohane. The committee received its yearly income from local subscriptions, chapel collections and the quarterly salary paid by parents who could afford it. Around the early 1830's the usual attendance in summer was 130 males and 40 females, while in winter about 70 males and 25 females usually attended.

There were three teachers – two males and one female who taught plain needlework and dye-making only. The children were taught ordinary lessons on all weekdays. However portions of Mondays and Saturdays were set aside for religious education. The textbooks used were ordinary elementary ones but some parents bought extra books for their children, like little histories, printed under the sanction of the Kildare Street Society

The application for financial aid to cover the cost of work done to the school building was accompanied with a request for the reading books of the Commissioners of National Education as well as slates and pencils, scripture lessons and a history of the bible. The application was signed by both Catholics, including the parish priest, and Protestants. This was a development encouraged by the Commissioners nationally

TWO NATIONAL SCHOOLS

The population of the parish of Carrigrohane, which included the town of Ballincollig, continued to grow in the 1830's.[5] Other elementary schools continued to exist side by side with the national school.[6]

In the early 1840's the existing national school was struck off the Commissioner's list because the one teacher who taught there then was judged to be incapable of improvement and the Manager failed to appoint a competent teacher [7]

Within two years, however, there were renewed applications for aid from Ballincollig to the Commissioners of National Education. This seemed to be due to the appointment of a new and more vigourous parish priest, Rev. David Horgan.[8] Significantly whereas the first application for aid in the 1830's was signed by both Catholic and Protestant laymen, later applications were only signed by the parish priest.

In September 1843 the boys' school applied for aid and in July 1844 the girls's school did so.[9] The existing school building in the chapel grounds was renovated and a second storey was added. The boys occupied the bottom

18 REGISTER OF Ballincollig Male NATIONAL SCHOOL.

Date of Entrance, 18 64.	Register Number.	Pupils' Names in Full.	Age of Pupil last Birth Day.	Religious Denomination.	Residence.	Occupation or Means of Living of Parents.	State the Name and County of the last National School at which the Pupil attended; and the Class in which he last passed. School.	County.	Class.
June 6	6	1 Oc .. M	12	R.C.	Ballincollig	Soldier			
August 22 1865	7	2 M... D	12	R.C.	Powder Mills	Labourer			
July 24 1866	8	3 McC. J.	11	R.C.	Powder Mills	Cooper			
January 29	9	4 N. J	10	R.C.	West Village	Labourer			
February 5	10	5 M M	12	R.C.	Powder Mills	Labourer			

floor and the girls occupied the top floor Each now had a classroom with a floor area of 44 feet by 18 feet. The boys' attendance had only increased slightly from the 1830's but the girls had doubled and a further increase was expected.

The textbooks of the national school system were already in use in the schools and separate religious and secular education was being followed. Saturdays were used in both schools for religious instruction, while the girls' school also conducted religious instruction on alternate Wednesday evenings.[10]

MORE NATIONAL SCHOOLS

There was a major re-organisation of the schools in the 1870's. The continued growth in the number of pupils led to the establishment of the infant-school which came under the national school system in 1874.[11]

It also meant that around this time the original school building, dating from the 1820's with an extension in the 1840's, was not adequate any longer However in the 1860's and 1870's, the parish built a new Catholic church, and the old church now became the location for the three Catholic national schools – boys' girls' and infants'

For a short time also in the 1870's, Ballincollig-Carrigrohane had a fourth national school. Up to this time Church of Ireland parochial schools had stayed outside the national school system. Instead these schools were run by the Church Education Society As the national schools, more and more, became denominational schools, under the control of the Presbyterian or Catholic Church, the Church of Ireland was also able to control their own schools within the system. In 1872 the local Carrigrohane Church of Ireland school applied for aid from the Commissioners of National Education, but they only remained in the national school system until 1878.[12]

TEXTBOOKS

The textbooks used by the pupils in Ballincollig were the same as those used by the pupils of almost every other national school in Ireland at that time. They used the books which had been issued by the Commissioners. Though it was not compulsory to use these books, they were both cheap and very good.

The series included readers, grammars and texts on arithmetic, geography history geometry, and natural philosophy The basic set of seven readers from the "First Book of Lessons" to the "Fifth Book of Lessons" and including two sequels to the "Second Book of Lessons" took the pupil from elementary reading to a quite advanced standard. It is interesting to note that as well as providing a basis for the acquisition of reading skills, the texts were also designed to instil an appreciation of respectability and moral values.[14]

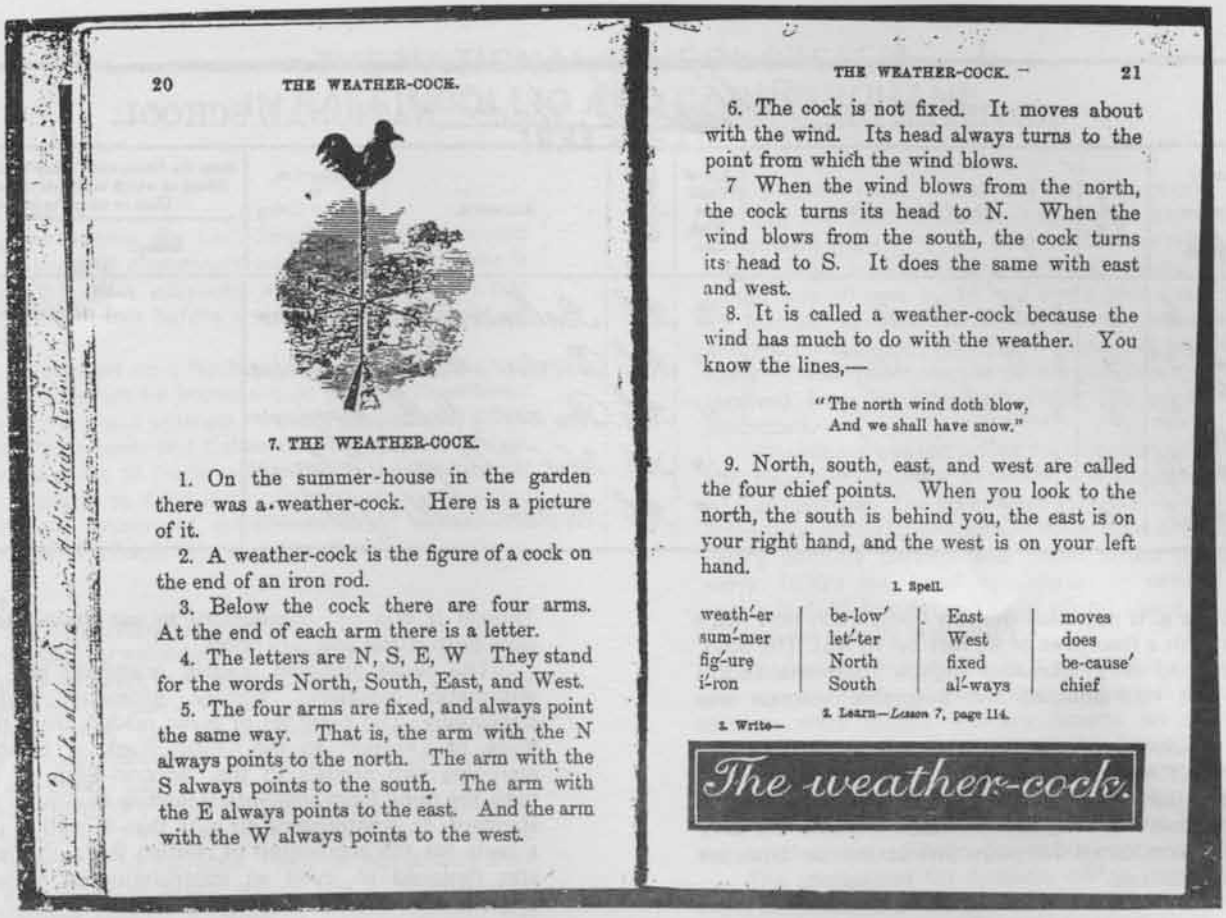
TEACHERS

The teachers faced a number of difficulties. First of all there were large numbers to be taught and if there was no assistant all classes from infants to sixth class were taught by the one teacher But even when an assistant was appointed, both teachers continued to teach in the one room.

Most of the teachers in Ballincollig in the middle of the 19th century were very young. In the 1840's, for example, the ages ranged from 26 to 16.[16] One of the reasons for this, probably was that the national school system had only been set up shortly before this and, therefore, as a growing system it attracted many young people.

As well as being young most of the teachers were untrained. This arose over a dispute between the Catholic school authorities and the Commissioners concerning teacher training. But at least one teacher had come up through the monitorial system. Monitors were children in fifth or sixth class who were good students and were picked out by the teachers to help with teaching by taking charge of some class while the teacher taught other classes.[17]

There were many problems in dealing with the new teachers and some of these were due to lack of teacher training. A number of teachers were inefficient and unsatisfactory at conducting their lessons. For example, two teachers in Ballincollig in the mid-1840's were dismissed for that reason, one by an inspector and another



20 THE WEATHER-COCK.

7. THE WEATHER-COCK.

1. On the summer-house in the garden there was a weather-cock. Here is a picture of it.

2. A weather-cock is the figure of a cock on the end of an iron rod.

3. Below the cock there are four arms. At the end of each arm there is a letter.

4. The letters are N, S, E, W They stand for the words North, South, East, and West.

5. The four arms are fixed, and always point the same way. That is, the arm with the N always points to the north. The arm with the S always points to the south. The arm with the E always points to the east. And the arm with the W always points to the west.

THE WEATHER-COCK. 21

6. The cock is not fixed. It moves about with the wind. Its head always turns to the point from which the wind blows.

7 When the wind blows from the north, the cock turns its head to N. When the wind blows from the south, the cock turns its head to S. It does the same with east and west.

8. It is called a weather-cock because the wind has much to do with the weather. You know the lines,—

"The north wind doth blow,
And we shall have snow."

9. North, south, east, and west are called the four chief points. When you look to the north, the south is behind you, the east is on your right hand, and the west is on your left hand.

1. Spell.

weath'-er	be-low'	East	moves
sum'-mer	let'-ter	West	does
fig'-ure	North	fixed	be-cause'
i'-ron	South	al'-ways	chief

2. Learn—*Lesson 7, page 114.*

3. Write—

The weather-cock.

Book II, The Royal Shamrock Readers.

A second class reader of 1901 had History and Geography lessons as well as verse and fable. "The Weather-Cock" reproduced here is a Geography lesson, while the History included the Story of St. Patrick in five parts.

A sixth class reader of that time was very advanced with extracts from Shakespeare, Goldsmith's Deserted Village, Grey's Elegy as well as History, Geography, and Science lessons on electricity and sound.[15] Sixth class boys in Ballincollig were taught Agriculture, Geometry and Algebra as extra subjects.

by the manager of the school. A third teacher just disappeared, never returning after the Christmas break in 1846.[18]

Not all the problems, however, were due to lack of training. One of the most unusual cases, concerned a teacher with venereal disease. A doctor's report to the Commissioners stated that a teacher in Ballincollig got venereal disease before arriving at the training centre in Glasnevin. The Commissioners deemed him unfit to teach and he was duly dismissed. The manager, however, thought this was unfair and asked for the teacher, who was now married, to be re-instated. But, the Commissioners refused to allow this to happen. Subsequently though, that teacher was employed and taught in Ballincollig for a few years after that.[19]

Political questions were just as likely to get a teacher dismissed as moral questions. Thomas Duggan taught in the boys' school and was involved in using the local branch of the Young Mens' Society as a 'cover' for recruiting IRB men. In spite of several warnings from the parish priest, he continued his involvement with the IRB and he was dismissed from his post in February 1862 by the Commissioners of National Education.[20]

Drink, or rather the sale of drink, also posed problems. An unusual case concerned a publican's wife who was appointed as an assistant teacher to the boys' school in the early 1900's. Rule 88a stated that the wife of a publican could not be a school teacher. The assistant was duly dismissed. The problem was solved, however, when her husband transferred the ownership of the pub by a deed of assignment to a third person and the teacher was re-affirmed as an assistant in 1907.[21]

Before becoming part of the national school system the teachers were paid by the pupils according to a scale of charges laid down by the parish priest. In the boys' school, for example, in 1843 reading and spelling cost 2 shillings (10p); a quarter 6d (2½p) was added on if writing was included; another 6d (2½p) for arithmetic; and another 3s (15p) for extra subjects. With successful applications for aid the teachers' salaries were paid by the Commissioners but there were also local contributions for the maintenance of the school.[22]

In the middle of the 19th century the salaries varied a good deal from £8 to £19, with trained teachers receiving more than their untrained colleagues. Teachers were also divided into classes. A first class teacher received more than a second class teacher who in turn received more than a third class teacher If an assistant teacher taught with the master or mistress, the master or mistress naturally received additional pay

After 1870 payment by results began. A teacher received extra after this depending on the results achieved by his or her pupils in annual examinations. On one occasion in Ballincollig this led to demands for payment due for teaching the extra subject of vocal music. An inspector's report was necessary before the money was paid.[23]

In 1907 a dispute broke out in Ballincollig over pay After the re-organisation of the schools which led to the abolition of the infant school the principal of the infant school became an assistant teacher in the girls' school. However this meant that her pay was reduced. The inspector suggested that she become a privileged assistant which meant that she would continue to receive a principal's salary. If this was to happen the salary of the existing principal of the girls' school would have to be reduced as the principal would have to share the Residual Capitation Grant with the assistant. The existing principal refused to pay any part of the grant to the new assistant, the manager said he had no power to compel the principal to do so and it is not clear how the differences were resolved.[24]

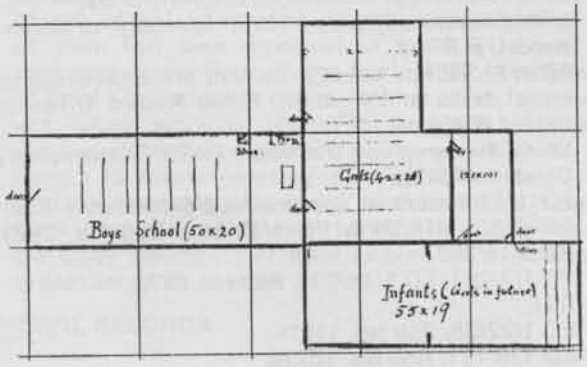
DECLINE AND RE-ORGANISATION

The population decline in Ballincollig and Carrigrohane in the late 19th century from 2,049 in 1871 to 1,377 in 1911 naturally led to a decline in the number of children attending the schools.[25] The numbers of new entrants to the boys' school declined from 46 in 1878 to 21 in 1911 [26] The average attendance dropped from 95 in the boys' school and 78 in the girls' school in 1869 (total = 173) to the following average attendances in 1906: boys' school = 37.8, girls' school = 37.4, infants' school = 43 (total = 118).[27] Confirmation numbers also declined. Between 1873 and 1881 an average of 133 pupils were confirmed every two years; but between 1899 and 1907 this fell to 77 every two years.[28] The fall in numbers naturally led to problems.

Until 1906 each of the three schools had two teachers, a master/mistress and an assistant. However because of a decline in rolls and average attendance, the assistants were lost and the schools would only be entitled to junior assistant mistresses. The need for re-organisation was obvious. The manager suggested the abolition of the infant school and the transfer of these children to the existing boys' and girls' schools. The transfer would result in an average of 50 pupils in each school and allow a certified assistant to be appointed to both schools. This was an advantage to the schools because although the staff was numerically weaker certified assistants were better qualified.[29]

The inspector agreed with the manager's suggestion but he was not satisfied with the arrangement of classrooms. The girls' room was neither well lighted nor well ventillated, the lowest window being 8 or 9 feet above the floor and the area of glass was insufficient. This was due to the fact that the building was formerly a chapel. The former infants' room was much better and only needed slight improvements. It was suggested that the girls transfer to the infants' room and the manager agreed with this. The new girls' room was 55 feet x 19 feet and could accommodate 81, while the boys' school was 50 feet x 20 feet and could accommodate 80.

However further renovations suggested by the inspector such as the partitioning of the girls' room and the boys' room, so that each of the teachers would have separate classrooms and the conversion of a former kindergarten room into a cloakroom were resisted by the manager The manager was adamant that the parish had no money – so adamant, indeed, that the inspector believed there was no point in pressing the matter any further [30]



Plan of National Schools, 1907.

CONCLUSION

By 1921 therefore, Ballincollig and Carrigrohane was down to two national schools. Over the previous ninety years, the numbers of national schools had varied depending on the efficiency of the local manager (parish priest or rector), the size of the population and the attitude of the various churches to the national school system.

The system was run very strictly by the Commissioners of National Education through their grants of money their books and, above all, their inspectors who reported on applications for aid, on teachers and on plans for re-organisation. But there was a limit to the power of the Commissioners as the local manager had power of appointment and dismissal of teachers. He could also resist suggested changes by inspectors and it was through the manager that the Commissioners dealt with the school.

While the national schools in Ballincollig helped reduce illiteracy, [31] they also provided more than a basic education of reading and writing as judged by the textbooks. Pupils reading the sixth reader would have touched on many subjects which are left to post-primary students today.

But the national school system both nationally and locally failed to achieve one of the main aims – that of providing a 'mixed' education. In Ballincollig and Carrigrohane even though the first national school in 1833 had both Protestants and Catholics on the application form, there was only one religious signature, that of the Catholic parish priest. The clergy of other denominations were asked but refused to sign. In further applications during 1840's there was no communication between the clergymen

of the different denominations.

However, even before the national school system was set up there was already virtually denominational education in the area. In 1826 only one school of seven was mixed, and only 14.5% of Catholic children were educated in that school. Perhaps the battle for 'mixed' education was lost long before the national school system was set up.

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27. ED 4/6 V17/27/14; ED 9/11649.
28. Confirmation Book.
29. ED 9/11649.
30. Ibid.
31 D. O'Hanlon, "The Population of the Parish of Carrigrohane, Co. Cork, 1841 1911", Journal 1984, p. 23.

Colette Murphy Sandra Webster

TRACING YOUR ANCESTORS – FIRST STEPS IN GENEALOGY

Genealogy for so long associated with Irish-American visitors to Ireland, is quickly re-establishing itself on the home ground in its proper place as a near-relation of local history A properly constructed research project into one's family history will reveal more contextual local history than many of the popular thematic exercises researched by local historians. The following notes offer some hints to the beginner in family history and concentrate on the field-work that the debutant researcher must undertake before any approach is made to libraries, archive repositories, or public records.

FAMILY INTERVIEW

The beginning point in any family history is within one's family circle. The senior member of the family or some other member with a retentive memory will be likely to be the source of the oral history and tradition of the family On occasion an elderly neighbour may be able to provide useful clues at this stage of research. In any case, the **interviewing process** is of paramount importance in laying the groundwork for a research project.

On the basis of interviewing relatives and other people, it is possible to create the **skeleton of a family chart**. This works in the reverse order of a finished family chart, i.e. it reads from the bottom (your own generation or your children's) back through each generation. On the basis of interviewing, you should be able to plot in the names of your four grandparents at least and probably some, if not all, relatives in that generation line. Models of such family charts can be seen in books on family history or can be constructed with a little forethought.

Because you are creating the raw material for a proper genealogical search, you must obtain certain **approximate information**, e.g. **dates of birth, marriage and death**, place of residence. While these will enable you to verify the records of your family history it is also important to glean the maximum of social information at this stage. Occupation, farm tenancy academic and social achievements, involvement in national and social movements are some of the areas that should interest you.

Conflict of evidence will arise at this stage. Bias may also be evident and an individual's achievements may be exaggerated or denigrated depending on the interviewer's opinion. This should not unduly worry the researcher as the later stages will involve verification of the material gathered. From gravestone inscriptions and by deduction from other records it is possible to zone in on approximate dates of birth, marriage, etc. At the end of this stage of research, you should have a good idea of the basic family tree and should have amassed enough material to begin the verification of oral genealogy through consultation of records.

PARISH RECORDS

Since **parish registers** of baptism and marriage are the principal source for the genealogist, it is important, and will save time and trouble later to know where the relevant record is likely to be found. Baptismal records will almost always be found in the parish of residence, but marriage records will most frequently be found in the bride's parish, since the tradition of marriage in the home parish of the bride is by no means of recent vintage. Again, a clue to place of origin will frequently be the burial place of the family. Catholic parish registers are all in local custody of the P.P and microfilm copies are held in the National Library (to consult the parish registers of Cloyne and Kerry dioceses in the N.L.I., the permission of the P.P is required). Church of Ireland registers are more complicated as many of them had been deposited in the P.R.O.I. and were destroyed in the Four Courts fire in 1922. Amalgamation of C. of I. parishes has also meant that parish registers may not, where surviving, remain in the parish of origin. A number of Muskerry registers are reproduced in Dr A. E. Casey's 15 volume genealogical series 'O'Kief, Coshe Mang' (see accompanying list), as also are those from a number of Blackwater parishes. It must be kept in mind when using the Casey volumes, that these records are transcripts and as such are prone to error

CIVIL RECORDS

The state registration of births, marriages, and death began in 1864 and all of these records are preserved in the office of the Registrar General, Custom House, Dublin 1

Locally there are three offices in Co. Cork (at Cork, Mallow and Skibbereen) each serving as the registration office for their respective area. In the interests of genealogists worldwide, it is advisable not to approach the custodians of either parish registers or civil records on a wild goose chase. The searches that can ensue from a badly approximated date or location are not calculated to temper the goodwill of the clergyman or official at the receiving end.

There are secondary sources available in both the County and City Libraries that can prove useful to the genealogist. They are briefly described as follows:

TITLE APPLOTMENT BOOKS AND GRIFFITH'S VALUATION – The former (1823 1837) by parish and townland, give the names of land occupiers only the amount of land held and the tithe due by them. A microfilm copy for County Cork is in Cork County Library The latter (1850 1852 for County Cork) shows the names of all occupiers of land and buildings, the name of the lessor etc. and is arranged by barony civil parish and townland. Indexes of surnames occurring in each parish in these two sources are available (commonly called the 'Householder's Index').

ABSTRACT OF WILLS AND ADMINISTRATIONS – An abstract of Cork and Kerry wills and administrations (1858 1900) is published in the Casey series of volumes and is useful because of its accessibility Like newspapers, wills are a selective source of genealogical data. The proportion of people who made wills pre-1900 was small, as also was the proportion of people whose birth, marriage or death was published in the 19th century newspapers.

DIRECTORIES – Directories for the years prior to the 1875-76 Guy's Postal Directory are very selective for the county-at-large, though there are Cork City directories of traders, shopkeepers, gentry etc. for 1820, 1824, 1841 1863, 1867 and some of these also include the larger towns. While the Guy's series of directories (published up to 1938) are somewhat selective, they do the principal residents and traders of each post office area.

I have touched on only some of the potential secondary sources available to the genealogist. Newspapers are another source that the researcher may wish to explore, though here the principal value for the general family history will be in providing social background. Published announcements of birth, death, marriage pre-1900 was confined to fairly select strata of society

In conclusion, remember that the success of a family research project will be in proportion to the groundwork done in the initial stage. The last word is – don't wait for the summer or next year to begin – Granny's memory won't last forever!

Muskerry registers published in Casey's "O'Kief, Coshe Mang "

Church of Ireland		
Aghabullogue	1808	1843
Ballyvourney	1845	1935
Clondrohid	1848	1884
Donoughmore	1845	1887
Inniscarra	1820	1903
Macroom	1727	1913
Catholic		
Ballyvourney	1810	1868
Inchigeela	1816	1900

Tim Cadogan
(Cork County Library)

For further information, please consult the following:

D. F Begley (ed.), Irish Genealogy – A Record Finder (Dublin, 1981).

R. I. Henchin, Trace Those Ancestors, Cork Holly Bough, 1971.

P O Maidin, Family Tracings and Public Records, O' Mahony Journal, Vol. XI, 1981 p. 53-57

Tim Cadogan, Cork County Library

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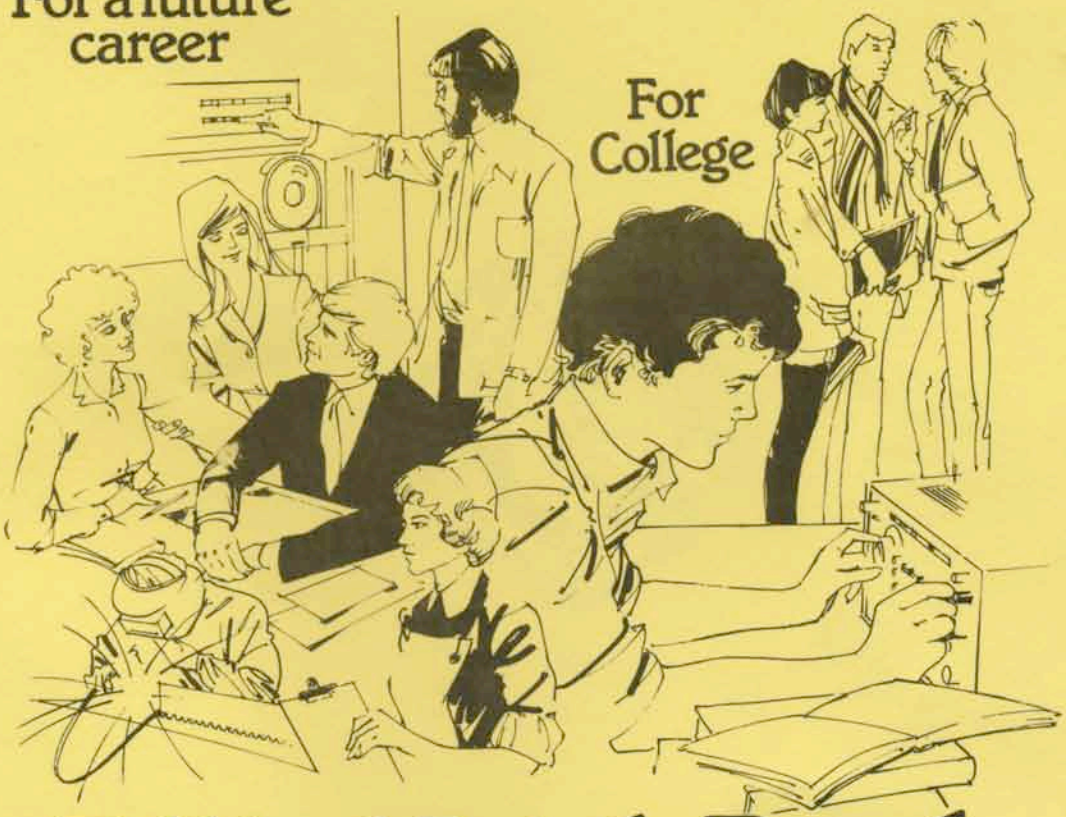

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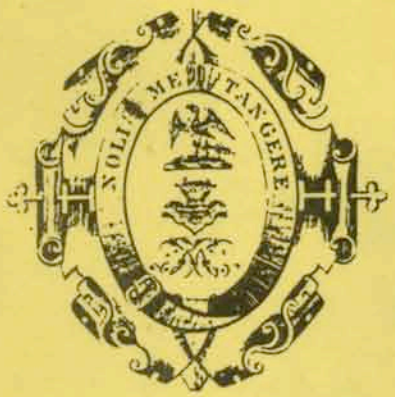

Sir Thomas Tobin

Tobin (Ballincoilig, co. Cork; granted to Sir THOMAS TOBIN, of Ballincoilig). Vert a knight's helmet ppr. betw. three nettle leaves pointing downwards or. *Crest*—On a mount vert a falcon rising ppr. belled or, and charged on each wing with a nettle leaf also ppr. *Motto*—Noli me tangere.