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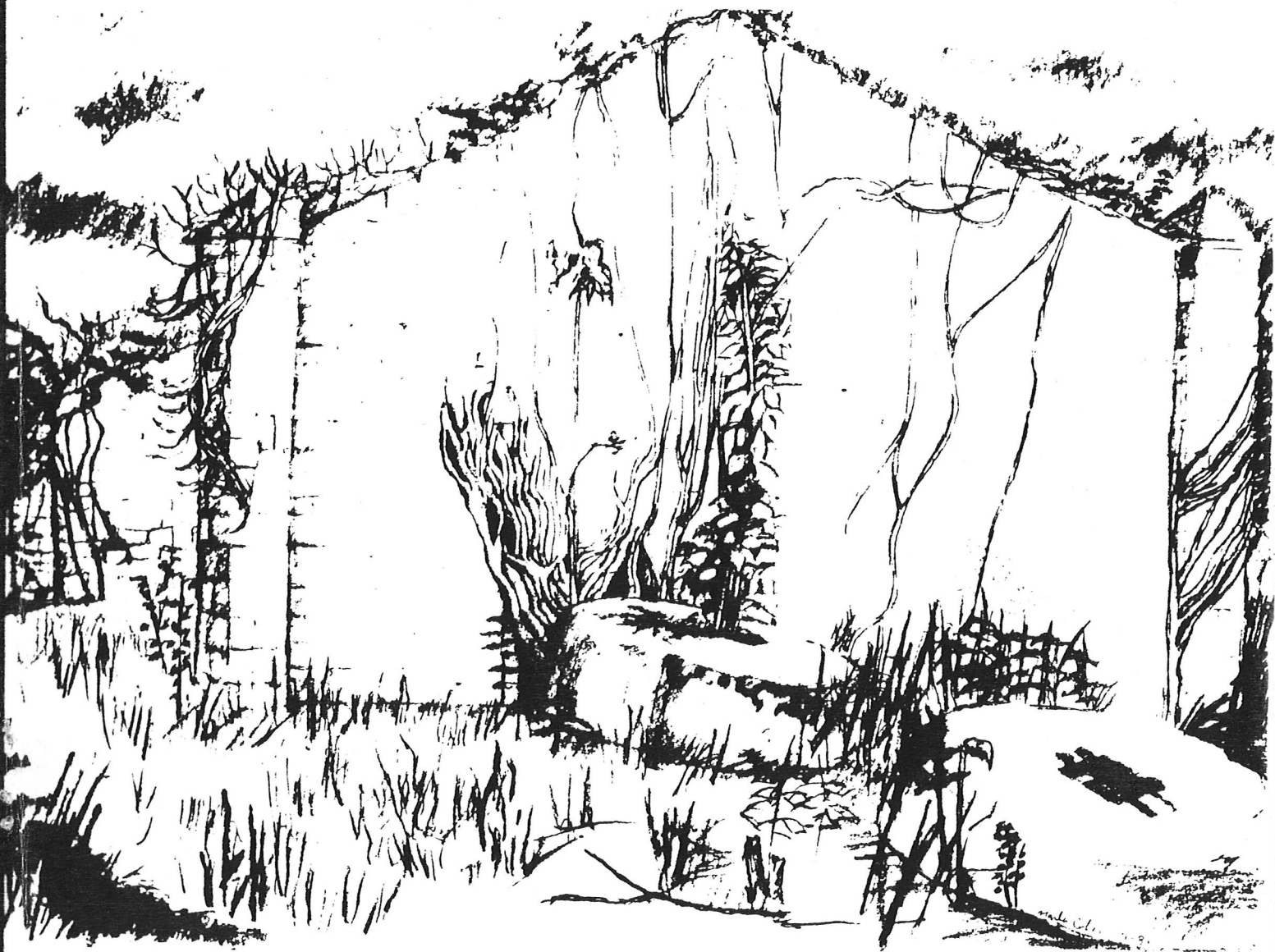


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# GUNPOWDERMILLS

## Ballincollig

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Graham Crocker  
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Cork County Council

WASC 984

DEVELOPMENT PLAN SECTION,  
PLANNING DEPARTMENT,  
CORK COUNTY COUNCIL,  
COUNTY HALL,  
CORK.

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## BALLINCOLLIG GUNPOWDER MILLS REPORT

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### INTRODUCTION

The Ballincollig Gunpowder Mills are located on the southern banks of the River Lee adjacent to the satellite town of Ballincollig in County Cork. The area constitutes no less than 150 acres of late 18th and 19th century buildings and other structures associated with the commercial production of gunpowder.

Ballincollig, lying five miles west of Cork City, has experienced marked changes over the past 200 years. Although an earlier medieval castle exists in Ballincollig, the town's initial growth dates from the location of a British Army Cavalry Barracks there in 1804. Shortly after the establishment of the Powder Mills in 1794, the expansion of the Mills in the 1840's and '50's triggered a growth in industrial prosperity for the town notable even in the context of Ireland's larger urban centres. A newspaper report of 1856 tells of the Mills employing some 500 people - a very sizeable enterprise for the time. Indeed, some of the workers' houses are still in existence and occupied to the present day.

Although the prosperity of the Mills declined in the early years of this century, since 1960 Ballincollig has experienced a huge upsurge in population, from 2,000 in 1970 to c. 10,000 in 1984 and it is likely to double by the end of the century. While latter day industrial development provides some employment locally, the town is to a considerable extent dependent on Cork City for employment and as a focus for other amenities. Indeed, with the growth of Cork itself, Ballincollig is in danger of losing some of the strong individual identity which had developed over a century when the Powder Mills were in full production.

An important aim in initiating the Powder Mills project was to assist in retaining that identity while at the same time providing an amenity area along the Lee Valley for the town and the hinterland around it.

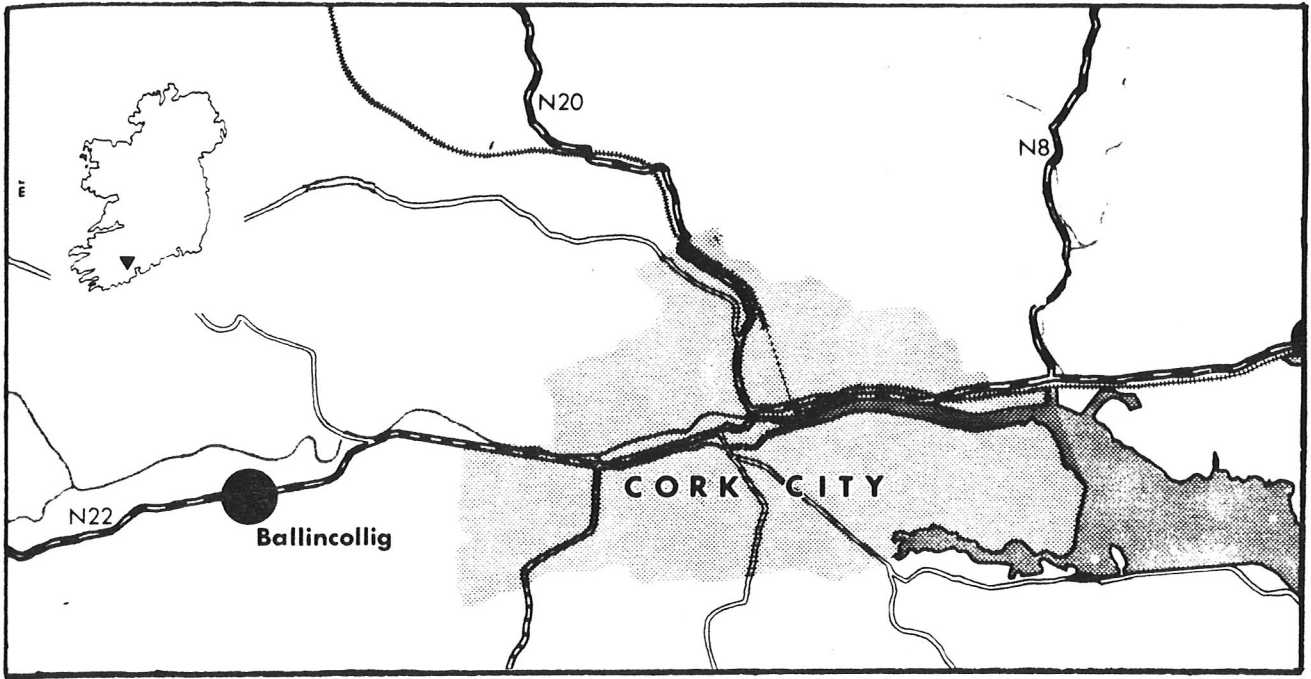


Fig. 1 Ballincollig - Lying 5 Miles West of Cork City

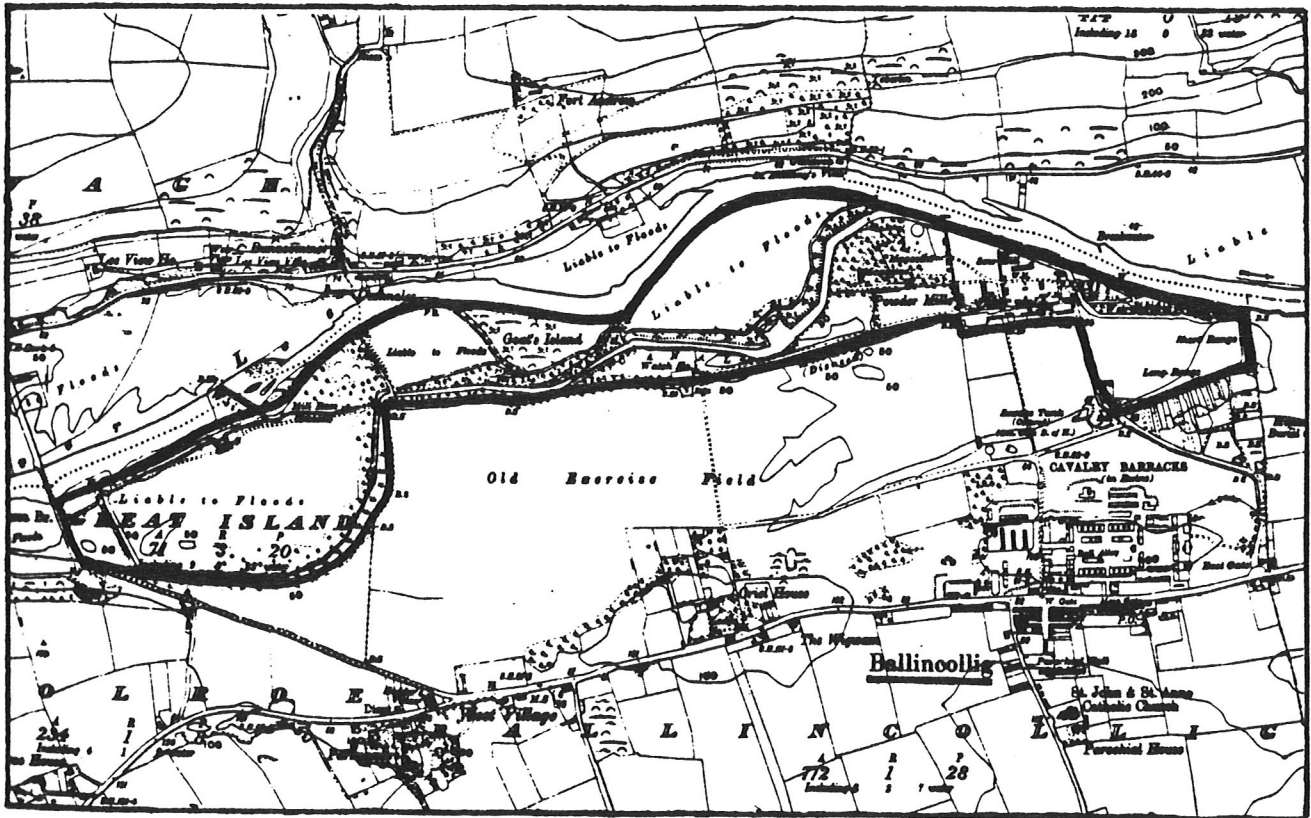


Fig. 2 The Powder Mill Complex

### Brief History of the Gunpowder Mills:-

Not only does the Powder Mill site cover some 150 acres - it also stretches 1.5 miles along the River Lee from Inniscarra Bridge in the west to the Short Range in the east (Figs. I and 2). This formidable industrial complex contains all the structures needed for the production of Black Powder from its raw materials to the finished product. Even the barrels and packing cases were produced on the site. All these structures are still visible in Ballincollig although many are now heavily overgrown and in a poor state of repair after 75 years of neglect. Even so, some fine mill races and canals of cut limestone and brick are visible close to the river.

The Gun Powder factory was established in 1794 by Charles Henry Leslie. Leslie, a wealthy banker and entrepreneur also built the well known Oriel House at the western side of Ballincollig. The mills thrived in their early years, supervised and managed by Leslie himself. However, with the unrest in Ireland following the 1798 rebellion, security at the Mills became increasingly important. An armed party was dispatched from Cork Military Barracks daily to guard the premises.

In 1804, Leslie sold his interest in the factory to the British Board of Ordnance who renamed it the Royal Gunpowder Mills. The importance of controlling the production of gunpowder was probably a significant factor in the purchase of the Mills by the British. This may also have been a consideration in the establishment of a substantial Cavalry Barracks in the village around 1810.

Gunpowder was in considerable demand during the Napoleonic wars and in response the Ballincollig Mills continued to expand. The powder when ready for shipment was carried by wagon to a powder magazine near Wellington Square in the south west of the present City along the appropriately named - Magazine Road. From here the powder was taken to the Cork docks to a point which became known as Gunpowder Pier located some distance down stream from the main berthing area adjacent to the present Marina Power Station.



The remoteness of this location reflects the respect felt for the explosive nature of the substance.

Demand for gunpowder declined following the end of the Napoleonic wars and in 1832 the Board of Ordnance saw fit to offer the factory complex for sale. A notorious Liverpool businessman, Sir Thomas Tobin, bought the Mills in 1833. Tobin had already made his fortune in slave trading. He re-named the complex the "Ballincollig Royal Powder Works Ltd.". Under Tobin's management the industry expanded from employing 200 people in 1837 to 500 in 1856. By this time, the Crimean War, along with demand from the Americas provided a steady market for Ballincollig Gunpowder.

Tobin continued to own and run the complex until 1898 when he sold the business to Messrs. Curtis and Harvey. By this time Curtis and Harvey also owned eight other mills in Britain and following their purchase of the Ballincollig Mills, they had a monopoly of gunpowder production in these Islands. However, output at Ballincollig began to fall by the end of the century although the Boer war did provide a welcome increase in demand. Production finally ceased and the Mills closed in the early years of this century.

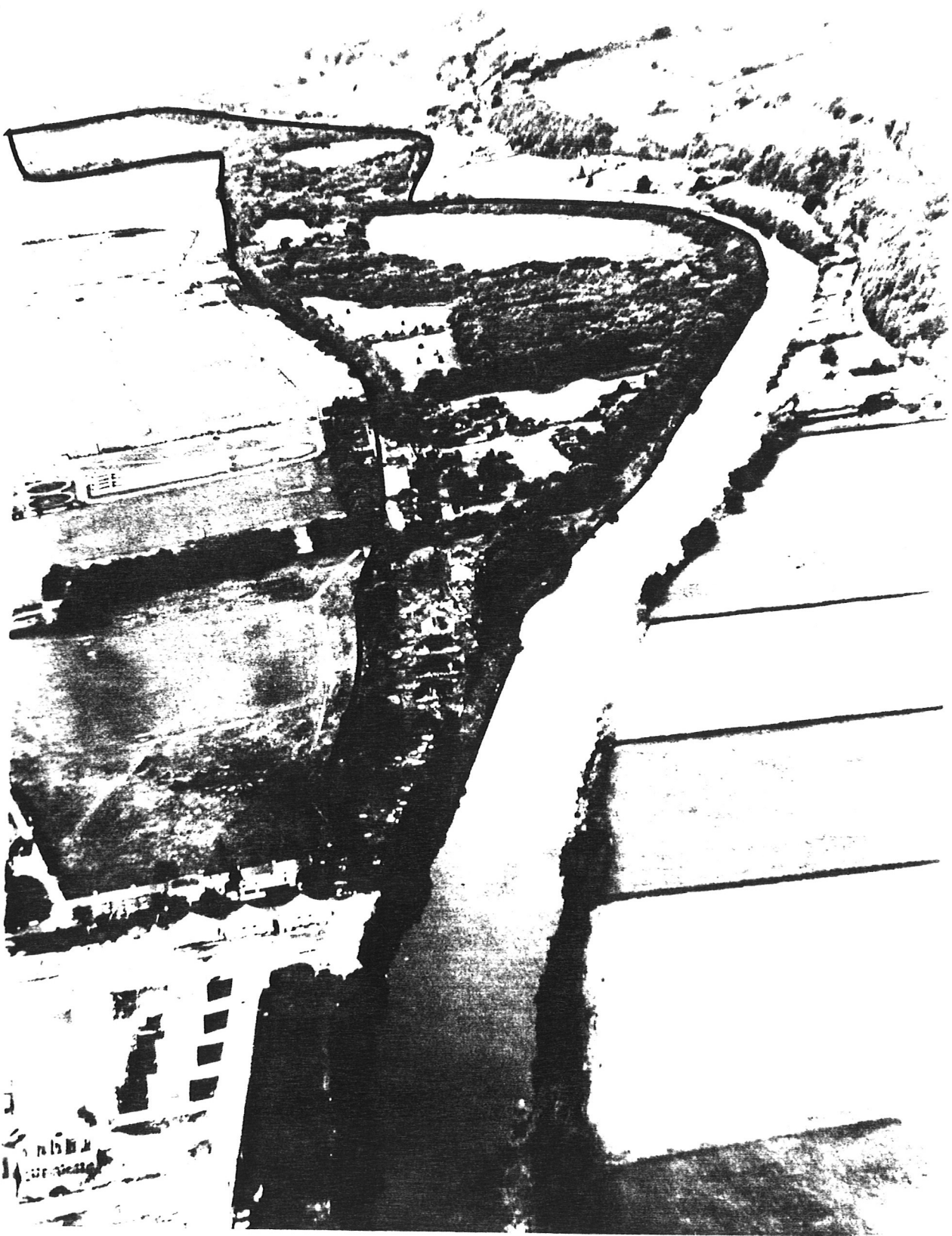


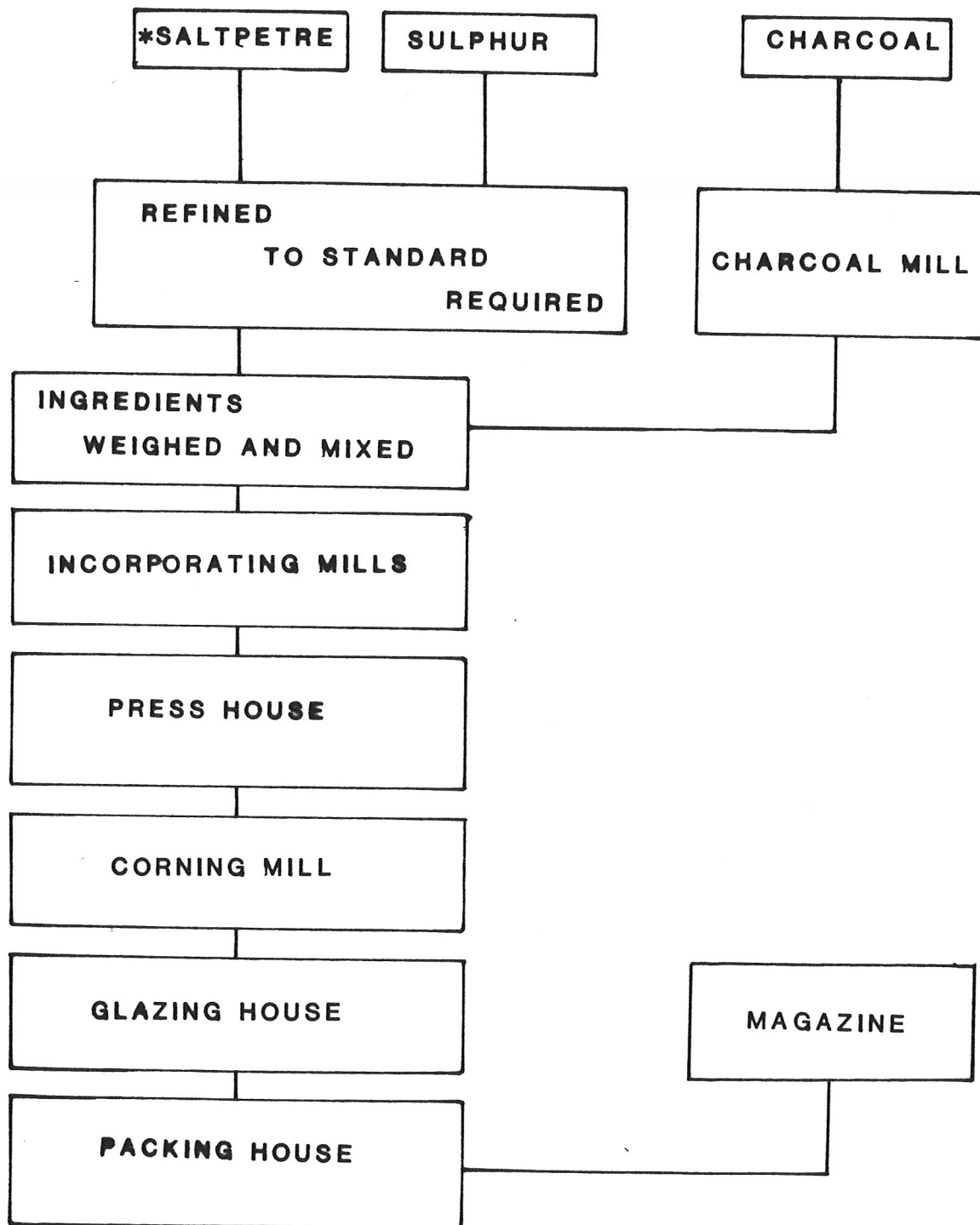
Plate 1 Aerial Photograph Showing Extent of Powder Mills Complex

### The Production Process

Commercial production of gunpowder involved three main ingredients:- charcoal, sulphur and saltpetre (potassium nitrate). The saltpetre and sulphur were refined, milled and purified to the specification of the manufacturer. The charcoal would also have been refined and added to the sulphur. This mixture was then weighed and added to the saltpetre. These ingredients were then crushed in the incorporating mills under 4 ton stone runner wheels driven by water power. Following this composition process the raw material was then compressed into slabs by wooden rollers. These slabs were chipped and ground (corned) and then dried to produce the finished product. The gunpowder was finally glazed with graphite (giving it it's black appearance, - hence black gunpowder) and packed into wooden containers (See Fig. 3). This was the basic process used in the Faversham Mills which were run by the British Board of Ordnance from 1750 until 1812. This same Board acquired and managed the Ballincollig Mills from 1804 until 1832. Hence it can be assumed that a similar process was in operation in Ballincollig.

All the structures involved in the process can still be seen at Ballincollig (Fig. 4). The various structures and the incorporating mills - the centre of the complex - were set apart from each other to limit the potential damage of explosions. Many of the materials needed at the various stages of production were carried by a canal which runs for the full length of the site. This canal would also have provided the water to power the various mills in the incorporating section. The charcoal needed for the production process was produced from locally grown Alder, Hazel and Willow. It is important to note in this context that charcoal production had a long history in County Cork going back at least to the 17th Century when it was used in vast quantities for iron-smelting. The saltpetre was imported from India and the sulphur from Italy. There were transported by ship to Cork and by wagon or barge along the Lee Valley to Ballincollig. On arrival the saltpetre was refined in structure 9 (Fig. 4). The charcoal was milled in structure 11 and both were further mixed and refined in the dusting house - structure 17. All the ingredients, including the sulphur, were then mixed together and transported by canal to the incorporating mills - structure 22.

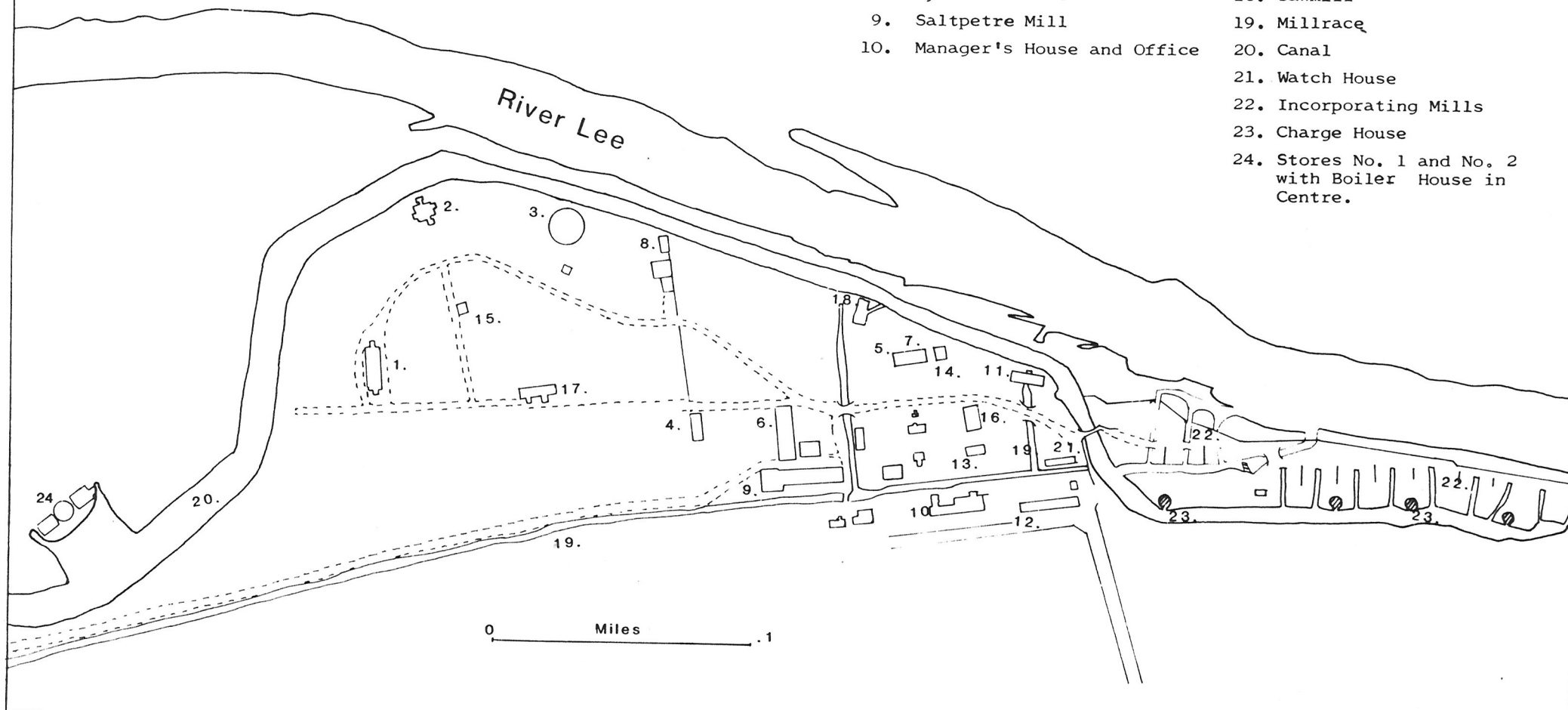
**FIG.3 THE PRODUCTION PROCESS**



\* SALTPETRE : Potassium Nitrate.

**FIG.4** The Royal Gunpowder Mills  
Ballincollig

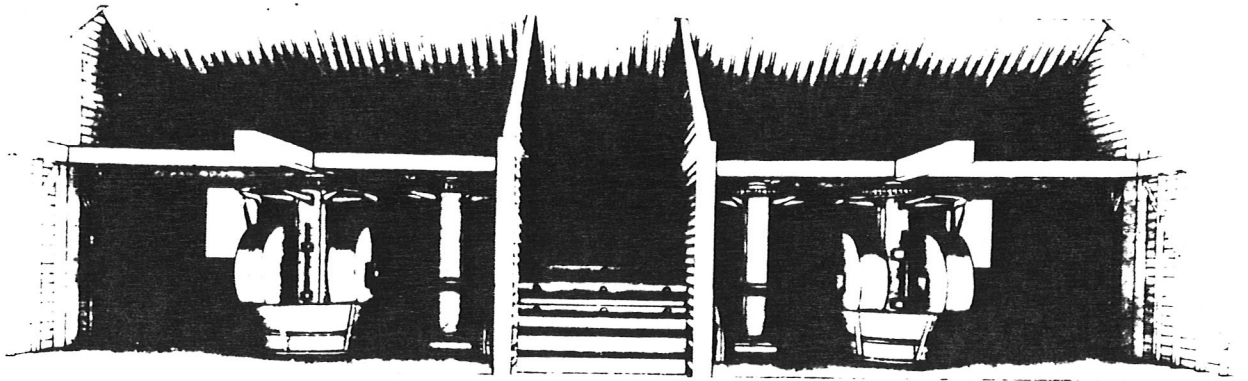
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|--------------------------------|---|
| 1. Magazine No. 1              | 11. Charcoal Mill   |
| 2. Magazine No. 2              | 12. Stores  |
| 3. Coal Store                  | 13. Forge   |
| 4. Straining Shop              | 14. Copper Store  |
| 5. Millwright's Shop           | 15. Canister House  |
| 6. Drying House                | 16. Cooperage   |
| 7. Carpenter's Store           | 17. Dusting House   |
| 8. Cylinder House              | 18. Sawmill   |
| 9. Saltpetre Mill              | 19. Millrace  |
| 10. Manager's House and Office | 20. Canal   |
|                                | 21. Watch House   |
|                                | 22. Incorporating Mills                                       |
|                                | 23. Charge House  |
|                                | 24. Stores No. 1 and No. 2<br>with Boiler House in<br>Centre. |



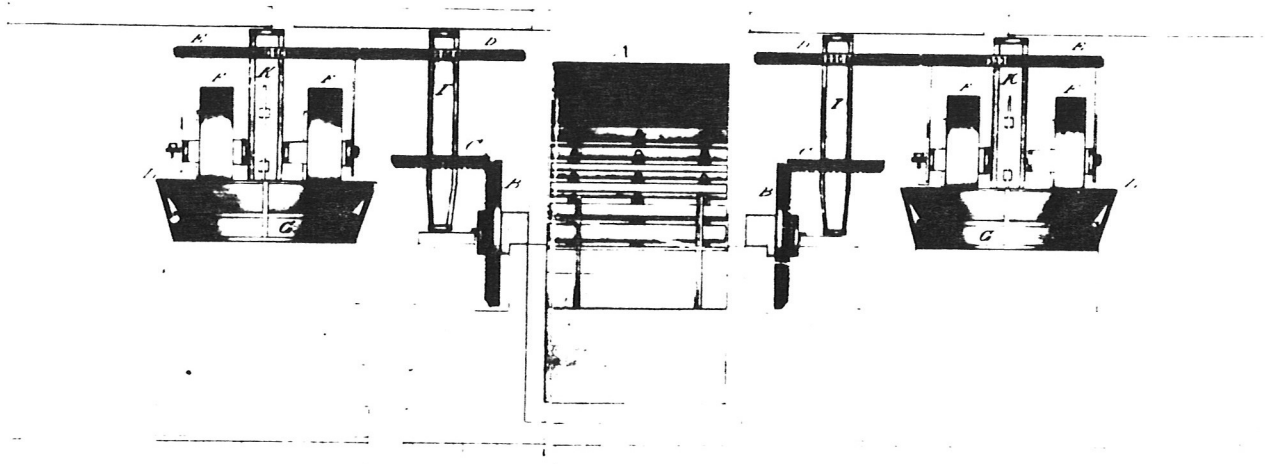
The raw material was then (as described early) crushed under the edged runner stones of the incorporating mills. These were powered through a complex gearing mechanism by a water wheel (see plate 2).

The recently completed vegetation clearance programme revealed the existence of twelve such water wheels in the incorporating mills, (Fig. 5) each providing power for two crushing areas. Another important feature of the incorporating mills identified by the vegetation clearance was the existence of four charge houses (Fig. 5). These are circular, corbel-roofed buildings with limestone walls of considerable thickness. Due to the large crushing capacity of the incorporating mills it is conceivable that after crushing, the then highly explosive substance would have been stored in these charge houses until it was required for further processing. The mixture was then pressed and dried in structure 6 (Fig. 4). The finished product would have then been packed in cases and stored in either of the magazines or in the gunpowder store - structure 24 (Fig. 4).

Safety was an extremely important consideration in the factory. There are many reports of explosions through the years and precautions were constantly amended. The distance between the various buildings testifies to this. Similarly, the massive blast walls in the incorporating section were so positioned to confine any explosion to one mill area. The presence of a copper store in the complex also testifies to the attention paid to safety. Copper would have been used on working surfaces as it minimises friction and therefore the possibility of explosion.



*PERSPECTIVE VIEW OF THE INTERIOR.*

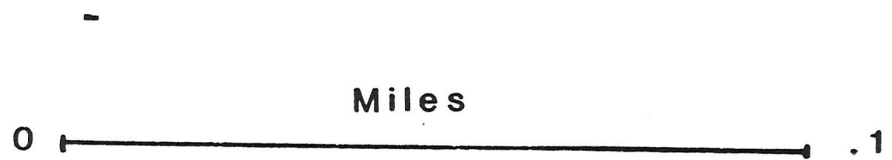
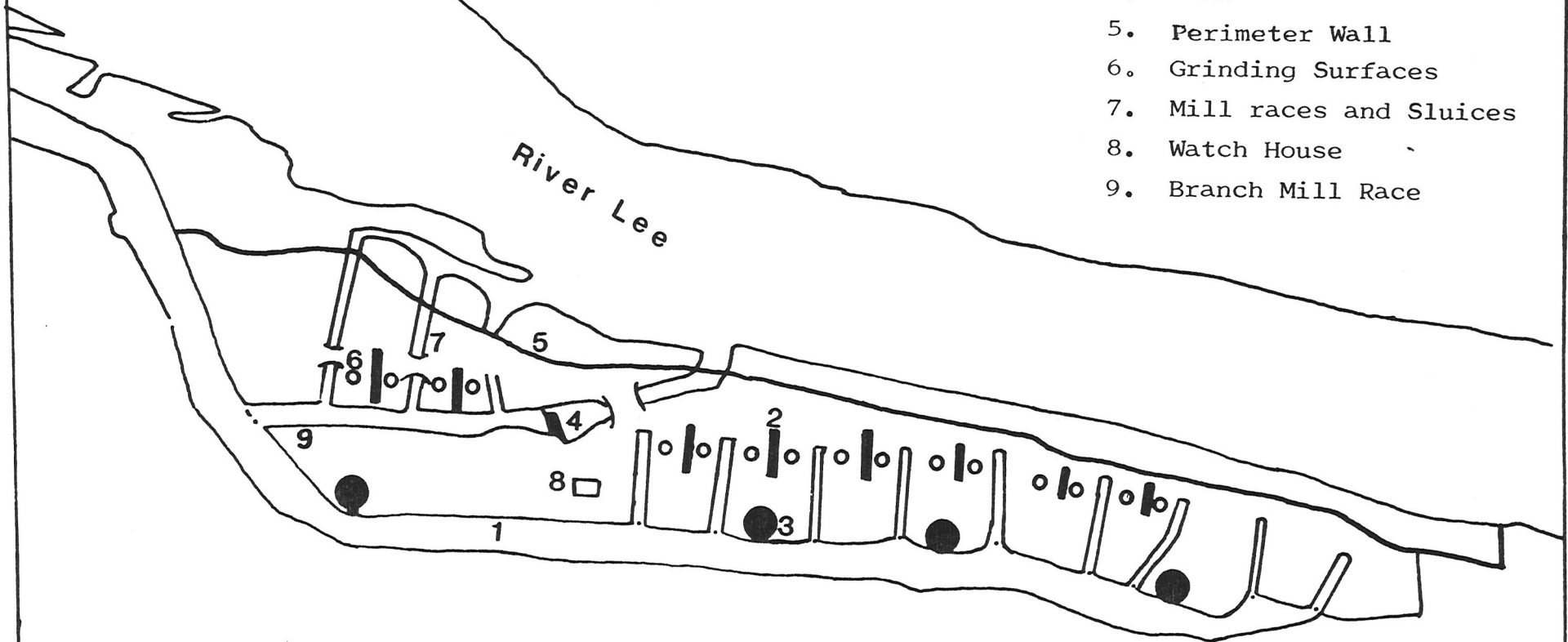


GEOMETRICAL SECTION

**Plate 2 Perspective View and Section of Crushing Area and Waterwheel - Typical of Similar Mills Elsewhere**

**FIG. 5** Incorporating Mills  
**Royal Gunpowder Mills**  
**Ballincollig**

1. Canal
2. Blast Walls
3. Charge Houses
4. Weir
5. Perimeter Wall
6. Grinding Surfaces
7. Mill races and Sluices
8. Watch House
9. Branch Mill Race





## The Ballincollig Powder Mills Industrial Archaeological Project

A report by Brady, Shipman & Martin (1979) for Cork County Council, who own the area, felt that the incorporating mills of the Ballincollig Complex were of central importance to the proposed amenity area. Relatively speaking, the incorporating mills make up a small area of the total Ballincollig complex but they are by far the most important section of the 19th century factory and are still the most visually impressive section.

During the peak of production in the 1840's and '60's, water from the canal powered 12 water wheels which operated no less than 24 crushing areas. These crushing areas fall into two distinct groupings. Three of the water wheels were supplied by water from a branch mill race and the remaining nine wheels were powered directly from the canal (Fig. 5.). The incorporating mills also contain an elaborate weir, seven blast walls and four charge houses. All these features provide an impressive focus for the complex as a whole (Plate 3).

Following the initial pilot study carried out by Cork County Council, six stages in a conservation and restoration programme were outlined ranging from scrub clearance to full scale reconstruction of at least one of the incorporating mill units and it's associated mill race as the focus of an Industrial Archaeological Museum.

Stage 1 has begun and is partially complete involving the clearance of existing vegetation to ground level. This also included the maintenance of a screen of trees along the perimeter of the site and the erection of a perimeter fence of 400 metres to include the whole site. The incorporating mills site constitute approximately 11 acres and was thickly covered with 75 years of vegetation growth. The removal of this growth was necessary before beginning the careful cleaning and exposure of brick and stone surfaces.

Stage II, already well underway, involves the detailed recording of the overground structures revealed by the clearance of the vegetation. This has necessitated the making of detailed drawings of each mill area, wheel pits, edge runner stones and all other



Plate 3 Aerial View of Incorporating Mills [after clearance]

structures on the site. To accompany this survey, detailed notes and photographs, were taken to assess the condition of each structure and the materials used in its construction. These will provide a comprehensive "as found" record of the incorporating mills before any decay, alteration or conservation can take place.

Stage III, yet to be undertaken, will involve recording the structures not fully visible on the surface. This is essential in order to obtain a complete ground plan of the structures that once existed and detail their construction. Such information is necessary before any conservation or restoration works takes place.

As with Faversham, all the mill gearing at Ballincollig was covered by some type of structure and it is necessary to discover the ground plan of these. As the foundations of these buildings are still visible in places, this would not present a problem but will nevertheless require selective archaeological excavation.

It is envisaged that Stage IV of the project will be undertaken at the same time as the work programme already outlined in Stages 2 & 3, and will involve the compilation of a detailed historical record of the site. This will necessitate a thorough document search of military records, maps and sketches pertaining to the Mills, their establishment and particularly their architectural development. This information, taken together with the "as found" record and the results of the excavation work, will provide the basic blue print from which **the** conservation and restoration programme can be developed.

Stage V of the programme will involve selective restoration of some of the structures in the incorporating mills. The Faversham society has a group of four incorporating mills at their site in Kent, one of which has been restored. The Ballincollig site has 12 such mills with all the crushing stones remaining. As with Faversham, the restoration of one mill would seem the most achievable aim at present. However, the other mills will still need to be stabilised and conserved.

For a worthwhile restoration, a portion of the canal system would need to be reflooded, the waterwheel replaced and the relevant gearing mechanism fitted. The reconstruction of the

building covering the mill area would then also be necessary. For the reconstruction to be successful, it will be essential to consult with the Faversham Society and the Du Pont organisation. Contact has already been made with both groups; both are extremely keen that the project should develop and are willing to advise as far as possible. Engineering and construction problems will also need to be taken into account and expertise in those areas would need to be consulted.

This programme of conservation and reconstruction will necessitate major funding both from public and private sources. Private individuals, companies and societies who may be interested in supporting or being involved in the project will be informed of the scheme.

However, the restoration/conservation stage is of major importance and cannot be undertaken before the preliminary research outlined in Stages I, II, III and IV is completed.

Stage VI. The final phase of the project concerns the broader amenity aspect of the site. Following the conservation and restoration programme the site will form the focus of the Ballincollig Regional Park. Access, footpaths, seating and car parking will be essential developments at this stage to enhance the site and its magnificent location.

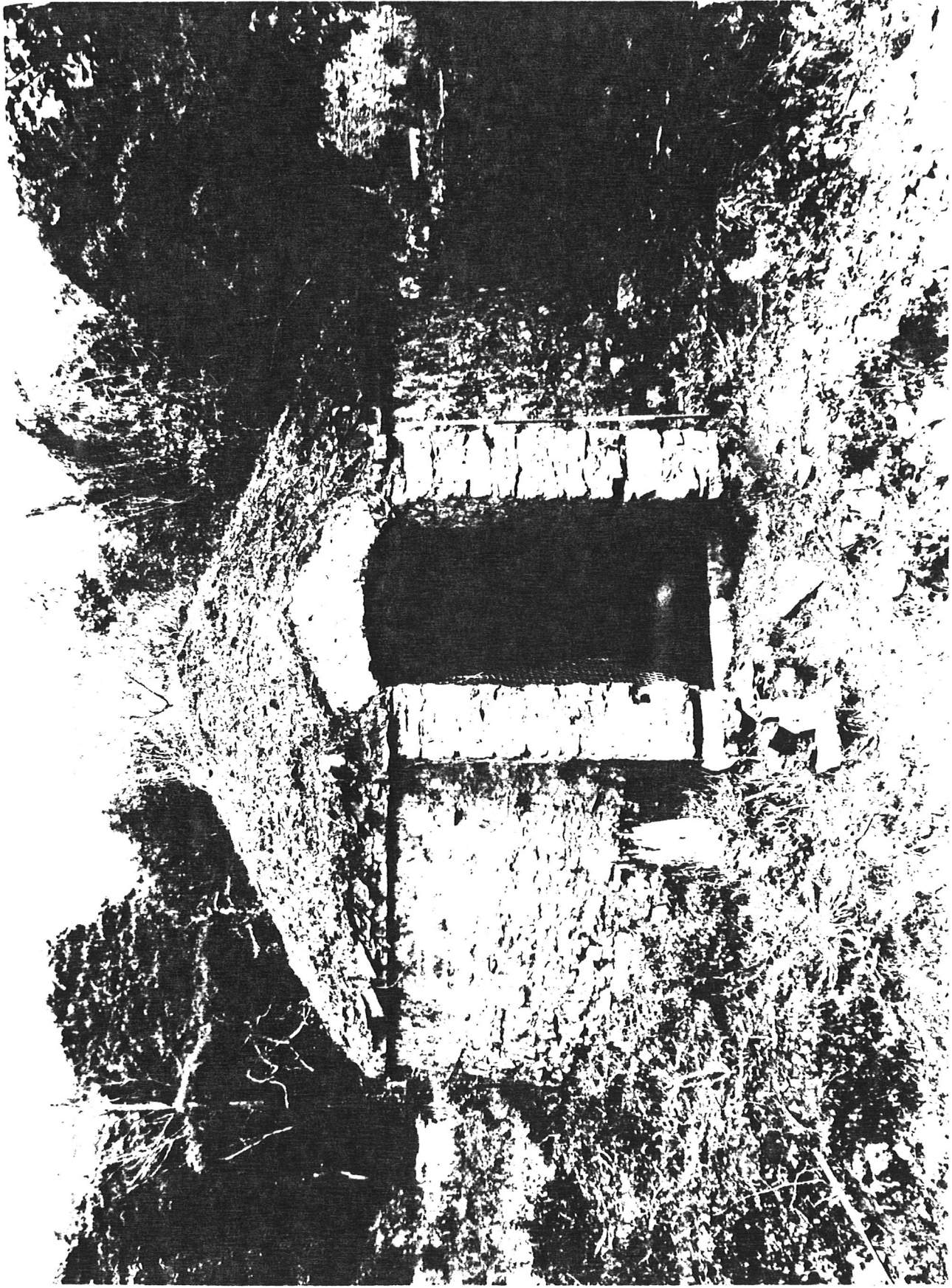


Plate 4 Charge House - Revealed During Clearance Works

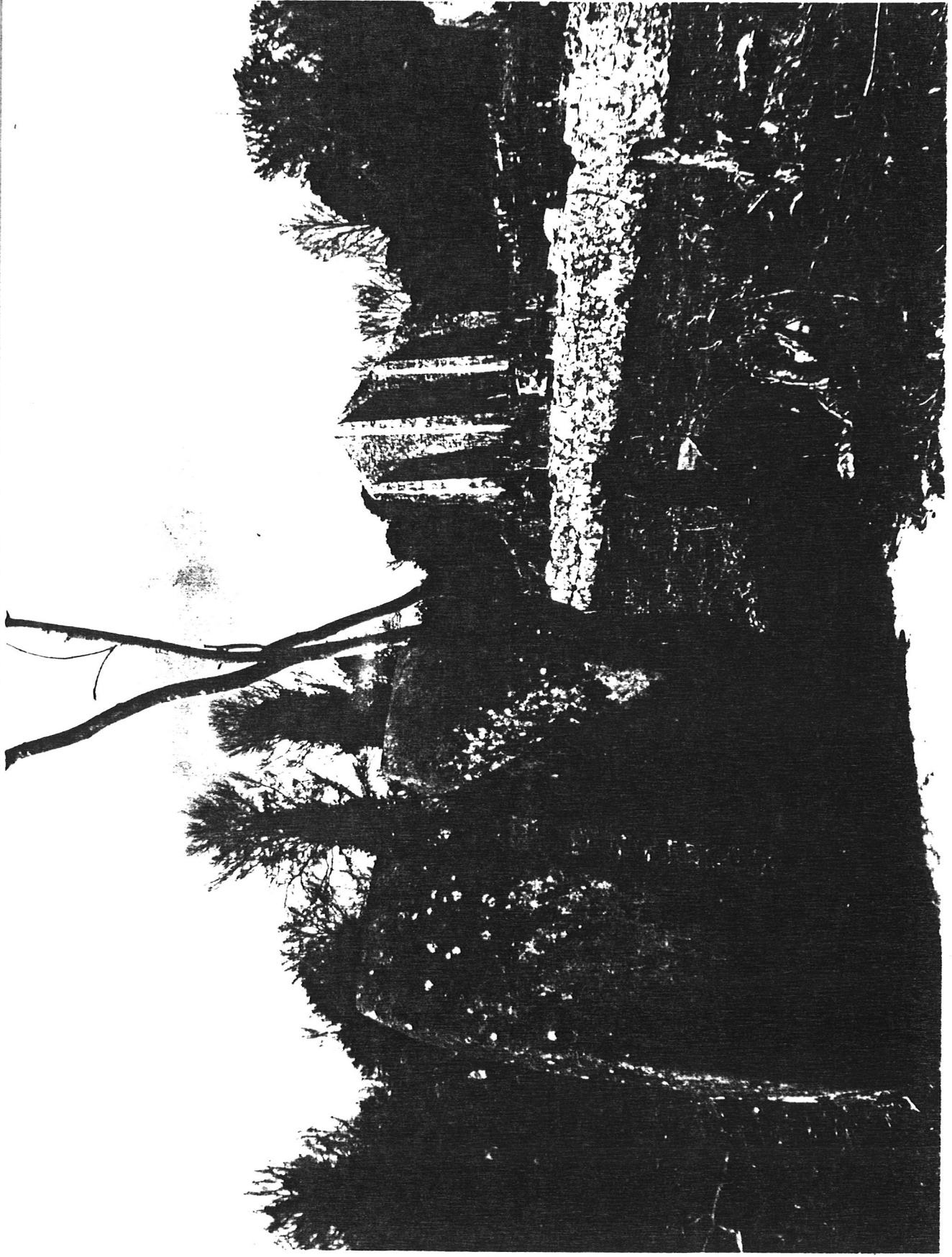


Plate 5 Grinding Stones, Blast Wall and Branch Mill Race in Incorporating Mill Site

### The Project at Present

Following a number of meetings between Cork County Council Planning Department, Comhchairdeas (Irish Workcamps), The Archaeological Department, U.C.C., Dun Ui Mhurchadha, Ballincollig and Ballincollig Community School in the Spring of 1983, a six week work scheme was organised for the summer of that year to begin vegetation clearance on the 11 acre site of the incorporating mills. Work commenced on July 10th. The labour force consisted of two groups of 20 volunteer workers forming a summer work camp organised by Comhchairdeas. The Department of Archaeology, U.C.C., provided a work supervisor to advise and monitor the clearance, particularly as it affected the stability of some of the structures. Accommodation for the volunteer workers was provided by Ballincollig Community School with the Army of Ballincollig Barracks providing additional facilities. The first season of work finished on August 20th, 1983 and succeeded in exposing five acres of the site. This work scheme also revealed one charge house which was not visible before the work began. In addition, it exposed details of six mill areas, the blast walls and other related features. At the completion of the 1983 season of work a six foot perimeter fence was erected to enclose the whole site.

During the late Spring of 1984, a similar programme of work was organised to complete the vegetation clearnace. Mr. Donnall Fleming, a research assistant, was employed to the scheme for 12 weeks to begin recording the structures "in situ" as they were revealed. This recording involved making detailed scaled plans and photographing each of the features in order to compile a comprehensive record of the condition of each of the structures and the materials used in their construction (Fig. 6). The scheme ended on August 31st, 1984 with all twelve mill areas fully revealed by the workcamp and ten of them subsequently recorded.



Plate 6 View of Branch Mill Race, Weir and Blast Wall



The objectives outlined in Stages I and II have been substantially completed. However, it is of some urgency now that the work outlined in Stages III and IV go ahead without delay to avoid losing ground on what has been already achieved. The recording of structures not visible on the surface as noted earlier necessitates archaeological excavation of selected areas. The evidence acquired in this way will be invaluable for the future development of the site.

It must be emphasised that a long break in the work at this stage would set the programme back substantially, especially since having cleared the site of trees and undergrowth, the structures are more susceptible to deterioration and vandalism. Indeed, during the winter of 1983-1984, significant portions of the weir area and one of the wheel pits collapsed. Such deterioration will continue without a rapid commitment to maintain the site and consolidate these features. To this end major funding is currently being sought, through the Government's Social Employment Scheme, to carry out the necessary excavation and essential repair work with a view to ultimately reconstructing at least one of the Mill Wheel and crushing stone areas. It is hoped that such a project would be commenced in mid 1985.

The Ballinacollig Mills project as outlined in this paper, provides an opportunity and a challenge not only for the people of Ballinacollig but for the region generally to develop Ireland's first working Industrial Archaeological Museum.