## Chapter 9

# The Grocers' Warehouse, Castlefield: the First True Canal Warehouse?

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### Introduction

The Castlefield terminus of the Bridgewater Canal has attracted a considerable amount of interest from historians since the 1860s, and from archaeologists since the 1960s.<sup>1</sup> These studies have developed two themes; the complexity and success (or failure) of the water management systems built by James Brindley, and the physical development of the basin as a warehouse zone. A central feature of the basin was two adjacent late-eighteenth-century warehouses, the Duke's Warehouse and the Grocers' Warehouse. The Duke's Warehouse is usually regarded as the first canal warehouse on the Bridgewater Canal, and thus in Britain, but the Grocers' Warehouse was a more complex and, ultimately, more influential structure due to its use of internal canal arms and split-level loading. The subject of pioneering industrial

Fig 9.1 The Reconstructed Grocers' Warehouse in Castlefield (copyright Michael Nevell).



archaeological recording and excavation in 1960, and detailed survey and reconstruction in the mid-1980s, the ruins of this warehouse form the earliest surviving building in the terminus.

# Origins of the Coal Tunnel and Castle Quay

Although there are two studies of the Grocers' warehouse, the first by V I Tomlinson published in 1961 and the second by Cyril Boucher published in 1989,<sup>2</sup> the re-cataloguing of the Bridgewater archives held by Salford City Council and the University of Salford, and further recording of the ruins since 1989, has uncovered previously unseen material and new physical evidence which relates to the origins and development of the warehouse.<sup>3</sup> This material concerns the inspiration for the design of the coal tunnel



Fig 9.3: The southern end of the 1760s coal tunnel by the Grocers' Warehouse (copyright GMAU).

beneath the warehouse and the date and development of the warehouse's structure.<sup>4</sup> The development of such an innovative building was necessitated

Fig 9.2 Johann Hogrewe's 1777 plan and cross-section of the Castlefield Basin showing the Grocers' Warehouse (arrowed). Note the absence of the Duke's Warehouse on this plan (courtesy of Chetham's Library).





Fig 9.4: John Foulkes' map of the Castlefield canal basin in 1785 showing the site of the Grocers' (A) and Duke's (B) warehouses and the location of the 1760s coal tunnel and its extension. Courtesy of Salford City Archive (Bridgewater Collection).

as much by the accident of geography as the result of industrial inspiration; a case argued first by Tomlinson.<sup>5</sup> The development of this structure was proceeded by an earlier wharf and loading arrangement which directly influenced the later warehouse.

The topography of the River Medlock through the Castlefield area of Manchester was very similar to that of the Irwell below the Collegiate Church (now Manchester Cathedral), with sheer cliffs at a number of points along the river valley between the line of Deansgate and the junction of the River Medlock with the River Irwell. Castlefield was chosen by Brindley as the terminus for the Duke of Bridgewater's new industrial canal, once the second Act was passed in 1760,<sup>6</sup> partly because it was the area closest to Manchester, from the south, on the same level as the line at Worsley. This new line would bring coal from the Duke's mines at Worsley Delph to the edge



Fig 9.5: A reconstruction of the western façade of the Grocers' Warehouse in the late eighteenth century (copyright Michael Nevell).

of eighteenth-century Manchester, but clearly the height difference between the river and the town, approximately 7.7m (25ft), would be a problem when unloading the coal from the Duke's barges.

When the Castlefield basin was opened in the summer of 1765<sup>7</sup> it lacked any warehouse facilities so initially coals were hauled by carts from the quay up a steep routeway cut into the northern terrace of the River Medlock.<sup>8</sup> An anonymous letter published in the Manchester Mercury on 1st July 1765 noted that 'from the wharf, at this place, the poor of Manchester fetch great quantities of coal in wheelbarrows: and Mr Brindley in order to remove the inconvenience of carrying them up Castle Hill, is driving a large tunnel through the centre of this hill, into which he intends to introduce his barges, and by a crane, which is to be worked by a box-water-wheel, he proposes to land the coals close to this town'.9 It appears to have been completed by the time another letter about the works at Castlefield was published in the same journal on 1st August 1765.10 The entrance to this water-filled tunnel was at Castle Quay, created by cutting back the escarpment edge, on the site of what would become the Grocers' Warehouse. At this date the wharf did not included any warehouse structures.

By 1769 this system was functioning and comprised 'first...a common wharf for the landing of coals out of large barges, for the supply of carts and wagons. The second is a subterraneous canal, arched over, into which long but narrow boats enter, being of a construction fitted for a peculiar purpose elsewhere. This subterraneous passage extends from C to D. At E, in the roof of the arch turned over this water, is a well, bricked like common ones, which is sunk from the ground above;...upon which and near the mouth of this well, is erected a crane of a new construction, which turning upon a pivot, is brought at pleasure over the well, and draws up the coals... This subterraneous canal is extended further than the crane with design to erect another upon the same principles.' The arrangement is shown on a plan published by Arthur Young in that year (Fig 3.1) and the

Fig 9.6: John Claude Natte's 1807 drawing of the Castlefield Basin showing the Grocers' Warehouse (left) and the northern end of the Duke's Warehouse (right) (copyright Salford Museum and Art Gallery, T2791).





Fig 9.7: An 1825 Bridgewater Estate map of the Castlefield canal basin, amended in the 1830s, showing the range of warehouses (shaded) in the basin by the mid-nineteenth century. Courtesy of Salford City Archives (Bridgewater Collection).

extension shown on Foulkes' 1785 map running for c. 125 metres north as far as Bridgewater Street. Power to the crane was provide by a 30 foot (c. 9.14 metres) in diameter waterwheel, 4.5 foot (c. 1.37 metres) wide, which turned a wooden cylinder carrying a rope for operating the crane, whilst a sluice controlled the flow of water from the underground canal so it passed through a rock-cut channel to drive the waterwheel.<sup>11</sup> The remains of this wheel pit and the waterwheel within it were discovered and described in detail in 1960, and a second shaft located which was probably part of the extension to the tunnel also mentioned by Young in 1769. Another vertical shaft 15 metres north of Bridgewater Street on the same alignment was discovered and recorded by Paul Sillitoe in 2007, though its precise relationship to the coal tunnel remains unclear.<sup>12</sup> The design of this tunnel and its hoist combined several elements of

Brindley's earlier work. Firstly, the size and design of the tunnel itself mirrored parts of the underground network of canals at the Worsley coal mines devel-







Fig 9.9: A view looking east towards the Bridgewater Viaduct of the site of the Duke's Warehouse during demolition after the 1915 fire (courtesy of Michael Nevell).

oped from 1758 onwards.13 Young is clear this tunnel was designed to take the coal boats from the Worsley mines, and the hoist and shaft designed to lift the coal boxes from these boats.<sup>14</sup> Secondly, the employment of an undershot waterwheel in a situation where there was a very limited head of water available, thus restricting the type of waterwheel that could be used, can be seen at two earlier Brindley sites; in 1752 at Leek corn mill which used water from the River Churnet;15 and at the Old Mill at Congleton, a large silk mill run by a waterwheel whose water came from the nearby River Dane.<sup>16</sup> Thirdly, Brindley used a similar arrangement of tunnels, this time involving a rock-cut channel with a rock-cut tailrace tunnel, to power a waterwheel at Clifton Colliery in 1752, in order to pump water from the coal mine.17

A further parallel from Brindley's work can be drawn from the location of the Old Mill wheel-pit, in the centre of the mill façade beneath a pediment, and the main southern façade of the Grocers' Warehouse. Here, the canal arm was placed centrally beneath the main loading doors and a large dorma opening on the roof, flanked by two bays of windows to each side giving a symmetrical classical façade. This architectural arrangement may be coincidence and nothing to do with Brindley, but the other three cases provide cumulative evidence to strongly suggest Brindley used more than a decade of his experience with managing water to design the first phase of the wharf at Castlefield during the mid-1760s. This original coal tunnel was incorporated within the later Grocers' Warehouse at a skewed angle.<sup>18</sup> The leap from a crane, shaft and tunnel system for unloading the coal boats to replacing the crane with a warehouse with a water-powered hoist system over the same tunnel was short, but radical, one.

### Dating the Grocers' Warehouse

As an archaeological monument type the canal warehouse was a product of the Industrial Revolution and was one of a number of industrial warehouse types that developed from the mid-eighteenth century onwards.<sup>19</sup> The various designs of canal warehouse have been classified and of the four typological forms identified the most original and influential was the Type 1 canal warehouse, of which the Grocers' was an early example.<sup>20</sup> Such Type 1 canal warehouses were structures combining multistorey, splitlevel loading, terracing, internal canal arms and a hoist system run by water power.

Circumstantial evidence such as name and geographical location led Tomlinson to believe the first purpose-built (Type 1) canal warehouse of this classic design Duke's Warehouse (so-called because it was built for the Duke of Bridgewater as part of his canal works), adjacent and to the east of the Grocers'.<sup>21</sup> This building straddled the River Medlock at the head of the canal basin, just east of the modern Deansgate Bridge. An undated plan of the Castlefield canal basin, but almost identical to Young's map, can be found in Chetham's Library. This shows the crane and tunnel in this area, and notes that Knott Mill Bridge was 'where they intend to Build Warehouses over the River'.<sup>22</sup>

Tomlinson lacked the detailed evidence to prove this warehouse with its two internal canal arms was built before 1777, when the Grocers' Warehouse is first shown on a map of the basin.<sup>23</sup> This documentary evidence appeared to have been uncovered during research prior to the excavation of the remains of the Duke's Warehouse in 1998. Amongst the Bridgewater archives held by the City of Salford was a map of the Deansgate area around the River Medlock with the date 1771.<sup>24</sup> The map showed a rectangular building covering the Medlock and described as the 'new warehouse'.

More detailed examination of this document and the map sequence for the Castlefield Basin suggests this elegant solution to the date of the Duke's Warehouse, and confirmation of its primary position as the first canal warehouse, is not as straightforward as it seems. Tomlinson knew the Duke's Warehouse had been burnt down and rebuilt in 1789 but was unclear on how the fire affected its original planform.<sup>25</sup> The 1771 map and Foulkes' 1785 plan of the Castlefield Basin<sup>26</sup> capture this form before that fire. Both show a square building west of the bridge over the River Medlock. On each map the structure does not straddle the Medlock; rather it juts out southwards approximately half way across the width of the river. Foulkes' map is particularly useful as it has been annotated by a later hand to show the planform of the Duke's Warehouse as rebuilt after the fire of 1789 and captured on all later maps. The rebuilt warehouse was larger and did straddle the River Medlock. However, it had an irregular plan that seems to have included some of the buildings shown on the two earlier maps either side of the river, which suggests that the fire did not destroy all the buildings on the site. Though finally destroyed by fire in 1915, the pier supporting this second warehouse survives in the middle of the Medlock, showing that the 1789 rebuild included two shipping holes underneath and through the warehouse. Frustratingly, the only image of the warehouse to have so far come to light is on the Natte view of the Castlefield basin drawn in 1807. To the east of the Grocers' Warehouse on the right-hand edge of the picture is the end three bays

Fig 9.10: The Grocers' Warehouse in the 1980s after demolition in 1960 (copyright GMAU).



Fig 9.11: The layout of the late eighteenth century Grocers' Warehouse, showing the primary 1770s phase (black) and the 1780s extension (grey). It also shows the location of the canal arms and the penstock (PS) and wheelpit (WP) that powered the internal hoist system. Based upon the work of Boucher and Tomlinson (copyright Michael Nevell).

of a five-storey warehouse over the River Medlock that can only be the northern range of the Duke's Warehouse. It is thus unclear what the appearances of the rebuilt and original Duke's Warehouse were. It is unknown whether the first warehouse had several stories with a central pier, like its successor or whether the first warehouse was a single storey structure with a pent or roof over part of the canal – a design familiar from dock-side structures of the period and common across the canal network in the nineteenth century.

A further difficulty in assessing the original form of the warehouse from the map evidence is the absence of the Duke's Warehouse from Johann Ludwig Hogrewe's plan of the basin drawn in 1777 and published in 1780.<sup>27</sup> This does, however, show the Grocers' Warehouse. If it was drawn just after the building of the Grocers', but just before the construction of the Duke's Warehouse that would explain the discrepancy; yet the Bridgewater Archives plan of 1771 would seem to make this impossible. Just how reliable these primary sources are is unclear, so for the moment the question of the date of the construction of the Grocers' and the Duke's Warehouses must remain unclear. Since the contemporary written accounts of John Whittaker in the mid-1760s<sup>28</sup> and of Arthur Young's from 1769 make no mention of either warehouse, a date range of 1771-7 remains our best estimate on the present evidence. However, it is clear from both the 1771 and 1785 plan that the Duke's was a smaller warehouse, without the internal canal arm arrangement of the Grocers'. The Grocers' thus appears to be the first Type 1 warehouse to be built, with the rebuilt Duke's Warehouse following this design in 1789.

## Development of the Grocers'

The primary *c*. 1771-7 phase of the Grocers' Warehouse was 63 foot (*c*. 19.2 metres) deep and 31.5 foot (*c*. 9.6 metres) wide with five storeys rising 45 foot (*c*. 13.72 metres) from the 'quay to the eaves'.<sup>29</sup> Tomlinson, who surveyed the building before demolition in 1960, records that the floors were softwood supported by a central brick wall running the length of the original structure. There were doorways in this

internal partition to allow access from front to back and hoist holes on each floor above the loading docks which allowed goods to travel up the building.

The later development of the Grocers' Warehouse can be recovered from the map sequence, written material and sketches of the building in the decades after 1777. Contemporary accounts are not detailed enough to highlight the extension and development of the warehouse. Ogden did not mention any warehouses in his description of Manchester in 1783. Phillips writing about the quays in Castlefield around 1792 described seeing 'vessels sail into the warehouses and a great quantity of corn in there of all sorts'.<sup>30</sup> The map evidence is the most revealing in terms of the physical development of the warehouse. Foulke's map of 1785 is a little difficult to interpret due to the later annotation but it shows the Grocers' with a single canal arm and what appears to be an eastern extension roughly one and half times the length of the original warehouse. Green's map of Manchester published in 1794 (Fig 7.9) shows a further eastward extension that included a short northern wing. Nattes' drawing of the Grocers' Warehouse in 1807 showed the second canal arm had been built by that date. Stott's 1821 map shows yet another eastward extension that took the warehouse almost to the western side of Deansgate. It was this extended form of the warehouse that was bisected by the construction of the Bridgewater Viaduct in 1841.31

The tenants of the Grocers' have been outlined by Tomlinson, beginning with Hugh Henshall, Brindely's brother-in-law, in 1777,<sup>32</sup> with more tenants being added by the 1790s and 1800s to reflect the expansion of the building, down to 1811 when the Manchester Grocers' Company took over the whole complex. Despite being known as the Grocers' ever since, by 1836 it was being run by Mark Nightingale & Co. Soon after, in 1853, the middle section of the warehouse was sold and demolished.<sup>33</sup> By 1900 a pent or roof over the canal had been added to the southern elevation of the warehouse. This truncated warehouse, which amounted to half its 1841 length was retained until its demolition in 1960.<sup>34</sup>

Though the warehouse was partially reconstructed in the mid-1980s<sup>35</sup> substantial elements of the original warehouse survive into the twenty-first century. The most extensive is the rear, northern brick wall which acts as a retaining wall for Castle Street and which runs for more than 50 metres. This wall survives up to three storeys high and was built in English Garden wall bonded-brick. A building break can still be seen marking the division between the original eastern gable of 1771-7 warehouse and the lateeighteenth century eastward extensions. The truncated stubs of three cross-walls also survive in the eastern half of the warehouse indicating the position of a series of cross-walls that rose through the building. At the western end of the warehouse a fragment of the south-western wall facade from the original 1770s warehouse has been incorporated within the 1980s reconstruction and includes an original keystone arched window opening. The basement of the reconstructed western section retains the 1770s wheel pit (see above) and the line of the two canal arms. These remains are sufficiently extensive to give an impression of the substantial and imposing nature of the Grocers' in the late-eighteenth and earlynineteenth centuries.

### The Significance of the Grocers'

The Grocers' Warehouse is not the first canal warehouse on the British Canal system, and as it may not have been built until as late as 1777 it was probably not designed by James Brindley, who died in 1773. Rather, the Grocers' Warehouse should be regarded as the first true canal warehouse; that is the first warehouse to be built using internal canal arms and split-level loading facilities, thus breaking with earlier river- and dock-side warehouse forms. Its development marked the culmination of a decade of innovation in waterways design along the Bridgewater Canal and by the end of the 1770s this style of Type 1 canal warehouse was being built on other British canals.

It had a lasting impact on goods handling within canal warehouses, this design being used until the mid-nineteenth century.<sup>36</sup> Furthermore, it had a direct impact on the railway warehouses of the nineteenth century, for the design of the 1830 Liverpool Road Railway Warehouse was probably adapted from a Type 1 canal warehouse plan-from.<sup>37</sup> Split-level internal loading combining rail and water transport remained a feature of warehouse design as late as the 1920s.<sup>38</sup> The Grocers' ruinous remains are thus one of the most iconic and most important buildings on the British canal system.

#### Notes

1) See the bibliographical note at the end of this monograph. In each case it seems likely that the anniversaries of the opening of the canal (the 100<sup>th</sup> in 1861, the 150<sup>th</sup> in 1911, and the 200<sup>th</sup> in 1961) spurred a period of academic and popular research. In the 1860s this coincided with a renewed interest in local history, whilst during the 1960s it coincided with the emergence of industrial archaeology as a significant branch of archaeology.

2) Tomlinson V I, 1961, 'Early warehouses on Manchester Waterways', *Transactions of the Lancashire and Cheshire Antiquarian Soci*ety 71, pp. 129-51. This paper includes the first industrial archaeology excavation in Manchester; the excavation of the two wheelpits associated with the Grocer's Warehouse. Boucher C T G, 1989, 'The restoration of two water mills in Greater Manchester', *Manchester Memoirs: Memoirs and Proceedings of the Manchester Literary and Philosophical Society* Volume 127 for 1987-88, pp. 18-27. This latter paper built on the restoration work Boucher did for the Castlefield Redevelopment Corporation in the mid-1980s and some earlier research of his in the mid-1960s published in Boucher C T G, 1968, James Brindley Engineer 1716-1772, Goose & Son Limited, Norwich, pp. 46-64.

3) Some of the rediscovered documentary material was used in a 2003 article by the current author; Nevell M, 2003, 'The Archaeology of the Canal Warehouses of North-West England and the Social Archaeology of Industrialisation', *Industrial Archaeology Review* 25.1, pp. 43-58.

4) A collection of papers edited by Adrian Jarvis and Ken Smith discuss the functional and structural development of dock- and river-side warehouses and transit sheds: Jarvis A & Smith K, 1999, *Albert Dock: Trade and Technology*. National Museums and Galleries on Merseyside.

5) Tomlinson 1961, pp. 129-33.

6) Malet H, 1977, *Bridgewater, the Canal Duke*. Second edition. Manchester University Press, p. 61.

7) Malet 1977, 99; Tomlinson 1961, pp. 132-3.

8) Whittaker J, 1771, The History of Manchester. Volume I, 81.

9) Anon 1766, *The History of Inland Navigation*. London, p. 39, quoting this anonymous letter of 1<sup>st</sup> July 1765.

10) Anon 1766, 48. A similar canal tunnel and hoist system was used by John Gilbert on the Donnington Wood Canal, built 1765 -7. Lead P, 1989, *Agents of Revolution. John and Thomas Gilbert -Entrepreneurs.* Staffordshire Heritage Series, Centre for Local History, University of Keele, pp. 64-5.

11) Sillitoe P, 1989, 'Water Power and Containerisation at Castlefield. Current investigations into Eighteenth-Century Innovative Technology', *Greater Manchester Archaeological Journal* Volume 3, p. 119; Tomlinson 1961, pp. 139-40; Young 1769, *A six months tour through the North of England: containing an account of the present state of agriculture, manufacturies and population. Volume 3.* (London), pp. 201-2; p. 208.

12) Tomlinson 1961, 141. Sillitoe P, 2007, 'A new 'Brindley' find at Castlefield, Manchester', *Industrial Archaeology News No. 142*, pp. 6-7. The alignment of this coal tunnel was cut through by the Rochdale Canal in 1799 according to Hadfield C & Biddle G, 1970, *The Canals of North West England*, Volume II, p. 272, and since that canal was higher than the Bridgewater this new section of tunnel was abandoned.

13) Aldred J, 1988, *A historical geography of Worsley village 1200-1850 from contemporary maps and records.* Worsley Civic Trust; Boucher 1968; Malet 1977.

14) Young 1769, pp. 202-7.

15) Boucher C, 1968.

16) Fletcher M, 2008, Old Mill, Congleton, Cheshire – Brindley's Grand Design?' *Industrial Archaeology Review* 30.1, pp. 49 -70.

17) Boucher 1968, pp. 28-9.

18) Tomlinson 1961, p. 137.

19) Palmer M, Nevell M & Sissons M, forthcoming 2012, *Industrial Archaeology: A Handbook*. Council for British Archaeology Practical Handbook series, York.

20) Nevell 2003; the Type 1 canal warehouse also influenced railway warehouse design – see Nevell M, 2010, 'The Archaeology of the Rural railway Warehouse in North-West England', *Industrial Archaeology Review 32.2*, pp. 103-15.

21) Tomlinson 1961, pp. 143-5.

22) .Sillitoe 1989; A Plan of bis Grace the Duke of Bridgewater's Curious Weir...in Castle Fileds, near Manchester. MS plan in Manchester Scrapbook, Item No 199, Chetham's Library, Manchester.

23) A copy of Hogrewe's map of Castlefield, drawn in 1777 and published in 1780 in his *Beschreibung der in England seit 1759...can be found at the* British Library, entitled 'A colored map of the Duke of Bridgewater's canal between Liverpool, Manchester and Worsley; drawn in 1777, on a scale of 3 <sup>1</sup>/<sub>2</sub> miles to an inch, by Johann Ludewig Hogrewe, Captain of Engineers'.

24) Bridgewater Archive, Salford City Council; UMAU, 1998, *Knott Mill Bridge: An Archaeological Evaluation*. University of Manchester Archaeological Unit unpublished report; Nevell M & Walker J, 2001 *Portland Basin and the archaeology of the canal warehouse*. Vol. 1 The Archaeology of Tameside (Tameside MBC with the University of Manchester)., pp. 22-5.

25) Tomlinson 1961, pp. 142.

26) Bridgewater Archives, Salford City Council. Goads Insurance map of Manchester, published in 1888, describes the Duke's, or 'Old', warehouse as being five storeys high and containing cotton warehousing and flour warehousing.

27) Sillitoe 1989.

28) Whittaker's account was not published until 1771.

28) Tomlinson 1961, pp. 135-6.

29) Bradshaw 1987, pp. 20-1.

30) Tomlinson 1961, p. 148.

31) Clegg H, 1955, The Third Duke of Bridgewater's Canal Works in Manchester', *Transactions of the Lancashire and Cheshire Antiquarian Society*, vol LXV, p. 100.

32) Tomlinson 1961, pp. 146-8.

33) According to Tomlinson 1961 the final form of the interior of the warehouse was caught in a series of photographs taken by the City Council in 1960, but so far these have not been located.

34) Boucher 1989; Grigor J, 1994, 'The Castlefield Renaissance', in Manchester Memoirs: Memoirs and Proceedings of the Manchester Literary and Philosophical Society Volume 133 for 1993-94, pp. 61-70. 35) Nevell 2003.

36) McNeil R, 2004, "The 1830 Railway Warehouse: an old model for a new system", *Transactions of the Lancashire and Cheshire Antiquarian Society* vol 100, pp. 91-101.

37) Nevell 2010.



The Bridgewater Canal was first opened on 17th July 1761. 2011 marked the 250<sup>th</sup> anniversary of this momentous event. It was affectionately known as the 'Duke's Cut', and was viewed by contemporaries as one the most influential transport monuments of the Industrial Age. The papers in this monograph take a fresh look at the archaeological and historical importance of the 41 mile (66 km) long canal. They range from studies of the Worsley canal village, the underground canals accessing the coal mines, and the barges using the canal, to the Castlefield canal basin, Runcorn terminus and the warehouses along the route. The monograph also summarises archaeological and historical work on the canal over the last 20 years, as well as suggesting a research strategy for the future. From canal boats and aqueducts, to embankments, warehouses and water-management, the Bridgewater Canal was the fore-runner of many of the innovations in transport during the Industrial Revolution, making it a monument of world significance.

Front Cover (top to bottom): Boothstown barges; Broadheath New Warehouse in 1943; Worsley lime kiln excavation; The Barton Swing Aqueduct; Runcorn terminus in 1785; Bridgewater House, Runcorn.

Back Cover: Portrait of the Duke of Bridgewater in later life. An engraving by C Picart from a painting by J M Craig (courtesy of Salford City Archive, The Mullineux Collection, T1647).

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