THE DEVELOPMENT OF CANALS IN WARWICKSHIRE, AND THEIR INFLUENCE ON THE SOCIAL AND ECONOMIC GEOGRAPHY OF THE COUNTY.

by

ELIZABETH AKU ARDAYFIO, B.A.

A Thesis submitted for the Degree of
Doctor of Philosophy in the Faculty of Arts.

Department of Geography.
University of Birmingham.

July, 1974.

SYNOPSIS

The major factors affecting canal routing in Warwickshire, as well as the importance of the canals in linking Coventry and the Avon towns of Stratford and Warwick with the growing industrial centres of Birmingham and the Black Country, and their function in providing an outlet through other canal connections to the four major ports of the Mersey, Humber, Severn and Thames are here discussed. Considerable transformations were also effected by the part the canals played in the Industrial Revolution: they proved pre-eminently a remarkably cheap way of moving bulky goods, particularly coal, to meet the country's agricultural, extractive and manufacturing demands between 1790 and 1838. The influence of canals on the distribution of coal during this period was enormous; coal markets were geographically extended beyond purely local markets, and coal prices were halved, while a wider variety, both cheaper and dearer kinds, became available in consequence of the canal revolution. Besides facilitating the distribution of goods, the Warwickshire Canals were to stimulate the development of industries, giving rise to factories and associated wharves, particularly in towns such as Birmingham, Warwick and Stratford. The secondary effects of the canals were no less impressive, particularly in their influence on settlement, giving rise to such features as lockmen's cottages and canal inns, most of which arose where roads had been intersected by canals so requiring the construction of distinctive bridges. In the fourth decade of the nineteenth century, however, the pattern of development began to change drastically with the advent of railways, a process which quickened during the middle of the nineteenth century

when canal development was arrested. Stagnation and decline of the canals as commercial waterways set in from 1838, with only occasional and short-lived recovery until a revival of interest for non-commercial reasons around 1964 when canals began to play a part in the provision of recreation facilities which are deemed so important today.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

I must acknowledge with gratitude the assistance given by Professor Harry Thorpe, Geography Department, University of Birmingham, whose valuable criticism, guidance, and encouragement throughout the period of my research, have contributed largely to make this work a success. I am also grateful to him for having made my stay here so stimulating academically. Thanks are also due to other members of the lecturing staff of the Geography Department and my postgraduate colleagues who have helped me in various ways. Messrs. R. Swift and G. P. Dowling worked hard to reproduce photographically the maps within a very short time, while Mr. D. W. Oliver, the chief technician, has always given me the most cordial assistance. I also thank Dr. A. W. A. White, Coventry, for his fruitful discussions.

The help that I have received from a large number of Record Offices has been considerable, and special acknowledgement must be made to the archivists, librarians, and staff of the County Record Office (Warwick), Shakespeare's Library (Stratford), Birmingham Reference Library, House of Lords Record Office and the British Transport Historical Record Office (London), whose assistance has been courteously placed at my disposal. I wish also to thank Sir William Dugdale for permission to use information from his manuscript collections at Merevale, and the Curator of the Canal Museum at Stoke Bruerne for kindly making the old canal photographs (32, 33) available.

Thanks are no less due to canal cruising firms, angling societies, the British Waterways Board, Trent and Severn River Authorities, for their kind co-operation in supplying information and to the numerous canalside firms for returning questionnaires so promptly. Finally, I express my gratitude to the many friends that I have found in canal cottages, who kindly gave me access to their homes for discussion and close investigation.

LIST OF TABLES

LIST OF FIGURES AND DIAGRAMS

LIST OF PLATES

ABBREVIATIONS

B'ham Ref. Lib.	Birmingham Reference Library.
B.T.H.R.	British Transport Historical Record Office, London.
C.R.O.	County Record Office, Warwick.
H.L.R.O.	House of Lords Record Office, London.
Shakespeare's Lib.	Shakespeare's Birthplace Library, Stratford-upon-Avon.
V.C.H.	The Victoria County Histories of Warwickshire.
B.C.N.	Birmingham Canal Navigations.
B.W.B.	British Waterways Board, London.
DART.	Dartington Amenity Research Trust, Devon.
B.S.R.	Birmingham Suburban Railway.
G.W.R.	Great Western Railway.
L.N.W.R.	London and North Western Railway.
L.M. & S.R.	London Midland and Scottish Railway.
M.R.	Midland Railway.
O.W.W.R.	Oxford, Worcester and Wolverhampton Railway.
S.V.R.	Stour Valley Railway.

INTRODUCTION

The study is essentially concerned with the theme of canal developments in Warwickshire, and their influence on the social and economic geography of the county. While it is essential, through the systematic study of the canals, to consider Warwickshire within the national pattern, local regional influences are closely examined. The canals, totalling 124 miles selected for study, comprise the Coventry, Stratford, Birmingham-Warwick, Warwick-Napton, Birmingham-Warwick-Junction Canals and the Oxford Canal from Hawkesbury Junction to the north of Claydon. Canals like the Birmingham-Fazeley and the B.C.N. are deliberately omitted because they are Black Country Canals; similarly, the Worcester-Birmingham Canal is excluded since only four miles of its course run through Warwickshire. The choice of Warwickshire provides a broad framework in which to consider the impact of canals, both singly and jointly, on a county located in the heart of Midland England. On the other hand, problems clearly arise from the difficulty of being able to appreciate fully the influence of such canals as the Oxford Canal, whose greater length falls outside the study area. Thus the major part of the course of the Oxford Canal lies within the Cherwell-Thames drainage system[1], which falls completely outside the region of study. Moreover, it is often difficult to establish Oxford Canal data which applies only to Warwickshire.

---

(1) Appleton, J. H. (1962). The Geography of Communications in Great Britain. Chapter 4. Oxford University Press. London.

The study of canal patterns can be approached from two main points of view - physical or historical. Farrington[2] employed a physical approach in his study of the English canals, in which he examined the relationship between canal routes and their physical environment. But the present study of the Warwickshire Canals, being essentially an essay in historical geography is approached from the historical point of view[3], considering the pattern and function of the Warwickshire Canals through time, from their establishment to the present day, in order to achieve[4] a fuller understanding of the geographical implications of the canal system, its spatial character, distinctive features, and the impact which it had both socially and economically on the county of Warwickshire. The genetic approach has been used by many historical geographers to elucidate problems concerned with the historical development of transport systems. For instance, R. W. G. Bryant[5] used this approach

---

(2) Farrington, J. H. (1969). Morphological Studies of English Canals. Ph.D. Thesis, University of Hull.

(3) Appleton, J. H. (1965). A Morphological Approach to the Geography of Transport. University of Hull, Occasional Papers in Geography, No. 20, pp. 26-8. Hull.

Darby, H.C. (1936). Historical Geography of England before 1800. Cambridge University Press. Vide Sauer, C.O. (1941). "Foreword to Historical Geography," Annals of the Association of American Geographers, 31, No. 1, March 1941, pp. 1-24. Lancaster.

(4) Clark, A. (1954). "Historical Geography", American Geography Inventory and Prospect, p. 72. Syracuse University Press.

(5) Bryant, R. W. G. (1939). The English Canal System in its Geographical and Industrial Relations, unpublished M.A. thesis, University of London. Vide Porteous, J.D. (1968). Urban Genesis and Development. Ph.D. Thesis, University of Hull. He used the genetic approach in the study of four canal-created ports viz. Runcorn, Stourport, Goole and Ellesmere.

to show the development of canals throughout the whole of England, as did A. J. Williams[6] in his attempt to understand the establishment and the impact of the Bridgewater Canal on the areas through which it passed. The same method[7] was used, albeit for a different transport medium in a comparative study of two rail networks in the Columbia Basin and South Australia by D. W. Meinig, who admirably brought out the importance of the evolutionary aspect in an interpretation of the morphology of a railway network. To him "areal patterns are rarely as simple as they seem and to divorce the pattern from the process is an invitation to error..."[8], hence his plea for an historical approach in the understanding of pattern in railway networks. Such a genetic approach is employed in the present thesis, but to the historical geographer the establishment of chronology is only a beginning. A major aim in the study is, therefore, to examine the nature of, and relationships between, causes and effects in canal development by scrutinising emergent patterns, space relationship and both local and regional responses at different points in time to the advent and continuation of canals. It is unlikely that generalisations reached for Warwickshire would be necessarily applicable, in whole or in part, to other English counties with canal networks. Although the concern of the thesis is with the main Canal Age, the importance of the past in the living present is not overlooked and the final chapters are concerned with the changing function of canals since.

---

(6) Williams, A. J. (1957). The Impact of the Construction of the Bridgewater Canal on Land-use in Adjacent Areas. M.A. Thesis, University of Manchester.

(7) Meinig, D. W. (1962). "A Comparative Historical Geography of Two Railnets: Columbia Basin and South Australia". Annals of the Association of American Geographers, 52, pp. 394-412, Syracuse University Press.

(8) Meinig, D. W. (1962), op.cit.

The whole period of study, therefore, may be conveniently divided into three. The first phase, 1790-1838, represents the period of major canal construction and of economic prosperity of the canals, while the second, 1838-1964, saw the decline of the canals. In 1880 the Royal Commission on Canals and Inland Waterways was set up to investigate the problems and factors that had caused the decline of the canals, and so it is a convenient limit to the period when canals were considered profitable as commercial waterways; the latter part of the period, namely 1880 to 1964, covers a period of general neglect and stagnation punctuated by two World Wars. The definition of the two phases mentioned is not rigid, for there was a considerable overlap between the end of the first period and the early years of the second. For example, the last Warwickshire Canal (Birmingham-Warwick Junction) was not finished until 1844; furthermore, canals continued to operate despite serious threat from, and gradual replacement by, the more efficient railways. The final short period, 1964-1973, discusses changing attitudes towards canals and their functions; although rightly identified as a period, one would emphasize that the seven years covered in this thesis mark only the beginning of what is likely to be a lengthy period of great activity which will form a worthy topic for postgraduate dissertations in future years. 1964 is chosen as the beginning of this 'final period' because it was during this year that a report, produced by the British Waterways Board, officially declared non-profitable commercial waterways as cruising waterways.

In Chapter One emphasis is placed on the need for canal construction, and on the factors influencing the local county pattern.

These embrace topographic considerations as well as social and economic factors. Chapter Two focuses on the economic viability of the canals during the period 1790-1880, by considering in detail their impact on the distribution of goods, especially coal, their catchment areas and their effect on coal prices. Attention is also devoted to waggon roads and tramways which acted as important feeders to the canals. Chapter Three considers other economic developments particularly the role canals played in attracting industries, factories and associated wharves. In Chapter Four the secondary and cultural effects of the Warwickshire Canals are discussed, with particular reference to their influence on settlements ranging from various forms of canal cottages to canal inns. The arrest of both economic and social developments with the coming of the railways in the 1930's forms the basis of Chapter Five, which also appraises physical problems, as well as economic factors, which were to lead to the subsequent decline of canals. The concluding chapter, Six, attempts to re-appraise canals in a modern context, the uses of the network today evaluating both old and new functions.

Sources of Information and Problems encountered in the Study

Research in Historical Geography as in most disciplines, faces particular problems. Firstly, there is often a lack of basic source material, and, even when such data exist, problems may arise from the inaccurate and dubious nature of some of the material.

The use of Directories, such as those of Pigot, White and West, used widely in Chapter Three, fall into this latter category. The most notable characteristics of such Directories is their commercial nature[9], having developed as accessories to trade and the distribution of goods. As contributors presumably paid for inclusion it is likely that only the more substantial tradesmen and professional classes were included. It is misleading, therefore, to regard them as either comprehensive or accurate. For example, in 1850 Slater listed only six coal merchants in Stratford, whereas White's Directory gave fourteen. This is just one local example, but one could quote many instances of such inconsistencies[10], and even of downright dishonesty, among Directory compilers so casting serious doubts on the reliability of at least some Directories. A major problem in this study has been that of adapting and processing collections of material which have often been fragmentary, piece-meal, local rather than regional in cover, and lacking close coincidence of date, units of measure or descriptive detail. A study confronted with such problems requires an approach that is, unfortunately, less rigid than that used in a deliberately designed and controlled experimental analysis. With regard to the present thesis, canal documents, such as ledgers and Minute Books are far from complete, with large gaps during the period of study. Rarely do Minute Books give a regular recording of tonnage of goods carried, for in some years there was no recording[11]. As an example of such difficulties, one finds that only one volume of the Stratford Canal Company Minute Book survives; similarly when the Great Western Railway

---

(9) Norton, J. E. (1950). Guide to the National Provincial Directories of England and Wales, excluding London, published before 1856. pp. 1-18. Royal Historical Society. London. Vide West, J. (1962). Village Records, p. 162. Macmillan and Co. Ltd. London.

(10) Norton, J. E. (1950). op.cit.

(11) Hadfield, C. (1955). "Sources for the History of British Canals". The Journal of Transport History, Vol. II, pp. 80-8. The University College of Leicester.

bought it up in 1862, the former set up a special canal committee, as did many railways, but none of the Minute Books of this committee survives. Even when data is fortuitously available, it often covers only a short period, making it difficult or even impossible to establish clear trends within the period of study. Nor does modernity guarantee requisite detail, as an examination of the British Waterways Board annual statistics (1967-72), used for analysis in the first part of Chapter Six, confirms. The annual counts by the British Waterways Board of participants in various forms of recreation on the canals are undertaken in August, the peak of the season, by an enumerator who is allocated a length of five miles. The method of counting clearly leads to understatement of the actual use of the waterway because, as will be seen in Chapter Six, the enumerator fails to count boats, anglers or casual visitors travelling behind or ahead of him. Moreover, counts may be affected by the weather which might be dry in one part yet wet in another part of the same county. The annual counts, therefore, give only a general picture of the use of the canals for recreation, but satisfactorily show canal stretches popular for cruising and angling, and to what extent the popularity of the system changes from year to year. Thus, important though some of the broad generalisations may be, detailed information may be misleading or incomplete. With the problem of fragmentary evidence that besets such a study as the present, the generalisations reached are conditioned by the documents on which they are based, and cannot have the same authenticity as those for which numerical data is available.

In the course of this study a wide range of published and manuscript material has been consulted. Minute Books, housed in the British Transport Historical Record Office, London, of all the canals under investigation, were a primary source covering all aspects of the transactions of the canals. They provided information ranging from problems of construction and finance to traffic. Though the Minute Books are useful, they seldom give reasons for action or confirm that action has been taken; they only record that a decision to take action was made. Ledgers, surviving for the Coventry and Oxford Canals, are of two types - those which record the trade in quantity, kind and revenue at toll houses, and those that record the accounts of the Company. The former type is invaluable for analysing the nature and extent of trade on the canal, and the value of such information offsets the considerable time involved in their analysis. Traders' accounts and receipts are also useful for economic analysis of canals, but there are significant gaps and even within the sporadic periods covered, data for particular months are missing. These documents cover mostly coal traffic, but remain silent on the effect of the canals on local agriculture, though occasional mention was made of the carriage of limestone and lime, for use as fertiliser. The problem of fragmentary data has been considerable, especially during the periods of decline. There were, for example, very useful specimen returns of traffic on the Oxford Canal at Hawkesbury, Hillmorton and Napton showing origin and destination of traffic, but this covers only two years (1942-44).

Many documents were unfortunately destroyed during World War II, and this seems to contribute to the lack of consistent data.

Records of Turnpike Trusts, including Minute Books, plans of projected improvements, housed in the C.R.O., Warwick, were used in an attempt to establish the complementarity between roads and canals. Other original manuscripts include the diary of G. R. Bird and the memoranda book of the Pickford Carrying Company, which are invaluable sources of information concerning the kinds of physical problems that faced canal operation and influenced the speed of fly boats. Private manuscript collections like those of the Newdigates (now in the County Record Office, Warwick) and the Dugdale Muniments in Merevale, contain collections of reports by North-East Warwickshire colliery companies, which provide a source of information for such matters as the prices and conveyance of coal. The Jewel Baillie Collections (in Birmingham Reference Library) also contain papers and plans of the Stratford and Warwick Canals (1794) about correspondence between landowners and the respective canal companies concerning the agreement for purchases of land, but the manuscripts are barely decipherable. Included in the documentary and printed sources are Parliamentary Reports like the Canal Acts and Reports of Parliamentary Commissions, such as the Canal Returns made to the Board of Trade on canal statistics in 1888 and 1898; and the Report of the Royal Commission on the Canals and Inland Navigations of the United Kingdom of 1906-11, particularly, volumes 9-12, which provides a mine of information during the last period of canal carrying. To these can be added the Committees of Inquiries into the inland coal trade in 1800, and 1830. Another source of information consists of miscellaneous reports, papers and documents, which do not easily fall into categories: among these are contemporary journals, like the Canals and Waterways Journal, published in Birmingham (1919-48). These give a great deal of information about the reports, notices of meetings and advertisements.

Aris's Birmingham Gazette (1779-1850), housed in the Birmingham Reference Library, was also used.

Cartographic evidence has been of particular value in this study. Deposited plans, stored in the County Record Office, Warwick, show canal routes which were modified, and collateral branches that were never built. Moreover, they illustrate the property which was to be affected by the canal and the type of land-use along the canals. Estate, enclosure and tithe awards, comprising plans and written documents are a wealth of information on the effect of the canals on land-use[12], particularly on agriculture and wharf development. Before 1850[13] the large-scale enclosure and tithe maps form an invaluable source of information for nineteenth century agriculture, and give full information about field-names, as influenced by canal development, land-use, roads and footpaths. They also provide detail of the various farm units[14]. The enclosure and tithe maps tend to complement each other in both date and coverage, the former covering the century after 1750 whilst the latter for Warwickshire concentrate between 1838 and 1850. Though these maps yield valuable information to support generalizations, other documentary sources like the first editions of Ordnance Survey 6" (1886-1914) and 25" (1851) maps are used to test the accuracy of these maps. Other contemporary maps such as those of Henry Beighton (1722-5) and William Yates (1793), George Bradshaw's map

---

(12) Vide Harley, J. B. (1962). "Enclosure and Tithe Maps". The Amateur Historian, Vol. 7, no. 8. pp. 270-5. National Council of Social Service. London.

(13) Harley, J. B. (1967). "A Guide to British Sources. (2) Estate Maps". The Amateur Historian, Vol. 7, No. 7, pp. 223-231. National Council of Social Service. London.

(14) Baker, R. H. (1962). "Local History in Estate Maps". The Amateur Historian, Vol. 5, No. 3, pp. 66-70. National Council of Social Service. London. Vide West J. (1962). Village Records. pp. 139-146. Macmillan and Co. Ltd. London.

of the Midland Canals in 1830, and Ordnance Survey maps, scale 1/500 (1881), 1/1250 (1851) have also been used. The Ordnance Survey maps just mentioned are very detailed and have been most useful as a basis for analysing the influence of the Stratford and Warwick Canals in establishing industries and associated wharves in Stratford, Warwick and Long Itchington. In addition, extensive field work, involving the study of the canals on the ground, has been undertaken for the 124 miles of canals in the study area, in order to determine their major characteristics and to ascertain the pattern of distribution of such features as lock-keepers' cottages and canal inns. During this field survey the 2½" Ordnance Survey maps were found to be very useful because details could be added and they are less cumbersome than the 6" maps. Finally, additional information has been obtained either through interviews or personal correspondence with the B.W.B., Trent and Severn River Authorities, and angling and cruising clubs. Interviews and communication with canal cruising firms did not present any problem - letters were promptly replied to; but, with the angling and cruising clubs, several letters and telephone calls became necessary to obtain information. A similar problem was encountered with the amenity section of the B.W.B. where information about residential mooring of boats has not yet been received. Questionnaire surveys of canalside firms along the Coventry and Stratford Canals were conducted to obtain information relating to the present use of the canals. Since it was difficult to establish the address of the canalside factories from directories or Ordnancy Survey maps, the questionnaires were distributed personally to the managers of the firms who readily co-operated in supplying information. There was a 60% response, which provided information on which valid conclusions have been based.

CHAPTER ONE

THE DEVELOPMENT OF THE WARWICKSHIRE CANAL SYSTEM

Need for Canal Construction

Even before the eighteenth century several major roads ran through Warwickshire, such as that running from London through Daventry, Coventry and Coleshill shown on the 'Anonymous' Map of 1603, and the London-Shrewsbury road passing through Birmingham and Warwick, as Ogilby illustrated in his road book[1]. But most of the roads were highways catering for the movement requirements of an economy in which productive activity was directed mainly to serve local needs, where specialization was achieved within the confines of local market areas. Under these circumstances goods were transported over short distances to and from markets between adjoining villages and nearby towns. It must be pointed out that there was some long distance trade by cart in special classes of heavy goods, like millstones, and in luxuries such as silk, fine quality cloth, wines and pigments, which were sufficiently compact to be carried by horse and of sufficient value to cover the cost of transport to fairs. There was also some long distance trade, for instance, in coal by sea[2] to British Ports. While many attempts had been made to improve the roads of the country to meet the growing transport demands, these were only partially

---

(1) Ogilby, J. (1675). Britannia, Vol. I. An illustration of the Kingdom of England & Dominion of Wales, London. The Britannia, containing strip maps of the roads and the details in their immediate neighbourhood and also a descriptive text, was the first measured survey of the English roads.

(2) Jackson, W. T. (1916). The Development of Transportation in Modern England, pp. 58-84, University Press, Cambridge.

successful. For the eighteenth century Acts of Parliament sustaining the Common Law obligations of towns and parishes as regards road maintenance, were difficult to enforce. Turnpikes were established on roads whereby tolls were levied on road users. Though the first turnpike dates from 1663, it was not until the eighteenth century that turnpike roads became numerous; even then it was only to a small proportion of roads that turnpike treatment was applied. Turnpiking in the eighteenth century was concerned generally with short lengths of road, so that on the main thoroughfares the state of the road would vary, stretches of road in poor condition alternating with better stretches maintained by the Turnpike Trusts. A general improvement in the roads of the country had to await the development of road-making techniques of the eighteenth century and early nineteenth century, of which Metcalfe, Telford and Macadam were the pioneers.

Analysis of turnpike roads by Cossons[3] and Albert[4] shows that only few turnpike Acts were passed between 1751 and 1772, during the turnpike mania. Among these turnpike Acts can be cited that for the Meriden-Dunchurch Road (17 miles long), passed in 1664, that of Birmingham to Stratford (12 miles long) and the Warrington-Birmingham, both passed in 1725 (Fig. 1). By 1839, however, 73% of the roads in Warwickshire, covering 468.3 miles, had been turnpiked. The improvements in road conditions resulting from turnpiking were of

---

(3) Cossons, A., (1946). "Warwickshire Turnpikes". In Transactions of the Birmingham Archaelogical Society, p. 53 ff, University Press, Oxford.

(4) Albert, W. (1972). The Turnpike Road System in England, 1663-1840. pp. 301, 224-8. University Press. Cambridge. Albert's work is about the whole of England as the title suggests, but he agrees with Arthur Cossons that only a few turnpike Acts existed between 1751 and 1772.

DEVELOPMENT OF TURNPIKE ROADS IN WARWICKSHIRE 1700-1850

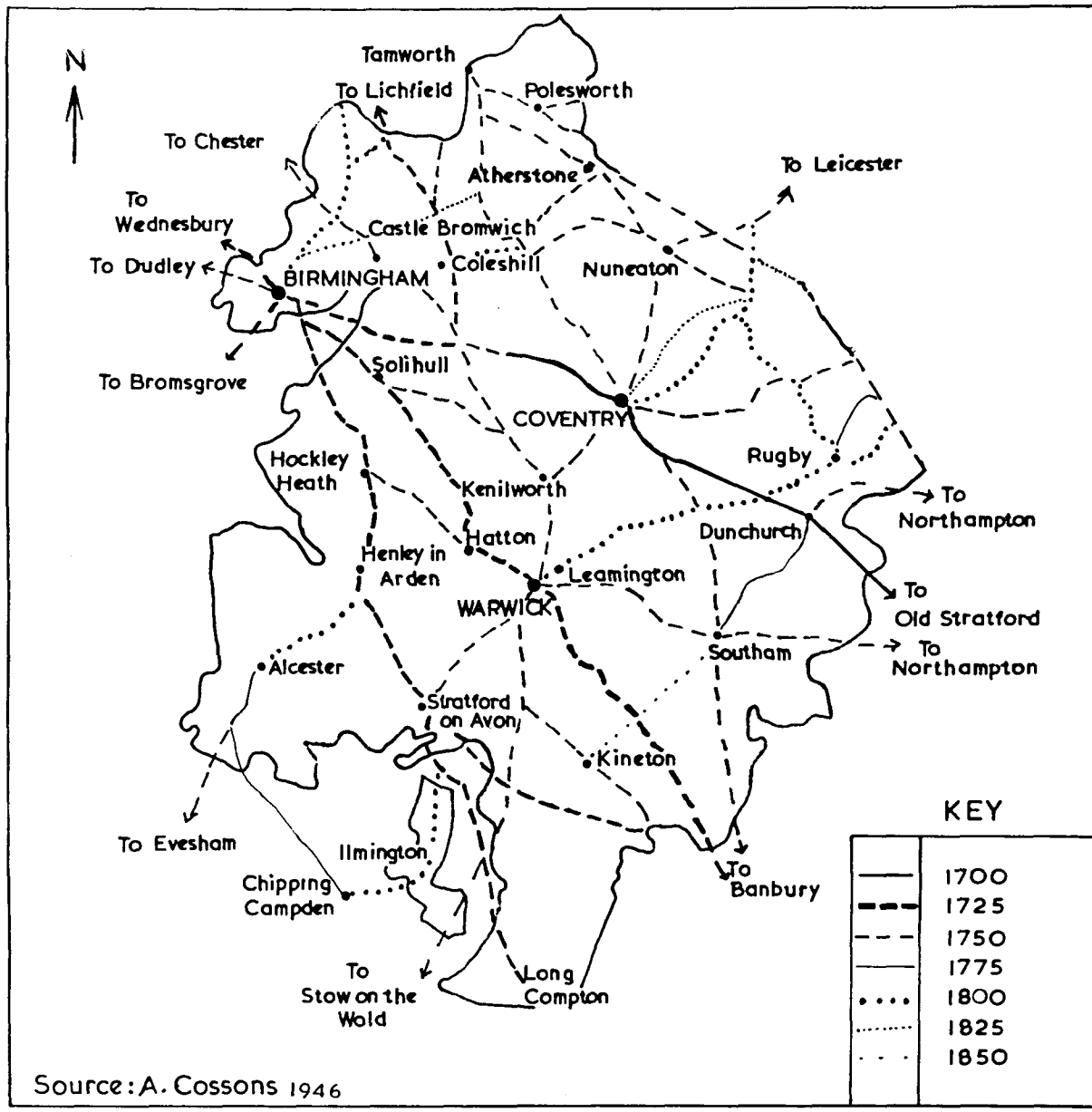


FIG. 1

singular importance since they served as the basis for subsequent road improvements, and later, assisted the flow of goods to canal points. More important still, the turnpike period witnessed considerable investments in agriculture and decline in agricultural prices arising from lower transport costs which helped to extend agricultural markets. The importance of turnpiking to agricultural development is further supported by Albert,[5] who pointed out that the great majority of enclosures in the 1760s and 1770s were within one to three miles of an existing turnpike. Thus, small market towns like Southam and Kineton, mainly concerned with the collection and distribution of local produce, (Fig. 1) were linked to each other and to the regional centres of Birmingham and Coventry, to which the shire town of Warwick and the market town of Stratford transported surplus grain by cart from their rich hinterlands. In return they obtained coal and iron brought by waggons from Birmingham and the Black Country.

Stratford, at the head of navigation of the Avon, benefited greatly from its river-road links with market towns like Evesham further down the Severn-Avon system. Defoe visited Stratford-upon-Avon in the eighteenth century. To him "the navigation is an exceeding advantage to all this part of the country, and also to the commerce of the city of Bristol. For by this river they derive a very great trade for sugar, oil, wine, tobacco, iron, lead and in a word all heavy goods which are carried by water almost as far as Warwick; and in return the corn, and especially the cheese is brought back from Gloucestershire

---

(5) Albert, W. (1972). op.cit. Vide Dyos, H. J. and Aldcroft, D. H. (1969). British Transport: An Economic Survey from the C17th to C20th. pp. 65-72. University Press, Leicester.

and Warwickshire to Bristol"[6]. In 1831 Priestley[7] remarked that "the river is of infinite advantage to the towns of Evesham, Pershore, Stratford and in the country adjacent, supplying them with coal and merchandize and serving to export their surplus agricultural produce". From Tewkesbury merchandize like wine, cider, cast and pig iron and coal, especially from the Severnside collieries, were shipped to Stratford and its environs, though Wheeler suggests that as roads were improved they encouraged more direct movement of goods to the Midlands, so by-passing Stratford. It was this fact, together with the general improvement in transport in response to long distance hauls necessitated by the growth in agriculture in the country and manufacturing activity in and around the expanding towns, that stimulated Stratford's interest in canals.

Development of the Warwickshire Canals in Relation to the National Pattern

In the latter part of the eighteenth century, as the Industrial Revolution gained momentum, the inadequacy of the existing inland communications became more pronounced and many parts of Great Britain began to require coal in increasing quantities. Consequently, the need for a better and cheaper method of moving coal became urgent[8].

---

(6) Defoe, D. (1928). A Tour through England and Wales. 2nd ed. (1948), ii. p. 42. J. M. Dent and Son. Ltd., London. Vide Hadfield, C. and Norris, J. (1968), Waterways to Stratford, p.22, David and Charles, Newton Abbot.

(7) Priestley, J. (1831). Navigable Rivers and Canals of England and Wales, p. 39. Longman, Rees, Orme, Brown and Green. London.

(8) Knowles, L. C. A. (1929). The Industrial and Commercial Revolutions in Great Britain during the Nineteenth Century, 4th ed. (1947), pp. 238-241. George Routledge and Sons, London.

For example, furnaces in the Black Country required large quantities of charcoal or coke for smelting iron; similarly, the North Staffordshire pottery industry required china clay from Cornwall to supplement local Etruria marl and other resources, as well as coal for firing, and - above all - a cheap and secure method of transporting the manufactured pottery. The national timber famine made coal increasingly important in urban areas, while the growing textile industries consumed vast quantities of coal. So it was not surprising that the first canals originated in the expanding industrial districts of Lancashire and North Staffordshire. The Bridgewater Canal was opened in 1761 to provide a more economic transport outlet from the Worsley Pits to Manchester and Runcorn. (Fig. 2). It was the success of this canal which sparked off the speculative "canal mania" of 1792[9]. (Actually the Sankey Brook or St. Helens Canal was the first to be built in 1755, but the Bridgewater Canal was cited as the first canal because it sparked off the "canal mania".) The mania started with the Trent-Mersey and the Staffordshire-Worcestershire Canals in 1766 to connect the rivers Trent, Mersey and Severn. These were followed by the Birmingham Canal in 1768, a first step in a process that was to establish Birmingham as a national canal centre. By 1790 the Birmingham Canal had been connected to the Coventry and Oxford Canals. The connection formed the first real canal network in Britain and saw the realization of Brindley's objective to link the Mersey, Severn, Trent and Thames by a 'great cross' of over 260 miles.

---

(9) Phillips, J. (1803). History of Inland Navigation, pp. 70-1, Architectural Press, London. Vide Hodgkinson, H. R. (1913). Notes on the History of Midland Waterways. T.B.A.S., 39, pp. 83-8. Hudson and Son. Birmingham. Kirkaldy, A. W. and Evans, A. D. (1915). The History and Economics of Transport. pp. 20-5. Sir I. Pitman and Sons, Ltd. London.

THE MIDLAND CANALS IN RELATION TO THE MAJOR NATIONAL CANAL PATTERN OF ENGLAND

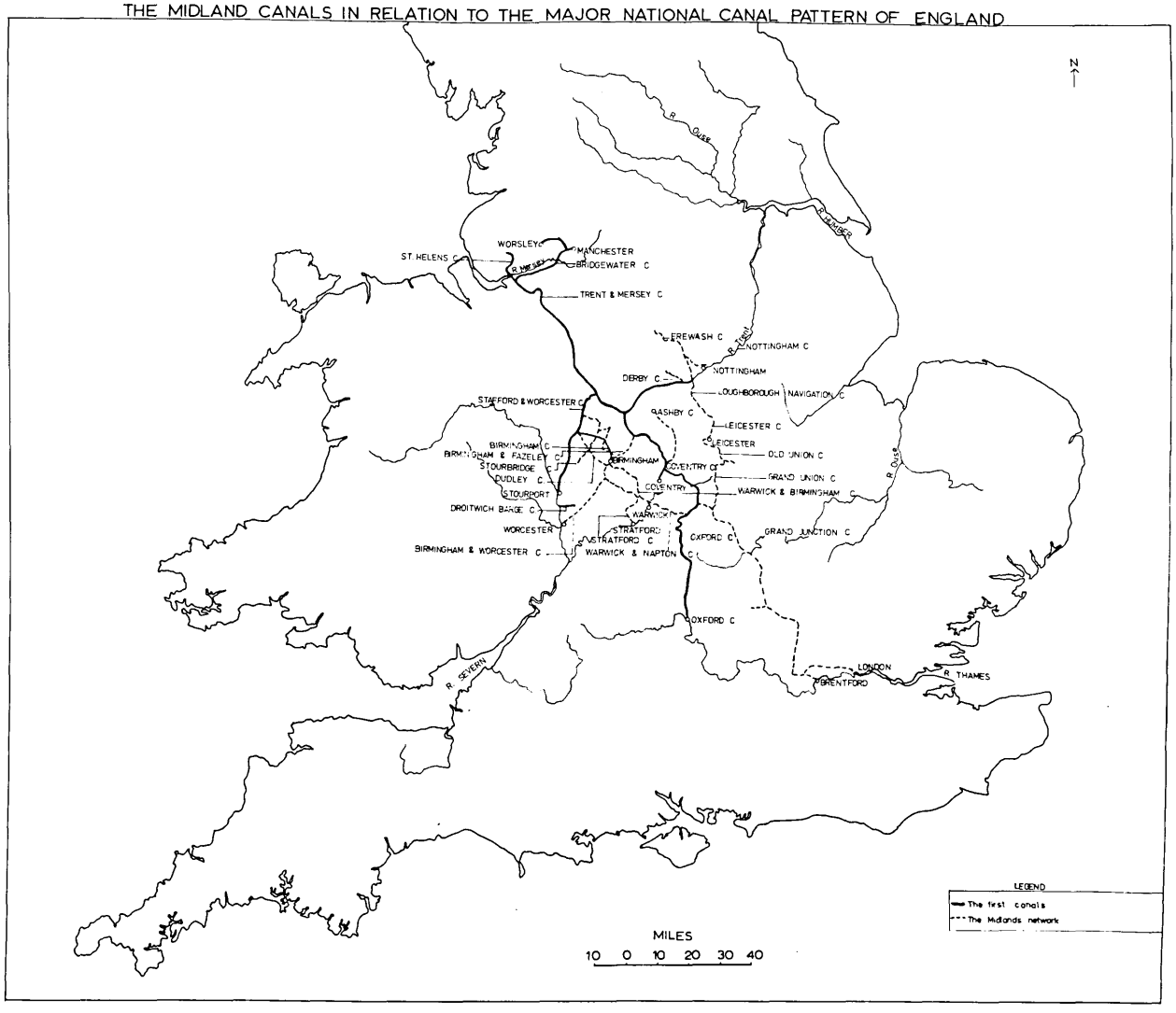


FIG. 2

Though the Manchester district was the birthplace of the English canal system, the centre of gravity was soon to shift to the Midlands - to the manufacturing centre of Birmingham and South Staffordshire, which became the hub of the canal network, as shown in Fig. 2. Expansion continued and the four canals, already mentioned, soon proved inadequate outlets to the major rivers. Consequently, in 1791 the Worcester-Birmingham Canal was authorized, promising a much more direct route to the Severn. With the promotion of the Grand Junction Canal in 1792, the Dudley Canal Company planned to extend its line eastwards to join the Worcester-Birmingham at Selly Oak so forming a much more direct route to London independent of the Birmingham Canal. Meanwhile the opening of the Birmingham-Fazeley Canal in 1789 had seriously affected the trade of the Warwick and Stratford markets[10] which used to sell their corn in the Coventry area conveying it by cart. Though the River Avon assumed considerable importance, as already explained, the problem of linking the hinterland of Stratford with the growing industrial centres of Birmingham and the Black Country still remained. As a result, both the market town of Stratford and the shire town of Warwick became interested in the possibilities of canal links. There was, therefore, an early plan[11] for a line from the Birmingham Canal to Stratford with a branch to Warwick, but the Birmingham Canal Company intervened because it saw the possibility of a shorter link than the route through the Birmingham-Fazeley Canal to London.

---

(10) Aris's Birmingham Gazette, 11 April 1774. The Aris's Birmingham Gazette became a regular daily newspaper in 1743 and was circulated as far north as Newcastle and as far south as London.

(11) Aris's Birmingham Gazette, 11 April 1774.

Their influence led to a split in the project and two separate schemes resulted; one became the Stratford Canal and the other the Warwick-Birmingham Canal both authorized in 1793. The Warwick-Braunston (later altered to Warwick-Napton) was authorized in 1794 to extend the latter to the Oxford Canal. The completion of these canals, together with the Birmingham-Warwick Junction in 1844, saw the emergence of the major canal pattern of Warwickshire as part of the Midland network serving not only the county of Warwickshire, but also the rest of England through its linkages to the major 'Cross'. By 1844 Warwickshire was covered by approximately 124 miles of canals but with limited access. These embraced the Coventry, Stratford, Warwick-Birmingham, Warwick-Napton, and Warwick-Birmingham Junction Canals, and the Oxford Canal from its junction with the Coventry Canal to the north of Claydon, but excluding the Birmingham Canals which are in Staffordshire. As shown in Fig. 3, the rate of growth was slow indeed. The Warwick-Birmingham Canal of $22\frac{5}{8}$ miles and the Warwick-Napton Canal of $14\frac{1}{4}$ miles were the quickest to build, taking six years, but the construction of the Stratford Canal ($25\frac{5}{8}$ miles) took no less than twenty years, starting in 1793 from Kings Norton, and not reaching Stratford until as late as 1816. The reasons for the slow progress are examined later in this chapter.

Factors affecting the Canal Pattern

Physical Considerations

Dominating the relief of Warwickshire is the north-west Birmingham Plateau (a pear-shaped mass mainly lying over 400', and rising to 1,036' in Walton Hill) which is separated by the Tame, Blythe and their tributaries from the East Warwickshire Plateau (Fig. 4).

THE DEVELOPMENT OF THE CANAL PATTERN OF WARWICKSHIRE

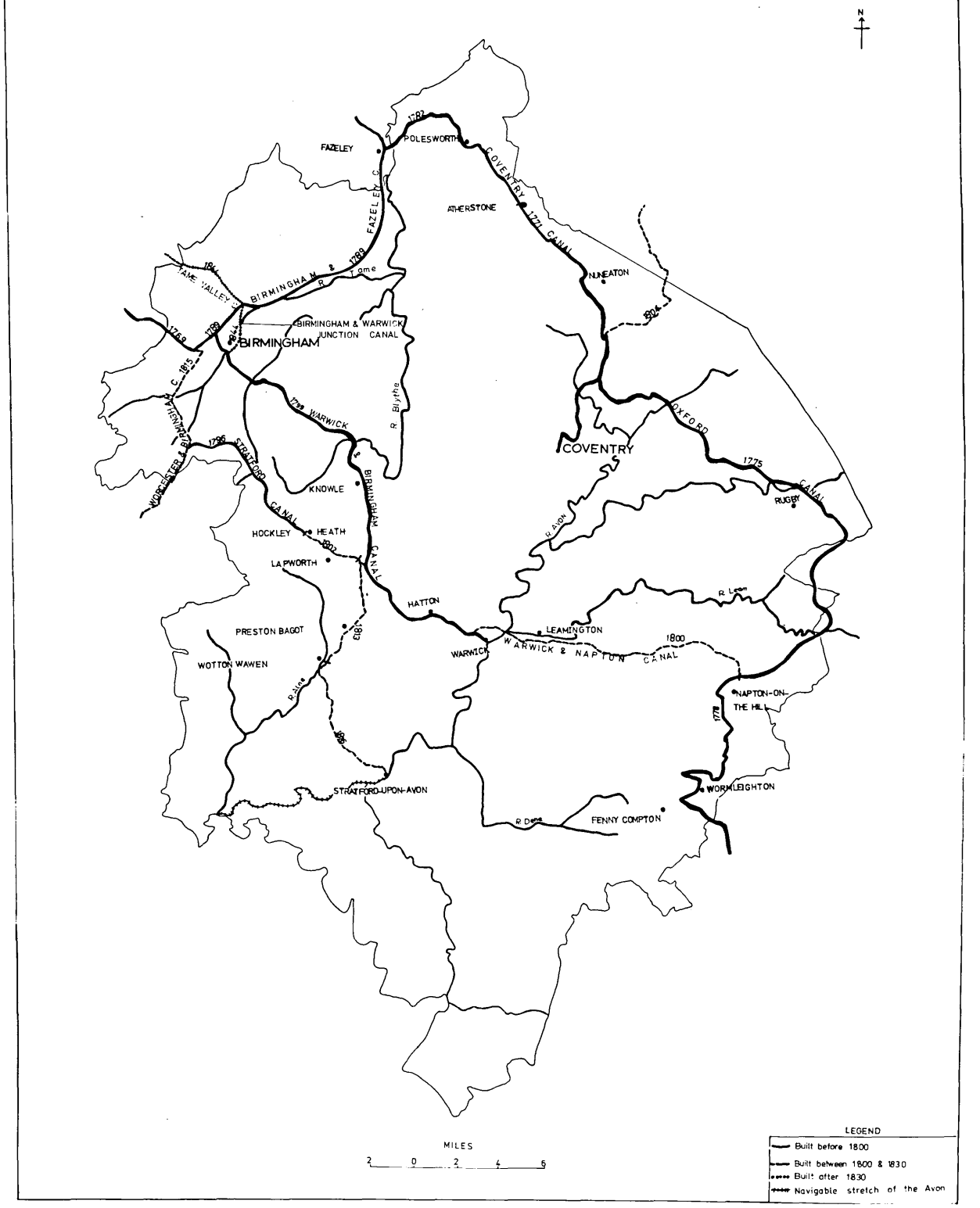


FIG. 3

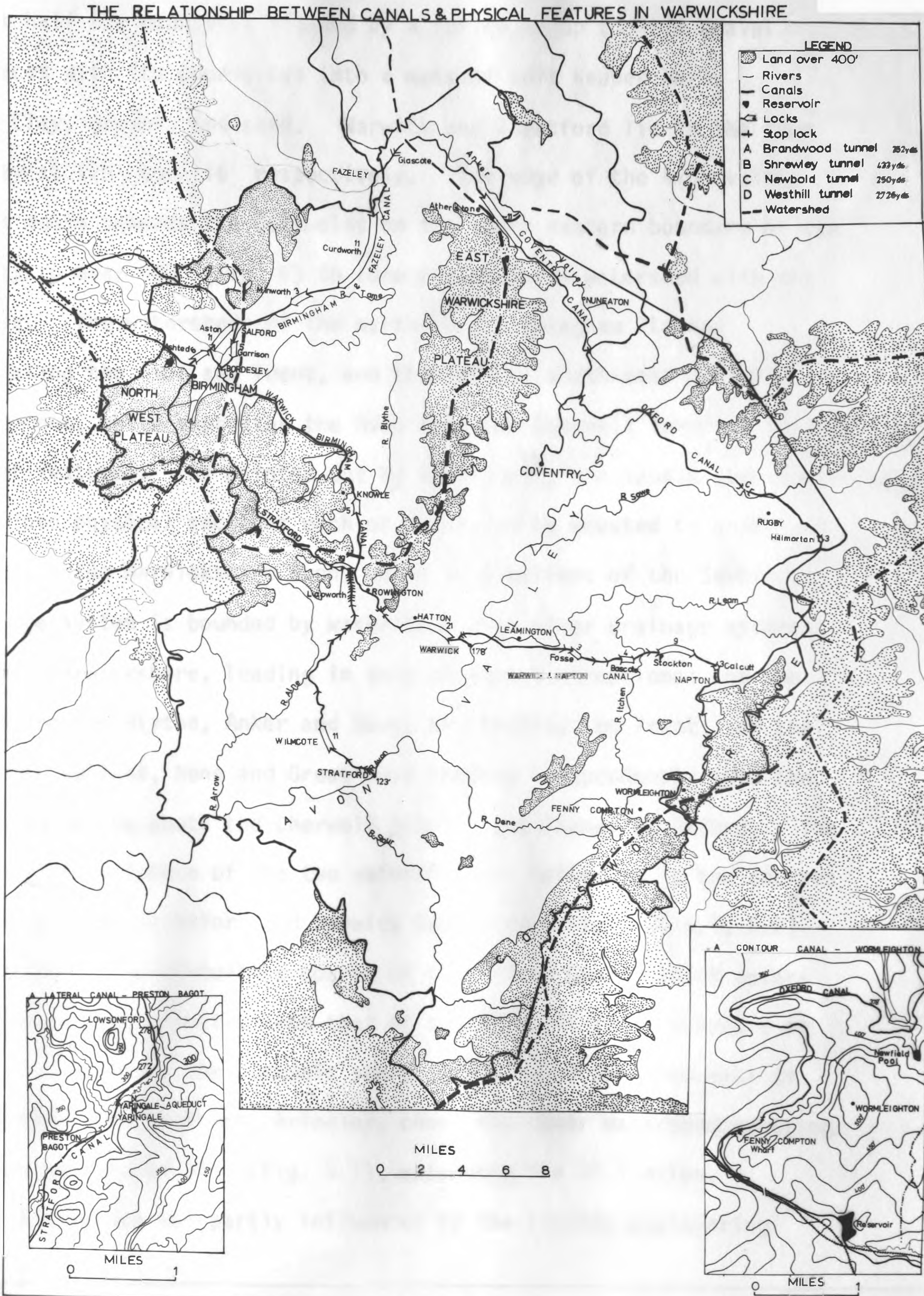

THE RELATIONSHIP BETWEEN CANALS & PHYSICAL FEATURES IN WARWICKSHIRE
LEGEND
Land over 400'
Rivers
Canals
Reservoir
Locks
Stop lock
A Brandwood tunnel 352yds
B Shrewley tunnel 433yds
C Newbold tunnel 250yds
D Westhill tunnel 2726yds
Watershed
FAZELEY
Glascote
Atherstone
Curdworth
Minworth
BIRMINGHAM & FAZELEY CANAL
R. Tame
EAST
WARWICKSHIRE
PLATEAU
COVENTRY CANAL
NUNEATON
R. Anker
Aston
SALFORD
Garrison
BORDESLEY
BIRMINGHAM
NORTH
WEST
PLATEAU
WARWICK & BIRMINGHAM
R. Blythe
OXFORD CANAL
COVENTRY
R. Sowe
RUGBY
Hillmorton
KNOWLE
STRATFORD CANAL
ROWINGTON
Lapworth
HATTON
LEAMINGTON
R. Leam
WARWICK
Fosse
Bascote
Stockton
Calcutt
NAPTON
WARWICK & NAPTON CANAL
R. Itchen
R. Alne
WILMCOTE
STRATFORD
R. Arrow
AVON
R. Stour
R. Dene
WORMLEIGHTON
FENNY COMPTON
A LATERAL CANAL - PRESTON BAGOT
LOWSONFORD
YARINGALE AQUEDUCT
YARINGALE
PRESTON BAGOT
STRATFORD CANAL
MILES
0 1
MILES
0 2 4 6 8
A CONTOUR CANAL - WORMLEIGHTON
OXFORD CANAL
Newfield Pool
WORMLEIGHTON
FENNY COMPTON Wharf
Reservoir
MILES
0 1

FIG. 4

The Avon with its tributaries the Leam, Dene, Stour and Arrow, draining about half the county is flanked by a series of up to five gravel terraces with its course cut into a mass of soft Keuper Marl, Lias Clay, gravels and sand. Warwick and Stratford lie in the Avon valley at 178' and 116' respectively. The edge of the Avon valley rises again towards the Cotswolds on the south eastern boundary of the county to over 600' (Fig. 4) to form the southern watershed with the Thames. The watersheds of the north-west Birmingham Plateau separating the Avon and Trent, and that of the south-east Jurassic escarpment, which separates the Avon from the Cherwell form the strongest relief features. As pointed out by Appleton[12], the canals seem to fall into physical sections each of which can be equated to a drainage system. The Warwickshire Avon, which is a salient of the Severn drainage system is bounded by watersheds with other drainage systems, outside Warwickshire, leading in very different directions: on the north are the Blythe, Anker and Soar, all feeding the Trent; on the east the Welland, Nene and Great Ouse feeding independently into the Wash and on the south the Cherwell joining the Thames at Oxford. The pronounced influence of the two watersheds is reflected in the courses of the Oxford, Stratford and Warwick Canals (see Figs. 5, 5.1, 5.2). For example, the circuitous course of the Oxford Canal, which enters the Avon system directly from that of the Cherwell is illustrated in Fig. 4. To cross the Jurassic scarp, trending from north-east to south-west, the engineer, Brindley, chose the lower watershed crossing at an elevation of 377' (Fig. 5.1), extending for 10.1 miles. While his choice was partly influenced by the limited engineering

---

(12) Appleton, J. H. (1962). Geography of Communications. pp. 101-4. University Press. Leicester.

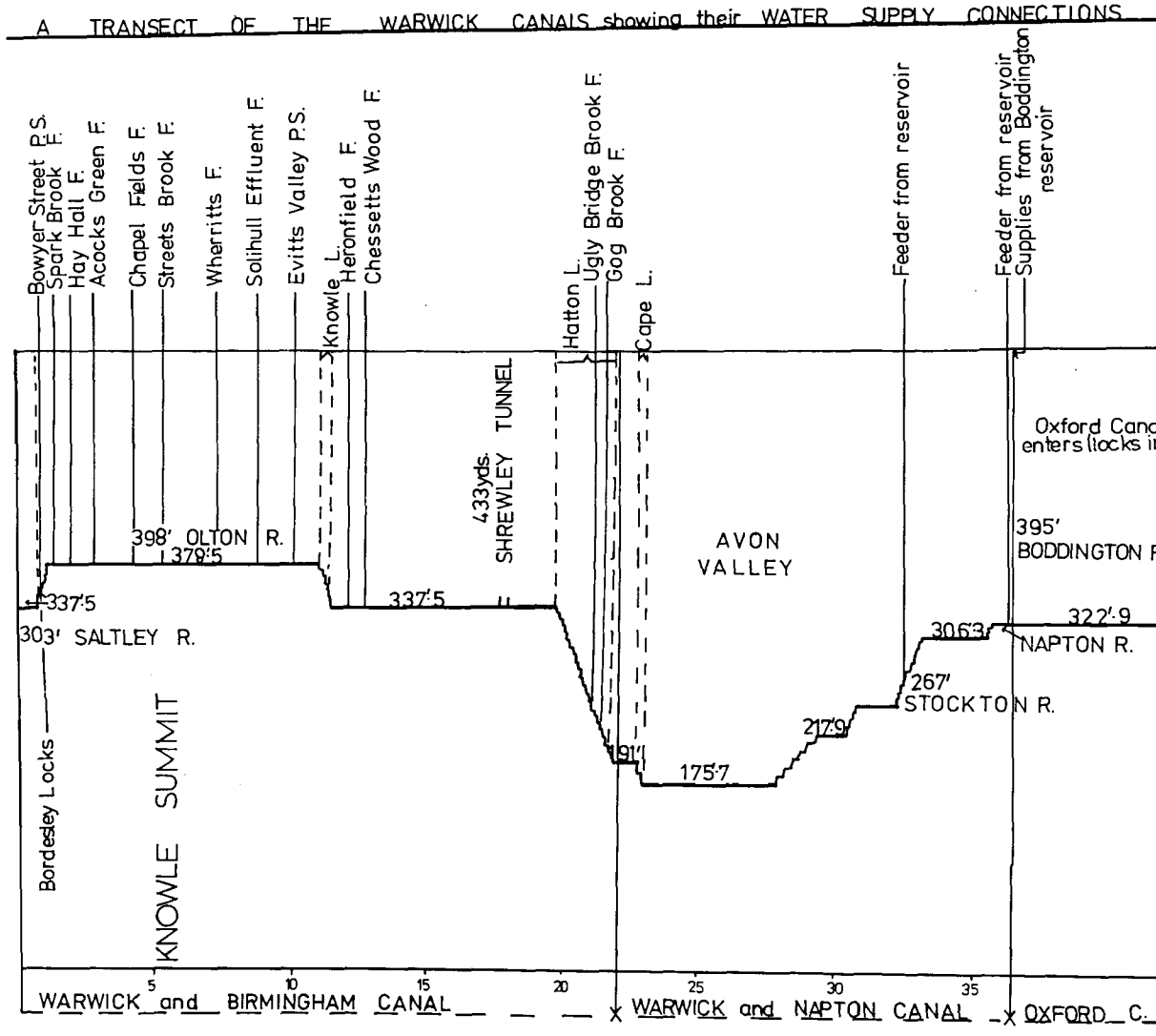

A TRANSECT OF THE WARWICK CANALS showing their WATER SUPPLY CONNECTIONS
Bowyer Street P.S.
Spark Brook F.
Hay Hall F.
Acocks Green F.
Chapel Fields F.
Streets Brook F.
Wharritts F.
Solihull Effluent F.
Evitts Valley P.S.
Knowle L.
Heronfield F.
Chessetts Wood F.
Hatton L.
Ugly Bridge Brook F.
Gog Brook F.
Cape L.
Feeder from reservoir
Feeder from reservoir Supplies from Boddington reservoir
Oxford Canal enters locks in
433yds. SHREWLEY TUNNEL
AVON VALLEY
398' OLTON R.
379'5
337'5
337'5
303' SALTLEY R.
395' BODDINGTON R.
322'9
306'3
NAPTON R.
267'
STOCKTON R.
217'9
191'
175'7
Bordesley Locks
KNOWLE SUMMIT
5
10
15
20
25
30
35
WARWICK and BIRMINGHAM CANAL
WARWICK and NAPTON CANAL
OXFORD C.

FIG. 5

A TRANSECT OF THE OXFORD CANAL

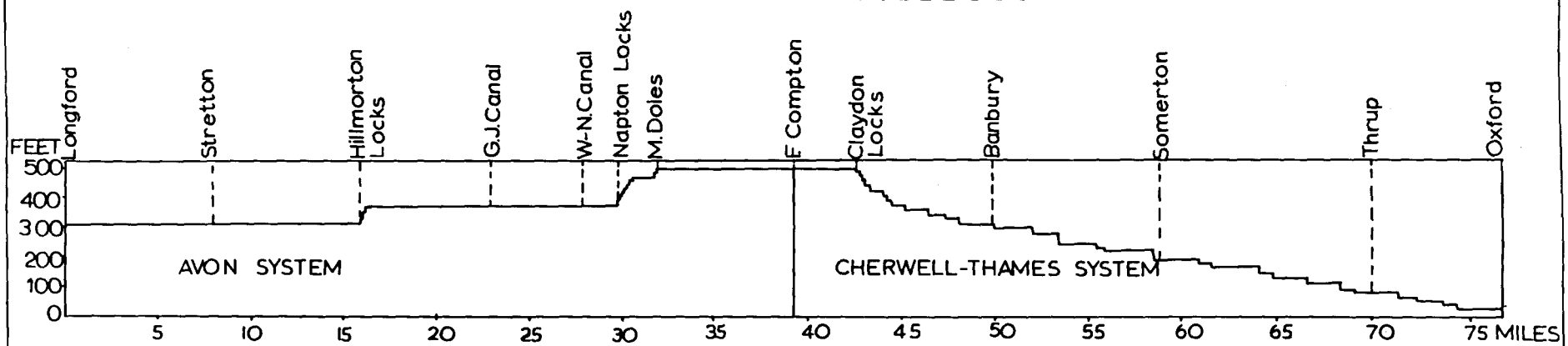


FIG. 5.1

A TRANSECT OF THE STRATFORD CANAL

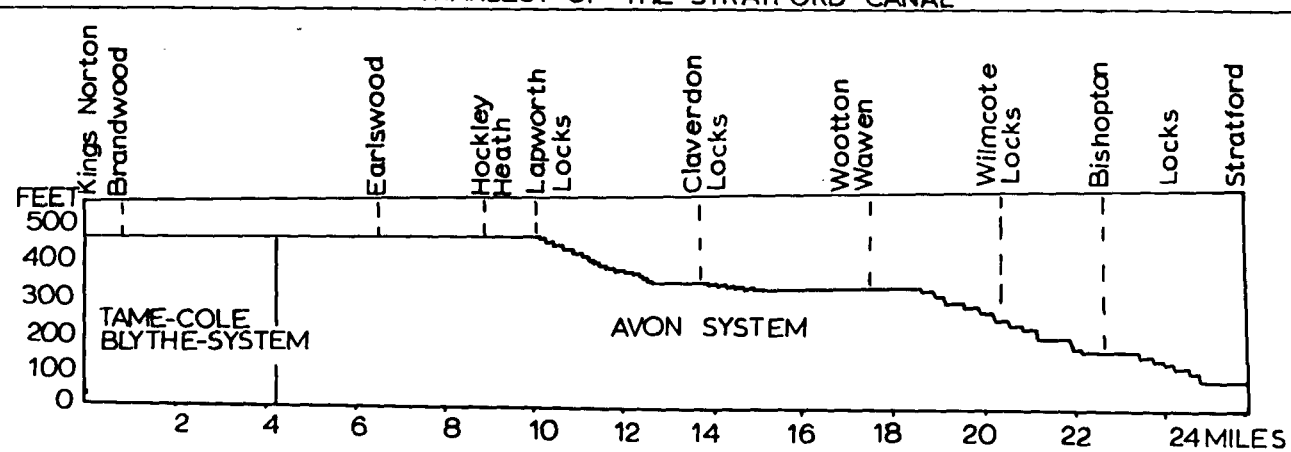


FIG. 5.2

techniques and small capital available, the need to secure a large supply of water for feeding the canal remained of great importance. From the Braunston summit level the canal made use of the Fenny Compton gap at 340', which was formed partly by the headward erosion of dip-slope streams like the Clayholme Brook draining to the Cherwell, and partly by downcutting associated with an overflow of the glacial lake, Harrison[13]. There were two other gaps[14] through the Jurassic scarp: the Daventry gap (470') and the Avon Dassett gap (435'), but the Fenny Compton gap was the obvious choice because it is the lowest and on the desired route between the Thames and the Coventry Canal to which the Oxford Canal was linked. Once through the gap, the Oxford Canal swings north-eastward, following very closely the 400' contour which coincides with the foot of the scarp. The effect of such contouring becomes more conspicuous from Wormleighton Hill, which the canal almost encircles like a moat (Fig. 4 inset). A long-standing legend maintains that Earl Spencer, who owned lands at Wormleighton,

---

(13) Shotton, F. W. (1953). "The Pleistocene Deposits of the area between Coventry, Rugby and Leamington and their bearing upon the Topographic Development of the Midlands". Philosophical Transactions of the Royal Society of London. Series B. Biological Sciences, No. 646, Vol. 237, pp. 209-260. Vide Bishop, W. W. (1958). "The Pleistocene Geology and Geomorphology of Three Gaps in the Midland Jurassic Escarpment". Philosophical Transactions of the Royal Society of London. Series B. Biological Sciences, No. 682, Vol. 241, pp. 256-262.

(14). Shotton, F. W. (1953). op.cit. pp. 251-2.

raised objections to the cutting of the canal and would only consent to the canal passing through his property on condition that it passed through the enclosed lands of each of his tenant farmers (Fig. 6). However, the Oxford Canal minute books state that the plan produced by Simcock, Brindley's assistant included no lock on Earl Spencer's property, so that "the navigators will have no business to stop for any purpose, so that the apprehended 'Danger' from the inroads will be less"[15]. This suggests that Earl Spencer agreed somewhat unwillingly to the canal - a fact further supported by his insistence that the wharf and inn should be outside his parish[16]. The Oxford Canal Company themselves in explaining the need for the improvements of the canal in 1824, gave economy and opposition of landowners as the cause of the unsatisfactory course of the original line. Though there might have been initial opposition from Earl Spencer the pattern clearly emphasizes more the effect of relief, and it is largely fortuitous that the canal passes through the separate farm tenancies. North of Wormleighton the canal falls in two stages, by 55'3" at Napton and 18'10" at Hillmorton (Fig. 5.1) to a level of 303' which is maintained for 16 miles to Longford (120'), the lowest point anywhere on the upper Avon watershed.

---

(15) B.T.H.R., Oxford Canal Company Minutes and Reports, 26th April, 1775, OXC1/2.

(16) Thorpe, H., (1965). The Lord and the Landscape, Transactions, Birmingham Archaeological Society, Vol. 80, p. 71. University Press, Oxford.

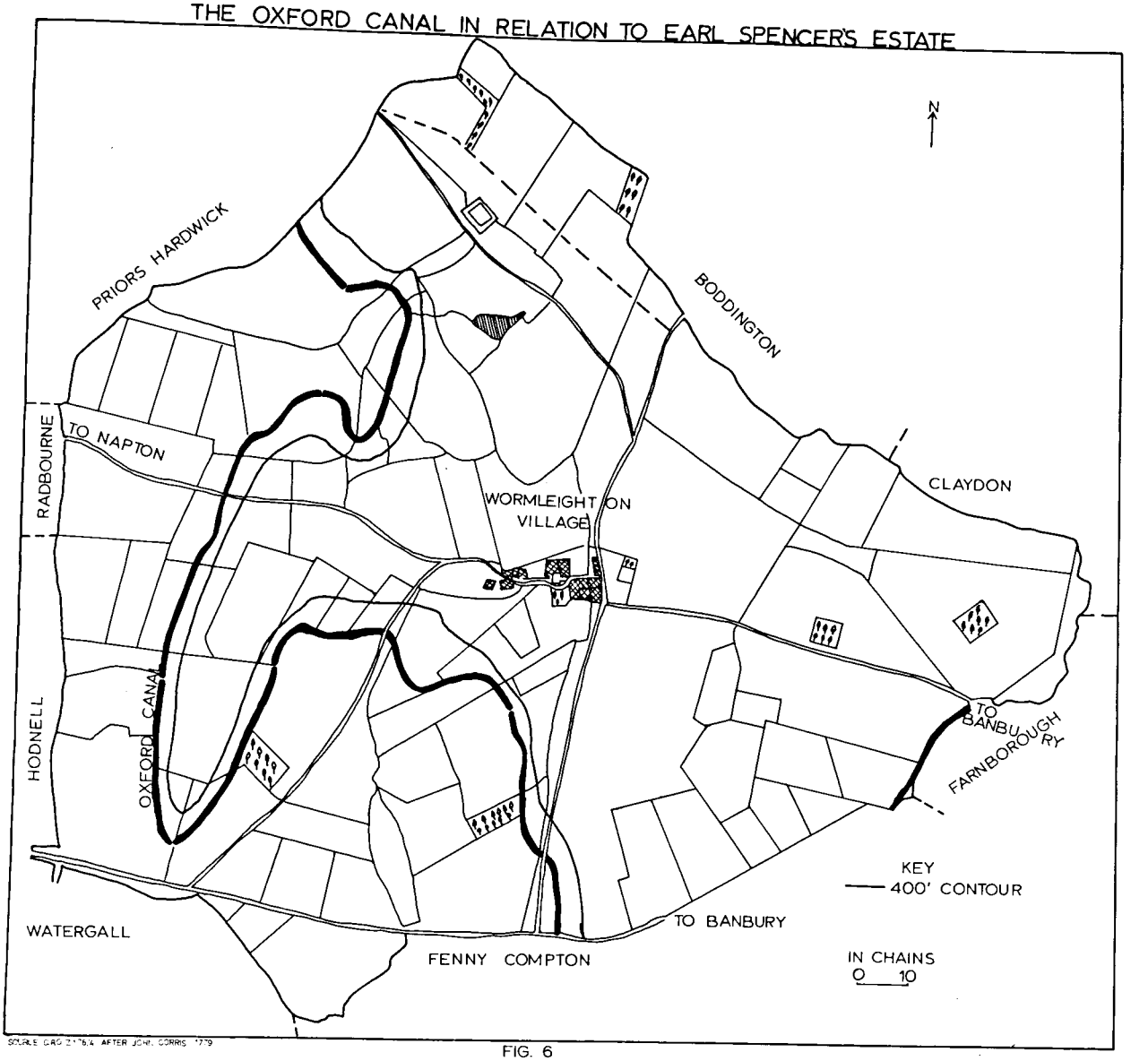

THE OXFORD CANAL IN RELATION TO EARL SPENCER'S ESTATE
N
PRIORS HARDWICK
BODDINGTON
TO NAPTON
RADBOURNE
WORMLEIGHTON VILLAGE
CLAYDON
HODNELL
OXFORD CANAL
TO BANBURY
FARNBOROUGH RY
KEY
400' CONTOUR
WATERGALL
FENNY COMPTON
TO BANBURY
IN CHAINS
0 10
SOURCE C.R.O. Z 176/4 AFTER JOHN. CORRIS 1779

FIG. 6

The Warwick Canals[17], constructed to shorten the route between Birmingham and London, were profoundly affected along their course by the north-west Birmingham Plateau, but their routes show a departure from the physiographic optimum represented by the contour Oxford Canal. They descend the plateau to the Avon valley by a remarkably direct route that involved heavy engineering works, such as embankments, tunnels and aqueducts, to keep the level of the canal, as well as locks to provide means of passing from one level to another. When the fall or rise was steep a flight of locks was needed. Fig. 5 is a transect of the Warwick-Birmingham Canal illustrating this point. From Digbeth junction in the Tame Valley the canal was raised 42' by the six Camp Hill locks at Bordesley from a level of 337'5" to the Knowle summit (378'5") where there was a fall of 42'0" to a level of 337'5". From Knowle the canal followed a southerly route, making use of the 330' col at Kingswood, found at the head of the Blythe valley: during the glaciation of the Birmingham Plateau, this col probably served as an overflow channel for lakes in the Blythe-lower Tame basin[18]. To keep the 337'5" level an embankment was constructed at Rowington (the embankment being lined with a thick layer-twenty to thirty feet - of puddled Keuper Marl). To maintain this level further the Shrewley tunnel, 433 yards long, (Photo 1) was cut through the Keuper Marl at Shrewley Hill. The level was maintained as far as Hatton where the sharp break of slope (Photo 2) demanded many locks. A flight of 21 locks allowed for a fall of 146' to Warwick, at a level of 191', while the two Cape locks

---

(17) The Warwick Canals comprise the Warwick-Birmingham, Warwick-Napton and the Birmingham-Warwick Junction Canals.

(18) Shotton, F. W. (1953). op.cit. pp. 250-252.

Plate 1: SOUTHERN ENTRANCE TO THE SHREWLEY TUNNEL. This tunnel, 433 yards long, cut through Keuper Marl, maintained the level of the Birmingham-Warwick Canal at 337' 5" from Knowle to Hatton.

Plate 2: VIEW OF HATTON LOCKS LOOKING NORTH. The descent from the sharp edge of the Birmingham Plateau to the Avon Valley necessitated the construction of a flight of twenty-one locks.

on the Warwick-Napton Canal fell by 14'6" into the Avon valley (178') where a three arch masonry aqueduct takes the canal over the Avon in Warwick.

The Stratford Canal, like the Warwick Canals descended the Birmingham Plateau by a direct route, but its ultimate pattern exhibits more engineering works because the Avon valley at Stratford is 62'0" lower than at Warwick, and more tributary valleys had to be crossed. The Stratford Canal was level from Kings Norton as far as Lapworth (Fig. 5.2), whence it fell by no less than 54 locks to Stratford. At Lapworth there was a flight of 25 locks with a total fall of 338'. The streams and valleys to be crossed led to the construction of, firstly, the brick aqueduct over the River Cole and three interesting iron trough aqueducts at Wootton Wawen, Yarningale and Bearley (Photos 3,4). With a length of 475'3" and a height of 28', the Bearley (Edstone) aqueduct spans the Alne valley carrying the Stratford-London road, and ranks as the largest iron trough structure after the Pontcysyllte aqueduct on the Llangollen Canal. By contrast, the one at Wootton Wawen, only 15.0' high, is supported on girders and brick pillars taking the canal over the Birmingham-Stratford-London road. For convenience in construction a small stream in Preston Bagot was chosen for the canal route: such a canal is called a lateral canal (Fig. 4. inset). The classic example is in Devon where the Bude Canal almost unerringly follows the Tamar valley. The canal at Preston Bagot was carved out along the slopes just above the stream, the earth being piled up on the lower side nearest to the stream, and on this bank the towpath was laid. A major advantage of this construction method was the fact that the canal captured all the water which previously flowed into the stream on the upslope side - for water supply is of paramount importance in canal construction, especially where the canal crosses a level,

Plate 3:

THE BEARLEY AQUEDUCT. This impressive structure, 475' long

Plate 4:

and 28' wide, carries the Stratford-upon-Avon Canal across the Alne Valley.

low-lying watershed which is out of reach of large supplies from streams.

Water Supply

The importance of water supply in the choice of routes cannot be over-emphasized. When the lowest available crossing of the watershed was determined, the canals length and elevation were determined by the interaction of two conflicting factors and by the compromise effected by the engineer. The two conflicting factors were the need for a large supply of water, which implies low level, and the need to keep lockage, as well as length and depth of tunnelling and cutting, to a minimum which implies a high and horizontal summit level. The way in which this conflict was resolved has already been illustrated by the Oxford Canal, which necessitated the construction of a tunnel through the Jurassic scarp at Fenny Compton while the 377' level was maintained for 10'1" miles. The problem of water supply was solved by reservoirs at Boddington, Byfield, Clattercote and Wormleighton. Except the last reservoir, which was originally a mere[19] (Cranmere) and occupied a small depression in the clays of the Fenny Compton gap, the others, constructed purposely for the canal, store water from the headwaters of the Cherwell. When the canal crossed a watershed that was out of reach of large supplies, provision of water to the summit level was much more difficult. The various methods of supplying the summit may be illustrated by taking the Warwick Canals as examples.

---

(19) Thorpe, H. (1965). The Lord and the Landscape, Transactions of the Birmingham Archaeological Society, vol. 80, p. 41. University Press. Oxford.

There were four major ways by which canals in general might be fed - firstly, by flow directly into the canal, by rivers or streams. The quantity available from these feeders depended on the nature and area of the gathering ground, its geology and the amount of rainfall. The flow varied from time to time according to the intensity of the rainfall and the run off[20]. From Knowle summit, (Fig. 7.1), the Warwick-Birmingham Canal was fed by streams with small catchment areas - the Spark Brook (464 acres), and Acocks Green (262 acres). The largest was the Heronfield Feeder with a catchment area of 3,000 acres. The Hay Hall feeder was supplied by springs and the Solihull effluent by treated sewerage. The canal crossed Keuper Marls with occasional glacial drift; the Keuper Marls were quite retentive but the drift was a source of loss of water because it was rather permeable. Where the canal crossed streams and land drainage channels culverts were made beneath the bed of the canal to carry the flow below the canal, for example, 43 culverts exist beneath the bed of the Warwick-Birmingham Canal[21]. When the inflow to the canal exceeded the requirements, the excess was usually passed back by means of overflow weirs to the stream from which the supply had been obtained (Photos 5 and 6). There were not many overflow weirs on the Birmingham-Warwick Canal, a fact that emphasizes the point that the canal did not have much excess water.

Secondly, the canals were also supplied by gravitation, and by pumping from storage reservoirs fed by the rainfall on their gathering ground. The Olton reservoir, (21 acres) astride Knowle Summit, was the major reservoir for the canal under consideration.

---

(20) H.M.S.O. (1911). Royal Commission on Canals and Waterways, Vol. 10, p. 77., London.

(21) Ibid. p. 10.

WATER SUPPLY OF THE BIRMINGHAM AND WARWICK CANAL

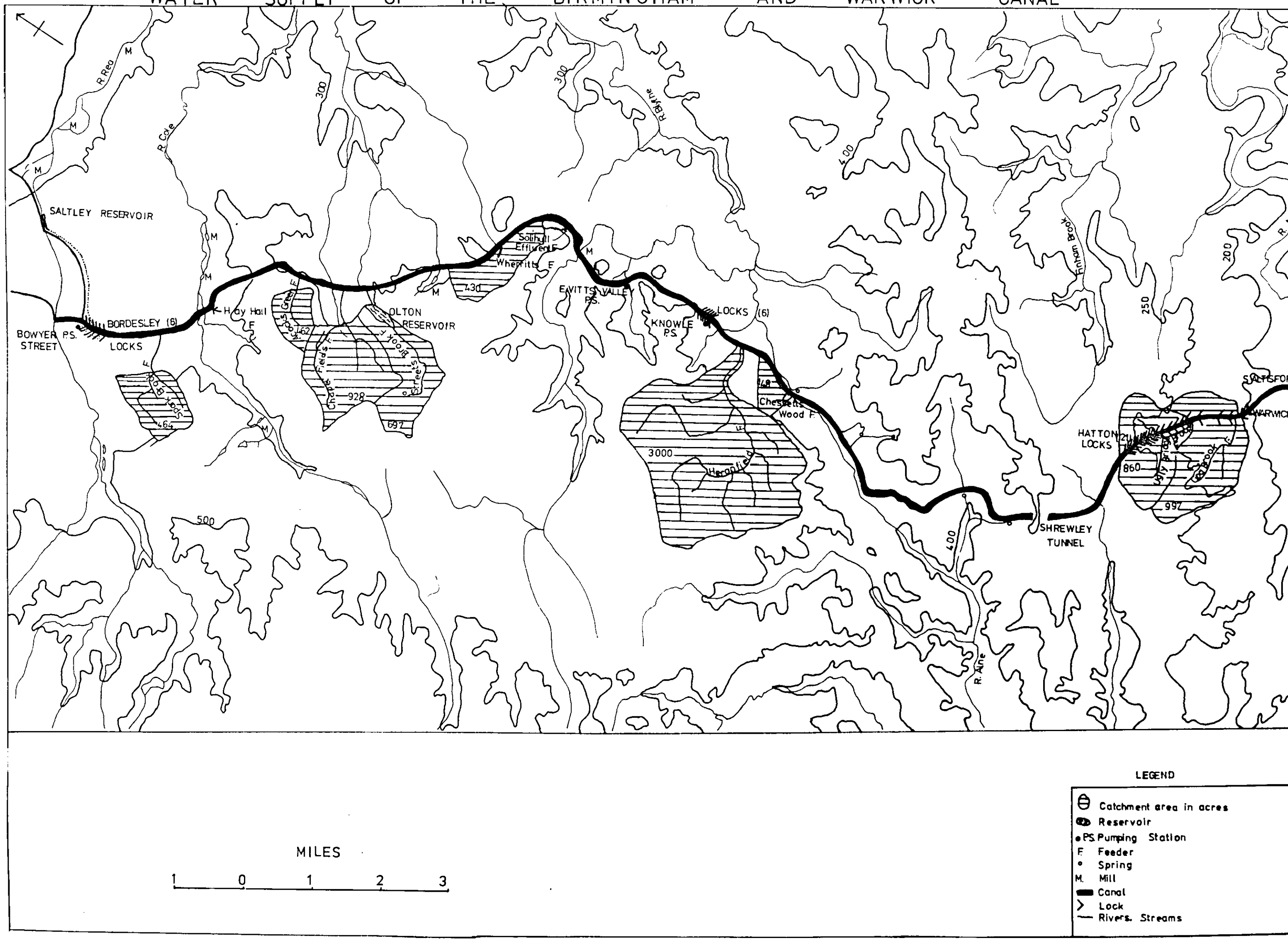


FIG. 7·1

Plate 5: OUTFLOW WEIR ON THE STRATFORD CANAL NEAR BISHOPTON.

Water supply was of utmost importance in canal operation, and the level of water in the canal must be maintained. Whenever

Plate 6: INFLOW WEIR ON THE STRATFORD CANAL NEAR BISHOPTON.

the water level exceeded the requirements the surplus water passed back by means of the outflow weir and was directed into the canal on the lower reaches through the inflow weir.

With a capacity of 8 million cubic feet it was far smaller than the Earlswood reservoirs, sprawling across the main watershed between the Avon and the Trent and forming the largest reservoir in Warwickshire, with a capacity of nearly 40 million cubic feet[22]. The Olton reservoir drew its water from a stream fed by springs. Some of the supply was obtained by pumping from storage reservoirs which could not supply the higher reaches by gravitation. For instance, the Bowyer Street pumping station with a Cornish beam engine lifted water from the Saltley reservoir which was fed by water passing down Bordesley and Garrison locks (Fig. 7.1) on the Birmingham-Warwick Junction Canal. Similarly, the Knowle pulsometer lifted water from Heronfield and Chessetts Wood feeders and lockage water passing down Knowle locks 45' to the summit level. The pulsometer was capable of raising 250,000 to 270,000 cu.ft. of water a day. Finally, water was supplied to the canal from mines, rivers, and wells where storage reservoirs were not possible. Thus, the Evitts Valley pumping station pumped water from a limestone mine and Purnells brook (Fig. 5) to the summit but the source from the former was small and uncertain.

Fig. 7.2 shows how the Warwick-Napton Canal supplies were obtained. The rivers Avon, Leam and Itchen were not available for the use of the canal so the canal was fed by springs and wells; but such supplies being inadequate a reservoir became essential. Nevertheless, problems arose concerning feeders to the reservoir. According to Rolt[23] it was the problem of water supply that forced

---

(22) Ibid. p. 11.

(23) Rolt, L. T. C. (1950). The Inland Waterway of England, 4th ed. (1962). Allen and Unwin, London.

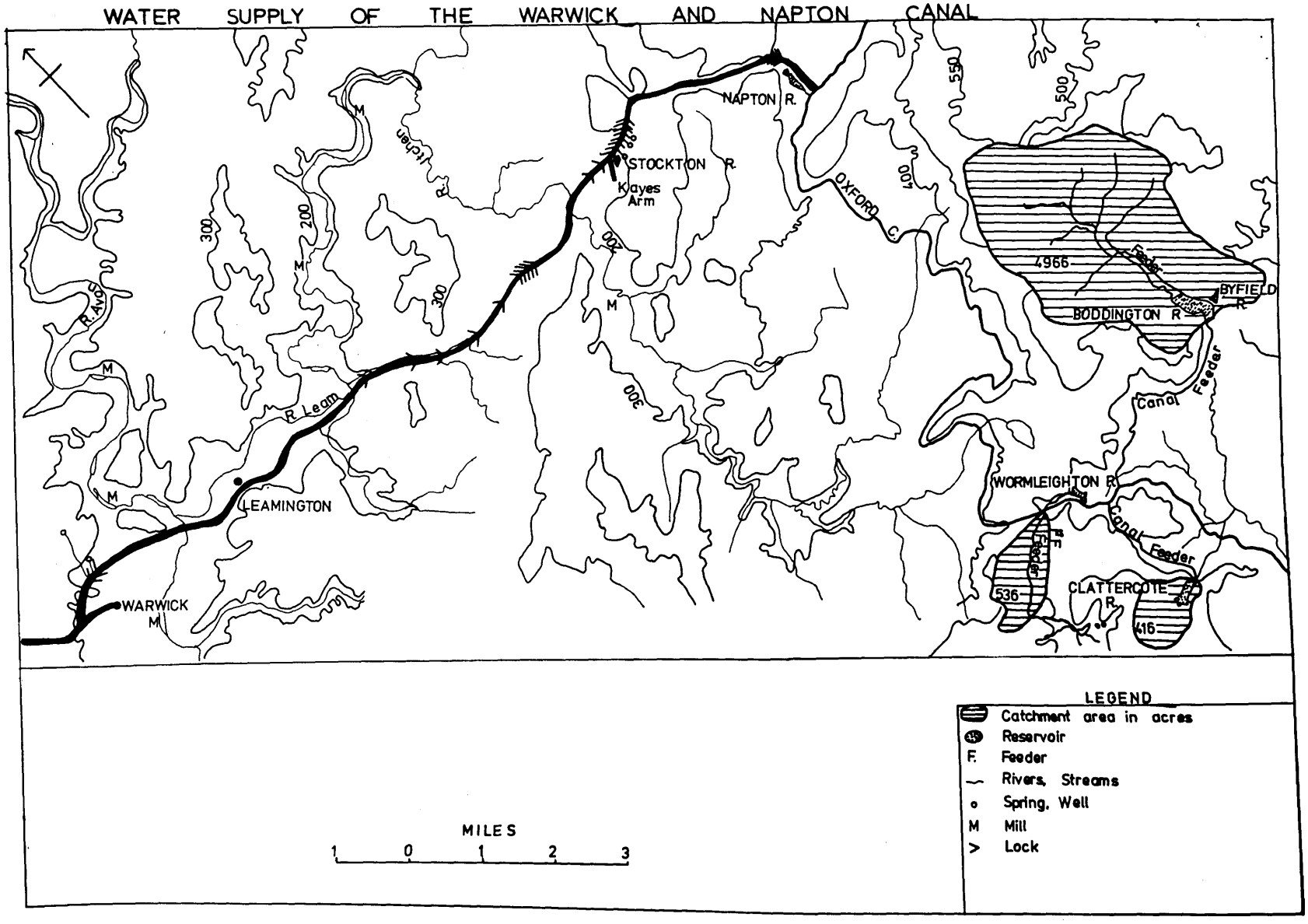

WATER SUPPLY OF THE WARWICK AND NAPTON CANAL
NAPTON R.
STOCKTON R.
Klayes Arm
Itchen R.
R. Avon
R. Leam
LEAMINGTON
WARWICK
OXFORD C.
4966
BODDINGTON R.
BYFIELD R.
Canal Feeder
WORMLEIGHTON R.
536
CLATTERCOTE R.
416
MILES
1 0 1 2 3
LEGEND
Catchment area in acres
Reservoir
F. Feeder
Rivers, Streams
Spring, Well
M Mill
> Lock

FIG. 7·2

the alteration of the canal pattern, though Hadfield thinks it was because of cost and difficulty of relief. Instead of going to the expense of building a reservoir, the Warwick-Napton Company decided to join the Oxford Canal and buy water from them at 2/- per boat passing Napton Junction. Ultimately, however, the company decided to build its own reservoir at Napton. Eventually, the Boddington reservoir was built by the Oxford Canal between 1807 and 1815[24], and was enlarged in 1833 for £1,500 at the expense of the Warwick Canals who needed more water to supplement their supplies. Difficulty over water supplies led all canal companies to safeguard their water. In fact, it was this which brought into being the stop lock, at the junctions of two canals to prevent the interchange of water between two canals so that if one canal lost water it could not draw from the other. Usually the difference in level was a matter of only a few inches. For instance, at the Coventry and Oxford Junction it was 6 inches. At Kingswood Junction the arm linking the Stratford and Warwick-Birmingham Canals consisted of a stop lock, and at Kings Norton the Stratford Canal was fitted with a guillotine stop lock to prevent interchange of water since both the Worcester-Birmingham and the Stratford Canals were on the same level.

Social Considerations

Social factors, especially ownership of land, influenced the precise route adopted in many ways. The routes followed by the canal were worked out by the engineers and surveyors considering the topography of the country to be traversed, potential traffic flows,

---

(24) B.T.H.R., Warwick-Napton Canal Proprietors Minute Book, 21 January, 1833, WNC1/9.

and above all the cost of construction which was put before a promotion committee for approval. The ultimate choice remained with the engineer. The lands through which the canals passed were purchased by the canal companies which had compulsory purchase powers by Acts of Parliament specifying the exact route to be followed. If the landowner and the company could not agree on the price, they could make use of an arbitrator; in the last resort they could go to a quorum of the commissioners mentioned in their Acts, composed of landowners who were unlikely to set a price too low, and finally to a jury summoned by the county sheriff whose decision was binding. The purchase of land from landowners by all Canal Companies often sparked off conflicts and loud protests from wealthy land- and mill-owners who were reluctant to accept the canal. The Melton and Oakham Canal (Leicester Canal Navigation), for example, met a strong protest from the Leicester coal-owners, the proprietors of various lime works, the Soar Navigation Company and from the landowners of estates[25] and mill-owners. Such opposition delayed the authorization of the Act for the construction of the canal for 11 years. The Ashby-de-la-Zouch Canal was opposed by the public in general[26], but more strongly by the Hon. Penn Assheton Curzon of Gopsall who, as a member of Parliament for Leicestershire, exerted considerable influence and argued that the projected canal would, in the opinion of the most experienced miners, inevitably destroy the invaluable and only spring of rock water that supplied his house, which has cost more than £100,000[27]; any interference would cost the company £500,000.

---

(25) Patterson, T. A. (1949). "The Making of the Leicestershire Canals, 1716-1814". Transactions of the Leicestershire Archaeological Society, Vol. 25-27. p. 67 et seq. Leicester.

(26) C.R.O., Public Utility unmasked or Fallacy Detected, undated, CR. 764/264.

(27) ibid.

The Warwickshire Canal Companies encountered their own share of opposition. There were loud protests from land-owners who feared that the canal might be carried through their fertile low-lying lands and, therefore, drain their water meadows or divide their property, thus preventing them from enlarging their parks, and introducing bargemen who did not always respect the game laws. The mill-owners feared loss of water from the streams leading to their pools and were supported by the farmers who depended on the mills for the grinding of corn. The Coventry Canal Company, for example, was instructed not to make the cut "at any greater distance than 120 y s from the Watling Street through or over the Avenue leading to the mansion house of Francis Stratford at Merevale or to make any towing path on that side of the cut which shall be next to his mansion and garden"[28]. This point can be further illustrated by examples from the Stratford-upon-Avon Canal. Fig. 8 shows John Mills' Estate in relation to the Preston Bagot stream which was tapped to form pools to work his corn mill[29]. For fear of the canal being carried through his estates, so draining his pools or separating his property, he directed that the 'cut' should be made in such a way as to go on the southern side of his mills and that the route of the canal should not be diverted or changed without his consent[30]. This specification accounts for the eastern swing of the canal at this section, as well as the occasional flood experienced here. Flooding occurs because the towpath suddenly

---

(28) Birmingham Reference Library, 17066, Coventry Canal Act, (8 Geo. 3, c.36), 1767, Canal Acts, Midland District, Vol. I.

(29) C.R.O., Tithe Map and Apportionment, Preston Bagot (1844) CR. 569/192.

(30) Birmingham Reference Library, 17100, Stratford Canal Act 1793, (33 Geo. 3, c.112), Canal Acts, Midland District, Vol. 3, p. 103 ff.

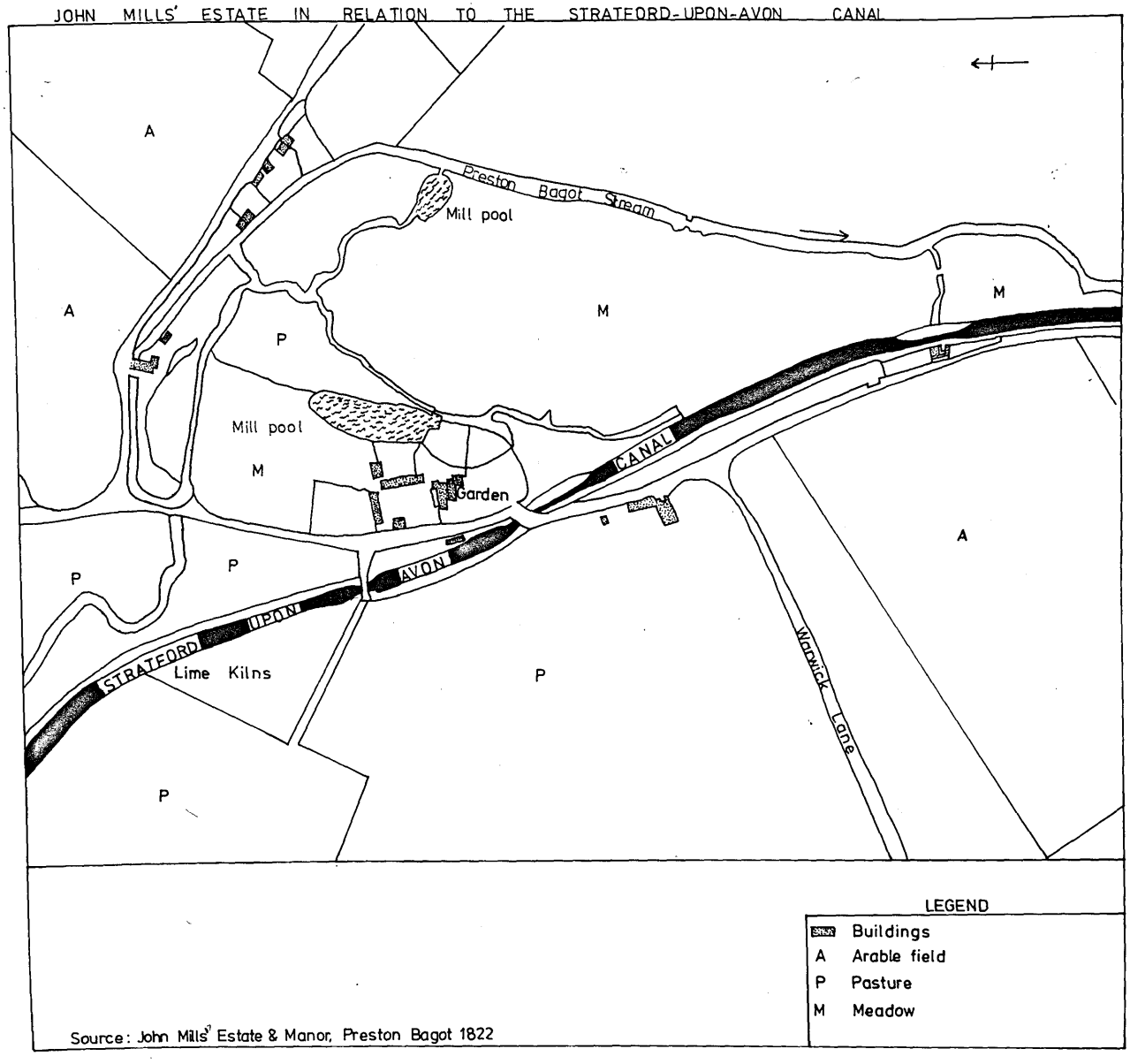

JOHN MILLS' ESTATE IN RELATION TO THE STRATFORD-UPON-AVON CANAL
A
A
P
M
M
Preston Bagot Stream
Mill pool
Mill pool
Garden
CANAL
AVON
STRATFORD UPON
Lime Kilns
P
P
P
P
A
Warwick Lane
LEGEND
Buildings
A Arable field
P Pasture
M Meadow
Source: John Mills' Estate & Manor, Preston Bagot 1822

FIG. 8

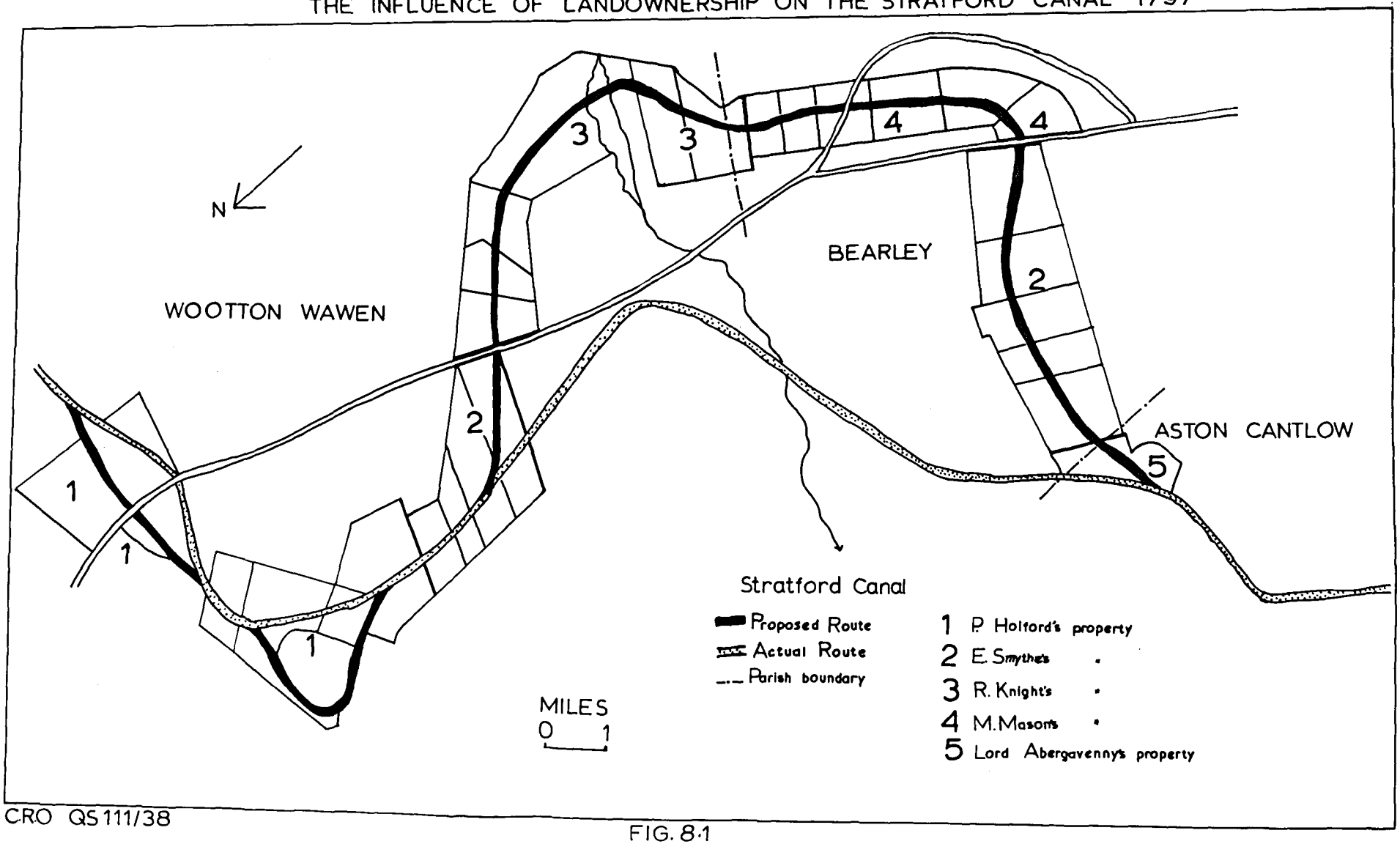
changes sides just below lock 36 due to John Mills' directives and continues on the side away from the river for a relatively short distance, which includes the point where flood water flows in and out. The absence of a towing path embankment further encourages flooding. The section of the Stratford Canal in the parishes of Wootton Wawen, Bearley and Aston Cantlow further illustrates the opposition of landowners. Fig. 8.1 shows the canal as constructed in 1813 and the proposed route in 1797. The route which was ultimately adopted ran almost parallel to the Alne brook, which the canal intersected 23 times. Another route was, therefore, proposed to save engineering works and construction costs, but negotiation with powerful landowners like Peter Holford, the lord of the manor of Wootton Wawen, Lord Abergavenny of Aston Cantlow, together with the three other landowners whose property the canal was to intersect (Fig. 8.1), failed, thus leading to the abandonment of this route.

Where the land was to be obtained by compulsory purchase, the Stratford Canal Company recompensed the owners and occupiers of the lands affected. They compensated for all the tithes of the fields which they took for the canal. Landowners adjoining the canals were entitled to fish in the canal reservoirs, trenches and sluices, and to use pleasure boats on the canal, but other boats only for the conveying of cattle from one farm to another. Until all agreements had been made, the Stratford Canal Company was not permitted to start cutting the canal; as stated by the Act, "until such payments, security or tender shall be made, it shall not be lawful for the said company to dig or cut the lands or grounds of the persons entitled to such payments or security"[31].

---

(31) Stratford Canal Act, 1793. op.cit.

THE INFLUENCE OF LANDOWNERSHIP ON THE STRATFORD CANAL 1797



CRO QS 111/38

FIG. 8.1

Economic Considerations

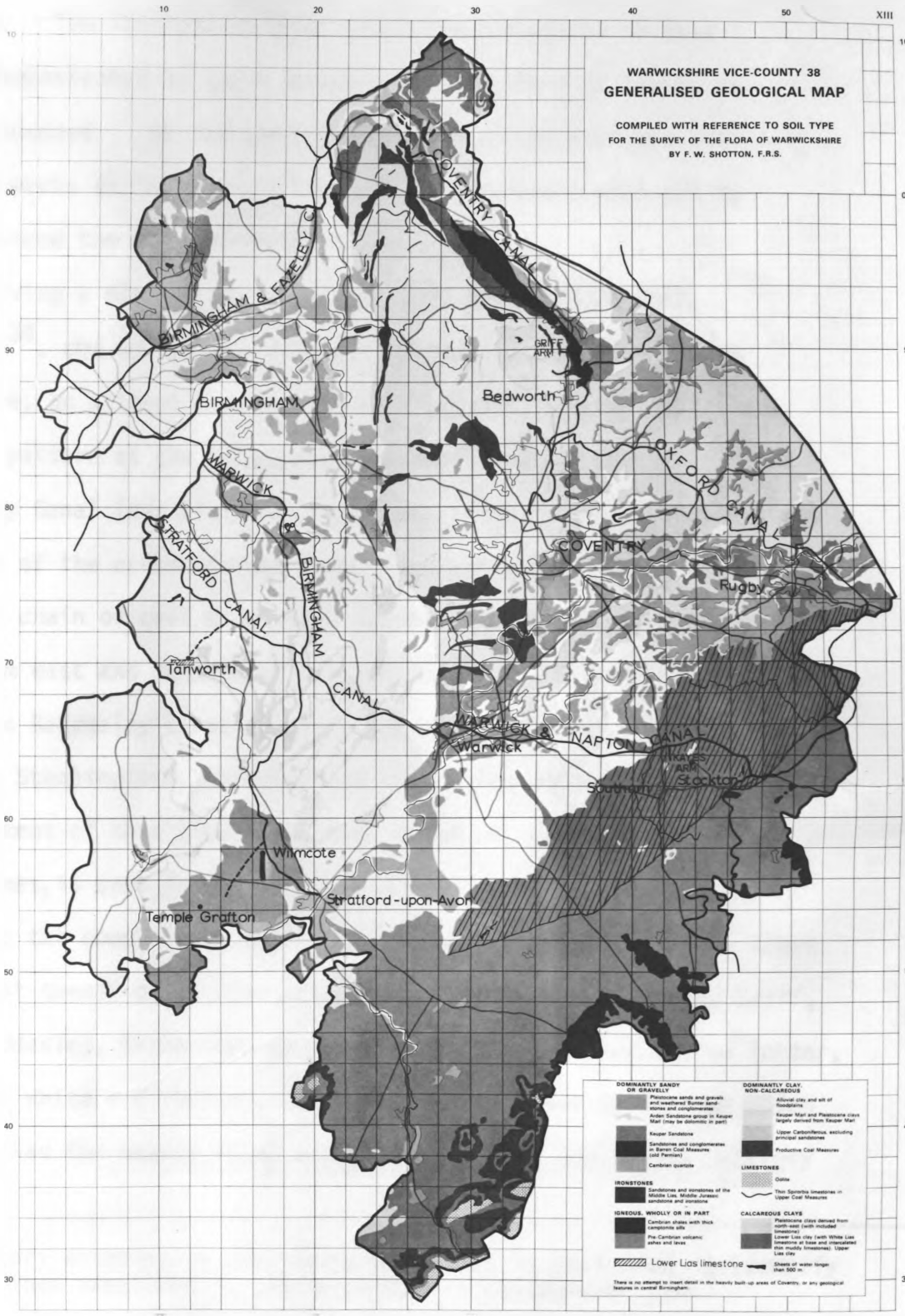
As we have seen, the physical personality of Warwickshire exerted a strong influence on the morphology of its canals, but the latter like any lines of communication are built to perform a specific function within the framework of the economic geography of the areas they serve. Their morphology, thus, reflects this purpose. In Warwickshire the potential traffic was to be derived not only from a considerable quantity of agricultural produce, and manufactured goods, but also from the valuable geological formations such as those in Tanworth (Arden Sandstone), Temple Grafton and Wilmcote (Rhaetic Lias Limestone), and the North-East Warwickshire coalfield. From Fig. 9 one might conclude that the relationship between geology and canal construction was locally slight. In terms of advantage the Keuper Marl was easy to dig while there was also a close relationship between water supply and geology where springs occurred in lenses of Arden Sandstone within Keuper Marl formations and fed the canal. Economic geology was also an important consideration where valuable stone like Carboniferous formations or Arden Sandstone occurred.

Despite the fact that the Warwickshire Canals ran mostly through rural areas and so might benefit agriculture, they were constructed primarily for industry as stated by the Acts of Parliament which authorized their construction. The Coventry, and Stratford Canals[32] were built to serve primary industries already in existence, while the Warwick Canals[33] were constructed primarily to shorten

---

(32) Coventry Canal Act, 8 Geo. 3., C36, 1767.
Stratford Canal Act, 33 Geo. 3., C112, 1793.

(33) Warwick-Birmingham Canal Act, 33 Geo. 3., C38, 1793.
Warwick-Napton Canal Act, 34 Geo. 3., C38, 1794.



THE RELATIONSHIP BETWEEN CANALS & GEOLOGY IN WARWICKSHIRE

FIG. 9

the distance between the expanding industrial centre of Birmingham and London. The interest of Birmingham industrialists in this route is demonstrated by their promotion of the Warwick Canals as already discussed. On the other hand, the existence of the lime and cement works at Southam and Long Itchington would seem not to have influenced the Warwick-Napton Canal route.

Using a plan of the original route surveyed in 1767, directories[34], and an article produced by the coalowners of North Warwickshire, an attempt has been made to reconstruct the existing industrial pattern at the time, and show how it affected the route of the Coventry Canal (see Fig. 10). The basis of the local industry was the outcrop of the carboniferous formations, which had given rise to a long narrow chain of coal mines that extended southwards for about 20 miles[35] from east and south-east of Tamworth through Shuttington and Kingsbury to Baddesley Ensor whence a long, narrow strip extends past Atherstone, Stockingford, Nuneaton and Bedworth; an earlier stage in the development of this linear pattern, which was initiated in late medieval times, is seen in Henry Beighton's one-inch map of 1725/8. According to the complaints advanced by the coalowners in 1785[36], there were at least twenty productive "coal works", such as the Wyken, Griff, Parrots, Baddesley, Birch Coppice, and Bedworth collieries. The latter, according to White's directory, comprised two valuable collieries which had been worked for nearly three centuries[37]. The Hawkesbury Colliery

---

(34) Directory evidence is admittedly later but is here used to identify coal mines mentioned in the Warwickshire coalowners' case.

(35) C.R.O., The Warwickshire Coalowners Case, 1785, CR 764/264.

(36) Ibid. pp. 1-3.

(37) White, F. & Co. (1850). History, Gazetter and Directory of Warwickshire, p. 569. John Blurton, Sheffield.

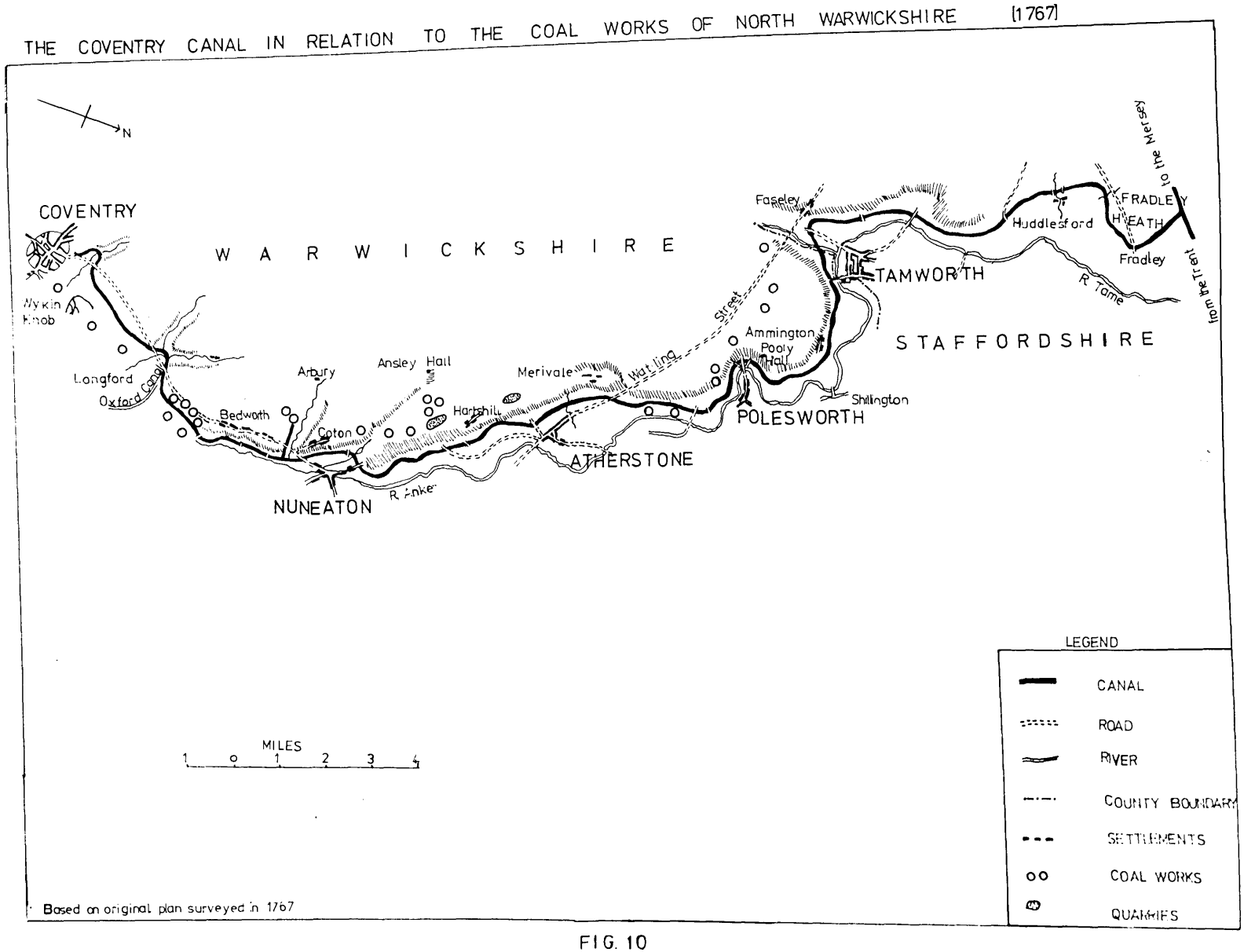

THE COVENTRY CANAL IN RELATION TO THE COAL WORKS OF NORTH WARWICKSHIRE [1767]
N
COVENTRY
WARWICKSHIRE
Wyken Knob
Longford
Oxford Canal
Arbury
Bedworth
Coton
Ansley Hall
Harpshill
Merivale
Watling Street
Faseley
Ammington
Pooly Hall
POLESWORTH
Shilington
ATHERSTONE
NUNEATON
R. Anker
TAMWORTH
R. Tame
Huddlesford
FRADLEY HEATH
Fradley
to the Mersey
from the Trent
STAFFORDSHIRE
MILES
1 0 1 2 3 4
LEGEND
CANAL
ROAD
RIVER
COUNTY BOUNDARY
SETTLEMENTS
COAL WORKS
QUARRIES
Based on original plan surveyed in 1767

FIG. 10

Company had extensive coal and ironstone mines covering 400 acres of land and employing 500 hands in the late eighteenth century. Another important colliery was the extensive establishment at Exhall embracing about 200 acres of coalfield, the seams of which were 30' thick. These flourishing coal mines promised a traffic worthy of the intended canal from Coventry, and was a major factor in the choice of the route as stated in the Act which promoting it stated its aim as "to open an easy access to the different collieries between Coventry and Tamworth"[38]. Associated with the coal were thick beds of clay worked in open pits for bricks, while Staffordshire blue bricks were also made in this area from the clays of Etruria Marl overlying the coal measures[39]. Beds of ironstone, pyrites, fire-clay and limestone were also worked in this belt of diversified geology. Quarrying was also important, as at Caldecote Hill and at Hartshill. In both places a sharp upfold exposed the hard Pre-Cambrian quartzite which was about 500' thick. Such quarries were to generate traffic to feed the Coventry Canal, for quarried stone was in great demand to improve the turnpike roads.

In Wilmcote, in the parish of Aston Cantlow, the blue-grey Lower Lias Limestone provided a useful building material which had led to the opening of three quarries there as early as the sixteenth century. Stone had been supplied by a Thomas Edkins in 1541 and 1546, while the account of the Chamberlains contain certain references to the purchase of Wilmcote stone including the supply of a Wilmcote stone Chimney Piece for their hall. St. Mary's Church in Warwick had Wilmcote stone

---

(38) Coventry Canal Act, (1767), op.cit.

(39) Mitcheson, J. C. (1950). "The East Warwickshire Coalfield". In Birmingham and its Regional Setting, pp. 294-5, Birmingham.

incorporated in it when it was reconstructed after the fire of 1694[40]. (Fig. 11) shows the relationship between the stone quarries and the projected canal. Such thriving quarries undoubtedly exercised a "pull" on the Stratford Canal for it was partially "to open communication with the valuable mines and quarries of building stone, flagstone, marble and limestone"[41], that the canal was constructed. Collateral branches were proposed, one $2\frac{1}{2}$ miles from near Hockley Heath to the Arden Sandstone quarry in Tanworth and the other $3\frac{7}{8}$ miles from near Wilmcote to Temple Grafton to tap the limeworks of Billesley and Binton. However, as has already been asserted, the cement works of Southam and Stockton based on the outcrop of Lower Lias Limestone did not exert any influence on the Warwick-Napton Canal. The original Warwick-Braunston Canal was to follow a more northerly route to join the Oxford Canal at Braunston, but its route was altered because of difficulties of relief and water supply. The route selected might be related to the fact that the Birmingham Canal Company, which promoted it, was more concerned with through traffic from Birmingham to London and vice-versa.

Construction Costs

Whether the selected route would be economically viable or not clearly depended on construction costs, which could not easily be determined in advance. Thus, it was not unusual to find that the cost of cutting the canal over certain sections was greater than the

---

(40) C.R.O., Wilson, R. B. (1948): The stone quarries and cement works of Wilmcote and Aston Cantlow, passim B.Ast.Wi(P), Warwick.

(41) Stratford Canal Act, 1793, op.cit.

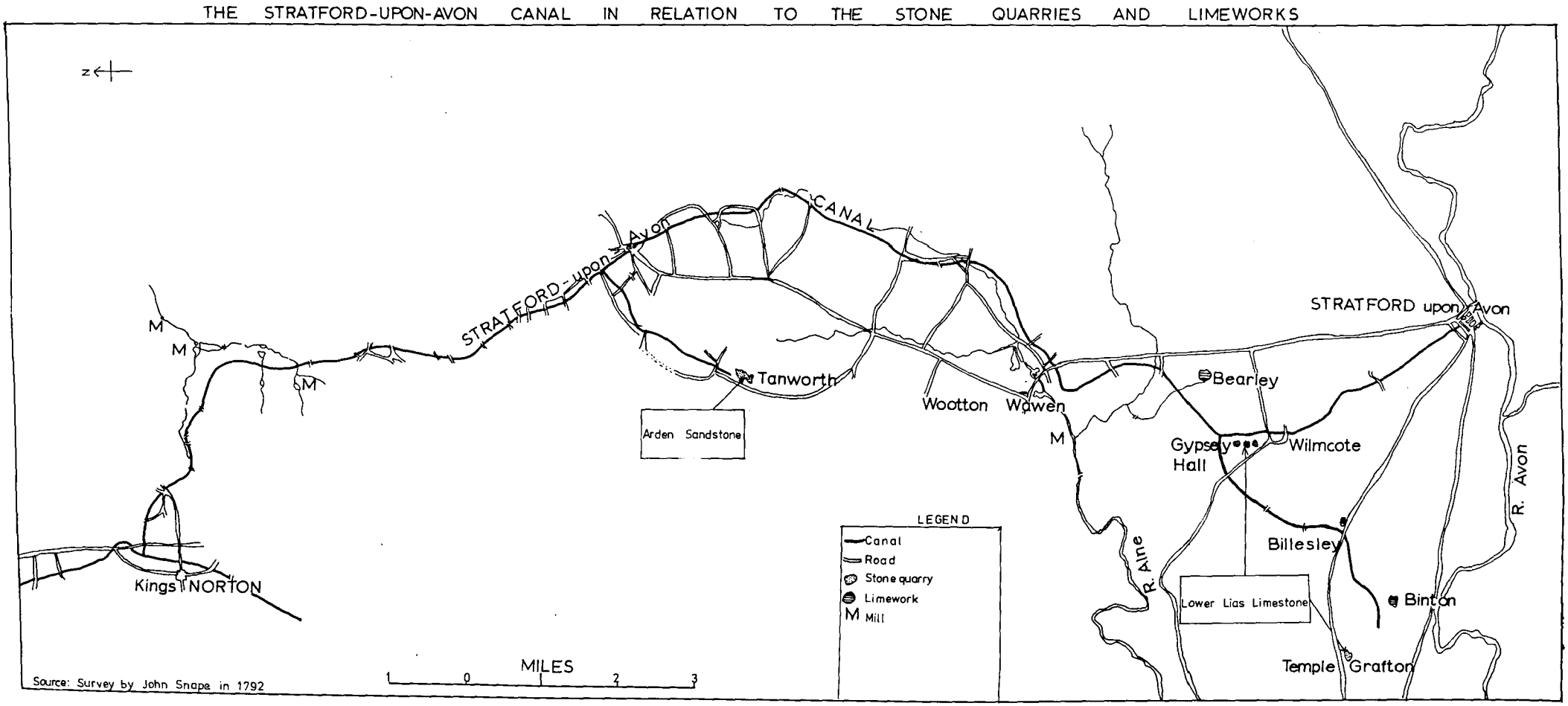

THE STRATFORD-UPON-AVON CANAL IN RELATION TO THE STONE QUARRIES AND LIMEWORKS
N
CANAL
STRATFORD-upon-Avon
STRATFORD upon Avon
Tanworth
Arden Sandstone
Wootton Wawen
Bearley
Gypsey Hall
Wilmcote
Billesley
Binton
Temple Grafton
Lower Lias Limestone
R. Alne
R. Avon
Kings NORTON
M
LEGEND
Canal
Road
Stone quarry
Limework
Mill
MILES
1 0 1 2 3
Source: Survey by John Snape in 1792

FIG. 11

estimated amount with the result that the route was shortened as much as possible. Such a case was the Stratford-upon-Avon Canal. The first 8 miles from King's Norton to Hockley Heath alone with no major engineering works except the 352 yard long Brandwood Tunnel, cost nearly £120,000 (£14,990 per mile), an amount which had at first been considered sufficient to build the whole canal[42]. The Company was so short of money that it issued endless calls in the Aris's Birmingham Gazette[43] to pursue shareholders who had defaulted in making payments. It, therefore, became necessary for the Company to reduce its expenses and it proposed a plan to shorten the Kingswood branch to 1½ miles. A third Act, supporting further capital of £50,000 and a variation of the route, sought to bring the canal nearer the Warwick Canal in order to reduce the length of the Kingswood branch to ⅛ of a mile[44]. By the time the canal reached Kingswood in 1803, £153,771 more had been raised. Indeed, this section proved the most expensive with a construction cost of £42,586 per mile, though the engineer did not account for the extreme cost of this section. Although the rise in prices following the outbreak of the Napoleonic Wars may have contributed to this[45], the possibility of under-estimation and misappropriation of funds could not be ruled out.

---

(42) C.R.O., Report of the Engineer on the Stratford Canal Navigation, undated HR 83/49.

(43) Aris's Birmingham Gazette, 6th June, 1796, 26th Feb. 1797, 21st August, 1797, 26th Feb. 1798, 12th Oct., 7th Dec., 1801. C.R.O., CR580 box 50, Canal Agency papers of W. Pratt, relating to several canal companies in the Banbury area. This collection contains many letters about the Stratford Canal, recalling shares from shareholders who had refused to pay their £5 shares for three months. See, for example letters dated to Fiennes Wykham, 20th Aug. 1799, and John Walsingham, 8th April 1801.

(44) Ibid. HR 83/49.

(45) Hadfield, C. (1968). The Canal Age, pp. 153-4, 211-2. David and Charles, Newton Abbot. Vide 33 Geo. 3, C 60, 1799.

Similarly, the construction costs between Harborough Banks, and Wootton Wawen were extemely high. This was due principally to the ill-advised alteration of the route under the third Act of 1799, which directed the canal to be cut parallel to the Alne brook, which it intersected no less than 23 times in 4 miles. To overcome these difficulties, attempts were made to obtain new treaties with landowners to modify the route, but this attempt failed. In addition, the ground to be traversed, comprising mostly Keuper Marl, was very boggy due to the wetness of the winter, and the premature frosts greatly impeded the manufacture and movement of bricks and other materials needed for the construction of locks and bridges. Consequently, a rail-road, nearly seven miles long, was laid from the brickyards at One Elm[46] (Stratford) to facilitate easy movement of the bricks. It became necessary, therefore, to cut the basin of this section 6 feet deeper than anticipated, and 7 road bridges, 10 accommodation bridges, 18 locks, a reservoir to supply the lower section of the canal and the cast iron aqueduct at Wootton Wawen had to be constructed. Finally, the lock at the Warwick Junction had to be altered as the contractor, Mr. Cartwright, erected it on the branch to the Warwick Canal instead of on the Stratford Canal by some unaccountable mistake or negligence! The very expensive and tedious operation of building the section as far as Wootton Wawen explains the simplicity and difference in design of the works. The stop gates, locks and bridges were made "on new principles, combining a degree of durability with economy which will bear comparison with the most approved canals in this Kingdom"[47]. The financial difficulties

---

(46) Ordnance Survey, 1886, 1/500, Sheet nos. XLIV 6.9, 6.14.
(47) C.R.O. HR83/49.

of the Stratford Canal were the main reason why the collateral branches to the quarries and limeworks shown by Yates in his one inch map of Warwickshire (1787-9) were never built (Fig. 12). For the average cost per mile of the whole canal was finally no less than £19,623 as compared with £12,972 for canals like the Croydon or the Grand Union, completed by 1816.

The Coventry Canal Company faced similar financial embarrassment so the canal had to end 8 miles short of the intended route to Fradley Heath[48] (Fig. 12). Bedworth was reached in 1771, by which time the whole of the £50,000 capital was expended[49]; the canal, therefore, remained an isolated stretch for many years. Finally, by the Coleshill agreement of 1782 the Birmingham, Oxford and the Trent-Mersey Canal Companies consented that the Coventry Canal Company should continue its canal as far as Fazeley to join the Birmingham-Fazeley Canal. The Birmingham Canal Navigations were to build the Coventry Canal to Whittington Brook and the Trent-Mersey Canal the other half to Fradley. The Coventry Canal Company purchased the other half built by the Trent-Mersey Canal within two months of completion at basic cost plus interest. The Coventry Canal, therefore, remained in two sections separated by 4 miles of the Birmingham Canal from Fazeley to Whittington Brook. The Coventry Canal was the most expensive of the canals finished before 1790 with a cost of £5,395 per mile as against the average cost of £3,323. Brindley might have faced difficulty at Bedworth Hill, for he consequently resorted to extra cutting, more construction work including gutterage and the laying of

---

(48) B.T.H.R., Ledger of the Coventry Canal September 1771, CVC 4/104.

(49). Ibid. May 1769 to September 1770.

THE INTENDED AND ACTUAL CANAL PATTERN OF WARWICKSHIRE

Source Plan of the STRATFORD and WARWICK CANALS 1795

FIG. 12

an aqueduct at Griff and Bedworth field[50], which involved extra expenses. But it seems Brindley was also suspected of mismanagement and misappropriation of funds leading to his dismissal by the Coventry Canal Company. There might be some truth in the allegation of mismanagement because Brindley, having in hand about half a dozen big schemes at the same time, delegated his responsibilities to his assistants who could easily disregard his orders in his absence. According to the Coventry Canal Company minute book[51] one William Adie, and all the colliers of the Bedworth colliery who were employed in the work on the canal were dismissed, while Parker and Bull were served with strong notice of instant dismissal if they disregarded the orders of the Committee. It was also ordered that no work be carried on beyond Bedworth Hill until a survey of the works had been completed, and an estimate had been laid before the committee. Financial considerations also contributed to modification of the original plan for the Warwick-Napton Canal to join the Oxford Canal at Braunston, for Charles Handley, one of the valuers of the canal, suggested that a tunnel costing £50,000 at Leamington would be saved if the route was altered from Offchurch to join the Oxford Canal at Napton.

The various factors that influence the route of the Warwickshire Canals have already been discussed, but the relationship between the ultimate canal pattern and factors such as physiography, morphology and function are far from simple, similarly, other variables, such as the influence of wealthy land- and mill-owners, changing techniques of construction and operation, and difference in the availability of finance affected the technical basis of the relationship.

---

(50) B.T.H.R., Coventry Canal Minute Book, 9th May 1769. CVC1/1.

(51) Ibid, 9th May, 26th September, 1769.

Important though these factors may be in acting jointly to mould the precise route of the canals, the study emphasizes that physiographic factors are more influential in determining the morphology of the Warwickshire Canals, while economic factors largely industrial, determined the broad route of the Warwickshire Canals. It would seem that opposition of wealthy landowners called for only minor alterations in the precise routes.

CHAPTER TWO

ECONOMIC INFLUENCE OF THE WARWICKSHIRE CANALS

Areas of Influence

The success of canals in the period 1790-1838 revolutionized transportation in England as a whole. The effect on the Midlands was particularly marked with a new-found accessibility to the major ports on the Mersey, Humber, Severn and Thames. Birmingham lay at the hub of the national canal system with the Warwickshire Canals forming important links between these four estuaries (see Fig. 2). The services provided by the Warwickshire Canals during this period (Fig. 12.1), demonstrate both local canal influence in the county as well as long distance services through it. Precise information on the nature of these services and their implications is not easily obtainable, but an attempt has been made to reconstruct the canal service pattern existing during the period, 1800-1850, by using advertisements from the Aris's Birmingham Gazette[1], Pickford Company memoranda book[2], and various directories[3], which mention the frequency of operation of boats, their origin,

---

(1) Aris's Birmingham Gazette, Vide July 15, 29, Oct. 14, 1805; March 3, June 23, 1806; March 25, April 22, 1811; July 4, 5th, Sept. 12, Nov. 28, 1814.

(2) B.T.H.R. Pickford Company Ltd. Memoranda Book, (1829-1835) PIC 4/7.

(3) Pigot & Company, National Commercial Directory for Staffordshire, Warwickshire and Worcestershire, (1828-9), London.
White, F. & Co., History, Gazetteer, and Directory of Warwickshire (1850). Birmingham.
Slater's National and Commercial Directory (1850), Isaac Slater, Manchester.
Wrightson's New Triennial Directory, (1818). Birmingham.

Fig. 12.1

Source: Aris's Birmingham Gazette (1805-1811).

Wrightson's New Triennial Directory of Birmingham (1818).

Pigot and Co's Directory of Staffordshire, Warwickshire and Worcestershire (1828-9).

Pickford Co. Ltd. Memoranda Book (1829-35), B.T.H.R. PIC 4/7.

White, F. & Co. History, Gazetteer and Directory of Warwickshire (1850).

Slater's National and Commercial Directory, (1850).

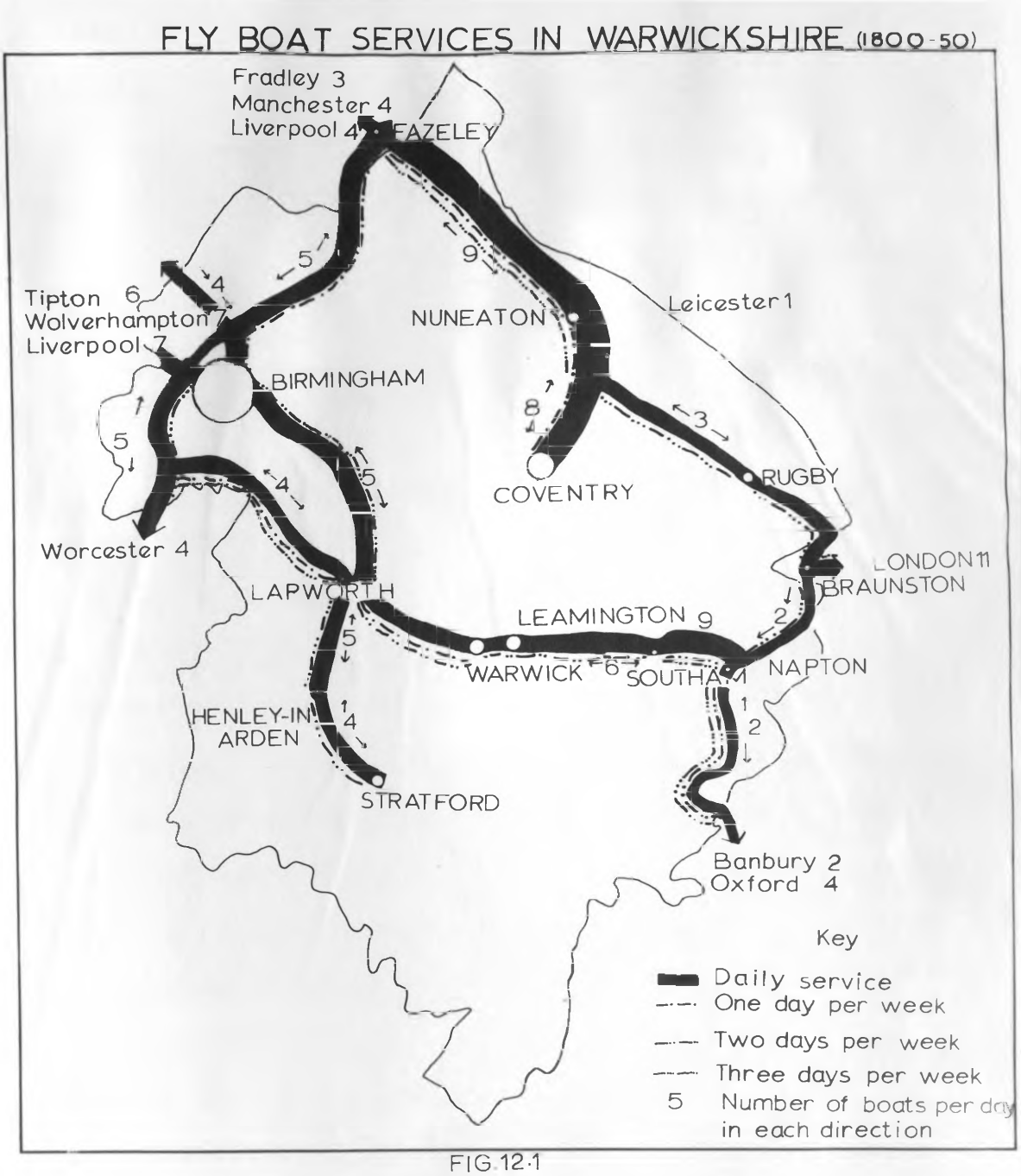

FLY BOAT SERVICES IN WARWICKSHIRE (1800-50)
Fradley 3
Manchester 4
Liverpool 4
FAZELEY
Tipton 6
Wolverhampton 7
Liverpool 7
BIRMINGHAM
NUNEATON
Leicester 1
COVENTRY
RUGBY
Worcester 4
LAPWORTH
LONDON 11
BRAUNSTON
LEAMINGTON 9
WARWICK 6
SOUTHAM
NAPTON
HENLEY-IN-ARDEN
STRATFORD
Banbury 2
Oxford 4
Key
Daily service
One day per week
Two days per week
Three days per week
5 Number of boats per day in each direction

FIG.12·1

destination, loading and unloading places. The information provided by these sources varies, and they contain many conflicting statements. Coventry, for example, has a very low coverage in both the Aris's Birmingham Gazette, Pigot's and Wrightson's directories, which mention only Pickford and Company's fly boats serving Coventry, but according to White and Slater directories, there were eight canal carriers serving Coventry. This understatement also applies to Stratford-upon-Avon, which was served by only one fly boat belonging to Pickford Company. Though such understatements could, in large measure, be attributed to the purpose and method of compilation of directories[4], and to partisan subscription (contributors insisting that only their own boats were mentioned), the nature and method of operation of the canal transport system is also a contributory factor. Canal transport was flexible with no scheduled time table, and it had an organization which was frequently informal and varied. It is, therefore, not surprising for small carriers to be omitted in advertisements. Moreover, many services through Warwickshire, but avoiding Birmingham, are not indicated. Despite these short comings, all the directories, Aris's Birmingham Gazette and Pickford Company's memoranda book jointly give quite comprehensive information about the nature of fly boat services in the county. (The fly boats used, averaging 3-3½ m.p.h., carried 10 tons of goods and worked for twenty-four hours, with a crew of four and a frequent change of horses every ten or twelve miles.) The nature of the canal service network, shown on the map, clearly illustrates the major routes used by the fly boats. These services were characterised by strong competition

---

(4) Vide Norton J. F. (1950). Guide to the National and Provincial Directories of England and Wales, excluding London, published before 1856. pp. 1-18. Royal Historial Society, London. The directories were commercial in nature and provided information on trade and distribution of goods, but usually only the more substantial and professional classes are indicated.

and rivalries among the carriers, each one claiming to operate the most efficient service, and served all towns along the route, though this is not revealed on the map. The services focused on Birmingham, whence there were regular daily services to other towns in Warwickshire. The most frequent canal services were on the Coventry and Oxford Canals where in 1835 there were as many as nine daily services operating each way on the two canals, with Nuneaton and Rugby forming important intermediate service centres. The Warwick-Napton Canal between Leamington and Southam was equally important with nine services in 1835 whilst the Warwick-Birmingham Canal had seven services and four on the Stratford Canal in the same period. As Fig. 12.1 illustrates, there were also some regular services apart from the daily ones. For example, Pickford and Company's fly boats called at Nuneaton thrice a week, and Thomas Jackson's boats twice a week. Out of the nine services operating on the Warwick-Napton Canal through Southam three boats, operated by Whitehouse and Company and G. R. Bird, called twice a week, and Crowley, Hickling and Company operated three times a week in 1850. The major areas of service reflect the areas of greatest transport demands in the county. For instance, the heavy services on the Coventry Canal were associated with traffic from the North-east Warwickshire coalfield, whereas those on the Warwick-Napton Canal reflect traffic from the industrial area of One Elm (Warwick), and the lime and cement works in Southam, Stockton and Lond Itchington. Though one might expect quantities of agricultural produce to be carried on these canals, the pattern portrayed by the information is biased towards the transport of coal and manufactured products, and one cannot obtain quantitative data on farm produce carried.

In addition to serving settlements in the county the canals of Warwickshire provided connections to all other parts of the country linked by canal. As Fig. 12.1 shows, Worcester, Leicester, Liverpool, Manchester, Oxford and above all London, became accessible through the canals in Warwickshire. In the 1790's the Coventry and Oxford Canals formed the only inland waterways from Birmingham to London via the Fazeley-Birmingham Canal until the opening of the Warwick-Birmingham, and the Warwick-Napton Canals in 1799 and 1800 respectively. The last two together with the Birmingham-Warwick Junction Canal (1844) and the four miles of the Oxford Canal, lying between Napton and Braunston, formed the most important direct link between Birmingham and London. It shortened the former route by 41 miles and avoided the long and circuitous course by the contour Oxford Canal. In view of the importance of canals to the regions served, it is not surprising that the opening of even a short section was attended with great jubilation and colourful festivity. For example, when the Oxford Canal was opened between Coventry and Banbury in March 1778, the first cargo of Warwickshire coal[5] was ushered into the wharf at Banbury with much jubilation. On January 1st 1790, the remaining section of the canal between Banbury and Oxford was opened and boats entered Oxford with more than 200 tons of goods including coal and corn, with the first boat "displaying the Union Flag and having on board the band of the Oxford Militia"[6]. Such a joyous atmosphere[7], stemming from the advantages to be derived from the canals, pervaded everywhere[8] a canal was opened. The event

---

(5) Aris's Birmingham Gazette, 6th April, 1778.

(6) Aris's Birmingham Gazette, 4th Jan. 1790.

(7) Shakespeare's Lib, R. B. Wheeler, (1814). Guide to Stratford-upon-Avon, a note by author in miscellaneous collection. ER 37/1.

(8) Aris's Birmingham Gazette, 23 Dec. 1799. Vide Birmingham Reference Library. 176121.
G. H. Osborne, Newspaper cuttings relating to canals 1886.

was planned with considerable care, bearing in mind the numerous economic advantages that would accrue from this waterway; the festivities in themselves constituted a good local advertisement. Thus, the improved transportation system associated with canals transformed the geography of the districts served. Market areas were extended, and bulky goods conveyed more economically; a whole new sequence of revolutionary changes came about.

Goods Carried

Roadstone, limestone for foundries and limekilns, lime for use as fertiliser, iron, timber, slate, Staffordshire blue bricks, and manufactured goods were profitably and conveniently carried. Running as they did mostly through rural areas, one would obviously expect the Warwickshire Canals to carry much agricultural produce; but such homely, ubiquitous cargoes were seldom recorded in detail. Thus, although Murray[9] mentioned the immense benefit derived by the Warwickshire Canals from the agricultural point of view, he said little more. The early volumes of the V.C.H. for 1904 and 1908[10] and the reports of the Select Committees on agriculture[11] are also silent concerning the effect of the canals on local agriculture. It is, therefore, difficult to quantify how many cattle or livestock from the Feldon of South Warwickshire, or loads of wheat and malt from Stratford-upon-Avon were carried by the canals. Suitable adjustments

---

(9) Murray, A. (1813). General View of Agriculture of the County of Warwick. A Report to the Board of Agriculture. pp. 310-320. London.

(10) W. Page (1904, 1908). Victoria County Histories of Warwickshire, Vols. 1, 2, 3. Archibald Constable and Company Ltd. London.

(11) H.M.S.O. (1820-1868). British Parliamentary Papers, Reports from Select Committees on Agriculture, Vols. 1-11. The first volume, for example, deals with the depressed state of agriculture in the United Kingdom from 1820-1828, while Vols. II and III deal with causes and extent of the agricultural distress in 1833 and 1836 respectively.

in local marketing patterns no doubt resulted, too, but records are silent on this interesting subject. Early large-scale maps and plans, particularly enclosure, tithe and estate maps (Fig. 12.2) were also studied in an attempt to establish the influence of canals on nineteenth century agricultural land-use, but very little is revealed by these maps. As Fig. 12.2 demonstrates the Warwickshire Canals pass through no less than sixty-five parishes, thirty of which are covered by enclosure maps. Only six of these enclosure maps (1770-1863) show canals cutting across the fields, or running along pre-existing farm boundaries where farmers objected to the canals passing through their fields. Similar remarks apply to the eight tithe and eleven estate maps embracing canals. Though occcasionally there are wharves suggesting that the canal was used as a means of transport in connection with the farms, either for despatching agricultural products like wheat, barley and oats, or for bringing in manure or lime which was used widely as fertiliser, the maps do not reveal the value of the canal to the farmer[12].

Though roadstone, limestone, manufactured goods and agricultural produce were profitably and conveniently carried in the period 1790 to 1838, none of these commodities was nearly so important as coal, which comprised no less than 54% of the total canal tonnage. Indeed, coal prices were drastically reduced under the canal revolution. Different types of coal were carried. On the Coventry Canal North-East Warwickshire coal formed the most important commodity between 1800-1807 (Fig. 13) and easily dominated[13] the traffic with the value rising steadily from

---

(12) See Figs. 26 and 27 for areas with evidence on canal side land-use.
(13) B.T.H.R. State of Trade on the Coventry Canal, CVC 4/156, 1801-1807.

Parishes through which the canals passed

1. Saltley, Aston.
2. Edgbaston.
3. Acocks Green.
4. Solihull.
5. Elmdon Heath.
6. Balsall.
7. Hampton-in-Arden.
8. Kingswood.
9. Rowington.
10. Shrewley.
11. Hatton.
12. Budbrooke.
13. Warwick.
14. Royal Leamington Spa.
15. Offchurch.
16. Long Itchington.
17. Birdingbury.
18. Bascote.
19. Leamington Hastings.
20. Napton-on-the-Hill.
21. King's Norton.
22. Yardley.
23. Solihull.
24. Tanworth.
25. Hockley Heath.
26. Lapworth.
27. Preston Bagot.
28. Wootton Wawen.
29. Aston Cantlow.
30. Old Stratford.
31. Shuttington.
32. Glascote.
33. Polesworth.
34. Grendon.
35. Atherstone.
36. Merevale.
37. Mancetter.
38. Hartshill.
39. Caldecote.
40. Nuneaton.
41. Chilvers Coton.
42. Bedworth.
43. Foleshill.
44. Coventry.
45. Coombe Fields.
46. Ansty.
    Shilton.
47. Stretton-under-Fosse
48. Brinklow.
49. Easenhall.
50. Harborough Magna.
51. Little Lawford.
52. Newbold-on-Avon.
53. Clifton-upon-Dunsmore.
54. Willoughby.
55. Wolfhamcote.
56. Grandborough.
57. Lower & Upper Shuckburgh.
58. Upper Radbourne.
59. Priors Hardwick.
60. Stoneton.
61. Wormleighton.
62. Fenny Compton.
63. Farnborough.
64. Middleton.
65. Lea Marston.
66. Curdworth.
67. Minworth.

For Source of Fig. 12.2 see Appendix I.

EVIDENCE OF CANALSIDE LANDUSE IN ENCLOSURE, TITHE & ESTATE MAPS

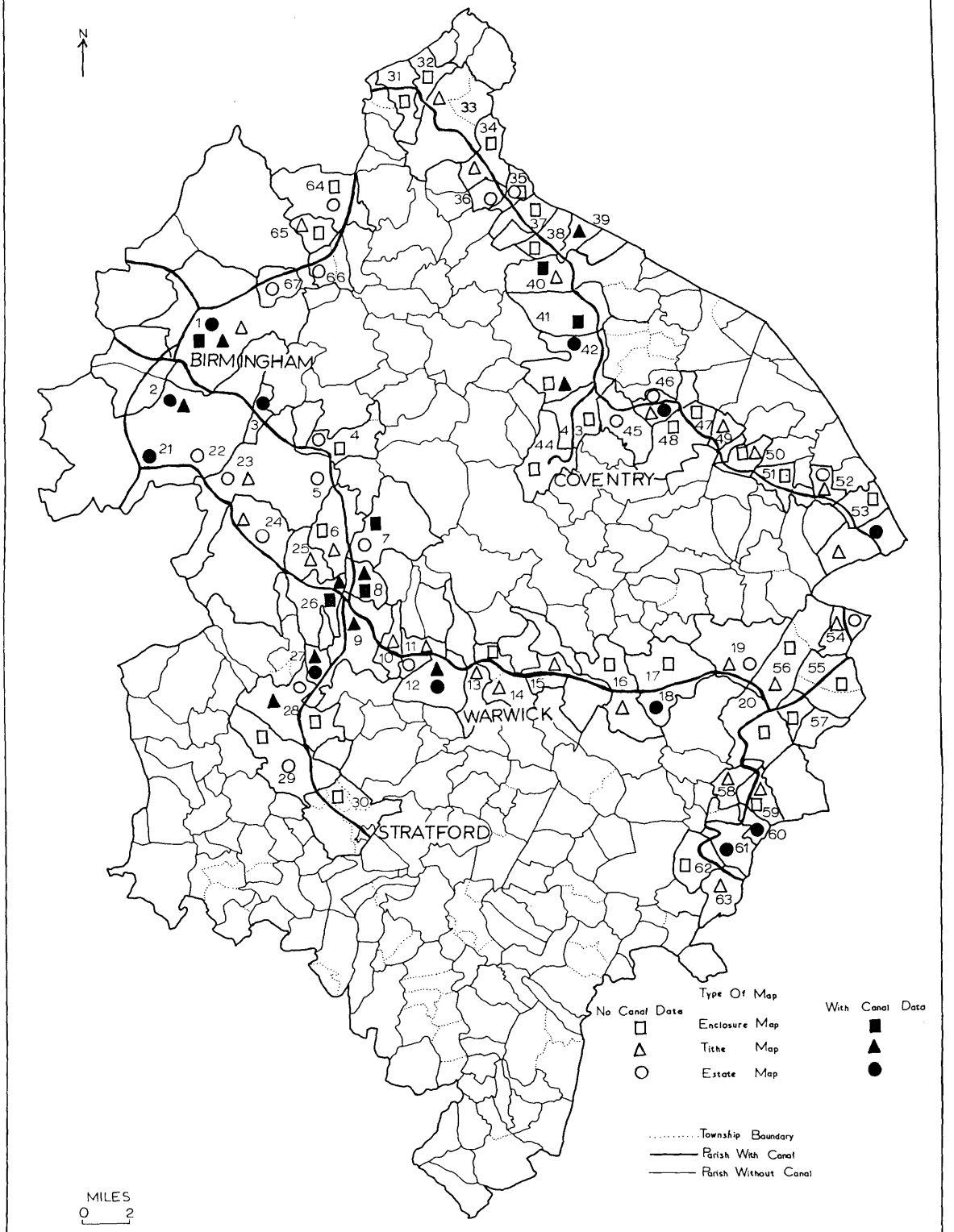


FIG.12.2

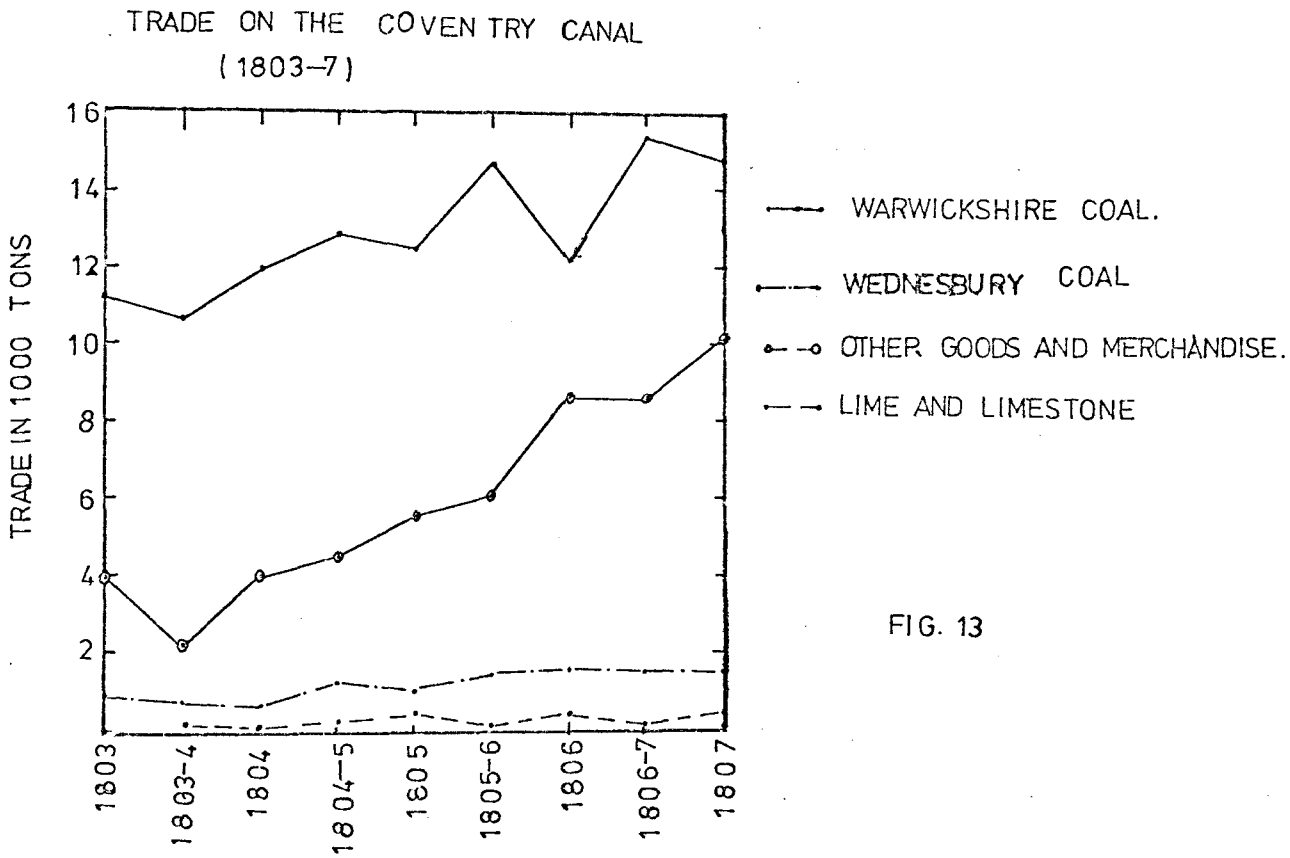

TRADE ON THE COVENTRY CANAL
(1803–7)
TRADE IN 1000 TONS
16
14
12
10
8
6
4
2
1803
1803-4
1804
1804-5
1805
1805-6
1806
1806-7
1807
WARWICKSHIRE COAL.
WEDNESBURY COAL
OTHER GOODS AND MERCHANDISE.
LIME AND LIMESTONE

FIG. 13

1804 (Fig. 13). On the other hand, Black Country coal from Wednesbury bound south and south-east to Oxford and London was comparatively unimportant, though the tonnage increased by about 46% between 1804 and 1806. There are no statistics between 1809 and 1821, but it is possible that the rise continued reaching a peak in 1831 with an increase of about 92,000 tons by the latter date[14]. Fig. 14 shows a sharp rise from 1823 to 1824, thence there was a steep fall to 1826, followed by another rise in 1831 after which the tonnage started to drop falling sharply in 1834 in response to railway competition. It is interesting to note the negligible tonnage of Leicestershire coal carried on the Coventry Canal in 1804, but not easy to account for this.

The Leicestershire coalowners had faced strong competition in their own market as early as 1790[15] from cheaper, better quality Derbyshire coal. This had cut Leicestershire coal prices by 2d per hundredweight, - possibly forcing Leicestershire coalowners to look for alternative outlets. One would, therefore, expect infiltration of small quantities of Leicestershire coal into Warwickshire, but according to the statistics available for the early nineteenth century, it was only in 1804 that Leicestershire coal was navigated on the Coventry Canal, suggesting that the supply to Warwickshire was very irregular. By 1843, however, Leicestershire coal had become both common and popular in Coventry, and showed an increase between 1843 and 1859 (Figs. 15.1, 2, 3).

---

(14) B.T.H.R. An Account of Wednesbury Coal and Coke navigated on the Coventry Canal, CVC 4/156, 1821-1834.

(15) Patterson, R. (1949). "The making of the Leicestershire Canals", Transactions of the Leicestershire Archaeological Society, Vol. 25-7, p. 67. Leicester.

WEDNESBURY COAL AND COKE CARRIED ON
THE COVENTRY CANAL(1821–1834)

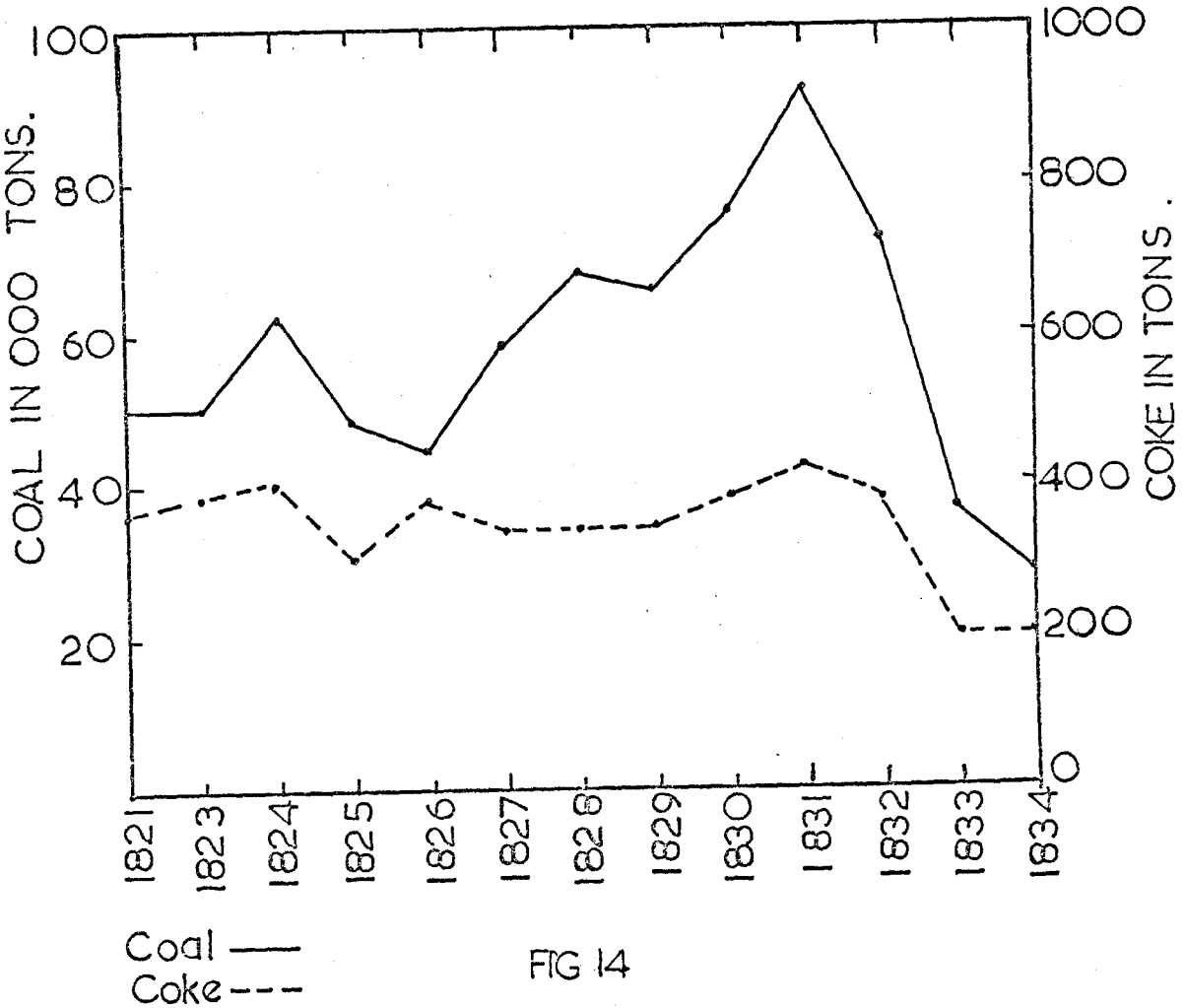


FIG 14

COAL TRAFFIC FROM WARWICKSHIRE, CANNOCK CHASE
& LEICESTERSHIRE COALFIELDS (1843)

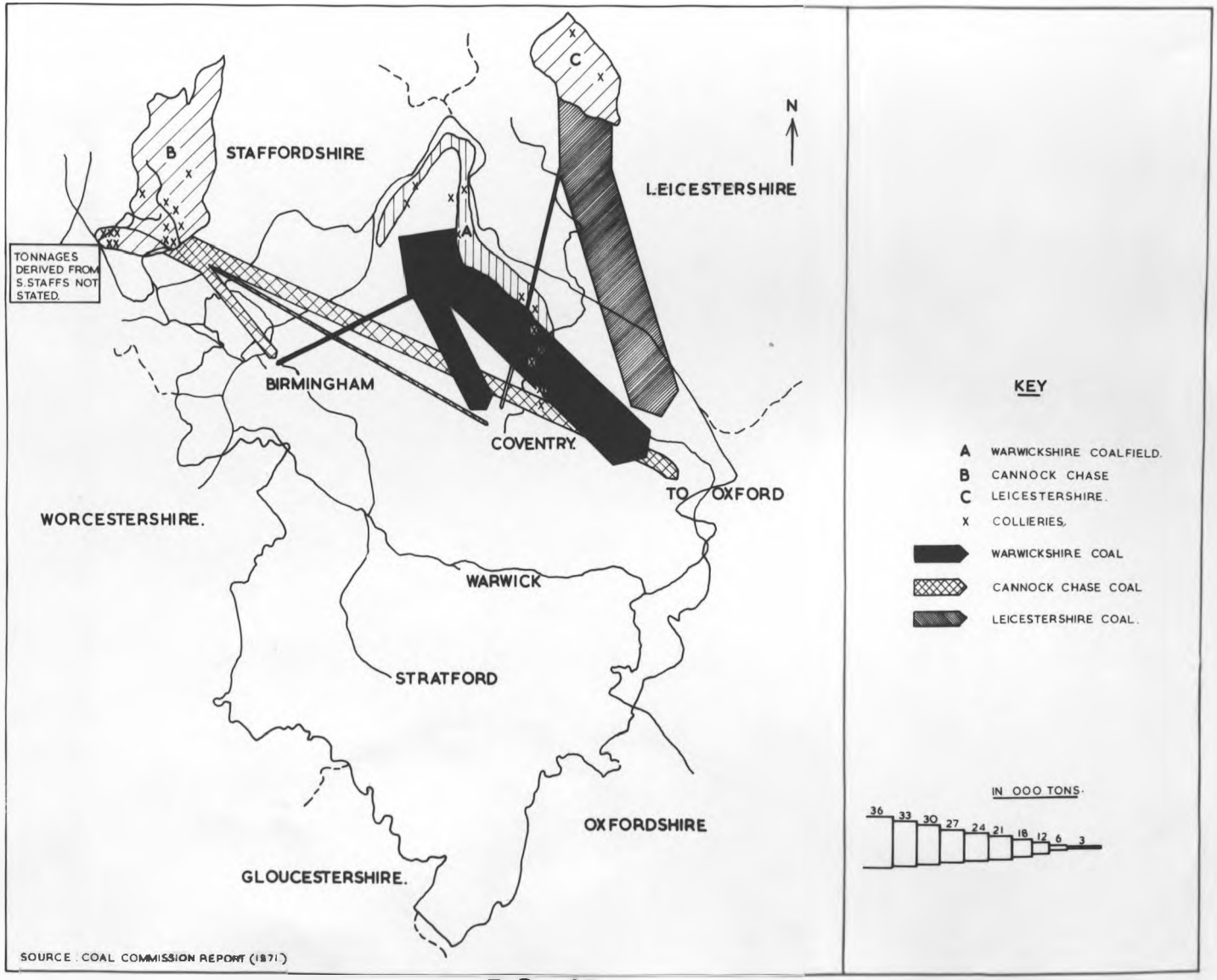


FIG 15·1

COAL TRAFFIC FROM WARWICKSHIRE, CANNOCK CHASE
& LEICESTERSHIRE COALFIELDS (1849.)

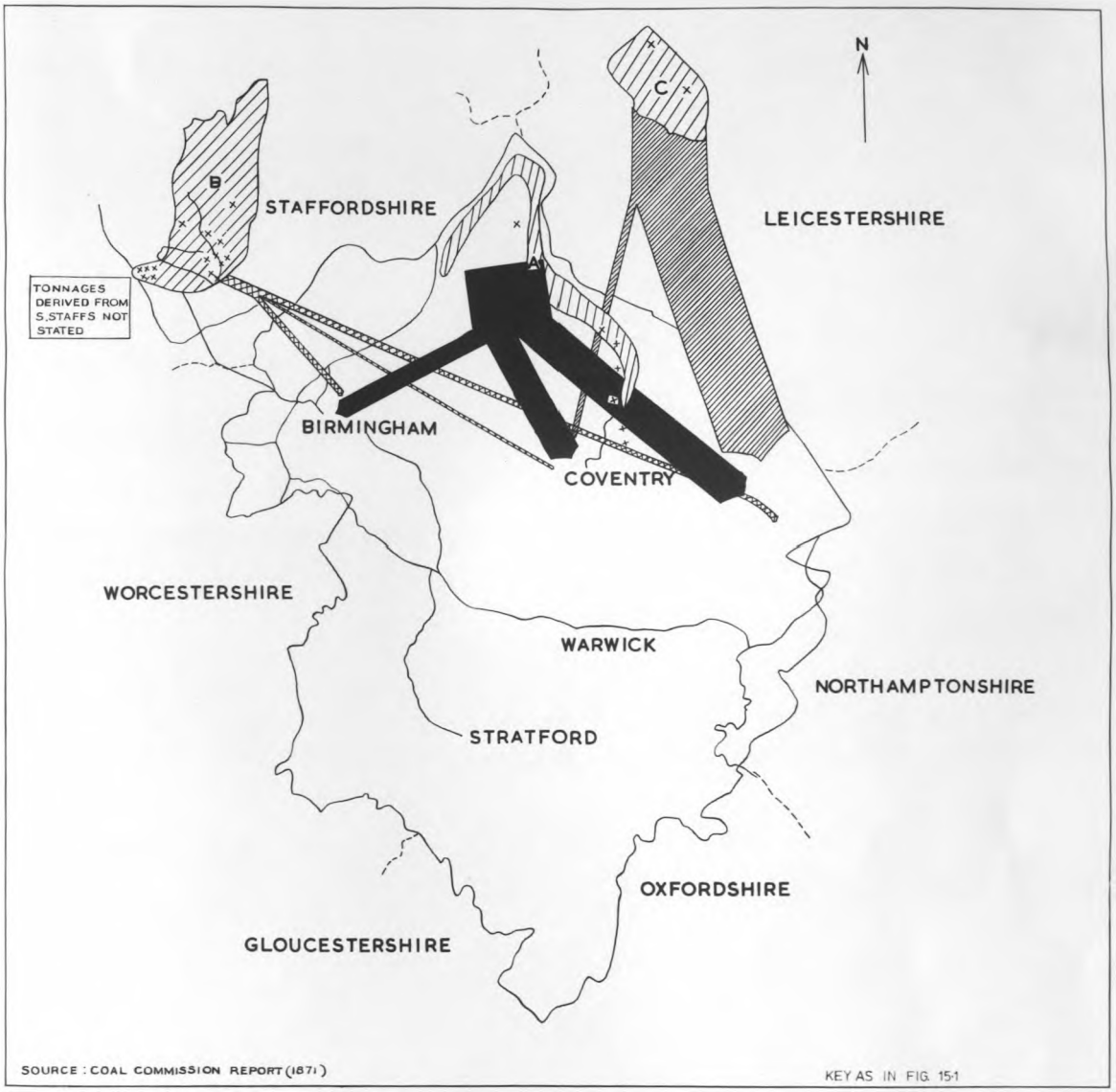


FIG.15.2

COAL TRAFFIC FROM WARWICKSHIRE, CANNOCK CHASE
& LEICESTERSHIRE COALFIELDS (1859)

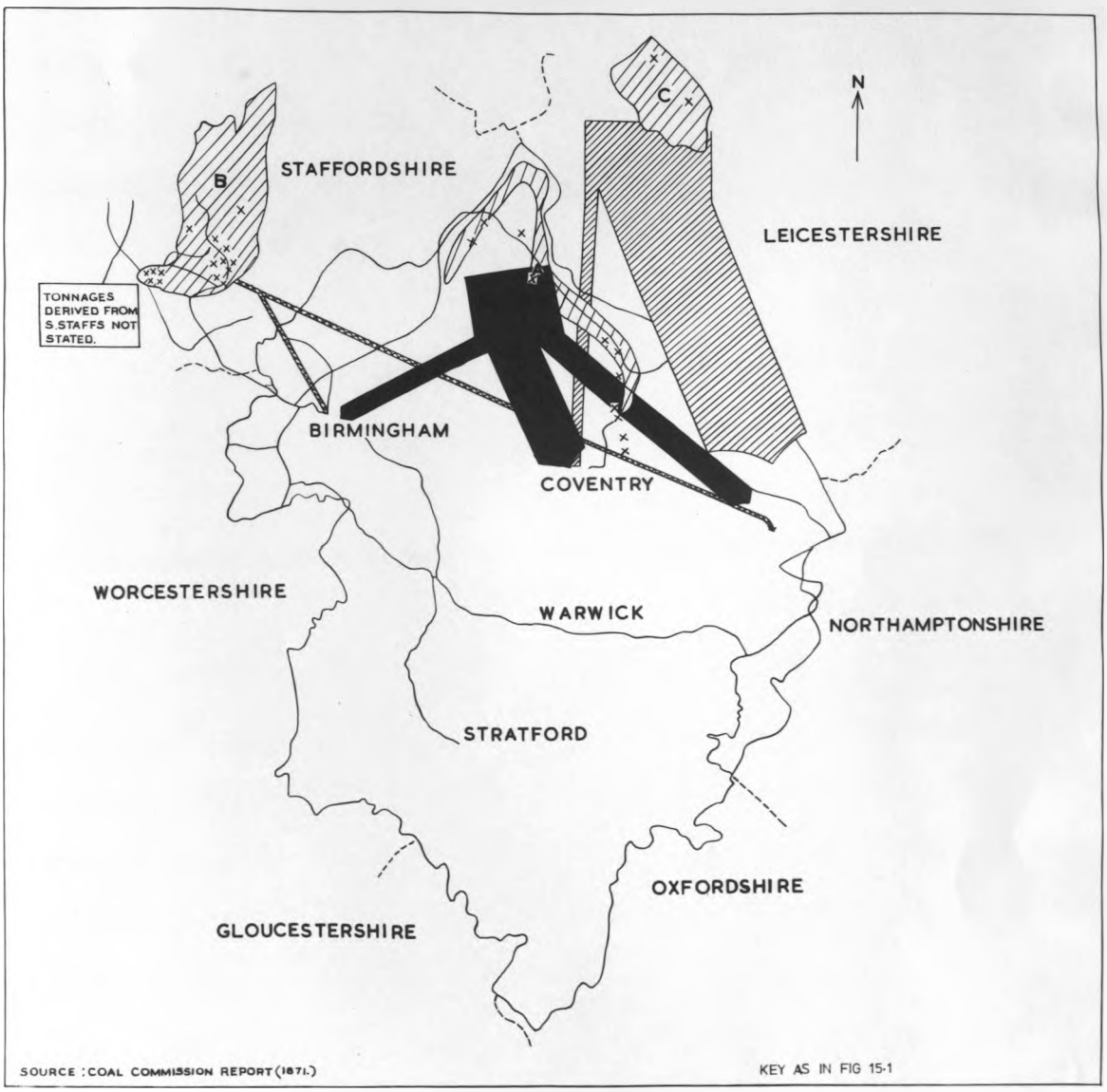


FIG. 15.3

Fig. 15 shows that Coventry received only small amounts of coal from Cannock Chase (- though the amount of coal coming from elsewhere in South Staffordshire is unknown). Only 100 tons of coal were recorded on the Coventry Canal whereas more than 22,000 tons of Cannock Chase coal were recorded on the Oxford Canal for distribution in Warwickshire, Oxfordshire, Northamptonshire, Buckinghamshire and London. Nevertheless, this amazing quantity on the Oxford Canal was to decrease considerably by 1858. Similarly, there was a decrease of Warwickshire coal on the Oxford Canal from 1843 to 1859[16] as is discussed later. As Cannock Chase coal bound for Birmingham, Coventry and Oxford decreased, Warwickshire coal going to Birmingham and Staffordshire increased (Fig. 15.1, 2, 3).

This period coincided with a time when the productivity of the South Staffordshire coalfield had started to decline[17] due to partial exhaustion, so that instead of being a coal exporter as before, it became an importer. As the Warwickshire coalfield was the nearest to Cannock Chase and South Staffordshire it began to meet the demands of Birmingham and the Black Country. Such demands might be the cause of diminution of Warwickshire coal southward bound to Oxford. Though Mitcheson states that there was no demand for Warwickshire coal in South Staffordshire till about 1880, Figs. 15.1, 2, 3, show that Birmingham started to import increasing quantities of coal from the East Warwickshire coalfield as early as 1849 when imports to South Staffordshire increased by no less than 41.2% between 1843 and 1849 and by 84.4% in the period of 1859. This considerable leap shows the

---

(16) H.L.R.O., Coal Commission Report, 1871, Vol. 3, p. 120.

(17) Mitcheson, J. C. (1950). "The East Warwickshire Coalfield", Birmingham and its Regional Setting, British Association, p. 296, Birmingham.

TRADE ON THE OXFRD CANAL

(1803 – 1807)

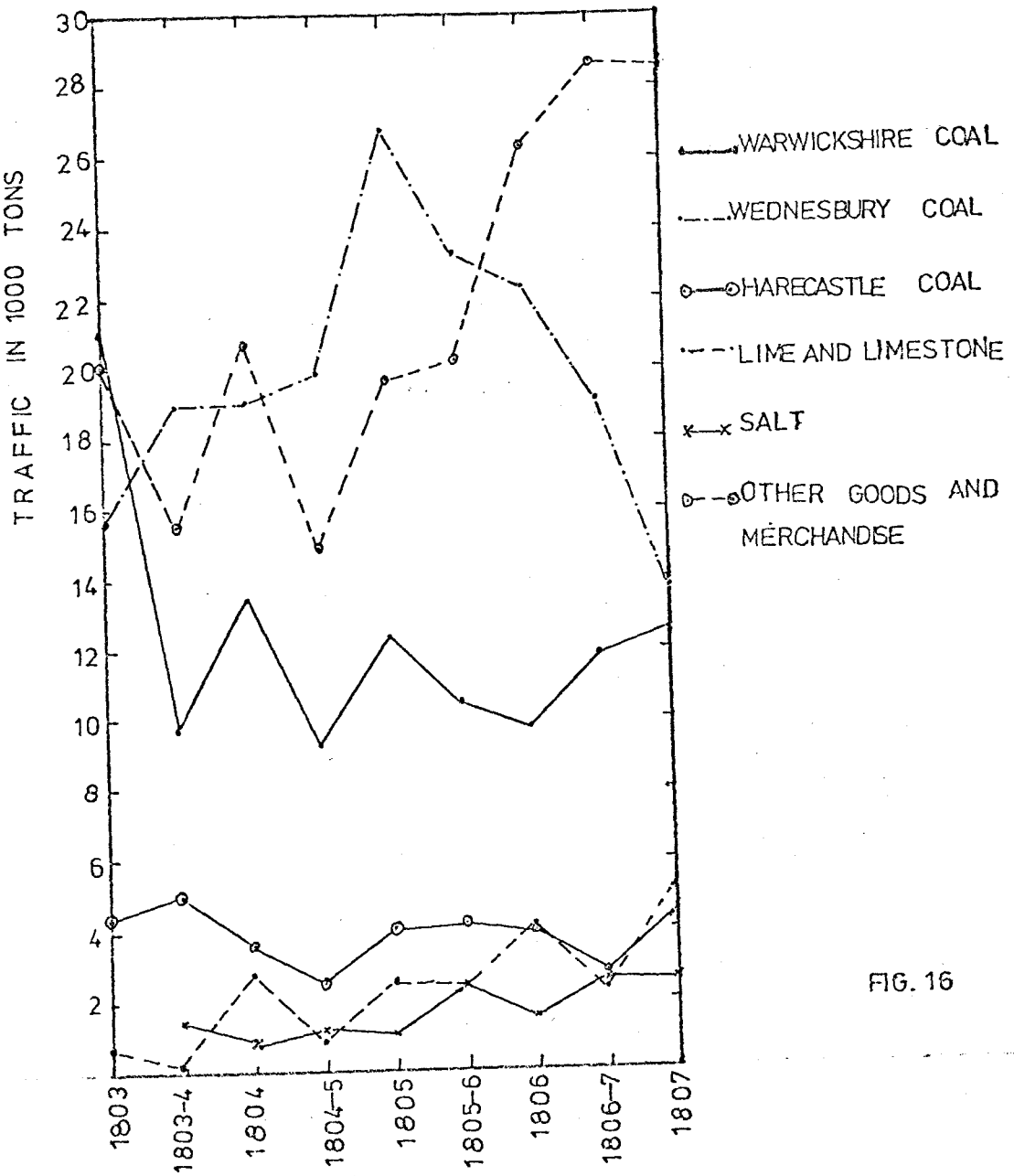


FIG. 16

ever growing popularity of Warwickshire coal in Staffordshire at that time. Overall tonnage receipts of the Coventry Canal[18] were about £12,000 in 1802 rising steadily to well above £63,000 in 1815. In 1816, on the other hand, receipts were halved. This could be explained by the diversion of traffic caused by the opening of the Warwick Canals which shortened the Birmingham-Fazeley-Coventry route by 41 miles. The effect was only conspicuous between 1800 and 1816, though it was very likely that the fall in receipts continued till the early 1820's.

Traffic on the Oxford Canal

More varieties of coal were carried on the Oxford Canal than on the Coventry Canal. Warwickshire coal on the Oxford Canal compared in quantity with that on the Coventry Canal suggesting equality in tonnage of internal and external coal traffic on the latter canal. The most important and interesting feature of the coal traffic was Wednesbury coal (Fig. 16) which increased[19] by over 4,000 tons per annum from 1803 to 1805 whilst Warwickshire coal decreased by about 8,000 tons per annum over the same period[20]. Thereafter the decline was about 1,000 tons per annum (Fig. 16). The high rate of increase in Wednesbury coal on the Oxford Canal is discussed later in the chapter. An average of 3,700 tons of Harecastle coal was carried annually on the Oxford Canal (Fig. 16) after a long trip through the Grand Trunk, the Staff-Worcs, the B.C.N. on to the Warwick Canals.

---

(18) B.T.H.R., Coventry Canal Tonnage Ledger, 1814-1820. CVC 4/84.

(19) B.T.H.R., Coventry Canal Tonnage Ledger, 1801-1807. CVC 4/156.

(20) Ibid.

In view of the shorter route of the Coventry Canal, preference for the longer route through the B.C.N. may seem strange. Possibly the carriers preferred the longer, more straightforward route (despite its 205 locks) to the circuitous northern Oxford Canal. The lower tonnage rate, levied on traffic on the B.C.N., was a further attraction.

The Oxford Canal carried an amazing variety of goods in addition to coal. Pig and cast iron from Wednesbury, Darlaston and Cannock Chase areas were transported to London as were iron pipes for factories and waterworks from Coalbrookdale. Such traffic reached the Oxford Canal via the B.C.N. and the Stratford and Warwick Canals. Bricks were another component of the traffic (either Staffordshire blue bricks, bricks from North-east Warwickshire, or fire bricks from Stourbridge). Limestone and lime, obtained from the Silurian limestone of South Staffordshire and Leicester, used widely for agricultural and building purposes, was small (699 tons) in 1803, but rather significant because the canals made lime widely available as a fertiliser. Liberal use of fertilisers had become particularly important during the twenty five years prior to 1815 while England was cut off from foreign supplies of wheat during the Napoleonic Wars and every available means of increasing her home production had to be tried. This accounts for the steady rise of lime (Fig. 16) from about 700 tons in 1803 to 5,600 tons in 1807. Other goods included agricultural produce such as hay, straw and vegetables, glass from Stourbridge, nails from Derby and the Black Country, stone from Hartshill, Mountsorrel and Quorndon on the Leicestershire route all southward bound. Northward bound traffic, mostly from London, consisted of groceries and other goods - either manufactured or imported to the Midlands.

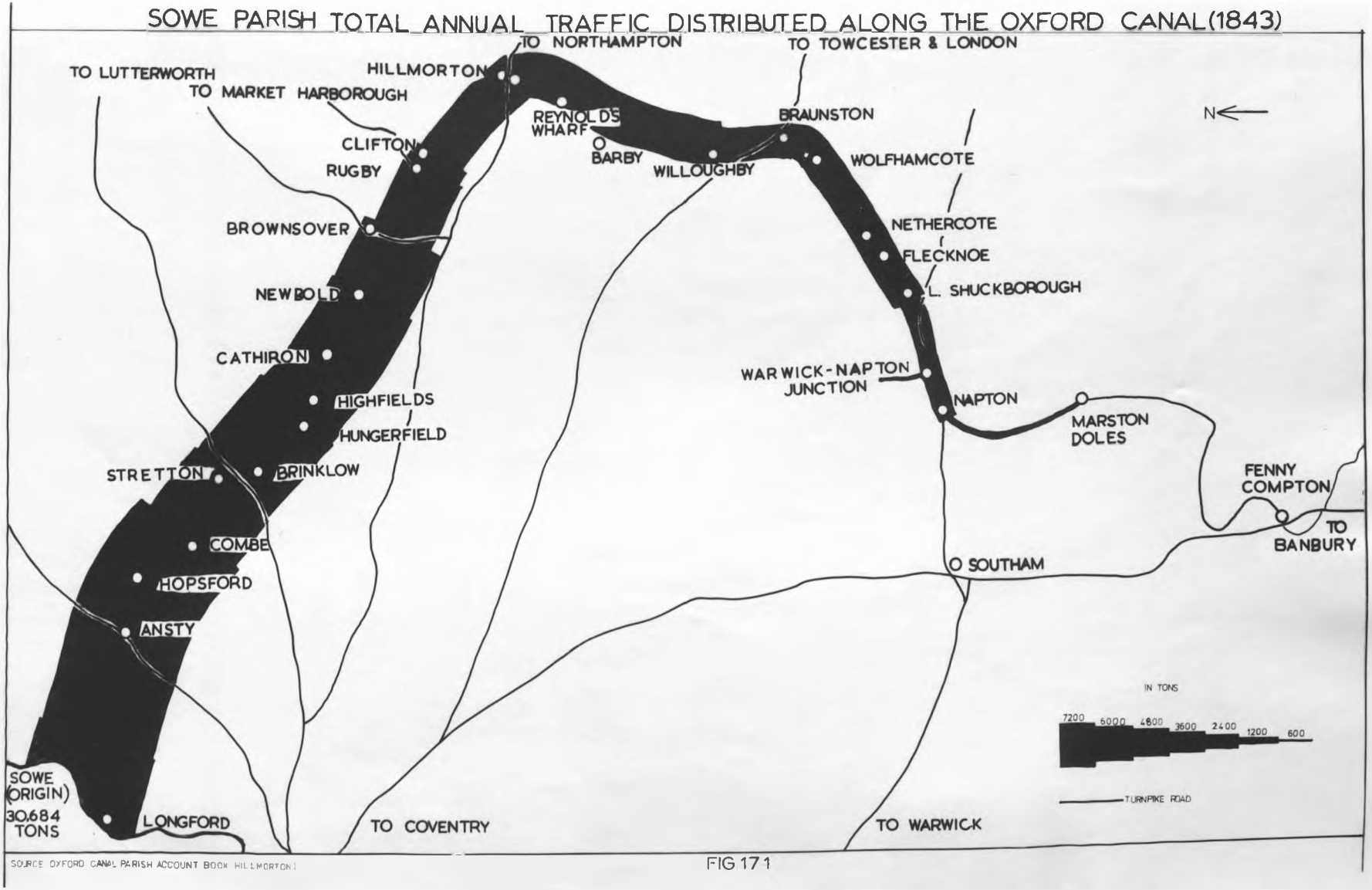
Fig. 17.1 shows a further analysis of Oxford Canal traffic from Longford and Sowe parishes distributed in towns along the Oxford Canal in Warwickshire. Though the composition of the traffic was not stated[21], commodities like grain[22] from nearby parishes such as Foleshill and Sowe, coal from the North-east Warwickshire coalfield, Wykin and Craven collieries[23], Wednesbury and Harecastle, as already discussed, and limestone and lime from South Staffordshire and Leicester were also carried. In this connection it would have been interesting to know the exact proportion of each commodity discharged in the various parishes and how these varied from month to month, but, unfortunately, lack of such desirable data does not permit detailed analysis of the influence of the canals on these parishes. However, some generalisations can be made from the limited data available. It is clear from Fig. 17.1 that all settlements along the Oxford Canal benefit ed from traffic along it. For instance, 86% of the settlements, including Hopsford, Newbold and Barby, received average about 100 tons of goods per annum via the Oxford Canal, while the remaining settlements received an annual average of over 3,000 tons. The highest tonnage of goods was off loaded at Rugby, which received no less than 6,514 tons amounting to 21.3% of the total annual traffic originating from Longford.

---

(21) Oxford Canal Parish Account, 1843, Q2. This account book together with other miscellaneous collections of the Oxford Canal can be found at the British Waterways Depot at Hillmorton.

(22) B'ham. Ref. Lib. Miscellaneous Manuscript containing Notes on Canals and Railways, about 1840, p. 19 et seq. 395899. There is evidence here about grain carried on the Coventry Canal from Longford and it is possible that some of the grain was carried down south through the Oxford Canal from Longford.

(23) Oxford Canal Parish Account, op.cit. p. 55-6.

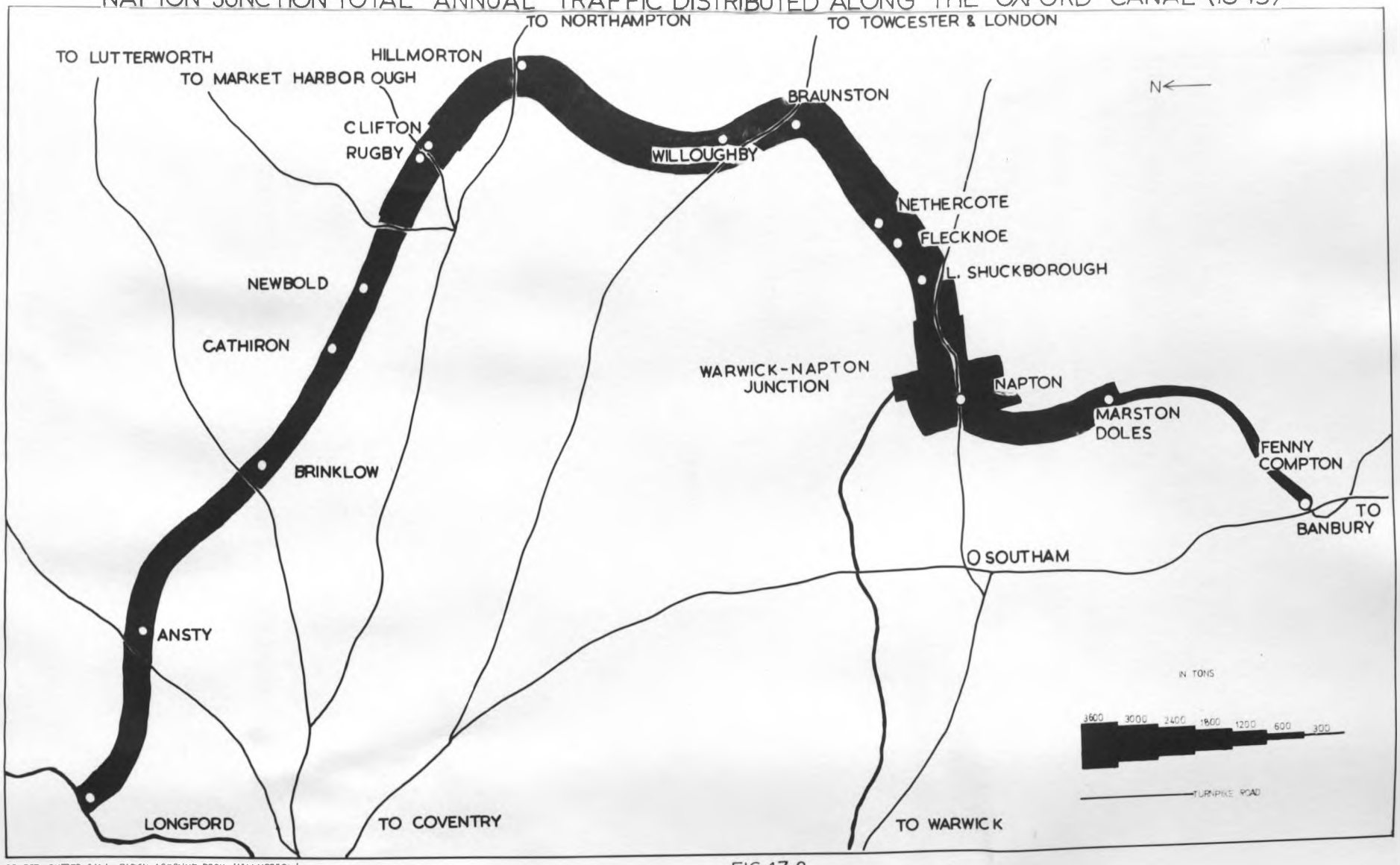


SOURCE OXFORD CANAL PARISH ACCOUNT BOOK HILLMORTON]

FIG 17.1

Stretton received 4,009 tons (13.1%), Hillmorton wharf 3,659 tons (11.9%), Warwick-Napton Junction 3,361 tons (10.9%), and Braunston 2,647 (8.6%). An important point revealed by the map is the location of these towns at a junction of turnpike road and canal, suggesting complementarity between the two modes of transport. The highest proportion of traffic was unloaded at Rugby where the Warwick-Rugby-Northampton road, turnpiked in 1800, crossed the canal. The Coventry-Leicester turnpike, also completed by 1800, intersected the canal at Stretton, while the road from Warwick to Northampton crossed the canal at Hillmorton wharf. It would seem that goods were unloaded at the wharves, located at the canal and road junctions, for further distribution by road. At Napton and Braunston some of the goods were redistributed by the Warwick-Napton and the Grand Junction Canals respectively. The importance of road, and canal junctions in the distribution of canal traffic is further illustrated by Fig. 17.2, which shows merchandise that passed from the Warwick-Napton Junction to Longford on the Oxford Canal. The highest tonnage of 1,790 tons a year was unloaded at Longford, the junction of the Oxford and Coventry Canals, and 470 tons a year at Lower Shuckborough where the canal was intersected by the Southam-Northampton road, whilst the other towns received on average less than 100 tons a year. The only exception to the settlements that received a high percentage of traffic from the Oxford Canal was Marston Doles, which was not located at any major road crossing but received well over 8,000 tons of goods per annum. This high tonnage can be attributed to the presence of the extensive warehouse here where goods could be stored while awaiting distribution. It is possible that the storing facilities at Fenny Compton also contributed to swell the amount of traffic discharged here.

NAPTON JUNCTION TOTAL ANNUAL TRAFFIC DISTRIBUTED ALONG THE OXFORD CANAL (1843)



SOURCE: OXFORD CANAL PARISH ACCOUNT BOOK (HILLMORTON)

FIG.17.2

Traffic on the Oxford Canal increased very rapidly with the completion of the Birmingham-Fazeley and Coventry Canals in 1790. Tonnage receipts almost doubled between 1788 and 1790 with a subsequent steady and continuous rise[24], culminating in over £90,000 in 1830 when the highest tonnage ever was recorded on the Oxford Canal. Despite the general rise of tolls, there were periods of decline in the 1800s due to competition from other canals. The Oxford Canal Company gained initially from its links with other canals which eventually diverted most of their traffic. For example, with the opening of the Grand Junction Canal, which in 1805 acted as a feeder to the Oxford Canal, tonnage receipts increased to over £60,000 in 1807 and continued to rise, benefiting from the large and varied traffic of the Grand Junction Canal to and from London. The goods came to Braunston through the northern section of the Oxford Canal or via the Stourbridge, Dudley, Stratford and Warwick Canals to the four miles of the Oxford Canal linking the latter to the Grand Junction Canal. The trade on and off the Warwick Canal paid tolls and also yielded good profits to the Oxford Canal Company from the heavy compensation payments granted by the Act of Parliament[25]. Fig. 18 shows the situation on the Oxford Canal at three interchange points. Before the opening of the Warwick Canal in 1800 the tonnage receipts at Hawkesbury (the interchange point with the Coventry Canal), were about £7,000 for the three year period between 1793 and 1800, falling off by £2,000 between 1803 and 1812 when the Warwick line diverted most of the trade to its line.

---

(24) Hadfield, C. (1966). Canals of the East Midlands, 2nd ed., 1970, pp. 156-9, also Hadfield, C. (1950). British Canals, 4th ed., 1969, p. 177, David and Charles Limited, London. It would be interesting to know the amount of increased tonnage receipts due to increased charges, and how much to increased amounts carried, but the available data does not permit such analysis.

(25) B'ham Ref. Lib., 17105, "Warwick and Napton Canal Act, 1796, 36 Geo., C.95". Midland Canal Acts, Vol. III, pp. 268-270.

TOLL RECEIPTS AT HAWKESBURY, NAPTON AND BRAUNSTON
1793—1832.

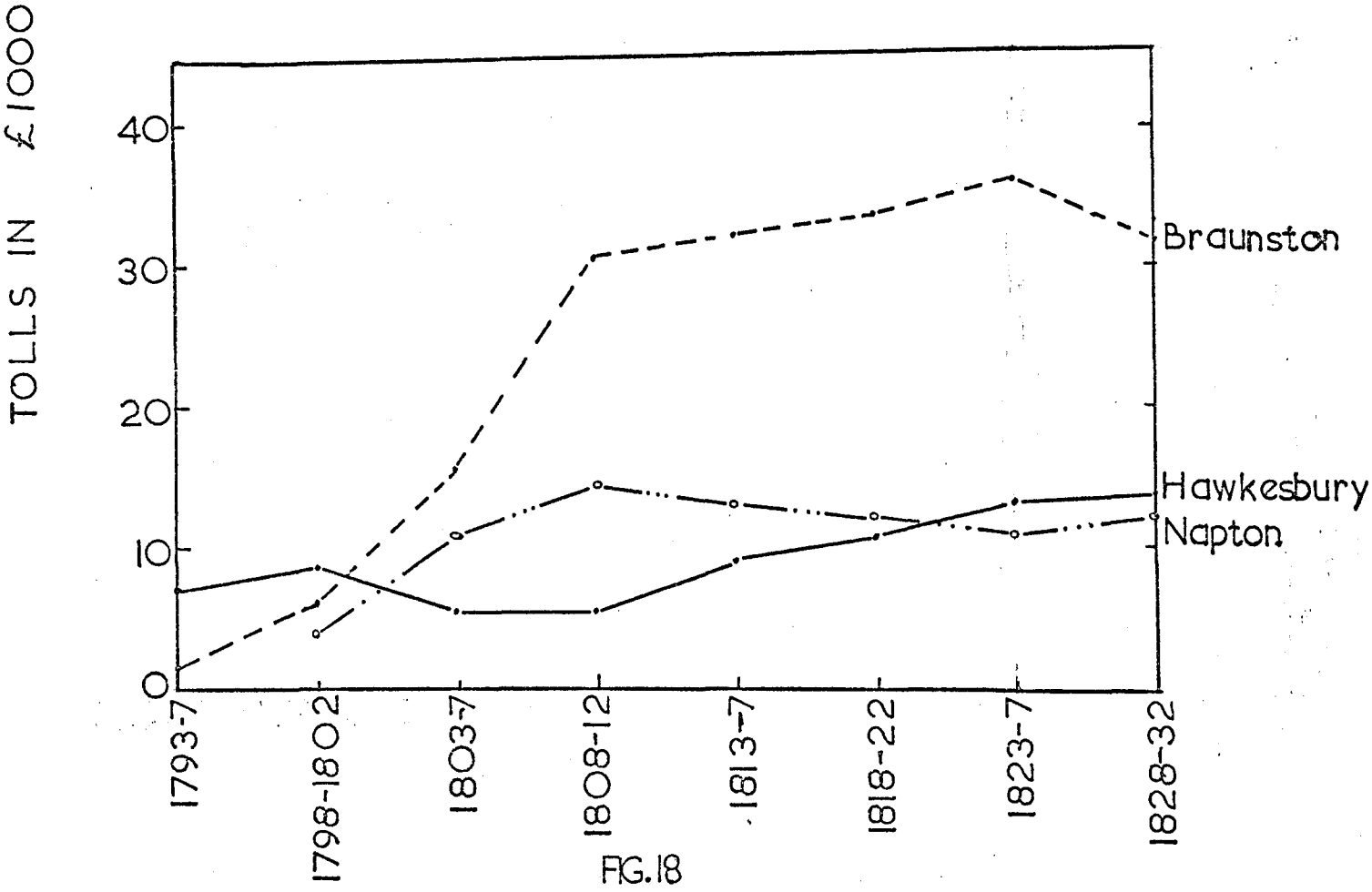


FIG. 18

Similarly, with the opening of the Grand Junction in 1805, the tonnage receipts at Braunston (the interchange point with the Grand Junction) trebled. In effect trade was gradually diverted from the northern section of the Oxford Canal by the Warwick Canals and from the southern section by the Grand Junction Canal which provided a much more direct route to London, leaving only the four mile section as an important link between the two latter canals. Indeed, the Oxford Canal Company protested strongly against such crippling interruption of trade. As compensation the company was granted a £10,000 toll/per annum for traffic that passed to and from its canal to the Grand Junction Canal. Furthermore, the company was authorized to charge 2s.9d. a ton for all coal from the Oxford to the Grand Junction Canal irrespective of distance[26]. The guarantee of revenue was never required but the Oxford Canal collected large sums of compensation tolls at Napton and Braunston, earning a large proportion of its revenue in this way.

Traffic on the Stratford and Warwick Canals

The balanced traffic of the Oxford Canal contrasts that of the Stratford-upon-Avon Canal where most of the traffic was eastbound and concentrated on the King's Norton-Kingswood branch. Through or external traffic was made up of iron, fire bricks and other industrial products from Stourbridge and Coalbrookdale, and salt from Droitwich. Local traffic formed a large proportion of the total movement and comprised mainly coal from the Netherton and Dudley collieries bound for Stratford and its neighbourhood. Northbound traffic was partly

---

(26) Ibid. pp. 268-270.

agricultural produce: corn, malt and cheese, (cheese had been particularly important in the eighteenth century when there was a swing from corn farming to dairying[27]. The most important traffic southwards, however, was limestone, paving stone and marble carried to the canal by a horse-tramroad from Temple Grafton to Wilmcote whence it was taken to Birmingham, and the Black Country and London. Lime and cement from Wilmcote were also carried. Trade on the canal was encouraged firstly, by the local trade of the River Avon which carried down the river the coal brought by the canal, and secondly by the Stratford and Moreton Tramway which benefit ed the Stratford Canal Company by taking canal coal down to Moreton and bringing back corn for the Stratford and Birmingham market. A handsome revenue of over £2,000 per annum was earned for the canal company by the tramway and well over £1,000 per annum by the Lower Avon Navigation between 1831 and 1839.

The Warwick-Napton Canal traffic was made up of about equal proportions of through traffic passing between London, Birmingham and Staffordshire, and of local traffic originating and ending on the canal. The principal external traffic was lime bound for London[28] from the limestone quarries at Wilmcote and coal from the Coventry and Nuneaton collieries comprising about 50% of the traffic, the rest of the traffic being sundries. Traffic on the Birmingham-Warwick Junction Canal was external (i.e. originating from the canal and passing on to other canals), with practically no exclusively local traffic. 90% of the traffic originating from this canal passed on to

---

(27) B.T.H.R. Stratford Canal Proprietors' Minute Book, 26th June, 1822, SCN/1.

(28) B.T.H.R. "Birmingham-Napton Canal", Canal and Railway Rates, 1888, MT1/22.

South Staffordshire[29]. Northward bound traffic went through the Tame Valley branch of the B.C.N. in the direction of Cannock Chase. Good use was also made of the Birmingham-Warwick Junction Canal by the factories adjoining it for carrying goods between works. Before the construction of this canal interchange and flow of traffic between the Warwick-Birmingham Canal and the B.C.N. occurred at Digbeth Junction where in 1832 no less than 218,000 tons of coal passed from the B.C.N. to the Warwick-Birmingham Canal as is shown by Fig. 19.1. The quantity represents the largest proportion of coal passing on to other canals[30]. After 1832, however, the coal traffic to Warwick and Coventry experienced a steady decline; by 1850 that of the Warwick had dwindled to almost 50% (Fig. 19.1, 2, 3, 4). The supply to the Coventry Canal was the lowest, and by 1850 there was a reduction of 46,000 tons because of the exhaustion of the South Staffordshire supplies, as already explained (vide p.45-6 supra).

Impact on Warwickshire

Influence on Prices

The opening of the canals had an immediate and most striking impact on carriage rates, leading to a sharp fall in the price of coal[31] and other bulky commodities like road stone, lime and manure. Because of the wide divergence in toll rates between different canals, and in transport charges between the many carriers, it is difficult to

---

(29) B.T.H.R. "Birmingham-Warwick Junction Canal", Canal and Railway Rates, 1888. MT1/22.

(30) House of Lords Record Office, Select Committee on the Coal Trade, June 13, 1838, p. 140.

(31) Vide Abercrombie. Sir L. P. and Nickson, R. (1949). Warwick: its Preservation and Redevelopment. p. 13. Architectural Press, London.

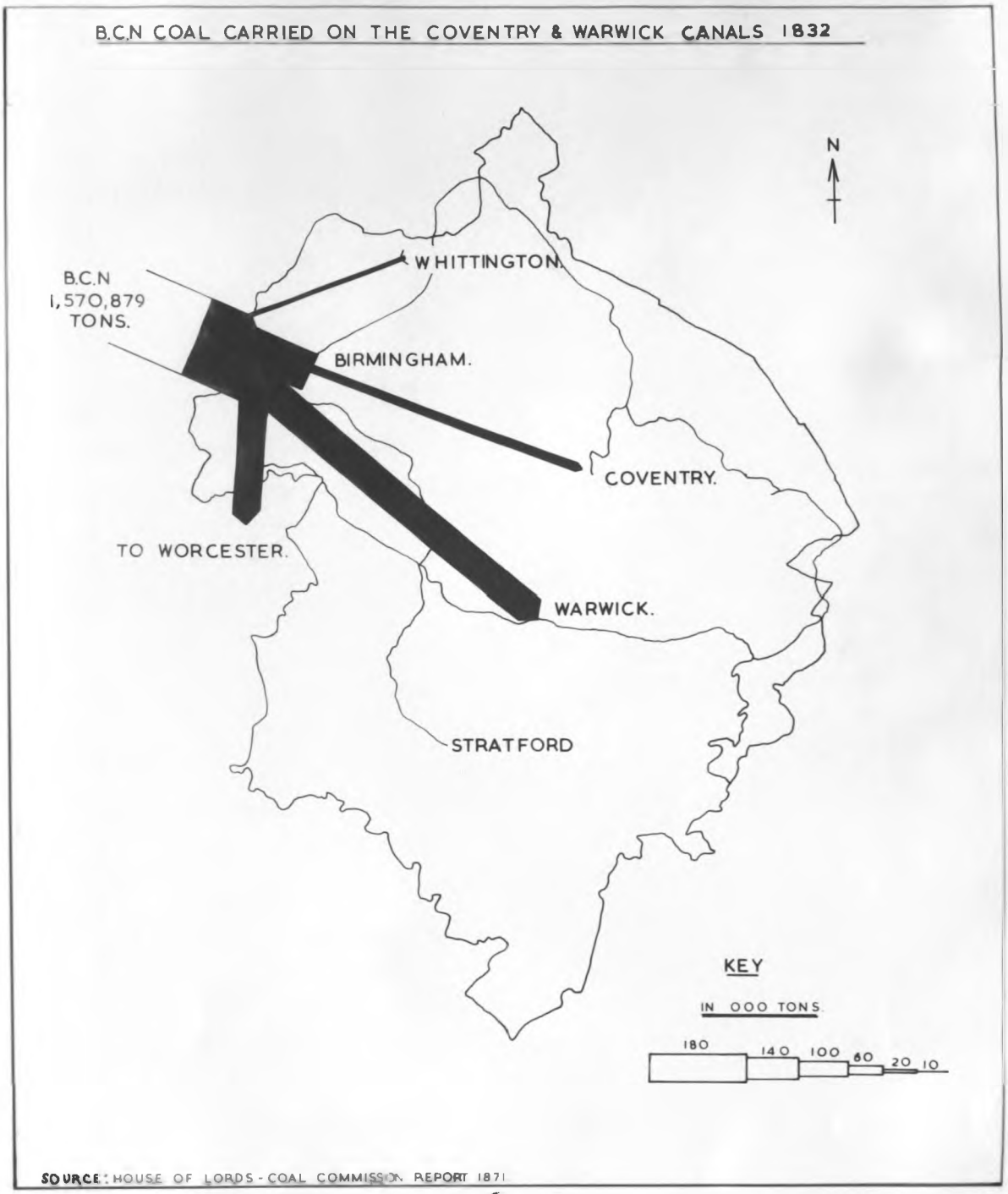
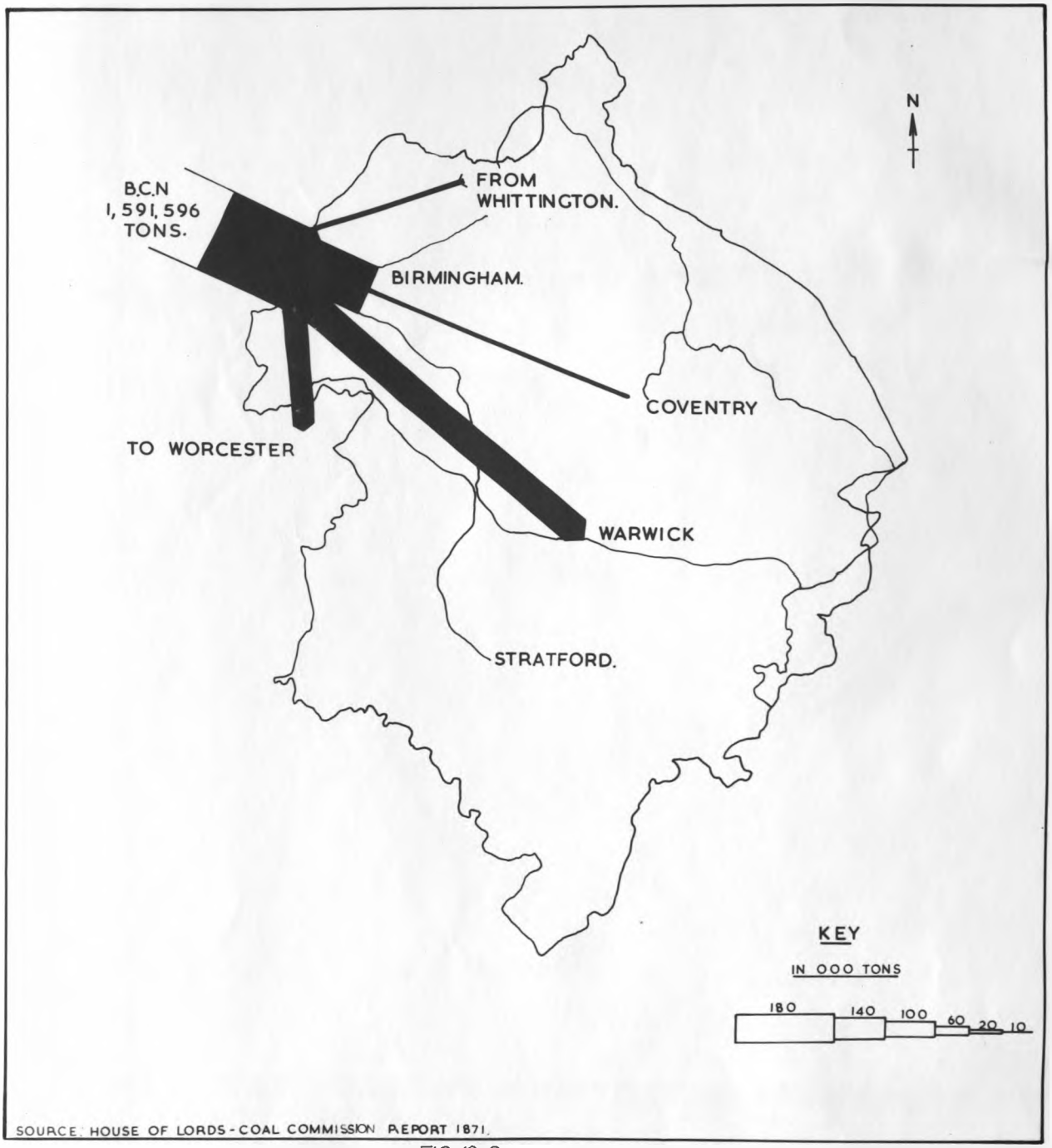

B.C.N COAL CARRIED ON THE COVENTRY & WARWICK CANALS 1832
N
WHITTINGTON.
B.C.N
1,570,879
TONS.
BIRMINGHAM.
COVENTRY.
TO WORCESTER.
WARWICK.
STRATFORD
KEY
IN 000 TONS
180
140
100
60
20
10
SOURCE: HOUSE OF LORDS - COAL COMMISSION REPORT 1871

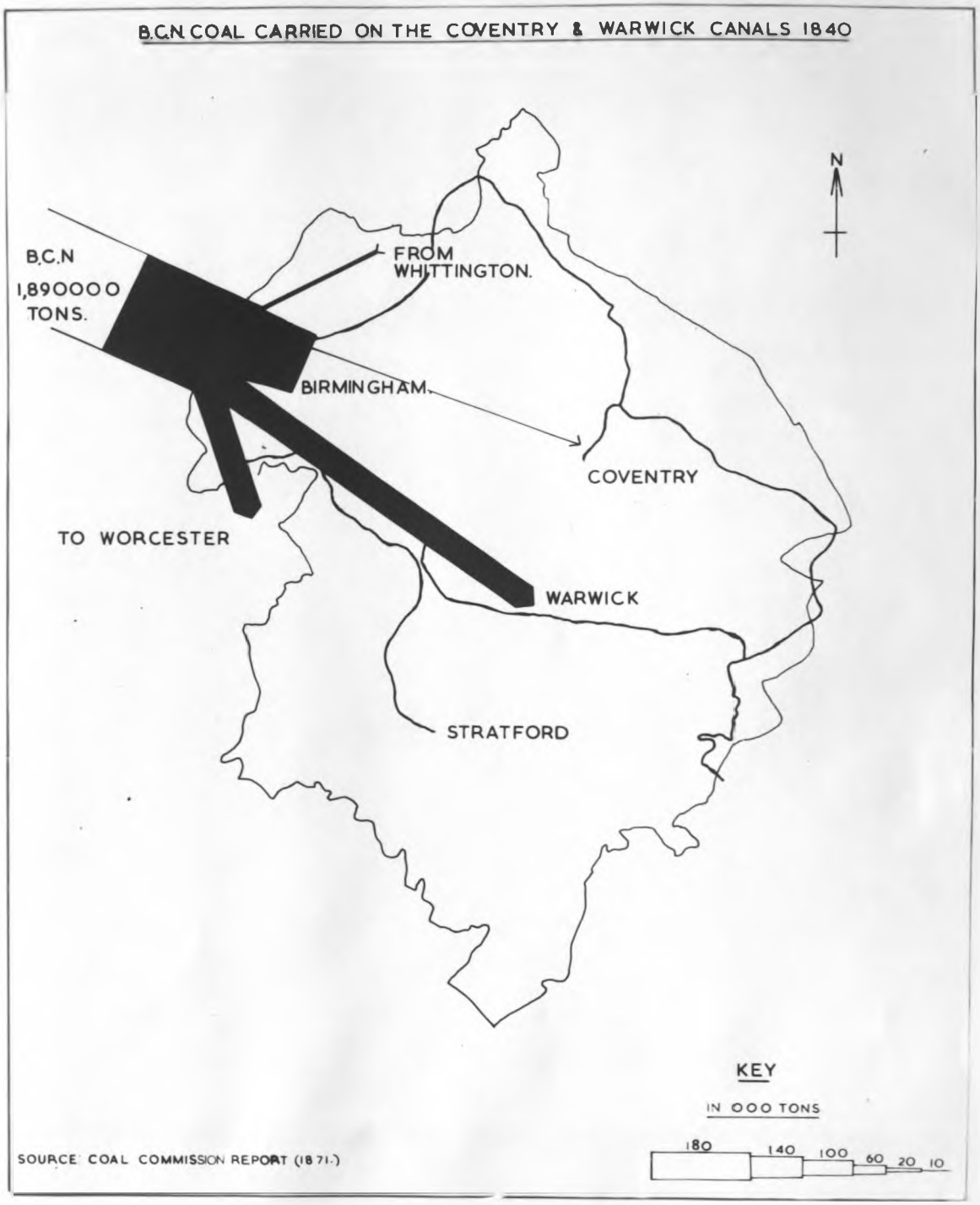
FIG.19

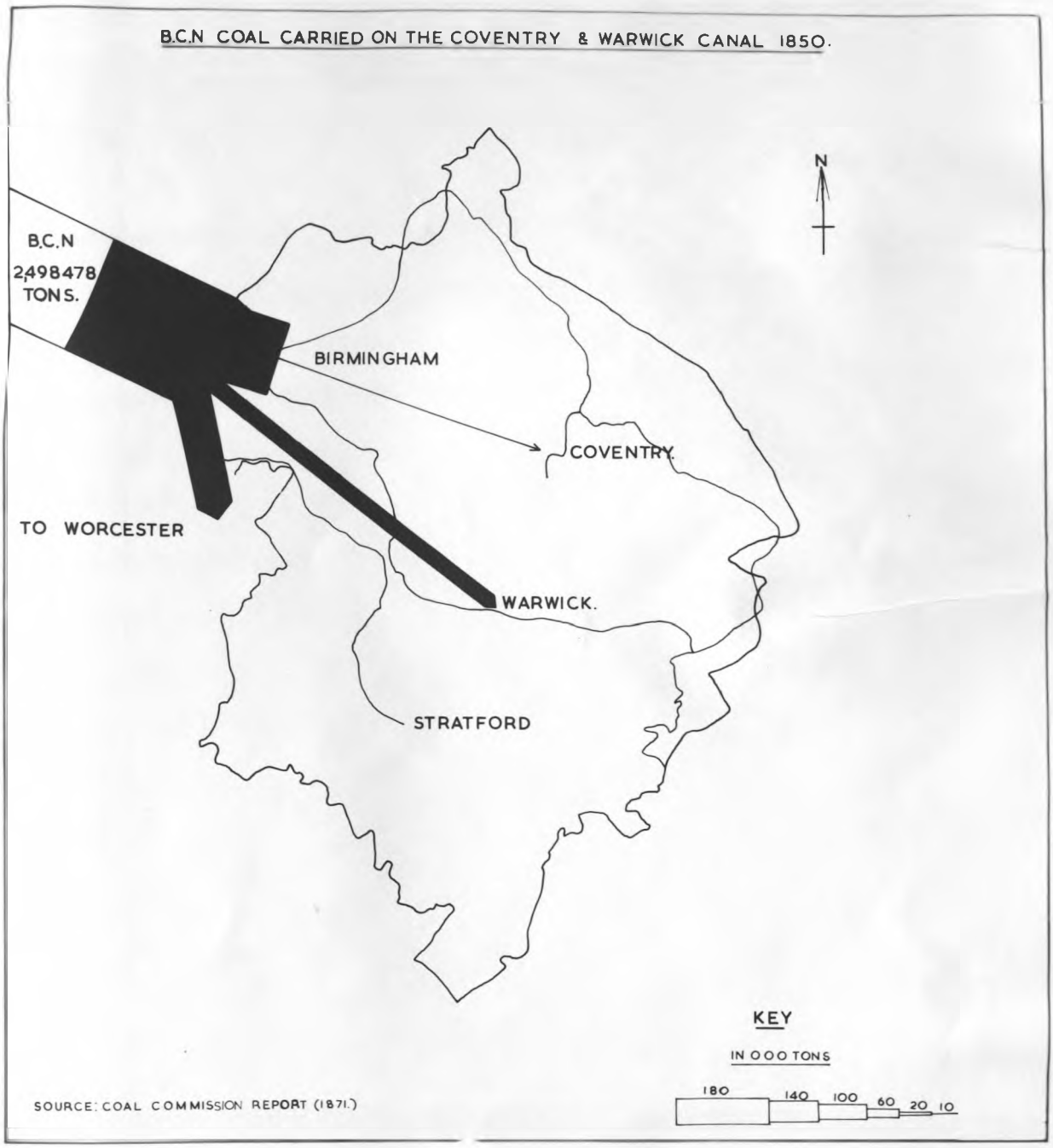
B.C.N COAL CARRIED ON THE COVENTRY & WARWICK CANALS 1837



SOURCE: HOUSE OF LORDS - COAL COMMISSION REPORT 1871.

FIG. 19.2


B.C.N COAL CARRIED ON THE COVENTRY & WARWICK CANALS 1840
N
B.C.N
1,890000
TONS.
FROM
WHITTINGTON.
BIRMINGHAM.
COVENTRY
TO WORCESTER
WARWICK
STRATFORD
KEY
IN 000 TONS
180
140
100
60
20
10
SOURCE: COAL COMMISSION REPORT (1871.)


B.C.N COAL CARRIED ON THE COVENTRY & WARWICK CANAL 1850.
N
B.C.N
2,498478
TONS.
BIRMINGHAM
COVENTRY.
TO WORCESTER
WARWICK.
STRATFORD
KEY
IN 000 TONS
180
140
100
60
20
10
SOURCE: COAL COMMISSION REPORT (1871.)

estimate the reduction of transport costs per ton/mile throughout Warwickshire, but a fair figure may be arrived at by examining some of the changes effected. In Coventry the price of coal was lowered by half while in Birmingham[32] coal, which had sold at 13s.0d. a ton and over, dropped to 7s.6d or less representing exactly half the road price; Allen gives a drop from 13s.0d. a ton to 8s.4d.[33]. Though this difference might be due to variation in price in different parts of Birmingham depending most probably on the type of coal, its source and the carriers, it demonstrates, nevertheless, a substantial reduction in the cost of carriage. Jackman[34] states that canal carriage is only one quarter to one third as much as road carriage per ton per mile; Phillips shared the same views and argued that the low cost of canal transport could be attributed to the fact that one horse could draw as much as thirty or forty tons and that a mile of canal was often made at less expense than a mile of turnpike road[35]. The cheapness of canal carriage can be further demonstrated by the result of experiments carried out at the height of the 'Canal Era' to show what load a single horse was capable of drawing on road, canal and rail:-

---

(32) Court, W. H. B. (1928). Rise of Midland Industries, 1600-1838, p. 164, Oxford University Press, Oxford.

(33) Allen, G. C. (1938). Industrial Development of Birmingham and the Black Country, p. 307. George Allen & Unwin Ltd., London.

(34) Jackman, W. T. (1916). The Development of Transportation in Modern England, pp. 58-84, University Press, Cambridge.

(35) Phillips, J. (1803). History of Inland Navigation, pp. 128-135, I.and J. Taylor, London.

Table 1[36]

Average pack-horse load	...	1/8 ton
Stage waggon, soft road	...	5/8 ton
Stage waggon, macadam road	...	2 tons
Barge on river	...	30 tons
Barge on canal	...	50 tons
Waggon on iron rails	...	8 tons

Geographical Extension of the Coal Market

The canals not only facilitated movement of bulky goods but also stimulated trade by the extension of the markets of the Warwickshire coalfield both locally and outside the county[37]. As shown in detail by Bunker (1952) and White (1970), before the advent of canals, the market for Warwickshire coal in the seventeenth and early eighteenth century covered a pentagonal area, approximately 60 miles from north to south and 46 miles from east to west with the bulk of the sales effected between Nuneaton and Coventry. There is evidence from both municipal and private business records that Warwickshire coal was sold as far as Oxford, Leicester and in parts of Northamptonshire. (The sale outside Warwickshire was irregular and infrequent due to the bad condition of the roads and high cost of haulage.) It was further demonstrated that in 1621 Bedworth coal was used by the Spencer family at Wormleighton, while Wednesbury (Wedgebury) coal was purchased by Magdalen College, Oxford

---

(36) Rolt, L. T. C., (1950). Inland Waterways of England. 4th ed. 1966, p. 1. Allen and Unwin Ltd., London. This is general data applying to different forms of transport in England and it is used here in the absence of local information.

(37) H.M.S.O., (1800). Report of Coal Commission, London.

in 1689, 1694 and 1696. In 1631 both Staffordshire and Warwickshire coal was sold in Leicester. Coal used regularly in Stratford between 1720 and 1730 came from coal pits in Staffordshire, Warwickshire and possibly Shropshire making the Midland coalfields an established source of fuel for the countries of the south and south east Midlands.

The high cost of land carriage during the seventeenth and eighteenth centuries severely limited the extent of the coal market because of its effect on the price of coal. William Benson, a Coventry baker, testified in 1826 that Wednesbury and Hawkesbury coals[38] sold for 7½d. and 8d. per hundredweight, while coal from Bedworth, nearly 3 miles away from Hawkesbury, sold for 10d. to 1s.0d. per hundredweight. At Griff Colliery, 6 miles from Coventry, the pithead price ranged between 2s.4d. and 2s.6d. per hundredweight during main working periods, thus making the Coventry market a worthwhile prospect for ventures like those of Sir Richard Newdigate II. Griff coal was sold to smiths and tile makers in Bedworth and Nuneaton and to a lesser degree in Lutherworth (fourteen miles away). Householders and innkeepers bought considerable quantities at the pit head while nearby landownders who possessed no share of the outcrop sent their men to the collieries for supplies. The high cost of road transport made it necessary for many districts to draw from the nearest collieries because choice of coal was rather expensive. Attempts were made at Griff to produce coal more abundantly and cheaply than at rival collieries by employing the latest mechanical devices including the establishment of a Boulton and Watt atmospheric engine in 1771 for pumping out the workings.

---

(38) Merevale Collections, number 17417, Statement by W. Benson, 1826.

This effort to extend their coal market was, however, curtailed by the heavy strain on the limited supply of draught animals for transporting the coal. Richard Newdigate II's policy of sharp competition with nearby rivals was made the more potent by a 50% increase in retail prices during the first quarter of the eighteenth century. The interest of Richard Newdigate II and the Warwickshire coalowners in more distant markets obliged them, to help finance first turnpike roads and later canals.

As canals were linked together so coal from various colliery districts began to move further under the stimulus of improved transport. Warwickshire coal came into competition with coal from Staffordshire and Leicestershire as well as from sea-borne coal from the eastern Midlands and North Eastern England. The 1830 Coal Report[39] is full of complaints by Northern colliery owners, that Warwickshire coal had captured their markets in the Eastern Counties[40]. An extract from the Wear Colliery Owners' report read before the Coal Commission[41] claimed that in 1816, 162,962 chaldrons[42] of Warwickshire coal, canalised to the East, captured markets formerly dominated by sea-coal imported from the North-East. This estimated 431,849 tons seems a highly exaggerated figure, but even in its true perspective depicts the remarkable influence of Warwickshire coal in the East.

---

(39) H.M.S.O. Coal Commission Report, 1830, p.16, London.

(40) It is difficult to establish the influence of the Warwickshire Canals on the distribution of North-east Warwickshire coal without relating it to other coals which benefited from the canals.

(41) Ibid. p. 59.

(42) Meade, R. (1882). The Coal and Iron Industries of the United Kingdom, p. 127, Crosby Lockwood and Co. London. Meade gives an equivalent of 431,849 statute tons.

More locally intensive competition was generated between North-East Warwickshire and Wednesbury (South Staffordshire) coal in the early 1800's. Of course, the two types of coal had been in competition earlier at Coventry[43] prior to the advent of canals as already discussed, but Warwickshire coal seems clearly to have had the upper hand due to the high freight rates involved in the long distance haul of Wednesbury coal[44] from 30 miles away. But when the Birmingham and the Coventry Canals were opened the Wednesbury coal was assured of more markets in Warwickshire and Oxfordshire as well as of selling at much lower prices than before. By August 1800 it was popular in Coventry and easily dominated the Warwickshire coal traffic southbound to Oxford. Further competition was generated by smaller local producers in Warwickshire and from suppliers in Leicestershire. Paradoxically, it was the canal system so warmly hailed and supported by the coalowners, that was responsible for the declining influence of Warwickshire collieries by the end of the eighteenth century. For the canals widened choice by providing supplies from other colliery districts like Wednesbury.
In 1831, for example, the Oxford Canal Company wrote to the Staffordshire coalowners when competiton was intensifying to complain that the cargoes they were sending were of mixed quality - "the coals on the outside of the cargo were good but those inside were bad" ... and demanded quality if they were to compete more effectively[45].

---

(43) Bryant, R. W. G. (1939). The English Canal System in its Geographical and Industrial Setting. Unpublished M.A. Thesis, University of London, p. 99. Vide Ashton, T. S. and Sykes, J. (1964). The Coal Industry of the C18th, pp. 235-7, University of Manchester. Manchester.

(44) C.R.O. The Case and Papers Relating to the Navigable Canal intended to be made from the Coal Mines in Wednesbury to Birmingham and Fazeley 1767. CR 764/264/1.

(45) B.T.H.R. Oxford Canal Minute Book, 14 July 1811, OXC 116.

Consideration of Wednesbury coal explains why it was to gain the stronger hold in Warwickshire. Staffordshire coal was acknowledged to be superior in quality[46] to that of Warwickshire during the late eighteenth century. Moreover, most Warwickshire collieries were operating at much greater depth than those in Staffordshire, hence the coalowners of the latter possessed the advantage of getting their coal to the surface for 3s.0d. per ton less than Warwickshire coal would be obtained at Bedworth and Griff. Furthermore, under the Fazeley Canal Act, the Wednesbury coalowners had the unreasonable bounty of 18d. per ton. In Staffordshire coal cost 3s.8d. per ton in 1780[47], 6s.0d. in 1795, and 8s.4d. at the pit-head in 1815. On the other hand, second rate Warwickshire coal was being sold between 1729 and 1735 for 9s.0d. per ton. In 1780 the price of 3s.0d., charged per Staffordshire ton, was approximately 40% of the average price charged by both Richard Parrot of Exhall Colliery in 1770 and Sir Roger Newdigate at Griff between 1791 and 1793. In addition the relationship between retail prices in the two counties was of the order 2:5 in favour of Staffordshire. The combination of low pit-head prices with superior quality, therefore, explains why Staffordshire coal stood to gain more than its Warwickshire counterpart from a revolution in transportation. The competition generated was not unusual during the 'Canal Era', for Tipton coal came into keen competition with Wednesbury coal after 1770 and Bilston coal competed with both in the same year[48]. Indeed, it was such competition that led to reduction in price of coal.

---

(46) C.R.O. Case of the Warwickshire Coalowners, 1785, CR 764/264.

(47) C.R.O., Newdigate Collection, CR 136/V/119. Vide White, A. W. A., 1970, Coal Mining in Warwickshire from 1600 to 1750, p. 200. M.Sc. Thesis, Economics Dept., University of Birmingham.

(48) Court, W. H. B. (1928) op.cit. p.164.

The popularity of Wednesbury coal in Warwickshire was in the ratio 40:1[49]. At Banbury and Oxford it was used by many people because Warwickshire coal was dearer than that of Wednesbury[50], (as Table 2 shows), thus allowing the latter to dominate the market in the south as well. The figures from the "Comparative price of Staffordshire and Warwickshire coals" are misleading because at Banbury Wednesbury coal (S. Staffordshire) was sold cheaper than Warwickshire coal from Bedworth, Griff, Birch Coppice and Wilnecote. With justifiable fears, the Warwickshire coalowners petitioned Parliament to deprive the Wednesbury coalowners of the lower tonnage rates granted them by the Birmingham-Fazeley Canal Act[51]. The North-East Warwickshire coalowners argued that the price of Wednesbury coal in Warwickshire was 2d. per hundredweight cheaper than North-East Warwickshire coal. As Table 2 indicates, coal from Wilnecote on sale in Coventry was 1/4 per ton dearer than Wednesbury coal from Staffordshire; that from Baddesley was 2/8 per ton dearer, and that from Oldbury and Bedworth cost 3/4 per ton more. Given, therefore, lower prices, better quality as well as a low tonnage rate, (which to the North-East Warwickshire coalowners was unreasonable), North-East Warwickshire coal would be displaced in its old established home market by Wednesbury coal. Moreover, the North-East Warwickshire coalowners held the view that the capturing of their local market by Wednesbury coal might lead to the closing of their collieries, thus depriving the "thousands of the poor"[52] which could not be sufficiently supplied with coal from Wednesbury. Apparently, the protest of the Warwickshire coalowners was not against competition, which was inevitable with improved means of transport, but against the unreasonably lower

---

(49) Case of the Warwickshire Coalowners, op.cit.

(50) C.R.O., Comparative State of the Price of Staffordshire and Warwickshire Coals. CR 1022/2.

(51) B'ham Ref. Lib. 17090, "Birmingham Fazeley Canal Act", (1790), Midland District Canal Acts, Vol. II. p. 71.

(52) C.R.O. Facts Relating to the Equality of Tonnage on the Oxford and Coventry Canals. 764/264/1.

TABLE 2

Comparative Prices of Staffordshire and Warwickshire Coals, 1785

Origin of coal	Pithead prices per ton	Price at Coventry per ton	Relationship of Warwickshire to Wednesbury Coal in terms of price			
			Warwickshire Coal Dearer		Warwickshire Coal Cheaper	
			At Coventry	At Banbury	At Banbury	At Oxford
1. Wilnecote	5/-	9/8	1/4	-	1/-	2/3
2. Birch Coppice	5/-	9/-	2/-	-	4d	1/7
3. Baddesley	5/-	8/4	2/8	4d	-	1/1
4. Wednesbury	3/6	11/-	-	-	-	-
5. Oldbury	5/-	7/8	3/4	-	-	7d
6. Griff	6/8	8/-	3/-	4d	-	11d
7. Bedworth	6/8	7/8	3/4	8d	-	7d

Source: C.R.O. CR 1022/2

tonnage rate for carriage on the Birmingham Canal enjoyed by the Staffordshire coalowners giving them a considerable advantage over their Warwickshire counterparts.

As the canals became more and more prosperous canal companies tried to corner as much trade as possible on their waterways by diverting traffic through price cutting and by demanding unreasonable tonnage charges from traffic passing from other canals on to their own. Such action usually led to ill-feeling and division among canal companies, an attitude which eventually contributed to their downfall as will be shown later. The authorizing Acts of Parliament embodied clauses stating the tonnage rates to be paid by canal companies navigating traffic on other canals. The Coventry Canal Company, for example, received 5d. per ton on all coal and goods which passed from the Ashby-de-la-Zouch Canal on to the Coventry, Oxford or Grand Junction Canals, whereas the Warwick-Birmingham Canal obtained no more than 3½d. per ton on coal and all other goods passing from the Stratford-upon-Avon Canal[53] to its own canal. The Coventry Canal[54] was also entitled to all rates arising from coal on the Oxford Canal on the two miles nearest the Coventry Canal, and the Oxford Canal Company on all rates arising from all articles except coal navigated upon any part of the Oxford Canal and afterwards on the Coventry Canal within three and a half miles from the junction of the two canals towards Coventry as stated in the Oxford Canal Act[55]. Indeed, it was this stipulation and rivalry between the companies which caused the two canals

---

(53) B'ham Ref. Lib. "Stratford Canal Act", 1793, 3 Geo. 3, C112, Midland District Canal Acts, Vol. 3, p.134.

(54) B'ham Ref. Lib. "Coventry Canal Act", 1767, 8 Geo. 3, C36, Midland District Canal Acts, Vol. I, p.218.

(55) B'ham Ref. Lib., 17066, Oxford Canal Act, 9 Geo. 3, C70 1768. Midland District Canal Acts, i, pp. 409-412.

to run parallel to each other for a mile before meeting at Longford. With the opening of the Grand Junction in 1800, the Warwick Canals tried to divert traffic from the Coventry Canal[56] in face of keen competition from that Company, but this proved difficult because the Birmingham Company preferred the Fazeley-Coventry route on which it got better tolls. A year later[57] price-cutting with the Coventry Canal began and payments to the Oxford Canal were raised in two stages of 2s.3d. and 2s.5d. The price-cutting became so acute that negotiations were opened with the Coventry Canal Company, and in 1810 an agreement was reached to share markets, and raise tolls; the bounty paid to the Oxford was also reduced by 6d. Further rivalry was demonstrated by strong opposition of canal companies to improvements proposed by other canal companies which they felt would undermine their monopoly.

Development of Collateral Branches and other Connections

As the canals became more and more prosperous they encouraged the establishment of collateral branches to works situated some distance from the canal, but receiving raw materials or sending away finished products by canals. The most notable example of a collateral canal was that of Arbury developed between 1770 and 1787 by Sir Roger Newdigate whose keen interest in canals was awakened after acting as counsel in connection with the Bridgewater Canal's extension to the Mersey in 1762[58] or possibly earlier in the 1750's when Iremonger wrote to him from France describing the

---

(56) B.T.H.R., Coventry Canal Minute Book, 19th September, 1800, CVC 4/156.
(57) Ibid., October 1801.
(58) C.R.O., 136/Diary. August 1762.

fascinating features of the French Royal Canal. He was also influenced by his father's ideas of a canal scheme to join the Rivers Severn and Trent in 1700 to link his coalmines to Coventry and Nuneaton. Sir Roger Newdigate's purpose was facilitated by the advantageous geography of Arbury. The many streams and brooks traversing the family estate drained eastward into the Wem brook, and there was a small lake known as Seaswood pool which was to act as the main reservoir to the Arbury Canals. A list[59] of pools and waterways, dated 1711, and signed by Richard Newdigate III on the occasion of the colliery being leased[60] to Messrs. Parrott and Sparrow, confirms the existence of sixty-five pools and streams together with boatways. By the time a second lease[61] was drawn up two years later between the same parties the total[62] had risen to seventy-two pools and moats, plus eleven water courses and canals, one of which winding its way from a point on Nuneaton Common south eastwards for over two and a half miles to Ridings Pool near Collycroft. This particular waterway later formed the basis of Arbury Canals leading to the colliery at Griff and the Bedworth worsted mill. (Fig. 20). There is no doubt that the Newdigates exploited the streams to their utmost advantage both aesthetically and to provide motive power: a water wheel raised water from the coal mines or turned the corn and worsted mills at Collycroft (Fig. 20).

---

(59) C.R.O., Newdigate Collection. CR 136/B 2681, 30 April, 1711.

(60) C.R.O. CR 136/C3150, lease, Sir Richard Newdigate III to Richard Parrott and George Sparrow, 1 May 1711.

(61) C.R.O. CR 136/C 3152, 26 Dec. 1713.

(62) C.R.O. CR 136/B 2684.

THE ARBURY CANALS

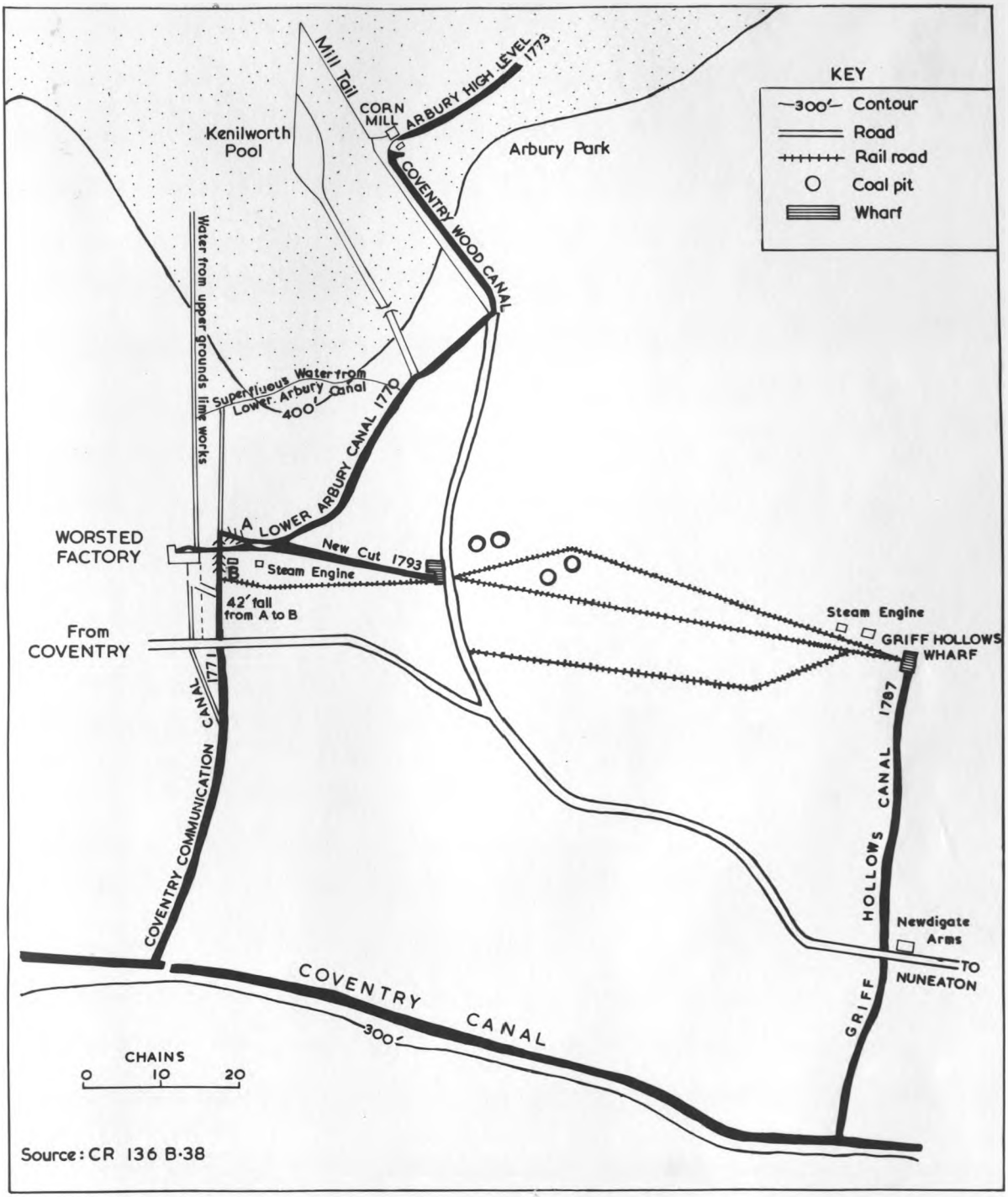


FIG. 20

Coal mining was then a major industry in the surrounding districts of Bedworth and Nuneaton, and the fortunes of the Newdigates resided to a considerable degree in local mines at Griff, (Fig. 21) between Bedworth and Nuneaton. With the commencement of the Coventry Canal in 1768, Sir Roger Newdigate seized the opportunity as stipulated by the Coventry Canal Act[63] to construct a collateral branch from the main canal to his colliery. His objective for a canal system was two-fold. Firstly, to link together his coal pits as well as to provide a more economic way of conveying estate products such as coal and timber, large quantities of which were needed for the building and lining of the pit shafts and the preparation of the underground workings at the colliery. As early as 1711 three boatways had been constructed to carry coal from the pits to the nearest tramway. Secondly, he wished to increase opportunities for pleasure boating on his estate. The Arbury Canal system consisted of eight short lengths totalling six miles two furlongs and three chains, and not five miles as stated by Hadfield or three miles by Millward and Robinson[64]. The whole system was completed in three phases.

The first phase commenced with the Arbury High Level Canal (Fig. 20) and Alderswood in June 1768, but on 5th November, 1767 Sir Roger Newdigate had had a discussion with Brindley with a view to linking the Coventry Canal to his "Colepit field"[65] which at that time was located at the Collycroft (see Fig. 21). The Coventry Wood was

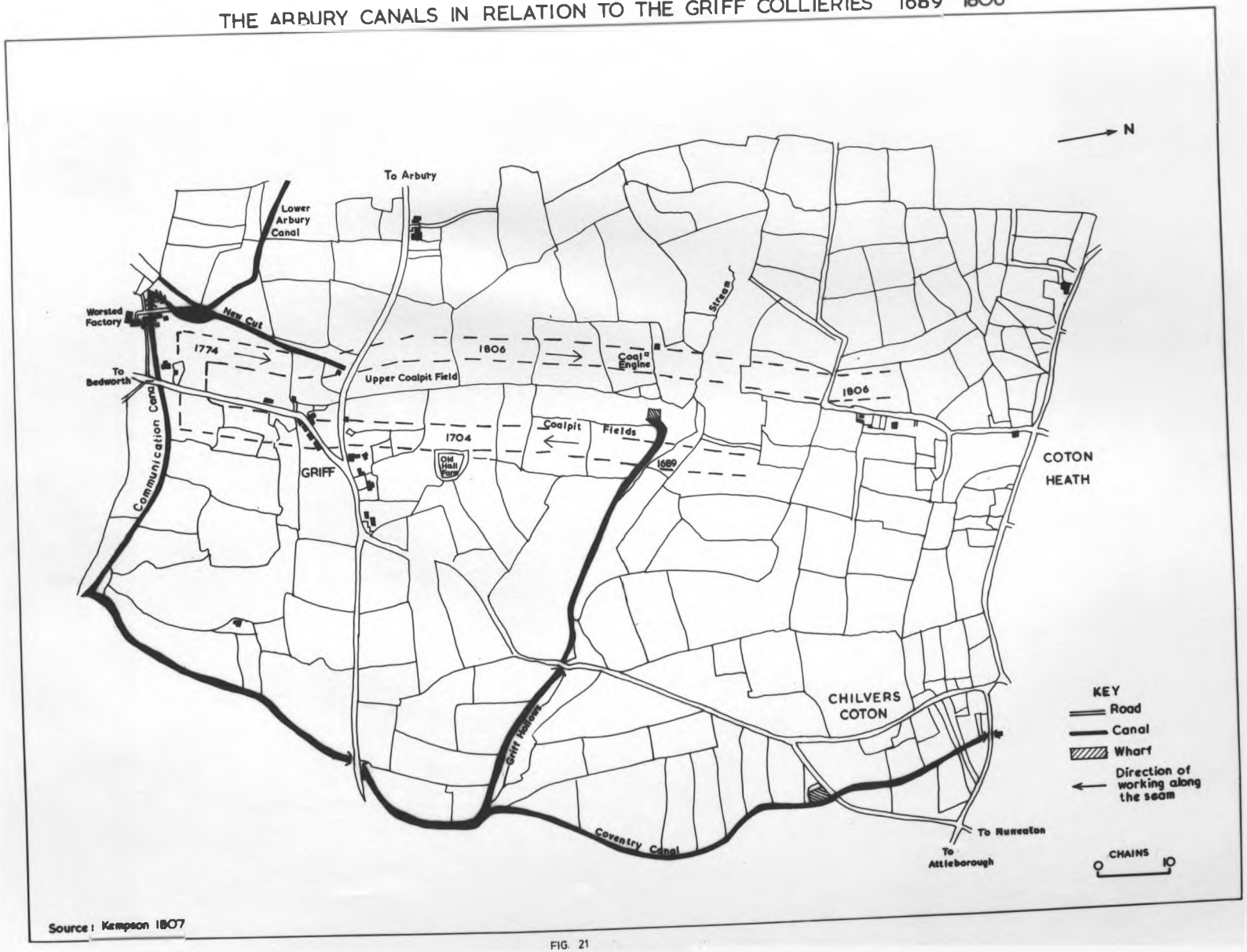
---

(63) Coventry Canal Act, 1767, op.cit., p.210.

(64) Millward, R. and Robinson, A. (1971). The West Midlands, pp. 132-3, Eyre and Spottiswoode, London.

(65) C.R.O. CR 136/Diary, 5 Nov. 1767.

THE ARBURY CANALS IN RELATION TO THE GRIFF COLLIERIES 1689–1806



Source: Kempson 1807

FIG. 21

begun in October 1770 to be followed a month later[66] by the Arbury Lower Level Canal. The Communication Canal (1078 yards long) connecting the main Coventry Canal was linked to the Arbury Lower Level by a flight of six locks allowing for a fall of 42' from A to B (Fig. 20). The construction of the locks took five and a half years to complete, thus effecting an access to the Coventry Canal in 1773. The second phase, which fell between 1774 and 1776, saw the preliminary work on the Seaswood complex. The next seven years were used for widening and deepening the Seaswood Pool. The first load of Griff coal passed from Griff Colliery to Seaswood in October 22, 1783[67]. Trade in coal in Stockingford resulted from this in 1784 and a special wharf was constructed at a section of the pool to cater for it. The final phase was the connecting of the various parts of the colliery to the main canal between 1785 and 1795. The Griff Hollow Canal (Photo 7), finished by 1787, commenced at the Hollows, two and a half miles south of Nuneaton, and ran westward following the course of a small feeder to the coal wharf (Fig. 21). This was fed by the "New Cut" (1793) constructed, above the locks to a new wharf, chiefly to carry coal from the pits at Griff, by-passing the locks that were liable to stoppage due to scarcity of water[68]. The wharf was connected to the pits by a double horse tramway. The completion marked the end of the Arbury Project and the beginning of a complete water connection with the Griff Collieries.

---

(66) C.R.O. CR 136/Diary, Nov. 1770.
(67) C.R.O. CR 136/Diary, 1783.
(68) C.R.O. CR 136 M.48.

Plate 7: THE GRIFF HOLLOWS CANAL (1787) NEAR MARSTON JABBETT. This linked the Arbury coalfield to the Coventry Canal. Note the tramway which carried coal from the wharf.

Plate 8: THE OLD NEWBOLD TUNNEL. This section (250 yards long) without a towpath was abandoned during the improvement of the Oxford Canal (1829-1834). During World War II it was used for storing ammunition but is now a cattle shed.

The Arbury Canals, costing £2360.11.0, a sum slightly larger than that expended on Griff Colliery in 1701, may seem ambitious but they reflect a general trend during the canal era as further demonstrated.

In 1815 a plan was deposited by Charles Handley and John Tomes for a level branch canal, two and a half miles long, from the Warwick-Napton Canal near Long Itchington to connect with the lime works and quarries at Southam. The agreement on the scheme by the Warwick-Napton Canal Company led to the construction of the Kayes Arm serving the Long Itchington limeworks. Elsewhere Barber[69] planned two parallel canals, four and eight chains respectively, from the Coventry Canal to his collieries at Haunchwood (Fig. 22) both extended by railroads and connected to waggon roads. Though the map does not carry any date it seems that the collateral branches were planned in the early 1800's when keen competition ensued among coalowners who found it advantageous to have a canal connection to their collieries. On the Stratford-upon-Avon Canal a tramway was substituted by the canal company for the intended collateral branch from Temple Grafton which might have proved too expensive to build in the light of the great financial problems which faced the Company. Fig. 23 shows the connection of the tramway feeding the quarries and the Blue Lias Limestone works at Wilmcote.

---

(69) Merevale Collection, no. 1891.

PROPOSED CANAL FROM THE COVENTRY CANAL TO BARBER'S COLLIERIES

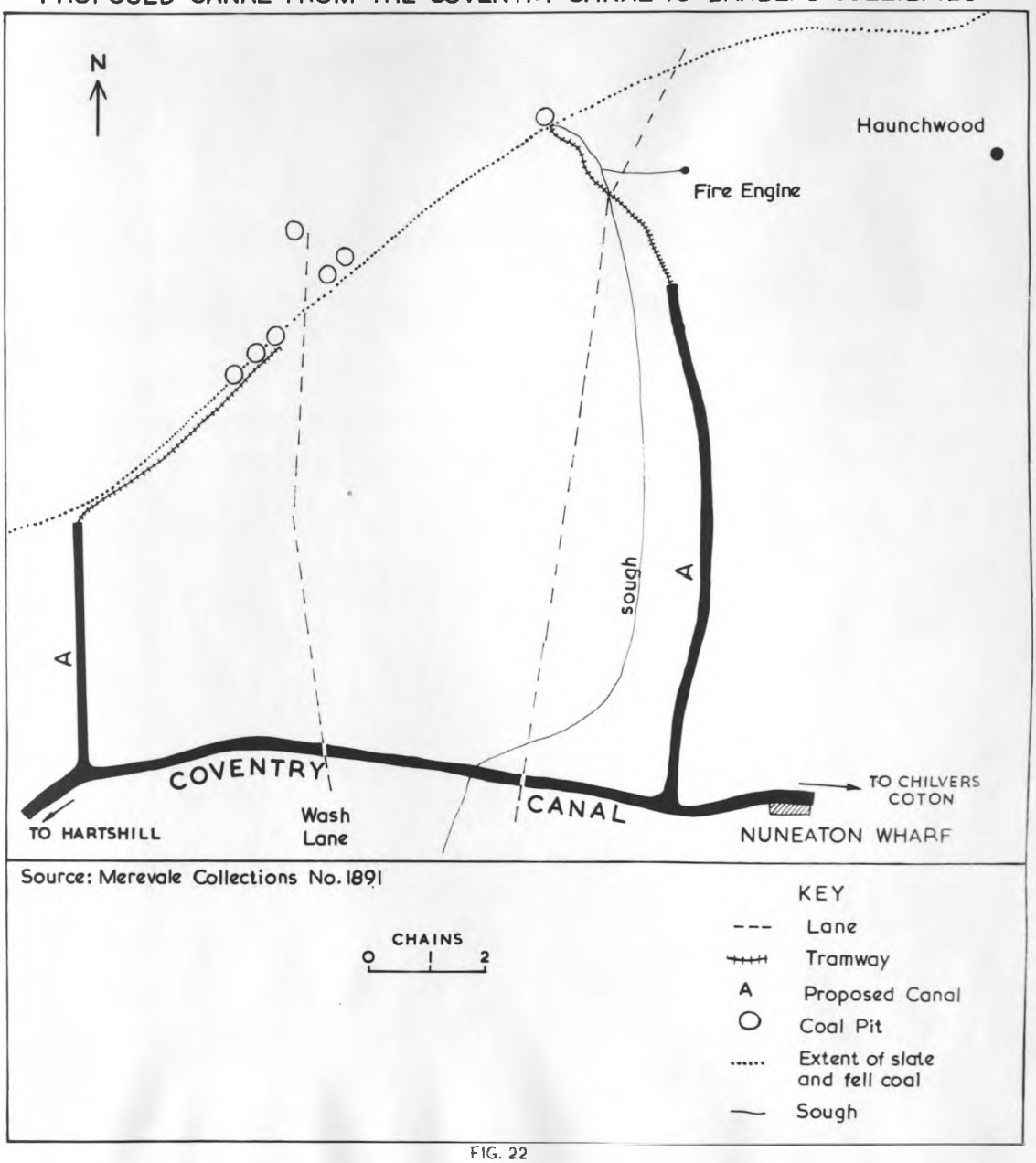
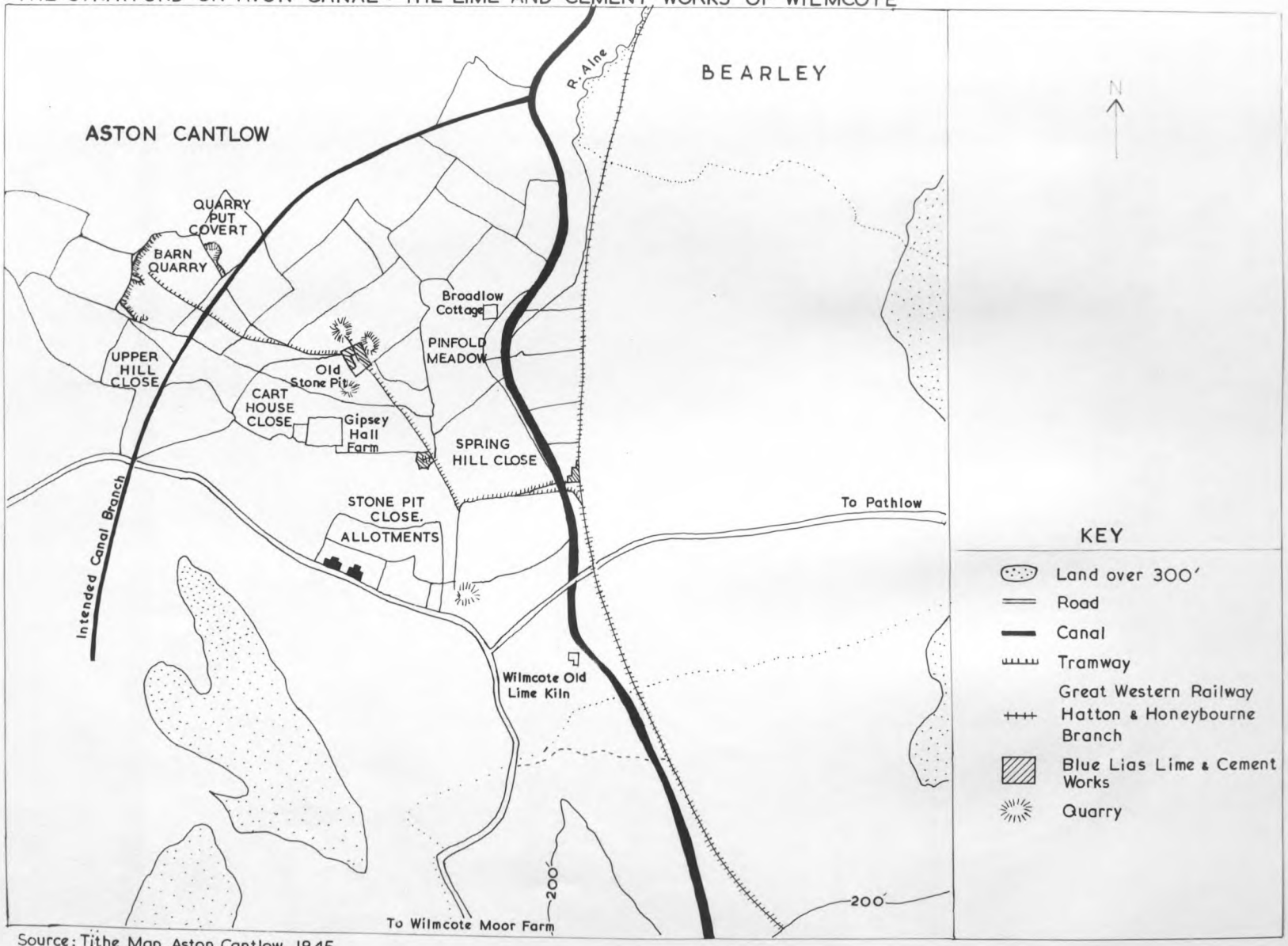


FIG. 22

THE STRATFORD ON AVON CANAL : THE LIME AND CEMENT WORKS OF WILMCOTE



Source: Tithe Map Aston Cantlow 1845
6" Ordnance Survey 1885 (15 NE)

FIG. 23

This tramroad ran from the large quarries in the north-east through the first works and down to the lower works to a stone pier bridge which carried it over the canal. The line then continued on a stone faced embankment while a branch line turned off into a cutting and terminated alongside the canal, presumably for loading direct on to barges. Temple Grafton is not shown on the map but there was a connection to the quarries where limestone, paving stone and marble were carried by tramroad to be loaded on the canal at Wilmcote. Some years later industrialists like Richard Greaves[70] and Thomas Higgins and Co. developed a quarrying industry and used the tramway extensively for the transportation of bricks and cement to the Stratford-upon-Avon Canal.

Collaboration between canal, road and tramway was essential in canal transport as Albert[71] remarked. Though the canals excelled in the carriage of bulky low-value goods over long distances, the roads made an essential contribution by acting as feeders to the canals and by distributing canal carried goods. As already discussed, the Sowe parish traffic distributed along the Oxford Canal (Fig. 17.1, 17.2) illustrates the complementarity between canal and road, for wharves located at canal and road junctions received by far the highest tonnage of goods for further distribution by road. The fact that carriers, like Pickfords Carrying Company, combined both land and water services underlies this complementarity. Canals had become undoubtedly more profitable with industrial expansion and adjustments in local marketing but the improved turnpike system contributed positively to this[72] for from

---

(70) Salzman, L. F., (Ed.) (1945). The Victoria County History of Warwickshire, 3, pp. 42, 243. Oxford University Press, London.

(71) Albert, W. (1972). The Turnpike Road System in England, 1663-1840, pp. 116-8. University Press. Cambridge.

(72) Ibid. p. 118. Vide Dyos, H. J. and Aldcroft, D. H. (1969). British Transport: An Economic Survey from the C17th to C20th. p. 109 et seq. Leicester University Press.

the eighteenth century road and canal construction proceeded side by side[73] meeting jointly the needs of an expanding economy. Plans and documents concerning turnpike roads, and road improvements[74] involving diversions, have been studied in an attempt to establish a pattern of complementarity. Fig. 23.1, based on the plan of Merevale showing a diversion of a footpath from Atherstone to Baxterley, provides an example of interaction between the Coventry Canal[75], intersected by the Watling Street, an old Roman road, and the road, running from Atherstone to Coleshill, turnpiked in 1750. Wharves developed at both road intersections for exchange of goods, which were presumably unloaded by road and transferred on to the canal for distribution or brought in by canal and off-loaded. Fig. 31[76], based on de Salis[77], shows that a wharf arose where there was a break in transportation, particularly at the junction of roads and canals where the former acted as feeders to the latter.

Fig. 24, illustrates clearly a high degree of collaboration between canal, road and tramways in the transportation of bulky commodities, such as coal and roadstone. Canal haulage undoubtedly led to improvement of roads connecting collieries, quarries or wharves for the delivery of

---

(73) The canals took the heavy load off the roads as from the eighteenth century, thus enabling them to be improved.

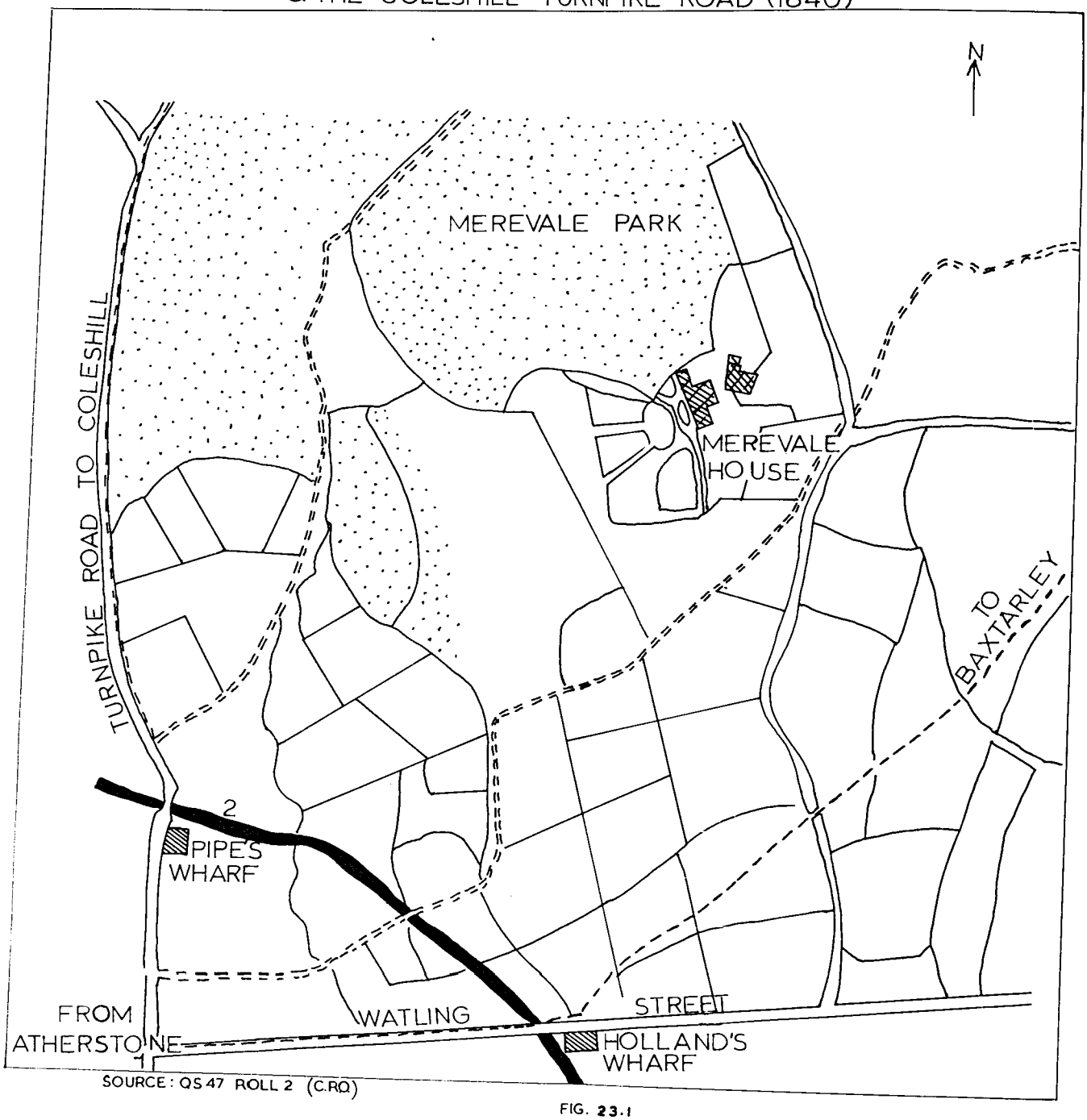
(74) Records of Turnpike Trusts, including Minutes and Accounts, C.R.O. QS.32. Highway Diversions between 1804 and 1854. C.R.O. QS.47. See bibliography for full reference of records studied.

(75) C.R.O. Quarter Session Papers, QS.47, roll 2.

(76) This shows location of wharves in Warwickshire.

(77) de Salis, H. R. (1833). Bradshaw, Canals and Rivers of England and Wales, (3rd ed.) 1904, p. 97 et. seq. E. Ruff. London.

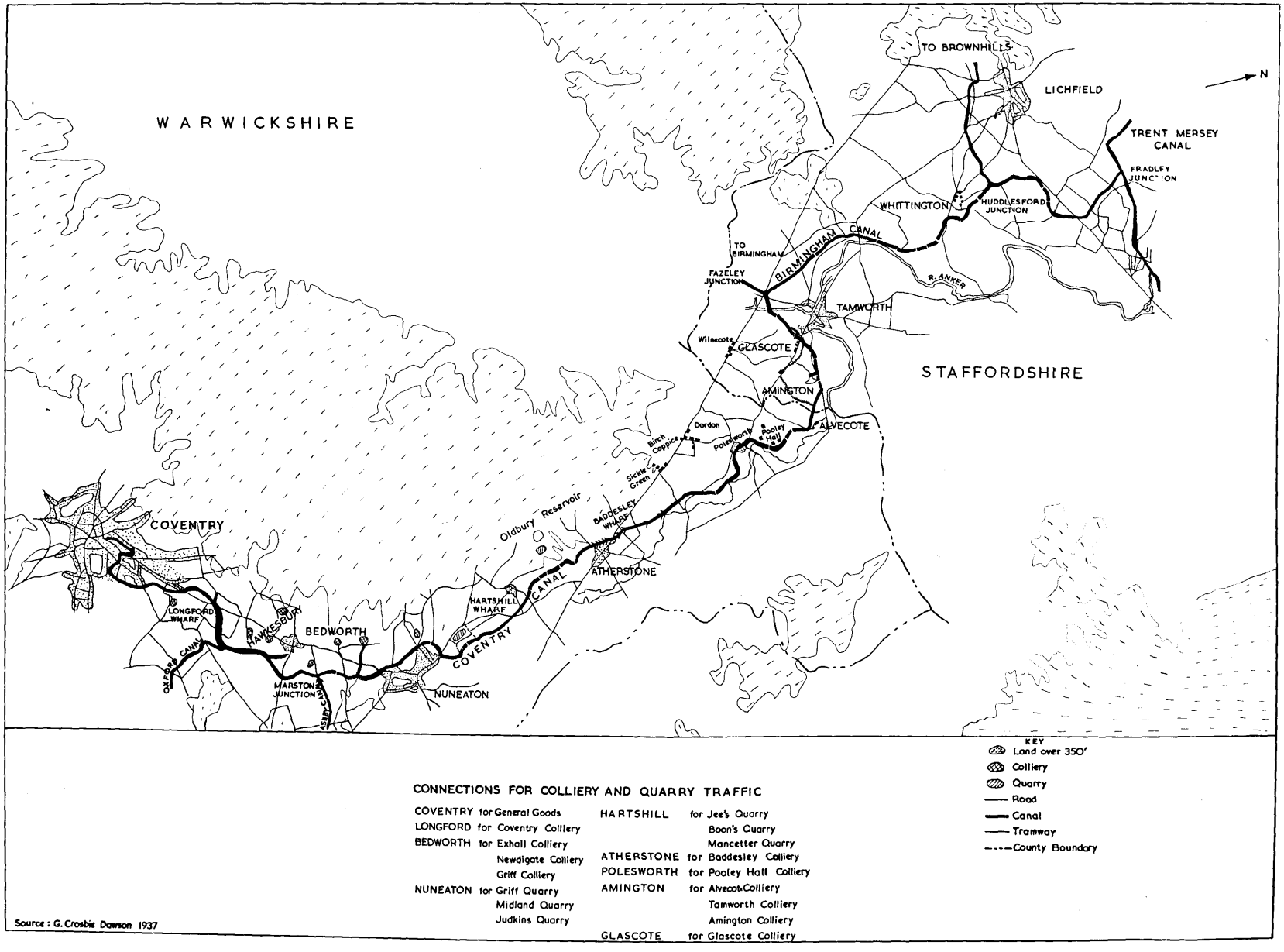
THE RELATIONSHIP BETWEEN THE COVENTRY CANAL
& THE COLESHILL TURNPIKE ROAD (1840)



SOURCE: QS 47 ROLL 2 (C.R.O.)

FIG. 23.1

COVENTRY CANAL SHOWING CONNECTIONS FOR COLLIERIES AND QUARRIES



CONNECTIONS FOR COLLIERY AND QUARRY TRAFFIC

COVENTRY	for	General Goods
LONGFORD	for	Coventry Colliery
BEDWORTH	for	Exhall Colliery
		Newdigate Colliery
		Griff Colliery
NUNEATON	for	Griff Quarry
		Midland Quarry
		Judkins Quarry
HARTSHILL	for	Jee's Quarry
		Boon's Quarry
		Mancetter Quarry
ATHERSTONE	for	Baddesley Colliery
POLESWORTH	for	Pooley Hall Colliery
AMINGTON	for	Alvecote Colliery
		Tamworth Colliery
		Amington Colliery
GLASCOTE	for	Glascote Colliery

Source : G. Crosbie Dawson 1937

FIG. 24

general goods, as in Coventry. The function of such roads was, in fact, recognized by the canal proprietors who promoted the canals. The Coventry Canal, and in general all canal companies, granted free tonnage on paving stones, sand, gravel and all other material for the repair of roads "provided they do not pass a lock, except at such times as the water flows over the weir"[78]. This stipulation encouraged improvements in roads to meet their integral functions as canal links which assumed very great importance because of their flexibility as a means of transport. Except for the tramway running from near Alvecote to Glascote and that of the Pooley collieries, all the linkages to the Coventry Canal were roads connecting the North Warwickshire coal mines to the canal since they were not located directly on the canal. Nine major road connections to the canal in question can be discerned. In Coventry there was a connection for general goods while at Longford an access was provided to the Coventry collieries. Where collieries were close together access was afforded by one major connection (Fig. 24). At Bedworth, for example, there was a link to the Exhall, Newdigate and Griff collieries; at Amington there was one to Alvecote, Tamworth and Amington collieries, at Glascote there were linkages to Glascote and Wilnecote works and at Polesworth there was a connection to Pooley, Birch Coppice and Sickle Green. A similar pattern was established for quarry traffic. At Nuneaton there existed a link to Griff, Midland and Judkin's quarries and at Hartshill for Jees, Boons and Mancetter quarries lying adjacent to each other. It was, however, realized that if the canals were to be more efficient, improvements were needed in their routes. This awareness was to lead to proposals for improvements to make them more viable.

---

(78) Oxford Canal Act 1768, op.cit., p. 380 et seq.
Stratford Canal Act 1793, op.cit., p. 104-5.

Improvements in the Canal Routes

The most notable improvement of a canal in the 1830's was that on the contour Oxford Canal which was shortened from 91 miles to 77⅜ miles by the building of a virtually new waterway over the northern section of the Oxford Canal lying between Hawkesbury and Wolfhampcote, which territorially falls within Warwickshire. The line of the improvement was recommended by Marc Brunel and surveyed by Charles Vignobles. The project cost £131,877 and was opened in 1834. The scheme was to improve navigation not only on the Oxford Canal, but on all the canals that had linkages with it in association with the new Central Union Project that will be described shortly. Robinson, in his evidence to the Royal Commission on Canals and Waterways[79] denied that the canal was shortened in order to make it an effective competitive route with the Warwick-Napton Canal for London and Birmingham through traffic, but there is little doubt that the improvement encouraged such competition. The straightening of the canal involved the building of a new tunnel at Newbold 250 yards long with a double towing path and the abandonment of the old Newbold tunnel (Photo 8) and a short one at Wolfhampcote. An embankment had to be built alongside the Brinklow aqueduct so that it could be widened, and three other expensive aqueducts were constructed: one over the River Swift, over the Rugeley-Lutterworth Road, and over the River Leam near Braunston. The old curves were abandoned and graceful iron bridges were built over them as they cut the new line. Some portions

(79) B.T.H.R. "Oxford Canal", Canal and Railway Rates 188 8. MT1/22.

of the loops were sold[80], while some were used as branches to villages such as Stretton-under-Fosse that had previously been on the main line. On completion of the alterations on the main line an agreement was reached with the Coventry Canal for a new junction between the two canals, to reduce the distance between Longford and Coventry at Hawkesbury in 1836, the old line to Longford being, nevertheless, retained for traffic to Coventry.

In view of further improvements a proposal was made which, if executed, could have brought a considerable change in canal transport from the Midlands to London. This was the Central Union Canal (Fig. 25) whose significance can only be appreciated in relation to other canal improvements in the Midlands. In 1826 an Act authorized the construction of the Birmingham-Liverpool Junction Canal (later known as the Shropshire Union) to cut across the Midlands from the Staffordshire-Worcester Canal, to join the Ellesmere and Chester Canals at Nantwich, whence there was an existing line via Chester to Ellesmere Port on the Mersey. In conjunction with this scheme the Birmingham Canal Company modernized its own line. By 1834 the improvements had been completed and there was the prospect of attracting increased traffic from Liverpool to Birmingham, as well as towards London. But all traffic to London had to go either by the long and very winding Coventry and Oxford Canals (59 miles), or by the short but heavy locked Warwick Canals with a total mileage of 38, neither of which was originally planned as a direct route between London and Birmingham. Moreover, the varying draughts of the canals made it difficult to transport manufactured articles of more than nine feet dimension from the foundries of Staffordshire to London. Such problems encouraged the search for

---

(80) Op.cit. MT 1/22.

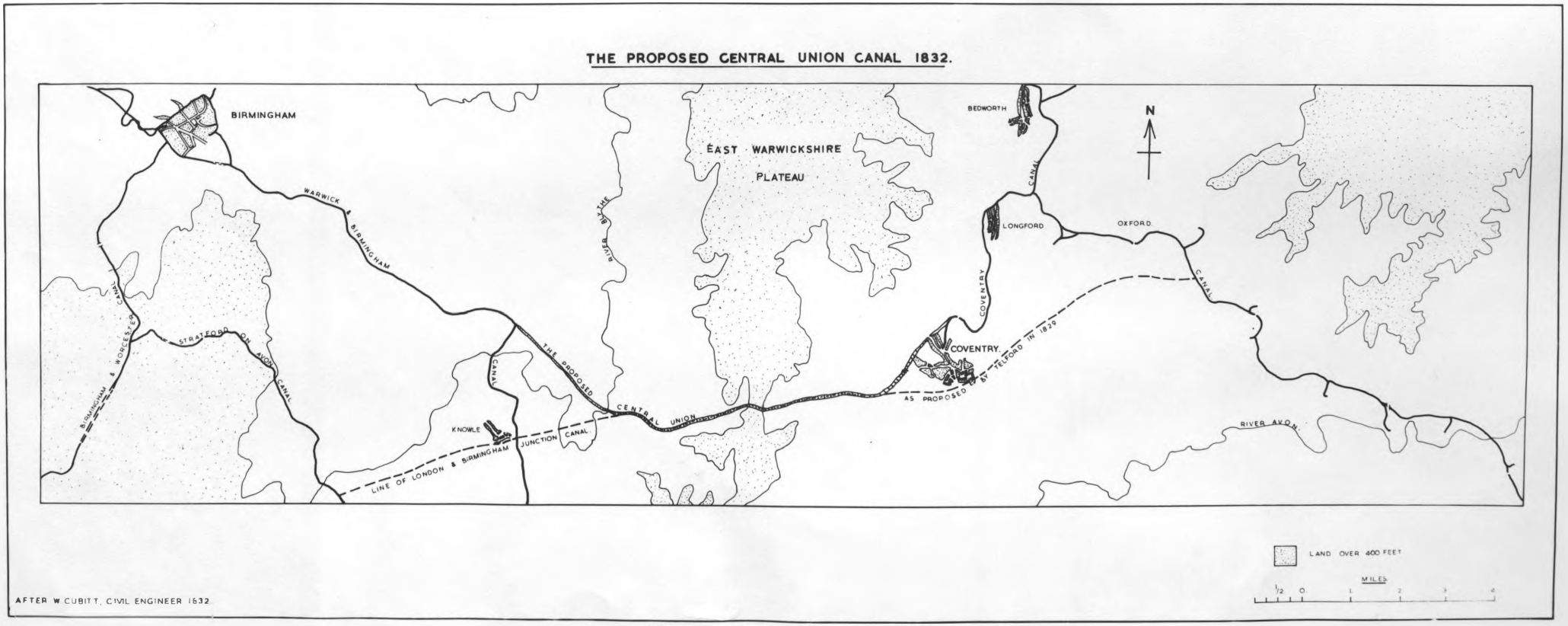

THE PROPOSED CENTRAL UNION CANAL 1832.
BIRMINGHAM
WARWICK & BIRMINGHAM
BIRMINGHAM & WORCESTER CANAL
STRATFORD ON AVON CANAL
RIVER BLYTHE
EAST WARWICKSHIRE PLATEAU
BEDWORTH
N
COVENTRY CANAL
LONGFORD
OXFORD
CANAL
COVENTRY
AS PROPOSED BY TELFORD IN 1829
THE PROPOSED CENTRAL UNION CANAL
KNOWLE
LINE OF LONDON & BIRMINGHAM JUNCTION CANAL
RIVER AVON
LAND OVER 400 FEET
MILES
½ 0 1 2 3 4
AFTER W CUBITT, CIVIL ENGINEER 1832

FIG.25

a route to reduce the canal distance between London and Birmingham. The idea led to the promotion[81] of the Central Union Canal which was proposed as the London-Birmingham Junction project in 1827. After several changes it became the Central Union, labelled finally as the London-Birmingham Canal. From Birmingham the proposed new canal was to connect the Worcester Canal at Birmingham, then pursue the course of the Warwick-Birmingham Canal for 8 miles as shown in Fig. 25. It would then follow the proposed London-Birmingham Junction[82], and terminate finally at the head of the Coventry Canal making a total length of 11 miles with 9 locks. Included in the plan[83] was the alteration of 3 locks at Hillmorton to agree with the other thirteen locks on the proposed canal and similar to those on the Regents Canal, i.e. double locks each fifteen feet wide and capable of passing a double number of boats at the same time with half the quantity of water. The plan was to shorten the distance between London and Birmingham by 36 miles, and according to the proposals, cut down the cost of iron and coal by 50%. From a canal point of view there was ample justification for the building of the canal,but just before the last bill came out the London-Birmingham railway was opened, crippling the proposed scheme. Indeed, the advent of the railway in the 1830's arrested further canal developments as is demonstrated in Chapter Four.

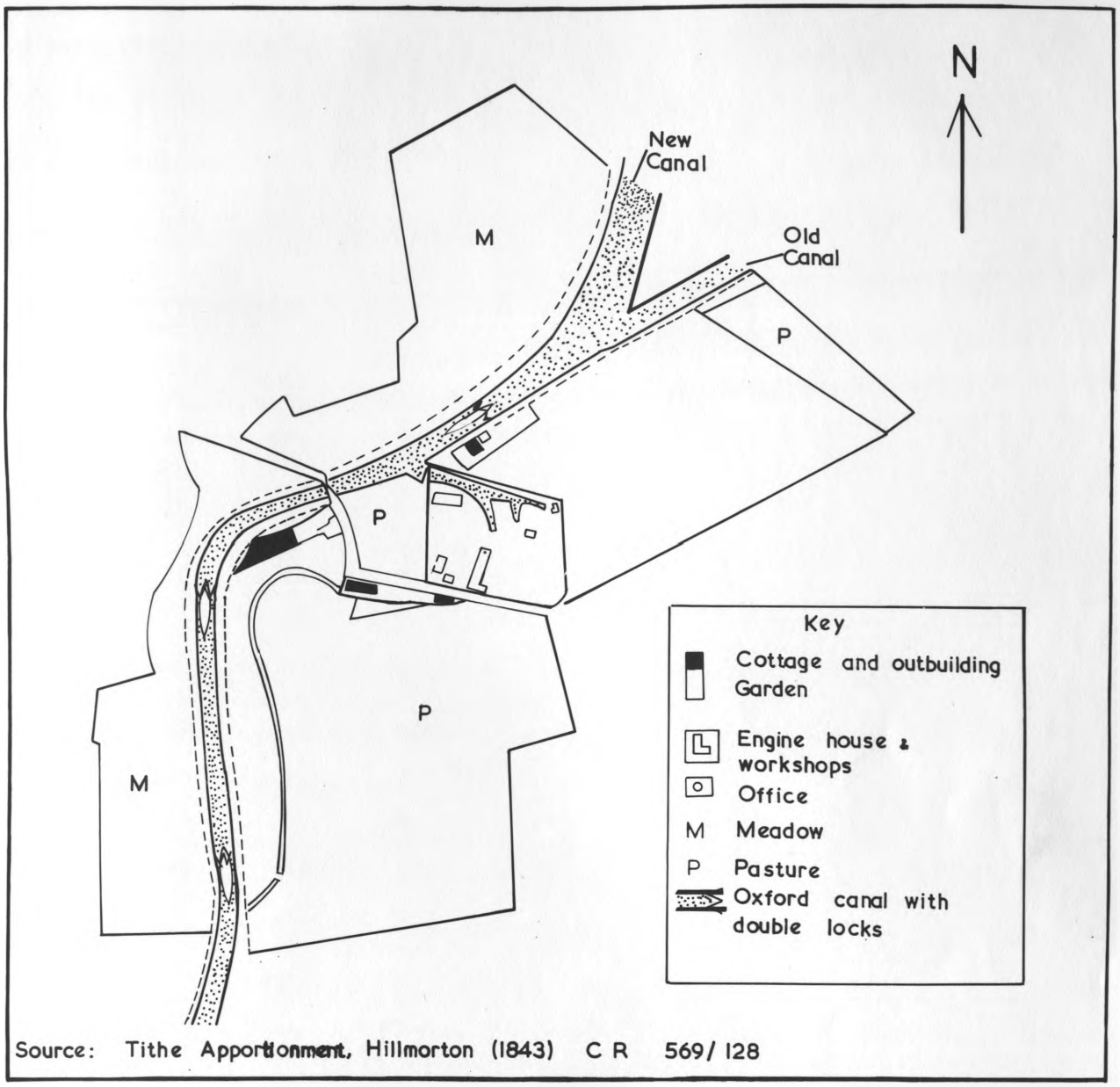
---

(81) B'ham Ref. Lib, 275146, Central Union Canal, undated, pp. 1-4.

(82) Manning Lewis E. (1923). "Inland Waterway". In Canal and Waterways Journal, 5, no. 12, p. 244. Vide B'ham Ref. Lib. 275146. Cubitt W. Observations on the proposed London-Birmingham Canal, 1836.

(83) C.R.O. Tithe Apportionment of Hillmorton. CR 569/128. Vide Fig. 25.1.

PLAN OF THE OXFORD CANAL(HILLMORTON) SHOWING COTTAGES & WORKSHOPS 1843



Source: Tithe Apportionment, Hillmorton (1843) C R 569/ 128

FIG.25.1

The economic benefits conferred by the Warwickshire Canals during the latter part of the eighteenth and early nineteenth centuries were considerable. Not only did they provide a cheap and more viable means of conveyance for bulky commodities, especially coal, the price of which fell by half in Birmingham and Coventry, but the ready availability of limestone and lime, used widely as fertiliser, led to improvements in agriculture. Roadstone (especially Cambrian quartzite) from the North-East Warwickshire coalfield, was to contribute in the eighteenth century to the improvement of road surfaces, thus directly aiding the canals in the collection and distribution of goods.

CHAPTER THREE

WHARF AND FACTORY DEVELOPMENT

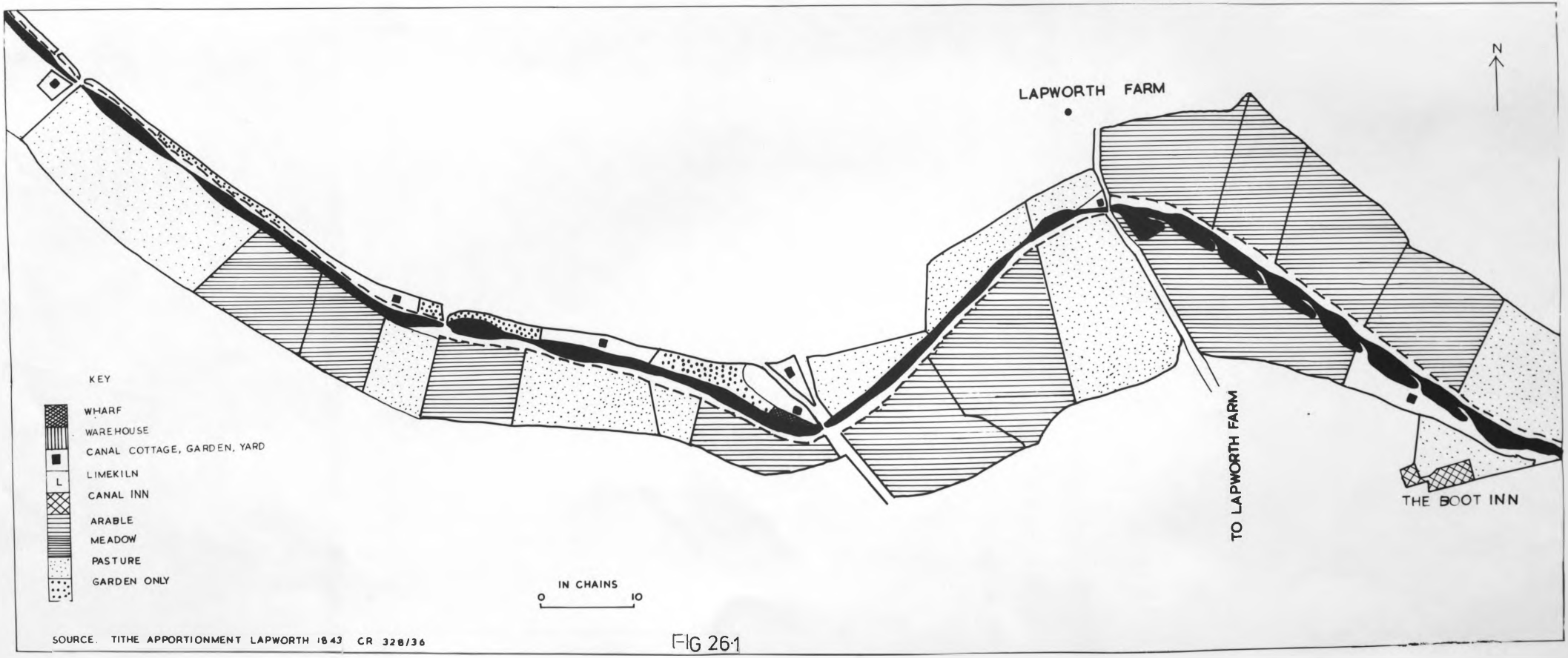
It is not easy to determine the exact extent to which canal development stimulated industrial activity because of the difficulty in distinguishing between cause from effect, though some changes can safely be attributed to the advent of canals. Estate, enclosure and tithe maps of the parishes traversed by the Warwickshire Canals have been studied in an attempt to comprehend general character of landuse before canals were cut, and subsequently to identify changes initiated by the cutting of canals (Fig. 12.2). From the maps studied those available on the Stratford and Coventry Canals (Figs. 26.1, 26.2, 26.3, 27) were chosen for detailed analysis because they were industrial canals, passing through agricultural areas and reveal the economic character of the areas through which they passed through the development of wharves and works along their canal banks.

Canalside Landuse of the Coventry and Stratford-upon-Avon Canals about 1844

An analysis, based on tithe maps available for these canals, as well as directories and field surveys, shows the effect of the canals on the adjacent environment as it existed about 1844. The purpose of this analysis is to bring out the general influence of the canal on the bank area; specific influences are discussed later.

Wharf development is evident at the first major bend (Fig. 26.1), at the junction between the Birmingham-Warwick and the Stratford Canals (Fig. 26.2) and in two places on the Wootton Wawen stretch (Fig. 26.3). Primary industrial establishments such as limekilns at Dick's Lane, which were to benefit from the proximity of the canal

MAJOR CANALSIDE LAND-USE C.1840 LAPWORTH AREA



SOURCE. TITHE APPORTIONMENT LAPWORTH 1843 CR 328/36

FIG 26·1

MAJOR CANALSIDE LAND-USE C.1840 LAPWORTH AREA.

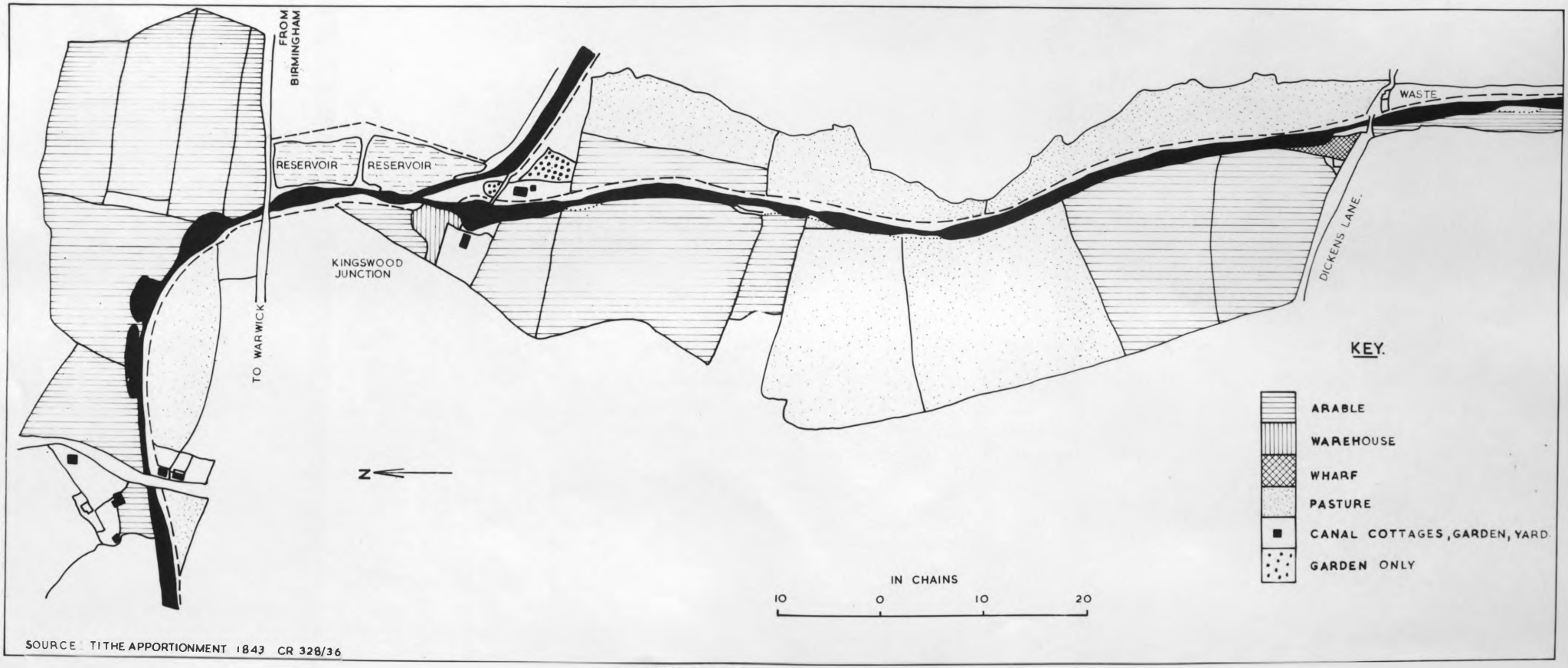


FIG.26·2

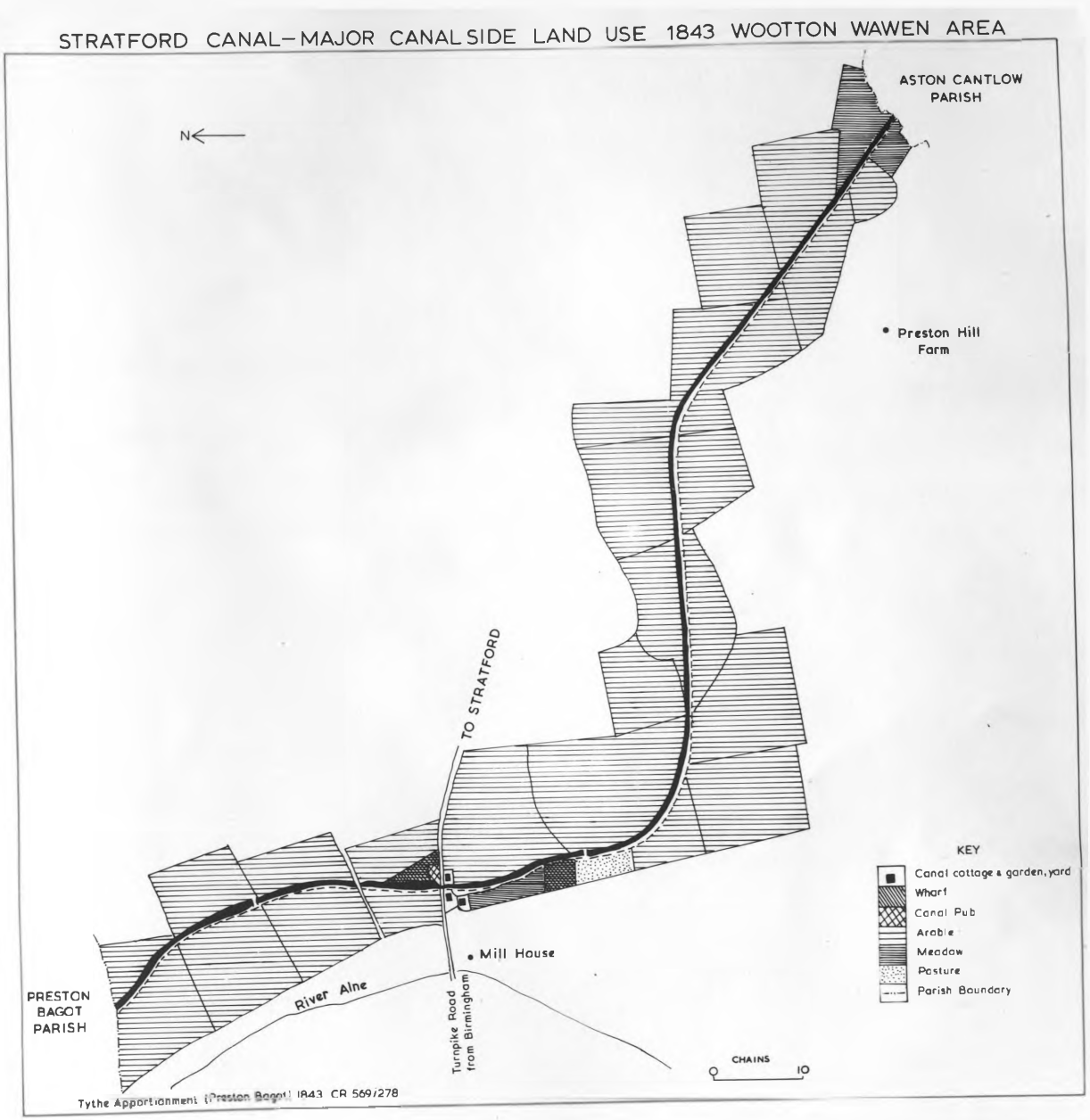

STRATFORD CANAL – MAJOR CANAL SIDE LAND USE 1843 WOOTTON WAWEN AREA
N
ASTON CANTLOW PARISH
Preston Hill Farm
TO STRATFORD
Mill House
River Alne
Turnpike Road from Birmingham
PRESTON BAGOT PARISH
CHAINS
0
10
KEY
Canal cottage & garden, yard
Wharf
Canal Pub
Arable
Meadow
Pasture
Parish Boundary
Tythe Apportionment (Preston Bagot) 1843 CR 569/278

FIG.26.3

COVENTRY CANAL - MAJOR CANALSIDE LAND-USE c1844 : NUNEATON AREA

source: Tithe Apportionment 1844 CR 569/184

FIG·27

for the transport of lime and cement, possessed their own private wharves. Warehouses are found at the junction with the Warwick-Birmingham Canal (Fig. 26.2) where there was a break in transportation. Another interesting feature revealed by the landuse map is the effect of the canal on the areas through which it passed. At Lapworth, for example, the Stratford Canal cut through many fields, most of which bore names like Top Canal Meadow, Navigation Close, Grass in Little Wharf Piece and Canal Piece, indicating the impact of the canal on local perception. In Wootton Wawen the canal passed through arable land; the only section with evidence of canal activity was located at the wharf where the canal halted for three years due to financial difficulties of the Company. A cottage with gardens, most probably for the wharfinger, also emerged here. Between Hockley Heath and the first side-pond in Lapworth the northern sections of the fields truncated by the canal were extremely small and narrow-hemmed in between the canal to the north. There is evidence[1] that the Stratford Canal Company sold such lands. As they were too tiny to be farmed the new owners used them for gardens or cottage building (Fig. 26.1). Plots adjacent to the canal and too tiny to be sold by the Canal Company were kept as gardens for the use of its staff.

These remarks could be applied generally to all canals: in Fig. 27 the section of the Coventry Canal in Nuneaton area is taken as an example. The fields truncated by the Coventry Canal, were more varied than those along the Stratford Canal. Fifty per cent of the fields were under pasture in 1844; meadow and arable land

---

(1) C.R.O. Estates belonging to the Proprietors of the Stratford Canal Navigation sold by auction, 11th Dec. 1816, CR/611/Box 18.

each occupied twenty five per cent. The bank areas associated with most activity were at canal and road junctions where a warehouse was located to facilitate the distribution and collection of goods to towns located away from the canal. (Distribution and collection of goods are discussed later on in the chapter.) In conjunction with the warehouse there was a wharf with cottage (and gardens for the wharfinger). At the second junction there is a canalside inn and a limekiln. The general influence of canals on their immediate surroundings can, therefore, be seen in their impact on functional landuse: warehouses and depots, wharves, limekilns, canal cottages and canalside inns dramatically changed the rural character and calm of the countryside. Some of the fields were halved, others lost small sections; division might be inconvenient to the farmer, but the agricultural use of such fields often changed very little because they could still be ploughed or left under grass (Figs. 26, 27).

Factory Development

Factory development in Warwickshire was minor and sporadic. Large scale industrial development in the North-East Warwickshire Coalfield took place later and may have commenced a century or so after that of South Staffordshire[2]. This was due firstly to the difficulty with which the coal was worked. The Warwickshire coal seams dip away from the surface at steep inclination. Before any extensive area could be won, the depth of seams rapidly increased and problems arose in

---

(2) Mitcheson, J. C., (1950), "The East Warwickshire Coalfield". In Birmingham & its Regional Setting, pp. 294-5, Birmingham.

hauling the coal up and in keeping the mine clear of water. Moreover, much of the outcrop of the Thick Coal was covered by some twenty feet of water bearing alluvial gravel which fed water into the shafts. Even with the application of steam power the scale of production was limited by steep haulage and the heavy cost of high lift pumping with primitive machinery. Secondly, there was no large local market in Warwickshire comparable to the wide market of the Black Country. Thirdly, not only was Warwickshire coal dearer but it was of poorer quality. The only local industry apart from the extractive industries associated with coal, diorite and quartzite workings were the small silk and woollen industries of Coventry and the brick and tile works of Wilnecote and Nuneaton. The latter relied on the Etruria Marl workings which did not become well established till the nineteenth century. Ironstone mining and smelting never developed on a large scale. Development of industries in the North-East Warwickshire Coalfield in the 1850's was little influenced by the canals as Kirkham has shown[3]. His argument was further supported by Bunker[4], Millward and Robinson[5] who held that the greatest development of the East Warwickshire Coalfield did not occur until after 1880 when the better seams of South Staffordshire were worked out and the Black Country became an importer, rather than exporter, of coal. The completion of the Birmingham and Derby Junction Railway in 1839 was intimately connected with the coalfield. From Tamworth it passed through Wilnecote, Kingsbury and the northern mining area,

---

(3) Kirkham, M. E. (1933). East Warwickshire Coalfield Industry, B.A. Thesis, No. 20, Geography Dept., Univ. of Birmingham, pp. 54-5.

(4) Bunker, R. C. (1952), Development of Population in the North-East Warwickshire Coalfield, Unpublished M.A. Thesis, No. 240. Geography Dept., Univ. of Birmingham, p. 103.

(5) Millward, R. and Robinson, A. (1971). The West Midlands, pp. 131-2. Eyre and Spottiswoode, London.

and its importance may be judged by the Kettlebrook, Wilnecote, Hockley Hall collieries which sprang up before 1850. The Trent Valley Railway (1847) benefited the extreme north-east of the coalfield considerably. This line, providing a more direct route from London to the north and avoiding Birmingham, ran from Rugby through Nuneaton, Atherstone, Polesworth and Tamworth to Stafford, making use of the Anker Valley. Immediately after its completion in 1847, Pooley Hall Colliery was opened (1848); Glascote and Amington were opened about 1850. In addition new collieries like Haunchwood, Griff, Clara and Arley opened between 1880 and 1910 along the Coventry-Nuneaton Railway. During the period after 1840, therefore, the railways were of greater importance for location than the canals. Associated industries, based on Etruria Marl and the fireclays of the Middle Coal Measures, (like the extensive brick, terra cotta and ornamental tile works established by Gibbs and Canning in 1850, and the superior brick and tile of the Glascote-Kettlebrook Area[6], Stockingford, Bedworth and Griff located on the Warwickshire coalfield) also reflect a bias towards the railway.

The most extensive canalside works in Warwickshire were in Birmingham at the commencement of the Warwick-Birmingham Canal, especially at Digbeth Junction, and at the junction of the Birmingham Canal Navigations with the Worcester-Birmingham Canal (Fig. 28). There arose here an extensive basin with foundries, rolling mills and nail factories. To the north of the Warwick-Birmingham Canal were the Banbury and Corporation wharves separated by the River Rea. On the waterside stood

---

(6) Pigot and Co's Commercial Directory of Birmingham and its environs, 1828, p. 736, London.

K E Y

1. Bordesley Wharf.
2. Warwick Wharf.
3. Banbury Wharf.
4. Corporation Wharf.
5. Mineral Manufactory.
6. Ice Manufactory.
7. Rolling Mills.
8. Tube Works.
9. Cycle Works.
10. Britannia Tube Works.
11. Boyer Street Works.
12. Cement Works.
13. Small Arms Factory.
14. Worcester Wharf.
15. Birmingham Wharf.
16. Coal Wharf.
17. Crescent Wharf.
18. Noshall Wharf.
19. Lower Lovedall Wharf.
20. Brewery Wharf.
21. Nechells Gas Works.
22. Saltley Gas Works.

Source: William Till, 1884.

WHARF DEVELOPMENT IN BIRMINGHAM 1884

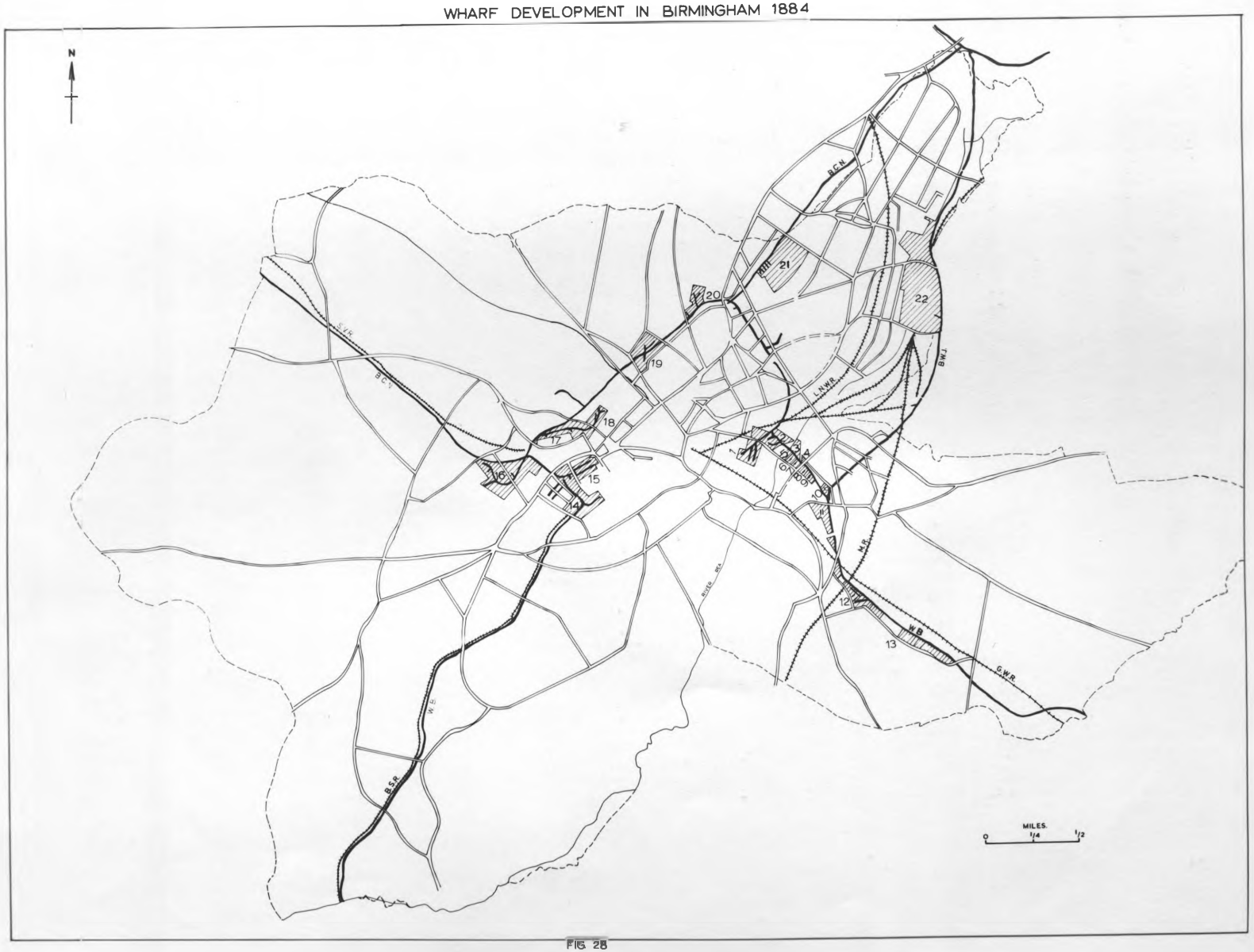


FIG. 28

a factory producing agricultural tools, an ice manufactory and wire, tube and rolling mills. This industrial area is an extension of the industrial complex of Birmingham and the Black Country, and its location and success is best considered in relation to the industrial development of Birmingham, where the comparative speed and cheapness of carriage afforded by the canals led to the development of brassware manufacturing as a staple trade during the late eighteenth and early nineteenth centuries. The manufacturing of brassware became almost completely localised in the vicinity of the junction of the Birmingham and the Birmingham and Warwick Canals along which wharves developed to bring in coal from South Staffordshire, copper and zinc came in from Devon and Cornwall, and despatch the brassware. Other wharves developed here to serve factories producing nails, implements and edge tools[7].

The Cement Works of Stockton and Long Itchington

There are, on the other hand, works and factories outside the Warwickshire coalfield which can also be attributed in large measure to the attraction of a canal. In Stockton the Blue Lias Limestone has long been known as a valuable source for the manufacture of lime and cement, and by 1850 the workings were described as very extensive[8]. The quarries extend into the parishes of Long Itchington and Southam.

---

(7) Wise, M. J. (1950). "Factors influencing the growth of Birmingham", Geography, 33-35. pp. 176-190. Manchester.

(8) White, F. and Co. (1850). History, Gazetteer, and Directory of Warwickshire, p.701, John Blurton. Sheffield.

With the opening of the Warwick-Napton Canal in 1800 Blue Lias Lime and cement works strung along the canal to take advantage of the canal for bringing coal in cheaply and for marketing the cement. Fig. 29, based on the 6" Ordnance Survey map of 1886, 34S.E., and the plan of the London North Western Railway (Daventry-Leamington branch)[9], shows that most of the Blue Lias Limeworks of Stockton and Long Itchington were located along or connected by a collateral branch of the Warwick-Napton Canal. There is no evidence from contemporary maps like Beighton's of 1728 and 1750, or Yates's one inch map of Warwickshire (1787-9) concerning any limeworks in Stockton but there is evidence that Greaves lime and cement works, the first in Warwickshire, were to be the forerunner of the canalside works in the area. The first Ordnance Survey one inch map of Warwickshire, 1834, shows Greaves lime and cement works, though no mention of this was made by any directory before 1850. Greaves' works in Stockton were originally involved in the production of Blue Lias Lime, and later Portland and Roman cement. The kilns for production were thirteen in number, of variable sizes. It is probable that one of the three products mentioned, quite likely lime, was not produced all the time and that the small limekilns were to reduce the cost of smaller production. The 1886 Ordnance Survey 6" map shows the existence of other kilns at Greaves' cement works, apart from the thirteen already mentioned. Wiles casts doubts about the ownership of the additional kilns, but they probably belonged to Greaves Company. The first kilns were built close to the canal to facilitate easy transport, but with the completion of the Daventry and Stockton Railway the works moved to the railway, Fig. 29, which provided a quicker and more efficient means of transporting the cement, leading to ultimate abandonment of the old canalside kilns.

---

(9) C.R.O. Plan of London North Western Railway, 1848. part 3, section 1, CR 1207/2/9.

THE STOCKTON QUARRIES AND CEMENT WORKS IN RELATION TO THE WARWICK NAPTON CANAL (1886)

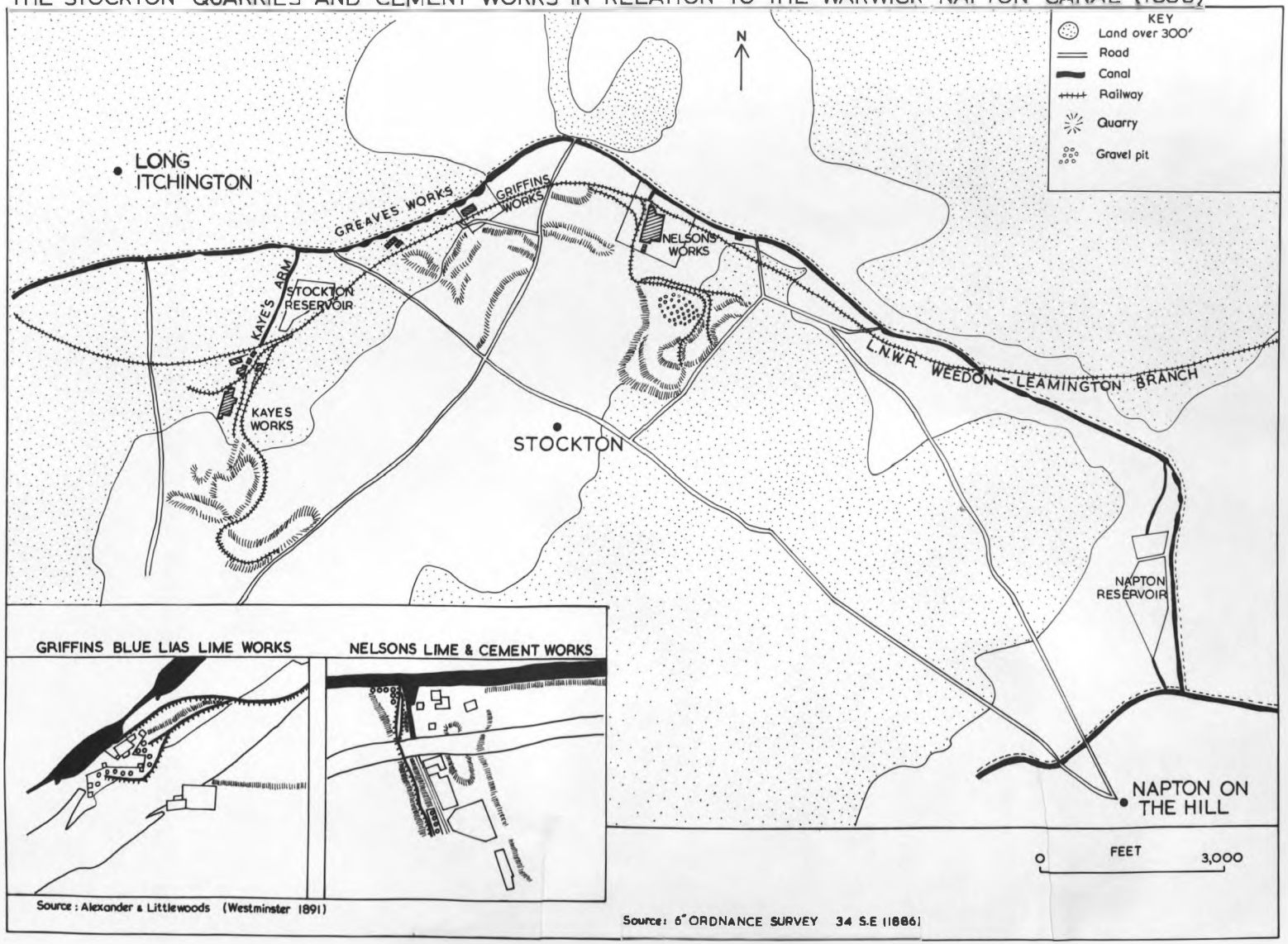


FIG. 28

Griffin Company Limited (Fig. 29) came into operation at about the same time as Greaves, as Blue Lias Lime producers[10]. To facilitate the importation of coal and marketing of cement, Griffin's works (like Greaves') were located along the canal near the seventh lock, and fed by the limestone quarry to which it was linked by a tramway (see Fig. 29). Lime production was of considerably greater importance than cement, for William Griffin, the proprietor of the works, was mentioned by White's Directory[11] as an arable farmer and a limeburner. His interest in agriculture coupled with the fact that the Company never appeared to be very ambitious suggests that lime was originally burnt for agricultural purposes and sold for building as a profitable sideline. The works seem to be small considering the smaller number of kilns - mostly vertical intermittent ones - and never grew to any large proportion.

East of the Greaves'[12] works were those of Charles Nelson and Company Ltd. They were first referred to in 1856 as manufacturing Portland cement in Warwick (Emscote) and Stockton in 1860. The original location of Charles Nelson's kilns, like Griffins and Greaves, were very close to the canal, (although some developed away from the main canal, but nearer the quarry, and were served by a small canal branch for an easy access for the transport of the cement). The link between the new kilns and the canal is brought out clearly by the plan of the Daventry-Stockton Railway[13]. The last works related to the canal was the Blue Lias Limeworks

---

(10) Wiles, P. J. (1971). Raw Materials in the Rugby area, B.Sc. Thesis for Lancaster Polytechnic, Rugby, Dept. of Mechanical Engineering, p. 27.

(11) Ibid. p. 384.

(12) CR 1207/2/9, op.cit.

(13) C.R.O. London North Western Railway, Daventry-Leamington Branch, CR 1207/2/9.

of Kaye and Company Ltd., of Long Itchington, established in 1854. The "Builder" of 1855 mentions first Oldham and Tatham, and later Tatham and Company, as cement manufacturers at Long Itchington, but by 1871 the name had changed to Tatham, L. M. Kaye and Company Ltd. White mentions in 1874[14] Messrs. Charles and William Witherington as owners of extensive limestone quarries. The Witheringtons may have owned the quarries, but the extraction and burning was carried out by Kaye and Company. It appears that the old kilns, shown by the 6" Ordnance Survey Map (1866 Sheet No. 34 S.E.) belonged to the Witheringtons and might have been abandoned by the 1850's. In 1854 the Kaye Company installed new bottle kilns to raise production. To establish a link to the Warwick-Napton Canal the Kaye's arm (canal branch), three and a quarter miles long, was constructed from the canal near Long Itchington to the kilns (Fig. 29). The assent for the construction of this private collateral canal was granted by the Warwick-Napton Canal Company as early as 1819 in anticipation of the establishment of Kaye's Cement and Lime Works. The advantages derived by the canal connection was two-fold: the canal provided good access for coal to the limekilns, and at the same time the Blue Lias Lime and cement were easily distributed to rapidly developing towns like Birmingham and London both of which had a direct link with the Warwick-Napton Canal.

Industrial Development in Warwick

So great was the effect of the Warwickshire Canals in stimulating industrial development in Warwick that industries began to spread in three

---

(14) White, F. and Co., 1874, p. 834, op.cit.

main localities. By the last decade of the nineteenth century industrial areas stimulated by the Warwick Canals could be discerned in the Saltisford at the Warwick-Birmingham terminal basin, and at the Cape and Emscote along the Warwick-Napton Canal - what Rhys[15] called the 'Outer Fringe Zone' of Warwick as is explained later. Warwick benefited more from the canal than from any other means of transport, even the railways having less impact[16].

By improving communications and enabling raw materials like cotton and wool and coal to be brought in cheaply, the canal enabled Warwick to develop a considerable trade and industry for a small shire town. Until the end of the eighteenth century the Saltisford area was characterised by a line of houses on either side of the Birmingham Road[17], with the Priory Estate on the east and the Common Brook to the north-east (Fig. 30.1). This situation was profoundly transformed by the Warwick-Birmingham Canal, and especially by the construction of the basin in 1793. The chief factory (Fig. 30.2) to appear at the Saltisford wharves was the Worsted Manufactory established in 1796 as a joint partnership[18] between the Parkes brothers, Samuel Crompton and Brookhouse[19],

---

(15) Rhys, W. T. (1961). Warwick: A Study in Urban Geography, Unpublished M.A. Thesis, University of Wales, Aberystwyth, pp. 94-5.

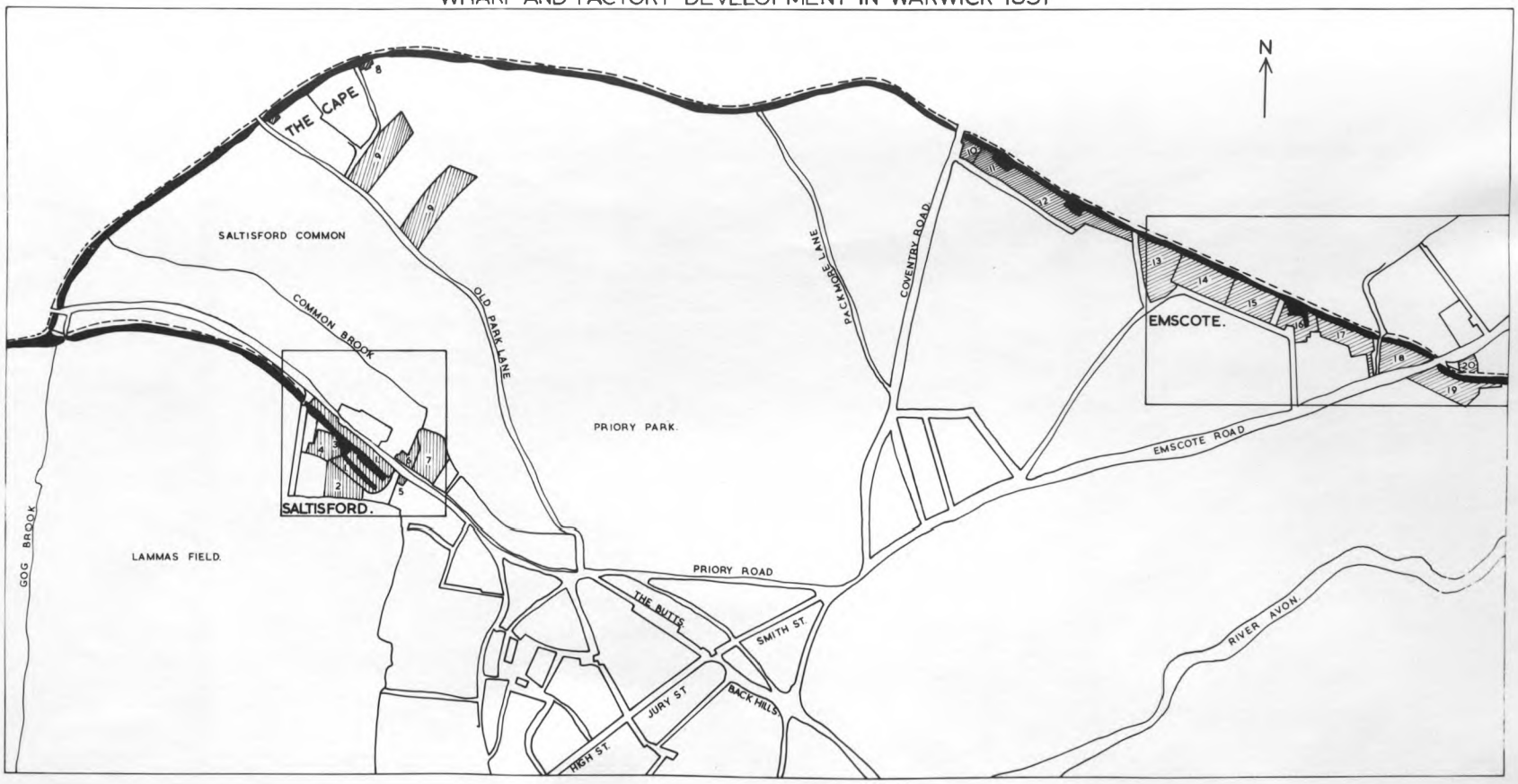
(16) Abercrombie, L. P. and Nickson, R. (1929). Warwick: Its Preservation and Redevelopment, 2nd edition, (1949), pp. 25-6, Architectural Press, London.

(17) Pugh, R. B. (1969). "The Victoria County History of Warwickshire", 8, p.837. Oxford University Press, London. Vide Funnel, D. C. (1969). Development of Transport and Urban Growth in South Warwickshire, Unpublished B.A. Thesis, p.29, University of Cambridge.

(18) Field, W. (1815). An Historical and Descriptive Account of the town and Castle of Warwick, pp. 76-8. H. Sharpe, Warwick. Vide C. H., op.cit., p.508, Chapman, S. D. (1967). The Early Factory Masters, the Transition to the Factory System in the Midlands Textile Industry, pp. 115-6. David and Charles, Newton Abbot.

(19) C.R.O., D 913 HUG(P), Hughes C. J. (1968), Industrial Archaeology, p.3.

WHARF AND FACTORY DEVELOPMENT IN WARWICK 1851



SALTISFORD.

1. WHARF
2. YARD (COAL)
3. WAREHOUSE
4. PARK'S MANUFACTORY
5. NAVIGATION INN
6. BRICK KILN
7. GAS WORKS

THE CAPE.

8. CAPE OF GOOD HOPE
9. BRICK YARD

EMSCOTE.

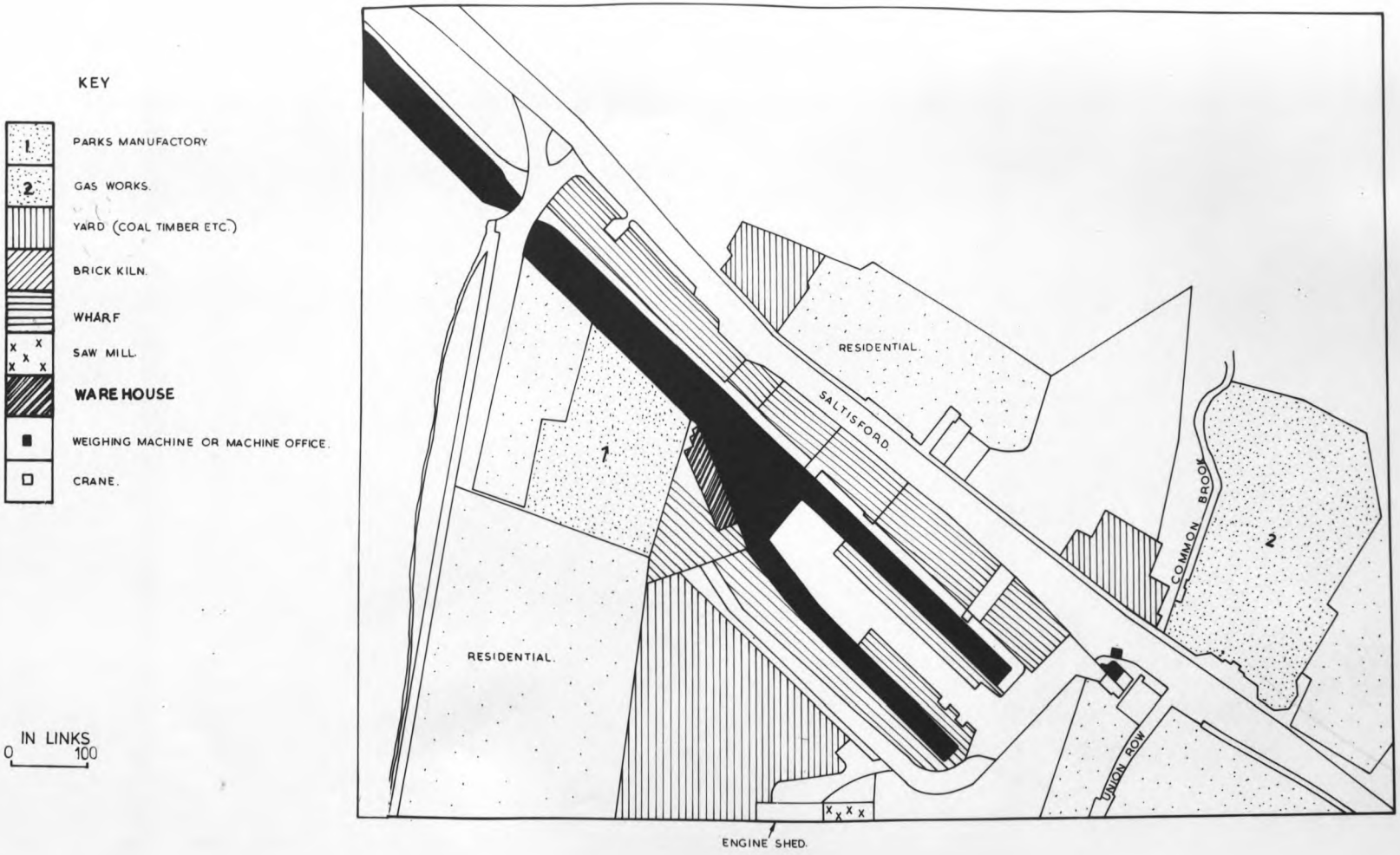
10. THE NEW INN
11. LIMEKILNS
12. LIMEKILNS
13. TIMBER YARD
14. NELSONS GELATINE MILLS
15. COAL & TIMBER WHARVES
16. UNION WHARF
17. YARD (COAL, TIMBER, SLATE)
18. EMSCOTE WHARF
19. LIMEWORKS
20. EMSCOTE MILL

SOURCE: ORDNANCE SURVEY 1/250 1851.

IN FEET.
0 500 1000

FIG·30·1

WARWICK- BIRMINGHAM TERMINAL BASIN 1851.



SOURCE: ORDNANCE SURVEY 1/250 1851

FIG. 30-2

a cotton spinner who moved from Leicester to Warwick. In 1791 the Parkes brothers had bought substantial townhouses and an area of land extending in curve from Linen Street to Wherrotts Close, bounded on the west by the Lammas Field and on the east by properties, which fronted Theatre Street and part of the Saltisford. On part of this land they built warehouses, apparently in anticipation of the cutting of the Warwick-Birmingham Canal whose Private Act was passed in 1793 - the names of the Parkes brothers appearing among the proprietors[20]. Production began in 1797, the factory employing about 500 people by 1815. A 30 h.p. Boulton and Watt engine was installed to drive the machinery. Coal was brought from Birmingham by the Warwick-Birmingham Canal at a cost of two shillings and ninepence a ton and unloaded at the company's wharves in the Saltisford. The fleeces went through all the successive processes of sorting, washing, combing, dyeing and spinning into worsted and yarn, both of finer and coarser qualities. By 1823 the output was twenty packs of yarn (i.e. 4,800 lb.) per week[21]. The worsted was for the hosiery and the yarn for the carpet manufactory. The canal formed a unifying link between the products and their markets. The principal markets for the worsted were at Leicester, Hinckley and Nottingham, and for the yard at Worcester and Kidderminster. Much of the raw wool, came from Leicester. The Parkes Industrial boom, however, did not last for long and by 1820 the worsted factory had ceased production due to financial difficulty following the slump after the Napoleonic Wars - many partnerships were advertised as being suitable for worsted, silk or cotton. One Thomas Fielding, a former agent of the Parkes' firm, set up his own mill at Leicester. Moreover, the manufactory suffered much fire damage in

---

(20) "Warwick-Birmingham Canal Act", 1793. In Canal Acts Midland District Vol. III, p.485.

(21) Chapman, S. D. (1967), op.cit.

the mid-nineteenth century, and was finally pulled down in 1855[22].

In the same year as the opening of the Worsted factory[23], Messrs. Parkes also opened a cotton weaving factory in Oil Mill Lane, employing about two hundred hands and depending entirely on Manchester for its raw material, cotton. The woven cotton in the form of calicoes, fustians, velveteens and velverets were sent to Manchester. By 1820[24] the worsted factory had ceased production and Parkes disappeared from the Directory, no mention being made of him in Pigot's Directory of 1822. A further industrial development in the Saltisford was the Gas Works erected in 1822 by the Barlows near the canal basin (see Fig. 30.2). This received coal from wharves established at the waterside. In 1885 the Gas Company leased a wharf[25] at the basin for obtaining coal. In the central block of the works was located the office, valve house and 'loder'; to the north were the coal shed, limeshed and purifying house[26], and to the east a circular gasometer (photo 9). The works expanded rather rapidly and by 1841 it was lighting over 126 lamps in the town, and for about 120 years the company played an important role in lighting Warwick. The output continued to expand to meet increasing demands, so that by 1850 three gas holders were storing 32,000 cubic feet of gas. There also developed huge timber yards - two of which were located near the Gas Works and the other between the canal and Hill House.

---

(22) Rhys, W. T. (1961), op.cit., p.77.

(23) Field, W. (1815), op.cit.

(24) Tibbits, E. G. (1952). Factories on the Hill House site at the Saltisford, Warwick, p.1-2. C.R.O., B.WAR Tib(P).

(25) C.R.O., Lease of Wharf situated between the Warwick-Birmingham Canal and the Warwick Gas Works, 1885, CR 1209/18.

(26) V.C.H., 8, op.cit., p.437.

Plate 9: WARWICK GAS WORKS. This interesting structure, built in 1822 by the Barlows, depended on the Birmingham-Warwick Canal for bringing in coal and for despatching coke and tar.

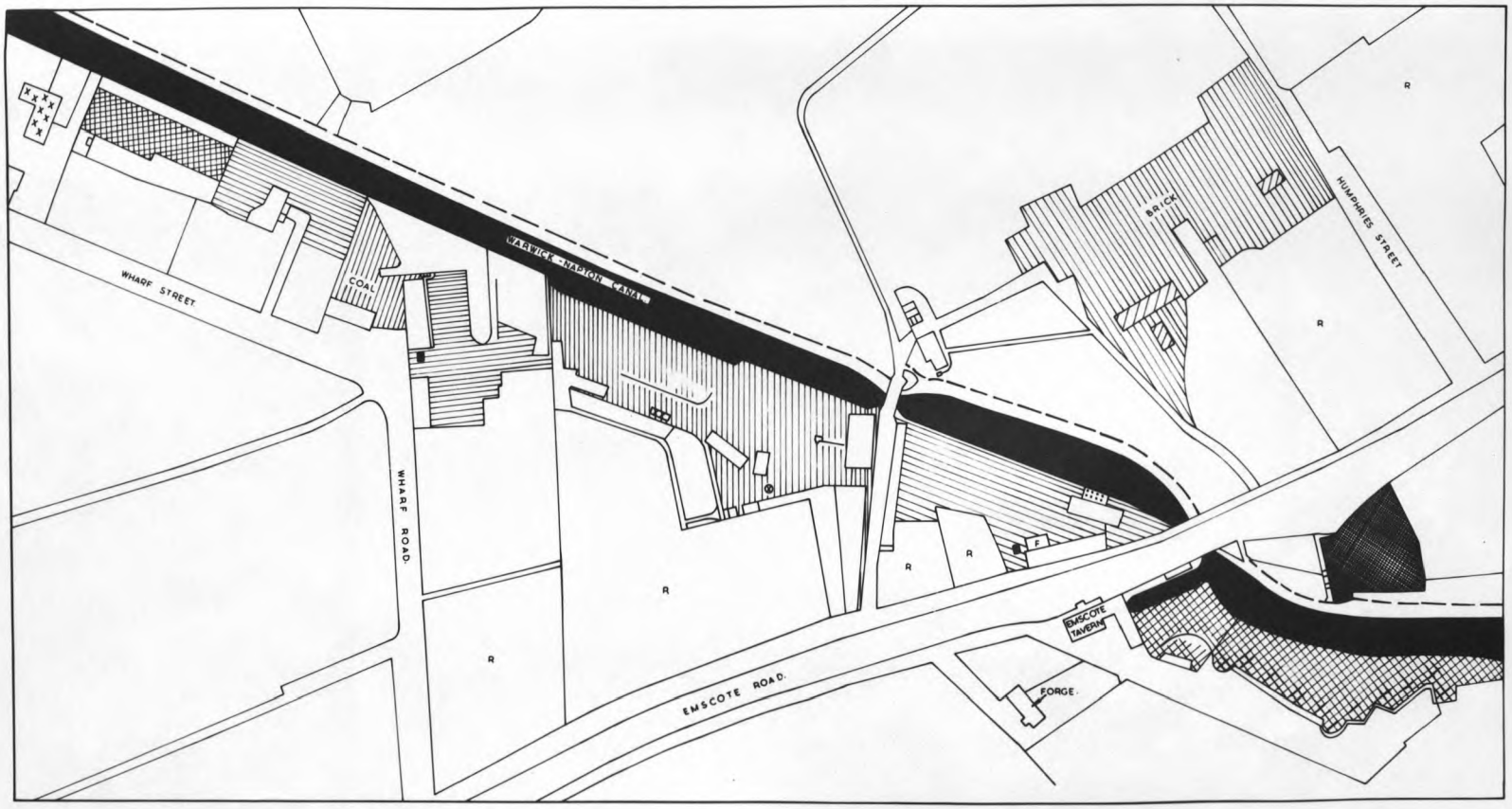
Plate 10: MINION'S CORN WAREHOUSE, ATHERSTONE. As this served a corn mill an extensive intermediary basin grew up here in the nineteenth century.

The Warwick-Napton Canal was to create industrial units along its route through suburbs of Warwick, in the 'Outer Fringe Zone' following the line of the canal from the road to Birmingham in the west to the River Avon in the east (Fig. 30.1). Before the completion of the Warwick-Napton Canal in 1800 the only industrial plant at Emscote was the cotton manufactory established by Messrs. Smart in 1792[27] as both a corn and cotton spinning mill. This work, usually referred to as the Rock Mill, was undoubtedly the first building to be used for cotton spinning in Warwickshire, and the work was carried on partly by means of water and partly by steam. In 1797 it also produced 360 bushels of corn a week in the four driest months and 495 bushels a week in the remaining eight months[28]. The maximum output of corn was thus limited by scarcity of water, until the installation of a steam engine in the early nineteenth century. The cotton manufactory obtained cotton from London and Liverpool by road and after 1800 by canal; and above all coal was also brought by canal. The Warwick-Napton Canal brought into existence series of isolated development units at Emscote and the Cape between the Coventry Road and Emscote Wharf, each unit having as its nucleus the wharves attached to this new fixation line. Fig. 30.3, a plan of Emscote, shows the layout of the various wharves which were primarily concerned with the movement of coal, timber and lime. Closely associated with them were several brickyards and quarries. One of the most important factories was Tomes and Handley's Navigation Mill of 1805 near the Navigation Bridge[29]. No mill in Warwick benefited more from the canal. In addition to being accessible by canal, the mill was furnished with five pairs of stones three of which were kept constantly in motion. Its cast-iron water-wheel of the back-shot

---

(27) Field, W. op.cit., p.78. Vide V.C.H., Vol. 8, op.cit., p.445.
(28) C.R.O., Hughes, C. J., (1968) op.cit, p.1.
(29) Field, W. (1815), op.cit., p.78.

WHARF AND FACTORY DEVELOPMENT IN EMSCOTE 1851.



KEY

- WHARF
- YARD (COAL, TIMBER ETC)
- BRICK KILN
- LIME WORKS
- SAW MILL
- CORN MILL
- WEIGHING MACHINE OR MACHINE OFFICE
- CRANE
- WAREHOUSE
- BOAT HOUSE
- F — OFFICE
- R — RESIDENTIAL

IN FEET
0 100 200

SOURCE: ORDNANCE SURVEY 1/1250 1851.

FIG. 30.3

type was turned by the superflous water flowing from the Warwick-Napton Canal down a fall of 27 feet, and thence into the River Avon. Through the efficiency of the turn-wheel, the mill was capable of grinding and dressing bread flour of 300 bushels and more a day - almost equivalent to the weekly turnover of Smart's corn mill. Nunn, Brown and Freeman's lace manufactory, producing Bobbin, Mechlin and Valenciennes, appeared in 1810, followed by Kench and Cattell's Emscote mill in 1828 and finally George Nelson, Dale and Company's Emscote mills in 1837 as timber merchants and gelatine manufacturers[30]. Each one had wharves or canalside landings (Fig. 30.3) for receiving coal and raw materials like corn and timber, and sending off the finished products. Further impact of the canal in Emscote is expressed in local place names like Wharf Road, Navigation Bridge and Navigation Mill.

The third and final suburb to benefit from the canal was north of Priory Pool (Fig. 30.1). Development started at the Cape where the meadow lands between Old Park Lane and the Warwick-Napton Canal were replaced by the brick and tile yards of William Betts, and John Green and the canalside inn "Cape of Good Hope" by 1851. The contribution of the Warwick Canals to the economic development of Warwick during the last decade of the eighteenth century and early half of the nineteenth century was very considerable. They gave impetus to industrial development, hitherto unknown in Warwick, reinforced by the Great Western Railway in 1860. The rapid expansion of its population is evidence of Warwick's growth during this period. There was a steady rise from 5,692 in 1801 to 6,497 in 1811[31], and by 1851 the population had doubled with 10,973 inhabitants.

---

(30) White, F. and Co., op.cit., p.540. Vide Pigot & Company National Commercial Directory for Staffordshire, Warwickshire and Worcestershire, (1828-9), p.840, London.

(31) H.M.S.O. (1811). Population of England and Wales, 1812, ii, p.83, London.

Storage and Wharfage. Location of Wharves

The need for facilities for collecting and distributing incoming and outgoing commodities led to the development of wharves which reflect the economic activities of the canals. In 1841 there were 582 wharfingers, warehousemen and women in Warwickshire[32]. According to Bradshaw[33] there were 193 wharves in Warwickshire in 1904 (Fig. 31). This is an under-estimate, for the Royal Commission on Canals and Waterways[34] named 60 wharves on the Warwick-Birmingham Canal alone and 49 on the Warwick-Napton Canal as against the 42 and 28 respectively, mentioned by Bradshaw. Many interesting points come to light through the study of Fig. 31. A wharf was developed wherever there was a break in transportation. The most notable location points were at the junction of roads and canals where the roads acted as feeders to canals, as already explained in the previous chapter. Canals thus located bear names like Saltley Road Bridge Wharf, Bulkington Lane Wharf, Stockfield Road, Yardley Road, and Lincoln Road Wharves. Where the canals were connected by tramways, as in the Warwickshire Coalfield and Wilmcote quarries, the wharves were conveniently sited at such junctions. Bradshaw's reference shows that most of the wharves were so located, suggesting considerable involvement of horsedrawn waggons and tramway in canal transportation.

The junction of one canal with another affords a good site for wharves. As can be seen from Fig. 31, there are wharves at all the canal junctions. These include the collateral branches like

---

(32) H.M.S.O. Census of England, Wales and Scotland, 1841, Vol. 3. Occupation Abstract, Parts I-II, 1844, pp.192-9, London.

(33) de Salis, H. R. (1833). Bradshaw, Canals and Rivers of England and Wales. (1904), p.95 et seq., E. Ruff, London.

(34) H.M.S.O. Royal Commission on Canals and Waterways, 1911, Vol. 10, Statistical Survey, pp. 84-6, London.

LOCATION OF WHARVES IN WARWICKSHIRE 1904

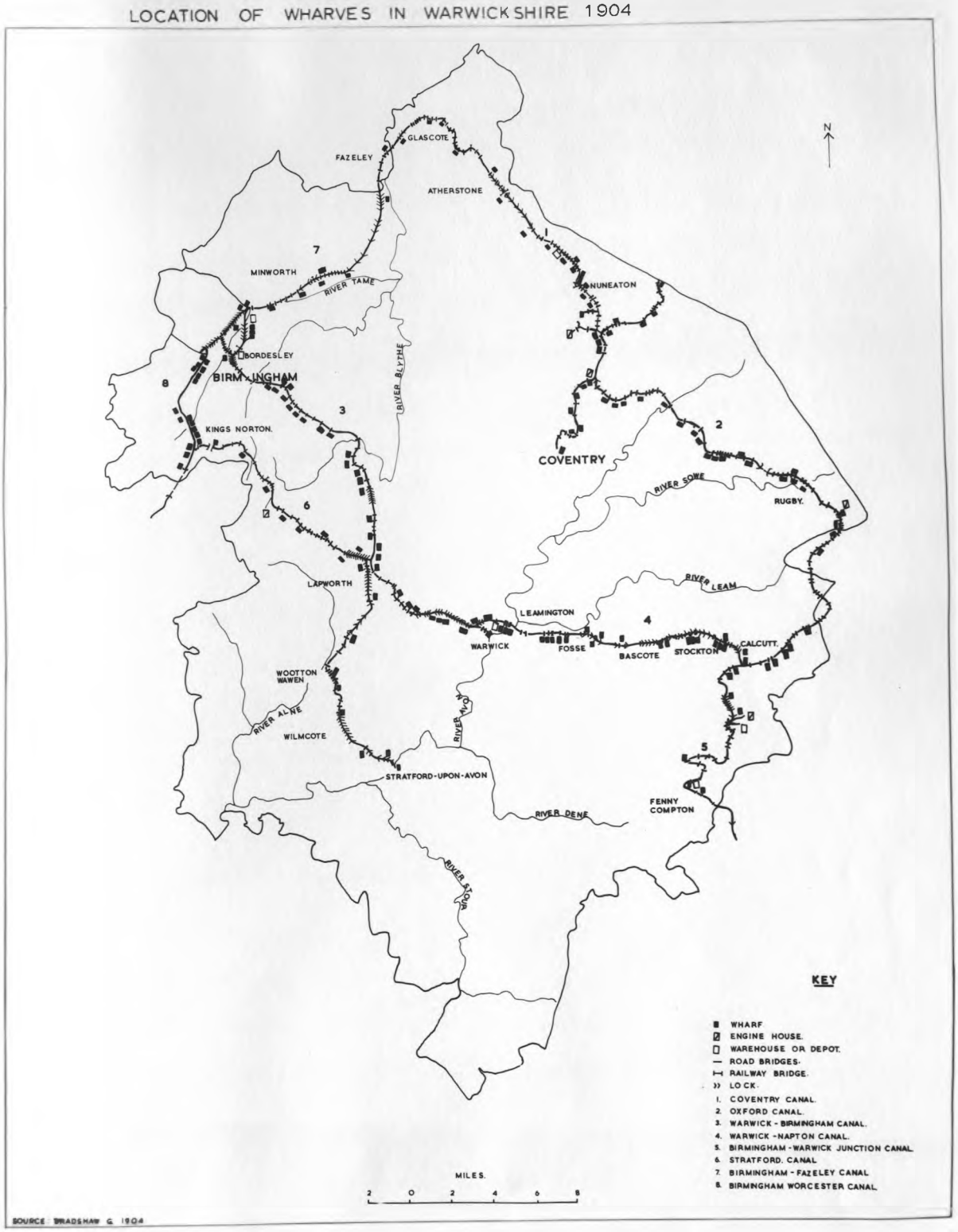


FIG.31

the Griff Arm, the Coventry Communication Canal and the Kaye's Arm. Wharves permitted interchange of goods from one canal to another and from one carrier to another. Hawkesbury, a major junction between the Coventry and Oxford Canals, provides a very good example of this. The junction was originally at Longford in 1777, whence the Oxford Canal ran parallel to the Coventry Canal for a mile. In 1785 a more sensible connection was made at Hawkesbury. Before this time Hawkesbury was meadowland belonging to William Smart[35]. By 1828 an extensive wharf had developed (Fig. 32.1). Gradually a small settlement grew up with a public house, a shop and a few cottages lining the canal wharf. The initial junction, with its characteristic features illustrated in Fig. 32.1, contrasts with the junction of the Grand Junction and Oxford Canals at Braunston (Fig. 32.2) whose personality had fully emerged by 1828. It seems further expansion of wharf facilities did not take place till after 1851[36]. By 1886 there emerged a mature junction comparable to the Oxford Junction at Braunston (Fig. 32.3) though Hawkesbury had no warehousing. There was, however, a nineteenth century pumping house with a Newcomen pumping engine (1711), which was used to maintain the water level in the canal. Few wharves could be found near lock cottages which were not accessible by road. Boats docked here to unload coal for the domestic use of the lock-keeper. Pumping stations and engine houses possessed wharves for receiving coal for heating, as did Gas Works. The development of the Gas Industry dates from about 1820, and contemporary directories show that most of the Gas Works were established between 1820 and 1841. That of Coventry was completed in 1821,

---

(35) C.R.O. Inclosure map of Foleshill Parish, 1775, Q S/75.

(36) Vide Ordnance Survey, 1/63,360, (1834) and 1/1250, (1851).

PLAN OF HAWKESBURY AND BRAUNSTON JUNCTIONS 1828

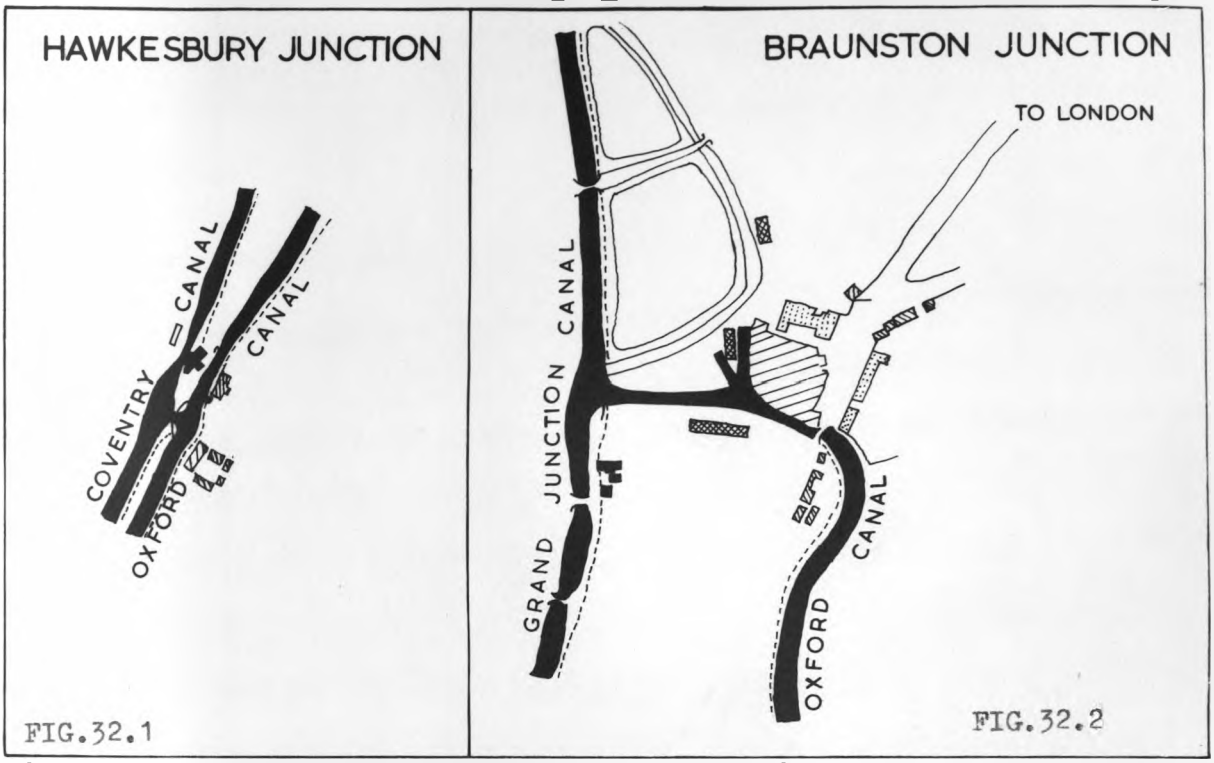


FIG.32.1 FIG.32.2

Source: Plan of the Intended Improvement on the Oxford Canal 1828 CRO CR 1365

PLAN OF HAWKESBURY JUNCTION 1886

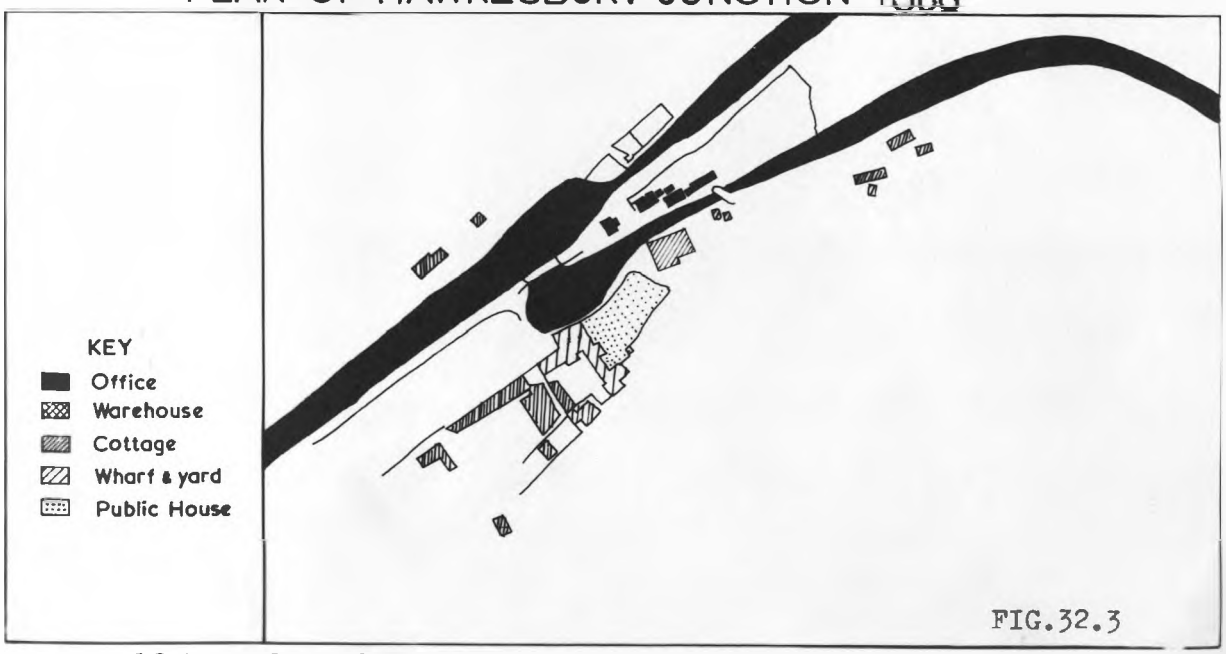


FIG.32.3

Source: 6" Ordnance Survey 1886 17 S.W.

Warwick 1822, Nuneaton 1836, Stratford and Rugby in 1838[37] and Atherstone in 1841. These Gas works were built to carbonise coal and produce gas and coke[38] hence their invariable location by the canal, (Figs. 28, 30.2) which was used extensively to bring in the coal required and for removal of coke, tar for proofing fences and other by-products.

Warwick

The greatest activities of wharfage were concentrated on the extensive wharves located at the basins, where facilities like weighing machines and cranes also existed for the handling, loading and unloading of goods. Reference has already been made to the industrial development in Warwick; with these industries came three large extensive and multi-purpose wharves in Emscote and no less than twenty in the Saltisford[39]. There were also extensive timber yards for the boat building industry of Joseph Monks and Thomas Sanders[40] and yards for slate, and lime from Derbyshire for the brick and tile works of Emscote.

The most remarkable wharf ever developed in Emscote was that of the Gelatine manufactory of Nelson, Dale and Company (Fig. 30.3) for unloading the hides, and for loading the gelatine. This manufactory, comprising over thirty acres, was established by George Nelson and John Dale along the Warwick-Napton Canal in 1842. The firm was founded as far back as 1837 at Rock Mills at Leamington Spa, where it secured a patent[41] for the manufacture of gelatine in 1838. Since this time

---

(37) White, F. & Co., op.cit., pp.166, 797. 494.
(38) Personal correspondence from the West Midlands Gas Board, 1971.
(39) Pigot & Co. (1828-9), op.cit., p.840.
(40) Pigot & Co. (1828-9), op.cit., p.839.
(41) Barnard, A. (1899). Round about Warwick with a peep into the Gelatine Factories at Emscote Mills, p.32. George Nelson, Dale & Co. Ltd., Wariwick and London.

the business had prospered considerably, and by 1842 reached such dimensions that it became absolutely necessary to remove to large premises. It was at this stage that George Nelson acquired the Emscote Mills to which the manufactory was moved in 1842. He definitely had in mind the advantage of the Warwick-Napton Canal in transportation of the finished products as well as for the receiving of the hides; for the manufactory was bound in its entire length by the canal. Being on the main and direct canal route from Birmingham to London it was convenient to obtain its raw materials the source of which was hides, calves' feet, and various tissues of animals. Though local supplies of hides and bones were used, buffalo hides, measuring about 10' x 9', were the main raw material for the manufacture of the gelatine. Thousands of buffalo hides were shipped from Singapore to London, whence they were transhipped by canal to Emscote[42]. Several barges and fly boats brought the hides to the capacious canalside warehouses where large stacks[43] of the hides, from twenty-five to thirty feet square and containing about ninety to a hundred tons, were assembled. Besides the canalside warehouses, there was another large store, holding upwards of £12,000 worth of skins. The diverse products manufactured by the company were sent to markets not only in Warwickshire, but all over Britain and overseas as well[44]. The Warwick-Napton Canal played a substantial role in the transport of such products before the opening of the Leamington branch of the Great Western Railway in 1860.

---

(42) C.R.O. Nelson and Dale Co. Ltd., Letter Book, 1882, CR 1294; Vide Barnard, A. op.cit., p.30 et seq.

(43) Barnard, A. op.cit., p.30.

(44) C.R.O. Nelson and Dale Co. Ltd., Ledger Book, CR 1294, 1838-1870. passim.

Though there is no specification about the proportion of the products transported by canal on the one hand and by road and rail on the other, it appears the road was used for small individual orders most of which were delivered by parcel posts[45]. Large orders for photographic gelatine from the United States, especially from Philadelphia and New York[46], from Paris (France)[47], Ghent (Belgium)[48] and Brisbane (Australia)[49] were conveyed by the Warwick-Napton and Grand Junction Canals to London whence they were transhipped to their respective markets.

Stratford-upon-Avon

In Stratford similar developments took place with six coal wharves (1850) according to Slater[50] (Pigot, in fact, names eight coal merchants). Because Stratford was a major distribution centre for Staffordshire coal, one might well have expected a larger number of coal wharves. Indeed there was a strong evidence for this since White lists fourteen coal merchants in 1850[51], while Kelly's list mentions twenty-two (1886). In addition to coal wharves, corn, lime and timber

---

(45) Letter Book, CR 1294, pp.20-4, 31-9, 53-9.

(46) Letter Book, op.cit., p.55.

(47) Ibid., p.16.

(48) Ibid., pp. 21, 23.

(49) Ibid., pp. 49, 59.

(50) Slater's National Commercial Directory (1850). Isaac Slater, Manchester. Such conflicting statements can be largely attributed to the nature and method of compilation of directories and to partisan subscription. The directories tend to be inaccurate due to the method of collecting information, and misleading because only the more substantial tradesmen and professional classes are included.

(51) White, F., & Co. (1850), op.cit., p.805.

wharves were also in operation. The wharves expanded towards the Bancroft (33, 33.2) and One Elm (33.1) where a semi-industrial colony sprang up along the short canal arm built parallel to the Birmingham Road. Brick and lime works came into being in 1822 (using Rhaetic Lias Limestone from Wilmcote) followed by Greaves limekilns in 1832, the Gas Works in 1834, a brewery[52] and a large tannery taking advantage of local hides. Expansion of wharves in Stratford was prominent due to its importance as a converging point between the canal, the Avon Navigation and the Stratford, Moreton and Shipston-on-Stour tramroad. In 1845, Richard Greaves testifying to the Select Committee of the House of Commons on the Oxford Worcester Wolverhampton Railway Bill, claimed that 48,000 to 50,000 tons of coal a year was brought to Stratford, 15,000 went down the Stratford-Moreton tramway and about 8,000 went down the Avon to Evesham[53].

The Bancroft was then a scene of considerable activities. Most of the wharves were leased from the Stratford-upon-Avon Canal Company to interested merchants at an average cost of £15 per annum with a term ranging between 21 and 50 years[54]. Table 3 gives details of six lessees of wharves at the Bancroft from 1828 to 1878. Four out of the six lessees held for a term of thirty-five years. The length of lease may well reflect the economic prosperity of the lessees though it may have been related to the person's age and expectation of life. The longest lease of 50 years was held by Richard Greaves, an industrialist in Stratford, who owned brick and lime works in Stratford and needed a wharf

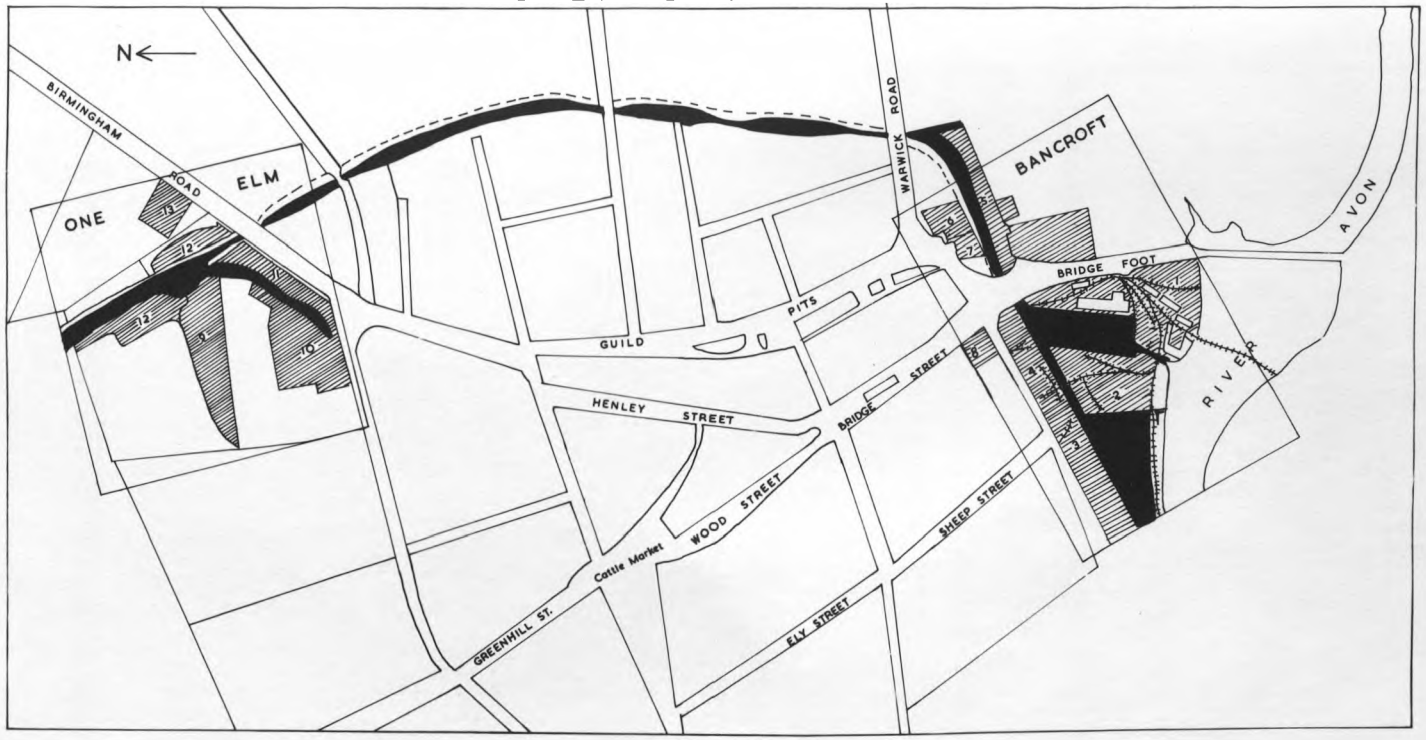
---

(52) V.C.H., 3, op.cit., p.243; vide Bowen A. C. (1949). The Growth of Stratford, unpublished B.A. thesis, no. 107, p.39. Geography Dept., Birmingham University.

(53) Shakespeare's Birthplace Library, Miscellaneous Collection on the Stratford Canal. ER 37/1, no. 105.

(54) Shakespeare's Birthplace Library, Miscellaneous Collection on the Stratford Canal. ER 37/1, no. 109.

WHARF AND FACTORY DEVELOPMENT IN STRATFORD UPON AVON 1851



BANCROFT

1. TIMBER YARD
2. COAL WHARF
3. " "
4. " "
5. COAL, SLATE, TIMBER WHARF
6. RED LION INN
7. SMITHY
8. ANCHOR INN

ONE ELM

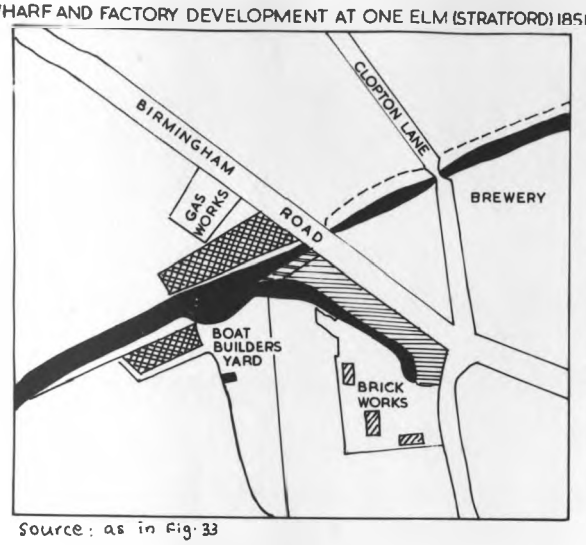
9. BOAT BUILDING YARD
10. BRICK YARD
11. ONE ELM WHARF
12. LIME AND STONE WORKS
13. GAS WORKS

SOURCE: ORDNANCE SURVEY $\frac{1}{1250}$ 1851

IN FEET
0 500 1000

FIG.33

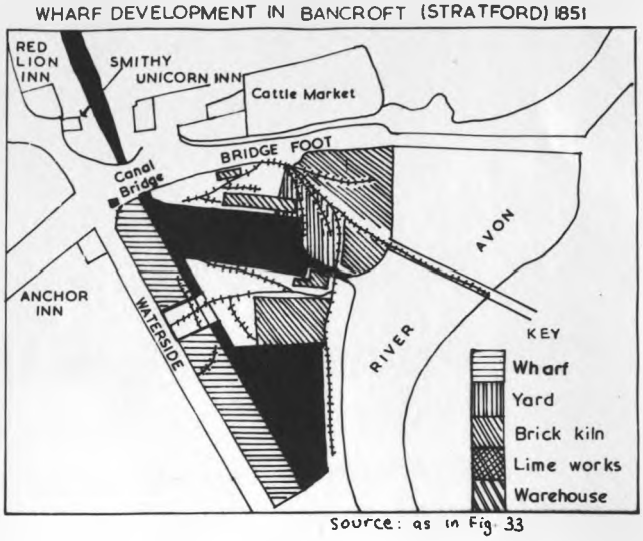
WHARF AND FACTORY DEVELOPMENT AT ONE ELM (STRATFORD) 1851



Source: as in Fig. 33

FIG.33.1

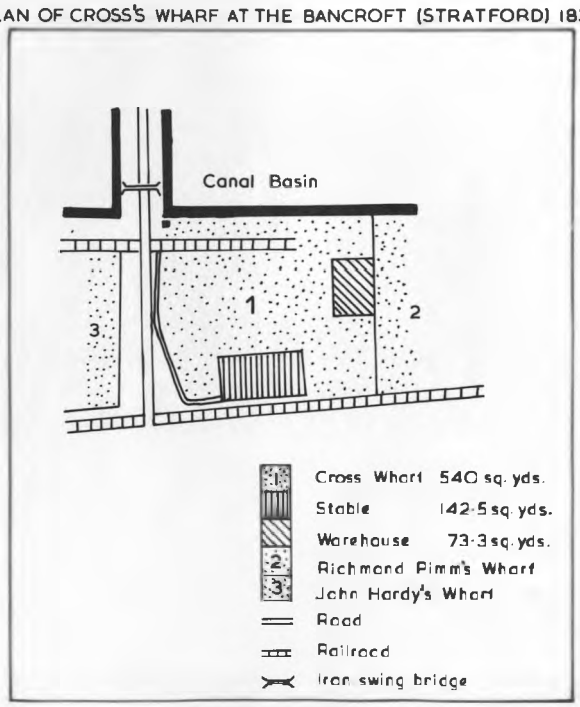
WHARF DEVELOPMENT IN BANCROFT (STRATFORD) 1851



Source: as in Fig. 33

FIG.33.2

PLAN OF CROSS'S WHARF AT THE BANCROFT (STRATFORD) 1835



Source: Shakespeare's Birthplace Library

FIG.33.3

TABLE 3

LESSEES OF WHARVES IN THE BANCROFT, STRATFORD-UPON-AVON CANAL BASIN

Name	Commencement of Lease	Term	End of Lease	Rent per annum £. s. d.
Richard Greaves	29 September 1828	50 years	29 September 1878	24.10.0.
Thomas Hutchings	29 September 1831	35 years	29 September 1866	5. 0.0.
Brooke Evans	29 September 1833	35 years	29 September 1868	12.10.0.
Benjamin Baylis	25 March 1836	35 years	25 March 1865	20. 0.0.
Charles Pratt	25 March 1837	21 years	25 March 1858	20. 0.0.
John Hardy	25 March 1828	35 years	25 March 1863	20. 0.0.

Source: Shakespeare's Birthplace Library ER37/1, no.109.

for receiving coal from the Black Country for the burning of lime and for loading the lime and brick. The rent paid depended on the extent of the wharf used by the lessee. A picture of the layout of a typical canal wharf at the Bancroft is given by Fig. 33.3, showing Thomas Cross' wharf. On the north-east of this wharf was a road leading to other wharves; on the south-east was the canal basin. Richmond's wharf was to the south-west and the Common Town Street on the north-west. The wharf occupied 540 square yards and to the south was a one-storey warehouse covered with slates measuring 20' by 11'. The west was occupied by a loft and a two-storey stable with an area of 28.5' by 15'. Though Slater, Pigot[55], West and White did not make mention of Thomas Cross there is evidence that he was a wharfinger at Bancroft between 1835 and 1870[56].

A rather impressive intermediary basin could be seen at Atherstone (Photo 10) established by Minion, one of the distinguished corn dealers in Atherstone, in the early nineteenth century. The extensive basin (Fig. 34), serving his corn mill, was well equipped with weighing and wharfage facilities. On the waterside, just opposite the basin were lime-kilns (using Lower Lias Limestone from Wilmcote) and a timber yard. To the west of the canal was the Gas Works established in 1841.

The wharves, particularly those of the Canal Companies and Carrying firms, were very busy indeed. A penny magazine[57] describes scenes at the wharves of Pickford and Fellows, Clayton and Morton Companies

---

(55) Vide reference 50 for shortcomings of directories.

(56) Shakespeare's Birthplace. op.cit.no. 109.

(57) B.T.H.R. PIC 4/1, The Penny Magazine, August 20, 1842, p.37.

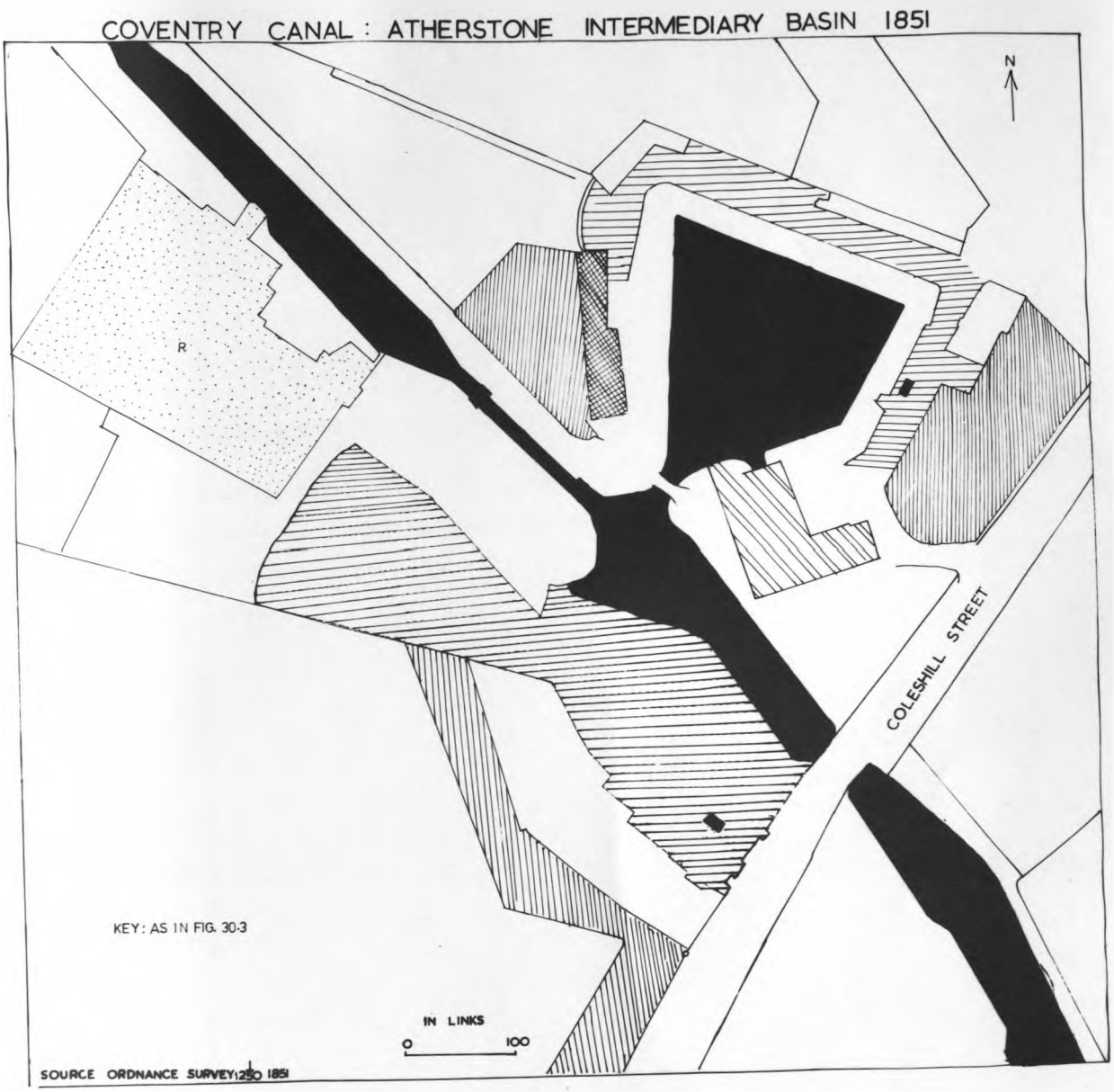

COVENTRY CANAL : ATHERSTONE INTERMEDIARY BASIN 1851
N
R
COLESHILL STREET
KEY: AS IN FIG. 30-3
IN LINKS
0
100
SOURCE ORDNANCE SURVEY 1:2500 1851

FIG.34.

in London and Birmingham respectively. Generally merchandize received at the wharves was dispatched by boat the same night, though incoming cargoes were sometimes stored in warehouses until called for. Photo 11 shows the warehouse of the Oxford Canal in Marston Doles erected in 1865 and Photo 12 the extensive one of the Coventry Canal basin at Leicester Row in Coventry. When a boat arrived at the basins it was drawn up to the side of the warehouse[58] and a crane then speedily removed the cargo. Each one was weighed, compared with the invoice and placed in one or other of several separate groups which were then laden, each one with packages consigned to one particular district. The waggons were then dispatched while the boats waited till the return cargo was ready. This is more characteristic of the big organised canal carrying concerns like Pickford and Company Ltd., or Fellows, Clayton and Morton Ltd. "The Number Ones" (usually individual canal boatowners operating the boats with help of their family) were less organized and carried mostly coal to Banbury and Oxford, generally with simple boats pulled by a horse or mule[59].

Distribution of Wharves

Wharf distribution was determined by the availability of traffic and by the need for facilities to receive goods conveyed by the canal. Though no definite pattern can be established it is clear that wherever traffic-generating centres occurred in close succession the distribution of wharves followed a similar pattern. Thus, the distance between one wharf and the next varied considerably. It ranged

---

(58) Ibid. p.37.

(59) Wilson, R. J. (1972). The Number Ones, p. 3, Robert Wilson, London.

Plate 11: THE OXFORD CANAL COMPANY'S WAREHOUSE IN MARSTON DOLES. This building, bearing an inscription of 1865, shows the plain design of canal architecture.

Plate 12: THE COVENTRY CANAL COMPANY'S WAREHOUSE AT LEICESTER ROW BASIN, COVENTRY. The small regular windows at a high level guarded unauthorized entry.

from a hundred yards to about two miles or more. The Birmingham-Warwick Junction Canal from Salford to Bordesley was strung by works and their associated wharves. Similarly, the whole length of the Warwick-Birmingham Canal from Digbeth Junction to Sampson Road was flanked by works and wharves. The distance between the Arms Factory and Horsefall's Hay Mills wharves was nine hundred and sixty yards but that between the latter and Whitfields was as little as ninety yards. There was no defined distance between wharves, but they were closer together where generating centres occurred in close proximity or where there was a break in transportation. In some cases the distance was negligible with two or more wharves located very close together as in the case of the Sanitary Authority, the Warwick-Birmingham Public and Boston wharves, all located in a chain in Yardley. On the Stratford Canal the interval was greater, in some cases even exceeding a mile. To give a few examples, the wharves at the Kingswood Junction were about a mile from the wharves at Dick's Lane wharf and a similar distance separated the Wharf Inn (Hockley Heath) and the Boat House (Lapworth). The greater intervals on the Stratford Canal can be attributed to the existence of fewer traffic generating points like primary or manufacturing industries. The Coventry Canal also contrasts with the Stratford Canal because of the very great concentration of wharves connected with the North-East Warwickshire coalfield and its associated quarries. Indeed, the wharves of the Midland, Nuneaton, and Judkins quarries were all located very close together because the quarries occurred together.

The influence of settlements on wharves cannot be over-emphasized. The demand for domestic coal made it necessary for wharves to develop in most of the settlements through which the canals passed.

Most of such wharves bore the name of roads at which junction they were located, or the names of the settlement like Tyseley, Yardley, Stockfield, Olton, Catherine-de-Barnes and Knowle wharves. Along the Warwick-Napton Canal the frequency of the wharves depended on the size and demand of the settlement concerned. For example, Warwick's suburbs of the Cape and Emscote together boast of not less than fifteen wharves due to the semi-industrial colony located along the canal. In the village of Stockton there were sixteen wharves due to the influence of the Blue Lias Limestone works and quarries, whereas Leamington had twelve serving the Gas Works, mills, foundries and Gulliman's works[60], while Fosse and Bascote had a wharf each.

Ownership

Ownership of wharves varied widely and can be classified into three categories. There were private wharves built by firms like those of the Blue Lias Lime and Cement Works, (Stockton and Long Itchington) which also possessed extensive basins for loading and unloading their raw materials and products. However, occasionally unloading was done from a warehouse built along the canal. On the Warwick Birmingham Canal 33%[61] of the wharves were private serving works or manufactories such as the Corporation of Birmingham at Montague Street, rolling mills, and foundries producing castings of all kinds including plates, sheets, bars and rods. No less than 75%[62] of the wharves on the Warwick-Napton Canal were privately owned because of the numerous limeworks, mills and the brewery at Emscote and Leamington,

---

(60) H.M.S.O. (1910). Royal Commission on Canals and Waterways, Vol. 9, p.184, London.

(61) Ibid. p. 184.

(62) Ibid. p. 184.

not to mention the important limeworks at Stockton and Long Itchington. The greater the number of industries the greater the number of private wharves. Occasionally wharves were built jointly by the Canal Company and the landowners, though sometimes landowners could erect wharves exclusively as stipulated by Acts of Parliament. Wharves built by such joint efforts were considered semi-public and could be used by the public as well as the landowner. These wharves formed the smallest proportion, for on the Warwick-Napton Canal only 6% were semi-public. These were not necessarily situated by works, but at the junction of roads and canals suggesting that the landowners were not necessarily manufacturers but their lands were conveniently placed for a wharf.

Finally, there were the public wharves built by the canal companies at the commencement, intermediate and terminal basins with cranes, weighing facilities and warehouses for the use of bye-traders on payment of fees. 42% of wharves on the Warwick-Birmingham Canal were public, but on the Warwick-Napton Canal it was only 19%. Included in this group were wharves owned by the big carrying firms. Though it is difficult to distinguish between the share of these firms it is very likely that they owned wharves along each canal. Though the Canal Companies provided the public wharves they owned very few. The Coventry Canal Company owned five wharves situated at Coventry, Stoke Heath, Longford, Nuneaton, Atherstone and Whittington[63], all of which were opened for the use of traders, except the one at Longford which was let to a tenant. Wharfage charges, unlike toll charges were

---

(63) B.T.H.R., "Coventry Canal", Railway and Canal Traffic Act, 1888, MTI/22.

not credited. All traders accounts and tonnage receipts[64] show that all settlements were made by ready cash. Charges at the public wharves depended on two factors - the type of commodity and the canal on which the goods were loaded or unloaded. On the Coventry Canal, for example, there was an all-round charge of 3d. per ton on all articles which remained on the wharf for more than 24 hours, but no charge was made for the use of the cranes[65], and wharfage on gas-tar, and bricks was free. The Stratford Canal Company did not have any fixed rates but claimed reasonable compensation for goods remaining on a wharf for more than twenty-four hours[66]. On the other hand, the Oxford Canal had a range of charges for different types of goods depending on their weight. Wharfage and warehousing of coal, metals and other goods cost 2d. per ton, and so were parcels weighing less than 56 lbs., but parcels weighing over 600 lbs. cost 4d. per ton and those over 1,000 lbs. 6d. per ton[67]. If any of these goods remained for more than 24 hours ½d. per ton more was paid for wharfage and, 2d. per ton for warehousing for the first seven days and the same sums respectively for every further seven days. On the Warwick-Birmingham Junction Canal no landing charges were made by the Company in fulfilment of the agreement made by Lord Norton[68] of Bordesley, the owner of the land.

---

(64) B.T.H.R., Coventry Canal Ledger, 1803-7, CVC 4/97.

(65) B.T.H.R., MT1/22. op.cit. Vide "Coventry Canal Act", 8 Geo. 3, C36, 1767, Midland District Canal Acts, i, p. 218-221.

(66) "Stratford Canal Act", 33 Geo. 3, C.112, 1793, Midland District Canals Acts, iii, p.134.

(67) Oxford Canal Act, 9 Geo. 3, C.70, 1768, Midland District Canal Acts, i, pp. 409-412.

(68) B.T.H.R., "Warwick-Birmingham Junction Canal", Railway and Canal Traffic Acts, 1888, MT1/22.

Transformation of the contemporary landscape of Warwickshire by the canals was prominent in all the areas through which they passed, but the change was most remarkable in the suburban areas of Warwick and Stratford where industries were stimulated and attracted owing to the easy and convenient means of transport afforded by the canals, and in the Lime and Blue Lias Cement Works of Stockton and Long Itchington. Of more interest still were the wharves developed on the canal routes and the basins, which reflected the economic activities of the canals.

CHAPTER FOUR

CULTURAL EFFECTS OF THE WARWICKSHIRE CANALS

As an important secondary effect of canal development in Warwickshire, cottages, stables and bridges were constructed for the maintenance of the canal and organisation of traffic. Canalside inns were also built as social rendezvous for the Canal Company staff and particularly the canal boatmen and their families. The object of this chapter is to consider such cultural effects on Warwickshire. The tremendous impact of these was reflected in the architecture of works and other buildings associated with the canals. The canals thus exemplify functionalist tradition: they were built at a time when new engineering techniques aroused enough enthusiasm for pure structure to be accepted without self conscious adornment while paucity of finance and limited skills of the canal engineers contributed to the simplicity of canal architecture. Such functionalism could be seen wherever a canal made its appearance. Warehouses and depots with plain designs and windows regularly balanced (Photos 11, 12, 13) as well as engine or beam houses (such as those at Hawkesbury, Earlswood (Photo 14) and Saltley erected to pump water from a steam engine into the canal) show the functionalism of canal architecture. Even more widespread were lock- and toll-keepers' cottages, and bridges.

Plate 13: THE BEAM ENGINE HOUSE AT EARLSWOOD. Constructed about 1799 to pump water from the Earlswood Lakes into the Stratford Canal, this building reflects the simple functional design.

Plate 14: THE COVENTRY CANAL DEPOT AT HARTSHILL. This building with a clock turret of 1842, shows characteristic canal architecture.

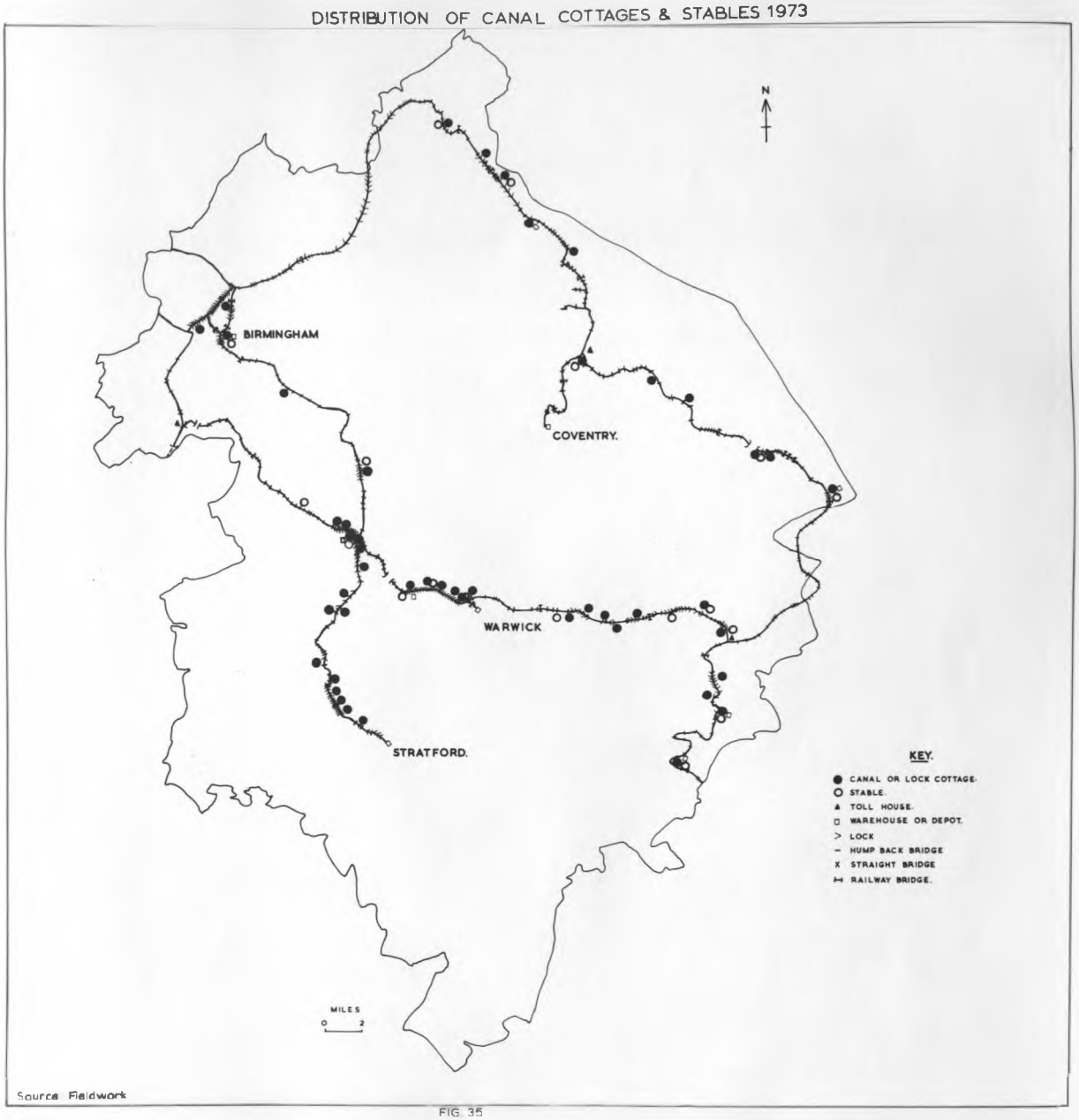
Lock and Toll Cottages

The influence of physical features, particularly the problem of overcoming high relief which led to construction of locks, has been fully illustrated in Chapter One. The operation and maintenance of the locks and towpaths, required that cottages for the lock or lengthsmen be provided. The lock-keeper ensured that the boatmen observed the bye-laws and did not damage gates or structures. Sometimes he was engaged in toll collecting and traffic loading near the locks. To be near his work, each lock-keeper was allocated a cottage adjoining the locks for which he was responsible as Fig. 35 shows. Photo 15, the Hatton top lock cottage (now the Water View Cottage)[1] was responsible for the five locks from Hatton top lock to bridge number 54. The toll-collector used to collect tolls from an office attached to the cottage, (Photo 15). A personal survey shows that the two-storey cottage boasts six rather small rooms comprising three bedrooms on the top floor (12' x 10', 8' x 10' and 7' x 10') a kitchen (12' x 8') a backroom (12' x 8') and a front room (the most roomy, measuring 24' x 14'). There were four fire places, two on each floor. Like other canal cottages it had a cellar, extending halfway under the cottage, used for storing coal. The out-building is shown in Photo 15: night soil was disposed of by burying it in the garden thus acting as a fertiliser. The cottage lacked a bathroom, water supply was poorer still. Unlike cottages in Warwick which had wells sunk into the lenses of Arden Sandstone in the Keuper Marl formations this cottage had no well, but a tank for catching rain water.

---

(1) Thanks are due to the Browns who kindly allowed me access to their home for observation.

DISTRIBUTION OF CANAL COTTAGES & STABLES 1973



Source Fieldwork

FIG. 35

Plate 15: LOCK COTTAGE AT HATTON TOP LOCK (BIRMINGHAM-WARWICK CANAL). The lock-keeper originally collected tolls from the office adjoining the cottage on the right and now converted into a living room. At the rear of the cottage is the detached toilet.

Plate 16: LOCK COTTAGE AT BASCOTE (WARWICK-NAPTON CANAL). This is still occupied by a "lengthman" responsible for maintaining the towpath and hedges bordering the canal.

The number of locks on a canal determined the number of canal cottages. For example, the Stratford-upon-Avon Canal had fifteen lock-cottages associated with its fifty-six locks, the Warwick-Birmingham Canal had nine with thirty-three locks and the Coventry Canal with thirteen locks. Fig. 35, based on personal survey, illustrates this - the "contour" Oxford and Coventry Canals had fewer lock-cottages because of the minimal need for locks. Occasionally a lockkeeper might be in charge of only one lock where the lock occurred in isolation as the 'Odd' lock at Edstone (Stratford Canal), the Napton bottom lock and the Bascote lock (Photo 16), (Warwick-Napton Canal). Where there were flights of locks, the lock-keeper was assigned a number of locks as at Hatton where there were five lock-keepers to twenty-one locks. The Wilmcote flight of locks consisted of eleven locks in three groups - three, five and three. The bottom and top cottages were allocated three locks, and the rest to the middle cottage. It was not unusual to find cottages in the absence of locks. Such cottages - labourers' or lengthsmen cottages as they were called - were more common on the Oxford and Coventry Canals. Where there were fewer lock-keepers, more labourers were needed to maintain the canal towpath, fences and hedges. There were lengthsmen or labourers' cottages at Hartshill, Polesworth and on the Coventry Canal (Fig. 35 and also Photo 17).

The cottages were very simply designed and strongly functional. The forty-three[2] cottages in the county can be divided into three major groups. There was the simple one storey cottage found on all the canals.

---

(2) This number represents the actual number including those that have fallen into ruins.

Plate 17: LENGTHMAN'S COTTAGE AT HARTSHILL (COVENTRY CANAL). Note the arch at the bottom of the cottage making room for the stern of the long narrow boats which were maintained in the dry dock located very close to the cottage. The hump-back bridge has a gradient of one in thirteen on the road approaches.

Secondly, there were two-storied double cottages, i.e. cottages put side by side for the use of the lock-keeper and the toll-keeper, or the wharfinger as in Atherstone and Marston Doles (Photos 18, 19). The most interesting architecturally among the canal cottages were the five with barrel vaulted roofs[3] on the southern section of the Stratford-upon-Avon Canal (Photo 20). The design, characteristic of this canal, is not difficult to explain. To economise on funds the engineer, Josiah Clowes, designed very simple cottages combining a degree of "durability with economy[4]; in consequence the techniques employed really reflect those of a canal engineer. The builders had no difficulty in putting up four brick walls, for bricklaying was an integral part of canal construction. But the provision of a roof posed a problem! To the engineers 'roof' meant only one thing - the curved brick construction that they employed for tunnels and bridges. Thus they built the four walls to roof height to enclose an area 14' x 35', and laid iron bars along the top of the brick-work, joined at the corners to make a flat rectangular frame strengthened by cross-bars. The brick-work was continued, curving it upwards and over to form a roof. Consequently, these cottages looked very much like tunnels above ground, and constitute an original and unique feature of the rural landscape between Lapworth and Preston Bagot.

In charge of tolls were the toll-keepers who held a higher status than lock-keepers and lengthsmen as is reflected in their two-storey cottages, usually sited at the junction of two canals.

---

(3) I am grateful to the Wagstaffes for kindly taking me round their barrel-vaulted roof cottage at Preston Bagot.

(4) C.R.O., Report of the Engineer on the Stratford Canal Navigation, undated. HR 83/49.

Plate 18: A TWO-STORIED DOUBLE COTTAGE AT ATHERSTONE. This housed the lock - and toll-keepers. To the right is the toll office.

Plate 19: A DOUBLE COTTAGE AT MARSTON DOLES. This housed a lock-keeper and a wharfinger.

Plate 20: A BARREL-VAULTED ROOF COTTAGE AT DICKEN'S LANE. (Stratford-upon-Avon Canal). This interesting architectural form was based on tunnel design and effectively combined durability with economy. The tiled section was added later.

Plate 21: TOLL-KEEPER'S COTTAGE AT THE JUNCTION OF THE STRATFORD AND THE WORCESTER-BIRMINGHAM CANALS. A distinctive "canal style" is revealed in the gaunt brick cottages, slate roofs and long rectangular windows shown in Plates 19, 21, 22.

Such cottages were built at Hawkesbury (Coventry and Oxford Canals junction), Napton and King's Norton (Fig. 35, Photo 21). These cottages were invariably two-storied with a modified Georgian architecture and formed a deliberate stopping place where tolls were charged on cargoes. Cargoes were charged by the tons carried per mile, and maximum tools for various classes of goods were specified in all the Canal Companies' Acts[5]. On the Oxford Canal, for example, coal was rated at 1d. per ton per mile and all other goods at 1½d. per ton per mile[6]. But specified portions of the route such as tunnels, bottlenecks and other places where traffic was exceptionally heavy, counted as longer than the true distances because of slow and difficult progress. The same was true of places where there were a great many locks. At some locks, especially large ones which had to be worked by a lock-keeper, (usually the boatmen worked the locks themselves) a specific charge was made for going through. Certain classes of traffic, such as stone, sand and gravel for road works, were exempted from tolls provided they did not pass through any locks. Similar concessions applied to all fertilizers moved by arable farmers whose land had been taken for canal construction[7]. Occasionally controversy arose concerning payment of toll, as in the case of the Hereford Militia whose baggage was transported from Braunston to Longford on the Oxford Canal in 1798[8]. The troops claimed that they were exempted from tolls and refused any payment of over £39[9], though the Oxford Canal Act[10] did not contain a clause to that effect.

---

(5) See, for example, Coventry Canal, 8 Geo. 3, c.36, 1767 in Canal Acts Midland District, Vol. I, p.218.
(6) Oxford Canal Act, 9 Geo. 3, c.70, 1768 in Canal Acts Midland District, Vol. I, pp. 409-412.
(7) Oxford Canal Act, 1768, op.cit.; Warwick-Napton Canal Act, 1794, op.cit.
(8) B.T.H.R., "A letter in regard to the payment for tonnage on baggage of troops passing over the Oxford Canal", 11/7/1798, Oxford Canal Company Guard Book, OXC 4/110.
(9) B.T.H.R. A letter dated 27/9/1798, op.cit. This large sum covered the toll of the entire luggage of the Hereford Militia over a distance of 91 miles.
(10) Oxford Canal Act, 1768, op.cit.

Stables

Any account of organisation of canal traffic would be incomplete if it did not mention the horses, which laboured day and night to keep the boats moving. Arrangements for the shelter of the horses were particularly important, for at night they were left in stables set at regular intervals along the canal, generally two or three hours apart[11]. The stables were provided for the use of boatmen by the Canal Companies or by private carrying firms such as Pickford and Company Limited. The stables were normally of very simple and plain construction most of them being one storey buildings with compartments for horses. Most public stables[12], provided by the Canal Companies, were attached to lock-cottages (Fig. 35). There are examples on the Coventry Canal at Hawkesbury, Chilvers Coton, Atherstone and Polesworth, and on the Oxford Canal at Newbold and Rugby. As these stables were located by lock-cottages, the lock-keeper was responsible for the horses. He fed and watered the horses, and cleaned out the stables. In addition, he maintained corn, bedding and water supplies[13], and forbad the passing of any barge towed by horses insufficiently shod. This arrangement applied more to the "Number Ones" whose horses made at least ten miles a day, for the amount of time the boats worked each day was limited by the strength and endurance of the horse[14] which towed the leading boat with the second one towed on a line behind.

---

(11) Wilson, R. J. (1971). The Number Ones, p. 13, Robert Wilson, London.

(12) The stables plotted are those in evidence on the ground, though there is no doubt that many more existed during the canal period.

(13) Anonymous, (August 1923), "Current Topics", Canals and Waterways Journal, Vol. 5, no. 8, p.153.

(14) Wilson, R. J. (1971). The Number Ones, p.13, Robert Wilson, London.

The average weight per horse was fifty-six tons[15], though some horses could cope with eighty tons. Most of the horses used by the "Number Ones"were employed in carrying coal from the Warwickshire Coalfield to Croxley in Hertfordshire. It took a horse carrying coal from Griff to Croxley (100 miles) about eight days to make a round trip[16] under favourable conditions, with minimum delays in negotiating locks. The horse took four days travelling from Griff to Croxley loaded up and was detained one day in emptying: returning empty took three days. The horse made an average of twenty-six trips per annum representing two hundred and eight days. The remaining one hundred and fifty-seven days the horse was at rest due to the long delay (ten days for a fortnight) before they were reloaded at the collieries after each trip. Sometimes there could be thirty or forty boats waiting to load at one pit[17]. During periods of delay when boats waited turns, horses were given shelter in nearby stables while the boatmen returned to their homes.

The small stables contrast with the extensive ones as at Marston Doles (Photo 22) located at wharves and sheltering about fifteen horses. At Fenny Compton stables twenty to twenty-five horses could be safely kept. Such stables, as stated before, were private, belonging to either the canal companies or to big carrying firms like Messrs. Fellows, Morton and Clayton, Ltd. This firm owned two hundred and twenty-nine horses[18] for stage boats or fly boats, which

---

(15) H.M.S.O. (1908). Royal Commission on Canals and Waterways, Vol. 3-4, Appendix 7, Statement no. 7, p.21, London.

(16) Ibid., p.21.

(17) Royal Commission on Canals and Waterways, (1908), op.cit., p.21.

(18) H.M.S.O., (1908). "Evidence of Fred Morton, Director of Messrs. Fellows, Morton and Clayton Ltd.," Royal Commission on Canals and Waterways, June 1906, p.139, London.

Plate 22: THE OXFORD CANAL COMPANY'S STABLES AT MARSTON DOLES. The long low stable, adjacent to the double cottage (see Plate 21), provided a shelter for fifteen horses.

Plate 23: THE CANTILEVER BRIDGE AT SHIRLEY (STRATFORD CANAL). This was one of the cheapest types of canal bridges to construct.

carried double crews to work round the clock using relays of horses. However, their canal business in fast consignments and parcels was expanding so rapidly that even this number was insufficient and they were constantly hiring[19] horses from the canal carrying companies. These canal carrying companies also owned extensive stables - many located at wharves. Fig. 36 shows the plan of one at Whittington Wharf[20], on the Coventry Canal, which sheltered thirty horses. The canal companies and carrying firms hired out a horse-keeper for the care and maintenance of the horses; Pickford Carrying Ltd., for example, spent an average of about 5d. per mile[21] on each horse. The highest expenditure of £13,500 a year was for provender or straw[22], followed by £2,000 on wear and tear of the horses. Table 4 shows the average cost per mile spent on the Company's horses between 1829 and 1835. The horse-keeper in charge of the horses was paid between seven and twenty-seven shillings a week, depending on the number of horses maintained[23]. The keeper at Warwick received 2/1½d. per horse and the one at Atherstone 2/5d - 2/8d. per horse. There is no doubt that stabling and maintenance of horses gave rise to the establishment of small workshops like the saddlers for harness repair and smithies for shoeing the horses. This is especially true near the extensive wharves of the Canal Companies, as for example, in Warwick and Stratford (Figs. 30.1, 33).

---

(19) Ibid. p.139.

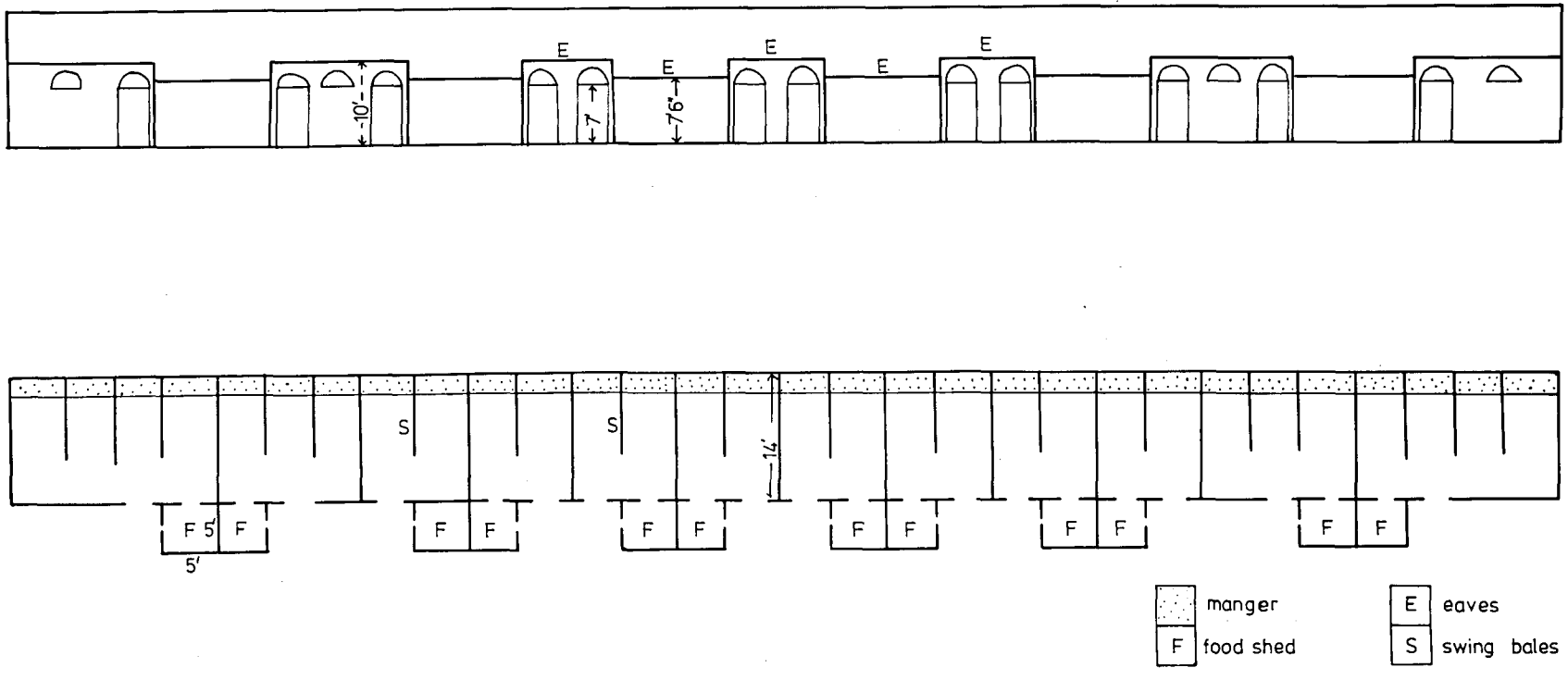
(20) Merevale Collections, The Design of Stabling at Whittington Wharf, undated. Muniment no. 3014.

(21) B.T.H.R., Memoranda Book, Pickford Company Ltd., 1829-1835, pp. 109-110, PIC4/7.

(22) Ibid. p.10.

(23) Pickford Memoranda Book (1829-35), op.cit., p.31.

PLAN OF STABLES AT WHITTINGTON — COVENTRY CANAL C.1830



Source: after Smith R.S. (Merevale Collections, 3014)

FIG. 36

TABLE 4

Average Cost per mile on Boat Horses. (Pickford Carrying Company Ltd), 1829-1835.

Year	Provender	Wages	Salary	Rent	Stock Repairs	Travelling expenses	Black Smiths	Saddler	Oil	Stabling	Taxes	Tolls	Sundries	Wear and Tear on Horses	Miles Worked	Average per mile	Total Expenses
	£	£	£	£	£	£	£	£	£	£	£	£	£	£		£	£
1829	12,310	1,501	1,000	661	106	47	715	252	65	-	66	-	141	2,518	787,788	6d	19,694
1830	11,540	1,554	1,000	693	161	66	664	249	24	31	111	5	40	2,179	757,831	5¾d	18,156
1831	13,280	1,575	1,000	714	274	65	727	265	35	58	109	9	71	2,438	857,034	5¾d	20,538
1832	12,298	1,617	1,000	771	276	54	675	231	42	19	116	19	59	3,028	831,193	5¾d	19,914
1833	10,010	1,595	1,000	779	227	53	622	212	30	7	111	10	116	1,942	831,578	4¾d	16,458
1834	12,649	1,931	1,000	824	319	123	751	263	30	14	128	8	199	2,777	1,058,392	4¾d	20,947
1835	15,744	1,745	1,000	885	307	125	846	359	35	21	120	6	149	3,138	1,129,686	5¼d	24,712

Source: B.T.H.R., P1C 4/7.

The distance between one Pickford horse station and another varied from ten to fifteen miles, the average being about twelve miles. The distance, for example, between Longford and Newbold was 11¾ miles, Longford and Atherstone 12 miles, the latter and Fazeley 10 miles, Fazeley and Birmingham 15 miles. Occasionally, when a long distance was involved as between Warwick and Braunston (21 miles) it was possible to make use of a stable en route. The average speed attained by the horse varied with the load carried on the boat and the number of locks to be negotiated. The speed of the stage boats varied between 1 and 2 miles per hour[24]. Fig. 37, based on evidence from Pickford's Company[25] fly boat services for the period 1829-1835, shows the speed per mile of a horse-drawn stage boat between their various stations in Warwickshire. The lower the number of locks the greater the mileage covered. Between Newbold and Longford the speed was 4.7 miles per hour with only three locks at Hillmorton. On the other hand, between Warwick and Birmingham with thirty-three locks the speed was as slow as 1.8 miles per hour and that between Birmingham and Fazeley with thirty-one locks averaged 2.3 miles per hour.

Bridge Types

The striking architecture of canal bridges appears in various shapes and sizes, providing some of the most interesting structures on the canal. The hump-back[26] bridges were built to

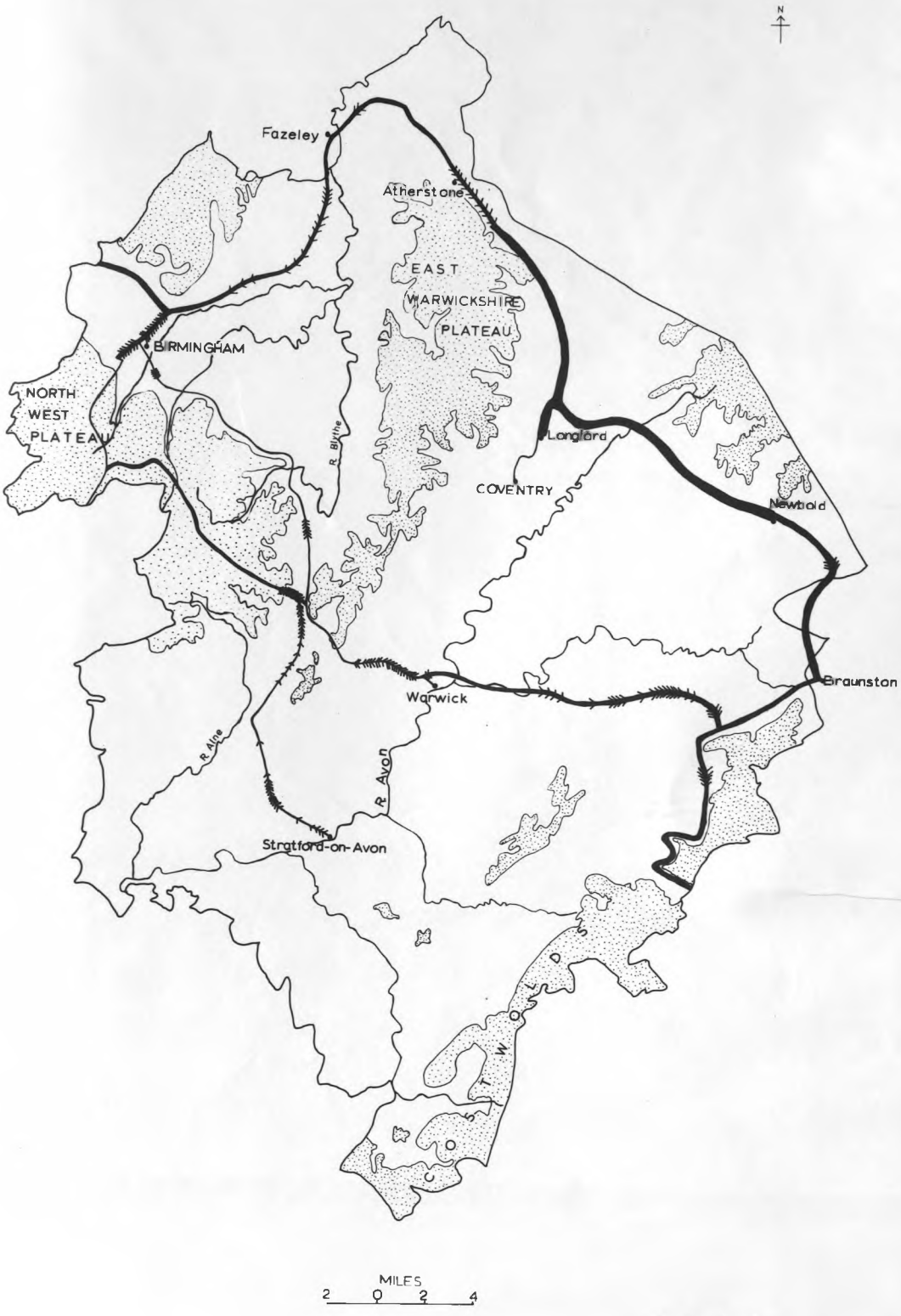
---

(24) Cadbury, G. and Dobbs, S. P. (1929). Canals and Inland Waterways, p. 71. Pitman, London.

(25) Pickford Memoranda Book (1829-1835). op.cit., pp. 18-31.

(26) See Photo 17.

AVERAGE SPEED PER MILE OF A HORSE-DRAWN BOAT



Based on Pickford Company's record book 1829-35

FIG. 37

carry road traffic across the canal, and may be traced back to the Acts of Parliament authorizing the construction of the canals. The Bill for the Coventry Canal, for example, provided that "if any canal should cross a public road, the bridge to be built should have a gradient of not more than one foot in thirteen, and that a good and sufficient fence should be made on each side of the bridge"[27]. On the Birmingham-Warwick Junction Canal the gradient of any bridge used by a turnpike road was not to exceed one foot in 30 feet, and in the case of any other public road, it was limited to one foot in 20 feet. With private carriage roads it was not allowed to exceed one foot in 13 feet. This specification was a compromise between leaving the arch sufficiently high for a boat to pass under and minimising the hump in the roadway. The maximum weight such hump-back bridges could carry ranged from four to six tons.

The hump-back bridge is only one example of a range of distinctive canal bridges found in Warwickshire. The Stratford Canal exhibits a variety of architectural features in its bridges not found on other canals in Warwickshire (Fig. 38). Most of the canal bridges in this group were movable (as Fig. 38 shows) affording communication between the fields and land which the 'cut' had divided. Such "accommodation bridges", as they are called, appear in several different forms. They were less expensive[28] to build, while still providing for passage which was invariably light or infrequent - mostly for cows passing to and from the milking parlour. The cheapest type was

---

(27) Coventry Canal Act, 1768, Canal Acts, Midland District, Vol. I, p.47.

(28) Harris, R. (1969). Canals and their Architecture, p. 41, Hugh Evelyn Ltd., London.

BRIDGE TYPES - STRATFORD - ON - AVON CANAL

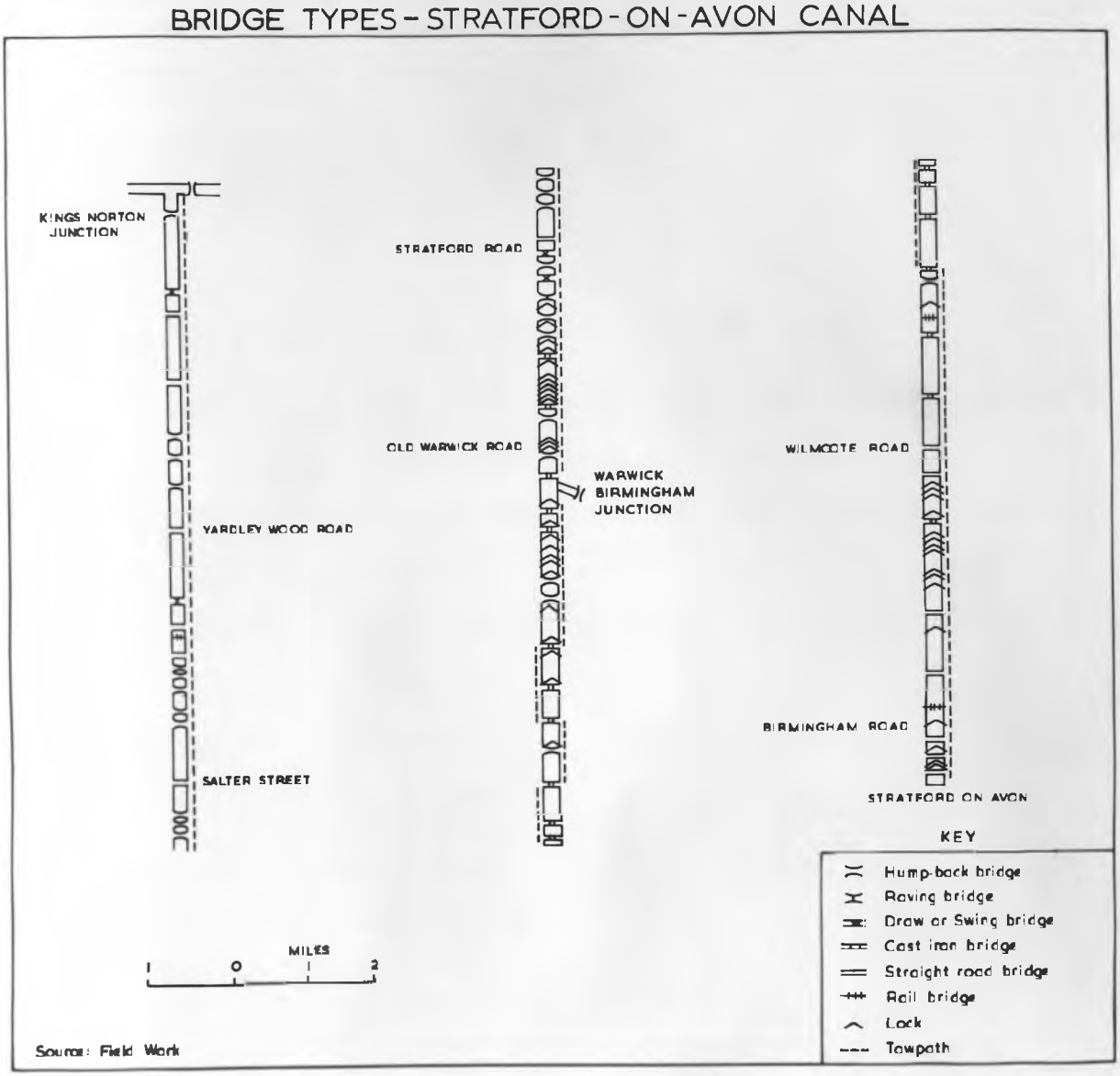


FIG.38

the movable cantilever bridge where the platform lifted to a near vertical plane, leaving the channel entirely clear for boats. This seems quite an obvious choice where the waterway was almost level with the surface of the land through which it passed. Considerable savings in width were also made by not spanning a towpath. Examples of such bridges may be found in Shirley and King's Norton measuring 12' x 9' and permitting 6 tons maximum weight. (Photo 23). The swing or turn bridge was an alternative form of moving bridge, being more expensive to construct and maintain. In this case (as at Lapworth, Photo 24) the platform was pivoted on the bank side, moving horizontally into a recess, again leaving the channel entirely clear. Perhaps, the simplest and most attractive bridge was the cast-iron bridge, fourteen of which are found between Lapworth and Preston Bagot (Photo 25) on the Stratford Canal (also part of the Worcester-Birmingham Canal). These had a gap between the sections enabling the towing line to pass through without being unhitched. This type of bridge, 8' x 10.3', allowed for only two tons maximum to cross.

So far this account has dealt with bridges affording passage over the canal to other forms of transport but the navigation of the canal itself depended on the towpath bridge and occasionally on the lockbridge. Roving bridges were designed to fulfil three functions. Firstly, they carried towpath from one side of the canal to the other where this became necessary due to the opposition of the landowner or perhaps to problems of relief[29]. They also carried the towpath across an arm of the canal if the need arose, (Photo 26) and

---

(29) In Chapter One physical problems as well as landownership affecting the canal route was fully discussed.

Plate 24: THE SWING BRIDGE AT LAPWORTH (STRATFORD CANAL). This accommodation bridge provided a passage over the canal for cattle.

Plate 25: A CAST-IRON SPLIT BRIDGE AT LAPWORTH. This interesting construction had no towpath, but the slit allowed an easy passage of the tow-rope. The horse was led over the bridge. Lock-keepers cottage with modified windows on right.

Plate 26: A ROVING BRIDGE AT THE JUNCTION OF THE STRATFORD AND BIRMINGHAM-WARWICK CANALS. This carried the towpath across the arm of the Stratford Canal.

across a junction of two canals[30]. The roving cross-over bridges were often carefully sited so that they could double as accommodation bridges. They carried no towpath and to pass them the towing line had to be disconnected and the horse led over.

Canal Inns

Of no mean importance in the life of the canal boatman was a recognized stopping place to refresh himself, and meet other boatmen. The canal inns, like any other public houses, touched life at every point and were the local club and focus of life[31]. In the public house boatmen met to relax, exchange news and sometimes drink away the money they had been given for tolls. Most of the inns provided victuals; boat accessories such as ropes could often be bought there, too. As a recognized stopping place for boatmen, stables were sometimes provided at the canal inns for the resting or changing of horses. Examples include the Bull and Butcher at Polesworth and the Barley Mow at Newbold. In this sense they were like the posting houses of coaching days.

The very location of the canal inn at the meeting of road and canal[32], made it attractive to thirsty road travellers as well. Fig. 39, based on a personal survey of canal inns, reveals two very interesting facts about their location. The inns often arose at points

---

(30) Gladwin, D. D. and White, J. M. (1968). English Canals, Part II Engineers and Engineering, p.35. The Oakwood Press, Surrey; Vide Harris, R. (1969) op.cit., p.48.

(31) See Oliver, B. (1934). The Modern Public House, p.3, Westminster Press, London. Also Richardson, A. E. (1934). The Old Inns of England, 4th Ed., (1942), p. 55, B.T. Batsford Ltd., London.

(32) Fig. 39.2 shows the location of the Navigation Inn at Wootton Wawen in relation to the Stratford Canal and the Birmingham-Stratford turnpike road.

DISTRIBUTION OF CANAL INNS IN WARWICKSHIRE

FIG.39.1

LOCATION OF BARLEY MOW & BOAT INN IN RELATION TO THE OXFORD CANAL (1829) NEWBOLD-UPON-AVON

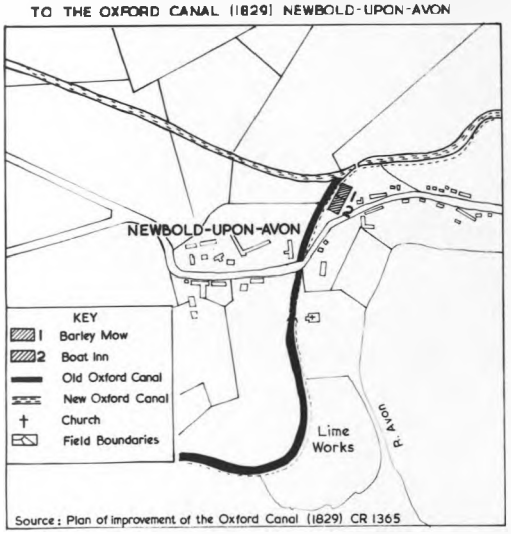


FIG.39.2

LOCATION OF NAVIGATION INN IN RELATION TO THE STRATFORD CANAL (1843) WOOTTON WAWEN

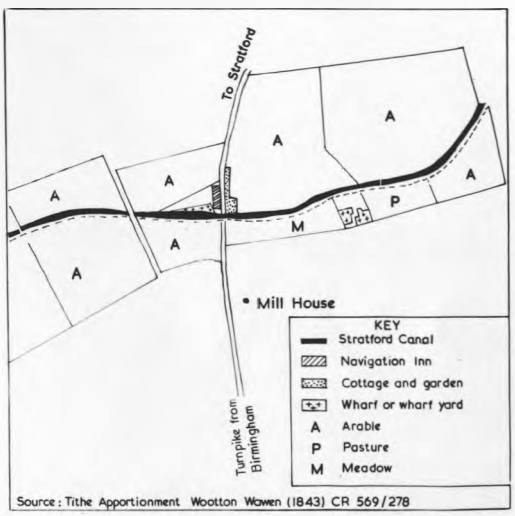


FIG.39.3

FIG. 39

where the canal intersected a turnpike road like the "Wharf" (Hockley Heath), "Navigation" (Rowington), "Two Boats" (Long Itchington), or the "Boat" (Catherine-de-Barnes Heath). Others were conveniently located at a junction between the canal and a lane as, for example, the "Boatman's Rest" (Shirley, Photo 27), the "Kings Head" (Hatton), "Barley Mow" and "Boat Inn", (Newbold; Photo 28). Newbold is the only place in Warwickshire where two canal inns were located together, and their location can be understood more clearly in the light of the improvements in the Oxford Canal between 1829 and 1834. The plan of the improvement of the canal in Newbold (Fig. 39.3) is an eloquent witness. The two inns used to face the canal which was cut off and filled in to form a lane between the Rugby-Newbold Road and the new canal. The inn may turn its face either to the road or the canal depending on whether the inn was pre- or post-canal. The "George and Dragon" (Fenny Compton), and the "Horse Shoe Inn" (Yardley), for example, were pre-canal inns and, therefore, faced important turnpike roads from Birmingham. Late inns contemporary with canals such as the "Two Boats" (Long Itchington), "Cape of Good Hope" (Warwick), "Boatman's Rest" (Shirley), and the "Greenman" (Hatton) faced the canal and were not located on turnpike roads. Despite the popular location of these inns at road junctions, a few, like the "Cape of Good Hope" (Warwick) and the "Greenman" (Hatton), were sited at convenient places along the canal. Thus the former was provided to serve the industrial area which arose by the Warwick-Napton Canal at the Cape in 1822.

Fig. 39.1, based on personal fieldwork, shows the distribution of the forty-five canal inns in Warwickshire. These inns fall into three classes. There is firstly the pre-canal inns

Plate 27: THE BOATMAN'S REST AT SHIRLEY. A red brick canal inn located at the junction of Salter Street and the Stratford Canal.

Plate 28: THE BOAT INN AT NEWBOLD. This was located at the junction of the Oxford Canal and what is now a lane which, however, before 1829 was the route of the old Oxford Canal. (vide Map 39.2). The old canal was infilled about 1830.

mostly associated with roads. The "Boot" (Chilvers Coton) and the "Navigation" (Rowington) were originally constructed in the thirteenth century for road travellers before they came under canal influence in the last decade of the eighteenth century. Secondly, there are the canal inns dating from the canal period and forming the greater proportion of the inns and might be considered as typical canal inns. Such inns include the "Wharf" (Chilvers Coton) (Photo 29), the "Navigation" (Warwick), "Anchor" (Stratford), all in existence, according to Pigot by 1828[33]. The "Boat" (Newbold), did not come into existence till about early 1829, and was shown on the plan for the improvement of the Oxford Canal[34]. There was no mention of it in Pigot or in any directory before 1850[35]. Finally, there were the inns post-dating the construction of the canals. The "New Inn" (Rowington), was such a late development, as was the "Wharf" (Hockley Heath) built in 1889 at a popular coal wharf on the Stratford-upon-Avon Canal.

The impact of the canals is reflected, in a simple and direct way, in the names of the canal inns. One of the commonest names is the "Navigation" found in Rowington, Warwick, Wootton Wawen, and Stratford. The inn at Lapworth provides a further proof of the impact of the canal. Built in the thirteenth century, it faced the Warwick-Birmingham road[36], and bore an unknown name[37] which was changed

---

(33) Pigot & Co's (1929). Commercial Directory of Birmingham and its environs, pp.829, 839, 841. London.

(34) C.R.O., CR 1365.

(35) White, F. & Co. (1850). History, Gazetteer and Directory of Warwickshire, p. 663. John Blurton, Sheffield.

(36) Richardson, A. E. (1934), op.cit.

(37) It has been difficult to trace the old name from contemporary sources.

Plate 29: THE WHARF INN AT CHILVERS COTON (COVENTRY CANAL). This is a typical canal inn dating from the construction of the canal in 1790. Unlike the red brick inns shown in Plates 27 and 28, this was built of irregular blocks of granite from local quarries.

into "Navigation Inn" (Photo 30) when the Warwick-Birmingham Canal was built close by. In contrast to this, the real canal inn was built about a mile away at Rowington and was named the "New Inn" (Photo 31). Names including the word "boat" were also common: the "Boat", "Two Boats", "Boatman's Rest" were widespread, as Fig. 39 shows. It is very likely that the "Boot Inn" in Lapworth and that in Chilvers Coton are a corrupt form of "Boat" because of their location by the Stratford and the Coventry Canals respectively. Though they were built in the thirteenth century and today have emblems in the form of a "boot", it is possible that the signs and the names, may well have changed. Two inns named "Anchor", both located on the Coventry Canal suggest a place where boats could be moored; the "Reservoir" was named after the Earlswood lakes and the "Wharf" (Hockley Heath and Chilvers Coton) after the wharves near which they were built. Other inns not bearing canal names were, nevertheless, clearly associated with the canals. The origin of the Cape of Good Hope (1822) has already been explained; the choice of name reflects a name in vogue. "Greenman", the name of the inn built along the Warwick-Birmingham Canal at Hatton about 1820, was taken from the arms of the City Companies for Forest Rangers[38].

Distinctive types of canal architecture in the form of cottages, bridges and public houses, therefore, loomed large in the landscape during the nineteenth century. Their functions have diminished considerably but their interesting and often unique characteristics remain as distinct features in the areas through which the canals pass, while the public houses now serve as a social

---

(38) Burke, T. (1930). The English Inn, pp.23-4, Longmans, Green & Co., London. Vide Richardson, A. E. (1934). op.cit. pp. 55-7.

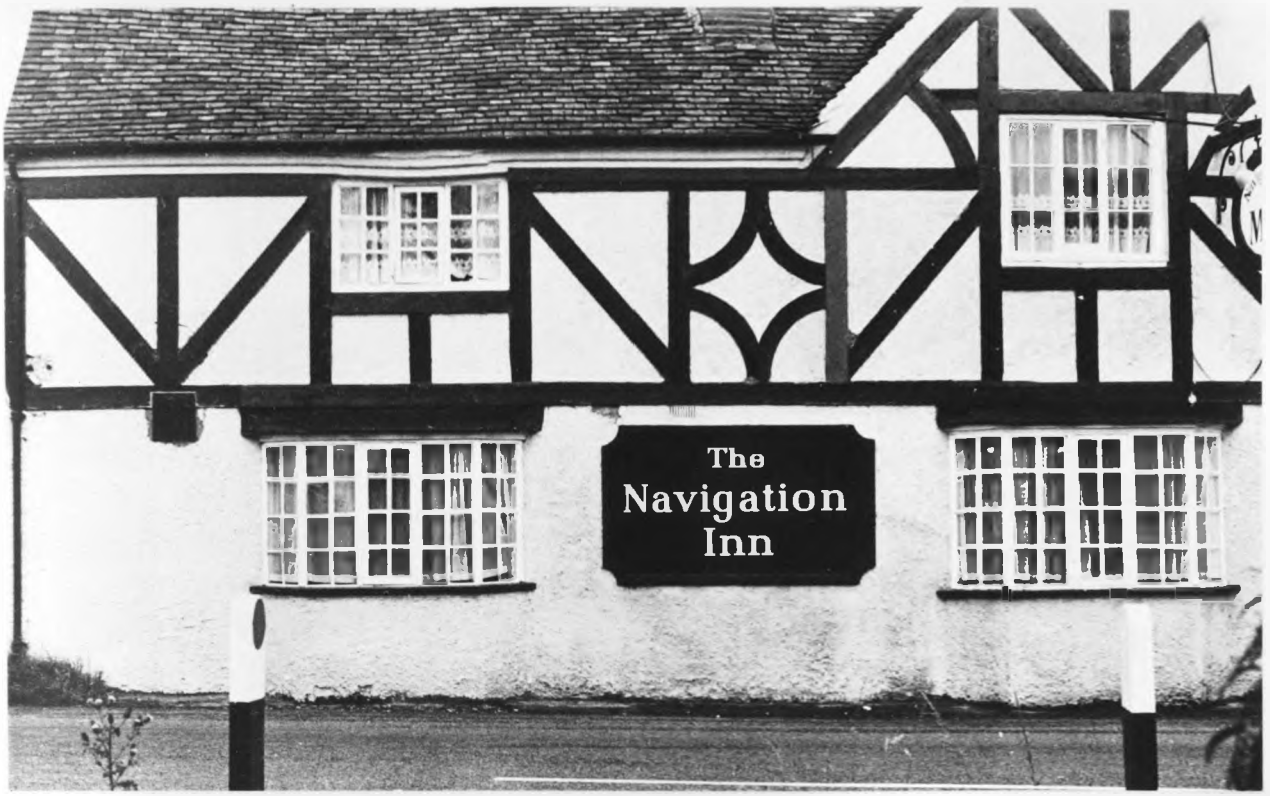


Plate 30: THE NAVIGATION INN AT LAPWORTH. This old inn, built in the thirteenth century alongside the Birmingham-Warwick Road, came under the influence of the Birmingham-Warwick Canal in the late eighteenth century and changed its name.

Plate 31: THE NEW INN AT ROWINGTON. This genuine canal inn was built at the junction between the Birmingham-Warwick Canal and the Birmingham-Warwick Road.

rendezvous, for travellers, hikers and canal fisherman as well as for local folk dwelling in the small settlements that over a century and more have sprung up by the canal.

CHAPTER FIVE

DECLINE OF THE CANALS

Physical Defects

The economic viability of the canals, and especially their effect on the extension of the North East Warwickshire coal market was fully discussed in Chapter Two. This impact was to be short-lived owing to general changes in trade and commerce, and the inadequacy of the canals to meet the increasing demands in transport made on them. The Warwickshire Canals are here considered in the context of the national situation.

A strong argument advanced against canal carrying was the fact that it was easily stopped or hindered by frost and flood in winter and by drought in summer. But of all these physical problems, that of frost is the most serious because severe and continued frost can lead to absolute stoppage. Apart from the loss of tolls involved, the advocates of better means of transport thought heavy expenditure arising from ice breaking activities was an ample justification for replacing a system which entailed so much uncertainty and delay. The diary of G. R. Bird, a Birmingham boat builder whose boats carried goods to and from London in the third decade of the nineteenth century, records the daily weather conditions, and their effect on the Warwick Canals[1]. When the canals were frozen during bad weather it was possible to keep boats moving up to a certain point. When the frost persisted it became very difficult to haul boats through. During severe frosts canals were often closed until the thaw[2]. Between 11th and 25th

---

(1) B'ham Ref. Lib. Diary of G. R. Bird, wharfinger and carrier of Birmingham, 1822-30, No. 662750, Birmingham.

(2) Bateman, F. W. (1921). "Icebound Canals", Canals and Waterways Journal, 3-4 (No. 3), pp. 355-6, Birmingham.

December, 1822, for example, there was a very sharp frost and two boats bound from London to Birmingham were trapped on the Warwick-Napton Canal at Long Itchington; similarly another boat, carrying heavy cargoes of goods and a chest of guns was trapped at Leamington[3] on the Warwick-Napton Canal. When the frost was very severe, as in the winter of 1823, boats took several weeks to make a round trip from Birmingham to London. On 29th January, 1823 the Warwick Canals were frozen up to nine inches thick, and as might be expected, traffic came to a standstill. Two boats which left Birmingham for London on 24th December did not return till 12th February. Two boats owned by Ambrose and Smith Masters, took five weeks (8th January - 17th February, 1823) to make the trip from Birmingham to London and back[4]. The problem of keeping the canal open commanded the attention of canal engineers for many years and was never really solved[5].

When ice-breakers were set to work in the early stages absolute stoppage could be prevented. To make this method effective the ice-breakers were run continuously throughout the night[6]. Though this could be an extremely hazardous undertaking, involving a considerable risk of injury to both man and horse who worked the ice-breakers, it became a necessity. If the canal froze so hard that boats could not pass there was only one thing to do - wait for the thaw - the length of the stoppage clearly depending on the weather[7].

---

(3) Diary of G. R. Bird, op.cit., p.2.

(4) Diary of Bird G. R., op.cit., p.4.

(5) Bateman, F. W. (1921), p.356.

(6) Fisher, G. (1919), (Ed.). "Icebound Canals". Canals and Waterways Journal, p. 77, Birmingham.

(7) See Bird, G. R., 1822-30, p.9.

To limit dangers on the canals, big canal carrying companies like Fellows, Clayton and Morton and Pickford and Company Limited were accustomed to stop traffic officially during frost[8]. Delays caused to traders and customers were sometimes reduced by both individual boat owners and canal carrying companies who arranged to have their goods sent by land. On January 21st, 1829, for example, Pickford and Company announced that during the canal stoppage, extra vans and waggons had been supplied from City Basin, London, to the Midlands. Similar arrangements could also be made by individual boatowners. On 24th January, 1829, Bird sent a waggon from Birmingham to Warwick to fetch about three tons of goods from the "Brittain" which was trapped in Warwick. Again during a prolonged frost lasting from 15th January to 7th February 1830, Bird sent a waggon on 4th February from Birmingham through the Warwick Canals to Braunston to collect about five tons of goods from his fly boat "Smith"[9].

The increasing complementary character of roads and canals during periods of frost is further illustrated by Fig. 40. This shows the relationship between sale of coal by road and by canal in 1825 at Baddesley Colliery[10]. The sale by land was inversely proportional to the sale by canal. When the amount carried from the Baddesley Colliery by road in January was 2,000 tons, the amount by canal was 875 tons. In July and August the amount carried by canal reached its peak of 1550 tons and 1675 tons in the two months respectively, whilst the amount carried by land was at its lowest with 425 and 700 tons.

---

(8) B.T.H.R. "Old newspaper cuttings and other Historical Documents" Pickford and Company Ltd. PIC 4/1, January 21, 1829; Vide Jan. 12, 1838.

(9) Bird, G. R., 1822-1830, pp. 15-18.

(10) Merevale Collection. Sale of Coal at Baddesley Colliery, No. 2548, A-J. 1825.

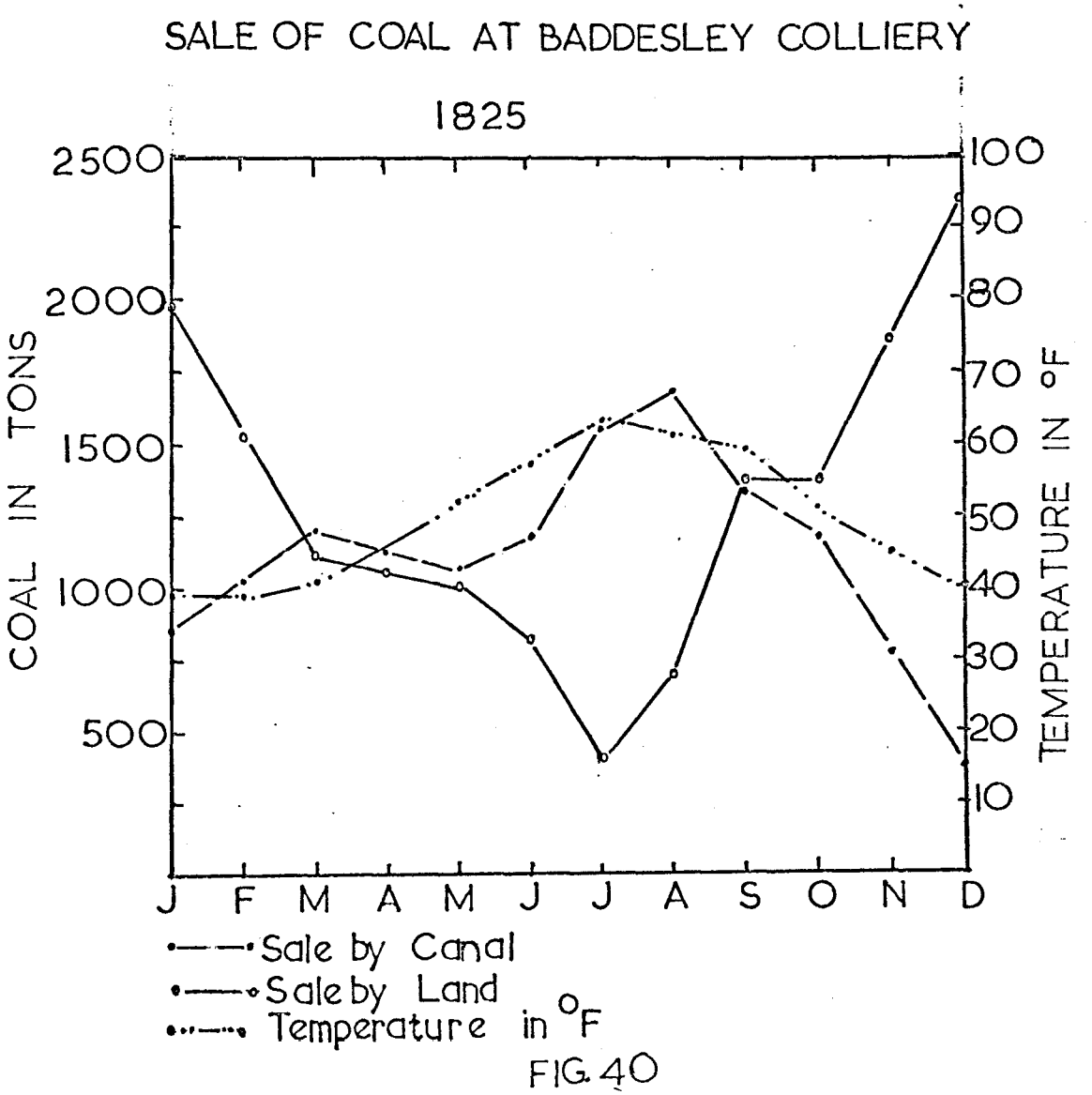

SALE OF COAL AT BADDESLEY COLLIERY
1825
2500
2000
1500
1000
500
COAL IN TONS
100
90
80
70
60
50
40
30
20
10
TEMPERATURE IN °F
J F M A M J J A S O N D
Sale by Canal
Sale by Land
Temperature in °F

FIG. 40

In December the pattern was similar to that of January: the amount carried by road was 2,785 tons whereas the amount carried by canal was only 375 tons. There appears to be a correlation between canal carriage and temperature for canal traffic tended to drop with a fall of temperature below 50°F. In January and December when the lowest tonnage of 875 tons and 375 tons was carried the temperatures of the Midlands[11] were 38.9°F and 40.3°F respectively. Sale by road reached its maximum in winter between October and January and fell considerably as July approached. A correlation test between land sales and temperature fails at 99% suggesting that temperature alone does not explain the rise and fall of sales; factors like demand and supply reaching their maximum in winter should not be overlooked in explaining the major land sales in winter months. The argument is further supported by Fig. 41 which shows the monthly passage of boats through locks at Hillmorton, Warwick-Napton Junction and Hawkesbury in 1855. Boat traffic was considered against the temperatures in 1855 when there were severe frosts in winter. There is a correlation between temperature[12] and passage of boats in all the three stations. The low passage of boats is very marked in February when the temperature in the Midlands fell as low as 28.9°F[13] resulting in a sharp drop of boats from 1,097 to 46 at Hawkesbury, from January to February, and 1,097 to 61 at Hillmorton and 825 to 19 at Napton[14]. The continuing problem of absolute closure due to frost caused such a great concern among all interests that as late as

---

(11) See Appendix II.

(12) Manley, G. (1953). Quarterly Journal of the Royal Meteorological Society, Vol. 79, p.258, London. This shows the mean temperatures of the Midlands between 1698-1952.

(13) Manley, G. (1953). op.cit.

(14) B.T.H.R., OXC 4/108, Oxford Canal Monthly Water Accounts, OXC 4/108, 1854-60. Vide Appendix III.

BOATS PASSING THROUGH LOCKS IN WARWICKSHIRE

1855.

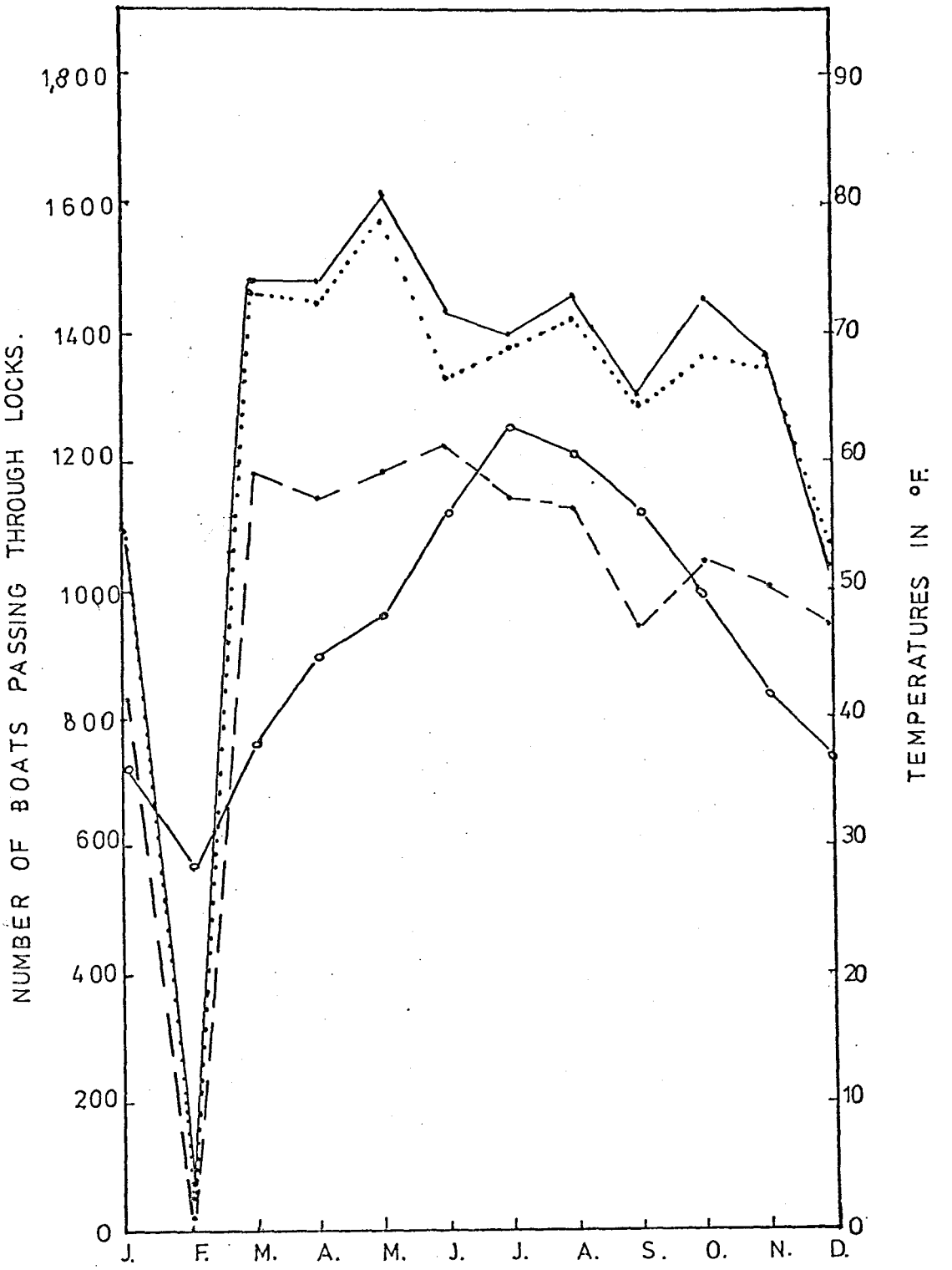


FIG. 41.

August 1900 a five pound prize competition was organized by the Canal Control Midland Sub-Committee in conjunction with canal companies, traders and boatmen, for ideas concerning improved methods of preventing the stoppage of canals in times of frost[15]. So urgent was this problem that in October 1900, the prize was increased from five pounds to ten pounds. The problems were not, however, solved by any of the suggested methods.

Other stoppages were due not to weather but to the needs for maintenance usually in summer. Such were the annual stoppages by the Canal Companies for repairs lasting for a week. Before the closure the public was widely informed well in advance through newspapers among which the Aris's Birmingham Gazette and the Morning Chronicle[16] featured prominently. On May 17, 1824, the Morning Chronicle gave a series of announcements about the closure of the Grand Junction and Warwick Canals on 25th May to 2nd June. During this period the canal was dredged and the banks repaired where necessary. In the latter case the section of the canal involved had its channel drained, the silt at the bottom cleared and eroded banks were reinforced by cement. The annual closure of the canals caused considerable inconvenience to manufacturers and traders who in most cases had to make alternative arrangements for the transport of goods. It was, however, possible for big carrying firms like Pickford and Company Limited to establish a daily supply of vans, waggons and caravans from Birmingham, Coventry and other stations in the Midlands and Lancashire to London during the closure.

---

(15) Fisher, G. (1919). op.cit.

(16) The Morning Chronicle, published in London, was the mouth organ of Pickford and Company Limited for their customers in London who sent goods to the Midlands, especially Birmingham.

Occasionally, stoppages could be initiated by drought as in the summer of 1838 and 1840, when Pickford and Company Limited reported that owing to the scarcity of water in the Stratford Canal[17] goods could not be forwarded to Stratford. Similarly, the Stratford Canal Company announced in December 1840 that "in consequence of the unusual drought which prevailed during the spring and summer, (1840) the trade on the canal was greatly retarded"[18]. By August of 1840 the Earlswood reservoirs were almost empty so that laden boats would not float in the canal. Trade on the canal was, therefore, diverted from the southern section of the Stratford Canal[19] at Kingswood into the Warwick Canal for no less than three months. The result of this stoppage was a loss of £1,235 in tonnage from the southern section of the Stratford Canal whence the traffic was diverted[20]. On less severe occasions boats were light laden and waited turns at the locks by order of the management[21].

Slow Speed of Canal Traffic

The top speed of a canal boat did not exceed four and a half miles an hour, the average being two and a half miles an hour including locks. It was believed that boats could not travel at a

---

(17) Aris's Birmingham Gazette, 5th May, 1837.

(18) B.T.H.R. Canal Proprietors Minute Book, Stratford-upon-Avon, SCN 1/4, 2nd December, 1840.

(19) The Earlswood Reservoirs, the feeder of the Stratford Canal, lying astride the Trent & Servern watershed, could easily suffer from drought during very dry summers because of lack of large rivers to feed the canal at such a summit level.

(20) Canal Proprietors Minute Book, (1840), op.cit.

(21) Parkes, J. (1825). "Statement of the claim of the subscribers to the Birmingham-Liverpool Railroad to an Act of Parliament in reply to opposition of the Canal Companies, p.40, London. Normally boats were worked through locks as they got to them but during periods of drought they had to wait in turns to save water.

greater rate than 4½ miles per hour without causing considerable damage to the banks of the canal. Such a slow speed was unsatisfactory to both traders and the public in general. It was for this reason that canal companies in co-operation with engineers tried several experiments to increase the speed of canal carriage. Most of the experiments were carried out on the Forth and Clyde, Union, Monkland and Ardrossan Canals, but were designed to apply to all canals of a similar character. The experiments on the narrow canal of Ardrossan were applied to the Warwickshire Canals. The most exhaustive series of experiments to study the wash created by different types of boats moving in a restricted channel at varying speeds was carried out on the Forth and Clyde and Union Canals. The results of the experiments were fully considered by Fairburn[22]. Twelve experiments were conducted in all: one series of experiments were conducted with a gig sixty feet in length and four feet six inches breadth on the Ardrossan Canal. The object of the trial was to ascertain the rate at which boats might be propelled along such narrow canals. The greatest speed attained during the journey was two miles in eleven minutes. During this voyage the surge behind was negligible even at curves; and there was no front wave except at bridges. The quicker the boat went, the more entire was the disappearance of all wave and surge, except where the water escaped in the centre of the canal, and met in two very noisy and rapid currents from each side of the boat at the rudder. This experiment confirmed another on the Forth and Clyde Canal which demonstrated that the greater the speed the less the

---

(22) Fairburn, W. (1831), Remarks on Canal Navigation, Illustrative of the Advantages of the Use of Steam as a Moving Power on Canals, passim. Longman, Rees, Orme, Brown and Green, London.

surge or wave, but it was shown that at a high speed surge and wave were done with altogether[23]. The experiments conducted induced Fairburn to recommend the widespread introduction of steam power on the canals in 1831. However, inspite of his advocacy, the introduction of steam never spread far partly because of the imminent collapse of the canal carrying industry in the face of railway competition, and partly because when applied to the canal trade, its advantage over horse-traction was not great. The average speed by steam haulage was three miles per hour, and horse haulage was two and a half miles per hour. Moreover, the steam engine occupied valuable cargo space and called for skilled men. Hence most of the early canal steamers were tugs, as used on the Midland Canals.

The steam tug started to gain the interest of canal carriers in the 1850's, and in 1854 the 'Birmingham', a boat fitted with a steam tug, belonging to a Mr. Inshaw of Birmingham, won a prize competition for the best steam tug. Nevertheless, the best adapted to the narrow canals of Warwickshire in the 1870's were the cargo-carrying steamers[24] attached to fly boats such as the most effective fleets operated by Messrs. Fellows, Morton and Clayton (See Photos 32, 33). The steam engine occupied ten tons of cargo space and consisted of a horizontal return tube boiler supplying steam to a tandem compound condensing engine built by A. H. Beasley and Sons. of Uxbridge. Each steamer worked in conjunction with a towed butty. The fly boat[25] was worked with a full complement of six men per pair. Messrs. Fellows, Morton

---

(23) Ibid., p.34.

(24) Cargo carrying steamers or steam boats were those fitted with compact engines and boilers and could tow a second boat.

(25) Fly boats, carrying 10 tons of goods, averaged 3-3½ m.p.h. and worked for twenty-four hours, with a crew of four and frequent change of horses between ten and twelve miles.

Plate 32: A HORSE-DRAWN BOAT ON THE GRAND JUNCTION CANAL NEAR BRAUNSTON CARRYING COAL FROM THE NORTH-EAST WARWICKSHIRE COALFIELD. This old photograph about 1850 is in the possession of the Canal Museum, Stoke Bruerne.

Plate 33: A FELLOW, MORTON AND CLAYTON COMPANY STEAMER. This company pioneered the extended use of steam on the canals in the 1870's. This old photograph of about 1870 is in possession of the Canal Museum, Stoke Bruerne.

and Clayton, operated widely on the Midland Canals, but principally between Birmingham and London using the route of the Warwick Canals and the Grand Junction. The steamers had a great reserve of power and there were no direct controls between engine and steerer; the helmsman, due to the quietness of running either gave verbal orders to the engine man or rang a small bell[26]. The crew consisted of four men on the steamer, working two to a shift round the clock. Shifts on the steamer were taken on distance rather than time. As might be expected horse traction continued to be applied on the Warwickshire Canals, especially by the old school of horse boatmen - the "Number Ones", who were accustomed to a more sober method of progress. With a slow adaption to steam haulage, the majority of boats in the study area were horse drawn for only three big canal carrying firms (Messrs. Fellows, Clayton and Morton, Pickford and Company Limited and Grand Union Canal Company) worked on the canals in the study area the rest being mostly "Number Ones". As late as 1880 the speed of canal traffic had changed very little.

Railway Rivalry

Development of Railways

Before discussing the development of railways and rivalry between canal and rail in the study area it is worth considering roads which preceded even the canals in the eighteenth century as the oldest form of transport. There had been no serious competition between road

---

(26) See Chaplin, T. (1967). A Short History of the Narrow Boat, passim. Geoffrey Dibb Ltd., Norwich.

and canal during the canal period (1790 to 1838), because road was not very important for bulky conveyance. It was rather the insufficiency of roads for transporting heavy goods that led to the birth of canals whose economic influence lay to a considerable degree in the conveyance of coal[27]. The canals extended the coal market of the North East Warwickshire Coalfield and reduced the price of coal in Birmingham by about half, from 13s.0d. per ton to 7s. 6d. per ton. As regards long-distance haulage of coal the roads did not serve a great purpose. There was, however, local traffic between collieries and the neighbouring districts, particularly between the Griff Colliery and the surrounding districts of Bedworth and Nuneaton which received 20 per cent of the total production of coal from the Griff Colliery by road. Despite the existence of such industrial roads during the mid-nineteenth century, canals proved the best means of conveying coal and other bulky goods like stone, corn and limestone. Thus, they took heavy loads off the roads and contributed materially to the improvement of the road system. Roads, therefore, were not serious rivals to canals for transporting bulky goods. So railways were developed from the third decade of the nineteenth century as a more efficient and reliable means of conveyance.

As early as 1825 the London-Birmingham Railway was proposed to convey to London the manufactures of Birmingham and the Black Country more quickly and cheaply. Agricultural produce would also be able to find wider markets and better prices. As might be expected the proposal met with strong opposition from all canal companies[28]. Such opposition

---

(27) See Chapter Two, pp. 57-64 which treats fully the importance of canals in the extension of the coal market.

(28) B.T.H.R. Minutes and Reports of the Coventry Canal, CVC 1/5, 15 September 1825.

began with pampleteering, the organisation of meetings, then petitions and finally the organizing of Parliamentary opposition. The London-Birmingham Railway interests were opposed by the canal companies between the Midlands and London. The fears of these canal companies were based on the assumption that the railway would tap a good deal of the traffic accustomed to going to the canal, thereby reducing its revenue at least relatively if not absolutely[29]. The Coventry Canal Company, having realized the threat of railways, resolved their committee to act from time to time to protect the interests of the company with respect to any and every application to Parliament for the making of a railway that might interfere with the advantage of the company[30]. Indeed so apprehensive were the canal companies of railway competition that their minutes and reports repeatedly made resolutions against railways[31]. In 1827, for example, the waterways interests in Birmingham pulled themselves together and proposed the formation of a new canal to be called the London and Birmingham Canal, which it was hoped, would render such great aid in the carriage of traffic that there would be no need for a railway[32]. It appears from contemporary evidence that the promoters of this canal, or one of their officials, falsified the subscription list[33], but the necessity of increased speed militated against the proposed canal.

---

(29) Birmingham Journal, Jan. 22, 1831, p. 1, Birmingham.

(30) B.T.H.R. Minutes and Reports of the Committee of the Coventry Canal, CVC 1/5, 29th Sept., 1825.

(31) B.T.H.R. CVC 1/5. (29th March 1842, 27th Sept. 1842).

(32) Aris's Birmingham Gazette, (Dec. 17, 1827, Feb. 2, 1829), gives the agitation for this canal. Vide Birmingham Journal, Nov. 17, 1827, p. 1; Dec. 15, 1827.

(33) Ibid., p. 1. Vide H.L.R.O. Report from the Committee on the Birmingham and London Junction Canal Petition. Parliamentary Papers 1830 (251). x, 719.

The Warwick-Birmingham Canal, which formed a direct link between London and Birmingham was also threatened by the possibility of having its traffic drained by the proposed London-Birmingham Railway. Thus, the Committee of the Warwick-Birmingham Canal resolved on 11th February, 1831[34] that "two of their members, Messrs. Russell and Crompton should act on behalf of the Company in conjunction with the Warwick-Napton Canal Company to protect the interests of those companies and for opposing the London-Birmingham Railway as they shall deem necessary". Another resolution appeared the following year emphasizing how injurious the rail project would be, not only to the Company but also the landed interest generally, without any permanent advantage to the country[35]. The Committee members of the Warwick-Birmingham Canal Company and the members of the Borough of Warwick were requested to attend a meeting on 3rd April, 1832 to oppose the London-Birmingham Railway bill[36]. The objection of the Warwick Canal Company that the railway offered no permanent advantage was ill-founded, as will be demonstrated in subsequent paragraphs. (The opposition from the Committee even culminated in a proposal for a Birmingham-Warwick Canal Railway in 1845[37].) Despite this opposition, the construction of the railways could not be prevented and in 1833 the Bill for the London-Birmingham Railway was passed[38], and in 1838 the company was given construction powers[39]. The section between Birmingham and Rugby, running through

---

(34) B.T.H.R. Minutes and Reports of the Committee of the Warwick-Birmingham Canal, WBC 1/10, 11th Feb. 1831.

(35) WBC 1/10, op.cit., 3rd April, 1832.

(36) Ibid.

(37) C.R.O., "Papers about the Birmingham-Warwick Canal Railway Papers", about 1845 to 1847, CR 556/684.

(38) C.R.O., Clinker, C. R. Railways of the West Midlands, pp. 10-19. C625.

(39) 3 & 4 Wm. IV. C.36.

Coventry was opened on April 9th, 1838, and that between Rugby and Denbigh Hall came into operation on September 17, of the same year, (Fig. 42), giving a through service from Birmingham to Euston. The next railway to be built was the Birmingham-Derby Junction Railway, incorporated in 1838[40], which commenced from a junction with the London-Birmingham near Stechford[41], ran through Tamworth to Derby, and was officially opened on August 12, 1839. There was a small branch of 6½ miles from Whitacre to Hampton on the London-Birmingham Railway, thus giving an alternative route between London and Derby independent of that formed by the Midland Counties, which came into operation on July 30th, 1840. Further railway developments followed, and the Warwick-Leamington Union Railway, which was absorbed by the London-Birmingham[42], was opened in December 1844, to link Coventry with Warwick and Leamington. All the towns formerly served by the canals were gradually and more efficiently connected by railways throughout Warwickshire. For instance, Rugby, already linked to Birmingham through the London-Birmingham Railway in 1838, was eventually connected to Leamington by the 14¼ miles long Rugby-Leamington Railway, which joined the former at Rugby[43] in 1851. Then came the Great Western Railway from Birmingham to Warwick, closely following the route of the Warwick-Birmingham Canal, whilst also running parallel to the Stratford-upon-Avon Canal.

---

(40) 6 & 7 Wm. IV. C.35.

(41) By Act 3 Vic. C.5, 1840, the Stechford and Whitacre line was abandoned, and replaced by a new line from Whitacre to Lawley Street (Birmingham) in 1842.

(42) Through the Warwick-Leamington Union Act 6 and 7 Vic. C.3, 1844, this railway became part of the London-Birmingham Railway.

(43) 9 and 10 Vic. C.368, 1846. The construction powers were granted in 1846, but it wasn't till 1851 that the railway was finally completed.

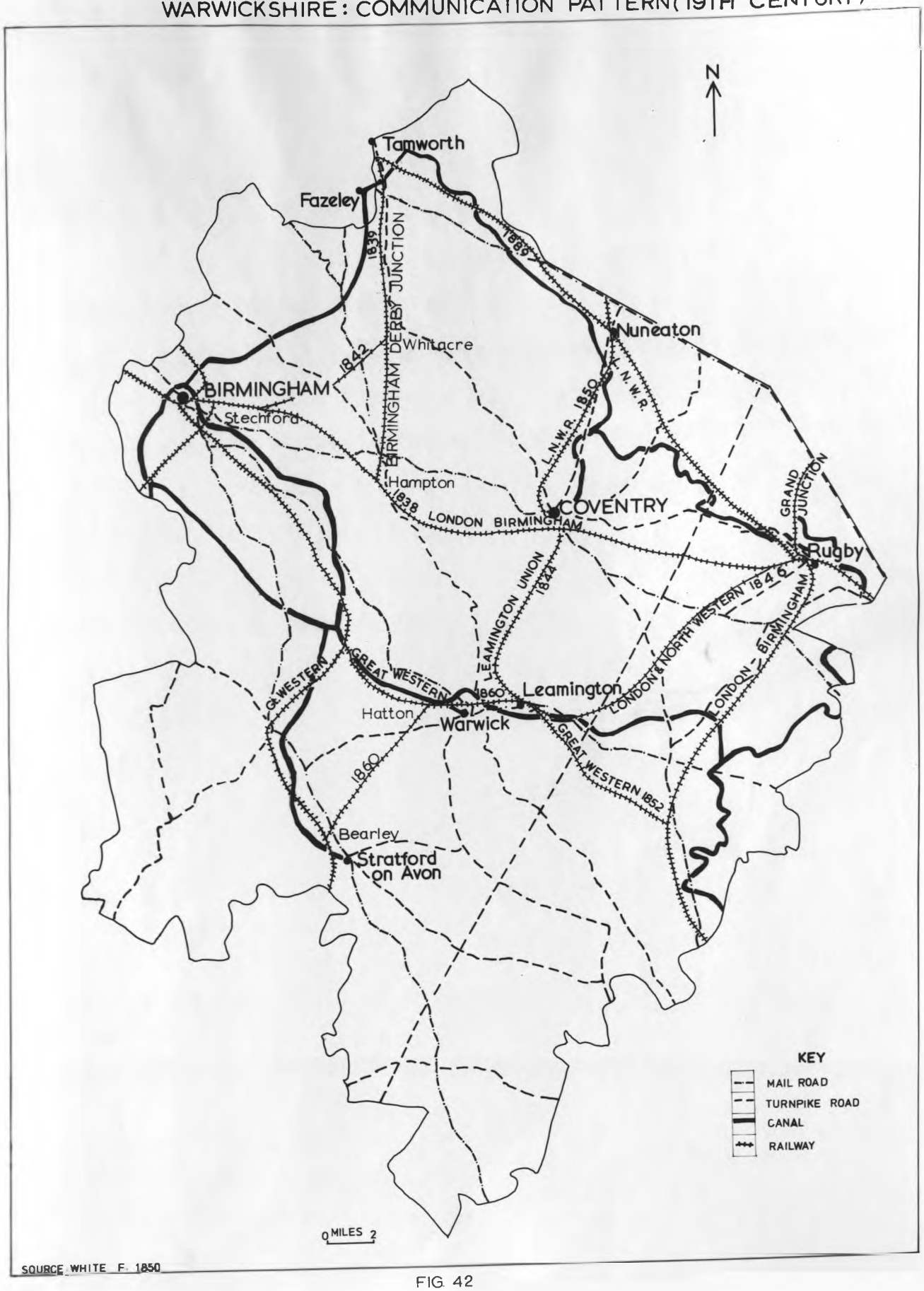
Source: 1. White, F. (1850). History, Gazetteer and Directory of Warwickshire.

2. Clinker, C.R. (1962) Railways of the West Midlands, C.R.O., C.625 Cli.

Note

1. The Birmingham and Derby Junction Railway, the Midland Counties and the North Midland Railway amalgamated in 1844 to form the Midland Railway.
2. The Trent Valley Railway was built in 1847 by the L.N.W.R., which was formed in 1846 by the amalgamation of the Grand Junction and the Liverpool-Manchester Railways.

WARWICKSHIRE: COMMUNICATION PATTERN (19TH CENTURY)



SOURCE WHITE F. 1850

FIG. 42

Stratford was also linked to Honeybourne by a 8¾ miles railway line, constructed[44] and opened in 1848, the same company also linking Hatton and Stratford in 1860. By this year the major railways of the county were in operation. Fig. 42 shows the growth of the railway pattern in relationship to canals in Warwickshire; as each railway was opened, keen competition arose between the railways and adjacent canals. For instance, the London-Birmingham Railway already mentioned, competed with the Coventry and Oxford Canals in the carriage of coal, roadstone, iron, hardware and other miscellaneous goods between Birmingham and London. The Coventry Canal was also rivalled by the London-North-Western and the Midland Railways; the Stratford Canal by the Midland and the Great Western Railways, and the Warwick Canals by the London-North Western and Great Western Railways. As Fig. 42 shows in each case a canal had to compete with two or more railways, considerably weakening the power of the canal right from the start. The commonest competitive weapon applied by the railways was price cutting, for the railways could afford to quote an uneconomic goods' rate and look to passenger traffic receipts (non-existent for canals) and high rates on less competitive routes to recoup the loss. The outcome was catastrophic for the canal companies. Even before the L.N.W.R. was opened in 1838, the coal dealers[45] in Oxford, who received coal by the Oxford Canal from the North-East Warwickshire coalfield, were very nervous of stocking too much canal coal lest they be undersold. After the opening of the L.N.W.R., the Oxford Canal Company made an attempt to reach agreement

---

(44) Construction powers were given by 9 & 10 Vic. C.278, 1846.

(45) B.T.H.R. Oxford Canal Minute Book. OXC 1/6. 17th March, 1852.

with the L.N.W.R. for equalising the charges on the transit of coals to Oxford by railway and canal, and proposed a division of traffic between the two routes, but nothing came of the negotiations.

As competition increased, a marked decline of gross receipts of the canals was experienced. For example, the gross receipts of the Oxford Canal dropped from £73,120 in 1841 to £66,219 in 1842. As the decline continued, canal tolls slumped even more. Thus, between 1850 and 1852 the coal toll of 4p per ton/mile over the entire Oxford Canal dropped by more than 50%, forcing down the Oxford Canal Company's takings by 58%[46]. For over twenty years thereafter the takings remained at little more than £26,000. The Canal Company's dividends, which stood at 30% in 1844, fell to 20% in 1850 and to as little as 9% in 1855. Tonnage in coal, roadstone, and iron (cast and pig) from Birmingham continually decreased between 1838 and 1858. Similarly, the rates of the Warwick-Birmingham Canal were forced down by the L.N.W.R. by about 20% in 1839, 33% in 1840 and 66% in 1844, whilst dividends also fell suddenly from 15½% in 1839 to 2% in 1845 and nothing thereafter until 1871. Financially the companies of the Warwick Canals (Warwick-Birmingham, Warwick-Napton Canals) were worse off than the Oxford Canal Company because they were rivalled on their entire length by the L.N.W.R. which provided a more direct route between Birmingham and London at a cheaper and faster rate. There was as a result a great deterioration in tolls; for toll receipts at Napton which had accounted for 67% of the total receipts in 1830 had fallen to 47% in 1869.

---

(46) B.T.H.R. OXC 1/6. 17th March, 1852.

Elimination of Competition

As competition between railway and canal continued, profits and dividends of each were, in effect, considerably reduced as has already been shown. To prevent further cut-throat competition some railways, like the L.N.W.R. and Great Western Railway, which had been aggresive rivals to the canals made a working agreement to end the competitive efforts of the canals. In some cases the canal companies in their attempt to flee from the enemy allowed their canals to be bought or rented by the railway companies for conversion into a railway. A good example is that of the Warwick-Birmingham Canal[47]. There was a proposal for a bill in 1845 by a London-Birmingham Extension Railway Company to purchase[48] the Warwick-Birmingham Canal for a railway or to make a railway by the side of the canal or alternatively to construct a railway to or from any places on the route of the canal. A branch railway was proposed from Knowle to Hampton-in-Arden. The directors for the London-Birmingham Extension Company took advantage of the very low dividend of 12 per cent per annum yielded to the Warwick-Birmingham Canal ever since the opening of the London-Birmingham Railway in 1838, and offered to purchase it. The Warwick-Birmingham Canal Company agreed both because of the fall in their toll receipts and dividends, and because they did not foresee any success in competing against the might of the L.N.W.R. The objective of the directors of the London-Birmingham Extension Railway was to use the canal in conjunction with its two original lines -

---

(47) The London-Birmingham Extension Railway was a project to be formed to embrace three companies, 1. The London-Birmingham Extension Railway Company (to build a railway between Northampton and Warwick), 2. The Warwick-Worcester Railway Company, 3. Grand Central Union Railway Company.

(48) C.R.O., London and Birmingham Extension Railway and Warwick-Birmingham Canal Railway Papers, CR 556/684, Part III. 1845-47. The documents concern the formation of the Warwick-Birmingham Canal Railway Company and the objectives of the Company.

(the Northampton-Warwick and the Warwick-Worcester Railways),

(1) To establish the shortest and most convenient route from London to Leamington and Warwick (by means of a siding at Weedon).

(2) To shorten the distance between London and Birmingham, and Warwick and Birmingham.

(3) To establish a new route via Oxford, from London to Birmingham (by means of a railway branch from Leamington to Fenny Compton).

(4) To provide communication between Warwick and the Droitwich Salt Works[49] in Worcestershire.

These advantages are considerable; but of equal importance was the Warwick-Birmingham Canal route for the construction of the railway. Railway Companies like Canal Companies met very strong opposition from wealthy landowners who did not want the route near or through their land[50]. Such opposition might force a change in the route of a proposed railway. The purchase of the canal would, therefore, ensure an already made route for the railway because nine tenths of the canal bed would be available for railway purposes[51]. No new lands were to be purchased; no enclosures violated; no buildings to be removed. Problems might arise with the twenty-one locks on the canal but this could be resolved by removal of locks with consequent widening and further cutting at Shrewley Hill. All purchase arrangements were concluded with the Warwick Canal Company but the proposal could not go very far

---

(49) C.R.O. CR 556/684, Part III, (1845-1847).

(50) See, for example, Chapter I, pp. 27-30.

(51) C.R.O. CR 556/684, op.cit.

in Parliament because the powerful Grand Junction Canal Company intervened because of the threat to continuous inland navigation[52]. The Committee of the Grand Junction Canal Company had, therefore, to oppose the proposal in Parliament[53].

Of greater interest still was the Stratford Canal, rivalled by the O.W.W.R., which initiated on 1st January, 1846 the purchase of the canal. The[54] Stratford Canal Company agreed to sell for £30 per share on 3,611 shares. The O.W.W.R. Company also agreed to take over the debts and liabilities of the canal company amounting to over £52,104, which it settled[55]. The willingness of the O.W.W.R. Company to purchase the canal, despite its tremendous liabilities, emphasizes the anxiety of the railway company to consolidate its position and eliminate any competitor - whether strong or weak. The Stratford Canal came into the latter class, for its dividend had never been above 7% since 1816; moreover the position of the canal had already been weakened by an additional railway (from Stratford to Honeybourne[56], Fig. 23).

---

(52) The purchase of the Warwick-Birmingham Canal would have dealt a death blow to the Grand Junction Canal because the former together with the Warwick-Napton Canal were linked to the Grand Junction Canal to provide the most direct route between London and Birmingham. The Grand Junction Canal would then be forced to take the circuitous route of the Oxford and Coventry Canals through the Birmingham-Fazeley Canal to Birmingham - a route 41 miles longer than that through Warwick. With the heat of railway rivalry the Grand Junction Canal would be paralysed.

(53) B.T.H.R., Birmingham Canal Navigations Minute Book, BCN 1/8, 22 February, 1878.

(54) Shakespeare's Library, Draft Agreement for the Sale and Purchase of the Stratford Canal Company, by O.W.W.R. Miscellaneous Collection, ER 37/1, No. 185, 1st Jan. 1846.

(55) Shakespeare's Library, Draft Transfer of the Canal to the Railway, ER 37/1, No. 190, 7th May, 1857.

(56) B.T.H.R., Stratford-upon-Avon Canal, MT1/22, 1888.

This additional line came into operation in 1858 and another from Stratford to Hatton in 1860. Together with the main O.W.W.R. this system provided an alternative form of transport from Birmingham running almost parallel to the canal for much of its course. Eventually all these lines passed into the hands of the ruthless Great Western Railway in 1863[57]. The situation deteriorated further with the opening in 1873 of the Midland Railway and the East and West Junction Railway which competed actively for the coal, limestone and corn originally carried by the Stratford Canal.

That the purpose of the railway companies was fulfilled there was no doubt. The intervention by and rivalry of the railways resulted in a loss of traffic leading to deterioration in gross receipts and tonnage. Canal receipts were reduced by 80% from 1865 to 1880; traffic moving on to the Warwick-Birmingham Canal at Kingswood had diminished by 29,000 tons between 1846 and 1880[58]. A dividend of 5% paid regularly prior to the Great Western Railway purchase had been stopped since 1846 and after 1880 cost of maintaining the canal had been in excess of income from coal and corn traffic. The loss gradually increased from year to year until it amounted to £540 on a revenue of £1,413 in 1880. The Great Western Railway denied that the deflection of traffic from the canal to the railway was due to the higher tolls that the canal charged. They attributed the loss to the increased and better facilities afforded by the railway, and not to any deliberate action on their part aimed at drawing off the canal on to the railway. The claim of the Great Western Railway Company is not very convincing in the light of their determination to prevent competition.

---

(57) C.R.O., Clinker, C. R., (1962). "Railways of the West Midlands", C 625 Cli, p. 11. This is a typescript on the development of the Railways in the West Midlands.

(58) B.T.H.R., Stratford-upon-Avon Canal, evidence of Lloyd, MT1/33, 1888.

There is strong evidence that loss of traffic, resulting in diminishing receipts, was the outcome of railway policy of charging excessive tolls on canal traffic[59]. Thus, a ton of coal carried by railway from Cannock Chase to Stratford cost four shillings and four pence for a distance of about thirty miles whereas coal of the same quantity carried by canal between Kingswood and Stratford, a distance of twelve and three quarter miles, cost four shillings and seven pence. A toll of 1/3d. per ton/mile on glucose was charged by the Grand Junction and the Warwick-Birmingham Canals while the Stratford Canal charged 2d. per ton/mile on glucose.

The evidence given by witnesses before the Royal Commission on Canals and Waterways in 1888[60] gives more weight to the argument. Lloyd, a member of a firm of millers and corn merchants at Stratford, had sent grain by canal to Worcester, Birmingham and Walsall since 1800. But he changed over from canal transport to the Great Western Railway probably in the 1860's because carriage of grain by the G.W.R. was cheaper by 1d. per ton per mile. He would have preferred to send grain by canal if the toll were reduced to less than 1d. per ton then charged. The other witness, Hutchins, was a member of a coal and iron merchants' firm, also in Stratford and brought coal from Polesworth, Cannock Chase and Dudley, both by canal and railway. The railway rate for a ton of coal from Polesworth to Stratford was 4s.3d. as against 7s.7d. by canal; from Cannock Chase the rate for coal was 4s.4d. by railway and 6s.1½d. by canal. Though the canal was more convenient[61] to him, and he had formerly used it to a greater extent, he had been forced to transfer the bulk of his traffic to the railway as a result of the high tolls on the canal[62].

---

(59) B.T.H.R., MT1/22, op.cit.
(60) H.M.S.O. (1908). Royal Commission on Canals and Waterways, Vol. 3-4, p.54. London.
(61) Mr. Hutchins found the canal more convenient because the firm to which he belonged had their wharves located at the canal basin in Stratford and so were the coal works at Polesworth, Cannock Chase and Dudley whence his firm purchased the coal.
(62) H.M.S.O. (1908). Royal Commission on Canals and Waterways, Vol. 3-4, evidence of Hutchins, p.54, London.

Loud protests also came from traders of Evesham and Pershore arising from a requisition read before the Stratford Canal Committee in 1852. Since its opening in 1852 the O.W.W.R. had carried coal from Leicester and Derbyshire to Pershore and Evesham at a reduction of 3d. per ton/mile[63] in order to attract coal traffic. In response, the Committee resolved that a reduction of 6d. per ton/mile should be allowed on coals passing along the Stratford Canal to Pershore and Evesham. Grain and sundries travelling by canal from Stratford to King's Norton were to be reduced by ½d. per ton/mile. Such a smaller reduction, amounting almost to nothing, suggests the reluctance of the O.W.W.R. Company to effect any reduction that might encourage grain traffic on the Stratford Canal. To another application on 5th August, 1852 for a further reduction of tolls in conformity with other canal companies, the Board of Directors of the O.W.W.R. replied that "in the opinion of the Board such reduction of tolls is inexpedient" and that "the Board declines to consent to reduction in the existing rate of tolls"[64]. Similarly, the Board refused reduction of tolls on salt from Droitwich requested by the Canal Company[65] and put an end to the reduction allowed on boats passing along the canal and down the River Avon[66].

The attitude of the O.W.W.R. is clearly contrary to its evidence at the Royal Commission of Enquiry in 1906 that it did not strangle the canal. Though the better facilities and greater speed afforded by the railways diverted some of the canal traffic, the

---

(63) B.T.H.R., Minute of the Stratford Canal Company, SCN 1/4. 24th June, 1852.
(64) B.T.H.R., SCN 1/4, op.cit., 5th August, 1852.
(65) B.T.H.R., SCN 1/4, op.cit., 20th October, 1855.
(66) B.T.H.R., SCN 1/4, op.cit., 20th December, 1856.

railway company naturally wished to carry traffic by rail and not by water, since otherwise they would be maintaining a competition with themselves. Such local traffic like lime and limestone as would help reduce their deficit on canal working without damaging rail transport between Birmingham and London was encouraged, but not through traffic to the independent Worcester-Birmingham and Warwick Canals which tended to be competitive[67]. Thus, deliberate intention on the part of the O.W.W.R., high tolls, lack of dredging, closure for leisurely repairs, and a lack of effort to attract traffic paralysed the Stratford Canal. Tolls fell steadily from £6,760 in 1860 to £1,905 in 1900.

Meanwhile the independent[68] canals had been struggling to maintain their viability in the face of railway rivalry. In 1845 the Grand Junction Canal Company tried to amalgamate with the Warwick and Oxford Canal Companies and to draw up a comprehensive through toll agreement between London and Birmingham because the Oxford Canal had been using the advantage of its central position[69] to charge more than necessary.

---

(67) See B.T.H.R., SCN 1/4, op.cit., 24th June, 1853, 5th & 11th, May, 1854.

(68) The four mile Oxford Canal forms an important link between the Grand Junction Canal at Braunston and the Warwick-Napton Canal at Napton which together formed a direct route between Birmingham and London. The high rate charged on the Oxford Canal would affect traffic rate on the two latter canals, thus driving traffic from them on to the L.N.W.R.

(69) The independent canals were those not bought by a railway company. All the canals in the study area fall under this group, except the Stratford Canal.

Thus, there was a charge of 1¾d. per ton/mile on the Oxford Canal for coal transport and 3d. per ton/mile for other goods to London while the Grand Junction Canal charged ¼d.per ton/mile for coal and ½d. per ton/mile for other goods to London. The Grand Junction Canal, therefore, appealed to the Oxford Canal on 9th October, 1844, for toll reduction to correspond with the recently advertised toll of ½d. per ton/mile for coal on the London-Birmingham Railway[70]. The appeal was turned down out of hand by the Oxford Canal; again, on 12th May, 1845[71], the co-operation of the Oxford Canal Company was requested, but without success. Furthermore, on 14th January, 1853[72] the Oxford Canal Company refused to attend a meeting of delegates of Canal Companies held at the Grand Junction Canal Office in London to consider a policy on railway and canal amalgamation, and especially on the proposed union with the L.N.W.R., Midland and North Staffordshire Railways. In refusing the invitation the Company said it could not be party in "inducing the Committee of the House of Commons on Railway and Canal Amalgamation to report in favour of a principle of legislation, which in its application would benefit one (Grand Junction Canal) canal company at the expense of others[73]".

It is apparent that the reluctance of the Oxford Canal Company to co-operate was due to its dislike of the Grand Junction Canal

---

(70) B.T.H.R., Minutes and Reports of the Proprietors of the Oxford Canal. OXC1/6, 9th October, 1844.

(71) B.T.H.R., OXC1/6, op.cit., 12th May, 1845, 10th December, 1845.

(72) B.T.H.R., OXC1/6, op.cit., 27th January, 1853.

(73) See B.T.H.R., OXC1/6, op.cit., 27.1.1853.

Company in particular, because the Oxford Canal Company had initiated an agreement with the L.N.W.R. when most of the traffic along its canal was being diverted. This agreement resulted in an equal division of coal traffic via the two routes, one by canal and one by rail to Oxford and Banbury. On the basis of this agreement tolls on coals from Longford to Oxford were reduced instantly to 2d. per ton/mile to comply with that on the L.N.W.R.[74]. However, by 1857 a satisfactory agreement for toll charges was reached between the Midland Canals, the L.N.W.R. and the G.W.R. leading to more stabilized tolls.

Another factor was to militate against the canals. Unlike the railways, the canal proprietors were not carriers, but merely toll-takers. Since they did not do their own carrying, they did not have so vital an interest in the state of the canals. Moreover, manufacturers who wanted to send goods by canal had to go to more trouble than if they had wished to despatch by rail. They had to find a canal carrier and entrust him with the necessary money to pay tolls and charges on the trip. However, by 1845[75] an Act was passed to allow canal companies to act as carriers, and to enable them to facilitate through-traffic rates by varying tolls or by leasing canals to one another. In view of the powers under which the canals were originally constituted (built by independent individuals and groups) they varied much more than was the case between railway companies.

---

(74) B.T.H.R., OXC1/6, op.cit., 6th February, 1852.

(75) H.M.S.Co. Canal Clauses Act, 1845, 8 & 9 Vict. Cap.42 Section 3. London. The railways were authorized to undertake the carrying of traffic on their own railways but at the same time provide reasonable facilities for interchange of goods with other companies, thus strengthening the power of railways in view of competition. See 8 & 9 Vict. Cap. 42, 1845, Section 86-69.

Hence it was impossible to maintain a uniformity of toll, rate and regulation as was practicable with railways. Worse still the Railway and Canal Traffic Act of 1854[76], aiming at a better regulation of the traffic on railways and canals, and stipulating that all reasonable facilities for through canal traffic should be provided, never came to fruition. Another Act in 1875 re-defined these facilities and insisted that all railway-owned canals should be properly maintained, while also prohibiting the railways from making canal toll agreements under the 1845 Act. This too proved abortive. A further Act[77] established by the Canal Commissioners followed in 1888 with powers to fix through-tolls, but again without success, due to the reluctance of the independent canal companies to co-operate. Divergence on tolls and jealousies of Canal Companies, especially the Oxford and Grand Junction Canal Companies, were not only a hindrance to a successful carrying business, but also a disadvantage when facing an opponent of the system as a whole.

The Last Period of Commercial Carrying

The struggle of the Warwickshire Canals with the railways, especially with the London-Birmingham and the Great Western Railways, resulting in catastrophic reduction of canal rates to uneconomic levels, as already discussed, led to many attempts to save the canals from complete failure. The first major step was the formation of the Royal

---

(76) H.M.S.O. Railway and Canal Traffic Act, 1854, 17 & 18 Vict. Cap. 31, p. 202, London.

(77) H.M.S.O. Railway and Canal Traffic Act, 1888, 51 & 52 Vict. Cap. 25, p. 271, London.

Commission on Canals and Inland Waterways[78] in 1880 which sat in 1888, 1898 and 1905 to investigate the major problems and identify the factors that had caused the decline; the results of these enquiries were published in twelve volumes between 1906 and 1912. A comparison of local annual tonnage shows an increase between 1898 and 1905 amounting to an increase of 25% in tonnage on the Coventry Canal, 19% on the Oxford Canal and 50% on the Warwick-Napton Canal. These were offset to some extent by a decrease of 24% and 76.8% on the Warwick-Birmingham and Stratford Canals respectively. The loss of tonnage on the Warwick-Birmingham Canal might have been due to the external nature of most of its traffic, for it formed part of the important through route from London to Birmingham along which travelled bricks and iron from the Black Country, and general merchandise moving up from London. Local agricultural produce carried on this canal was minimal[79], while there were few local industries along it to generate local traffic - a situation which greatly contrasted with that of the Warwick-Napton Canal where the Stockton Blue Lias Lime and Cement Works received coal from the Glascote district, and distributed

---

(78) H.M.S.O. Canals and Inland Navigation, Vols. 1-12, 1906-1912, London. Though these reports give useful information about the state of the canals during the first decade of the twentieth century the statistics on traffic returns leave much to be desired. There is a great discrepancy in the canal returns of 1888 and 1898 due to the subdivision of the traffic in Part II of the canal returns in 1898. Through traffic is divided into "loaded but not discharged on the canal" and "not loaded or discharged or discharged on the canal". By this method of classification the same traffic is included 2, 3, 4, 5 or even more times over as if it were independent traffic. This classification poses a considerable set back in any attempt to analyse the overall traffic of the Warwickshire Canals.

(79) H.M.S.O. Royal Commission on Canals and Inland Waterways, evidence on Agriculture by Fred Morton, 19th June, 1906, Vols. 1-2, p. 184, London.

lime locally. The reasons for the crippling decline of traffic on the Stratford Canal, controlled by the Great Western Railway, have been discussed at length at the beginning of the Chapter. It is clear that the Great Western Railway tried to eliminate traffic on the Stratford Canal by reducing railway tolls, and deliberately closing the canal for long periods of unhurried repairs[80]. As one might expect, despite the fall in traffic returns the nature of the goods carried changed very little. The picture of steady traffic returns on most of the Warwickshire Canals, as presented by the Royal Commission reports of 1898 and 1905, was soon to deteriorate - for the recommendations of the Royal Commission in 1906 that a Central Waterways Board should be set up to take over, improve and develop the canals and inland waterways were held up by World War I. On the outbreak of war[81], the railways and consequently the Stratford Canal, controlled by the Great Western Railway, were immediately controlled by the State through the Railway Executive Committee, but nothing was done by the government to bring the independent canals under State management[82], until rather belatedly. The control of the latter canals by the State in 1917 was two and a half years too late, considering that most of the canal traffic had disappeared by then. Moreover, most canal companies had lost many of their best employees, either by enlistment[83], or by the

---

(80) For a full discussion on this problem see pp. 139-143.

(81) Savage, C. I., (1957). Inland Transport, History of World War II, pp. 21, 82-4. Longmans, Green and Co., London.

(82) All the Warwickshire Canals fell within this category except the Stratford-upon-Avon Canal.

(83) Fisher, G. (1905), ed. "Transport Workers Battalion, Boatmen in Army". Canals and Waterways Journal, Vol. I, p. 29, Birmingham.

operation of the military service acts or by the attraction of better paid employment elsewhere. The effect of the war was clearly demonstrated in the case of the Coventry and Oxford Canals, for between 1914 and 1916 the total annual tonnage on the two canals fell by over 61,000 tons and 89,000 tons respectively. The Warwickshire Canals together with other Midland canals carried 23% less in 1916 than in 1914. The importance of the canals to the war effort between 1914 and 1918 had been comparatively small[84], and the attempt to relieve the overworked railways of congestion by putting more traffic on the canals came too late to succeed. The situation continued to deteriorate till 1920 when a Departmental Committee[85] was formed under the chairmanship of Neville Chamberlain to consider what could be done to make the canals efficient again. The Committee advocated the establishment of Public Trusts, each responsible for a particular group and subsidized by the State, but no action was taken.

The decline of the canals as commercial waterways was reflected in the gradual abandonment of wharves, a century earlier the scene of vigorous economic activities on the canals. Fig. 42.1, based on the 1" and 6" Ordnance Survey maps between 1919 and 1929, shows the existence of only 58 wharves with a reduction of no less than 77 since 1904 (Fig. 31). The canals mostly affected were the Coventry and Oxford Canals where wharves lost their function because collieries previously connected by canal were then served by a railway or because the collieries were closed due to exhaustion. On the Coventry Canal, for example, the

---

(84) Savage, C. I. (1957), op.cit.

(85) Ives, M. L., (1957). The Problem of Our Inland Waterways, p.3. British Transport Commission, London.

Source for Figs. 42.1, 42.2, 43.

1. 1" Ordnance Survey. Sheet 53, 62, 72, 73.
2. 6" Ordnance Survey.

   Stratford Canal SP, 07 N.E., 17 N.W., 17 S.W., 17 S.E., 16 N.E., 16 S.E., 25 N.W.

   Warwick Canals SP, 46 S.W., 36 S.E., 36 N.W., 26 N.E., 26 N.W., 16 N.E., 17 S.E., 17 N.E., 18 S.W.

   Coventry Canal SP, 38 N.E., 38 S.W., 39 S.W., 39 N.W., 29 N.E.

   Oxford Canal SP, 38 S.E., 48 S.W., 47 N.W., 47 N.E., 57 N.W., 57 S.W., 56 N.W., 45 N.E., 45 S.W.

Note:

The L.M. & S.R. was formed in January 1923 by the amalgamation of the North Western and the Midland, the Caledonian, the Furness, the Glasgow and South Western, the Highland and the North Staffordshire Railways to form the largest joint-stock railway company in Britain.

LOCATION OF WHARVES IN WARWICKSHIRE 1929

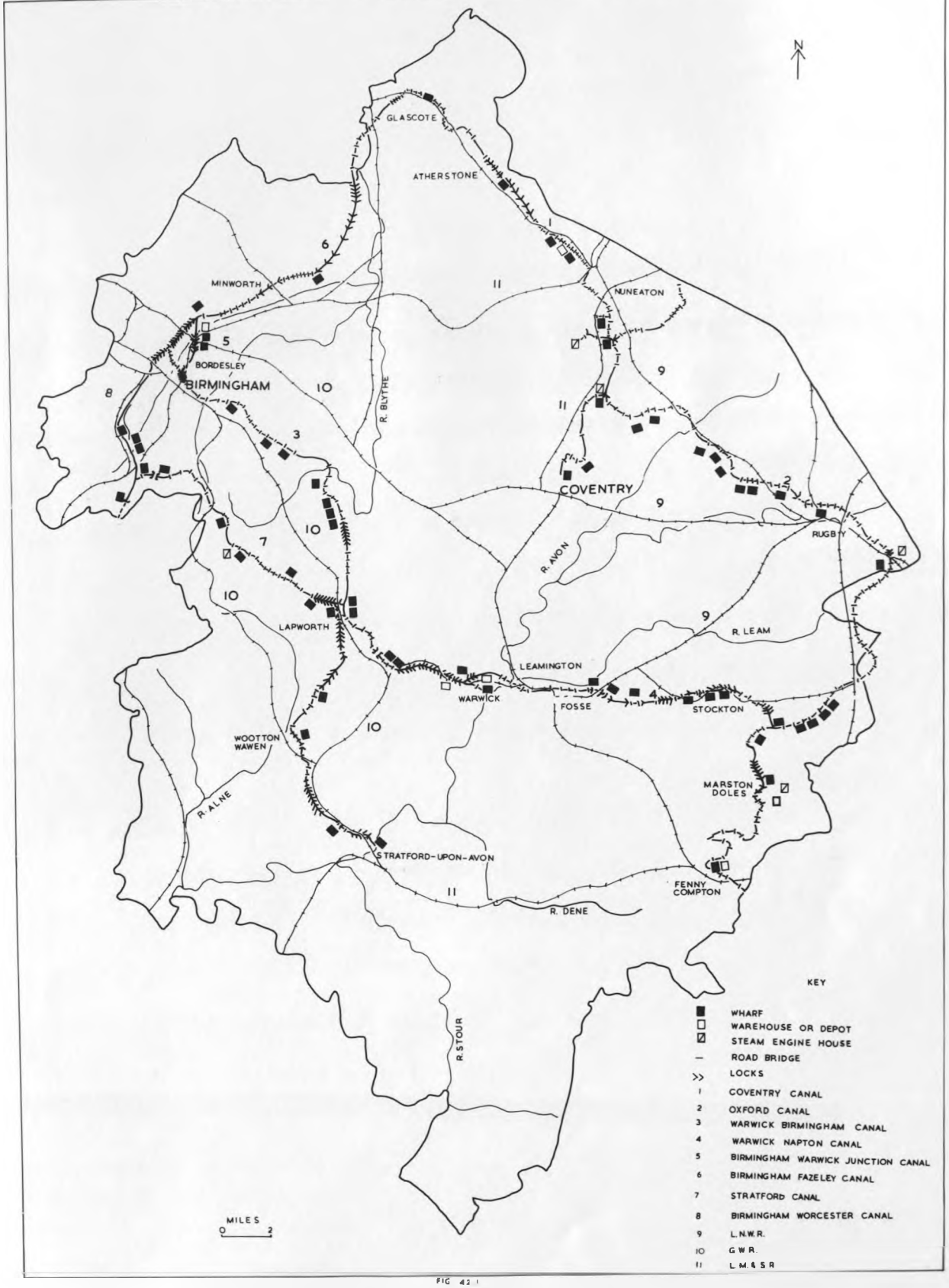


FIG 42.1

wharves leading to the Collycroft, and Haunchwood were no longer in use in 1929, for the collieries were served by rail sidings connecting the main London Midland and Scottish Railway as well as the London-North-Western Railway which supplied the Nuneaton and Coventry areas. There is evidence that the total annual tonnage of coal from Griff was distributed locally entirely by rail[86] and road in the 1920s. Similarly, the wharves at Baddesley, Wilnecote and Oldbury declined in importance due to the change from canal transport to road and rail both of which were faster and more efficient, while the Pre-Cambrian quartzite quarries of Caldecote Hill and Hartshill changed over to road transport. However, such collieries as that in Glascote distributing coal to the lime and cement works at Southam and Hams Hall power station[87] (Castle Bromwich) retained their wharves. The Coventry Canal depot also maintained its wharf for receiving timber and cement from Rugby for maintenance of the canal banks, and coal from the North-East Warwickshire coalfield. On the Oxford Canal most of the wharves located at small settlements, and particularly, those located along the old canal loops which were cut off during the improvements of the northern Oxford Canal between 1829 and 1834 were closed. Wharves at Hopsford, Cathiron and Cosford which used to receive coal from Wykin in Sowe parish were no longer in use due to exhaustion and consequent closing down of the Wykin collieries in 1921. Wharves at settlements like Brinklow and Hillmorton located at the junction of the Oxford Canal, the L.N.W.R. and the Lutterworth Road, and the Northampton Road respectively were still in use. It would seem that wharves, located at a junction with either road or rail so that one mode of transport complemented the

---

(86) C.R.O., Griff Colliery, 1888-1931. CR 1254.

(87) Information from M. J. Hayden, Samual Barlow Company Ltd., W. H. Willday and Company Ltd., Glascote, 1973.

other, were more likely to function longer. However, where road or rail transport was clearly favoured, the canal soon lost its traffic with consequent disappearance of its wharves. For example, wharves serving works, located along the canals, and later connected by railways gradually changed over to rail transport resulting in obsolete wharves. Such cases include the Small Heath arms factory on the Warwick-Birmingham Canal which changed over to the G.W.R. for distribution in the 1920s, while Nelson and Dale Co. Ltd., (Emscote) manufacturing gelatine, and using the canal extensively in bringing in raw materials (such as dried buffalo skin) from London, changed over to the G.W.R.[88] (complemented by road) in 1928 for distribution of its manufactured products. The Weedon branch of the L.M. and S.R. also attracted traffic from the Warwick-Napton Canal at Long Itchington and Birdingbury, leading to the disappearance of the wharves in these two villages.

With the continual deterioration in canal traffic and consequent dwindling of the distribution of wharves, an attempt was made to increase the efficiency of the canals by the formation of the Grand Union Canal in 1929 by the amalgamation of the Regents Canal with the Warwick Canals, the Leicester, Grand Junction, Old Grand Union and Hertford Canals[89]. This union benefited the Warwick Canals which formed a major link between London and Birmingham, and a very good service of motor-powered canal boats plied regularly on the Warwick Canals generating a large through traffic[90]. Most of the traffic was

---

(88) Nelson and Dale Co. Ltd., Letter Book, 1928. C.R.O. CR 1294. There is evidence in the letter book, asking the company agent in London to send the hides by the G.W.R. from London to Emscote.

(89) B.T.H.R. (1929-1947). Grand Union Canal Company, U.C.C.

(90) B.T.H.R. (1929-1947). Canal Transport: The Grand Union Canal Company. passim. Lib 3/39.

mainly external, local traffic having been replaced by road and rail, for an analysis of traffic at Napton Junction shows that the goods carried on the Warwick Canals were very miscellaneous, including steel, aluminium, electrical equipment, batteries, fire extinguishers, cylinders and scrap brass[91] carried from London to Birmingham. The nature of these goods contrasts sharply with traffic on the Coventry Canal which was invariably coal, originating from the North-East Warwickshire coalfield with the Newdigate colliery supplying 24.1% of the coal southward bound to Oxford, Banbury, Uxbridge and Campden Town. Despite the experience of neglect and deterioration during and immediately after World Way I, the government still decided not to bring the canals under State control, but granted them a subsidy of 50%[92] of the tolls paid to them in 1939. This grant helped to check the decline in canal traffic, but still the government did not bring the canals under the absolute control of the State. During World War II, the Warwickshire Canals like most of the English canals suffered loss of staff and traffic, resulting from closure of four mines of the eastern outcrop in the Warwickshire coalfield, and decline in coal output.

Before the War, the Grand Union Canal had depen ded to a large extent on coal traffic, but with the decline in coal output between 1939 and 1945 the traffic fell. To improve traffic flow the Ministry of War Transport had an official based on the Warwickshire coalfield to help with the organisation of the distribution of coal to available barges, but this was not a conspicuous success. The deterioration of the canals continued till 1948 when they passed directly from government control

---

(91) B.T.H.R. (1942). OXC 4/107.

(92) Savage, C. I. (1957). op.cit.

to the British Transport Commission, together with all other canals in Britain. The first major task of the Commission in 1948 was to tackle the back-log of maintenance between 1948 and 1953. The expenditure and maintenance and repair of most Warwickshire Canals over this period exceeded the income. The net deficit of the Grand Union Canal[93] including the Coventry, Warwick and the northern section of the Oxford Canal was £52,660 in 1951, and £55,019 in 1952 emphasizing the considerable loss at which goods were carried. Indeed, the deterioration in the canal trade was reflected in a correspondingly reduction of wharves as Fig. 42.2, based on the 6" Ordnance Survey (1951-5), shows. Only forty-five wharves were then in use - all depots or workyards where maintenance materials like cement and wood were stored, and so were generally those at the junction of one canal with another as at King's Norton, Lapworth, Napton, Hawkesbury and Fazeley. In addition, works located along canals and using coal or receiving raw materials and sending off finished products, continued to use the canal as has already been discussed, whilst a few coal wharves like that of Glascote continued to function till about 1954.

The problem of encouraging more traffic on the canals still remained controversial, and through a persistent agitation for their optimum use, a Board of Survey under Lord Rusholme was appointed in 1954 to consider whether the maximum economic advantage was being derived from the canal system, and what steps should be taken about any canals which could no longer be used economically[94]. The major conclusions, which were quite convincing, pointed out the declining traffic along the

---

(93) British Transport Commission (1955). "Canals and Inland Waterways", Report of the Board of Survey. p.90. London. It is difficult to estimate the deficit of individual Warwickshire Canals because they were grouped into divisions. The Coventry, Warwick and Oxford Canals fell under the South-East Division, while the Stratford Canal came under the South-West Division.

(94) Report of the Board of Survey (1955). op.cit.

LOCATION OF WHARVES IN WARWICKSHIRE 1955

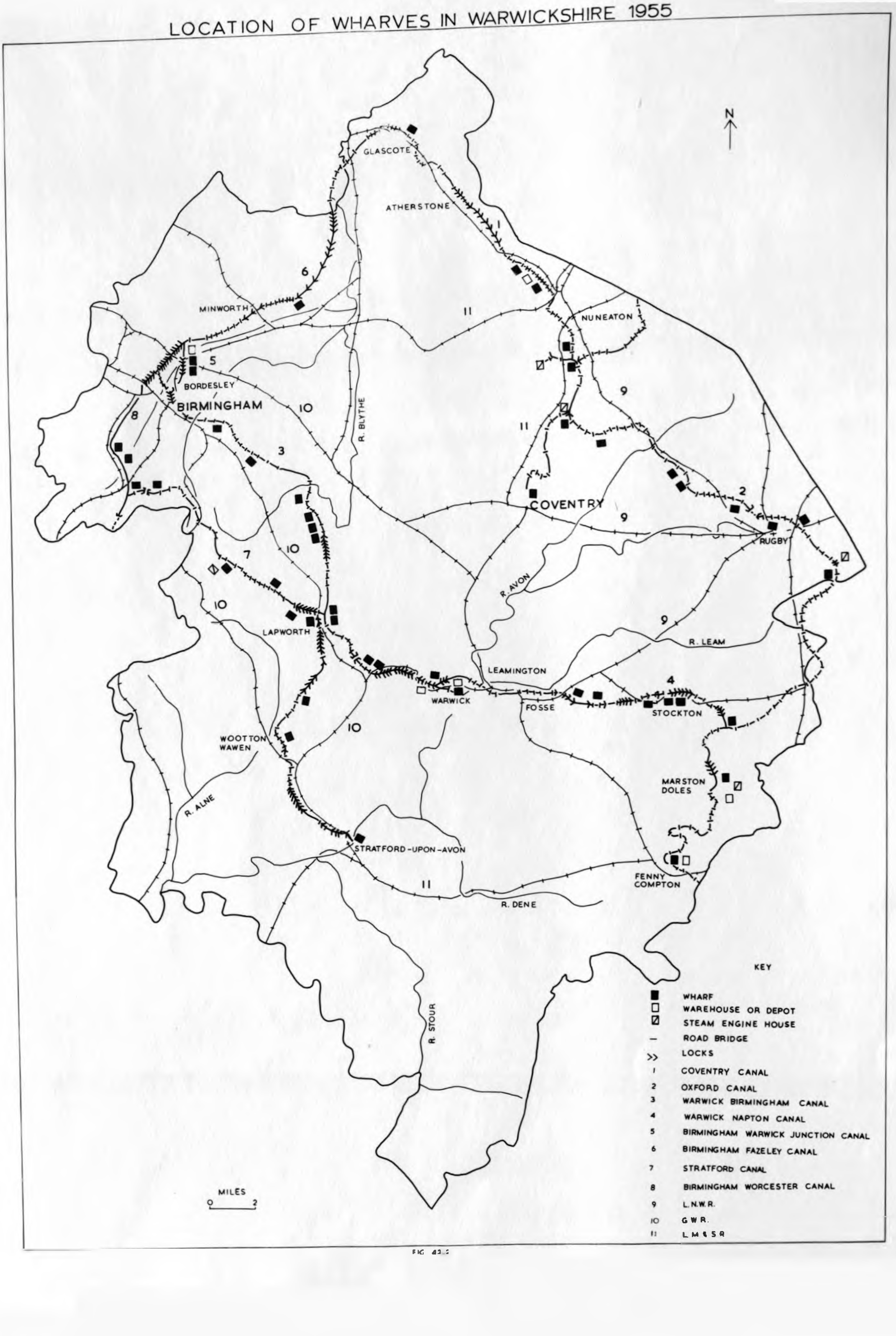


FIG. 42

Warwickshire Canals as well as on all the narrow canals of England since the advent of the railways and the development of speedy vehicular road transport. Very heavy expenditure would be required to put them in a good physical state in order to make them function economically, for, as was pointed out before, there were substantial losses on all the canals under consideration, and many private carriers, especially the "Number Ones"[95], carrying coal from the North-East Warwickshire coalfield had gone out of business and had not been replaced. In view of this serious position, the Board recommended the establishment of a separate organisation to deal with the waterways under the control of a general manager, who could give them his undivided attention. To this end the waterways were divided into three categories - the Warwick Canals fell within Group II[96], those to be retained and continue in use. These were to be maintained to an adequate standard of efficiency[97], and the development of traffic was to be encouraged in every way. Thus, it was proposed to have the canals broadened to accommodate larger craft on the basis advocated by some of the members of the 1906 Royal Commission, but eventually this was not accepted due to

---

(95) The Number Ones were the private carriers, who worked the narrow boat with the help of their families, carrying coal from the North-east Warwickshire coalfield to Banbury and Croxley.

(96) Group I consisted of waterways to be developed and Group III those having insufficient commercial prospects to justify their retention for navigation.

(97) H.M.S.O. (1958). Report of the Committee of Inquiry into Inland Waterways. p.30-2, London.

problems of cost and practicability. Nevertheless, the general level of maintenance was raised, resulting in an intensive drive for traffic, especially on the Warwick Canals which benefited from the introduction, by the British Transport Commission, of two hundred narrow boats (each with a capacity of twenty five tons) working between London and Birmingham. Unfortunately, this move certainly did not improve the flow of traffic, for goods were still being carried at a loss[98] and by the 1960s commercial traffic had practically ceased on the local canals except that to the industries along the five and a half mile stretch of the Coventry Canal, the Stockton Lime and Cement Works, and the Chemical Works at King's Norton on the Stratford Canal.

The fate of the canals from the beginning of the railway era was a sad one. Some of the major physical and economic problems confronting the waterways and giving their strong rivals, the railways, the upper hand from the start, have been described. The controversy on this subject was prolonged, but the outcome was the ousting of an older, slower means of transport by a much more efficient one. Though canal transport had stood little chance against the power of the railways, it had tried in several ways to establish a viable economic basis, but the might of the railways, coupled with increasing road competition in the mid-nineteenth century, was too much. However, the period of decline was eventually to be arrested by a new phase of development, with an emphasis on recreation and leisure, which will be discussed more fully in the next chapter.

---

(98) Ibid. p.32.

CHAPTER SIX

THE CHANGING FUNCTIONS OF THE WARWICKSHIRE CANALS 1964-1973

The significance of the Warwickshire Canals and their early economic impact on the county has been fully discussed in Chapters Two and Three, but their importance in the 1830's was soon to decline due to improved techniques of communication, setting new standards which the established canals could not attain. This technical change, coupled with alterations in trade patterns, disturbed the equilibrium of the existing canal system leading to a marked decline in efficiency compared with rail transport, whose advent in 1838, and later development of speedy vehicular traffic, had led to a gradual decline of canals. Figs. 28, 42.1, 42.2, illustrating the reduction in the number of wharves between 1904, 1929 and 1955, emphasize the extent of canal decline. By 1964, as Fig. 43 shows, very few wharves remained in use for no settlements and very few works along the canal received or despatched goods by water[1]. For example, John E. Sturge's chemical works, sited conveniently along the Stratford Canal, received limestone from Buxton in Derbyshire and coal from Dudley and North-East Warwickshire, and distributed precipitated calcium bicarbonate locally by the canal. Similarly, the Blue Lias Lime and Cement Works of Stockton made use of the Warwick-Napton Canal for carrying cement to their depot in Bordesley, whence the cement was distributed in the Birmingham area by road.

---

(1) Information from E. Sturge Ltd., 1973, King's Norton.

LOCATION OF WHARVES IN WARWICKSHIRE 1964

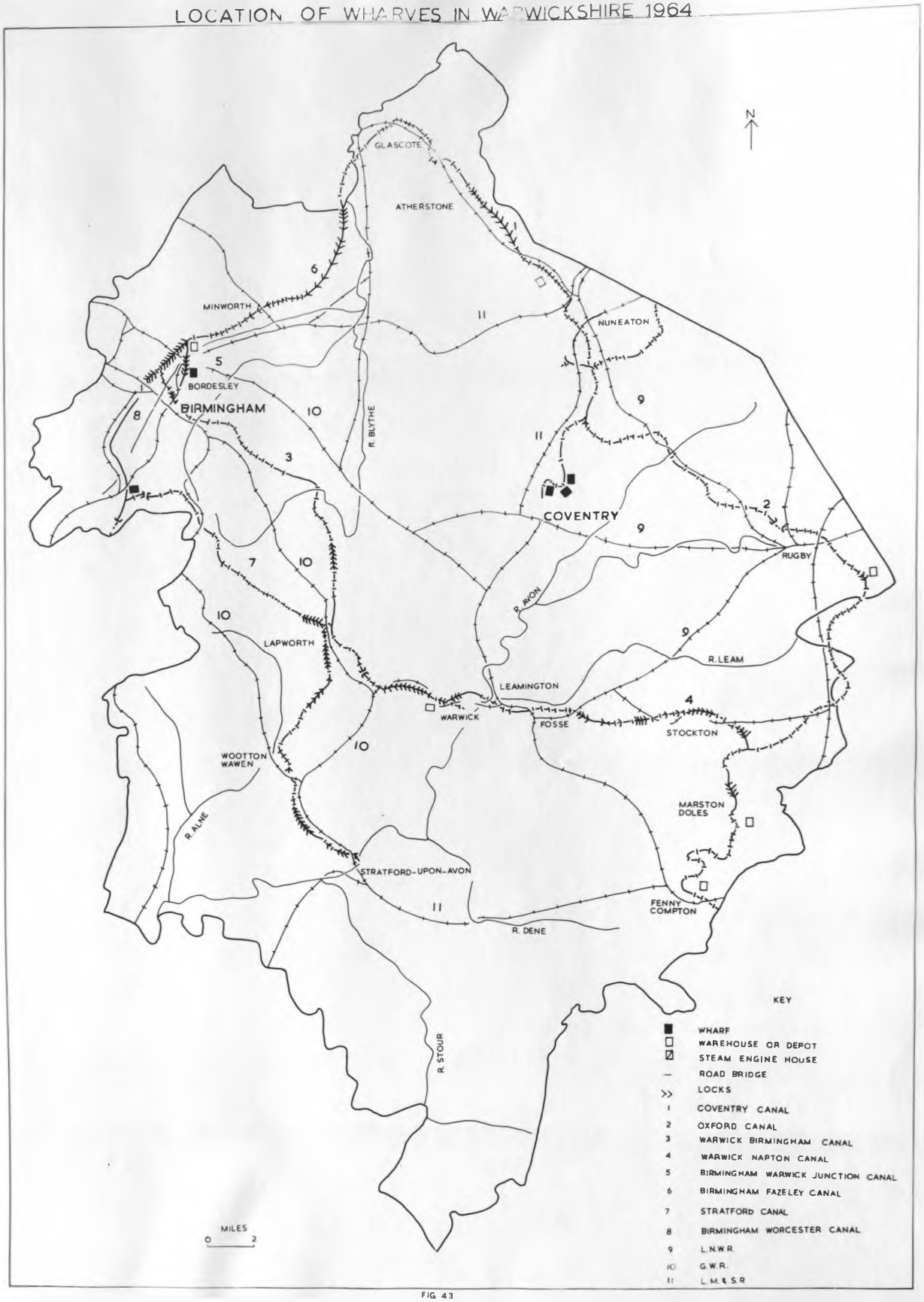


FIG. 43

A few wharves serving industries like the West Midlands Gas Board[2], British Celanese[3] and Ward Brothers and Company Ltd.[4], located along the Coventry Canal, found it valuable for bringing in coal from the North-East Warwickshire coalfield, while British Celanese also used it for transporting solid waste to a tip outside Coventry. In addition to these wharves were those of the canal companies' warehouses and depots which were retained for receiving coal, cement and other bulky materials for repair and maintenance of the canals, as has already been pointed out. With such a profound deterioration in commercial carriage on the canals, the once vaunted artery of the Industrial Revolution has recently been adapted for recreation and leisure, a function which, although usually considered to be very modern, may, however, be traced back to the Acts of Parliament authorizing the construction of the canals. For in these early days of development landowners, whose property adjoined the early canals, were given rights to fish in the canals and to use pleasure boats, whilst farmers whose lands bordered the waterways were also granted the right to use canal water for watering stock. Notwithstanding, it would seem that, apart from fishing, none of these functions was of any great importance during the period of commercial carrying on the canals. When, however, it became clear that the canals could no longer pay as commercial waterways the Committee of Inquiry into Inland Waterways, 1958, decided to authorize fishing in any nationalised canal (including the right of British Waterways to lease the fishing to angling clubs) and to encourage pleasure boating officially. The problem of making the canals viable and adaptable to this new course has been discussed at length

---

(2) Information from P. N. Nicholls, West Midlands Gas Board, Coventry, 1973.

(3) Information from C. K. Willmott, British Celanese, Coventry, 1973.

(4) Information from J. B. Ward, Ward Brothers and Company Ltd., Coventry, 1973.

elsewhere[5]. The interim report was produced by the British Waterways Board in July 1964 on the future of the waterways, and in December 1965 the result of its findings were published in the "Facts about the Waterways"[6]. All the canals in the study area were, however, designated cruiseways[7] in 1968, and since then these canals have witnessed increasing recreational activity. The reservoirs, originally constructed to supply the canals with much needed water, have also shared in this recreation boom. The first part of the present chapter examines the recreational uses of canals for pleasure cruising, angling, walking and picnicking. The last section considers non-recreational uses, (from water supply to industrial concerns) which gain more revenue for the B.W.B. than recreational activities.

Pleasure Cruising

The cruising waterways[8] in the study area are, largely, rural wandering through small towns and the countryside though part

---

(5) British Transport Commission (1955). "Canals and Inland Waterways". Report of the Board of Survey. London. H.M.S.O. (1958). Report of the Committee of Inquiry into Inland Waterways. London. British Waterways Board (1964). The Future of the Waterways: Interim Report of the Board. H.M.S.O. London. Vide H.M.S.O. (1967). British Waterways: Recreation and Amenity, September 1967, London. This states that non-commercial canals, like those of Warwickshire, should be opened for recreational use as well as for other activities like drainage and water supply.

(6) B.W.B. (1965). Facts about the Waterways, London.

(7) H.M.S.O. (1968), Ministry of Transport Act, Section 104, 12th schedule, London.

(8) B.W.B. (1965). Facts about the Waterways, p.25, London.

of the Grand Union Canal[9] runs through Birmingham, and five and a half miles of the Coventry Canal between the canal basin at Leicester Row and the Hawkesbury Junction also pass through industrial areas. The popularity of these canals as cruiseways is best explained in the light of the growth of water recreation in England as a whole. In his report[10] Michael Tanner discusses the factors underlying the growth of water recreation. Expansion of water-based activities did not get under way until the early 1950's, but since then nearly every activity has increased in popularity, and this is particularly true of sailing, trout fishing in reservoirs and inland pleasure cruising. The factors responsible for growth spring from more general changes in the pattern of leisure and recreation in Britain. Growing prosperity and increasing leisure time, both in the form of paid holidays and reduction of the working week, have been accompanied by the rising popularity of individual - and small - group activities, especially those requiring relatively less costly equipment like canal cruising and angling.

---

(9) In 1929 the Warwick Canals became part of the Grand Union Canal which was formed by the amalgamation of the following canals:

Grand Junction Canal (1793)*
Leicestershire-Northamptonshire Union Canal (1793)
Warwick-Birmingham Canal (1793)
Warwick-Napton Canal (1794)
Grand Union Canal ("Old" Grand Union Canal from Foxton to Norton, 1810)
Regent's Canal (1812)
Hertford Union Canal (1824)
Birmingham-Warwick Junction (1840)

The last canals to join the Union in 1932 were Loughborough Navigation (1776), the Erewash Canals (1777) and the Leicester Navigation (1791).

* The years in brackets indicate when the canal was established.

(10) Tanner, M. (1970). "Towards Water-based Recreation. A study of coastal waters in England and Wales", This is a draft report published in 1971 by the Sports Council, London.

A comparative review of pleasure boats[11] counts from 1967 to 1972[12] illustrates the steady increase of this form of recreation in Warwickshire from year to year (see Table 5). The average in boat numbers in Warwickshire after 1967 has been 13.4% per annum compared with a national increase of only 3.4%[13]. The total number of pleasure boats in 1968 showed a remarkable increase of 34% over that of 1967. This represents the highest growth ever experienced in Warwickshire. This was followed by a 20% growth between 1969 and 1970. The only period of decline was in 1969 when there was a slight drop of 3.7% compared with totals of 1967. It is not very difficult to explain this fall. As Table 5 shows, there was an expansion in pleasure cruising on all the canals except the South Oxford Canal where there was a drop of 114 boats due to the closure of this section of the canal in July 1969 for repairs, and traffic had not yet been fully re-established when the statistical counts took place. But for this closure the normal growth might have been maintained. In 1971, for example, the number of boats rose by 7.1% and in 1972 by 9.7%. The annual increase emphasizes the ever growing popularity of these waterways for cruising. The canal with the greatest density of boats was the Stratford-upon-Avon Canal. Its notional thirty boats per mile is high both by the standard of other canals in Warwickshire and by national standards - the density of the Stratford Canal being excelled in 1971 only by that of the British Avon (Hanham to Bath) as shown in Table 6. So far the discussion has been concerned with all boats counted on the canals, irrespective of whether

---

(11) Pleasure boats are divided into two distinct groups - those crafts used by their private owners and those hired from pleasure cruising firms.

(12) Pratt, F. (1967-1972). Recreational Use of Inland Waterways. B.W.B. London.

(13) Moon, F. (1971). Angling and Pleasure Boating on Inland Waterways. B.W.B. London.

Table 5

Pleasure Boat Counts [14] of the Warwickshire Canals, 1967-1972.

Canal	Miles	1967	1968	1969	1970	1971	1972
Coventry	31	131	138	150	172	193	227
Grand Union	45	231	297	501	536	687	695
Oxford Canal (N.)	29.75	184	230	252	235	275	287
Oxford Canal (S.)	49.5	160	313	199	324	400	408
Stratford	21.75	246	328	357	387	450	600
Total	177.00	952	1,306	1,459	1,654	2,005	2,217

(14) Ibid. Recreation counts are usually recorded annually on one day in summer, during August, the height of the cruising season, on all the canals at the same time when each enumerator is allocated a length of about five miles of waterway. The method of counting leads to understatement of the actual use of the waterway because the enumerator fails to count many of the boats travelling behind or ahead of him and those who visit the waterway after the period of enumeration. Moreover, counts could be affected by the weather which could be fine in one area and wet on the other. Also the count of pleasure boats are recorded during the week, but there is no doubt that more pleasure boats visit the canals during week-ends and public holidays. The statistics produced, therefore, give a general picture of the pleasure boats on the canals and show to what extent the popularity of the system changes from year to year.

they are ashore, moored or moving[15]. In Summer 1971 only 8% of the total pleasure boats in England and Wales were actually moving when counted whilst in Warwickshire 13% were moving, with 65.8% moored and 21.2% ashore. In effect, there was no canal with an average of much more than two boats cruising per mile. The southern section of the Oxford Canal from Napton ranks second in England and Wales after the Shropshire Union Canal with an average density of two moving boats per mile.

The density of all pleasure boats (Figs. 44-47) shows which canals are most popular with pleasure boating. The most important canal for cruising is the Stratford Canal with an intensity of thirty boats per mile in Summer 1971 as already stated. This canal boasts great scenic variety and attraction within a stretch of twenty-five and a half miles, winding through one of the most beautiful parts of rural Warwickshire. The wooded and delightful areas, particularly around Earlswood and Warings Green, are remniscent of the Forest of Arden which according to Dugdale[16] existed as far back as the fifth, sixth and seventh centuries.

Scenic beauty and the pleasant wooded and historical country of the Arden are not the only attractions. The Stratford Canal itself has its own attractions in the form of engineering feats, such as the flight of nineteen locks in Lapworth with side ponds to economise loss of water through lockage. There is also the iron trough Edstone Aqueduct, the second largest in Britain and spanning the Alne Valley, and the unique split iron divided bridges and the barrel vaulted cottages of the southern

---

(15) Vide supra reference No. 12. During the counts boats ashore are differentiated between those moored and those moving.

(16) Dugdale, W. (1656). Antiquities of Warwickshire, by Thomas, W. Pref. 3b. London.

Note: Figs. 44-47 based on the average annual statistical counts show the uniform intensity of cruising on the canals while Fig. 48 shows the varying popularity of the different stretches of each canal for cruising.

THE WARWICKSHIRE CANALS: INTENSITY OF PLEASURE CRUISING PER DAY (AUGUST 1967)

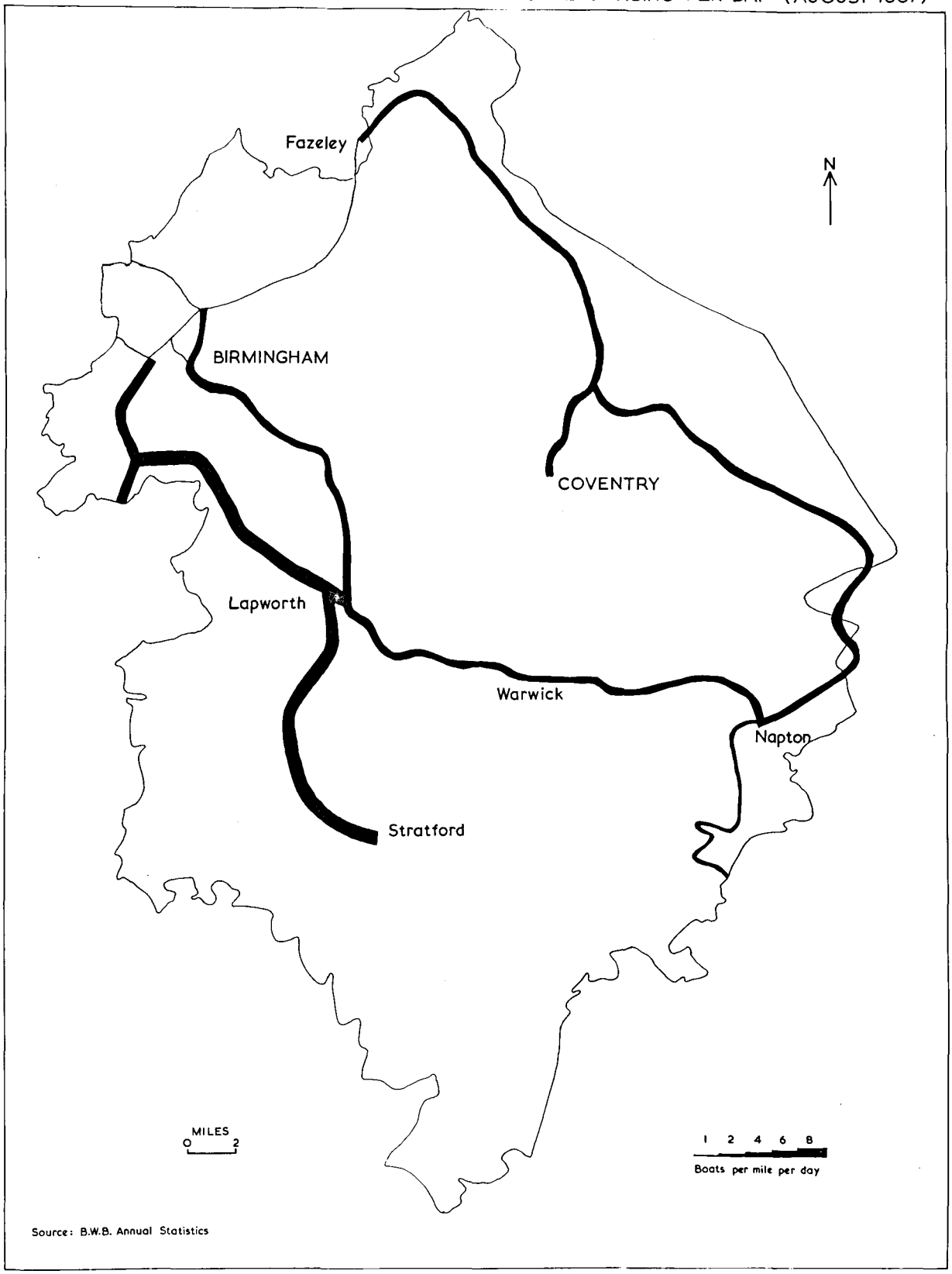


FIG.44

THE WARWICKSHIRE CANALS : INTENSITY OF PLEASURE CRUISING PER DAY (AUGUST 1969)

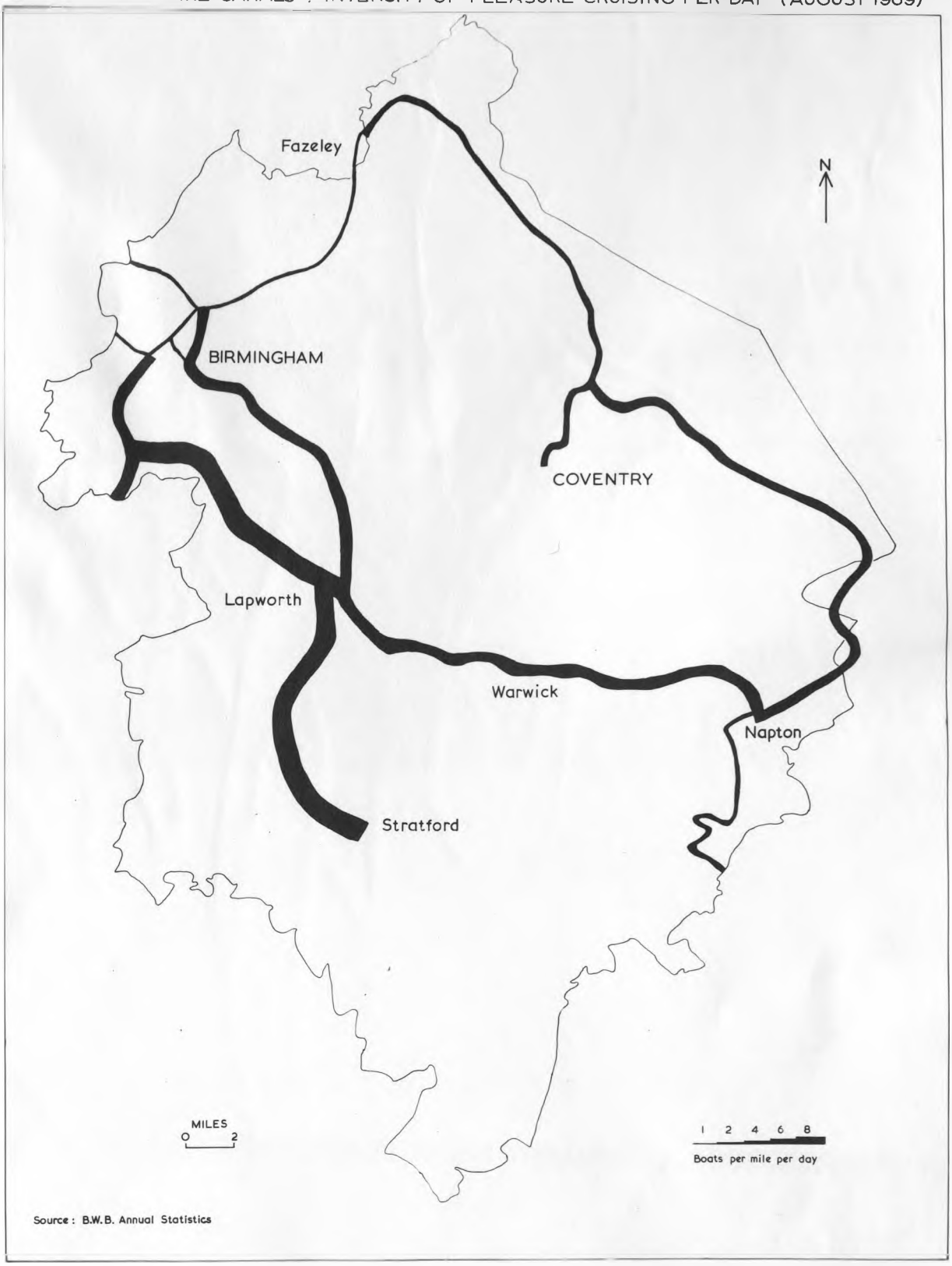


FIG.45

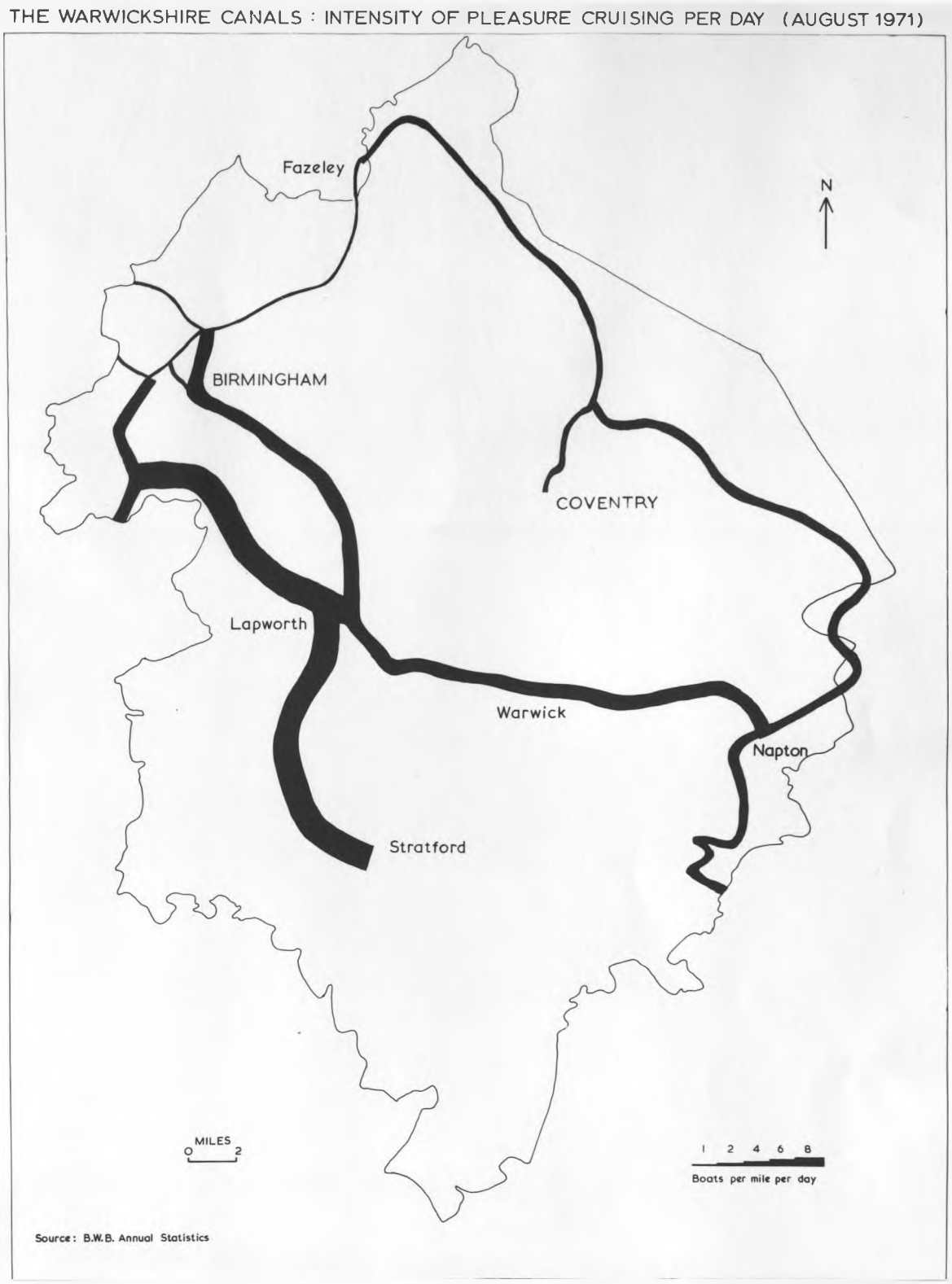

THE WARWICKSHIRE CANALS : INTENSITY OF PLEASURE CRUISING PER DAY (AUGUST 1971)
Fazeley
N
BIRMINGHAM
COVENTRY
Lapworth
Warwick
Napton
Stratford
MILES
0
2
1 2 4 6 8
Boats per mile per day
Source: B.W.B. Annual Statistics

FIG.46

THE WARWICKSHIRE CANALS : INTENSITY OF PLEASURE CRUISING PER DAY (AUGUST 1972)

FIG.47

Table 6

Density [17] of Pleasure Boats on Rivers and Canals in England and Wales

Rivers and Canals	Boats per Mile	
	1971	1972
Bristol Avon (Hanham to Bath)	42	-
Stratford-upon-Avon	30	33
River Lee Navigation	29	45
River Severn Navigation	24	24
Grand Union (Berkhampsted to Brentford and Slough Arm)	23	-
River Soar Navigation	22	23
Regents Canal (Hertford Union & Limehouse Cut	22	-

(17) Moon, F. (1971). Angling and Pleasure Boating on Inland Waterways. B.W.B. London. Vide Pratt, F. (1972). Informal Recreation on Inland Waterways. B.W.B. London. These counts were recorded in August and they show the density in Summer, which tends to decrease in winter.

section of the canal. Such factors contribute in no small way to making the Stratford Canal so popular amongst canal enthusiasts. Inspite of the overall popularity of this canal, the average of thirty-three boats per mile in 1972 is by no means evenly distributed. The most popular section with a density of forty-six boats per mile[18] is between Three Maypoles bridge and Wharf Lane bridge (Fig. 48) in a typical "Arden" country. In this section there is one cruising firm and the Earlswood Marine Services which are the origin and destination of many canal cruises. The fact that this length is accessible by the B 4112 road also contributes to make this section popular. Nearby is the Boatman's Rest (canal inn) where cruiser folk often refresh themselves on hot summer days. The next section of great popularity, with a density of forty-four boats per mile, is the feeder from the Earlswood reservoirs. This is mainly used by the Earlswood Motor Yatch Club and by a youth boating club. Another heavily used section is the Wootton Wawen stretch to Stratford through the reach from Wharf Lane bridge to Kingswood Junction (where the nineteen successive locks at Lapworth offset to a considerable degree the desire for cruising) is less well used.

Though the Stratford Canal is a popular route by itself, most canal cruiser folk prefer a cruise on circular route from their base. Such circular cruising is affected by three major factors - firstly, the choice of the cruiser folk based on the attractiveness of the canal; secondly, the proximity of a canal to centres of population and finally, the location of hire craft operators and mooring sites. The geographical centrality of the Warwickshire Canals makes them accessible for cruising both from the Midlands and South-East England, though they are more popular in conjunction with the London and Leicester

---

(18) Pratt, F. (1972). Informal Recreation on Inland Waterways, p.11, B.W.B. London.

THE WARWICKSHIRE CANALS: VARYING INTENSITY OF PLEASURE CRUISING PER DAY (AUGUST 1972)

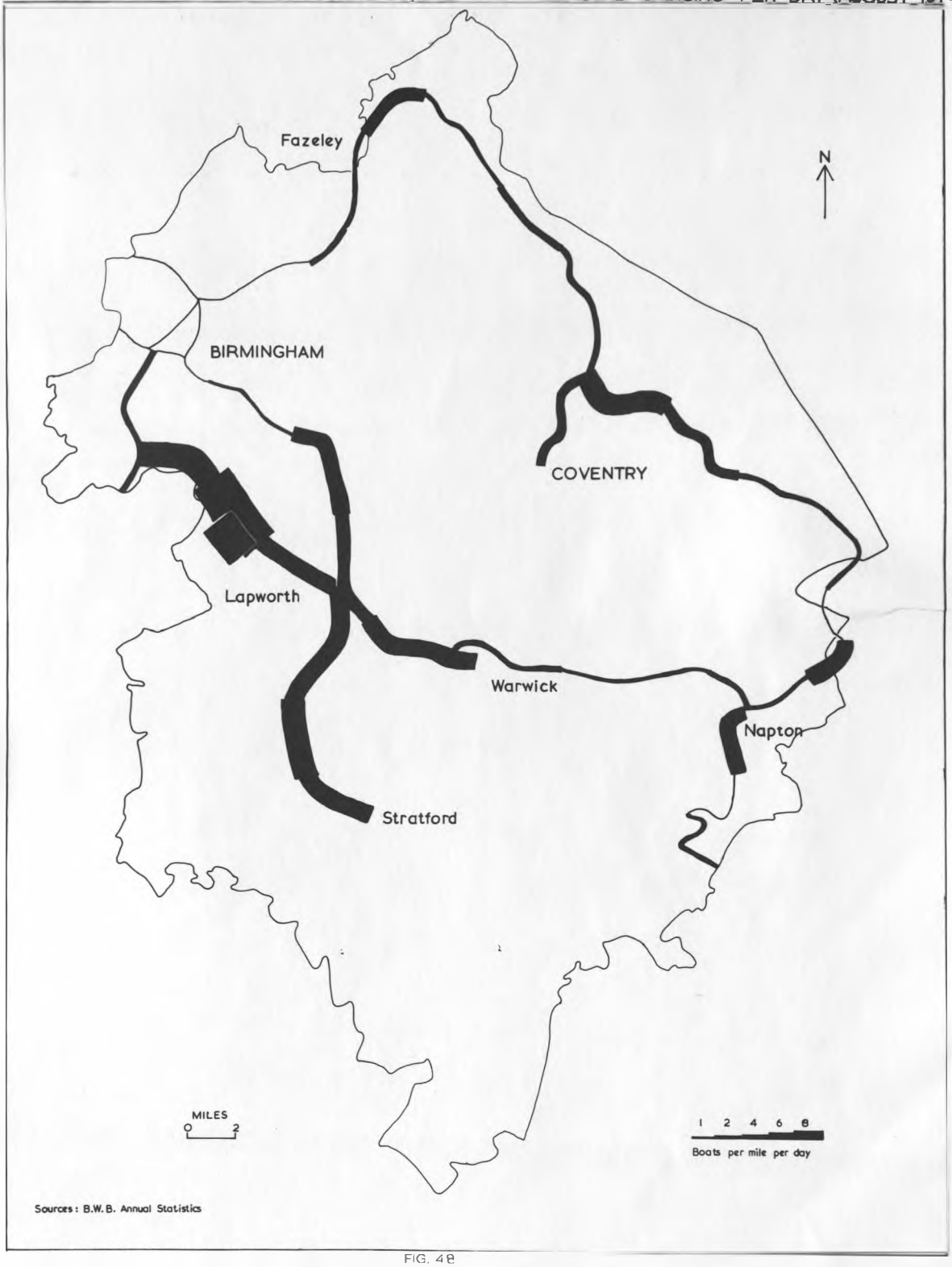


FIG. 48

branches of the Grand Union Canal. The importance of the centrality of the Warwickshire Canals to cruising is shown by the report of the Dartington Amenity Research Trust[19]. The most popular entry point to Warwickshire and Northamptonshire by cruise is Hillmorton (Table 7) while the most frequently used exit point is Buckby, though Napton is also important. The most popular routes are Hillmorton to Buckby and Buckby to Napton. The distribution of traffic is, however, not equal. For example, in the summer of 1971 one hundred and fourteen craft travelled from Hillmorton to Buckby while only twenty-four travelled from Buckby to Hillmorton. This reflects the circular routes followed by many holiday cruisers and also such special attractions as the Inland Waterways Rally in Northamptonshire in 1971.

The popularity of the entry and exit points as the above table shows relates to two important factors: the scenic attraction of the South Oxford Canal and the canal museum at Stoke Bruerne near Towcester on the Grand Union Canal. The major proportion of traffic at Napton and Buckby can be similarly explained. It is also related to the number of locks on the canal. In Chapter Four the effect of locks on the speed of horse-drawn canal boats was demonstrated: pleasure crafts are no less subject to delays by the operation of locks. It takes an average of

---

(19) Dower, M. (Director) (1972). Dartington Amenity Research Trust, Canals around Braunston, passim. Devon. This is a case study report (unpublished) on canals around Braunston (Northamptonshire) prepared by the Sports Council and the Countryside Commission. The canals involved are mostly in Warwickshire, but the report also covers Leicester and London branches of the Grand Union Canal extending as far as Watford and Buckby on the Leicester and London branches respectively. Braunston was chosen because it is a nodal point between no less than four canals - the Grand Union (Leicester-London branch), the Grand Union, Birmingham section, and the Oxford and Coventry Canals. The area covered by the research is marked by locks radiating in five different directions. To the north are the Hillmorton locks on the North Oxford Canal, then Napton locks at the junction of the Oxford and Grand Union Canals (Birmingham).

Table 7[20]

Pleasure Boat* cruising through Warwickshire/Northamptonshire showing the Points of Entry and Departure of the Craft (Summer 1971).

Entry point	% of Boat owners	% of Boat hirers	% of Total
Hillmorton	32.63	31.29	31.50
Watford	14.23	19.88	15.49
Buckby	21.25	19.29	20.03
Stockton	17.83	8.46	13.62
Napton	13.66	20.27	18.87

Exit point	% of Boat owners	% of Boat hirers	% of Total
Hillmorton	10.81	11.41	11.06
Watford	11.57	12.59	9.72
Buckby	43.45	20.66	26.90
Stockton	8.53	9.84	8.96
Napton	15.74	38.38	25.04
Non-response or stayed in system	9.82	0.59	18.34

* Cruiser folk are divided into two groups - those cruising in their own private crafts and those using hired crafts.

(20) Ibid. Section 16.

four minutes to operate a narrow lock like those at Hillmorton and Napton, but seven minutes for wide locks like those at Calcutt. It takes a total of fifty minutes to go through the Stockton flight of nine locks so the time and energy spent by cruiser folk on such activity is considerable. Initially, some cruiser folk may consider it fun operating locks but their attitude changes when they are as numerous as the flight of twenty-one at Hatton (Grand Union Canal) or the nineteen at Lapworth (Stratford-upon-Avon Canal). The absence of long flight of locks and the existence of two cruising firms on the northern section of the Oxford Canal help explain the importance of Hillmorton for cruising. The DART (1972) report points out that of the 1,044 transient crafts[21] on the canals in Warwickshire involved in circular routes twenty-four per cent go on circular cruises. Allowing for many minor variations where boats go up short canal arms, five different circular routes may be recognized in Warwickshire with the route through Hillmorton forming part of the most important circular route. This route runs from Braunston through the North Oxford Canal (Hillmorton), the Coventry Canal, Trent-Mersey and Grand Union Canals and accounts for 27% of all the circular route journeys. Route two, running from Braunston through the North Oxford, Coventry, Birmingham-Fazeley and Grand Union Canals, accounts for 23%. Routes three, four and six involving routes through the first two already mentioned and extending to either the Stratford Canal, River Severn or the Worcester-Birmingham Canal are of much less significance. There is a distinct relationship between popularity of route and the number of locks per mile with use falling off markedly above one lock per mile. The most popular route has 0.7 locks per mile, and clearly contrasts with route five's 1.3 locks per mile.

---

(21) Transient owners and hirers residing outside Braunston are distinguished from Braunston owners and hirers.

Zone of Influence of the Warwickshire Canals

The extent of the catchment area is given by the origin of transient cruisers as shown by the residence of transient crafts. Most cruisers on the canals in Warwickshire come from the East and West Midlands, though cruisers are drawn from all over the country and, indeed, from abroad. According to the DART report,1972, most Warwickshire craft owners, however, keep their boats at Braunston and cruise around. 56% of such craft owners are resident in the Rugby and Coventry area, most of them reaching Braunston by car. Hirers, more than owners of crafts tend to make longer trips since the average craft owner aims at using his boat very frequently in the summer, but in fact only few do so. The average trip made a fortnight covers about 150 miles[22] though it appears that the most popular duration of a cruise is one week. The figures for transient owners (see Table 8) suggest that when owners of crafts go on extended cruise it is often of over two weeks duration. There is also a large number of transient owners who go on cruises lasting more than a month. The length of cruise of Braunston-based hirers follows a similar pattern to that of transient hirers with a majority of one week cruises (Table 8). Braunston owners seem to take mainly short trips of one to two days duration.

Pleasure Cruising Firms

Pleasure cruising in Warwickshire has shown a marked increase over the past fifteen to twenty years but particularly

---

(22) Personal information from Maidboats Ltd., Brinklow, and Willow Wren Cruisers, Rugby, 1973.

Table 8[23]

Length of Cruise of Crafts in Warwickshire/ Northamptonshire, (1972)

Length in days	% of Transient owners	% of Transient hirers	% of Braunston owners	% of Braunston hirers
1	2	1	47	-
1-2	5	1	27	1
2-4	11	2	16	-
4-7	12	62	4	84
8-14	29	29	4	16
over 14	41	5	2	-

between 1967 and 1972. Their ever-growing popularity is mainly measurable through the growth of commercial interests, that is through the number of pleasure craft hire firms, although the number of privately owned craft has also risen sharply[24]. A personal survey of hire craft operators showed that there are thirteen such firms in Warwickshire (Fig. 49), a fairly large number considering the thirty

(23) DART Report (1972), op.cit.

(24) The West Midlands Sports Council, (1968). Recreational Use of Canals, p.10. Birmingham.

PLEASURE CRUISING FIRMS IN WARWICKSHIRE (1964-1972)

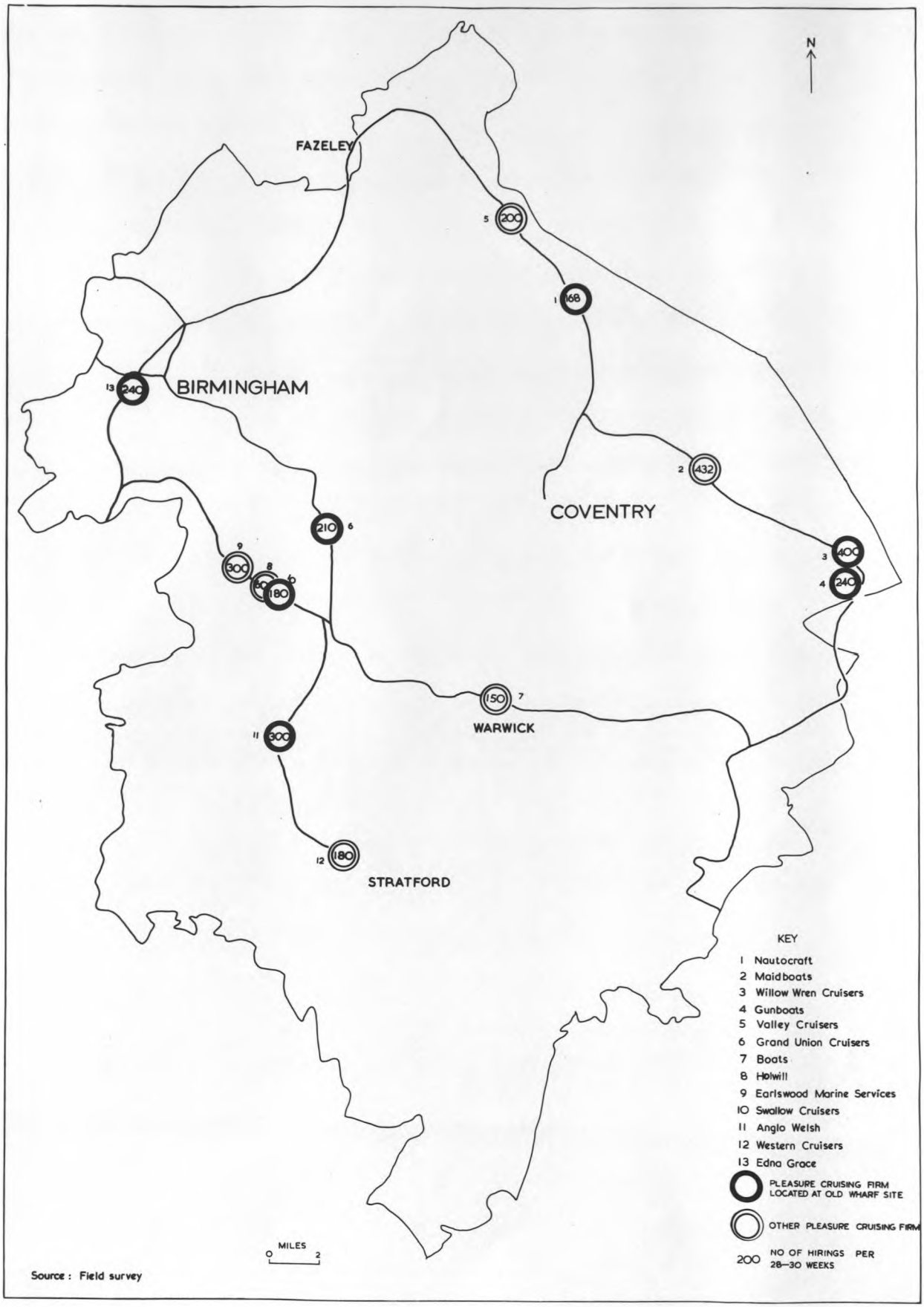


FIG.49

operators in the whole of the West Midlands[25]. The majority of these cruising firms are located near settlements and are readily accessible to the general public. Another interesting aspect of their location shows a close connection between most of their sites and sites originally concerned with commercial carrying on the canal[26]. For example 53% of the pleasure craft operators, are located at old wharf sites. Nautocraft Ltd.(27) (now Magpie Line Cruisers) occupies a site which originally was a coal wharf at Chilvers Coton on the Coventry Canal. Similarly, the Grand Union Cruisers at Knowle and Swallow Cruisers (Hockley Heath) on the Stratford-upon-Avon Canal are both located at former coal wharves. Maidboats Ltd., at Brinklow on the northern section of the Oxford Canal, is located at a site which was originally occupied by a toll-keeper's cottage[28]. The Boats[29] in Warwick, at the junction of Coventry Road and the Grand Union Canal, occupies the site of an old brewery. The predominance of hire craft operators at old wharf sites further reflects continuity in usage. As demonstrated in Chapter Three, the original wharf sites were located at or very near a junction of canal and road thus making them accessible to the public, the majority of whom reach the canals by car. For it has been shown by DART (1972) that about 98.6% of cruisers reach hire craft operators by car.

---

(25) The West Midlands Sports Council (1967). A report on use of Inland Waterways by Powered Pleasure Craft, pp. 3-6. Birmingham.

(26) Personal survey of Pleasure Craft operators in Warwickshire, 1973.

(27) Information from the Manager, Magpie Line Cruisers, 1973.

(28) Information from Maidboats Ltd., 1973.

(29) Information from Boats Warwick, 1973.

Hire craft operations started in 1953 in Warwickshire with the Maidboats (Midlands) Ltd., whose major operations are on the Thames, London, where the company operates a fleet of fifty cruisers. The Midland branch is located at Brinklow between Coventry and Rugby. This firm was one of the very first hire cruiser firms in England to offer hire boats for holidays on the canals. They operate a fleet of eighteen canal cruisers which operate for about twenty-four weeks per season[30], and carry an average of about five to six passengers. The Maidboats Ltd., is by far the biggest and best organised hire cruise operating firm, but the rest are also capable of providing reasonable facilities for holiday cruisers. Such a firm is Willow Wren Cruisers Ltd., at old Rugby Wharf, along a disused arm[31] of the Oxford Canal, established in 1962[32]. It provides facilities for about four hundred hire cruiser folk in 30 weeks (Fig. 49). The Grand Union Cruisers (Knowle top lock) also came into operation in the same year, but the Swallow Cruisers (Hockley Heath), and the Boats (Warwick) did not appear till 1964. As the popularity of canals for pleasure cruising mounts, so more cruising operators appear. Among the latest is the Western Cruisers, Stratford, (1969) which has strong commercial links[33] with Ladyline Cruisers (Braunston) which acts as sole booking agents for them. The link between the two firms means a wider choice for the hirer and the possibility of transferring customers to other bases during heavily booked periods. There is also the Rugby Boatbuilders Ltd.,[34] established in 1970 at Hillmorton, and the Magpie Line Cruisers[35] which

---

(30) Information from Maidboats (Midlands) Ltd., 1973, Brinklow.
(31) C.R.O. CR 1365. The Plan of the improvement of the Oxford Canal, 1829-1834. The arm was originally part of the main canal.
(32) Information from Willow Wren Hire Cruisers Ltd., 1973, Rugby.
(33) Information from Western Cruisers, 1973, Stratford.
(34) Information from Rugby Boatbuilders Ltd., 1973, Hillmorton.
(35) Magpie Line Cruisers, op.cit.

replaced Nautocraft Ltd., in 1971. Fig. 49 shows the total craft rentals of each Warwickshire Cruising Firm per season (28-30 weeks). The recently established firms operate small number of crafts ranging between six and eight: the Rugby Boatbuilders, for example, operate eight crafts and the Western Cruisers in Stratford operate six cruisers. The old firms like Willow Wren and Maidboats (Midlands) Ltd., operate seventeen and eighteen boats respectively. The crafts range between two berth and eight berth cruisers.

Maidboats (Midlands) Ltd., illustrates the extent of the cruising business, its operations and catchment area. There are craft rentals practically throughout the year, but rates per craft show a gradual rise at the beginning of May reaching a peak in July, and falling off gradually after September. This puts the peak season between May and August. During this period hirers of craft are drawn from throughout England and overseas as well. During the current season, for example, over 20% of the hirers were foreign and last year there were hirers from thirty different countries including Netherlands, Belgium, France, Germany, Austria and Italy. The popularity of Maidboats amongst foreigners can be accounted for by its connection with the main headquarters, based on the Thames in London, which provides many facilities for foreigners interested in cruising. Among these facilities is the Overseas Clients Transfer Service whereby a car meets the clients at the airport, either Heathrow, Luton or Gatwick, and takes them to the Yatch station. Facilities also exist for ferrying visitors' cars if they require this service, and attendants, who cook the meals and operate the locks, can be provided at an extra cost of £35 per week.

Cruiser folk who want a lazy holiday are those likely to opt for attendants. Visitors beginning a cruise from Brinklow have several routes to choose from. There is the popular cruise down the Grand Union to Brentford, up the Thames to Oxford and back to Brinklow via the Oxford Canal. Visitors can also choose the West Country via the Severn, the Worcester-Birmingham Canal and returning perhaps through the beautiful Staffordshire-Worcestershire Canal through the attractive Stratford-upon-Avon Canal or through the Leicester branch of the Grand Union. Visitors can also cruise northwards through the North Oxford Canal, Coventry and the Trent-Mersey Canal. Maidboats (Midlands) Ltd., like all hire firms, advises on routes, especially to novices, but the choice rests entirely with the customer.

Cruising Facilities

Increased use of the canals for pleasure cruising leads to a demand for more suitable facilities of all kinds including moorings, boatyards, inns and restaurants, car parks, road access, toilets and refuse disposal arrangements. The most widespread facility, and an index of capacity, is moorings of which two main types are distinguished. Temporary moorings (Fig. 50) are used mostly by transient craft and are designed primarily for the convenience of cruisers who wish to leave their boats for short periods of time, to visit local shops and the countryside, or from one weekend to the next during an extended cruise. Secondly, permanent mooring sites are used mainly by based craft and set aside for regular moorings. Owners normally return to the same base after a cruise[36].

---

(36) Information from the Amenity Activities Controller, B.W.B., 1972, Watford.

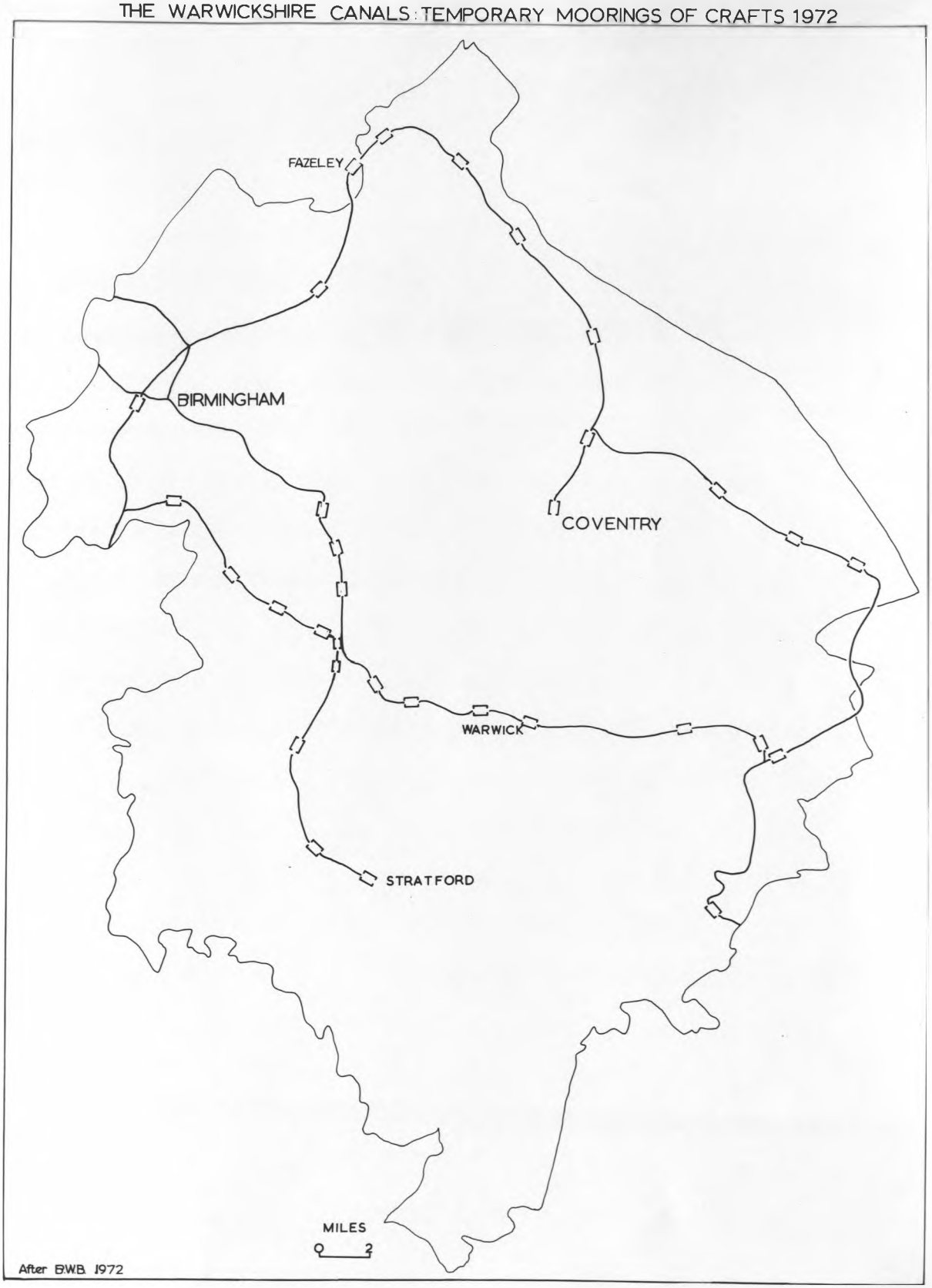

THE WARWICKSHIRE CANALS: TEMPORARY MOORINGS OF CRAFTS 1972
FAZELEY
BIRMINGHAM
COVENTRY
WARWICK
STRATFORD
MILES
0
2
After BWB 1972

FIG. 50

Thirty permanent moorings can be found in Warwickshire, most owned by the B.W.B., and hire operating firms. Permanent moorings are of two kinds - Class A and B. Most of those belonging to the B.W.B. in the study area are of Class A and are charged at the rate of 6p. per foot length per month. Boats over fifty feet long are charged at the rate of 4p. per foot per month on the understanding that at exceptionally crowded sites they will accept the less convenient positions when asked to do so. No charges are usually made for stays up to fourteen days at B.W.B. moorings, but boats regularly based at a site and paying for moorings there have priority during periods of overcrowding. All crafts moored against the B.W.B. property must hold a current licence payable in advance, however, mooring permanently against sites other than the usual classified moorings requires special permission from the B.W.B. at all times and will also be charged for at the rate of 4p. per foot overall length per month.

Cruisers may moor at isolated positions[37] provided there is no navigational objection and indeed many do so. On the southern section of the Stratford Canal moorings are mainly owned by the National Trust and according to observation and information from the National Trust section[38] boats can be moored anywhere throughout the length of the towpath though access limits such usage to only eight permanent mooring sites. Though there are no specific waterways regulations governing mooring sites, it appears that people select moorings for a number of reasons. They might choose a particular site because some friends keep

---

(37) Information from the Amenity Activity Controller, B.W.B. 1972, Watford.

(38) Information from Major C. B. Grundy, Canal Manager of the southern section of the Stratford Canal, 1973.

their boats there, or because car access or parking, drinking water, toilet and litter disposal facilities are provided. Proximity to the home address, shops, cafe, supervision and freedom from vandalism are other important attractions. The capacity of moorings in Warwickshire is considerable. No less than 1,117 moored boats were recorded during the B.W.B. annual daily counts in 1971[39] and 1,263 in 1972[40], most of which were temporary. The temporal nature of these moorings suggests the popularity of the Warwickshire Canals for cruisers outside Warwickshire.

In contrast to the two types of moorings already mentioned there are those connected with residential boats, or houseboats as they are sometimes called, which are permanently moored and used as living boats, as the name implies. Residential use of craft at any site on the Board's waterways for more than a fortnight is only permitted subject to a special certificate obtained by application. The applicant indicates the site at which the craft will normally be used residentially and the certificate issued is valid for residential use only at that site. The licence does, however, operate as a normal craft licence for any periods spent cruising. The suitability of sites for residential use is subject to many local circumstances like local bye-laws which limit the availability of residential mooring not only in the study area but the whole of England. The only site available for residential boats in Warwickshire is that at Lapworth between the Stratford Canal office and Dicken's Lane on the Stratford Canal belonging to the National Trust, and the canal arm linking the Stratford and Grand Union Canals. Only twelve such residential boats are moored here throughout the year.

---

(39) Pratt, F. (1971). Recreational Use of Inland Waterways, pp. 5-6, B.W.B. London.
(40) Pratt, F. (1972). op.cit., pp. 3-4.

Angling

Canals are among the main coarse fishing waters of the West Midlands and such fishing can be carried out far more cheaply than trout or salmon fishing on rivers. In 1969 1,000 miles of B.W.B. waterways were suitable for angling including the 124 miles stretch of canals in the study area. The annual counts[41] of the B.W.B. give statistics concerning the number of anglers using the canals each year since 1967. The number of anglers is affected not only by the weather but by the arrangement of match fishing venues (which may be on the waterways system one week and on an independent river the next) and also by the method of assessment itself. With regard to the latter, the enumerator fails to count most of the people travelling behind or ahead of him and those who visit the waterways after the period of enumeration. The annual one day count in summer is, therefore, not really adequate to monitor the popularity of the waterways for angling but it provides an index to its use by providing a very general picture of the situation on one day. Fishing rights on the canals have been leased to four fishing clubs - the Coventry and District Angling Association, Rugby Federation of Anglers, Leamington Angling Society and Birmingham Anglers' Association. The latter is the largest with 56,000 members, holding rights mainly on the B.C.N. and that part of the Grand Union between Birmingham and Hatton. The Coventry District Angling Association with 10,000 members and 140 affiliated clubs, holds fishing rights on about 200 miles of canal from Tamworth to Oxford[42].

---

(41) Vide ref. 12. The annual count of anglers takes place on a different day from the pleasure boat counts.

(42) Information from Secretary, Fisheries Committee, Coventry District Angling Association, 1973.

The greatest concentration of anglers in the study area is on the Grand Union Canal between Birmingham through Warwick, Napton and Buckby with an average of thirty-five anglers per mile[43] - the second highest canal intensity in England and Wales. The greatest density of anglers is on rivers where angling normally takes place on both sides (see Table 9).

The daily counts of anglers (Table 10) shows that unlike pleasure cruising, which has been witnessing a continuous expansion since 1967, the number of anglers shows a marked decline. The average decline is 41.6% per annum, but with a marked drop of 63.3% in 1971 and 73.2% in 1972. The very variable figures in Table 10 might be due to several factors such as the weather which might be fine on one counting day but not on the other or due to match fishing venues and the very nature of assessment which has already been explained. Inspite of this short-coming the general decline in angling is very evident from the above table. The factors that have contributed to such a decline are discussed below. The general pattern of distribution of anglers is illustrated in Fig. 51. As is well known, anglers are never distributed uniformly; for they have popular spots here called "usual sites" as reflected in Fig. 51. From personal observation, supported by evidence from the B.W.B.[44] it seems that the "usual sites" are influenced by critical factors such as tradition, shelter, shade and access to the canal. On the Grand Union Canal, the usual site, which commands an intensity of forty anglers per mile, is located between Shrewley Tunnel and the Saltisford basin (Warwick). This stretch includes Hatton which

---

(43) Pratt, F. (1972). Informal Recreation on Inland Waterways in 1972, B.W.B. London.

(44) Pratt, F. (1972). Recreational Use of Inland Waterways 1971-72. B.W.B. London.

Table 9[45]

The Greatest Concentrations of Anglers, in England, Wales and Scotland, Summer, 1972

River/Canal	Anglers per mile
River Wittam Navigation	153
River Severn Navigation	71
River Lee Navigation	66
River Trent Navigation	52
Kennet & Avon Canal (Hanham to Bath)	41
Grand Union (Birmingham to Buckby)	35
Fossdyke Navigation	34
Birmingham Canal Navigations (Rushall Canal)	26
River Ure Navigation	21
Paddington Branch Canal	21
River Stort Navigation	18

Table 10[46]

Comparative Daily Counts of Anglers per mile/day (Summer 1967-1972)

Canal	1967	1968	1969	1970	1971	1972
Coventry	964	328	421	281	221	208
Grand Union (Birmingham to Buckby)	1331	1267	893	523	420	548
Oxford (North)	974	1597	1102	882	669	334
Stratford	253	254	176	111	79	64

(45) Pratt, F. (1972), op.cit.

(46) Pratt R. (1972). Recreational Use of Inland Waterways. 1971-1972, B.W.B. London.

THE WARWICKSHIRE CANALS : INTENSITY OF ANGLERS PER DAY (AUGUST 1972)

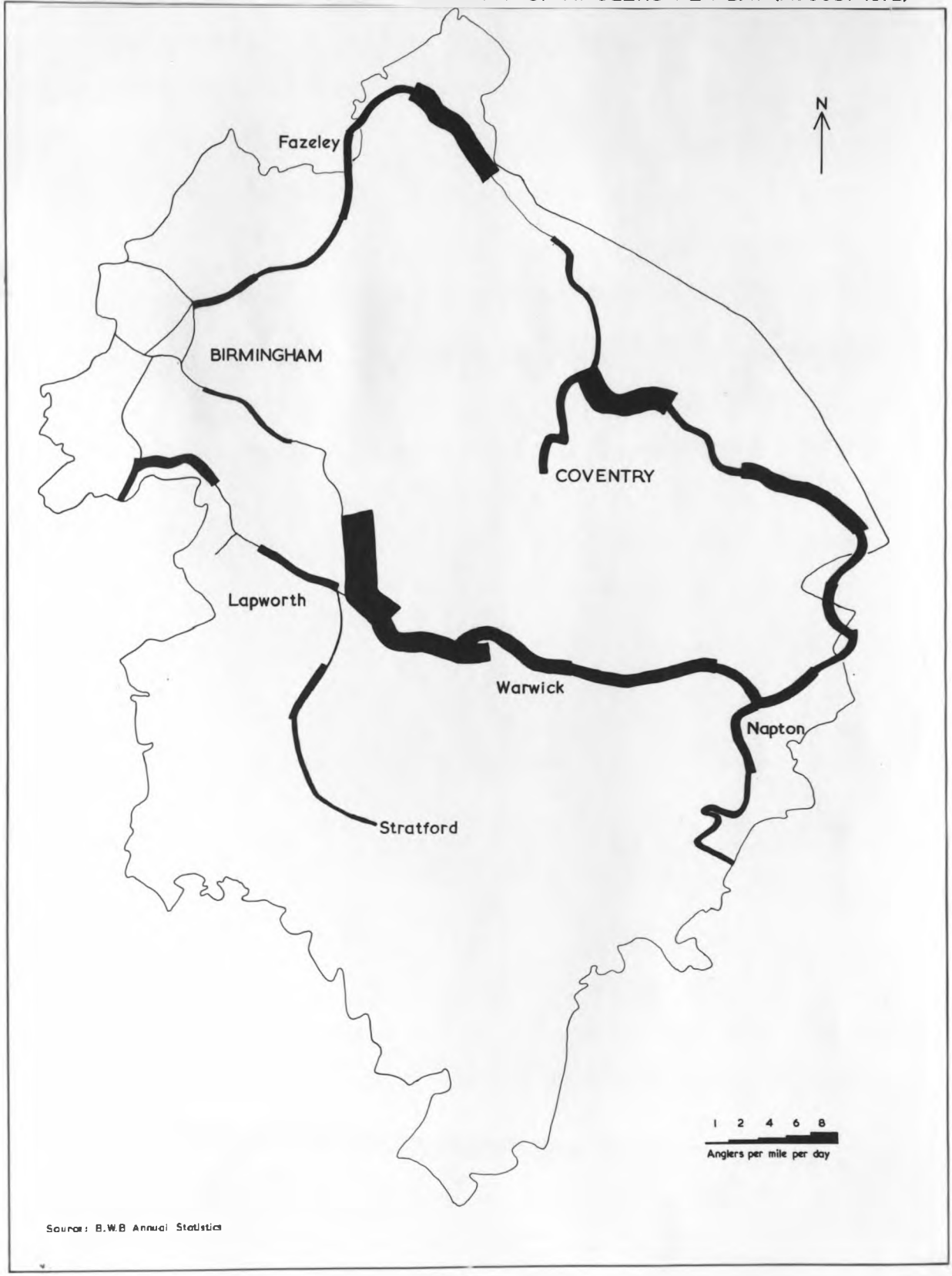


FIG.51

features predominantly as a "usual site" and is easily accessible from Birmingham and Warwick. Moreover, the wide ponds of the twenty-one flight of locks widened in the 1930's are very attractive to anglers. Another popular site lies between bridge 70 and Shrewley Tunnel (Fig. 51) with thirty-four anglers per mile with the main access also through Hatton. Other "usual sites" include the stretch from Calcutt locks through Napton Junction to Lower Shuckburgh and east of Stockton locks. All these sites have good access points. The importance of accessibility is further demonstrated by the density of one angler per mile between bridge 80 in Solihull to Heronfield where lack of access, made worse by the location of the West Midland Gas Board premises, prohibits free use of the canal. On the Oxford Canal the stretch from Hawkesbury Junction to Holly Hill bridge ranks highest with twenty-three anglers per mile followed by the section between the bottom lock Hillmorton to bridge 83 (Fig. 51) with seventeen anglers per mile.

The National Angling Survey 1970[47] shows that July, August and September are the most popular months for the coarse fishing season when over seven in every ten coarse anglers go fishing. Nevertheless, one quarter of anglers continue to fish through the winter months. The angler fishes on the average more than once a week during the popular fishing months and on the whole he fishes forty-six times a year. The DART report[48] supports these findings and points out that during the

---

(47) Jones, J. W. (Chairman) National Angling Survey, 1969-70, p.6. London. This survey was conducted by the N.O.P. Market Research Ltd., commissioned by the National Environment Research Council. The investigation, carried out in England and Wales, shows the percentage of the population who practise angling, what anglers fished for, their habitats, and their preferred sites, distance travelled to fishing sites and the age of anglers. The problems of anglers are also discussed.

(48) DART, op.cit.

angling season usage is heavily peaked at weekends, although there is a fair amount of weekday fishing during high summer, particularly on the stretch of canal around Rugby. Every type of coarse fish can be caught in Warwickshire Canals - from gudgeon to pike. The usual species caught are bream, roach, tench, pike, carp and perch[49]. Restocking of the canals takes place in conjunction with the Severn and Trent River Authorities because the canals are not very good breeding waters. Moreover, many fish are lost through disease and pollution caused by toxic industrial waste and agricultural insecticides escaping into the waters[50]. Moving pleasure boats which also empty their elsan toilets into the canal further increase the disadvantages of the canals for fish breeding.

Most anglers have to travel four to six miles to their "usual sites". This is a comparatively short trip compared with the average of eight miles for anglers in the whole of the West Midlands, and the fifty miles[51] averaged by most Birmingham Association anglers. The latter figure is over exaggerated and far from realistic. Even though the Birmingham anglers might make long trips because of the polluted nature[52] of the B.C.N., there are other canals, outside the B.C.N., like the Grand Union Canal between Birmingham and Hatton, with a distance ranging between four and twenty miles and can be visited by members of the Birmingham Association of anglers. Due to the length of trips involved in angling, anglers need transport to their usual sites,

---

(49) National Angling Survey (1969-70). op.cit., Vol. 2, Table IA, B. D.
(50) Information from the Secretary, Fisheries Committee, 1973, Coventry.
(51) The West Midlands Sports Council, (1967). A Guide to Water Recreation, pp. 8-9. Birmingham.
(52) West Midlands Sports Council, (1967). op.cit., pp. 8-9. Section 2.22 discusses the problems of fishing on the B.C.N. and suggests remedial solution.

but most sections of the canals are inaccessible by public transport. The best means of access is by car from one of the many road bridges where parking space can often be found on the grass verges at the approach to bridges. About 79% of anglers reach the canal by car and 3% make the trip by motor cycle. The proportion of those who travel by car is in excess of the national figure of 60%[53]. Another characteristic feature of the anglers is the predominance of men over women. The National Angling Survey shows that only one in fifteen anglers is a woman, whilst in Warwickshire the proportion of women is smaller still - only one in nineteen anglers.

According to the National Angling Survey, most anglers prefer to go fishing alone, seeking the peace and tranquility which the canal environment provides. The idea of tranquility is well expressed by the interviewees during the survey. "You can get away from the world with fishing more so than with many other things. (What is important is fishing), it's a complete break. You are just away from everyone. This is one of the great things about it as a hobby. That you can get away from people", says Mr. A. Mr. H. puts the case perhaps more lyrically, with similar emphasis. He is forcibly semi-retired for health reasons but he finds: "A tranquility of mind which cannot be found in any other sport". (He has tried badminton, tennis, football). "It captivates all the best qualities you have in you. It's not only the fishing - you are fighting the elements, as you go

---

(53) National Angling Survey, (1969-70), op.cit., p.6.

out in all weather. Then there is the occupational therapy of preparing your tackle which pacifies the nerves. It ties up all the loose ends of the strain of life for men. Also you are fishing in wonderful surroundings. When not fishing there are the birds and the peace of the scene. You see nature in a way you would never see otherwise. All men over forty need a gentle type of exercise which you don't get in other types of sport. You use your arm, muscles which help your digestion". On the whole respondents suggested that in search of solitude, to be accompanied is less preferable than to be alone. Yet, inspite of the explicit preference of many anglers to fish alone, it seems that many anglers still go fishing with a friend[54]. The average size of the fishing group in the study area is about 2.12 people.

Conflict

Angling demands an atmosphere of peace and tranquility, easily ruined by irresponsible use of water by other sports. The most emphatic reports of conflict are between boat and bank on the canals. Much of this conflict is caused by inconsiderate behaviour or sheer lack of skill on the part of the boat users[55]. For anglers often complain about the wash of passing craft and the disturbance of water levels caused by locks continually opening and closing[56]. Anglers have a long

---

(54) The DART Report (1972), op.cit., supports the view that most anglers go fishing accompanied.

(55) Central Council of Physical Education. (1964). "A Survey of the Recreational use of Inland Waters", The West Midlands: Inland Waterways and Recreation, pp.62-3. Birmingham.

(56) Information from Fisheries Officer, 1973. B.W.B. London.

tradition of using canals, which has continued almost uninterrupted until recent years. It is, therefore, understandable that they resist any potential interference with their sport[57]. Conflict and disturbance are worsened by the increasing numbers of pleasure boats which force the angler to pull in his line and disturb the fish, by stirring up mud on the bottom which results in increased turbidity. On the other hand, some anglers readily admit that the passage of boats in reasonable numbers is very necessary for the reduction of weeds in canals and, therefore, would probably welcome an increase in motor boat traffic on stretches of water which are quiet. Real conflict normally arises at focal points, that is the "usual sites" of the anglers such as the stretches between bridge 70 and Shrewley Tunnel and Saltisford (Warwick), which are popular for both pleasure cruising and angling. On a canal like the Stratford Canal which is so popular with cruisers, anglers are disappearing gradually, and they are almost non-existent on the most heavily cruised stretches. On the stretch between Three Maypole Bridge to Wharf Lane Bridge, for example, (Fig. 48) where there are forty-six boats to a mile, the density of anglers is only 1.9 to the mile, and on the feeder from the Earlswood Reservoirs with forty-four boats per mile the density of anglers is one per mile. Compare Figs. 48 and 51. On the Coventry Canal the greatest intensity of 19.5 anglers per mile is found on the stretch between Bridge 43 and Bridge 59 between Pooley Hall and Glascote where the density of pleasure boats is only 2.7. Hence the greater the density of pleasure crafts the less the density of anglers. With the continual expansion of pleasure cruising,

---

(57) West Midlands Sports Council (1968). Recreational Use of Canals, pp. 13-14. Birmingham. Vide Central Council of Physical Education, (1964), op.cit.

angling on the canals is in danger of fast decline. Where such conflict occurs the West Midlands Standing Conference of Sports Organisation, a body which attempts to bring all the voices of sports together, assists with advice and arbitration. All potential users of canals can, by affiliating to this body, express their views freely in an atmosphere which is marked by a common interest in sport and recreation.

Anglers are also limited in their pastime pursuit by other important factors such as the poor quality of fish in the canals. In February 1970 the B.W.B. appointed a Fisheries Officer, "to improve and strengthen this side of the Board's business"[58]. He will also be responsible for the development of new ventures, including fish-farming and re-stocking which the Board are anxious to introduce for the benefit of all their many thousands of anglers[59]. The Severn and Trent River Authorities have also been active in improving fish in the canal waters. The Severn River Authority, for example, released four thousand roach into the Coventry Canal around Bishop Street in 1971[60]. Many of the roach were from ½ lb. to ¾ lb. in weight - quality fish that any angler would be glad to catch. The fish boost provided a welcome spot because the Bishop Street areas was a 'disastrous zone' through oil and chemical discharges from industries adjoining the canal.

---

(58) Vide reference 56.

(59) Information from the Secretary of the Fisheries Committee, Coventry and District Angling Association, 1973, Coventry.

(60) Information from Severn River Authority, 1972. See also Coventry Evening Telegraph, 19th April, 1971.

Recreational Use of Canal Reservoirs

Canal reservoirs extend recreational activities on the canals and having been affected by the Water Resources Act, 1963[61], and the Countryside Act of 1968[62] they are accessible for varying recreational purposes. The six canal reservoirs in the study area are of varying sizes, the largest being the Earlswood Lakes, constructed astride the main watershed between the Avon and the Trent with a water area of 72 acres. Table 11 shows the size and location of the Warwickshire reservoirs.

Table 11[63]

Reservoir	Location	Water area in acres
Oldbury	near Atherstone	10
Olton	Solihull	21
Stockton	near Sutton	31
Napton	near Southam	5
Wormleighton	near Fenny Compton	12
Earlswood	Earlswood	72

(61) Water Resources Act, 1963, S.79 and 80.

(62) Countryside Act, 1968, S.6-10, 16, on provision of recreational and access facilities.

(63) B.W.B., (1965). Facts about the Waterways, p.123, London.

The reservoirs are popular for most sports like pleasure cruising or sailing, angling, bird watching, photography and nature study as well. Indeed, almost all these activities take place on the Earlswood Lakes which is scheduled by the Nature Conservancy as a site of scientific and educational interest[64]. These lakes are considered very important because of the rarity of their birds: they form a sanctuary for more than thirty birds; but particularly for duck disturbed from other sites. The Island Heronry and Cormorant Roost, a scarce feature in the Midlands, can be found and so are winter visitors like Fieldfare, Redwing and Brambling. The importance of conserving these lakes as a sanctuary raises the problem of reconciling conservation and recreation which may be formidable. The greatest problem is disturbance created by boating generally because of the noise of powered craft, and the disturbance of the water by sailing is considered to be damaging to wildfowl populations[65]. This problem is not too difficult to solve due to the threefold nature of the Earlswood Lakes: the various activities are effectively separated. Sailing dinghies are restricted on one reservoir, fishing on the other and a Bird Club rents the third. In this respect the Earlswood Lakes greatly contrast the Olton reservoir where the problem of disturbance from boats has a good deal of undesirable influence on bird life[66]. The number of several species has tended to decline,

---

(64) Central Council of Physical Education, (1964). op.cit. p. 34, 54.

(65) Ibid. pp. 34-54.

(66) Atkinson-Willes, G. L., (1963). Wildfowl in Great Britain. pp. 123-4. H.M.S.O. London. Vide The Nature Conservancy, (1968). Progress 1964-68. London.

particularly the Pochard which has become increasingly scarce, and both Mallard and Tufted Ducks have been forced to move from this reservoir. With the gradual disappearance of birds comes less popularity of bird shooting which used to be a famous sport at Olton.

There are marked variations in the intensity of recreational usage on the reservoirs (Fig. 52). The Stockton reservoir, for example, is used exclusively for fishing whilst the rest of the reservoirs in the study area are used for two or more sports, fishing being common to all (Fig. 52). This type of sport, however, shows a considerable drop since 1967[67] reflecting a trend similar to that on the canals. The Napton No. 1 reservoir experienced the worst decline - a drop of 37.5% being recorded between 1967 and 1968[68]. By 1971 the number of anglers had dropped by 81.8%. Indeed, a similar pattern of decline has been experienced at Napton No. 2 and the Olton reservoirs. The Wormleighton reservoir contrasts markedly with this pattern. The period between 1967 and 1968 saw an increase of 50% in anglers, and by 1972 the number has risen by 81.8%. Such expansion might have something to do with the absence of pleasure boats on the Wormleighton reservoir[69].

Pleasure cruising on the reservoirs shows fluctuation in use; for there have been definite rises and falls in the numbers of pleasure boats on both the Napton and Olton reservoirs. 1972, however, saw an increase of 75% in the number of sailing dinghies at Napton and 25% at Olton. Most of the pleasure boats are sailing

---

(67) Vide reference14 for remarks about the shortcoming of the B.W.B. Annual Statistical daily counts.

(68) Pratt, F. (1972). Recreational Use of Inland Waters, Supplement. 1967-72 p.110-1. B.W.B. London.

(69) Pratt, F. (1972)., op.cit.

THE WARWICKSHIRE CANALS : USE OF RESERVOIRS FOR RECREATION

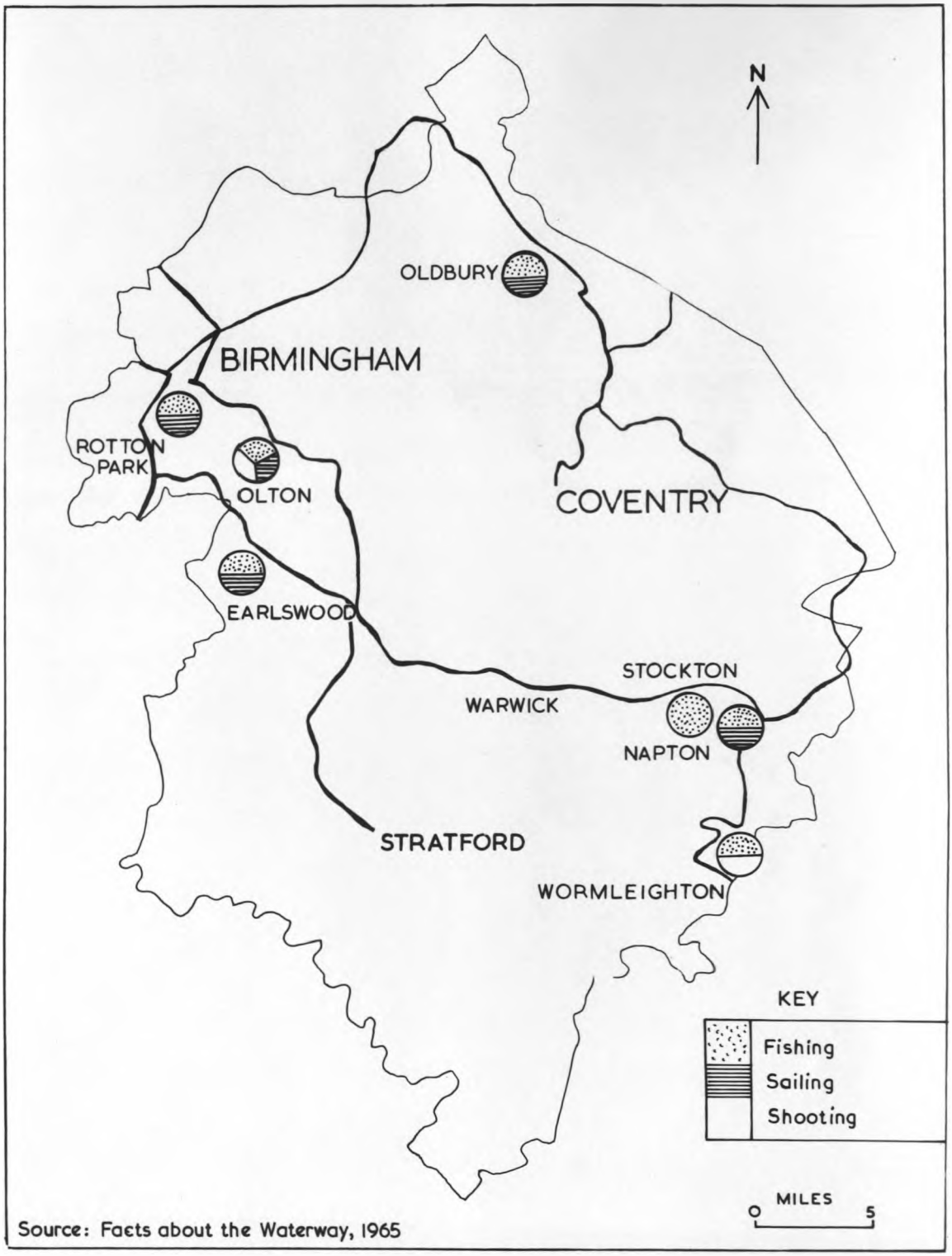


FIG.52

dinghies and the rest are either canoes and rowing boats or fishing punts. Excepting the Stockton reservoir, where all boats were fishing punts in 1970, and 1971, sailing dinghies form by far the greatest proportion of pleasure boats on the canal. On the Olton reservoir they formed 69.9% in 1970 and 83.6% in 1972; on the Napton 42.1% in 1970 and 92.9% in 1972. Canoes and rowing boats are of second importance while rescue boats are negligible.

As on canals, recreation on the reservoirs may lead to conflict in the varying activities, thus limiting the practice of a particular sport. The major conflict is between pleasure boating and angling. On a reservoir like Stockton where there is no pleasure boating, fishing is of the utmost importance, and on the Earlswood there is no conflict because the varying activities are separated as explained before. On other reservoirs like Napton and Olton where pleasure boating is popular the number of fishing boats is particularly low. Conflicts in activity is but one of the problems that face recreational users of reservoirs. These reservoirs fall under the broad control of the B.W.B. for their essential function of maintaining water levels in canals, but when it comes to recreational access the question is far from simple. The control of access is often vested in bodies other than the B.W.B. After purchase by the B.W.B. the fishing rights may remain with the previous owner, or even the owner before him. A further recreational access by a sailing club, might thus be possible with the permission of the owner of the fishing right. Thus, fishing rights on the Napton reservoir are vested in the adjoining owners, as are sailing rights on the third Earlswood reservoir. Sailing on the Oldbury reservoir

is let to a club[70], and in the case of Olton all activities are let to the Olton Mere Club. Stockton is let to the Stockton Blue Lias Lime and Cement Works and at Wormleighton fishing and shooting rights are vested in a private party. Another problem that relates to use of reservoirs for recreation is that of water. Their very purpose of maintaining the levels of canals could lead to shortage of water especially during the dry season restricting the sailing area and raising complications over the marking of racing courses, for example. Moreover, there is little protection of the club's property from vandalism because of the general access to the banks afforded to the public (and by roads).

Other Recreational Activities

The canals of the study area run largely through rural areas, except in Birmingham and Coventry, and their towing paths provide delightful and 'ready made' footpaths through many of the most pleasant parts of the countryside. There is also the added attraction of water. The intensity and variety of land-based recreation which includes such activities as towpath walking, cycling, picknicking, photography and nature trail is limited by the fact that most sections of the towpath are eroded in many parts and in summer the adjacent hedges are so overgrown that access is impossible along the towpath. This might be because the B.W.B. has no express duty to maintain the towpaths[71]. Observation on the ground shows that the canal is fronted mostly by fields which are fenced off, and the major access points are through road crossings

---

(70) B.W.B., (1965). The Facts about the Waterways, p.123. London.

(71) Vide Philip D. (1971). A Future for Towing Paths, passim. B.W.B. London.

as at Yardley Wood, Three Maypoles, and the Old Warwick Road in Lapworth and at inns which are mostly located at the junction of road and canal, and therefore provide access to the canal. This observation is supported by the DART report of 1972 and the B.W.B. statistical counts of 1970 to 1972. Inspite of the limitation of access to the towpaths, there are some stretches which are popular for walking. A comparison of Figs. 48, 51, 53 shows that with regard to numbers walking is less popular than pleasure cruising and angling on the canals in the study area. The Coventry Canal has the highest density of four walkers per mile/day in August 1972[72] followed by three walkers per mile on the Stratford and Oxford Canals. Fig. 53 illustrates the varying intensity of walkers per mile/day in August 1972[73]. This gives a general picture of walkers on the canal. Coventry basin and Hawkesbury Junction, and bridge 22 to bridge 43 on the Coventry Canal witness the highest number of over five walkers per mile; on the Stratford Canal the high densities are found between King's Norton Junction and Three Maypoles bridge, and Wootton Wawen and Stratford. The most popular stretch for walking is on the Oxford Canal between bridge 43 and the bottom lock, Hillmorton[74] with a density of nearly nine walkers per mile. This section is easily accessible from Rugby but lacks a beautiful and fascinating countryside like that of the Arden through which the Stratford Canal runs, a public inn and a big parking area, but even so it remains popular.

---

(72) Pratt, F. (1972). Recreational Use of Inland Waters. op.cit.

(73) Vide reference 14 for limitations of the B.W.B. annual daily counts.

(74) Pratt, F. (1972). Informal Recreation on Inland Waterways, pp.3-9. B.W.B. London.


THE WARWICKSHIRE CANALS : INTENSITY OF WALKERS PER DAY (AUGUST 1972)
Fazeley
BIRMINGHAM
COVENTRY
Lapworth
Warwick
Napton
Stratford
N
MILES
0 2
1 2 4 6 8
Walkers per mile per day
Source: B.W.B. Annual Statistics

FIG.53

This popularity is largely due to the fact that the canal is located at the urban periphery of Rugby and to a lesser extent to its set of locks. Most of the visitors are pedestrians, a high proportion being children. The canal appears to function as a 'playground', especially during the school holidays. Associated with walkers are those viewing and picnicking along the canal towpaths. The stretch around Stockton (Grand Union Canal) is important for such activities where the use contrasts strongly with the use at Hillmorton. Stockton, a popular site particularly on Sundays[75], has an advantage of an inn, a flight of locks and an expanse of wasteland, more like a common where people can park cars and picnic. On a lovely summer Sunday, over a hundred people and twenty-five cars may be present.

So far the discussion has been on walking which may be considered rambling, and picnicking, but there are walks for specific purposes such as those on nature trails existing on some stretches of canals in the study area where numbered stakes are placed at intervals to draw attention to notable features. Among these are the Earlswood nature trail adjacent to the Earlswood Lakes, the nature trail of the Alvecote pools, located very close to the North Coventry Canal and formed by land sinking and then flooding when coal mines underground collapsed between 1940 and 1945. There is also the Lapworth-Lowsonford nature trail on the Stratford Canal. These nature trails are particularly used by schools for biological studies, and this accounts for the lack of statistics from the British Waterways Board records since the counts take place in summer when the schools are on holidays. The Lapworth-Lowsonford trail is heavily used by school parties and provides a detailed study of

---

(75) DART. (1972), op.cit., section 10.4.

plants and animals. Cadbury, Hawkes and Readett (1971)[76] have mapped the types of flora found in the canal habitat. Included in this group are those growing completely submerged like the Potamogeton pectinatus (fennel-leaved pondweed) and the Potamogeton crispns (curled pondweed), and those growing along the canal banks. The canal bank forms a habitat for certain specialized plants, like alder, with roots growing in the water-logged soil. The bridges and lock walls are colonised by plants and ferns like Lycopus europaeus and Angelica Sylvestris which are normally found on natural cliffs and can grow with their roots in small deposits of soil.

The study on the varying recreational uses of the canals, particularly pleasure cruising, clearly points to a continual expansion except angling which experiences a very sharp decline due to the very nature of the sport and the environment of peace and tranquility it demands. The decline in angling is related to the varying uses of the canals, especially pleasure cruising which reduces the density of angling (as comparison of Figs. 48 and 51 shows) by disturbing the water level through the movement of craft, continual opening and closing of locks, and emptying of elsan toilets into the canal. With precaution and strict adherence to the B.W.B. regulations about speed and disposal of toilets canal cruiser enthusiasts will help anglers to participate equally in the canal recreational boom.

---

(76) Cadbury, D. A., Hawkes, J. G. and Readett, R. C. eds. (1971). A Computer-Mapped Flora: A Study of the County of Warwickshire, Birmingham.

WATER SUPPLY

During the period of commercial carriage, the canal was an important location factor, being used for transportation of bulky materials, especially coal. The function of the canal for such purpose is past but the canal is still used by most of these industries (discussed later), particularly for water supply, which has been the most important source of revenue for the British Waterways Board since the canals ceased to pay for themselves as commercial waterways during the mid-nineteenth century. The position of water sales is very healthy and further expansion is expected[77]. The revenue derived from water supply and pleasure crafts is shown in Table 12[78]. In 1963 water revenue comprised 53% of the total revenue and by the following year it had increased to 56%[79]. The trend follows a similar pattern to the sales of the whole country though the national[80] percentage is at a much higher level - 64.8% in 1963 and 66.6% in 1964.

Many canals act as suppliers of water, and those in the study area are no exception. Industries on the whole tend to obtain their water from the most economic source and because of the siting of some industries on canal banks, the canals have often been their source of supply. A word must be said at this point about "statutory abstractions" and agreements existing at the time of the

---

(77) B.W.B. (1965) Facts about the Waterways, p.25-6. London.
(78) Ibid, p.25-6.
(79) Ibid, p.25-6.
(80) Ibid, p.21.

Table 12

Revenue of the Warwickshire Canals

1963-1964

1963	Canals					Total
	Coventry	Grand Union (Birmingham to Buckby)	Oxford North	Oxford South	Stratford	
	£	£	£	£	£	£
Craft	1,579	4,774	1,746	1,517	1,301	10,917
Water	8,419	7,683	2,762	5,186	2,035	26,085
Other	2,741	4,578	1,267	3,045	523	12,154
Total	12,739	17,035	5,775	9,748	3,859	49,156

1964	Canals					Total
	Coventry	Grand Union (Birmingham to Buckby)	Oxford North	Oxford South	Stratford	
	£	£	£	£	£	£
Craft	1,971	5,076	1,296	1,398	1,108	10,849
Water	12,356	4,967	5,945	5,837	2,446	31,541
Other	2,410	6,455	1,094	3,227	615	13,801
Total	16,737	16,498	8,335	10,462	4,169	56,191

construction of the canals. The "statutory abstractions" are those where the canal companies entered into arrangements with riparian owners[81], usually at the time of the original construction of the waterway, to let the latter have water free. With the passage of time and the growth of industry, these commitments[82] have some of them become onerous, though it is fair to say that in a number of cases the industrialists concerned have been enlightened enough to make ex gratia payments. Later agreements required the industries to pay a bulk sum for the water extracted either yearly or half-yearly. The water thus extracted for industries is non-potable water and comprises two different types.

Firstly, there is water supplied for cooling, the water being used solely to remove unwanted heat. In this case quality is usually unimportant. In direct cooling the water is invariably returned to the same source at or near the point of abstraction, unchanged except for an increase in temperature. In a closed system the same water circulates around and the intake required is only to make up the losses to the atmosphere through evaporation as in cooling towers.

Secondly, there is process water which includes any water incorporated in the product, the use of water as a transporting medium as in paper mills or chemical plants. Invariably the quality of the water so employed is changed and could require some pre-treatment prior to discharge to a water course or public sewers.

---

(81) B'ham Ref. Lib. 17066, Oxford Canal Act, 9. Geo. 3, C.70, 1768, p.43-4.

(82) B.W.B. (1965) op.cit.

The Tamworth Colliery Company, whose collieries were mostly sited along the Coventry Canal, is an example of an industry using canal water in the 1910's. It entered into an agreement with the Coventry Canal Company to obtain water for condensing purposes in connection with the Company's steam plant[83]. This was abstracted by means of a twelve inch pipe for an annual sum of £100. The arrangements were to last for a year in the first instance and would continue after that date until either party should give the other six calendar months notice of their intention to end the agreement. If however, the Tamworth Colliery Company were in arrears for more than twenty-one days "it shall be lawful for the Coventry Canal Company to enter upon the premises of the Colliery Company and cut off all communication with the said company"[84]. Employees of the Coventry Canal Company were allowed on the collieries at reasonable times to examine the pipes connecting the colliery to the canal and recommend repairs if necessary. Between the beginning of the agreement (1971) and its expiration (1938) the Colliery Company extracted water[85] for use in the boilers and for condensing in connection with the steam plant. Some old agreements of this type have continued where industries have survived to the present time.

---

(83) C.R.O. The Tamworth Colliery Company Ltd. CR 1353/14. This is a miscellaneous collection of the Tamworth Collieries, most of which consist of communication between the collieries and the Coventry Canal Company.

(84) C.R.O. CR 1353/14. op.cit. Agreement between the Company of Proprietors of the Coventry Canal Navigation and the Tamworth Colliery Company, 1917.

(85) CR 1353/14. See list of water abstraction by the Pooley Hall Colliery, 1921-1938. It is very difficult to estimate the quantity of canal water used because the Colliery was charged according to the units of Horse Power it generated a day; it payed about 4/6 a day for 7,000 kilowatts of electricity generated.

At present there are twenty-two industries sited along the Warwickshire Canals which have arrangements with the B.W.B. for water supply. 45% of them are located along the Coventry Canal, another 45%, all sited in Birmingham, on the Grand Union Canal, and 5% each on the Oxford and Stratford Canals respectively. Over 12,000 million gallons of water are used by these industries[86] in a year. Questionnaire returns show that 468.8 million gallons of the above quantity is used by firms sited along the Coventry Canal a year on a take and return basis. Among the works using water on the Coventry Canal are Gees and Hartshill granite quarries, in Hartshill near Nuneaton, using water for stone washing. Other industries depending on the Coventry Canal for water supply are located on the five and a half mile stretch of canal between Coventry and Hawkesbury Junction as already mentioned. The industry with a greater share of water supply on this section is Courtaulds Ltd., a firm involved in the manufacture of artificial fabrics. The Coventry Canal was originally a determining factor in siting this firm, having replaced another building on the same site in 1905. The main use of the canal at this time was for the bringing in of coal from the North-East Warwickshire Coalfield and wood pulp from London. Though there is no documentary evidence[87] that the canal was used for the transport of the finished products, it is likely that some of the products found their way to the Midlands and London by canal. With the diminishing use

---

(86) Information from B.W.B., Water Development Officer, 1973. London. Statistics from this source does not give the quantity used by the individual firms, neither does it give addresses of the canalside firms using such water.

(87) Information from D. E. Williams, Courtaulds Ltd., Foleshill Road, Coventry, 1973.

of the canal for transport Courtaulds Limited also came to use it less. The transport of solid wastes by barge to a tip outside the City boundary of Coventry was also stopped in the 1930's, having been replaced by road transport[88]. In addition to being able to use the canal for transport the firm had an arrangement with the Coventry Canal Company for a limited supply of water, probably for the manufacture of Viscose Rayon to supplement the prime source of water derived from wells. The firm still depends on the artesian wells as the main source of supply and maintains the original arrangements by abstracting some 250,000 gallons of water per annum from the canal for fire fighting sprinkler systems and fire hydrants. The water thus extracted costs £150 per annum and is not returned into the canal.

The Midland Brick Works - Websters Hemmings and Sons Limited took a site along the Coventry Canal as early as 1860, but originally made relatively little use of the canal for water supply. The Coventry Canal was not necessarily a determining factor in its location but good use was made of it for the transportation of bricks to Coventry, Birmingham and other towns in the Midlands. Furthermore, water was and still is abstracted from the canal for use in boilers. The amount used appears to be very small, costing the firm only one pound per annum[89]. Unwanted water from the firm is also disposed into the canal[90].

---

(88) Ibid.

(89) Information from R. S. Hemming, Snr., Websters Hemming and Sons Ltd., Coventry, 1973.

(90) Ibid.

By contrast with the Midland Brickworks, the East Midlands Electricity Board used to occupy a site along the Coventry Canal: here the canal was a determining factor in its location in 1896. The canal not only provided a cheap and easy means of transporation of coal from the North East Warwickshire Coalfield, but also supplied water for the steam turbines generating electricity. The use of the canal by the Board ceased in 1929[91].

Coal being the motive for canal construction was enough incentive to attract firms using coal for generating purposes. The firms discussed so far were originally located by the canal for easy cheap transportation of coal. As discussed in Chapter Three (p. 92-3), Gas Works built during the nineteenth century were usually sited by a canal and the West Midlands Gas Works, Coventry, was such an example. The works were built in 1902 and the canal was used extensively to transport coal as well as to provide water for gas cooling towers. The use of canal water was then subsidiary to its use as a means of transportation. Transport uses discontinued prior to the closing down of the works five years ago when the town's borehole water was substituted for gas cooling[92].

Another large customer of canal water along the Coventry Canal is British Celanese Ltd., a drugs manufacturing firm. Established in 1927, it took a favourable site by the canal and all its coal requirements then came in by canal. The canal was also used to take away solid waste, like scrap and factory rubbish to a tip outside the Coventry town boundary. The use of the canal for transport

---

(91) Information from K. W. Brookes, The East Midlands Electricity Board, Coventry, 1973.

(92) Information from P. N. Nicholls, West Midlands Gas Board, Coventry, 1973.

has now ceased but the firm still uses the canal water for its fire sprinkler system. Into the canal is also discharged about 15,000 gallons of surplus borehole water a day, as well as surface water during storms when the local sewers cannot carry the additional volume. The use of the canal water costs the firm £400 per annum. The firm does not envisage any increase or decrease in the use of the canal as hydrant water or for the disposal of waste water: the present demand is considered to be fairly constant[93].

Other firms along the Coventry Canal do not use any water from the canal today but originally had taken advantage of the favourable canalside location for importation. Changes in techniques of transport encouraged the use of road and rail with a subsequent abandonment of the canal as a means of transport. Firms belonging to this category include Ward Brothers and Company Ltd., (Coventry). This firm was sited along the canal in 1916 though the canal was not necessarily the major determining factor. It was, however, used effectively in transporting coal and granite from the North-East Warwickshire coalfield[94]. At present the firm uses road for bringing in raw materials and the distribution of cement. TAC Construction Ltd., was established in 1939 in Kettlebrook, having replaced Fisher's Paper Mills. TAC Limited never used the canal but Fisher's Paper Mills did use it for the transport of coal from the Tamworth Colliery Company, like Pooley Hall, Wilnecote and Birch Coppice[95]. Before concluding the section on firms along the Coventry Canal a word must be said about W. H. Willday and Samuel Barlow Coal Company Limited. Both firms, which are dealers in coal occupied former coal wharf sites forty and

---

(93) Information from C. K. Willmott, British Celanese Limited, Coventry, 1973.

(94) Information from J. B. Ward, Ward Brothers and Company Ltd., Navigation Bridge, Stoney Stanton Road, Coventry, 1973.

(95) Information from H. L. Buxton, TAC Construction Materials Ltd., Kettlebrook, Tamworth, 1973.

ten years ago respectively. From these wharves coal was sent by barge to Hams Hall Power Station (Castle Bromwich) and other customers along the route. Since the 1940's the canal has not been of much use in this respect and road is now used for the distribution of the coal[96].

The Stratford Canal is a typical rural canal and, therefore, lacks a string of firms like those of Coventry. There is only one industrialist taking water from the Stratford Canal[97]. This is the chemical firm of John and E. Sturge Limited established on the Stratford Canal at King's Norton in 1898 to take advantage of the canal for the bringing in of its bulky raw materials in the form of limestone from Buxton in Derbyshire and coal from Dudley and North-East Warwickshire and for taking away precipitated calcium bicarbonate. In addition the canal water was used for processing, raising steam and for cooling towers. Water is abstracted at the rate of 263 million gallons a year. As far as water circulation for cooling towers is concerned the firm has increased its use of the canal though transportation, processing and steam raising uses have ceased. 98% of the water used for circulation is returned to the canal after use. Questionnaire returns show that the industrial colony, which sprang up along the Stratford Canal at Mason's Road in the 1950's and spread to Timothy Bridge in Stratford, utilises the land adjacent to the Stratford Canal not because it has any particular use of the canal, but because it is the area zoned by the Stratford-upon-Avon Borough Council for industrial development. Industries of all types are represented on the estate, among which are Alveston Kitchens Limited, producing frozen food transported by road in refrigerated containers, Quinneys Dairies Limited, C.A.R.E. Engineering Ltd.,

---

(96) Information from M. J. Hayden, Samuel Barlow Coal Company Ltd., W. H. Willday and Company Ltd., Glascote, 1973.

(97) Information from General Manager, John and E. Sturge Limited, King's Norton, Birmingham, 1973. The information is supported by information from B.W.B., Water Development Officer, Watford, 1973.

Young Engineering Limited dealing with scrap metal and the National Tyre Service Limited producing tyres. Although these firms have little use of the canal, five of them have fire fighting sprinkler systems using canal water for emergencies and testing their equipment. This point leads to another interesting use of the canal water in Warwickshire namely fire fighting.

Fire Fighting

In 1949 the B.W.B. came to an agreement with the Warwickshire County Fire Brigade, whereby the Fire Brigade takes water in an emergency from any canal in the county for fire fighting. Any time canal water is used the Brigade must notify the local Section Inspector in order that the levels of canal water can be maintained. Canals are not, however, the main source of fire fighting water. This is obtained from fire hydrants attached to water undertakings[98] from public water supply mains, and to a lesser degree private mains on factory premises. Nevertheless, advantage is taken of all open water supplies such as rivers, canals, docks, lakes for augmenting the main supplies. Water undertaker's mains are laid to provide water for domestic purposes and they do not always carry the pressure of water needed for fire fighting. Supplies for domestic purposes in heavily urbanised areas are normally sufficient; in addition each pumping appliance of the fire engine normally carries three hundred to four hundred gallons of water, and two of these appliances invariably attend very small domestic fires. The seven hundred or eight hundred gallons

---

(98) Information from the County Fire Officer, County Fire Brigade Headquarters, Leamington Spa, 1973.

immediately available is sufficient to deal with 95% of domestic fires. It is, however, an important factor when dealing with the larger industrial and commercial fires where the need to extinguish fire with a minimum of damage demands large quantities of water at an early stage in the fire fighting operations. Thus, open water is rarely used, but when it is used for due emergency it is badly needed. At such times when large volumes of water are required and during prolonged operations where the water mains are of poor capacity, or non-existent, canal water becomes valuable. For canal water to be useful it must be of reasonable depth, say eighteen inches, though if silted up for a small area, it can be dug out to form a temporary fire well. The great advantage of a navigable canal is the large amount of open water it contains.

Table 13 below shows the quantity of canal water used for fire fighting during five annual periods. The amount of canal water used varies from year to year depending on frequency of fires and on the site of fire occurrences. The period between 1967 and 1968 saw the greatest use of canal water in the county. Within the last twelve months no canal water has been used. Canal water is a cheap source of supply costing the Fire Brigade 2½ pence per thousand gallons. It is difficult to assess proportion of canal water used in relation to other sources, because it is only in cases where payment is made for the water taken or where the water is replenished that records are kept. Using canal water does not generally need specific pumping sites, but a number of small stations exists where a pre-planning is considered necessary for a particular risk[99]. Generally pumping may be carried

---

(99) Information from County Fire Brigade Headquarters, Leamington Spa, 1973.

Table 13

Canal Water used for Fire Fighting in Warwickshire (1967-72)[100]

Year	Quantity in Gallons
1971-72	193,000
1970-71	10,000
1969-70	192,000
1968-69	201,000
1967-68	231,000

out at any convenient site along the canals at the nearest point to fire fighting operations. With canals the main difficulty encountered is one of accessibility for road going fire engines. Access has to be gained via private and public property in agreement with the owners concerned, or via bridge doors - it usually being possible for two or four pumping appliances to get to work at each bridge. Canal aqueducts are not easily accessible except for portable pumps which have to be man-handled to the water's edge, and require at least fifty feet of hose to clear the embankment. Inspite of difficult access the fire services readily make use of canal sources if need arises.

(100) Ibid.

Cattle Watering

The Warwickshire Canals are also useful locally in a minor way as a source for watering cattle. The areas most affected are along the Oxford Canal which runs mostly through agricultural land used especially for grazing cattle. Nineteen arrangements exist on this canal - seven on the northern section and twelve on the southern section. The origin of supply of canal water for cattle watering dates back to the Oxford Canal Act[101] which states "that where any cattle are deprived of their usual watering places due to the construction of the canal the proprietors of the canal should be responsible for providing drinking places for the cattle at their own expense". In addition there were arrangements between the Canal Company and the farmers for troughs for watering cattle. There was "An acknowledgement of trespass and priviledge by a watering-place for cattle"[102]. Though records of old agreements are far from complete there is evidence of arrangements for the supply of water to farmers dating back to 1856 and 1861. The nineteen present arrangements on the Oxford Canal started in 1910 and are rather irregular and of very small scale. The first agreement was for only one cattle trough in Priors Hardwick. The next agreement did not start till 1934 after which time there was one agreement a year except in 1952 and 1954 when there were two and three arrangements respectively. Fig. 54, based on information from the Water Development Officer (B.W.B.), shows the villages with cattle-watering privilege on the Oxford Canal as well as those on other canals in Warwickshire. The water is fed into the trough by gravity through 1 inch diameter pipe fitted with a ball cock at the end. Cattle drinking from the canal with no agreement between farmer and B.W.B. is considered a trespass by the latter but since the B.W.B. does not check on such

(101) B'ham Ref. Lib., 17066, Oxford Canal Act, 1769, pp. 413-4.

(102) Information from the B.W.B., The Water Development Officer, London, 1973.

THE WARWICKSHIRE CANALS: WATER SUPPLY TO CATTLE 1910–1972

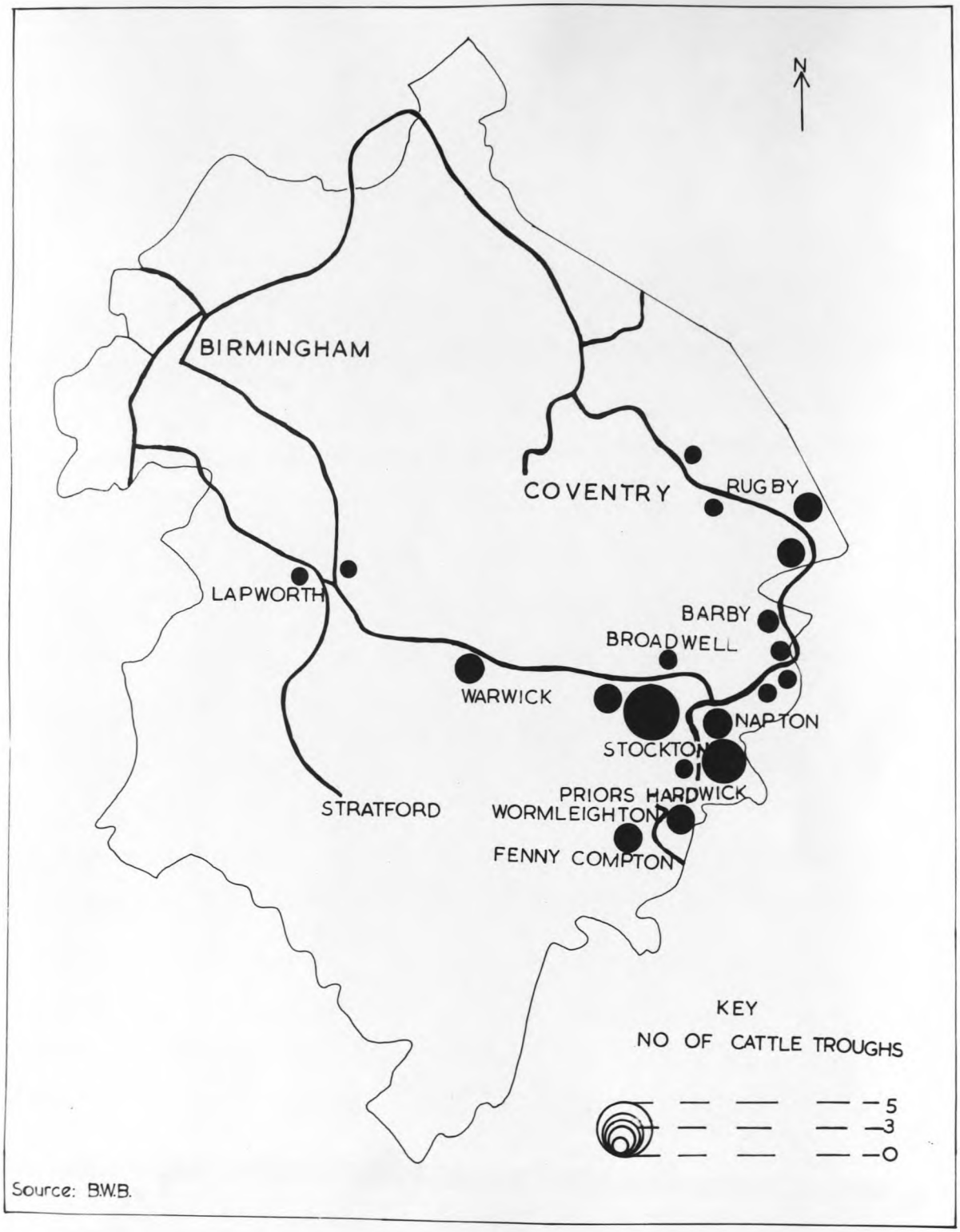


FIG. 54

offences cattle often drink from the canal as in Byfield (Oxford Canal) and Harborough Banks near Lapworth (Stratford Canal) without any payment.

It is evident from the map that no water rights are recorded on the Coventry Canal, and that there is only one cattle-watering right on the Stratford Canal at Lapworth where arrangements started in 1933. The Grand Union Canal has comparatively more arrangements for cattle watering. There are sixteen rights in all on the canal, two dating from 1929, three in 1935 and one each in 1936, 1938, 1949, 1953, 1956, 1957, 1962, 1969 and 1971. Most of them are located between Warwick and Napton, with Stockton featuring as the most outstanding with five troughs, followed by Southam with two troughs. Originally the amount paid by farmers to the Canal Companies was determined by the number of stock using the trough, but under present arrangements the farmers pay a lump sum for each trough regardless of the amount taken in the year. The British Waterways Board usually asks a small consideration of 50p for a trough. It is difficult to estimate the amount of water taken from the canal for this purpose since the farmers are not asked for a record of abstraction of quantities made. The revenue obtained from this source is only £52.80 per annum - £26.55 derived from the Oxford Canal, £25.20 from the Grand Union and £1.05 from the Stratford-upon-Avon Canal.

Water Pollution

So far the importance of canal water to industries, fire fighting and cattle watering has been discussed. The use of canal water by industries may present problems to recreation, especially where the industries return used water into the canal leading to pollution.

Pollution might be caused by industrial waste and sewage effluent. There is no case of sewage effluent causing canal pollution in the study area[103], but several instances of pollution by toxic industrial chemicals have been cited on the Coventry Canal. Most incidents occur on the five and a half mile stretch between Coventry and Hawkesbury junction where the canal is fronted by industries that use the canal water for cooling or processing as already discussed. The most common effect of such pollution is the depletion of oxygen caused by the breakdown of domestic or organic matter. The breakdown of these organic materials by bacteria requires oxygen and in heavily polluted waters the rate at which oxygen is used up may exceed its replacement. In such cases the capacity of the canal to support fish and other forms of life is reduced. Organic pollution is measured by the "biochemical oxygen demand test" or B.O.D. which gives the level of dissolved oxygen in the water[104]. The higher the B.O.D. the more polluted the water. Data available from the Trent and Severn River Authorities show the quality of water in the canals in Warwickshire (see Fig. 55) although variation within each canal occurs. The characteristics of the sites where samples are taken are set out in Table 14. The quality of the water is determined by the average ammoniacal nitrogen content of the canal water. The presence of ammonia is strong evidence that sewage or industrial waste is present. Though toxic chemicals have been reported near Coventry, apparently this is not very serious. The average ammoniacal nitrogen is between 0.2 and 0.0 milligrams per litre. The only sample area with high ammonia content is Lapworth with an average ammoniacal nitrogen of 2.7 milligrams per litre. On the Grand Union

---

(103) Information from the Trent River Authority, Pollution Control and Fisheries Dept., 1973.

(104) Trent River Authority, Ibid.

Coventry Canal

1 Polesworth
2 Nuneaton
3 Bedworth
4 Foleshill Road
5 Old Church Road
6 Hawkesbury
7 Coventry

Oxford Canal

8 Hawkesbury
9 Brinklow
10 Newbold
11 Hillmorton
12 Braunston
13 Napton
14 Marston Doles

Grand Union Canal

15 Napton
16 Stockton
17 Fosse Way
18 Leamington
19 Emscote
20 Hatton
21 Kingswood
22 Lapworth
23 Catherine-de-Barnes
24 Acocks Green
25 Nechells

Stratford Canal

26 Stirchley
27 Shirley
28 Hockley Heath
29 Lapworth
30 Lowsonford
31 Preston Bagot

Worcester-Birmingham Canal

33 King's Norton

Birmingham-Fazeley Canal

34 Salford Bridge
35 Minworth Locks
36 Off Tyburn Road
37 Fazeley

WATER QUALITY OF THE WARWICKSHIRE CANALS

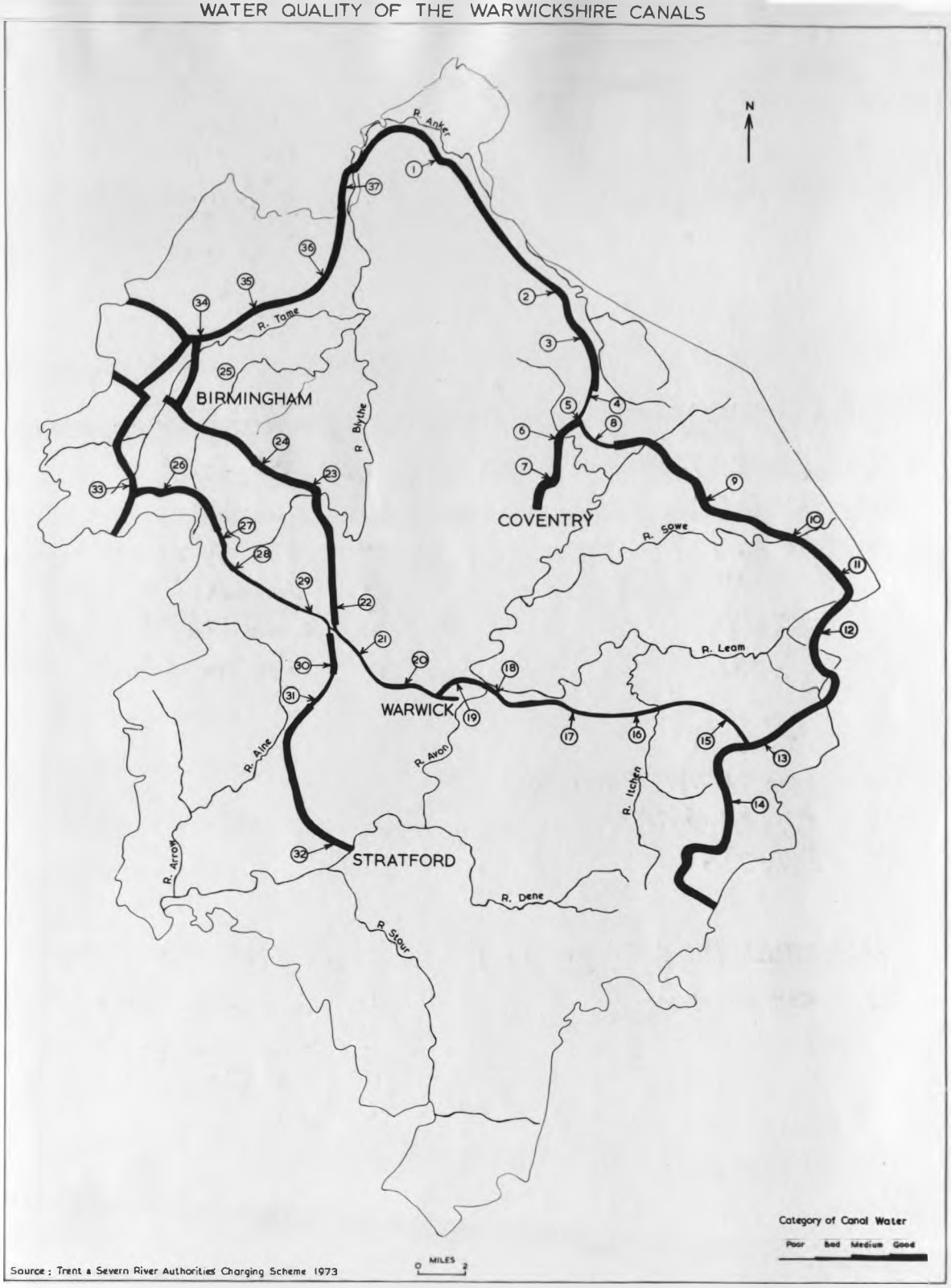


FIG.55

Table 14

Water Samples* of the Warwickshire Canals 1972-3

	Sample	Temperature °C	Suspended Solids mg/lr	BOD mg/lr	Dissolved oxygen content/% saturation	
Coventry Canal August (1972)	1	21.0	9	2.2	-	10.7
	2	22.0	58	3.6	-	9.3
	3	22.0	7	2.0	-	11.5
	4	19.0	-	0.65	102	-
	5	18.0	-	1.2	44	-
	6	16.0	-	5.4	64	-
	7	16.0	-	2.4	59	-
Oxford Canal May (1972)	8	13.0	-	3.2	118	-
	9	13.5	-	2.3	104	-
	10	13.5	-	2.1	120	-
	11	14.0	-	1.8	100	-
	12	13.5	-	6.6	189	-
	13	14.0	-	2.1	84	-
	14	14.0	-	3.7	84	-
Grand Union January (1973)	15	6.0	-	1.7	86	-
	16	7.0	-	2.1	98	-
	17	6.0	-	1.9	100	-
	18	8.0	-	5.2	100	-
	19	7.0	-	2.7	85	-
	20	8.0	-	2.9	82	-
	21	8.0	-	2.5	80	-
	22	12.0	13	3.8	-	11.1
	23	15.0	27	4.2	-	9.8
	24	15.0	26	3.0	-	9.5

* Source: Trent and Severn River Authorities, 1972-3.

Table 14 (Contd.)

	Sample	Temp-erature °C	Suspended Solids mg/lr	BOD mg/lr	Dissolved oxygen content/% saturation	
Stratford February (1973)	25	14.0	28	7.9		8.5
	26	22.5	32	7.8	-	9.4
	27	15.0	32	5.1	-	10.6
	28	15.0	45	1.5	-	11.8
	29	6.0	-	2.5	85	-
	30	7.0	-	3.6	95	-
	31	7.0	-	4.2	99	-
	32	7.0	-	2.5	89	-
Worcester-Birmingham February (1973)	33	9.0	11	16.8	-	4.6
	34	14.0	8	3.9	-	10.1
	35	7.0	16	3.2	-	9.8
	36	6.0	7	1.8	-	9.3
	37	5.5	8	2.7	-	10.8

B.O.D. Scale mg/lr

1. Very clean
2. Clean
3. Fairly clean
5. Doubtful
10. Bad

Canal the water is of medium quality with an average ammoniacal nitrogen of between 0.5 and 2.6. On the whole the canals in the study area have reasonable water quality as Fig. 55 shows. Pollution is nowhere near that of the River Trent, which drains the industrial areas of both the East and West Midlands, where toxic industrial effluents are

discharged into the river, seriously polluting its middle and lower reaches[105].

Water used for direct cooling and quenching will obviously be heated and is liable to contamination by oil, grease and other materials. Hence high temperatures are expected in areas where industries use canal water for direct cooling. As Table 14 shows there is a great variation in temperature in the sample areas making comparison very difficult. The variations, ranging from 22.0°C on the Coventry Canal to 6.0°C on the Grand Union Canal, are due to the season and time of day the samples were taken. Those of the Coventry Canal were taken in August 1972 whilst those of the Grand Union Canal were taken in January 1973. Temperatures are, therefore, not comparable. Suspended water solids in the canal water are a measure of the amount of material in suspension and it affects light penetration and consequently photosynthesis. Biochemical oxygen demand (B.O.D.) of the study area (see Table 14) shows that the Warwickshire Canals are on the whole fairly clean except in a few sample areas like Nechells and Stirchley where the B.O.D. of 7.9 and 7.8 mg/lr respectively, are at undesirable levels.

The net effect of pollution on the canals is twofold: it is most serious for anglers because angling is a sport depending on the existence of good quality water that can support fish breeding. The area affected most by pollution is the five and a half mile stretch of the Coventry Canal where fish suffer from toxic chemical effluents in the canal. The canal consequently needs continual restocking[106]. Pollution may also reduce the aesthetic value of the canal. In addition

---

(105) See Tanner M.F. (1970). Towards a Policy for water-based Recreation: A Study of Coastal and Inland Waters in England and Wales. Draft Report to the Sports Council, London, pp.116-117. This section discusses mainly the causes of pollution in rivers especially those which drain urban and industrial areas.

(106) Information from Fishing Committee, op.cit.

to destroying plant and animal life the water becomes unsightly because of discolouration and floating solids (like floating sewage solids as observed at Calcutt locks on the Grand Union Canal). Aquatic life is also endangered by a high speed of boats travelling beyond 4 miles per hour. The Water Authorities believe that the high fish mortalities two years ago resulted from de-oxygeneration of the water caused by boat traffic disturbing silt at the bottom of the canal rather than from any extraneous pollution.

Other Non-Recreational Use

Use of Canal Towpath for Services

The use of canals for the transport of coal to gas works has already been fully discussed in Chapter Three (p. 92-3), but the role of canals in performing this function was gradually taken over by the railways. However, up to the 1930's coal was being delivered by canal to gas works in Warwickshire, and barges used to take away coke and tar from Windsor Street Works, Birmingham until the mid-1950's[107]. Strangely enough, the discovery of natural gas has led to a marriage between the gas industry and the canals again. Often the West Midlands Gas Board finds the canal towpath the most convenient place to lay a pipe line, particularly in heavily built up areas like Birmingham and the Black Country[108]. In this region canal towpaths are used for the route of more than eight miles of mains laid to transmit natural gas[109]. Not only does the West Midlands Gas Board

---

(107) Information from the Public Relations Officer, West Midlands Gas Board, 1971.

(108) Ibid.

(109) West Midlands Gas Board, Flare, (1971). Birmingham, pp.10-11.

have mains of 27", 24", 18", 12", 10" and 6" diameter in the canal towpaths of Birmingham, but the Central Electricity Board has 33 KV and 11 KV cables, with smaller local and pilot cables, while British Oxygen has a 6" pipe from their main plant to their customers, and there are a number of telephone cables and communication wires for various firms on various canalside premises[110]. The urban areas suffer from such congestion, but the study area includes only limited urban extents. The towpaths of the canals in Warwickshire are not so congested except in Birmingham and Coventry.

The towpaths of the Grand Union Canal in Birmingham between Washwood Heath and Witton, Washwood Heath and Nechells, and Washwood Heath and Rigby Street are used for the main power transmission services of the West Midlands Gas Board[111]. So also are the sections between Catherine-de-Barnes and Solihull, and Acocks Green and Solihull. The other mains are along the Coventry Canal between the Coventry Gas Works and British Celanese where only these services occupy the towpath. It is the right of many statutory authorities like the Midlands Electricity Board, or the West Midlands Gas Board, to dig up roads or highways for services that lead to a great demand on the roads. It is such demands that make some of these authorities seek private thoroughfares such as the canal towpaths which are away from the main residential areas for security reasons. The suitability of canals for transmission services stems from the fact that the canal towpaths are linear features which are suitable for running these services.

---

(110) See Braithwaite, L. The Use of Urban Canals, 1971. p. 34. Centre of Urban and Regional Studies, Birmingham.

(111) West Midlands Gas Board, op.cit.

CONCLUSION

The Warwickshire Canals revolutionized transport (1790-1838) by carrying bulky agricultural produce like grain, lime used as fertilizer, stone for road building and, most important, coal, which gained considerable mobility under the stimulus of canals: the part they played in this transformation was very remarkable as their routes were deliberately planned to serve such primary industries as coal mining and quartzite quarrying in the North-East Warwickshire coalfield (Fig. 10), and also to serve the Arden Sandstone and Rhaetic Lias Limestone quarries in Temple Grafton and Wilmcote (Fig. 11). Important though these industries were in exerting control over the routes followed by these canals, there is strong evidence as is shown in Figs. 4, 5, 5.1, 5.2 that physiographic factors are more influential in determining the morphology of the canals while landownership called for only minor alterations in the precise routes followed by the canals. Due to the close relationship between the Coventry Canal and the North-East Warwickshire coalfield, it was instrumental together with the other Warwickshire Canals, particularly the Oxford Canal, in the distribution of coal. The economic impact of these canals on the distribution of coal was very striking, for the North-East Warwickshire coal market was geographically extended beyond its limited local area, while turnpike roads and tramways played a substantial role by acting as feeders to the canals (Figs. 17.1, 17.2), and distributing canal carried goods. There was an immediate and substantial reduction in the price of coal in towns like Coventry and Birmingham where the cost of coal dropped from 13s.0d. to 7s.6d. due partly to the cheap movement of coal provided

by the canals, and partly by competition between coal from different collieries meeting in the same market: for keen competition was generated between North-East Warwickshire coal and other coal from Staffordshire and Leicestershire. Such competition was to be expected and was beneficial because it cheapened the price of coal as well as widening its choice. However, to North-East Warwickshire coal such competition, particularly with Wednesbury coal, was disastrous because the latter had the advantage of being not only cheaper but of better quality than Warwickshire coal: indeed, the popular and superior quality Wednesbury coal nearly ousted North-East Warwickshire coal from its old established market in Warwickshire. However, the picture was to change in the late 1850's when, due to partial exhaustion of the South Staffordshire coalfield, Warwickshire coal became free from competition and started being exported to Birmingham and the Black Country (Figs. 15.1, 15.2, 15.3).

Another economic impact of the Warwickshire Canals is clearly brought out in factory development at the commencement and the terminal basins, as in Stratford (at the Bancroft area and One Elm) where an industrial colony sprang up on both sides of the Stratford Canal (Fig. 33) between 1822 and 1832 taking advantage of the cheap means of transport offered by the canal in bringing coal and sending goods like bricks and lime. The influence of the Warwick Canals was particularly marked in Warwick (Fig. 30.1) which developed a considerable trade and industry for such a small shire town. Industrial establishments were located in three conspicuous zones - The Saltisford (the Warwick-Birmingham terminal basin), the Cape and Emscote both on the Warwick-Napton Canal. The most remarkable industries were: first, the Parkes' Worsted Manufactory

at the Saltisford (Fig. 30.2) established in 1796, depending on the canal for receiving its raw material (wool) from Leicester and despatching the worsted to Northampton; second, the Nelson's Gelatine Manufactory (Fig. 30.3), built in 1842, bounded on its entire length by the Warwick-Napton Canal which brought in the raw material in the form of dried buffalo skin from Singapore and despatched the gelatine products to its markets in Britain as well as its established markets in the United States of America and Russia. Outside Warwick the Warwick-Napton Canal clearly benefited the Blue Lias Lime and Cement Works at Stockton and Long Itchington (Fig. 29) which used the canal extensively by bringing in coal cheaply and marketing the cement in the middle of the nineteenth century. The study also shows clearly that all the Gas Works in the county, established between 1820 and 1841, were invariably located by a canal. As an essential prerequisite to the establishment of these canalside factories were wharves for receiving raw materials and sending away the manufactured goods. Hence, the closer the factories depending on the canal for transport were to each other the closer the wharves as is illustrated by those in the Emscote industrial area (Fig. 30.3). In addition to wharves located in relation to factories, were those developed at settlements along the canal and at lock cottages receiving coal by canal. Wharves also developed where there was a break in transportation like the junction of roads and canals, Fig. 24, (for roads, especially turnpike and waggon roads played an integral part in canal transportation by complementing the canals, (Figs. 17.1, 17.2, 23), the junction of canals and tramways or the junction of one canal with another as at Hawkesbury (Fig. 32.1), the junction of the Coventry and Oxford Canals. The need for a break in the transport of goods at a junction of two canals did not only give rise to

facilities of handling, collecting and distributing goods but also gave rise to a small settlement as in Hawkesbury (Fig. 32.3) with a morphology very similar to that of Braunston (the junction of the Oxford and Grand Junction Canals) with lock keepers' and wharfingers' cottages, canal inns and other settlements (Figs. 32.2, 32.3) spreading outwards from the core marked by the location of wharves. Moreover, private industrialists like Barber (Haunchwood) and C. Nelson and Company Ltd., (Long Itchington) undertook construction of collateral canal branches in order to gain access from the collieries and Blue Lias Lime and Cement Works to the Coventry and the Warwick-Napton Canals respectively (Figs. 22, 29).

The stimulus given to industry by the canals and the specific economic impacts, already outlined, were to be short-lived, lasting for about fifty years due principally to the advent of railways in 1838, as better, cheaper and faster means of transport evolved, thus arresting any further development by canals. In connection with the North-East Warwickshire coalfield, whose location partly controlled the route of the Coventry Canal, the canal was no longer important for either the location of new collieries or for distribution of coal as is illustrated by the route of the Birmingham-Derby Junction Railway (1939) and the L.N.W.R. Trent Valley branch (1847) whose routes were very much connected with the northern and north-eastern areas of the coalfield. Thus, coal from the new collieries was distributed by rail rather than by canal. To the north-west and south of the coalfield the L.N.W.R. and the Midland Railway became serious rivals to the Coventry and Oxford Canals particularly for the carriage of coal - the railways quoted lower tonnage rates and recouped losses through passenger rates to the disadvantage of canals which relied only on tonnage rates. Due to low tonnage rates

and much efficiency in handling goods, as well as co-operation among the various railway companies, the railways soon had the upper hand: their policy was to eliminate any canal competition. The Warwick Canals foresaw the might of the railways, and tried to build an improved through route (the Central Union Canal in 1832, Fig. 25) which did not materialise. The Stratford-upon-Avon Canal was bought by the O.W.W.R. in 1846 and passed on to the Great Western Railway in 1863. The buying of the Stratford Canal served well the purpose of the G.W.R. Company in its policy of elimination. It did all within its power to divert traffic from the canal by raising canal tolls and lowering railway tolls, closing the canal indefinitely for leisurely repairs and refusing reduction of canal rates to equal those of the railway. As might be expected from such a deliberate policy of the G.W.R. Company, traffic from the Stratford Canal shifted to the railways thus paralysing the Stratford Canal. Railway rivalry was undoubtedly a major cause in canal decline as already discussed; the decline being reflected in the gradual deterioration of the number of wharves in the county (compare Figs. 28, 42.1, 42.2, 43). Nevertheless, the fact that there was a lot to be desired in the operation and management of the canals themselves, hastened their downfall. Canal speed was very slow averaging only 2½ m.p.h., a speed which was inconvenient for trading purposes and caused a great deal of concern, while physical defects like frost and drought sometimes led to indefinite closure. Moreover, petty jealousies and lack of co-operation among canal companies weakened them in their struggle with the railways, which replaced the canals as fast and more efficient means of transport.

Throughout the discussion the economic impact of the canals, their struggle with and their defeat by the railways have been clearly stated, but the social impact made by the canals cannot be overlooked;

for the appearance of the canals in Warwickshire has effected a pronounced and lasting influence upon the cultural landscape. The present patterns of canal cottages, now lengthmen's cottages or private dwellings, bridges and canal inns (Figs. 35, 38, 39) reflect the impact of the canals. The simple and varied architecture of the canal buildings, most of which were functional, were established for the maintenance and organisation of canal traffic. The most architecturally interesting of the canal cottages were the five unique barrel vaulted roof ones on the southern section of the Stratford Canal (Photo 20) where the peculiar design was a compromise arrived at by the canal engineer in his attempt to devise a very simple, inexpensive but durable cottage. Also unique on this stretch were the attractive cast-iron split bridges and movable cantilever bridges (Fig. 38), roving and humpback bridges which arose where the canal intersected a farm or a road or at the junction of two canals. Of a greater impact still were the canal inns which were the creation of the canals, as is clearly demonstrated by their location at the junction of canal and road, canal and lane or along the canal. The typical canal inns dated from the canal period (Fig. 39), as opposed to other canal inns pre-dating the construction of the canals and coming under canal influence during the last decade of the eighteenth and early nineteenth century. The typical canal inns bear names like "Navigation", "Wharf", "Reservoir" and "Boatman's Rest", reflecting the pronounced influence of the canals. Most of these inns still maintain their functions as canal inns but a few have lost their licence due to their location and the change in function of the canals. Clear examples are the "Blue Bell" (Wilmcote), the "Greenman" (Hatton near Shrewley), and the "King's Head" (Hatton near Warwick) all of which are near small villages. The "Blue Bell" on the

Stratford Canal and the "Greenman" on the Birmingham-Warwick Canal were both located along these two respective canals. Once the importance of the canals for commerce gradually declined from the 1830's, canal inns with no road intersection like the "King's Head", located between Wharf Lane and the Birmingham-Warwick Canal, were to suffer adversely with the change in function of the canals. These inns now have to compete with other inns which are more accessible and located right in the heart of a village like the "Mason's Arms" in Wilmcote or along major roads like the "New Inn" (Hatton) on the Warwick-Birmingham Road. The result was a decline in the number of customers to these canal inns which eventually lost their licence becoming merely residential houses in the early twentieth century: the "Blue Bell" became a living house in 1928, the "Greenman" about 1930 and the King's Head in 1938. Despite such modifications and changes most of the secondary effects of the canals in the form of warehouses, numerous canal cottages (Figs. 56, 57) and hump-back bridges, which now form serious bottlenecks for modern road users, still remain as a distant reminder of the industrial prosperity of the canals in the late eighteenth and nineteenth century.

With gradual decline of commercial transport the canals were rescued from further stagnation and complete abandonment in 1964 by an Act of Parliament which officially encouraged the use of the canals for recreation and leisure, while the canal water became more and more available as a cheap source of cooling and processing water for canalside factories. Through the backing of the Government the popularity of the canals in the study area shows an annual increase of 13.4% (1971-72), and this figure is likely to expand through the financial support given by the Government for the provision of cruising facilities, and wide

MAJOR CANAL SIDE LAND USE OF THE COVENTRY CANAL 1972

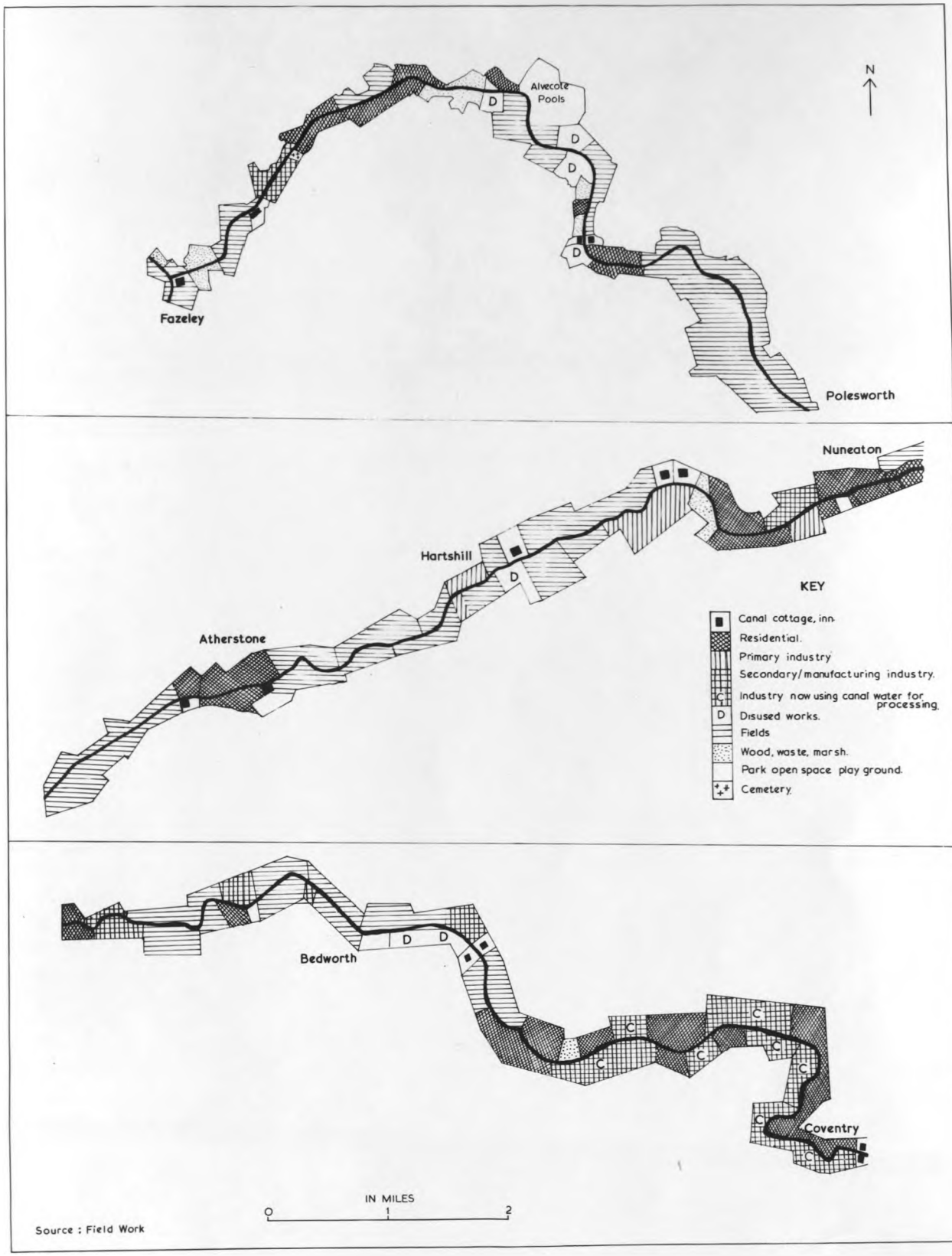
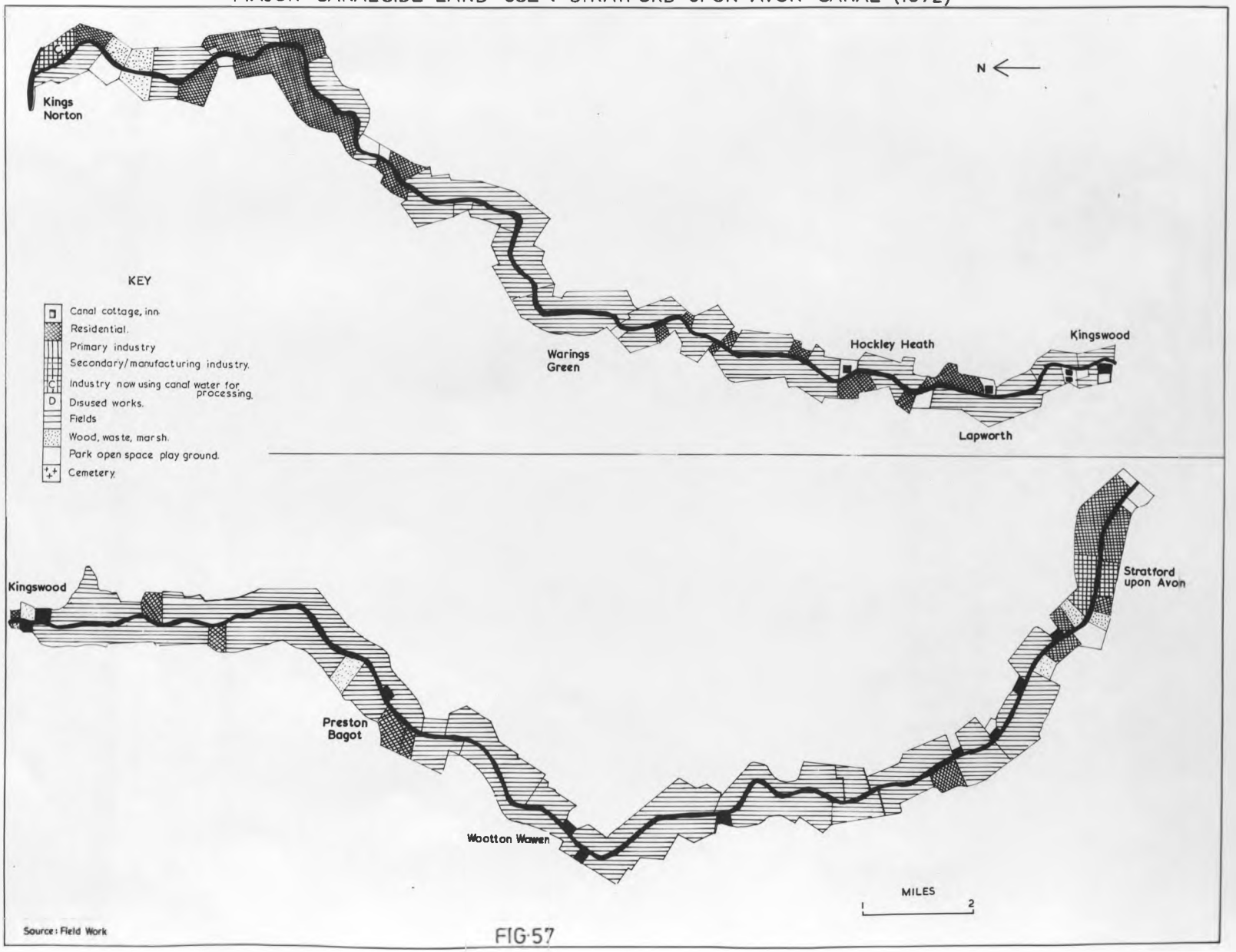


FIG.56

MAJOR CANAL SIDE LAND USE : STRATFORD-UPON-AVON CANAL (1972)



FIG·57

publicity given to recreation on waterways through the mass media. Already, the Warwickshire Canals have gained much popularity with holiday makers in Britain and those from the main continent of Europe. From the yearly expansion it is possible that recreation on the canals will accelerate in the years ahead, but a significant problem about the overall development of the canals is raised by the fact that no single statutory body is responsible for the overall control of canals. The B.W.B. is responsible for maintenance of canals as cruiseways, and for water sales; the Trent and Severn River Authorities are responsible for the control of pollution, while access to the canals and towpaths comes under the local authorities. Such complexity of control makes it difficult to work out a recreational policy which can be accepted and implemented by all. However, many forward looking planning authorities, notably the Coventry City Council[1], Birmingham Corporation[2] and Atherstone Rural District Council[3] have been showing active interest in the potentialities of the waterways for local amenities and recreation in the study area, and it is open to them to further this end in a variety of ways, by either developing parks and pleasure grounds for recreational purposes or by the creation and maintenance of public walks along towing paths. The Coventry Architect's Planning Office[4] allocated the sum of £5,000 in the 1971/72 capital works programme for improvement of the Coventry Canal basin which was to be undertaken in conjunction with the B.W.B. In a further attempt to improve the Coventry Canal, the

---

(1) The West Midlands Sports Council, (1972). A Guide to Water Recreation, p.13. Birmingham.

(2) Ibid. p.12.

(3) West Midlands Sports Council, (1970). Regional Recreation, p.40. Birmingham.

(4) A Guide to Water Recreation, op.cit., p.13.

enthusiastic Coventry Canal Society presented a comprehensive suggestion to the Coventry Planning Authorities and representatives of the B.W.B. in a series of working party meetings for the creation of four amenity areas to be linked by a tree-lined canalside walkway on the 5½ mile stretch of canal between Leicester Row basin and Hawkesbury Junction. This recommendation is receiving serious consideration. Elsewhere in Warwickshire the County Borough of Solihull[5] has a provision in its Green Belt Plan of 1973 for the development of the Grand Union Canal in Knowle, which has both a pleasant and tranquil setting suitable for creating recreational parks and also offers a convenient permanent mooring for pleasure craft. In Birmingham the B.W.B. are studying with the Corporation a linear amenity development of four miles of the Stratford Canal, and at Atherstone the Rural District Council[6] have sought the B.W.B.'s views on the development of a former colliery loading wharf as a boating centre. Implementation of these plans will undoubtedly enhance the boom in local amenities and recreation, and offer opportunities for relaxation to all cruiser enthusiasts, anglers, casual visitors and picknickers, who would choose to enjoy leisurely walks in such canalside parks and pleasure grounds. The present strides in recreation are most important at this stage, but one major point is clear - whatever recreation functions persist today the fact remains that a creative use is now made of a waterway which at one time was instrumental in effecting revolutionary changes in commerce and industry, but which was rendered obsolete and, therefore, became a backwater in the transport industry: it is, therefore, only with a close appraisal of Historical Geography that the changing role of the Warwickshire Canals can be wholly appreciated and interpreted.

---

(5) County Borough of Solihull, (September 1973), Green Belt Plan, Local Plan No. 1, pp.4-5, Solihull.

(6) Regional Recreation (1970), op.cit. p.40.

BIBLIOGRAPHY

The bibliography classifies the primary manuscripts and printed sources which have been used in this study. The details of the secondary authorities are given in the footnotes in the various chapters.

1. BIRMINGHAM REFERENCE LIBRARY

Diary of Bird, G. R., Wharfinger and Carrier of Birmingham, 1822-30, No. 662750.

Cubitt, W. Observation on the Proposed London-Birmingham Canal, 1836. No. 275146.

Jewel Baillie Collection.

Birmingham-Warwick Canals, papers and plans, 1800-1822. No. 83a.

Stratford-upon-Avon Canal, papers and plans, 1792-1862. No. 83d.

Notebooks and Papers, concerning negotiations with landlords and valuations for the purposes of compensation for land taken for the Warwick-Birmingham Canal between Yardley and Hatton, 1793-1797. No. 308.

Miscellaneous Notebook containing Notes on Canals and Railways. C.1840. No. 395899.

Maps, Plans and other Material Relating to Midland Canals, 1750-1850. No. 436711.

A Plan of the Proposed line of Navigable Canal from Warwick to Birmingham surveyed by J. Sheriff (with notes, 1792). No. 73384.

2. BRITISH TRANSPORT HISTORICAL RECORD OFFICE, LONDON

OXFORD CANAL

Minutes and Reports of the Oxford Canal Company, 1769-1854. OXC1/2-6.

Ledger, 1791-1892. OXC4/15-22.

Guard Book, (contains collection of historical, interesting and amusing records, letters about passage of H.M. Troops and material about the Oxford Canal) 1787-1900. OXC4/110.

Manuscript Book, about 1800. OXC4/104.

Monthly Water Accounts, 1855-6, 1859-60. OXC4/156.

Specimen Returns of Traffic at Hawkesbury, Hillmorton, Napton. (1942-4). OXC4/107.

COVENTRY CANAL

Minutes and Reports of the Coventry Canal Navigations, 1818-1842. CVC1/5.

Tonnage Ledger (includes daily notes on various matters) 1801-1802. CVC4/83.

Tonnage Ledger 1813-1820. CVC4/84.

"Memorandum" Book containing records of tonnages, State of trade on the Coventry Canal and other Canals, 1802-1808. CVC4/156.

An account of Wednesbury Coal and Coke navigated on the Coventry Canal, 1821-1834. CVC4/157.

WARWICK-BIRMINGHAM CANAL

Minutes and Reports of the Warwick-Birmingham Navigations 1820, 1830, WBC 1/2; 1838. WBC 1/3.

Warwick-Napton Canal

Minutes and Reports of the Warwick-Napton Canal, (1800-1834), WNC1/2.

STRATFORD-UPON-AVON CANAL

Minutes and Reports of the Stratford Canal, 1793-1798. SCN1/2.

Minutes and Reports, 1829-1857. SCN1/4.

Miscellaneous Collection

Pickford Memoranda Book, 1829-1835. PIC4/7.

Letters from Pickfords Ltd., to Oxford Canal Company, 1798-1847. OXC/110.

3. COUNTY RECORD OFFICE, WARWICK

NEWDIGATE COLLECTION

Diary of Sir Roger Newdigate, 1711-1761, CR 136.

Notes by Sir Roger Newdigate on Coventry Canal 1782-1783, CR 136/b 3717-18.

List of Pools at Arbury, 1711, 136/B 2681.

Griff Coalpit Account Book, 1728-30. CR 136 V.15.

Collycroft Mill, Water Supply and Canal. CR 136 E15-16.

Plan of Arbury Canal, Worsted Factory. CR 136 E.18-20.

Arbury Canal, 1771 CR 136 E.35.

Case of the Warwickshire Coalowners, 1785. CR 764/264.

Comparative State of the Price of Staffordshire and Warwickshire Coals. CR 1022/2.

Facts Relating to the Equality of Tonnage on the Oxford and Coventry Canals, CR 764/264/1.

MEREVALE COLLECTION

Abstract of Account of Coal got and sold at Baddesley Colliery, February-December 1825. No. 2548 A-J.

Plan and Elevation of Stable at Whittington Wharf by R. S. Smith. No. 3014.

Plan of Intended Navigable Canal from Coventry Canal to Mr. Barber's Colliery at Nuneaton. No. 1891.

Statements by individual colliery workers concerning Baddesley Colliery. No. 174/9.

OTHER MANUSCRIPTS FROM COUNTY RECORD OFFICE, WARWICK.

Case and Papers relating to the Navigable Canal intended to be made from the Coal Mines in Wednesbury to Birmingham and Fazeley, 1767. CR 764/264/1.

Papers about the Birmingham-Warwick Canal Railway Papers, 1845-1847. CR 556/684.

London and Birmingham Extension Railway and Warwick-Birmingham Canal Railway Papers, Part III, CR 556/684.

Nelson and Dale Company Ltd: Letter book 1882 CR 1294.
Ledger book 1838-1870 CR 1294.
Account book 1838-1870 CR 1294.

Turnpikes and Highways, Printed Acts, Reports and Statements, 1819-1871. HR 82.

Quarter Session Papers, Highway Diversions QS 32/2.

Wootton Wawen-Stratford, 1806. QS 47/37.

Rugby-Newbold, 1810. QS 47/39.

Rowington-Claverdon-Lapworth, 1811. QS 47/41.

Warwick-Budbrooke, 1813. QS 47 (Roll 1, 6F.)

Southam-Warwick, 1814. QS 47/51.

Solihull-Hampton-in-Arden. QS 47/77.

Minute Books, Deeds, Accounts of Birmingham to Warwick-Warmington-Edgehill-Stratford Turnpike, 1731-1871. CR 347/11-20.

Birmingham, Warwick and Edgehill Turnpike: Act, and Leases of Tolls, 1732-1803. CR 607.

Radford Semele: Plan of Improvements to Turnpike Road, 1836. CR 1291/357/4.

Stratford-upon-Avon Highway Board, 1803-82. CR 446/47-94.

Leamington, Warwick and Stratford Railway: Plan and Section, 1852, CR 919/9.

Dunchurch-Southam Turnpike, C18th-C19th. CR 580.

Warwick-Paddlebrook Trust (1816-71). CR 446/34.

Maps and Plans

Deposited Plans QS 111/38.

Coventry Canal to Ashby-de-la-Zouch, 1792.

Warwick-Birmingham Canal, 1792.

Warwick-Napton Canal, 1796.

Stratford Canal (construction, variations and reservoirs), 1792-1814.

Warwick-Napton Canal to the town of Southam, 1818.

Oxford Canal - improvements along the line of, 1828.

Stratford Canal - Reservoirs for the Supply of Water, 1836.

Birmingham Warwick Junction Canal, 1839.

Turnpike Plans

Warwick to Rugby Turnpike Road, 1812, QS111/28.

Coventry Turnpike Road from Rugby to Hinckley, 1812, QS 111/29.

Birmingham, Warwick, Warmington Road, proposed deviations and branch lines on, 1825 QS 111/51.

Other Plans

Plan of Oxford Canal through the Spencer Estate, 1777, Z176/3(U).

Plan of Wormleighton Farm, 1856, Z176/6(U).

For Estate, Enclosure and Tithe Maps used see Appendix 1.

Papers relating to the L.N.W.R., 1848, part 3, section 1. CR 1207/2/9.

4. HOUSE OF LORDS RECORD OFFICE, LONDON

House of Lords Sessional Papers 1871, Vol. 34.

Report of Committee "E".

Report from the Committee on the Birmingham and London Junction Canal Petition, Parliamentary Papers 1830 (251), X, 719.

OTHER PARLIAMENTARY PAPERS

Royal Commission on Canals and Inland Navigations Vols. 1-12, 1906-1912.

Royal Commission on Canal and Railway Rates, 1888.

Report of Coal Commission 1800, 1830, 1871.

Acts of Parliament

Coventry Canal Acts:	8 Geo. 3, C36, 1767.
	25 Geo. 3, C99, 1784.
	26 Geo. 3, C30, 1785.
	59 Geo. 3, C62, 1819.
Oxford Canal Acts:	9 Geo. 3, C70, 1768.
	15 Geo. 3, C9, 1774.
	26 Geo. 3, C20, 1786.
	34 Geo. 3, C103,1794.
	10 Geo. 4, C48, 1829.
Stratford Canal Acts:	33 Geo. 3, C112,1793.
	35 Geo. 3, C72, 1795.
	39 Geo. 3, C60, 1799.
	55 Geo. 3, C39, 1815.
	57 Geo. 3, C15, 1817.

Warwick-Birmingham Canal Acts:	33 Geo. 3, C38, 1793.
	36 Geo. 3, C42, 1796.
Warwick-Birmingham Junction Canal Act:	3 & 4 Vic., C57, 1840.
Warwick-Napton Canal Acts:	34 Geo. 3, C38, 1794.
	36 Geo. 3, C95, 1796.
	49 Geo. 3, C72, 1809.
Canal Clauses Act:	8 & 9 Vic., C42, 1845.
Railway and Canal Traffic Act:	17 & 18 Vic., C31, 1854.

Water Resources Act, 1963, S.79 and 80.

Ministry of Transport Act, 1968, S.104.

Countryside Act, 1968, S.6-10, 16.

5. SHAKESPEARE'S BIRTHPLACE LIBRARY, STRATFORD-UPON-AVON.

Miscellaneous collection on the Stratford-upon-Avon Canal, 1793-1886. ER 37/1.

APPENDIX I

Enclosure, Tithe and Estate Plans of the Parishes through which the Warwickshire Canals Passed.

Parish	Enclosure Map	Tithe Map	Estate Map
1. Saltley & Aston	662125 (B'ham Ref. Lib.) 1817*	299989 (B'ham Ref. Lib.) 1848* 661295 (B'ham Ref. Lib.) 1848	662752 (B'ham Ref Lib.) 1843*
2. Edgbaston		662129 (B'ham Ref. Lib.) 1827*	Colmore Estate* 567585 (B'ham Ref. Lib.) 1881
3. Acocks Green	-	-	572459 (B'ham Ref. Lib.) 1793*
4. Solihull	QS 75(C.R.O.) 1843	CR 328/23 (1841)*	-
5. Elmdon Heath	-	-	CR 328/17 (C.R.O.) 1840
6. Balsall	CR 486(C.R.O.)1802	HR 84(C.R.O.)1841	-
7. Hampton-in-Arden	CR 487(C.R.O.)1820*	-	Rotton Row Farm p.29(C.R.O.) 1734
8. Kingswood	QS 75/92(C.R.O.) 1824*	CR 328/30(C.R.O.) 1843*	-
9. Rowington	-	CR 569/197(C.R.O.) 1849*	-
10. Shrewley) 11. Hatton)	-	CR 569/126(C.R.O.) 1842	Bromley Throckmorton Estate, p.43 (C.R.O.) 1728
12. Budbrooke	-	CR 894/23(C.R.O.) 1842*	Dormer Estate* CR 895/101(C.R.O.) 1788

* Map with canal data.

Parish	Enclosure Map	Tithe Map	Estate Map
13. Warwick	-	CR 569/252-3 (C.R.O.) 1849	-
14. Royal Leamington Spa	QS75(C.R.O.)1768	CR569/155 (C.R.O.) 1853	-
15. Offchurch	-	CR 569/187(C.R.O.) 1848	-
16. Long Itchington	QS 75 (C.R.O.) 1776	CR 1311/381-2 (C.R.O.) 1836	-
17. Birdingbury	QS 474(C.R.O.)1804	-	-
18. Bascote	-	-	Bree Estate 1799* CR 1311 137(C.R.O.)
19. Leamington Hastings	-	CR 569/156(C.R.O.) 1844	Sitwell Estate CR 198/ 35 (C.R.O.) 1838
20. Napton-on-the-Hill	QS 75(C.R.O.) 1779	-	-
21. King's Norton	-	-	Grange Estate Farm* 383233(B'ham Ref. Lib.) 1868
22. Yardley	-	-	Taylor's Estate, 660178 (B'ham Ref. Lib.) 1807.
23. Solihull	-	CR 328/44(C.R.O.) 1844*	Green's Farm, 396430 (B'ham Ref. Lib.) 1831.
24. Tanworth 25. Hockley Heath	-	CR 328/53 (C.R.O.) 1842	Archer Collection ER 134/8 Stratford Lib. 1796-1812.
26. Lapworth	QS 75/69(C.R.O.) 1863*	CR 328/30(C.R.O.) 1843*	-

* Map with canal data.

Parish	Enclosure Map	Tithe Map	Estate Map
27. Preston Bagot	-	CR 569/192(C.R.O.) 1840*	Mills Estate, P.6* (C.R.O.) 1822
28. Wootton Wawen	QS 75/136(C.R.O.) 1776	CR 569/278(C.R.O.) 1843*	Wootton Wawen Estate K.15(C.R.O.)1776
29. Aston Cantlow	QS 9/12(C.R.O.)1776	-	Lord Abergavenny Estate, CR 882 (C.R.O.) 1776
30. Old Stratford	QS 75(C.R.O.) 1775	-	-
31. Shuttington	CR 460(C.R.O.)1805	-	-
32. Glascote	QS 75(C.R.O.)1809	-	-
33. Polesworth	-	CR 328/37(C.R.O.) 1850	-
34. Grendon	M1.175(C.R.O.)1806	CR 328/18(C.R.O.) 1850	-
35. Atherstone	DR 322(C.R.O.)1806	-	Bracebridge Estate P.7,8(C.R.O.)1716
36. Merevale	-	-	Dugdale Estate (C.R.O.) QS 47 roll 2
37. Mancetter	CR 491(C.R.O.)1811	-	-
38. Hartshill	CR 491(C.R.O.)1811	-	-
39. Caldecote	-	CR 569/5(C.R.O.) 1842*	-
40. Nuneaton	QS 75/83(C.R.O.)1806*	CR 569/184(C.R.O.) 1844	-

* Map with canal data.

Parish	Enclosure Map	Tithe Map	Estate Map
41. Chilvers Coton	QS 75/34(C.R.O.) 1775*	-	-
42. Bedworth	QS 75/11(C.R.O.) 1770	CR 569/24(C.R.O.) 1841*	Newdigate Estate* CR 764/104/3 (C.R.O.) 1807
43. Foleshill	QS 75/8(C.R.O.) 1775	-	-
44. Coventry	QS 75/2(C.R.O.) 1885	-	-
45. Coombe Fields	-	-	Estate of the Earl of Craven D.34(C.R.O.) 1823
46. Ansty & Shilton	-	CR 569/7(C.R.O.) 1852	Taylor Estate CR 285/Box 3(C.R.O.) 1770
47. Stretton-under-Fosse	QS 75(C.R.O.)1771	-	-
48. Brinklow	QS 9/12A(M.70) (C.R.O.)1742	-	-
49. Easenhall	-	CR 569/144(C.R.O.) 1842	-
50. Harborough Magna	QS 75(C.R.O.) 1755	CR 569/123(C.R.O.) 1842	-
51. Little Lawford	QS 175(C.R.O.)1774	-	-
52. Newbold-on-Avon	-	CR 162/46(C.R.O.) 1839	Cosford Estate, 28/5-6,24(C.R.O.) 1732-5.
53. Clifton-upon Dunsmore	-	CR 569/70(C.R.O.) 1849	-

* Map with canal data.

Parish	Enclosure Map	Tithe Map	Estate Map
54. Willoughby	CR 184(C.R.O.)1760	-	Willoughby Estate* CR 556/305(C.R.O.) 1853. Magdalen College Estate CR 406(C.R.O.) 1816
55. Wolf-hamcote	QS 75(C.R.O.)1738	-	-
56. Grand-borough	M.1 175(C.R.O.) 1806	CR 328/18(C.R.O.) 1850	-
57. Lower & Upper Shuckburgh	QS 75(C.R.O.)1779	-	1732-35
58. Upper Radbourne	-	CR 569/194(C.R.O.) 1849	-
59. Priors Hardwick	QS 75(C.R.O.)1758	CR 569/124(C.R.O.) 1847	-
60. Stoneton) 61. Wormleighton)	-	-	Earl Spencer's Estate Z176/3U, 1777; Z176/6 U(C.R.O.) 1856*
62. Fenny Compton	CR 479(C.R.O.)1779	-	-
63. Farnborough	-	DR 30C/1-2(C.R.O.)184	-
64. Middleton	QS 75(C.R.O.)1852	-	D 1851/10/3 William Salt Library 1851
65. Lea Marston	CR 482B(C.R.O.)1792	CR 328/14-16 (C.R.O.)1785	Adderley Estate 2766B (C.R.O.) 1846
66. Curdworth	-	-	Leigh Estate, Z142, map 13 (C.R.O.) 1769
67. Minworth	-	-	M.P.B. 10(2) Public Record Office, London.

* Map with canal data.

A P P E N D I X II

Mean Temperatures of the Midlands 1825, 1854-1860

Year	J.	F.	M.	A.	M.	J.	J.	A.	S.	O.	N.	D.
1825	38.9	39.1	41.0	48.3	52.8	57.3	62.9	61.3	59.1	51.5	41.3	40.3
1854	38.5	39.7	44.1	48.5	50.6	55.7	59.7	59.4	57.9	48.9	40.9	41.1
1855	36.3	28.9	37.9	44.7	47.8	55.9	62.3	60.2	55.7	49.5	41.5	36.6
1856	38.7	41.5	39.9	46.5	48.9	56.3	59.5	62.5	54.5	51.3	40.7	39.9
1857	36.7	39.7	41.5	45.5	52.3	60.5	61.5	63.4	58.1	52.3	44.9	45.2
1858	38.2	35.3	40.9	45.9	51.5	62.3	58.7	60.5	58.5	49.2	39.8	40.7
1859	40.8	42.3	45.1	45.5	53.1	58.7	64.9	61.1	55.3	49.2	40.7	34.9
1860	38.3	35.1	40.5	42.7	52.7	54.2	58.1	56.5	52.1	49.7	40.1	34.7

Source: Manley G. (1953). Quarterly Journal of the Royal Meteorological Society, Vol.79, p.258, London.

Appendix III

Boats passing through Locks

		1854	1855	1856	1858	1859	1860
Hawkesbury Locks	Jan.	909	1,097	1,182		1,121	1,293
	Feb.	1,368	46	1,258	1,148	1,527	1,068
	Mar.	-	1,476	1,206	1,115	1,457	1,192
	Apr.	1,295	1,472	1,283	1,398	1,306	1,189
	May	1,578	1,613	1,356	1,202	1,474	1,207
	June	1,229	1,435	1,025	1,293	1,189	1,366
	July	1,518	1,397	1,293	1,287	1,211	1,337
	Aug.	1,510	1,459	1,322	1,260	1,281	1,248
	Sep.	1,399	1,300	1,246	1,406	1,302	1,218
	Oct.	1,376	1,454	1,402	1,375	1,370	1,285
	Nov.	1,352	1,366	-	1,461	1,373	1,396
	Dec.	1,345	1,040	-	1,643	929	787
Total		14,879	15,155	12,573	14,588	15,540	14,586
Hillmorton Locks	Jan.	963	1,097	1,204		1,140	1,316
	Feb.	1,368	61	1,311	1,133	1,323	1,196
	Mar.	-	1,469	1,240	1,115	1,213	1,355
	Apr.	1,341	1,443	1,270	1,380	1,176	1,340
	May	1,593	1,567	1,377	1,217	1,292	1,341
	June	1,198	1,325	1,009	1,226	1,216	1,464
	July	1,548	1,380	1,265	1,296	1,243	1,374
	Aug.	1,495	1,421	1,406	1,332	1,283	1,473
	Sep.	1,429	1,297	1,347	1,360	1,337	1,378
	Oct.	1,405	1,361	1,384	1,315	1,363	1,493
	Nov.	1,380	1,353	-	1,479	1,352	1,533
	Dec.	1,346	1,075	-	1,752	979	1,084
Total		15,066	14,849	12,813	14,605	14,917	16,367
Marston Doles Locks	Jan.	322	363	418	499	504	504
	Feb.	523	19	467	-	540	491
	Mar.	-	566	478	517	586	574
	Apr.	501	567	501	558	528	526
	May	622	642	583	521	591	585
	June	444	519	391	620	513	645
	July	567	501	542	627	516	648
	Aug.	569	570	521	600	520	687
	Sep.	523	498	520	574	536	589
	Oct.	462	489	558	555	559	658
	Nov.	497	516	-	560	504	639
	Dec.	475	393	-	568	379	459
Total		5,505	5,643	4,979	6,199	6,276	7,005

		1854	1855	1856	1858	1859	1860
Warwick-Napton Junction	Jan.	765	825	983	-	922	919
	Feb.	1,118	19	939	1,027	876	862
	Mar.	,-	1,180	941	967	1,056	1,035
	Apr.	1,113	1,144	991	829	808	881
	May.	1,214	1,186	946	886	961	1,076
	June	957	1,221	676	886	963	990
	July	1,152	1,146	1,035	1,015	897	995
	Aug.	1,291	1,125	893	973	960	949
	Sep.	1,150	958	955	985	902	932
	Oct.	1,171	1,147	988	1,005	1,004	733
	Nov.	1,191	1,106	-	983	1,002	888
	Dec.	1,191	946	-	991	687	731
Total		12,313	12,003	9,347	10,547	11,038	10,991

Source: B.T.H.R. Oxford Canal Monthly Water Sales 1854-6, 1858-1860 OXC4/107.