

THE WEST RIDING RECOVERED WOOL INDUSTRY,
ca. 1813-1939.

A study of the growth and development of
woollen rag merchanting and the manufacture
of shoddy and mungo with an assessment of its
contribution to the West Riding woollen industry.

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Abstract

This study is concerned with the growth and development of the recovered wool (shoddy and mungo) industry located in the Heavy Woollen District of the West Riding, the principal activity of which was the reclamation of wool fibres for re-use in the woollen branch of the wool textile industry. Between ca. 1855 and 1914, recovered wool augmented the total clean weight of wool consumed in the United Kingdom by between 30 and 50 per cent and provided the major cost-reducing raw material in woollen products for the mass market.

The work is divided into four main chapters, following an initial introductory chapter, each considering different aspects of the industry. Chapter II covers the growth and size of the woollen rag merchanting sector, the development of an auction system, entrepreneurship, capital formation, and bankruptcy. Sources of supply of the raw material of the industry - woollen rags - are discussed in Chapter III. Chapter IV examines the shoddy and mungo manufacturing sector and covers a number of aspects of industrial development raised in Chapter II. Chapter V assesses the contribution of recovered wool to the growth of the West Riding woollen industry, and contains in computer print-out form a long-run price series of shoddy and mungo (from primary sources), cotton, and five different types of wool; secondly, the quinquennial or annual United Kingdom consumption figures of wool 'in the grease' have been adjusted to indicate the 'clean' weight in order to estimate the quantitative significance of recovered wool. The final chapter discusses the long tradition of opposition to the manufacture of 'shoddy' cloth.

A major conclusion of this study is that the development of this horizontally organised sector was crucial to the growth of the Yorkshire woollen industry between ca. 1850 and 1914.

Abbreviations

(i) Newspapers

B.R.	-	Batley Reporter.
D.R.	-	Dewsbury Reporter.
H.C.	-	Huddersfield Chronicle.
H.E.	-	Huddersfield Examiner.
L.I.	-	Leeds Intelligencer.
L.M.	-	Leeds Mercury.

(ii) Trade and other journals

E.H.R.	-	Economic History Review.
E.J.	-	Economic Journal.
J.R.S.S.	-	Journal of the Royal Statistical Society.
T.M.	-	Textile Manufacturer.
T. My.	-	Textile Mercury.
W.R.	-	Wool Record (and Textile World).
W.T.W.	-	Waste Trade World.
Y.B.E.S.R.	-	Yorkshire Bulletin of Economic and Social Research.

'... When you have nothing else to wear
But cloth of gold and satins rare,
For cloth of gold you cease to care -
Up goes the price of shoddy.'¹

1. W.S. Gilbert, Selected Operas (first series, 1939), 'The Gondoliers'
(first produced 7.12.1889), Act II, p. 183. Don Alhambra del Bolero
(The Grand Inquisitor) to two of the Gondoliers.

Introduction

During the past quarter of a century or so a number of important studies have done much to shed more light on the industrial development of the Yorkshire wool textile industry in the Industrial Revolution and the later nineteenth century. Some of these studies have directed their attention to specific aspects of industrial growth such as capital formation, credit, or wool prices, whilst others have combined the business history of a single firm with an economic survey of the industry. Most of this work as well as other contributions has drawn attention to the importance of the West Riding in the production of cheap woollen cloths for the mass market and the significance of the rapid growth in consumption of recovered wool as a major factor in enabling the industry to reduce the costs of its raw material inputs. Very little has been written, however, of the development of that section of the West Riding wool textile industry specialising in the supply of remanufactured wool to the Yorkshire trade. The present study is thus intended to supplement existing work by examining this small though important branch of the industry concerned with the sorting of new and used wool rags and the conversion of these into 'shoddy', 'mungo', or 'extract' - the technical terms used by the trade to distinguish between the different types of wool resulting from the reprocessing of woven and knitted fabrics.

Recent work discussing aspects of the development of the 'low' woollen industry of the West Riding includes Hartwell's survey of the Yorkshire wool textile industry between 1800 and 1850 and the more detailed analysis by Glover of the nineteenth century Yorkshire woollen cloth industry in his history of Wormalds and Walker Ltd., of

Dewsbury Mills.¹ This last study adopted and complemented the approach taken by Sigsworth who preceded his business history of John Foster and Son with an economic survey of the nineteenth century worsted industry.² More recently, Greeves has examined the effects of the American Civil War on the wool and linen industries, and his conclusion that one of the results of this was to stimulate a substitution of cotton by cheap woollen goods using considerable quantities of shoddy and mungo is broadly supported here.³ Other unpublished work covering aspects of the United Kingdom or Yorkshire wool textile industry in which a varying but small amount of attention is given to recovered wool are those of Dean (1963), Klein (1950), Philpott (1953), and Topham (1953).⁴ With the exception of Clapham (1907) and some recent work on the post-war experience of the wool and related textile industries,⁵ studies by the earlier generation of

1. R.M. Hartwell, The Yorkshire Woollen and Worsted Industries, 1800-1850, unpublished D. Phil thesis, Oxford University (Balliol), 1955; F.J. Glover, Dewsbury Mills: A History of Messrs. Wormalds and Walker Ltd., Blanket Manufacturers of Dewsbury. With an economic survey of the Yorkshire Woollen Cloth Industry in the Nineteenth Century, unpublished Ph. D. thesis, University of Leeds, 1959.

2. E.M. Sigsworth, Black Dyke Mills: A History. With Introductory Chapters on the Development of the Worsted Industry in the Nineteenth Century, (Liverpool, 1958).

3. O. Greeves, The effects of the American Civil War on the Linen, Woollen and Worsted Industries of the U.K., unpublished Ph. D. thesis, University of Bristol, 1969.

4. D.A. Dean, The Economic and Social Development of Dewsbury in the Nineteenth Century, unpublished M.A. thesis, University of Sheffield, 1963; H.V. Klein, International Trade in Apparel Wools 1914-1948, unpublished M. Sc. thesis, University of London, 1950; B.P. Philpott, Wool Prices, 1870-1950, unpublished M.A. thesis, University of Leeds, 1953; A.J. Topham, The Credit Structure of the West Riding Wool Textile Industry in the Nineteenth Century, unpublished M.A. thesis, University of Leeds, 1953.

5. J.H. Clapham, The Woollen and Worsted Industries (1907); D.C. Hague, The Economics of Man-Made Fibres (1957); G.F. Rainnie, The Woollen and Worsted Industry: An Economic Analysis (Oxford, 1965).

economic historians of the wool textile industry have either devoted little attention to the 'low' woollen industry of the West Riding or have confined themselves to the early period of the Industrial Revolution.¹

The purpose of this study is thus to attempt to redress past neglect of the West Riding low woollen industry by examining in detail, insofar as existing primary and secondary sources will permit, the emergence, growth, and development of the 'rag and shoddy' trade between ca. 1813 and 1939. Because so little is known of the industrial organisation of this sector, apart from the single contribution of Batley woollen manufacturer Samuel Jubb in 1860, this study has relied to a very large extent on evidence contained in various primary sources, trade journals, and the local press.² Complete sets of business records of rag merchants and shoddy and mungo manufacturers are very patchy until the late nineteenth and early twentieth century and have been supplemented by the relatively more plentiful material relating to West Riding woollen manufacturers and other firms who were closely associated with this sector: in this respect Miss Hudson's recent catalogue of West Riding wool textile records has been invaluable.³ Undoubtedly, however, the survival of so little direct material until ca. 1880 on the activities of a representative sample of firms in the

1. For example, K. Lipson, The History of the Woollen and Worsted Industries (1921); W.B. Crump and G. Ghorbal, History of the Huddersfield Woollen Industry (Huddersfield, 1935); H. Heaton, The Yorkshire Woollen and Worsted Industries from the Earliest Times up to the Industrial Revolution (1st edition, Oxford, 1920: 2nd edition, Oxford, 1965).

2. S. Jubb, The History of the Shoddy-Trade: its rise, progress, and present position (London, Manchester, and Batley, 1860). These are discussed in Chapter I.

3. P. Hudson, The West Riding Wool Textile Industry: A Catalogue of Business Records from the Sixteenth to the Twentieth Century (Edington, Wilts., 1975).

rag and shoddy sector has set certain limits on the range of questions that can be asked of entrepreneurial behaviour. On the other hand, information from a number of different sources has enabled various conclusions to be drawn on such aspects as capital formation, bankruptcy, or the background of entrepreneurs.

The scope of this study necessarily embraces both the approach and methods used in recent research undertaken on the wool textile industry, for example the work of Jenkins on fixed capital formation in the West Riding, but differs from others in that business records have been used as 'building blocks' to present as far as possible a comprehensive history of the industry.¹ The commencing date was chosen in deference to general although not unanimous agreement amongst local historians of the year in which shoddy was first innovated by Batley woollen manufacturer Benjamin Law. The main thrust of the study, however, covers the period between ca. 1845-1850 to 1914; the final period, 1914 to 1939, concentrates on an analysis of the reasons for the decline in United Kingdom consumption of recovered wool and the very different experience of the industry in the interwar years. Although this does less than justice to the more extensive collection of twentieth century archival and private records surviving, it is hoped that the approach adopted here meets to some extent criticism of past studies and makes a contribution to a period on which much work on wool textiles remains to be done.²

The work has been planned with two major objectives in mind: to add to existing knowledge of the West Riding wool textile industry

1. D.T. Jenkins, The West Riding Wool Textile Industry 1770-1835: A Study of Fixed Capital Formation (Edington, Wilts., 1975); Social Science Research Council, Research in Economic and Social History, (1971), pp. 72-73.

2. *ibid.*, p. 75.

by examining the growth of the interrelated but independently organised rag merchanting and shoddy manufacturing sectors, and secondly, to assess the contribution of recovered wool to the development of the West Riding woollen industry. To achieve this a price series for the two major types of recovered wool (shoddy and mungo) has been constructed for the period between 1828 and 1939, using material almost wholly derived from business records of West Riding firms. In order to determine the quantitative significance of recovered wool as a proportion of virgin wool consumed in the United Kingdom, the figures for retained domestic and imported wool - which are invariably and misleadingly presented in their 'actual' or 'greasy weight' form - have been adjusted to indicate the 'clean' weight of wool as it entered the initial manufacturing processes. Conclusions drawn from this suggest that the West Riding woollen industry relied to a far greater extent on recovered wool than has in the past been acknowledged, and that the fashion change of the last quarter or so of the nineteenth century which forced the Bradford trade to abandon mixed cotton and wool fabrics for all-wool merino worsteds may well have created serious wool supply problems for woollen manufacturers had they not been prepared to exploit fully the potentialities of wool recovered from rags.

The study is organised thematically following Chapter I, which presents brief background information on the Heavy Woollen District, an explanation of the various technical terms used, and a discussion of the major secondary sources referred to in the work. As subsequent chapters have drawn upon a variety of different primary and other sources, the methods used to interpret them are discussed either preceding the chapter or, in the case of Chapter III where this would impede the

narrative, in the form of an appendix. Chapter II is divided into two sub-periods, ca. 1813-1870 and 1870-1939, and deals with the West Riding rag merchanting sector. Sources of supply, quantities of imported and domestic woollen rags and imported recovered wool are examined in Chapter III, which is organised in three sub-periods, ca. 1813-1850, 1850-1914, and 1914-1939. These divisions have been determined largely by the improved quality of statistical and other material after 1850 and the desirability of approaching the period 1850 to 1914 as one of progressive growth in the supply of raw material to the West Riding recovered wool industry. A discussion of statistical sources and their interpretation is located in an appendix and forms an integral part of estimated production and consumption figures of recovered wool in Chapters IV and V. Chapter IV examines the growth and development of the shoddy and mungo manufacturing sector in three sub-periods; ca. 1813-1870, 1870-1914, and 1914-1939. As with Chapter II it is preceded by a brief introduction outlining aspects of the function and industrial organisation of the sector and, because it was considered to be of sufficient importance to warrant a separate discussion, an account of the progress and significance of technological development. Chapter V assesses the importance of recovered wool to the growth of the West Riding woollen industry and is sub-divided into periods similar to those of Chapter IV. It is introduced by a section outlining the construction of the shoddy, mungo, and textile raw material price series, the five and nine year moving averages, index numbers, and price relatives, which are presented in computer print-out form as an appendix. The second part of the introductory section discusses the method used to adjust the 'greasy' weight of wool to a 'clean' basis and is followed by a brief account

of processes in the manufacture of cloth containing recovered wool and a review of the more important technological developments in the manufacture of 'low' woollens. Finally, Chapter VI traces the long tradition of opposition to 'shoddy' cloth.

Throughout this study the phrase 'wool textile industry' is used to describe the combined worsted and woollen branches of the industry. These are individually distinguished as either the worsted sector/industry (combed wool section) or the woollen sector/industry (carded wool section).

CHAPTER I.

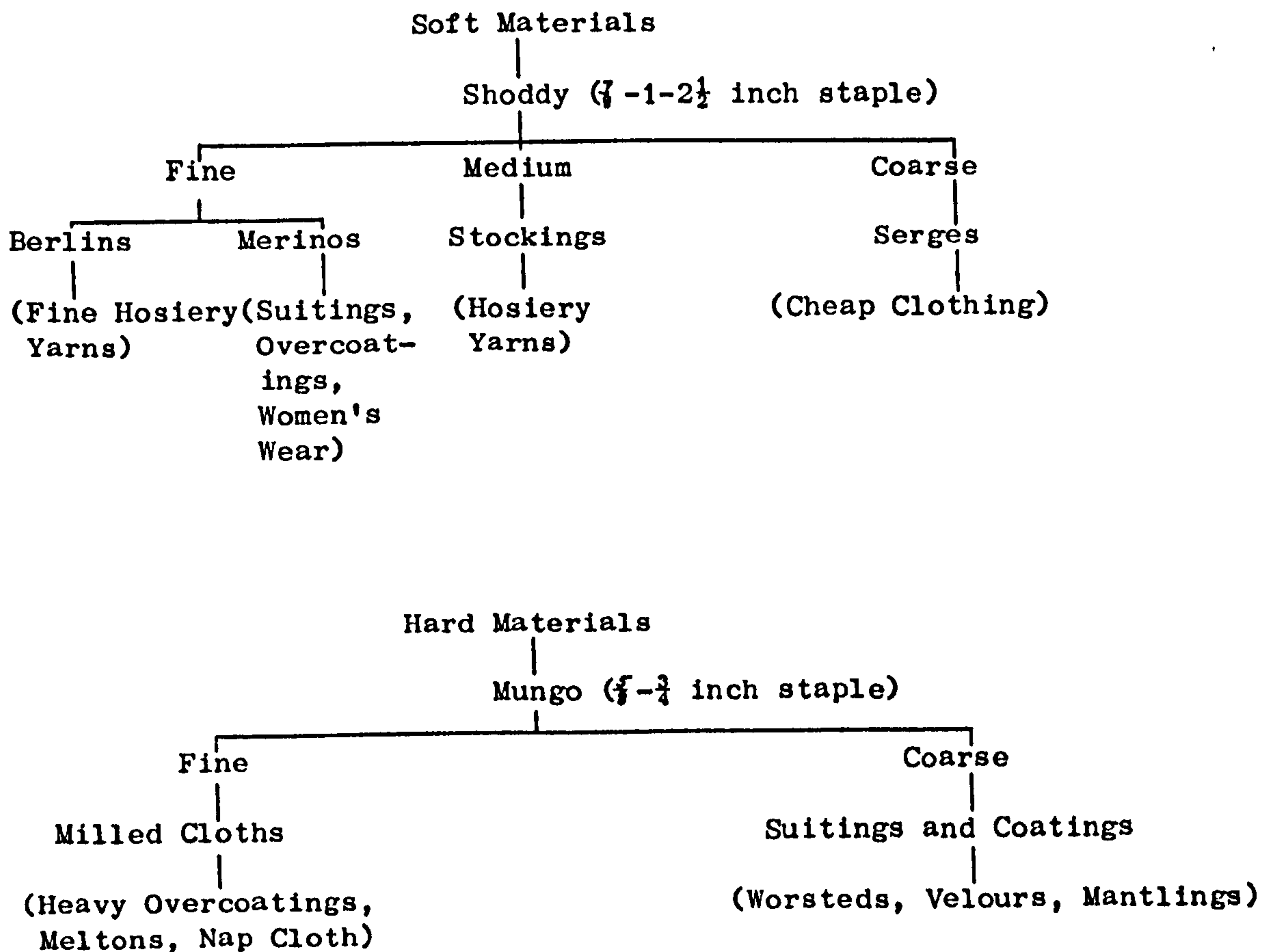
Some definitions, a discussion of secondary sources,
and an outline of the Heavy Woollen District.

As this study is concerned with the growth and development of a very specialised section of the West Riding wool textile industry about which little is generally known outside Yorkshire, the following discussion outlines briefly the main distinction between 'shoddy' and 'mungo', the reliability of secondary sources, and finally, the physical resources and communications of the Heavy Woollen District.

The raw materials used in the manufacture of recovered wool (or ragwool) were either new or worn rags of wool or wool/cotton mixture known generically in the trade as 'woollen rags' - whether of worsted, woollen, or knitted material - to distinguish them from the cotton and linen rags consumed by the domestic paper industry. All woollen rags were subdivided into two major categories, which, when reduced mechanically to a fibrous mass, closely resembled the original raw material. Soft or relatively loosely woven fabrics were made into 'shoddy', possessing a staple of about 1 to 2½ inches, although some qualities could be longer; hard or felted cloth rags, which had been originally hard-spun and then fulled in the stocks to produce a fabric in which the weave was completely obliterated, were manufactured into 'mungo', a material of very short staple because of the considerable force required to separate the matted wool fibres. A simplified classification of soft and hard rags is shown in Fig. I(1), the more important classes and sources of woollen rags used in the West Riding during the period covered by this study being set out in Appendix I-I below. From ca. 1860, but of less quantitative importance, a new category of recovered wool called 'extract' was introduced, which was the fibrous material remaining after cotton-warped wool fabrics or 'union' goods had been subjected to dilute acid to destroy the vegetable filaments. Shoddy, mungo, and extract were used almost

Fig. 1(i)

Types of woollen rags used to manufacture shoddy and mungo in the West Riding.



Source: H.S. Bell, Wool - an introduction to Wool Production and Marketing (1970), p. 181.

exclusively by the woollen or carded branch of the industry because of their short staple, and although small quantities appear to have been consumed by the United States worsted industry in the later nineteenth century, they were almost never used by the Bradford trade.

The technical term 'shoddy' describing wool recovered from loosely woven rags preceded by several decades the more pejorative and wider application implying flimsiness, pretentiousness, or sham. Possibly originating from the old English 'scadan', to 'separate or divide', the term first appears to have been used by the West Riding woollen industry to refer to the small pieces of wool 'shed' in the manufacture of cloth.¹ The more specific use of shoddy would thus seem a logical extension of this, and it is perhaps not surprising in view of the very localised nature of the early years of the trade that the first published reference to it was made as late as 1828 by the House of Lords Select Committee on the State of the British Wool Trade. The term 'mungo' is of more apocryphal origin, although commonly held by local tradition to be a contraction of the statement by its Batley innovator Benjamin Parr to a doubtful customer, that his new material 'mun go' - Yorkshire and Lancashire vernacular for 'must go'.² Wool produced from hard-felted rags was, however, being referred to as mungo in the records of Batley woollen manufacturer Thomas Taylor in 1838, or within some two to three years after being introduced into the district.

1. E. Partridge, Origins - a short Etymological Dictionary of Modern English (1961), p. 617; Chambers Encyclopaedia (1891), 9, p. 414.

2. An explanation which appears in most Yorkshire accounts of the Batley and Dewsbury trade. See, for example, S. Jubb (1860), *op. cit.*, p. 31; F. Fenton, 'Woollen Shoddy - its Invention, History, and Manufacture', T.M., 15.6.1881, p. 208, etc.

Published work on the development of the recovered wool sector, which was to remain a domestic monopoly of the West Riding woollen industry, is very sparse, the best-known account of the trade - used as a reference source for many subsequent studies of the industry - being Samuel Jubb's History of the Shoddy Trade of 1860.¹ Between 1860 and the second decade of the twentieth century Jubb's work was supplemented, for the most part unsystematically, by other accounts or references to the trade in the publications of local historians, topographers, and articles contributed to the trade journals. The more important of these contributions included Smith's three books on Morley published between 1866 and 1886, Willans on Batley and Dewsbury in 1880 and 1881 and a number of articles by Fenton and Reuss in 1881, and Reuss between 1913 and 1914.² The authors were all closely connected with the West Riding woollen industry in the nineteenth century. Jubb was co-partner with his brother Joseph in the family woollen firm of Joseph Jubb and Sons of Bank Foot Mill, Batley, Smith was shareholder in the company Gill Royd Mill, Morley, and also a manufacturer, and Fenton was a Batley manufacturer who had previously been associated with a woollen rag merchanting firm. Both Willans and Reuss were rag merchants, Reuss establishing a rag and recovered wool auctioneering

1. See, for example, R.M. Hartwell (1955) op. cit., F.J. Glover (1959), op. cit., O. Greeves (1969), op. cit., etc.

2. W. Smith, Rambles about Morley, with Descriptive and Historical Sketches; also An Account of the Rise and Progress of the Woollen Manufacture in This Place (1866), The History and Antiquities of Morley ... (1876), Morley: Ancient and Modern (1886); J. Willans, Batley Past and Present; its Rise and Progress Since the Introduction of Shoddy (Batley, 1880), Recollections of Dewsbury (Batley, 1881); F. Fenton, 'Woollen Shoddy: its Invention, History, and Manufacture', T.M., 15.4.1881-15.10.1881; F.W. Reuss, various articles in Wool and Textile Fabrics, 19.3.1881 and W.T.W., 1913-14.

business in Dewsbury in 1873. If their technical grasp of the intricacies of shoddy manufacturing or rag merchanting would seem to be undoubted, their abilities as trade historians were always open to criticism from contemporaries. Much of this revolved around Jubb's account of the early history of the industry and his 'presumption' that Benjamin Law of Batley may have been the first to use shoddy in 1813, provoking a sharp reply from Law's grandson to the Dewsbury Chronicle in 1869 that no other than Law had innovated the use of shoddy and that he was making cloth from it as early as 1809.¹ Following the publication of Fenton's series of articles on the history of shoddy in the Batley Reporter in 1880, subsequently extended and published in the journals Wool and Textile Fabrics and Textile Manufacturer the following year, the debate on the origins of shoddy was again re-opened by Law in the columns of the Batley press stimulating replies from Fenton, Jubb, and Willans.² The heat generated by this debate is no doubt understandable in view of the extensive proportions to which the industry had by that time grown, not only in the West Riding but in the woollen industries on the continent, in North America, and the dominions, and it was clearly a matter of local pride that those with personal connections with the early innovators were anxious to see 'justice to the memory of one to whom Batley owes so much'.³

As a source of recent and contemporary developments in the recovered wool sector, the accounts of these trade historians appear to have met with no substantive criticism. Biographical information

1. Dewsbury Chronicle, 14.8.1869.

2. B.R., 4.12.1880, 11.12.1880, 24.12.1880.

3. ibid., 4.12.1880.

on the background of entrepreneurs, many of whom were still active in the industry, would seem to be reasonably accurate, perhaps not unexpectedly, as the writers seem to have taken pains to consult many of them personally. Jubb's output and consumption estimates of shoddy and mungo were not questioned publicly and he was subsequently invited to read a paper on the subject to the Bradford meeting of the British Association in 1873. Indeed, in 1889 the Textile Manufacturer, in a technical article on the use of shoddy and mungo, observed that he was

'... the author of an interesting work on the subject, and as he has been one of the chief actors in the manipulation of the fibres, his authority may be accepted as conclusive in regard to them'.¹

Although a later writer in the Waste Trade World was to claim that

'... his book bristles with inaccuracies, and we hesitate to quote it even when it refers to contemporary occurrences and men'²

these remained unspecified and in all likelihood referred to the local press correspondence of 1880 which had been forwarded by the editor of the Dewsbury and Batley News.³

The motivations of the various authors in publishing their histories or reminiscences would seem to be clear - they were concerned, as Jubb noted in his preface

'... to seize facts and preserve them before they be lost in obscurity (and) supply in some measure the void in literature, and the want of any book of reference, as regards the shoddy trade.'⁴

Willans and Fenton expressed similar convictions,⁵ and Reuss published

1. T.M., 15.5.1889, p. 217. The same journal also favourably reviewed (and reprinted a section on the origin of mungo) Smith's History and Antiquities of Morley in 1876, concluding that it was 'a pleasing and worthy addition to the topography of Yorkshire' (15.9.1876).

2. 'The Shoddy Centenary', W.T.W. (supplement), 12.4.1913, p.v. See also H. Burrows, A History of the Rag Trade (1956), p. 43.

3. W.T.W., 5.7.1913, p. 22.

4. S. Jubb (1860), pp. iii, iv.

5. B.R., 20.11.1880, 4.12.1880 etc.

his reminiscences of 50 years in the woollen rag merchanting trade (which included his early career with a mungo manufacturing firm in Oberursal) at the 'editorial wish' of the Waste Trade World.¹ Their standing in the local community would appear consistent with this - Jubb was mayor of Batley in 1871 (having declined mayorship in 1870 because his brother was already sitting on the bench), chairman of the Chamber of Commerce at various times from 1870, and had actively participated in committees to organise assistance to the Lancashire cotton workers in 1862 and the 'distress in France' in 1871. Both Willans and Reuss were councillors in Batley and Dewsbury, Reuss subsequently serving as mayor and borough magistrate for Dewsbury, as well as writing the annual review of the Heavy Woollen District trade in the local press from the 1890s and market reports of the international rag trade for the Waste Trade World between 1912 and 1917. There would thus seem little reason to doubt that the authors made a sincere attempt to record information with fairness and accuracy given the limitations of the resources at their disposal, and where possible, this has been confirmed by evidence from independent sources such as insurance records or mill account books.

For information on market conditions and technical development, the Parliamentary Papers, local press, and trade journals have been used extensively in the present study. The use of these sources appears to present few problems with the exception of some of the statistical data such as the Factory Returns or the annual trade figures, and where relevant these are discussed in more detail in the following chapters. The trade reports were usually very comprehensive, particularly the annual reviews published in the

1. W.T.W., 5.7.1913, p. 22.

West Riding press, most of the monthly reports being based on material submitted by the various chambers of commerce, and they were clearly intended to provide a reliable guide to the industry on all factors affecting trade. Containing a mine of information on technical and trade developments as well as much useful contemporary opinion were the specialised textile journals which began to be published in increasing numbers in the final quarter of the nineteenth century. The principal sources used here are the Textile Manufacturer (Manchester, from 1875), the Journal of Fabrics (Bradford, from 1881), the Textile Mercury (Manchester, from 1889), and the Wool Record and Textile World (Bradford, from 1909).¹ All appear to have exhibited little local bias, the Textile Manufacturer, for example, devoting much space to the West Riding trade and not being above criticism of the Manchester industry. From 1912 the Waste Trade World catered to the needs of the by then extensive reclamation industry, providing weekly market and background information on all aspects of the woollen rag merchanting trade. Finally, a discussion of the problems associated with the use and interpretation of the nineteenth century trade directories follows in Chapter II.

The principal area with which this study is concerned is the triangle formed by Mirfield, Ossett, and Morley, containing Batley and Dewsbury, and commonly referred to as the 'Heavy Woollen District' of the West Riding. For much of the period covered here, Huddersfield and Leeds were closely connected with the recovered wool industry,

1. Other journals referred to in this study include Wool and Textile Fabrics (from 1881), Textile World (from 1881), Textile Recorder (from 1883), and Textile Journal (1902).

but towards the end of the nineteenth century the importance of Leeds as a woollen manufacturing area had declined significantly and the shoddy-using branch of the Huddersfield industry had become concentrated in the Colne Valley.

The location and growth of the recovered wool industry in Batley and Dewsbury owed much to the early specialisation of the district in the domestic manufacture of coarse, stout, and cheap woollen cloths and blankets. By 1828, as the evidence to the Select Committee of Thomas Cook, Benjamin Gott, and John Nussey indicates, the local trade was characterised by the production of 'low' woollen goods, exported in large quantities to the continent, and particularly, to North American markets. Although possessing ample supplies of soft water in natural underground reservoirs for scouring and dyeing, the absence of sufficient surface water encouraged the early adoption of steam power in the woollen mills of Batley, Dewsbury, Morley, and Ossett, and by 1835 very few were relying on water as a principal method of powering machinery.¹ This development was assisted by rich local sources of coal which were progressively exploited in the nineteenth century - by 1870, for example, some 40 collieries were within 3 miles of the centre of Dewsbury.²

Extensions to the Aire and Calder Navigation system and improvements to the docks at Hull and Goole in the 1820s provided good water communication to the east coast ports facilitating the increasing supply of bulky woollen rag consignments from London and the continent to Ravensthorpe and Dewsbury.³ Of great importance to the growth of

1. D.T. Jenkins, *op. cit.*, pp. 41-42.

2. C.J. James, M.P. for Dewsbury (Brighouse, 1970), p. 40.

3. W.G. East, 'The Port of Kingston upon Hull during the Industrial Revolution', Economica, XI, 1931, pp. 199-204.

the recovered wool industry, particularly in the development of the woollen rag and shoddy auctions at Batley and Dewsbury in the 1850s, was the completion in 1849 of the London and North Western Railway linking the Heavy Woollen District to Leeds, Huddersfield, Manchester, Liverpool, and London. The opening of the Ossett Branch railway in 1862, and an additional branch between Batley and Dewsbury in 1879, completed the major railway transport links between the towns of the Heavy Woollen District and their markets to the east and west coast ports and the growing ready-made clothing centres of Huddersfield and Leeds (Map I).¹ For local transportation, the hilly areas between Batley, Dewsbury, and Ossett benefited from the general road improvement and new building undertaken in the West Riding from ca. 1820 to 1840.²

The growth in population and commercial importance of the principal towns of the Heavy Woollen District was rapid in the nineteenth century. Between 1851 and 1871 the population of Batley increased from 9,308 to 20,871, and Dewsbury from 14,049 to 24,764, both being amalgamated into one municipal Parliamentary borough in 1869. Chambers of commerce were established soon after Huddersfield in 1853; Batley in 1856, Dewsbury in 1861, and Morley in 1869.

The staple productions of the Heavy Woollen District were substantial piece or wool-dyed cloths, heavily milled to conceal their weave and then raised and finished in a variety of textures. All contained varying amounts of recovered wool depending upon the quality and price at which they were to be marketed, and were used mainly for making-up into outerwear and suitings. As these cloths will be referred to frequently in subsequent chapters, Appendix I-II includes a brief list and description of the more common types manufactured in Batley, Dewsbury, Ossett, and Morley in the nineteenth century.

1. David and Charles edition. Sheet 21(88), Huddersfield, 'old series', N.W. quarter; sheet 22 (87), Doncaster, N.W. quarter. These were surveyed between 1839 and 1841 with railways added to January 1892.

2. F.J. Glover (1959), op. cit., I, p. 82.



CHAPTER II

The Organisation and Development of the
West Riding woollen rag and recovered
wool merchanting sector.

I. Sources and Methods.

Before examining the function, organisation and development of the specialised rag, shoddy, and mungo merchanting trade of the Heavy Woollen District the following discussion will outline the major sources used in this section and, particularly, their limitations.

Although the number of rag merchanting firms exceeded 200 from the late 1850s and a small proportion of these persisted into the twentieth century, very little has survived in the way of primary records such as books of account or correspondence. Two major factors would seem to explain why records relating to this sector have failed to survive in the archival collections of the West Riding. Firstly, it was common trade practice for most of the period prior to 1914 for many of the smaller West Riding rag merchanting firms to maintain only the most rudimentary records of day-to-day accounting transactions - partly for reasons explained by their lack of knowledge of accounting procedures and partly, as a trade historian candidly admitted, to avoid paying Income Tax.¹ This was closely connected to an ethos of economic individualism, the same writer noting that

'... it was loyally and universally held that the first duty of all in the trade was to tell nothing of the way in which they earned their profits in order to avoid the danger of excessive competition'²

1. H. Burrows, A History of the Rag Trade (1956), p. 60. This was particularly apparent in bankruptcy examinations. To give two examples, the first examination of Batley rag dealers Matthew and Benjamin Clegg in July 1864 had to be adjourned until December because no books of account had been kept. (H.E. 12.11.1864). In the bankruptcy examination of Thompson Haley of Heckmondwike of July 1920 only a day book was kept notwithstanding pressure from the Income Tax authorities for the maintenance of proper accounts (W.T.W., 7.8.1920, p.17). The Federal Trade Commission found a similar situation in the U.S.A. in 1919 - only a small percentage of woollen rag dealers had kept a full set of account books. Federal Trade Commission, Report on the Woollen Rag Trade (Washington, 1920), p. 25.

2. H. Burrows, *op. cit.*, p. 1.

The second reason, to be discussed shortly, was the high preponderance of small one-man firms in a trade in which frequent entry and exit was normal, a situation not conducive to the survival of primary records. It has been possible to examine the early and somewhat fragmentary records of a number of firms but the very uniqueness of this material raises the ever-present problem of representativeness. Whilst no two business operations of West Riding rag merchants were likely to be similar, the extent and range of their operations being determined primarily by the entrepreneurial vigour of each principal, it will be suggested that subject to this caveat the experience of Henry Day, a Hanging Heaton rag and mungo merchant whose records survive for the period between 1848 and 1864, could not have been markedly different to that of many of his contemporaries.

Direct documentary evidence of the activities of rag merchanting firms has been supplemented by information of their business dealings contained in the surviving account books of West Riding shoddy, mungo, and woollen manufacturers. Additional sources of material include evidence from the Census enumerator's notebooks between 1841 and 1871, insurance broking records of a Batley firm dating from 1865 and surviving rating records. The former provide a certain amount of information on individual entrepreneurs and, in many cases, the number of employees, so that it has been possible to assess change and growth over time. The great reluctance of the majority of small West Riding rag merchants to carry insurance for most of the nineteenth century - the degree of fire risk was characteristically low and insurance costs were thus considered unjustifiable for many low-capitalised firms - must again raise the problem of the representativeness of those firms who carried insurance, for it seems clear that the more substantial firms covered both their stock and property with some care.

However, as this source has been used more to indicate the extent of and variations in the proportion of fixed capital to inventory investment and not as a basis from which to calculate the overall fixed capital formation of the sector, the methodological problems associated with the use of insurance records while still present, are of diminished significance.¹

Of the secondary sources used in this chapter and Chapter IV, the trade directories present a number of problems of both a quantitative and qualitative nature. As Sigsworth and Blackman have recently noted, although the West Riding was well covered by the compilers of trade directories during the nineteenth century, the quality of the information they contained was not always consistent, and it would therefore seem appropriate to outline some of the more significant imperfections of this source as encountered in the present study.²

The most common method of compilation during the nineteenth century was by door-to-door and street-to-street enumeration. The earlier directories, such as those of Pigot, solicited the public to send information for amendments to the initial compilation and these were then issued free to the original purchasers. Others, notably Frederick Kelly, used letter-carriers to collect information until this practice was prohibited by the Post Office from ca. 1845, when full-time specially selected agents were employed.³ The method of

1. See, for instance, 'Comments' to Discussion 3 by D.T. Jenkins in J.P.P. Higgins and S. Pollard (eds.), Aspects of Capital Investment in Great Britain 1750-1850 (1971), pp. 110-14.

2. E.M. Sigsworth and J. Blackman, 'The Woollen and Worsted Industries' D.H. Aldcroft (ed.), The Development of British Industry and Foreign Competition 1875-1914 (1968), p. 129.

3. J.E. Norton, Guide to the National and Provincial Directories of England and Wales, excluding London, published before 1856 (1950), pp.17-20. See pp. 16-24 for a good discussion on 'Authorship, methods of compilation and tests for reliability' which covers most of the nineteenth century.

house-by-house compilation inevitably imposed a number of constraints upon enumerators, not least the severity of the weather, the difficulty of understanding local dialects and, as competition amongst directories increased, a 'frequent unwillingness of the public to supply information'.¹ Other problems, such as the lag in collecting and publishing information and the mobility of many small businesses, necessitate a cautious approach to the information contained in any particular directory as accurately reflecting numbers and location of firms in the year for which it was issued.

As the directories were explicitly collecting and classifying information deemed to be of most use to their subscribers, their 'agents' or enumerators in the field concentrated on the commercial and professional districts. Consequently, sometimes large areas containing predominantly working class housing, other than those with a sprinkling of businesses, tended to be omitted. This is particularly noticeable when contemporary directories are compared with the Census enumerators' notebooks for the years 1841 to 1871 - residential areas on the periphery of the commercial centres of Batley, Dewsbury, and Ossett which contained a significant proportion of one-man rag merchanting firms appear in the notebooks but not in the nearest corresponding issues of the trade directories.² A list of rag merchants compiled from the Census enumerator's notebooks for Batley and Dewsbury between 1841 and 1871 (Table II, (1)) indicates that

1. *ibid.*, p. 19. The preface to Kelly's 1861 Post Office Directory of the West Riding of Yorkshire expressed appreciation of the 'Clergymen and other Gentlemen' who had assisted their agents in collecting information (p. ii).

2. J. Pigot & Co., National Commercial Directory (1841), p. 52; W. White, Leeds and the Clothing District of Yorkshire (Leeds 1853); W. White, Leeds and Bradford Directory (Leeds 1861); W. White, Leeds and the Clothing District of Yorkshire (Leeds 1870). Entries under Batley, Dewsbury, and Ossett.

TABLE II(1)

Rag merchants or dealers not appearing in
Trade Directories, 1841-1871.

Census	Number of rag merchants, dealers	Number not in directory	Percentage omitted
1841 - Batley	22	15	68
- Dewsbury	6	3	50
1851 - Batley	68	29	42
- Dewsbury	29	16	55
1861 - Batley	111	56	50
- Dewsbury	70	55	78
1871 - Batley	81	53	65
- Dewsbury	41	17	41

Source: see note 1.

1. Census of Population of England and Wales, Enumerator's notebooks. (hereafter referred to as C.P.E.N.) 1841 - Batley, microfilm HO 107.1267; Dewsbury, HO 107.1268-69; 1851 - Batley, Dewsbury, HO 107.2322-2325-304-END; 1861 - Batley, RG 9.3399-3413-43-END; Dewsbury RG 9. 3409-3413-1-43; 1871 - Batley RG 10.4580-4585-1-END; Dewsbury RG 10.4600-1-END, 4604/7-1-END, 4612-1-END.

N.B. The list of rag merchants compiled from this source is not comprehensive as a number of parishes had been omitted at various times on the microfilms consulted. The table indicates the number of rag merchants listed from the microfilms not appearing in trade directories - a comprehensive list of all parishes would probably indicate a slightly higher proportion omitted.

approximately half of those who gave their principal occupation as 'rag merchant' or 'rag dealer' did not appear in the relevant trade directory, although a number of these subsequently appeared when they moved their operations to the rag warehouse areas. Even when an allowance is made for the lag in publishing information which may have been collected some time prior to the issue of a directory, the percentage of rag merchants omitted appears as a significant if fluctuating proportion over the thirty year period covered, suggesting that the reliability of trade directories in recording similar categories of small entrepreneurs requires some qualification.

The most plausible explanation of the rather high percentage of rag merchants and dealers omitted from the directories is to be found more by an examination of the occupational characteristics of this group rather than the intrinsic failings of the directories themselves - in this case the high proportion of one-man firms operating from their home address. Practical enumerative difficulties encountered by the collecting agents, such as the absence of a firm's principal, new premises, or merely a wish to remain incognito, may account for the disappearance and subsequent re-emergence of individual firms, or the delayed appearance of others, when independent sources - rating records or the Census notebooks for example - indicate continuity.

A third factor exerting an important influence on the accuracy of the directories was undoubtedly the limitations imposed by cost and the time available to update material between publication dates, particularly as the number and size of trades began to expand rapidly from 1850.¹ A not infrequent solution to this problem was to

1. Kelly, in the 1861 directory (op. cit.) noted the 'very great expense' in collecting information (p. iii).

leave substantially intact a trade classification of one or several smaller districts where change was thought minimal or to plagiarize selected information from the pages of a recently published competitive directory.¹ The 1883 edition of Slater, for instance, relies to a large extent on Kelly's lists of 1881 for Leeds, Huddersfield, and Wakefield, selectively amending that for Ossett and describing all those in the rag and mungo trade, whether merchant, dealer or manufacturer, as 'rag merchants'. Batley, Dewsbury, and Morley, on the other hand, appear to have been independently compiled for 1887.²

The last-mentioned problem, that of the accuracy of intra-trade classification, is not an easy one to surmount. The fault did not necessarily lie with the directory compilers, but could and frequently did originate from the manufacturer or firm - the practice of a small number of shoddy and mungo merchants who had their rags ground on commission but called themselves 'manufacturers' has been noted elsewhere.³ On the other hand, a number of firms described as 'rag', 'shoddy', or 'mungo merchants' clearly possessed and operated

1. J.E. Norton, op. cit. Norton has suggested that although copying was easy it 'seems to have been rare' (p. 23). This comment would apply more to the pre-1856 directories where the complexity of information was considerably less, Kelly in 1861 for instance, explicitly naming directory 'pirates' successfully prosecuted and warning that proceedings would be taken promptly in future (p.iii).

2. Kelly and Co., Directory of the West Riding of Yorkshire (1881).
1. Slater, Slater's Royal National Commercial Directory of Yorkshire (Manchester, 1887) I, II and III. This may have been influenced by the fact that Kelly and Co. eventually absorbed Slater. Nevertheless, The Textile Manufacturer recommended the Post Office and Slater directories of Yorkshire in 1881 as 'the most reliable directories we know of ...' T.M. 15.3.1881, p. 89.

3. G.F. Rainnie (ed.), The Woollen and Worsted Industry (Oxford, 1965), p. 18.

rag machines as evidence from other sources indicates.¹ It is very likely that some of these firms saw their major trading activity as merchanting with rag-pulling as a complementary or subsidiary function, and were consequently classified as such by the trade directories. However, if evidence from the Census and insurance records and other sources has indicated that the activity of certain firms is more accurately described as 'manufacturer', then the appropriate adjustment has been made in the following tables in the present chapter and those in Chapter IV. Errors of omission rather than commission would thus seem the most likely source of inaccuracy and even the directories of the twentieth century need to be approached with a certain degree of caution. A comparison of the specialised Worrall's Yorkshire Textile Directory (1900) with Kelly (1901) for Batley and Dewsbury indicates that each directory listed from three to four shoddy and mungo manufacturers not common to both, and Worrall omitted entirely the large mungo manufacturing firm of John Speight and Sons of Ossett.² In the tables that follow it has not always been possible to extract different information for a particular year from the same directory. Thus whilst White's 1870 and 1875 directory permit the listing of rag merchants or shoddy

1. This is evident in Industries of Yorkshire, 1890, Part II, pp. 341-347 where several shoddy and mungo manufacturers are described as 'dealer' or 'merchant'. Baker identified 12 firms in Leeds in 1858 possessing 16 rag machines, but as no indication of the identity of the firms is given, some of them may have been included amongst those described as 'shoddy, mungo and rag merchants' in Leeds ca. 1857-1861 in Table II (iii), p. 43.

2. John Worrall Ltd., The Yorkshire Textile Directory (1900). Kelly's Directory of Yorkshire - The West Riding (1901). Ashton and Chapman have noted that the 1884 edition of Worrall's directory 'was the first which they could guarantee as accurate' although it is not known what tests they applied to ascertain this. T.S. Ashton and S.J. Chapman, 'The Sizes of Businesses, mainly in the Textile Industries', J.R.S.S., LXXVII, 1914, p. 554.

manufacturers according to each town, they contain no overall trade classification for the West Riding. In such cases, the information has been taken from the nearest by year competitive directory, such as Kelly's 1867 or 1877 directory. Another problem encountered in constructing tables for long time periods is the sometimes marked short term fluctuations that appear to have taken place in the number of firms but which probably reflected more the degree of assiduousness exhibited by the compilers at the time they were collecting their information. Unless external evidence suggests reasons for these short-term fluctuations, it has been assumed that they should not be taken for more than what they were - a listing made in a particular year and subject to the financial and manpower resources available to the directory compilers in that year.

Finally, there is some evidence that a lag of sometimes up to two years occurred between the compilation of lists and the date of publication. The names of a small number of bankrupt or liquidated firms have been found to persist when trade sources have indicated otherwise, although it may be possible in some cases that the principals continued trading with the permission of their creditors.

A source which appears to have received scant attention from business and economic historians, perhaps because of its originally restricted circulation, is the bankruptcy gazette.¹ Perry's Bankrupt and Insolvent Gazette, unlike the London Gazette which also published

1. For instance, Sigsworth and Blackman (loc. cit.) have observed that although the turnover of firms in the woollen and worsted industries was high 'we would not wish at this point with our limited evidence to specify the causes of the latter, to what extent ... the disappearance of firms was accounted for by their going bankrupt ...' p. 132. In a later paper Sigsworth rightly points out that '... it seems extraordinary that the vast and highly controversial literature seeking to interpret British economic performance 1870-1914 and more especially that part of it dealing with "British entrepreneurship" ignores bankruptcy completely'. E.M. Sigsworth, 'Some Problems in British Business History, 1870-1914', C.J. Kennedy (ed.), Papers of the Sixteenth Business History Conference (Nebraska, 1969), p. 34.

other information such as military appointments, provides a weekly list of all bankruptcies in Great Britain from 1836.¹ Bankruptcies were included, with a few gaps, until November 1861 when a trade classification of the contents of each issue appeared on the last page. Owing to the voluminous nature of the material and the time period covered in the present study, this trade classification has been used and supplemented by the more detailed monthly gazette appearing in The Textile Manufacturer, The Journal of Fabrics and the local press between 1875 and 1900. Included with bankruptcies are liquidations by arrangement or composition which from 1887 were replaced by deeds of arrangement. As these were a common, although by no means always a popular expedient with creditors they are still quantitatively significant in an assessment of the rate and incidence of insolvency. Where available, qualitative evidence of the reasons for insolvency has been used to provide a more satisfactory picture of entrepreneurship in the rag and shoddy trade of the West Riding for most of the period covered by this study.

1. Perry's Bankrupt and Insolvent Gazette, I, 1828, to XXIV, 1861. Perry's Bankrupt Weekly Gazette, XXV, 1862 to LV, 1881. Perry's Gazette, LVI, 1882 et seq. The British Library collection commences with Volume IX of 1836 and it would appear that no earlier volumes have survived.

II. The Collection of Woollen Rags and the Wholesale Rag Merchants.

A fairly sophisticated and well-functioning organisation for the collection of domestic 'linnen' rags for the paper industry had sufficiently developed to draw comment in the 1690s on the wealth of a number of rag merchants.¹ Indeed, by 1747 it was noted that the capital required to establish a rag business in the City of London could vary between £200 and £2000.² In Scotland, the Edinburgh Society in 1756 actively encouraged the collection of rags for the native paper industry by offering prizes to those who could collect the largest quantities, and attempts were made by the Scottish paper industry to set up a 'General Rag Warehouse' to accumulate stocks and thereby lessen seasonal fluctuations in price and supply.³ A similar system for the collection of rags had also developed on the continent by 1725, when Customs records first specify rag imports from Germany, Flanders, Holland, Italy, and other countries.⁴

It seems fairly clear that in terms of the general organisation and collection of raw materials, the nascent shoddy industry of the West Riding was able to utilise fully an existing facility developed over several hundred years for British and continental paper makers.⁵

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1. D.C. Coleman, The British Paper Industry (1958), p. 37.
 2. R. Campbell, The London Tradesmen (1747), in W.T.W., 21.10.1916, p. 17.
 3. A.G. Thompson, The Paper Industry in Scotland 1590-1861 (Edinburgh, 1974), pp. 33-34.
 4. D.C. Coleman, op. cit., pp. 106-7.
 5. The use of rags by French paper-makers appears to date from the fourteenth century. Chambers's Journal, XIV, July-December 1860, p. 53.

Of considerably less value than linen rags as a raw material for manufacture, woollen rags were collected chiefly for their importance as a fertiliser, although there is some evidence that other uses were being found for them before and during the eighteenth and early nineteenth century.¹

The organisation of rag collecting as it had evolved for the domestic paper industry was ideally placed for the rapidly growing demands made upon it by West Riding shoddy manufacturers in the nineteenth century. Urban dealers or merchants were supplied with linen, cotton, and woollen rags² and other articles by rag and bone collectors, known either as 'bunters' in the early decades of the century when all collection was carried out on foot,³ or as 'tatters', with a horse and cart, towards the end of the century. Although local authority collection and disposal supplemented domestic collections from around the time of World War I, the method of household collection, often the weakest link on the supply side when prices were low, remained essentially unaltered for the duration of the period covered here.⁴ Although the existence of this large army of collectors receives some comment from contemporary writers⁵ and, in the case of dealers, as an occupational category in the Census of Population Abstract, their everyday presence appears to have excited little comment or interest, Meade King observing in 1891, for example, that

1. (i) In the manufacture of brown paper and blotting paper. D.C. Coleman, op. cit., p. 27.

(ii) For making into 'a Sort of Mops ... by the Birch Broom makers' in London. The London Tradesmen, loc. cit.,

(iii) By the saddle-flock manufacturers - v. infra p.2/4.

2. J. Bischoff, The Wool Question Considered (1828), p. 96.

3. H. Mayhew, London Labour and the London Poor (1851), II, p. 158.

4. W.T.W. 2.4.1924, p. 3, 20.11.1920, p. 3 etc.

5. H. Mayhew, op. cit., pp. 154-158; Chambers's Edinburgh Journal, VII, 1847, p. 22; Chambers's Journal, XV, 1861, p. 103.

'Everyone is familiar with the old rag and bone cart, which may be seen daily flitting from house to house in the back streets of every town, and from cottage to cottage in the most out-of-the-way parts of the country, collecting its miscellaneous load as busily as the bee collects its honey.'¹

An intermediate stage in the collection of rags, combining certain functions of the urban rag merchant and the primary collector, was the rag shop. Distinguished by 'the sign of a black doll dressed in a white frock' the rag shops of London were said to have collected 'the greatest part' of the city's cotton and woollen rags² -

'... thither servants and others resort with fragments of all sorts ... even economical families of the lower middle rank save their rags for this traffic, ³ receiving for them a price that varies with supply'.

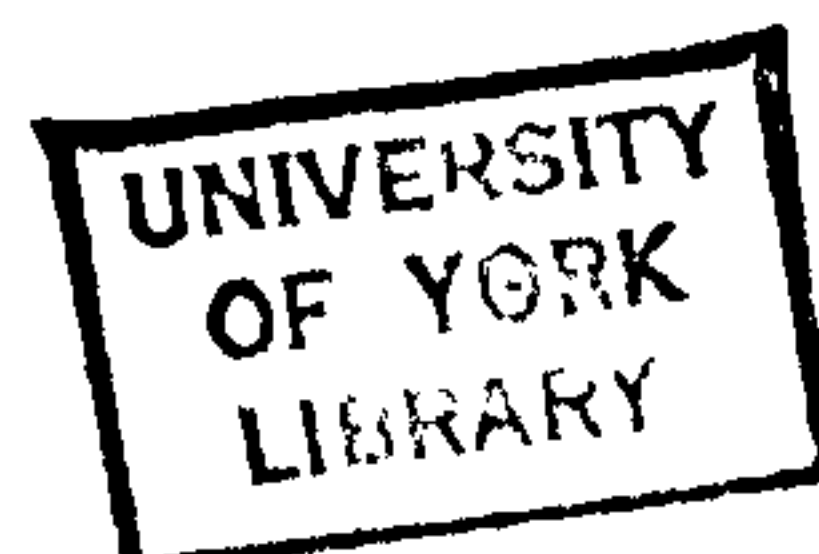
At this stage the rags were roughly sorted into approximately three categories - cotton/linen, wool, and mixed wool/cotton - and sold in lots to either the marine stores, or in the case of the rag shops and some of the marine stores, to the wholesale rag merchants in the larger towns and cities.⁴ Strictly speaking, the

1. Reports of the Inspectors of Factories and Workshops, P.P. 1890/91 (c. 6330), XIX, 476.

2. Chambers's Edinburgh Journal, 1847, op. cit., p. 22. This traditional sign, which seems to have disappeared during the 1930s, was said to have originated in Norton Folgate around 1750. W.T.W., 13.4.1935, p. 5.

3. Chambers's Edinburgh Journal, 1847, op. cit., p. 22. Quakers, it was alleged, were 'the most resolute hoarders of all such matters'. See also Charles Dickens, The Personal History of David Copperfield, (1850-1948 edition), pp. 180-84.

4. The origin of the term 'marine store', which was in regular use by 1849 (see Dickens op. cit.) is obscure. They were possibly so called because early stores had developed from trading in second-hand goods obtained from ships in breaker's yards (W.R., 96, 27.8.1959, p. 222). The marine store was the initial collecting and grading point of all waste and scrap material acquired by itinerant rag and bone collectors, or, in the case of larger businesses, by its own employees. The importance of the marine store as primary rag grader in the price/supply relationship of woollen rags, is briefly discussed in Chapter III, pp. 107-108.



marine store represented the final dealing stage in the process of rag collection, subsequent holders being either wholesale rag merchants or West Riding rag merchants, most of whom exercised varying degrees of the merchanting function.

An indication of the fluctuations in and size of the primary dealing sector can be seen from Table II(ii). Using Mayhew's estimate of ca. 1850 of the total number of 'bone-grubbers and rag-gatherers' as 800 to 1000, it would appear that London accounted for about one-sixth of the numbers employed in this occupational group in 1851, assuming that the majority of these were enumerated by the Census office as 'dealers' or 'gatherers'.¹

The marked increase in numbers of those employed as rag gatherers and dealers between 1841 and 1861 would seem primarily a response to rising rag prices and scarcity of rag supplies. Whilst the West Riding demand for domestic woollen rags rose appreciably to ca. 1855, the paper industry faced a tight supply situation from 1854 until 1861 as overseas prohibitions on the export of cotton and linen rags progressively forced it to turn to the domestic market for raw material.² The abrupt downturn in the price of paper-making rags beginning in 1861 and continuing into the 1880s as more rag-substitutes were tried in the paper industry, provides the most plausible explanation of the marked diminution in numbers of rag dealers and gatherers between 1861 and 1871. In addition to this, the opening up of the French market to the West Riding woollen rag trade in 1860 significantly eased the supply-problems of the 1850s

1. Booth included the following in his classification 'Marine Store and Rag Dealers', (i) marine store dealer, (ii) rag gatherer, dealer and (iii) woollen rag dealer. E.A. Wrigley (ed.), Nineteenth Century Society (1972), p. 290. From 1901 to 1911 the Census abstract classification was 'Rag gatherers, dealers' and for 1921 and 1931 'Rag, bone, bottle etc. Sorters'.

2. D.C. Coleman, op. cit., pp. 338-44.

TABLE II (11)

Marine Store and Rag Dealers, 1841-1931.

	MALES	FEMALES	TOTAL
1841	1,700	700	2,400
1851	3,500	2,500	6,000
1861	6,400	2,100	8,500
1871	2,300	1,400	3,700
1881	1,900	1,400	3,300
1891	2,300	1,800	4,100
1901	2,600	1,800	4,400
1911	4,373	5,058	9,431
1921	1,693	6,753	8,446
1931	2,106	7,883	9,989

Source: (a) 1841-1891. E.A. Wrigley, op. cit., p. 273.
 (b) Census of Population, England and Wales.
 Occupational Abstracts.

and would have had some impact on the number of those employed as dealers or gatherers as alternative job-opportunities became more attractive.¹ The slowly rising trend in numbers of this occupational group between 1881 and 1901 accelerated sharply to more than double by 1911 as the United Kingdom consumption of recovered wool reached historically high levels and the estimated weight of domestic woollen rags collected finally exceeded the greasy weight of the retained domestic dip.²

Quantitatively, little is available on the size of the primary gathering/dealing sector on the continent, although it was evidently of not inconsiderable proportions, as the import tables for woollen rags and shoddy imply.³ Certainly, as an occupational group the French rag-gatherers soon acquired a colourful reputation in their own country as well as in Britain,⁴ a writer in 1860 noting that

'Paris has its Dickens and its Mayhew in the persons of De Courcy and Ferré: and the life of the chiffonier (rag-gatherer) is as well-known as that of the London crossing-sweeper or pick-pocket.'⁵

Whilst an estimated 3,500 were occupied as chiffoniers in Paris in 1847,⁶ this had increased by 1880 to around 40,000, with the 200 sorting rooms in Paris employing an estimated 1,000 men and 10,000 women.⁷ Forty years later, a trade commentator noting the

1. This is discussed more fully in Chapter III, p.136.

2. v. infra., Table III (v), pp.127-128.

Whilst the wider Census classification of 1921 and 1931 may account in part for the continued high number of gatherers and sorters, a major factor was the growing importance of domestic woollen rags in the export market. v. infra., p.197

3. v. infra., Table III (viii), p.142.

4. H. Mayhew, II, op. cit., pp. 157-8. T.M., 15.4.1875, p. 151.

5. Chambers's Journal, 1860, op. cit., p. 54.

6. Chambers's Edinburgh Journal, 1847, op. cit., p. 23.

7. Cassell's Family Magazine, T.M., 15.1.1881, p. 26.

concern of the chiffoniers over municipal plans for more rapid refuse collection, observed

'Time and time again we have been told that they must disappear with the march of progress, and still it appears, that there are 15,000 of them ...'¹

The second identifiable sub-section in the industrial organisation of the woollen rag trade, already in existence to supply the requirements of the domestic paper industry, was the wholesale rag merchant. Distinguished from the rag shops and marine stores by performing the merchanting function of holding and financing rag stocks, the wholesale rag merchant was similar in many respects to the specialised West Riding rag merchant by sorting to standard classifications recognised in the trade. The wholesale rag merchant, supplied more or less constantly by small quantities of roughly graded rags from the marine stores, sorted the rags into the more specialised grades for the paper industry and the West Riding shoddy trade. The number of 'sorts' covered by each broad classification of woollen rags, a general term used by the trade to describe both woollen and worsted rags, would vary depending upon the resources of the wholesale rag merchant, the preponderance of certain classes of rags reflecting past clothing consumption, and the special types of rag demanded by West Riding customers.² Bristowe noted in 1866 that the major centres of the wholesale rag merchanting trade were located in London, Liverpool, Manchester, and Bristol, the largest merchant in London employing 100 sorters, although a more typical

1. W.T.W., 18.9.1920, p. 2.

2. S. Jubb (1860) op. cit., pp. 32-33. Jubb observes that London 'old' or used mungo rags were seamed prior to despatch to the West Riding, but this practice was to become less common as methods of carbonising the cotton stitches were perfected.

large merchant would employ about 20 sorters and eight packers and labourers.¹ London wholesale rag merchants were also the main suppliers of 'new clips' - new cloth cuttings from tailors' workrooms or the large military clothing establishments - an important class of raw material by 1860 and supplemented considerably by the growth of the Leeds and Huddersfield ready-made clothing industry from the 1870s.²

For the greater part of the period 1813-1939 West Riding rag merchants, shoddy manufacturers, and woollen manufacturers were supplied with domestic rags by both the city wholesale rag merchants and town and country marine stores. Generally speaking, the larger the business the more likely it was to be channelled through the wholesale rag merchants whose sorting and storage facilities could cope with a sudden demand for a particular 'sort'. For the smaller rag merchanting firms in the Heavy Woollen District whose profit margins were maximised by obtaining rags in as near an unsorted state as possible, for example in the form of 'mixed woollens', the country marine store was an important source of supply. The marked differentiation and specialisation in the West Riding woollen rag trade from the 1850s required, however, most marine stores to attempt some degree of sorting into approximately standardised qualities - 'mixed woollen stockings (all in)', 'mixed coloured serges', 'mixed fine marinos', 'white flannels', and other classes - the more astute marine store dealers being aware of the price advantage to be gained by so doing.³

1. Report of the Medical Officer of the Privy Council, P.P. (1866)(3645), XXXIII, 619.

2. S. Jubb (1860), op. cit., p. 33. At least one firm of London rag merchants had established a branch in Batley by 1871 - the stock of Mallett, Porter and Dove of City Road - 'Rag merchants and contractors of army cloth cuttings' was insured for £2,000. Bagshaw Museum, Batley, J.F.T. Spiking MSS. Policies 1870-1880. Folio 192, 6.12.1871 (hereafter referred to as J.F.T.S. MSS).

3. W.T.W. 10.7.1915, p. 3.

The twin pillars of the domestic collection of rags prior to their consignment to the Heavy Woollen District were thus the large and fluctuating army of unorganised collectors, for whom rags were but one useful commodity to be collected, merging gradually through the rag shops to the marine store dealers and wholesale rag merchants. The major determinant of the quantity of woollen rags reaching the West Riding was the price level in Batley and Dewsbury, which together with the relative price levels of other re-usable wastes such as bones, scrap metal, and cotton rags, directly influenced the number of casual and full-time rag gatherers employed.¹

1. W.T.W., 20.11.1928, p. 3. Competition between many urban and country marine store dealers was seen by the West Riding as an important factor on the supply side in that national price levels of woollen rags were more likely to be reflected in the prices paid to collectors rather than being determined arbitrarily by the dealer.

III. An Outline of the Function and Business Organisation of the West Riding Woollen Rag Merchant.

The supply of domestic woollen rags reached the West Riding rag merchant through either his trade contacts with the country and urban marine stores and the wholesale rag merchants or, from the late 1840s, the rag auction sales held at Batley and Dewsbury.¹ Purchase by private treaty was a common feature of the trade during the period covered by this study, with price formation being determined principally by individual negotiation. Trade contacts and prices paid to country dealers were closely guarded secrets of the West Riding merchant, for success in cultivating a regular supply of rags at competitive prices contributed significantly to the continued profitability of each firm. Trade terms were customarily cash on despatch or receipt of rag consignments and credit concessions appear to have been granted only rarely, for although prices paid for roughly sorted 'country rags' were considerably less than those commanded by large bales of graded rags at the auctions, West Riding merchants were prepared to purchase for cash any consignment however small.

The balance of domestic rags, baled and sorted to recognised classifications by the larger wholesale rag merchants outside the West Riding, were disposed of through the regular rag auctions in Batley and Dewsbury. These, and the greater proportion of imported rags and pulled shoddy and mungo constituted the bulk of woollen rags passing through the hands of the specialist West Riding rag merchant with only direct consignments of specially graded rags and

1. The development of the auction system is discussed infra p.62.

shoddy from overseas sellers to the larger shoddy and woollen manufacturers being excluded from the market.

The primary function of the West Riding rag merchant, the majority of whom were situated in the Batley, Dewsbury, and Ossett districts, was to sort, grade and prepare woollen rags for use by the textile industry. In so doing the merchant performed a dual role by being prepared to supply the immediate needs of users with special grades and secondly, by holding sorted stock in anticipation of future demand. Essential to the performance of these roles was the ability of rag merchants to even-out seasonal fluctuations in the primary collection of rags. Large quantities of rags became available in the spring and summer and, with a lag of approximately twelve months between initial collection, accumulation, baling, and despatch, supplies were regular until the end of the year.¹ Rag merchants soon appreciated the partly contracyclical demand from shoddy and woollen manufacturers and bought when rags were cheap and plentiful in the summer, selling their sorted stock when supplies contracted and prices rose in late winter and early spring.² Long-term stock holding (one year or more) was avoided as far as possible in the interests of maximising turnover and maintaining capital liquidity, it being an axiom of the trade that written-down stock at the end of the financial year represented grades for which demand was weak. Evidence suggests that accumulated stocks in the hands of West Riding rag merchants in the late nineteenth century was sufficient for three to four months normal demand from the textile industry,

1. Letter from Victor Galaup to the Textile Mercury, 10.9.1892, p.224. This had declined to about six months by the 1950s. R. Thornton & Sons, A Story of Woollen Rag Sales 1860-1960 (Dewsbury, 1960), p. 28.

2. H.E., 24.12.1896; H. Burrows, op. cit., p. 53; v. infra, pp. 163-64.

although in very exceptional cases stocks were held for up to 20 years.¹

The scale of operation of firms within the West Riding woollen rag sector varied considerably, ranging from the single proprietor firm to the larger establishments employing many sorters, although there was a tendency for these firms to integrate forward into rag-pulling, carbonising, dyeing, and carding. The smallest unit, a one-man firm typically trading from his home or lodgings, operated with minimal overhead costs by utilising the temporary storage facilities of the rag auction firms or the railway company and relying on a fast turnover with small profit margins. Firms in this category were essentially dealers with few merchanting functions and many of those enumerated in the Census returns as 'woollen rag dealer' and not appearing in the trade directories suggests that their existence may frequently have been of an ephemeral nature. The more typical rag merchanting firm employed from 10 to 20 highly skilled female sorters who were remunerated on a piece-rate system, supplemented by a number of part time sorters when trade was active, and either owned or rented a warehouse or occupied a floor in a mill.²

Operating in a market over which they were individually unable to influence price, rag merchants developed a high degree of product differentiation in order to maximise profits in a competitive situation. Beyond the basic division between 'cloth' (hard or mungo) rags and 'stockings' (soft or shoddy), specialisation could be very

1. v. infra, p. 189.

2. Wakefield and District Archives, Goodchild Loan MSS. Sorters' Weigh Book, 2.4.1864 - 23.4.1914, unidentified Ossett rag merchant.

narrow with some merchants concentrating on one or two 'sorts' for their customers, the number of sorts at any one time in the West Riding ranging from several hundred to over one thousand depending upon activity in the woollen textile sector.¹ Whilst facilities existed in Dewsbury for rag merchants to exchange specially sorted classes of rags to meet their own customers' requirements, no evidence suggests that supply monopolies existed or indeed could exist for more than a short period with new supplies of rags constantly reaching the West Riding auction rooms.

Prior to the more successful application of chemicals to woollen rags containing cotton stitching from the 1880s,² all mungo or cloth rags had to be 'seamed' to remove vegetable fibres which would impair subsequent cloth manufacture and dyeing, 'ripped' to reduce the size of the material to manageable proportions and finally 'cut' prior to passing through the rag machine.³ This operation would be carried out by the sorter using either a pair of shears or a fixed knife mounted on the sorting 'riddle' - a wooden bench frame with a wire mesh over which the rags were processed (Figs II (i) and II

1. Waste and Scrap Trades Handbook (2nd edition, 1948), p. 83. See also S. Jubb (1860) op. cit., p. 30. An initial sorting of black stockings, after separating the good material requiring no dyeing from the poor or faded material, would typically yield four sorts; 'coarse blacks', best and faded, and 'fine blacks', best and faded. These would then be subdivided again according to the nature of the rag merchants' market, but would include at least one further grading of both best and faded 'medium blacks'. W.T.W., 17.5.1919, pp. 1-2.

2. v. infra, p.212.

3. 'Ripping' was the process by which the rag sorter cut out the linings and seams from worsted or woollen garments using hand shears and leaving what was called in the trade the 'skeleton'. 'Seaming' was a more involved process than ripping, which removed the heavier seams only, and included careful removal of all cotton stitching and mending material. Because of its labour intensive nature, seaming produced an expensive and high quality rag but one which the rag merchant could guarantee contained a minimum of cotton thread.

Fig. II(i) Two views of the rag-sorting department of M.J. and G. Stross Ltd., Scout Hill Mills, Dewsbury, 1930.



Fig. II(ii).



(ii)).¹ In many firms, the rags were 'shaken' in a hand-operated enclosed rag shaking machine to remove dirt and dust prior to sorting and ripping.²

A typical rag-warehouse in the Heavy Woollen District consisted of two to three storeys and was ideally situated on a hillside on one of the thoroughfares adjacent to the railway station to utilise a 'flow system' in the various operations.³ Bales of rags entered the top floor from rear access to the warehouse or were hand-winchd up where they were opened and the process of shaking, ripping, seaming, and sorting was carried out in well lit and heated surroundings (Figs. II(i) and (iii)).⁴ As the 'skips' or boxes of sorted rags were filled (Fig. II(ii)) the rags were passed to the floor below through one of many small gravity chutes for the final processes of packing, baling, and despatch from the ground floor. Sorted and incoming baled rags were stored on the ground or first floor, a primary structural requirement of any rag warehouse being well-supported and strengthened flooring.

Success in the West Riding woollen rag sector, as in any commodity market, depended on the ability to buy and sell at the right moment and the right price and to anticipate future price movements in different classes of rags. Essential to this was an

1. Referred to colloquially in the West Riding as the 'lump'. Sorting was a highly-skilled but poorly paid occupation although there were a number of advantages not available to other West Riding textile workers - a relatively noiseless and unrestricted environment and frequent opportunity to purchase cheap re-usable items of clothing. See C.E. Collet, 'Women's Work in Leeds', E.J., I, 1891, pp. 466-67.

2. W.T.W., 3.3.1928, p. 9.

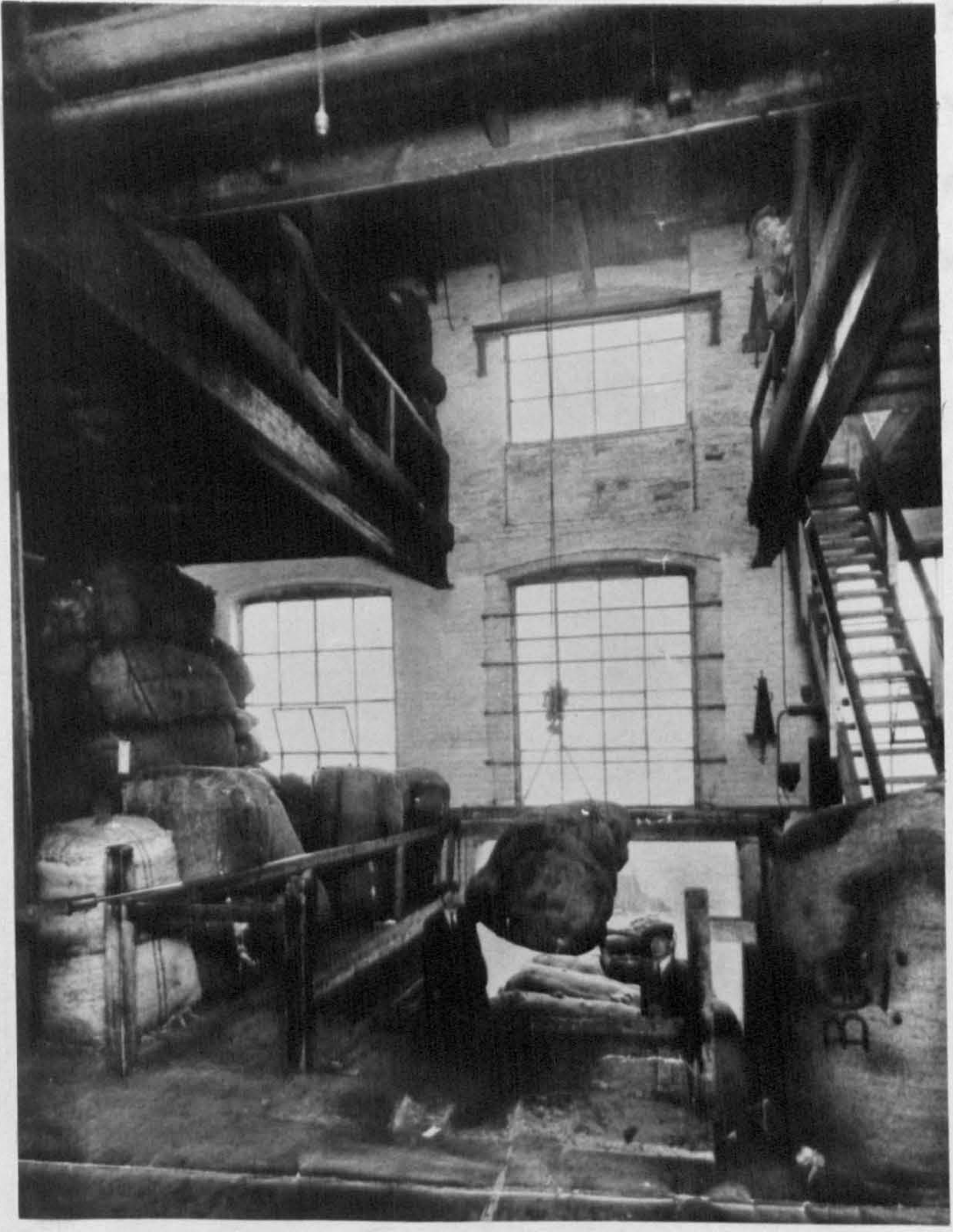
3. W.R., 27.8.1959, p. 225.

4. A skilled sorter using hand shears could be expected to process upwards of 30 cwt. of rags in a 35 hour working week. (Information kindly supplied by Mr. Exley, Dewsbury, 2.4.1977). See also Journal of the Textile Institute, 41, May 1950, no. 5, p. 195.

intimate knowledge of what the...
such as cotton, wools,...

Fig. II(iii). The storing department, M.J. and G. Stross Ltd.,
Dewsbury, 1930.

merchant needed to be...
rag pulling to be able...
desired quality...
could pull with a...
the West Riding...
the wools...
will, including...
and paydays, the...
ability - as...
acquaintance...



1. For example, James... (Butley, 1890),
Revelations of...
in my life',...
merchant and... and...

intimate knowledge of wool and other textile raw material prices, such as cotton, noils, waste, and hair, and also of manufacturing processes in the woollen textile branch. In particular, the merchant needed to be familiar with the intermediate stage of rag pulling to be able to produce a 'sort' which would yield a desired quality consistent with user's requirements and which would pull with a minimum of faults and breakages. In addition, the West Riding rag merchant possessed an extensive knowledge of the woollen manufacturing district - the name and location of every mill, including past and present owners, their business standing and paydays, the quality of goods manufactured, and their business ability - an accumulation of information acquired from long acquaintance with the industry.¹

1. For example, James Willans, Batley Past and Present (Batley, 1880), Recollections of Dewsbury (Batley, 1881), and F.W. Reuss, 'Milestones in my Life', W.T.W., 31.1.1914. Willans was a Batley rag and shoddy merchant and Reuss a German-born Dewsbury merchant and auctioneer.

IV - Early Development and Growth, ca. 1813-1870

The Development of the West Riding Woollen Rag and Recovered Wool

Merchanting Trade ca. 1813-1870.

The supply of woollen rags used by Batley and Dewsbury flushing and drugget manufacturers in the very early years of the West Riding shoddy trade appear to have been purchased direct from Scottish and London rag merchants specialising in cotton and linen rags for the paper industry. The two innovators of shoddy, Law and Parr of Batley for example, allegedly obtained their rags secretly from Scotland until ca. 1815 when other small clothiers and manufacturers of low woollen cloths began to utilise the new raw material.¹ By 1818, a witness informed the Wool Tax committee, the trade in woollen rags between the metropolis and the West Riding had reached 'large' proportions, and records surviving in 1880 indicated that a number of Batley manufacturers, who rented a warehouse in Basinghall Street for the disposal of their cloth, were regularly despatching rags by return to Dewsbury Moor.² Although local tradition suggests that at least one specialist rag merchant had become established in ca. 1820,³

1. F.. Fenton, 'Woollen Shoddy'; T.M., 15.5.1881, p. 172; F.W. Reuss, 'The Birth of the Mungo and Shoddy Industry', W.T.W., 12.4.1913, IX. Reuss refers to some records he inspected in 1913 of a Dewsbury firm of woollen manufacturers which showed that they were using shoddy in their cloth in 1815.

2. Examination of Petitions before the Privy Council against the Tax of Wool imported, P.P. 1820 (56), XII, 76; E. Law, 'The "Law" Family', W.T.W., 19.7.1913, p. 19. This article was first published as a pamphlet in 1880. Law possessed the early records of Benjamin Parr of Batley dating from 26.11.1823 to 28.8.1825 in which these transactions appeared.

3. F. Fenton, op. cit., T.M., 15.5.1881, p. 173. The first independent rag merchant in the Batley and Dewsbury district would seem to have been George Hall of Batley who commenced business in 1820 by supplying rags to local manufacturers. Fenton notes that he later became a blanket manufacturer which is confirmed by Parson and White's directory of 1830 and Pigot's of 1834. Nevertheless, he appears to have combined manufacturing with rag merchanting as Thomas Taylor was buying rags from him in 1834. University of Sheffield, J.T. & J. Taylor MSS., Waste Book 31.1.1834-31.12.1851, (hereafter referred to as J.T. and J.T. MSS.).

the growth of this sector in Batley and Dewsbury was not acknowledged by the trade directories until 1837, and it is not clear whether the rag merchants enumerated for Leeds and Wakefield from 1822 were dealing in all types of rags or specialising in woollen rags for the low woollen trade (Table II (iii)).

Direct purchase of rags from the Hull importers and London wholesale rag merchants by Batley and Dewsbury manufacturers would thus appear to have been common practice in the 1820s, for no reference to the existence of a separate rag merchanting trade in the district was made by the witnesses to the 1828 Select Committee on the Wool Trade.¹ Until ca. 1830, the larger manufacturers employed women to sort and cut away the seams of woollen rags prior to grinding and it would seem likely, as Jubb suggests, that small manufacturers, who used the grinding facilities of the larger mills, had begun to sell shoddy in the West Riding from the early 1830s.² As the growth in quantity and range of woollen rags increased the process of sorting and seaming became more complex, and, for the larger manufacturers receiving roughly classified rags from the wholesale rag merchant, a time-consuming operation in which only a proportion of the sorted rags could be used in manufacture. During the 1830s a number of the smaller Batley and Dewsbury flushing and druggat manufacturers began to diversify into rag merchanting by buying and reselling the surplus rags as well as securing their own sources of supply.

Thomas Taylor, a Batley pilot cloth manufacturer, was purchasing 'white shoddy', and 'ground stockings' from Jonathan Clegg, a small

1. Report by the Lord's Select Committee appointed to take into consideration the state of the British Wool Trade, P.P. 1828 (515), VIII, 445 et seq. 700. Evidence of John Nussey, a manufacturer of Carlinghow New Mill, Batley. Nussey sold his cloth at the White Cloth Hall, Leeds.

2. J. Bischoff (1828), op. cit., p. 96; S. Jubb (1860), op. cit., p. 29.

TABLE II(iii) Rag, shoddy and mungo merchants in the West Riding Heavy Woollen District, 1822-1870¹

	1822	1830	1834	1837	1841	1842	1847	1849	1853	1857	1861	1866/7	1870
Batley	-	-	-	11	52	21	37	99	57	101	103	117	80
Dewsbury	-	-	-	5	17	38			63	64	80	61	80
Heckmondwike	-	-	-	-	-	-	-	-	-	4	5	10	12
Ossett	-	-	-	-	-	-	3	5	18	43	36	51	61
TOTAL	-	-	-	16	52	38	78	104	138	212	224	239	233
Leeds	10	-	15	27	18	47	36	32	55	97	128	89	108
Morley	-	-	-	-	-	-	-	-	7	11	12	11	10
Huddersfield	-	3	2	4	3	8	11	5	39	55	51	90	74
Wakefield	3	-	-	-	-	-	7	3	11	8	5	8	7

1. Includes all rag dealers, whether woollen and/or cotton/linen.

Source: see below

- Source:- 1822 - E. Baines, History, Directory and Gazetteer of the County of York (Leeds), I.
- 1830 - W. Parson & W. White, Directory of the Borough of Leeds ... and the Clothing District of Yorkshire (Leeds).
- 1834 - J. Pigot & Co., National Commercial Directory.
- 1837 - W. White, History, Gazetteer and Directory of the West Riding of Yorkshire (Leeds), I and II.
- 1841 - J. Pigot & Co., Royal National and Commercial Directory.
- 1842 - W. White, Directory ... of the Borough of Leeds and the ... clothing District of the West Riding of Yorkshire (Leeds).
- 1847 - W. White, Directory ... of the Borough of Leeds and the ... clothing District of the West Riding of Yorkshire (Leeds).
- 1849 - I. Slater (Pigot), Royal National Commercial Directory.
- 1853 - W. White, Leeds and the Clothing Districts of Yorkshire (Sheffield).
- 1857 - W. White, Leeds and the Clothing Districts of Yorkshire (Sheffield).
- 1861 - Kelly & Co., Post Office Directory of the West Riding of Yorkshire, I and II.
- 1866 - W. White, Directory of Leeds, Bradford ... (Sheffield).
- 1867 - Kelly & Co., op. cit., I, II and III.
- 1870 - W. White, op. cit.

flushing manufacturer, as well as buying rags from other Batley flushing and drugget manufacturers including Hall.¹ By 1837, the emergence of a distinct woollen rag merchanting sector in Batley and Dewsbury was noted in White's directory and in the succeeding four years the growth in the number of merchants was rapid, followed by a second period of expansion between 1847 and 1857 (Table II(iii)).²

An analysis of the trade directories for 1837, 1841, and 1847 provides some information on the occupational background for those entering this recently-classified sector. Of the 16 rag merchants in Batley and Dewsbury in 1837, eight had been previously flushing, drugget, or padding manufacturers and of these two were listed as such in Baines' directory of 1822. All made the transition from manufacturing to merchanting between 1834 and 1837 and three manufacturers who were additionally classified as rag merchants in 1837 had become full-time rag merchants by 1841.

Table II(iv) sets out the persistence of firms over time as indicated by the directory listings of 1837, 1847, 1853, and 1870. From this it can be seen that in 1853 and 1870 a higher proportion of previously established firms existed in Batley with some 10 per cent of the total indicated firms in 1870 having been in operation for upwards of 17 years, whilst rag merchants in Dewsbury and Ossett in 1870 were predominantly new entrants to the sector between 1853 and 1870. Bankruptcy appears to have been of relative unimportance as a reason for the exit of firms, particularly as the major proportion of bankruptcies recorded here were of new firms established after

1. J.T. and J.T. MSS, loc. cit., Waste Book, op. cit.

2. A number of woollen manufacturers such as John Nussey of Carlinghow New Mill still continued to buy, sort, and grind their own rags. Kirklees Libraries and Museums Service, Huddersfield. Batley Valuation Book 1837.

TABLE II(iv) Rag, shoddy, and mungo merchants - persistence of firms over time, 1837-1870.

	No. of Firms established on or before:- (Cumulative Totals)					Bankruptcies
	1834	1837	1841	1847	1853	
1837 Batley/Dewsbury	16	8				(1837-1847)
1847 Batley	37	3	14			2
Dewsbury	38	8	16			-
Ossett	3	-	1			-
						(1847-1853)
1853 Batley	57	3	8	26		-
Dewsbury	63	1	6	15		-
Ossett	18	-	1	3		-
						(1853-1860) (1860-1870)
1870 Batley	80		1	5	8	1
Dewsbury	80		1	2	4	4
Ossett	61		1	2	2	-

Source: Trade directories, op. cit;

Perry's Bankrupt and Insolvent Gazette, IX, 1836 to XLIII, 1870.

1853. There is some evidence, however, of the ripple effects of bankruptcy amongst woollen manufacturers affecting rag merchants. Trade conditions between 1838 and 1842 in the Leeds area were very bad and had affected the Dewsbury blanket trade particularly severely.¹ The insolvency in 1843 of three Batley and Dewsbury blanket manufacturers appears to have contributed to the bankruptcy later that year of two other members of the family, one a rag merchant, and the other a shoddy merchant, who had commenced business in ca. 1837.² Although a number of provincial and metropolitan wholesale rag merchants experienced insolvency from the 1840s, entrepreneurial opportunities provided by the rising demand for shoddy and mungo would seem to explain the virtual absence of bankruptcy amongst West Riding rag merchants until the mid 1860s, when the after-effects of the American Civil War expansion resulted in a sharp upturn in the incidence of insolvency between 1864 and 1867.

A number of firms also left the merchanting branch by integrating forward into shoddy manufacture. John Jubb, who had been a flushing manufacturer between ca. 1837 and 1841 and subsequently a rag and shoddy merchant, had become a shoddy manufacturer by 1851 as did Henry Day in the early 1860s.³ Table II(iv) suggests, however, that the majority of Batley, Dewsbury, and Ossett rag merchanting firms persisted only for so long as the active business life of the proprietor and that death or retirement probably accounts for a large proportion of the exit of firms in this expanding sector between 1837 and 1870.

The surviving records of Henry Day of Hanging Heaton, near

1. L.I., 11.1.1840; L.M., 12.2.1842, 25.6.1842.

2. Perry's, op. cit., XVI, 1843. Frank Popplewell (blanket manufacturer), Aked Popplewell (rag merchant), and Samuel Popplewell (shoddy merchant). Subsequently Aked Popplewell became a flannel manufacturer, moving from Batley to Dewsbury, but was again made bankrupt in the banking crisis of 1866. XXXIX, 1866.

3. C.P.E.N. 1851 op. cit.

Dewsbury, dating from 1843 shed some light on the process of transition from manufacturer of drugget and pilot cloths to rag and mungo merchant that was not untypical of a number of his contemporaries. Day had assisted his brother Abraham and father George in manufacturing cloth at Albion Mill, Batley Carr, until the father's death in 1846, when both sons continued to manufacture cloth as a partnership until Day terminated the agreement and sold his last pieces of cloth to Joseph Newsome, a Batley Carr pilot cloth manufacturer, in April 1854.¹

Sometime prior to this, Day had begun to buy and sort rags in a small warehouse near his home in Hanging Heaton, the first records of these transactions commencing in 1848; by 1851 at the age of 32 he described himself as a 'rag merchant and manufacturer of cloth' employing eight women sorters and two men, the latter most probably weavers.² No doubt from his experience as a pilot cloth manufacturer together with a degree of acumen, Day specialised from the beginning in the growing market for mungo rags, although he also bought and sorted small quantities of soft rags.³

Following the practice of the specialist sorters in the paper industry,⁴ Day sold all his 'sorts' or blends by the stone (16 lb.), deducting tare and allowing a 1 per cent discount for cash. The sales ledgers indicate that in the period 1848-1855 about 80 per cent of his sales were to rag merchants and mungo manufacturers situated principally in Ossett, the balance of his trade being with woollen

1. W. White (1853), op. cit.; Savile Bridge Mills, Dewsbury. Henry Day and Sons Ltd. MSS., (hereafter referred to as H.D. MSS.). Sales Ledger 28.9.1852-20.12.1858.

2. C.P.E.N. 1851 op. cit. White's directory for 1853 still described Day as a cloth manufacturer only.

3. A decision fully justified by 1860, Jubb observing 'the great permanent increase in the value of mungo rag, and the brisk and extensive demand for it, sufficiently attest the esteem in which it is held' (p. 33).

4. A.G. Thomson, op. cit., p. 34.

manufacturers such as Mark Oldroyd of Spinkwell Mills, Dewsbury, who either possessed their own rag machines or who had the rags ground on commission.¹ The rapid rise in the price of and demand for mungo - new clips that had cost Day 17^s/- a hundredweight in 1849 had risen to 30^s/- by 1851 - and very probably the realisation that the fastest route to expansion was through selling pulled mungo direct to cloth manufacturers, led Day to commence selling small amounts of pulled mungo from ca. 1855.² After sorting and blending, the rags were ground on commission for Day by two mungo merchant/manufacturers in Ossett, John Marsden and Joseph Megson, for 7^s/- a pack, exclusive of olive oil. The use of olive or Gallipoli oil, normally mixed with only the finest wools for good quality cloth, indicates clearly that Day intended to provide a high quality material for his market, each pack of mungo pulled requiring just over 3½ gallons of oil at between 3^s/6^d and 5^s/- a gallon, or nearly twice the cost of pulling.³ Frequently Day would supply rags in payment for the pulling carried out for him by these firms, particularly American new and old mungo rags which he had begun to import in 1861.

From 1855 Day began to concentrate more on merchanting pulled mungo, the growing number and distribution of his customers indicating that he spent much time and effort travelling between West Riding

1. H.D. MSS., loc. cit., Sales Day Book, 19.1.1848-30.1.1864.

2. This is not clear from the Sales Day Book, for, until 1857, Day frequently used the term 'mungo' for sorted rags, and the difference is not always apparent from the quoted price.

3. H.D. MSS., loc. cit., Sales Ledger, 1853-1863. This practice varied with the quality of the material being manufactured, Reach in his 1848 article in the Morning Chronicle observing '... when the better sort of material is consigned to the teeth of the "devil" a quantity of coarse rank oil ... is thrown upon it'. Batley and Birstall Civic Society, From a Mere Hamlet (Batley, 1975), folio 3.

manufacturers.¹ Although some local mills were supplied with both rags and mungo on a regular basis, many of Day's customers were located in areas well-known for good quality broadcloth; Calverley, Leeds, Stanningley, Rawdon, Rodley, and Farsley as well as in Golcar and Huddersfield. Typically, connections with different mills once established persisted for many years, John Hainsworth and Sons of Stanningley, for instance, to whom Day began selling mungo in 1855, still retained strong connections with the firm in the 1930s.²

The records indicate that the colour of Day's mungo in the 1850s was consistent both with the colour of cloth then being manufactured in the West Riding and past clothing consumption - blue, black, brown, drab, and grey.³ A comparison between the buying price of 'mixed mungo rags', 'new clips', and the classes sorted from these mixed grades - blue and black mungo, new blue and black mungo, various drab mungos, and black stockings - reveals that in 1848-49 the selling price per lb. could be as much as 250 per cent more than Day's buying price, although a more normal margin was in the region of 150 per cent. Indicative of increasing competition, in particular from mungo merchants and manufacturers in Ossett, together with rising prices for unsorted mixed rags, the price differential between the two narrowed considerably from 1851-53 to fluctuate within a range of 60 to 100 per cent.

The proportion of the value added to rags in the sorting process directly attributable to labour and fixed costs cannot be calculated

1. Personal recommendation between manufacturers was important, a note in a Leeds woollen manufacturer's mill book of ca. 1870 reading 'DD (David Dixon, a large Leeds woollen manufacturer) recommends Mungo from Abhm. Marsden, Ossett'. Marsden was a rag and mungo dealer. Bagshaw Museum, Batley. Alfred Briggs and Sons MSS., Mill Book, 1858-1936.

2. H.D. MSS., loc. cit., Sales Ledger, 1.10.1906-20.9.1936.

3. Huddersfield and Holmfirth Examiner, 15.5.1858, 9.1.1860; W. White, A Month in Yorkshire (1858), p. 354. White noted that on his visit to a Batley shoddy cloth manufacturer in 1857 'a dingy brown or black was the prevalent colour; but some of the heaps were grey'.

from the records surviving, but as great care was necessary to ensure that the correct shade and quality conformed to customers' specifications, such costs would have formed a substantial element in the selling price of his rags, and mistakes were quickly pointed out. For example, John Speight and Sons, a large Ossett mungo manufacturer, complained in 1863 that

'out of the last lot of Blues sent us we took out 36 lbs. of pieces dyed black and other contrary colours' ¹

and returned the consignment.

By 1856 Day's operations were expanding steadily and he had his rag warehouse lengthened to accommodate more stock and allow greater room for sorting.² In 1861, at the age of 42, he was employing 18 female sorters and had begun to import fine mungo rags from America.³ Whilst it is not clear how Day made his initial approaches to American rag merchants - a William Day, who may have been a distant relative, had emigrated from Dewsbury to America in 1853 to start shoddy manufacture and could possibly have assisted him⁴ - some surviving correspondence indicates the high degree of trust and confidence placed in Day by his American supplier, John O'Neill of Philadelphia. O'Neill initially fixed the price of his rags, a consignment in April 1864 comprising

17 bales Cut Cloth 9694lbs at 3 $\frac{3}{4}$ d.	£151. 9. 4
6 bales New Cloth 2610lbs at 5 $\frac{3}{4}$ d.	62.10. 7
Insurance	4.11.11
	£217.19.11 (sic)

but relied on Day to adjust these if necessary.

1. H.D. MSS., loc. cit., letter from John Speight and Sons, North Field Mill, Ossett, d/d 21.1.1863.

2. H.D. MSS., loc. cit., 'Henry Day's Book', 13.1.1844-25.10.1856.

3. C.P.E.N. 1861. RG9. 3413 43-END.

4. Wool Year Book (Manchester, 1921), p. 28.

'If you can do better than these prices I hope you will as there is a man sending from here continually to Fox of Batley and I can't see how I can pay him at the prices this stock has been selling, for withall he gets better prices than this, but hoping you¹ will do what is right both to yourself and me ... '

The tenor of O'Neill's letters indicate that as their business relationship progressed, Day's ability to remit funds quickly at a time of fluctuating exchange rates and high American gold prices had persuaded O'Neill to place a great deal of confidence in the Dewsbury merchants' valuation of the consignments. In July 1864, for example, he wrote to Day

' ... you will give me £35 for "olds" - I did not state any price but left all to your own generosity ... I expect you will do what is right and if I did not expect that I would not² send the stock so allow me what you can ... '

From 1864 until 1893 no books of prime entry for the firm survive, but it is clear that by 1871 Day had integrated forward into mungo manufacturing, employing three female sorters and one rag machine minder, possibly operating one or two machines.³ Some documentary evidence of bills of lading for consignments of pipes of 'best bright Olive oil' from Lisbon, Malaga, and Naples from 1866 onwards indicate that Day had commenced manufacturing on, or shortly before, that date.⁴ He had timed his entry into the manufacturing branch well, for not until 1862 did the German rag-machine modification for the manufacture of high-quality mungo become available through machine makers Joseph Rhodes and Sons of Morley.⁵

1. H.D. MSS, loc. cit, letter and invoice d/d 8.4.1864 from John O'Neill, Dealer in Hard and Soft Woolen Rags, 107 North Front Street, Philadelphia.

2. loc. cit, letter dated 29.7.1864.

3. C.P.E.N., 1871. RG 10. 4604/5/6/7 and 4612, 1-END. Day described himself as 'Mungo manufacturer'.

4. H.D. MSS., loc. cit. Invoices 5.10.1866, 30.1.1867, 8.3.1867 etc.

5. This innovation is discussed in Chapter IV, p.221.

To what extent were Day's business dealings representative of other rag, shoddy, and mungo merchants in the period to 1870? Day was unusual in that he was one of the few mungo merchants and manufacturers to establish and continue his business outside of Ossett, the major centre of the Heavy Woollen District mungo trade.¹ He was also one of the first West Riding merchants to develop his own source of supply of American rags to meet a growing demand for light grey cloth and mungo that could be dyed in the manufacture of broadcloth. Clearly, whilst these factors set Day apart from many of his contemporaries, they reflect to a large extent his individual entrepreneurial abilities. He did, however, share a similar background to others in the rag and recovered wool merchanting sector in Batley, Dewsbury, and Ossett. As the Census enumerators' notebooks between 1841 and 1871 indicate, Day and the greater proportion of rag merchants were either born in the town in which they subsequently carried on their businesses or came from the immediate vicinity. Secondly, Day shared a common background with others entering the occupation before 1850 who had come from woollen manufacturing families and had been manufacturers themselves. Thirdly, as discussed below, although the size of Day's firm in terms of employees was marginally larger than the mean of firms in the sample of 1861, it compared very closely to the mean of 1851. Finally, there is no evidence to suggest that in the expanding but competitive rag and recovered wool market in the West Riding between the late 1840s and mid 1860s that Day's prices, profit margins, or business practices were markedly

1. J. Willans (1881) op. cit., p. 33.

different to those of many other merchants.¹

An examination of the age structure of rag, shoddy, and mungo merchants in Batley and Dewsbury between 1841 and 1871 and in Ossett in 1861 and 1871 indicates that Day was in the dominant 25-35 age cohort in 1851 (Table II(v)). There is a tendency for the proportion of those in this cohort to decline in Batley and Dewsbury so that by 1871 the largest percentage of rag merchants were in the 36-45 age group. Predictably, the proportion of those in the 46-55 cohort rise on trend, but not as sharply as would be expected, one reason for this being the small but growing number of rag merchants enumerated as 'retired' from the age of 45 onwards in 1861 and 1871.

The 'ageing' tendency apparent in the Batley and Dewsbury rag merchanting sector together with the markedly lower proportion of merchants entering the occupation in the under 24 age group strongly supports trade suggestions in the late 1850s that increased competition and wider knowledge of 'the mysteries of the business' had diminished profits.² Whilst this would not have dissuaded the determined, entry forestalling in the form of difficulty in breaching existing business connections or in establishing new ones profitably would have favoured the established rag merchant and discouraged the less ambitious newcomer. That barriers existed or that opportunities were diminished is suggested by the stability in number of rag merchants in Dewsbury between 1861 and 1870 and an actual decline in Batley between the same dates (Table II(iii), p. 43). The case of Ossett is somewhat different

1. Clearly the firm is atypical in that it has survived for over 130 years, but this would seem to reflect more the entrepreneurial responses of Day's successors to conditions outside the period being discussed here, although these responses were determined to an important extent by Day's original decision to become a mungo manufacturer in the 1860s.

2. S. Jubb (1860) op. cit., p. 39.

TABLE II(v) Age structure of rag, shoddy, and mungo merchants and dealers, Batley, Dewsbury, and Ossett

1841-1871.

	Number in sample*	Aged under 24 (%)	Aged 25-35 (%)	Aged 36-45 (%)	Aged 46-55 (%)	Aged over 56 (%)
1841						
Batley	22	13.6	59.1	9.2	4.5	13.6
Dewsbury	6	-	83.3	16.7	-	-
1851						
Batley	68	8.8	45.6	26.5	17.6	1.5
Dewsbury	29	20.6	34.5	31.0	10.3	3.6
1861						
Batley	111	9.9	32.5	24.4	18.8	14.4
Dewsbury	70	14.3	38.5	21.4	20.1	5.7
Ossett	26	15.4	57.7	15.4	11.5	-
1871						
Batley	81	8.5	29.6	30.9	18.6	12.4
Dewsbury	41	7.3	24.4	36.5	24.4	7.4
Ossett	17	11.8	17.7	29.4	41.1	-

Source: C.P.E.N. op. cit.

* v. supra p.17.

but consistent with the later growth of the mungo trade in this district from the 1850s. Although the sample indicates a smaller fall in the under 24 age group entering the sector there is a decisive 'ageing' of the group, but the smallness of the sample prevents more firm conclusions being made on the presence of any factors constraining younger men from becoming merchants in 1871 compared to 1861.

An analysis of the size of firms in terms of the total number of employees (Table II(vi)), shows that between 1851 and 1871 the proportion of single-proprietor firms increased, although as numbers were increasing in the sector as a whole (Table II(iii)), the actual number of firms employing more than one sorter is unlikely to have fallen. Also apparent is the growth in proportion of firms employing from one to five sorters and the emergence by 1861 of a small number of large firms (between three and four in the sample) employing upwards of 20 sorters and overlookers¹

As noted previously, an insignificant proportion of entrepreneurs entering the rag, shoddy, or mungo merchanting sector in Batley, Dewsbury, and Ossett were born outside the town or vicinity in which their business was located. In the small sample from the 1841 Census only one rag merchant, John Butterworth from Dundee, was born outside Yorkshire. The substantial immigration from Ireland in the late 1840s and 1850s contributed no more than one or two entrepreneurs to rag merchanting, but considerable numbers

1. In the Census enumerators' notebooks examined between 1851 and 1871, the instructions given to record employment seem to have been observed strictly for no known Batley or Dewsbury woollen or shoddy manufacturer failed to provide such details. This is not to say, of course, that all did or that the information given was accurate.

TABLE II (vi) Size of rag merchanting and dealing firms in Batley, Dewsbury, and Ossett according to numbers employed, 1851-1871.

	(a) Proportion of firms with more than 1 employee as a percentage of total sample*	(b) Number of firms with more than 1 employee	(c) Percentage of firms (b) employing from				
			1-5 persons	6-10 persons	11-15 persons	16-20 persons	over 20 persons
1851 Batley and Dewsbury	31.9	31	45.2	38.7	9.7	6.4	-
1861 Batley, Dewsbury and Ossett	29.5	61	52.4	22.9	16.5	3.3	4.9
1871 Batley, Dewsbury and Ossett	26.6	37	54.1	27.0	5.4	5.4	8.1

* v. supra Table II(v)

Source: C.P.E.N., op. cit.

to the ranks of sorters and rag-grinders.¹ Of the small number of rag merchants from outside the West Riding only Lancashire provided a significant proportion. Finally, a small number of merchants in each sample from the Census years 1851, 1861, and 1871, were engaged in subsidiary occupations, mainly as grocers or small farmers, and the practice of employing female members of the family as sorters continued to be a persistent characteristic of the occupation for a small number of merchants from 1851 to 1871.

Although these samples include many not found in the directories (Table II(iii) p. 43), from their numerical equivalence, especially in the case of Batley and Dewsbury, it is possible to make the general observation that a significant proportion of new entrants to the occupation from 1861 onwards were, as the Census information clearly indicates, the sons of 'first generation' rag merchants. It is also apparent both from the Census enumerators' notebooks and the directories that a small proportion of entrepreneurs in rag merchanting were women, some of whom carried on their husband's business after his death.

Capital requirements appear to have been low, an observer noting in the late 1850s that many of the merchants were 'originally men of small capital' and qualitative evidence from the Census records, particularly of the single proprietor firm operating from a home address in the working class districts of Batley and Dewsbury, would seem to support this.² By 1863 Day was one of the more prosperous

1. C.P.E.N., 1851-1870, op. cit.

2. S. Jubb (1860), op. cit., p. 39.

of the Dewsbury rag and mungo merchants and had insured his stock and warehouse for £1,000, reflecting to some extent the enhanced rag values during the American Civil War period, but the more typical insurance cover for fixed capital and stock of the medium-sized firms was £400 in the period 1865-1870.¹ Many rag merchants rented warehouse accommodation and, with the exception of a small investment in workroom equipment, used the greater proportion of their capital to finance stocks of sorted and unsorted rags as well as shoddy and mungo.² Capital investment in many rented warehouses in Batley from the mid 1840s appears to have come mainly from local sources - woollen manufacturers, shoddy manufacturers and other rag merchants - although outside investment could come from unlikely quarters.³ St. John's College, Cambridge, for example, owning a warehouse rented to rag merchants John and Benjamin Whitaker in 1867, financing another warehouse to the same firm in 1870, and in 1873 a small 'rag shed' to John Whitaker's widow, Isabella.⁴ Those merchants who owned the freehold of their warehouses rarely valued these at more than £200, an amount usually equal to or considerably less than the amount of insurance carried for stock, which varied between £150 and £900.⁵

1. H.D. MSS., loc. cit., receipt Sun Fire Office, Batley 8.10.1863; J.F.T.S. MSS., loc. cit., Policies 1865-1870. Whilst no evidence survives from which to comment on profitability in this sector, circumstantial evidence from local rating records indicates that as early as 1858 at least two rag merchants had financed and rented terraced property in working class districts. Kirklees Libraries and Museums Service, Huddersfield. Township of Batley, Valuation Book 1858. John and Phineas Fox.

2. Township of Batley, Supplementary Valuations, loc. cit., 1866-1873.

3. *ibid.* Valuation Book 1858, loc. cit., and Bagshaw Museum, Batley, Batley Township Rate Book, 2.8.1845.

4. *ibid.*, Supplementary Valuations 1866-1873.

5. J.F.T.S. MSS., loc. cit., Policies 1865-1870.

As no evidence of the size of insurance cover for the small rag merchanting firm appears in the records of the Batley insurance agents - and it is probable that few low-capitalised firms would have troubled to insure their small stocks - more specific conclusions on the minimum amount of capital required and the extent to which lack of capital presented a barrier to entry cannot be made. Many small entrepreneurs avoided this problem by entering the sector as rag or shoddy dealers and relying on their ability to match the immediate requirements of buyers and sellers, an operation requiring little initial capital and one which was greatly facilitated by the development of the rag auction and exchange system from the 1850s.¹

Although knowledge of the complexities of the rag and shoddy merchanting system had become less esoteric as the trade expanded in the 1850s, skill in buying and selling, which as Jubb infers could frequently be of a speculative nature given the sometimes rapid and large fluctuations in rag prices,² had necessarily to be matched with a sound background knowledge of the low woollen industry, a factor explaining to a large extent the local monopoly in rag merchanting. Those established in the trade were seen by an observer at a Batley rag auction in ca. 1857 as

' ... a shrewd-looking, hard-headed lot ... , the success which has rewarded their exertions in their peculiar trade shews them to be of the true English stamp of tradesmen'.³

Certainly, other evidence suggests that the rag merchants of Batley and Dewsbury possessed qualities of individualism mixed with

1. v. infra p. 60.

2. S. Jubb (1860), op. cit., p. 33.

3. ibid., p. 38.

some contempt for established social convention. Thomas Jubb, a woollen manufacturer of Branch Road Mills in Batley, noted an incident in his diary in September 1861

'This morning was witnessed an affray between two gentlemen of Batley, viz. W. H. Colbeck and Jas. Willans, Rag Merchant. The former gentleman went into a seat in Batley Church where Willans had been accustomed to sit. Mr. Willans pushed off Mr. Colbeck, whereupon Colbeck declared he would have satisfaction for the assault, and Colbeck as soon as the Church service was ended went at Willans ... the result was legal proceedings by Willans ... against Colbeck.'¹

The unconventional behaviour of rag and shoddy merchants did not go unnoticed in the press. In 1866 the Huddersfield Examiner noted with evident surprise the response of one of three Batley shoddy and mungo merchants who 'did not care a d--- for the summons' taken out by Robert Ellis, manufacturer and Mayor of Dewsbury, for their trespass on his land when hunting with the Clayton Harriers pack.²

Although manufacturers and press may have found the behaviour of some of the rag merchanting community sufficiently demeaning to cause comment, the very attributes suggested by this behaviour indicates those qualities most useful, in conjunction with knowledge and trading skill, to ensure the survival of the smaller rag and shoddy merchant in the increasingly competitive conditions of the 1850s.³

The most significant development in the growth of the

1. Batley Public Library, diary of Thomas Jubb, 'A Daily Record of Events Commencing January 1st 1861', 942.74. James Willans, a well-known Dewsbury rag merchant was author of Batley Past and Present (1880) and Recollections of Dewsbury (1881) and became a councillor in 1874 (Dewsbury Reporter 7.2.1874).

2. H.E., 31.3.1866.

3. S. Jubb (1860), op. cit., p. 39.

specialised rag, shoddy, and mungo merchanting sector between 1820 and 1870, was undoubtedly the introduction of regular rag and shoddy auctions in Batley and Dewsbury. The impact of this innovation, whilst of considerable influence in encouraging more efficient domestic woollen rag collection, acted as a major stimulus to the expansion of the supply of foreign rags, and particularly ragwool.¹

Prior to the introduction of rag auctions in ca.1846-8 the majority of foreign rags and shoddies were either purchased direct from importers in London and Hull or, in the case of pulled shoddy and mungo, from agents in Dewsbury and Batley appointed by the continental manufacturers.² The sales appear to have been started by William Pearson, a sheriffs' officer and registrar of births, and were mainly conducted at Canal Wharf, Ravensthorpe, near Dewsbury.³ The sales, modelled on the London wool auctions, expanded rapidly, and between 1851 and 1857 two more auction firms were established by George Rydill and Henry Cullingworth, the location of the auctions moving to the newly-opened London and North Western Railway station at Batley. Jubb reprints a detailed account of one of these auctions held by Cullingworth, and it is clear from this that the restricted facilities at Batley had become inadequate to accommodate upwards of 50 rag merchants attending the sales by 1857.⁴ Rydill,

1. The growth and timing of continental ragwool manufacture is discussed in Chapter III, pp. 118-24.

2. S. Jubb (1860), p. 36; F.W. Reuss, op. cit., in W.T.W. 12.4.1913, p. xii. Thomas Taylor was buying 'Hamburg' rags regularly from the Hull agents George Greenwood and F. Bogdon in 1836. J.T. and J.T. MSS., loc. cit., Waste Book 1834-1851.

3. S. Jubb (1860), op. cit., p. 36. J. Willans (1881), op. cit., pp. 34-35; F. Fenton, 'Woollen Shoddy', T.M., 15.7.1881, p. 252.

4. S. Jubb (1860), op. cit., pp. 37-40.

anticipating this, built a large warehouse for his auctions in Dewsbury where transport facilities offered by the centrally-situated railway station were far superior to those in Batley.¹

Although Rydill was unable to survive the sharp depression of 1857, his resources having been heavily extended by the construction of the saleroom, the remaining firms also re-located in Dewsbury and were joined by another, Benjamin Eastwood, who commenced his rag and shoddy sales in October 1857.² Each firm tended to specialise in different classes of rags - Rydill in German shoddy and mungo, Eastwood in French and Italian rags and Cullingworth in rags, shoddy and mungo from every overseas market.³ In 1860, an estimated 60,000 to 70,000 lbs of rags and ragwool were passing through Dewsbury weekly, the sales having

'... attained considerable importance (being) attended by parties interested from all the manufacturing districts around'⁴

By 1869, Cullingworth was operating sales on Mondays and Wednesdays, Eastwood on Mondays and a new firm, R.R. Nelson and Co., on Wednesdays.⁵

Both Eastwood and Cullingworth had entered rag auctioneering having had no prior connection with the trade. Cullingworth had been both postmaster for Dewsbury and proprietor of a successful

1. Another important reason for Rydill's decision was to prevent his consignments of high-quality 'foreign shoddies of approved marks' from getting wet and so reducing their value. J. Willans (1881), op. cit., p. 35.

2. J. Willans (1881), op. cit., p. 35.

3. F. Fenton, 'The Discovery and Early History of the Shoddy and Mungo Trade', Wool and Textile Fabrics, 15.1.1881, p. 607.

4. S. Jubb (1860), op. cit., p. 34.

5. Dewsbury Chronicle, 14.8.1869.

printing and stationery business before commencing his auctions in ca. 1850.¹ Eastwood, born in Ossett, had risen to the position of Chief Clerk for Dewsbury County Court when, at the age of 43, he had perceived an 'opening for the establishment of centres where rags could be disposed of in bulk to merchants and cloth manufacturers'.² The firms' full records, which were in existence in 1917, indicated the initial risk Eastwood undertook in the depression following the ending of the Crimean War. The first sale on October 16th 1857 realised £22.3^s/4^d, on which his commission must have been very small; the second sale on the following Friday realised a meagre 9^s/8^d.³ Eastwood, however, was quick to seize the opportunities offered by the newly-opened French rag market in 1859-60, and his first printed catalogue of June 11th 1860 offered 74 bales of rags, sold to Batley and Dewsbury merchants such as James Willans, and to manufacturers such as M. Oldroyd and Sons and Joseph Jubb and Sons.⁴

The extension of the market for foreign ragwool through the auctions permitted many rag merchants to either diversify their stock into shoddy and mungo or else specialise in certain classes of mungo. Although no separate classification of those merchants specialising in mungo and shoddy or those selling ragwool as a supplementary service to their rag dealing appears in the directories prior to 1861, it is apparent that by this date woollen manufacturers could choose from a multiplicity of sellers in addition to supplies

1. W.T.W. 12.7.1919, p. 11.

2. W.T.W. 27.10.1917, p. 5.

3. *ibid.*, also Kirklees Libraries and Museums Service, Huddersfield, Benjamin Eastwood and Nephew Ltd., MSS., document no. 1, B/BE.

4. *ibid.*

from domestic ragwool manufacturers. It is clear from the directories and surviving records that in the late 1850s and 1860s a large proportion of continental mungo imported and distributed through the auctions was being sold by Batley and Dewsbury rag merchants.¹ Although the market was undoubtedly competitive, as evidenced by the decline in the number of West Riding merchants offering mungo between 1861 and 1867 (from 93 to 60), the range and scale of product differentiation offered by the German mungo producers allowed many merchants to specialise in certain colours and qualities, and providing these remained reliable and competitively priced, manufacturers appear to have patronised the same merchant for several years running.²

The rapid growth in demand for continental rags, shoddy, and mungo in the West Riding in the 1860s attracted a small but significant number of German and French nationals either independently or as agents for their parent firms.³ When Rydill's auctioneering firm was closed in 1857-58 the commission business for the better shoddies and mungos was taken over by Klien, previously an employee of Rydill. Joined shortly afterwards by another German national, Steigerwald, the firm traded with great success in the 1860s under the mark 'K & S' by selling the finest quality German-manufactured mungos.⁴

1. J.T. & J.T. MSS., loc. cit., Blend Book 31.3.1857-10.3.1866; Bagshaw Museum, Batley, G. and J. Stubley MSS., Receiving Day Books 1.7.1864-4.8.1865, 8.8.1865-28.8.1866 etc., (hereafter referred to G. and J.S. MSS).

2. *ibid.*

3. J. Willans (1881), *op. cit.*, p. 31; Trade directories, *op. cit.*

4. J. Willans (1881), *op. cit.*, p. 36; G. and J.S. MSS., loc. cit., Receiving Day Books.

Reuss, a German national who had acquired his knowledge of the business whilst employed by a mungo manufacturer at Oberursal, near Bad Homburg, was sent by his French employers, the Paris rag merchants Souchet and Louvet, to establish a branch of the firm at Dewsbury in 1863. Although speaking little English, Reuss quickly rented an empty warehouse in Peel St., Dewsbury, and immediately began to sell French rags consigned by the parent firm. Following a disagreement in 1868, Reuss decided to set up his own firm in Dewsbury

'... and immediately I started for Paris, where some large firms who knew me well by name made shipments and invoiced out at once. The same occurred at Lyons, and when I returned home in September there were already invoices for large amounts, and, all upon credit, the business of F.W. Reuss was established in 1868-9.' ¹

As Reuss observes, the insularity of the French woollen rag market from the West Riding until 1860² ensured that in the early 1860s only the large Paris rag merchanting firms were aware of Dewsbury prices, and, with the exception of the Bordeaux firm M. Ariès Ainè, all French country houses shipped direct to Paris. No doubt as a means of attracting additional trade and also to widen supply at more competitive prices, Reuss went to France in 1866-67 to inform French country dealers of the Dewsbury auctions and how to sort rags into standard grades for the West Riding market. Of the large Marseilles firm of M. Barthelemy Barbier and M. Griozel, Reuss notes

'Until my first visit in 1867 they used to send all their rags to Paris in the raw state; I taught them how to manipulate the rags, and not long after some 300 military prisoners at Fort St. Nicholas, Marseilles, were busy seaming and sorting the rags for Dewsbury every day.'

1. F.W. Reuss 'Milestones in my Life', W.T.W. 31.1.1914, p. 10.

2. v. infra pp. 136-37.

That Reuss and others were successful in reducing imperfections in the French woollen rag market seems clear, for by 1866-67 most large rag merchants in the cities were sending their rags directly to the Dewsbury auctions and by-passing Paris. Only supplies from Nimes, Toulouse, and Limoges continued to be sent via Paris, a practice which finally ceased during the Franco-Prussian war.¹

Supplementary to the regular auctions in Dewsbury and facilitating the operation of the wholesale rag market, particularly in smaller quantities of sorted and semi-sorted rags, was the 'rag exchange' held every Wednesday in Dewsbury market place. Although it is not clear when this commenced, it was sufficiently large by the late 1860s to receive comment in the West Riding press.² For rag and shoddy merchants, and some woolstaplers, the exchange provided facilities whereby merchants could locate sources of needed rag 'sorts' or arrange 'stock swaps', and customarily attracted over 100 merchants or dealers every week.³

The rate and extent of expansion of the rag merchanting sector in the West Riding during the period for which quantifiable evidence exists, (1822 - 1870) was rapid. Whereas only 16 rag and shoddy dealers were noted by the directories in 1837 for Batley and Dewsbury, this had increased to 221 rag, shoddy, and mungo dealers, including the 'new' mungo town of Ossett, by 1870. Some of the conditions of perfect competition would seem to have applied - ease and frequency of entry and exit, and price information well disseminated by the auction system. Others did not, such as the marked product differentiation and importance of established trade connections. The following section, 1871-1939, examines the changes undergone by the merchanting sector as both supply and demand together with changes in the shoddy and mungo manufacturing branch exerted their influence.

1. W.T.W. 28.6.1913, p. 8.

2. H.E. 5.1.1867, 1.1.1870.

3. W.T.W. 2.4.1924, p. 5. The Statist noted that the rag exchange served 'precisely the same' function as the cotton and corn exchanges. (31.5.1919, p.975)

CHAPTER II

V Late Development, Consolidation and Decline, 1870-1939

Although Table II(vii) indicates an overall decline in the number of rag, shoddy, and mungo merchants in the four principal towns of the Heavy Woollen District between 1870 and 1912, individual inter-directory figures are not sufficiently comprehensive nor reliable until ca. 1901 to permit more than the drawing of general conclusions.¹ The fluctuations are, however, generally consistent with both trade reports and the wool/shoddy/mungo price index (Chapter V, Appendix V-III). Particularly noticeable is the marked drop in rag and mungo merchants in Leeds and Huddersfield from 1870, a drop partly explained by the increasing importance of fine or better quality cloth manufacture in those areas combined with a tendency for the Colne Valley tweed and cloth manufacturers to integrate backwards into rag-pulling and sorting and thus by-pass the specialist merchants.²

A comparison of the fluctuations indicated by Table II(vii) with the numbers of rag/shoddy/or mungo merchants in Table II(viii) is more revealing, indicating on trend a marked decline in the numbers

1. The apparent fluctuation between 1897 and 1901 in Table II(vii) would indicate that Kelly's listing of the latter date was less comprehensive, for there is no evidence to suggest why nearly 30 firms disappeared in this four year period.

2. H.E., 29.12.1883; Return of Woollen, Worsted, and Shoddy Factories, and of Machinery, 1904, P.P. 1904(293), LXXXVII, III. Leeds and Huddersfield woollen manufacturers worked 18.5 per cent of the total number of West Riding rag machines exclusive of those operated by shoddy and mungo manufacturers. A large proportion of the Leeds merchants appear to have been general rag merchants and marine store dealers, the sudden decline in numbers between 1912 and 1917 probably reflecting a more rigorous classification.

TABLE II(vii)

Rag, shoddy, and mungo merchants in the West Riding Heavy Woollen District, 1870-1936.

	1870	1875	1881	1887	1897	1901	1908	1912	1917	1927	1936
Batley	80	96	71	55	70	66	80	70	81	107	77
Dewsbury	80	52	68	71	63	41	50	46	61	50	40
Heckmondwike	12	4	6	3	4	5	10	6	17	13	11
Ossett	61	35	50	57	74	72	82	69	80	73	36
TOTAL (a)	233	187	195	186	211	184	222	191	239	243	164
Leeds	108	94	75	55	50	50	47	48	5	3	3
Morley	10	9	6	9	14	16	18	10	13	12	5
Huddersfield	74	47	16	16	13	7	6	8	8	3	1
Wakefield	7	7	10	10	5	3	6	5	6	2	4

Source: see below

Source

- 1870 - W. White, White's General and Commercial Directory of Leeds, Bradford ... (Sheffield).
- 1875 - W. White, White's General and Commercial Directory of Leeds, Bradford ... (Sheffield).
- 1881 - Kelly and Co., Kelly's Directory of the West Riding of Yorkshire, I and II.
- 1887 - I. Slater, Slater's Royal National Commercial Directory of Yorkshire (Manchester), I, II and III.
- 1897 - Kelly and Co., op. cit., Part I, vols. I and II; Part II, vols I and II.
- 1901, 1908, 1912, 1917, 1927 and 1936 - Kelly's Directories Ltd., op. cit., I and II.

TABLE II(viii) Rag, shoddy, and mungo dealers and merchants in the West Riding, 1861-1936.

	1861	1867	1877	1881	1889	1897	1901	1908	1912	1917	1927	1936
(a) Rag merchants and dealers	285	325	303	302	281	278	282	317	300	304	315	201
(b) Shoddy merchants and dealers	42	50	44	55	37	36	27	22	11	8	5	4
(c) Mungo, merchants and dealers	93	60	54	66	48	33	34	26	14	12	5	3

Source: Trade Directories op. cit.

1877 - Kelly and Co., Post Office Directory of the West Riding of Yorkshire, I and II

1889 - Kelly and Co., Kelly's Directory of the West Riding of Yorkshire, I and II

Note: These figures indicate the number of merchants in each category willing to supply woollen rags, shoddy, and mungo. As a number of merchants dealt in two or even three of these categories a total of the above figures has not been made as this would necessarily overstate the actual number of firms.

of shoddy and mungo merchants vis-à-vis the first category of rag merchant. Both categories were adversely affected by the increase in the number of shoddy and mungo manufacturers (Chapter IV, Table IV(vii), p.272), a development to which a number of rag merchants directly contributed by forward integration into pulling from 1870. In the fiercely competitive textile raw material market of the 1870 to 1903/4 period the specialised shoddy or mungo merchant suffered an obvious disadvantage in possessing little control over the buying or selling price of his material. In addition to this, two powerful factors were working against the specialist shoddy and mungo merchant. The first of these was a sharp decrease in the weight of imported ragwool, a movement which, in turn, was balanced by an increase in West Riding rag-pulling capacity between 1877 and 1908 (Chapter IV, Table IV(vii), p.272).¹ This was particularly noticeable in Ossett where the number of manufacturing units approximately doubled from 17 in 1887 to 32 in 1901, placing an additional strain on the middle-man function of the specialised shoddy and mungo merchant. On the one hand, the drastic decline in imported ragwool from the early 1880s began to exert great pressure on independent sources of raw material supply, and on the other, increased competition from new merchant/manufacturing units who, in highly price-competitive conditions, were in a more advantageous position in being able to control more effectively their input and output costs. Finally, the gradual but growing shift in demand from short-stapled fine mungo to longer-stapled shoddy is reflected in the disproportionately greater decline in mungo merchants compared with shoddy merchants from 1860.

1. v. infra. p.143.

As Table II(viii) illustrates, the process of decline in numbers of specialist shoddy and mungo merchants in the West Riding (Lines (b) and (c)) had been largely accomplished by 1912 as firms either left the sector (Table II(ix)) or moved into rag merchanting. The highest mortality from insolvency was concentrated in the period 1873-1884,¹ although as Table II(viii) indicates, the actual number of those supplying shoddy and mungo (but not necessarily the number of individual merchants) increased between 1877 and 1881. The reason for this apparent paradox would seem to be twofold. Scattered evidence from the directories suggests that a number of rag merchants expanded their operations to include mungo and shoddy merchanting and were additionally classified or re-classified in these categories by the directories. A second, and more plausible explanation is indicated in Table II(x) which reveals that the 1870-1912 period witnessed a high frequency of entry and exit in the merchanting sector. Certainly, market conditions in 1876-9 and renewed demand for continental mungo in 1881² were such as to encourage the entry of new firms to replace older established firms who were unable to return to profitable operation in this period, particularly those burdened with debt from the years of expansion between 1870 and 1873.

The survival rate of all merchanting categories in Batley, Dewsbury, and Ossett established by 1870 for the years 1875 and 1912 is set out in Table II(xi). Comparing the percentage figures for the Batley, Dewsbury, and Ossett districts with those of Sigsworth and Blackman it would appear that the degree of persistency of merchanting

1. E.M. Sigsworth and J.M. Blackman, loc. cit., p. 132.

2. T.M., 15.1.1882, pp. 9-10.

TABLE II(ix)

Failure of West Riding shoddy and mungo merchants
by Deed of Arrangement or Bankruptcy, 1870-1912.

YEAR	(a) SHODDY MERCHANTS	(b) MUNGO MERCHANTS	Firms merchanting both, inc. (a) & (b)	YEAR	(a) SHODDY MERCHANTS	(b) MUNGO MERCHANTS	Firms merchanting both, inc. (a) & (b)
1870	-	-	-	1887	1	1	1
1871	-	-	-	1888	-	-	-
1872	1	-	-	1889	-	1	-
1873	4	-	-	1890	1	1	-
1874	2	-	-	1891	-	1	-
1875	1	1	-	1892	1	2	-
1876	1	1	-	1893	-	-	-
1877	4	3	2	1894	-	-	-
1878	1	3	1	1895	-	2	-
1879	6	4	-	1896	1	4	1
1880	1	2	-	1897	-	-	-
1881	3	1	-	1898	1	-	-
1882	2	2	-	1899	1	-	-
1883	6	5	3	1900	-	-	-
1884	4	3	-	1902	1	-	-
1885	2	3	2	1903	-	1	-
1886	2	3	2	1908	1	2	1
				1912	1	1	1

Total failures - 82

Shoddy and mungo merchants - 14

Shoddy merchants - 35

Mungo merchants - 33

Source: Perry's Gazette, op. cit.

T.M. op. cit.; Journal of Fabrics, op. cit.

TABLE II(x) Rag, shoddy, and mungo merchants - persistence of firms over time, 1875-1912.

		Number of firms established on or before:- (Cumulative totals)						
	No. of firms	1841	1853	1870	1875	1881	1901	
1875	Batley	4	6	41				
	Dewsbury	-	3	14				
	Ossett	1	2	17				
1881	Batley		2	21	39			
	Dewsbury		3	13	20			
	Ossett		2	15	27			
1901	Batley		2	15	19	26		
	Dewsbury		3	4	4	4		
	Ossett		1	10	11	12		
1912	Batley		2	5	8	9	30	
	Dewsbury		3	4	4	4	19	
	Ossett		1	7	8	8	26	

Source: Trade directories, op. cit.

TABLE II(xi) Proportion of rag, shoddy, and mungo merchanting firms
in Batley, Dewsbury, and Ossett surviving between 1870,
1875, and 1912.

	<u>Percentage of</u> <u>firms in 1870</u> <u>surviving to</u> <u>1875</u>	<u>Percentage of</u> <u>firms in 1870</u> <u>surviving to</u> <u>1912</u>	<u>Percentage of</u> <u>firms in 1912</u> <u>surviving from</u> <u>1870</u>
<u>Batley, Dewsbury</u> <u>and Ossett (i)</u>			
Rag, shoddy, and mungo merchants	32.6 (41.2)	7.2 (9.5)	8.6 (11.3)
<u>West Riding (ii)</u>			
Wool merchants	40.0	6.1	9.5
All categories	49.1	9.0	16.8

Source: (i) Trade directories, op. cit.

(ii) Sigsworth and Blackman, loc. cit., p. 130.

'All categories' comprises: finishers, dyers, merchants, woollen manufacturers, worsted spinners and manufacturers, and worsted top makers. Excluded are shoddy and mungo merchants, scribblers, burlers and menders(p. 129n).

firms . . . corresponds closely with that of wool merchants but was considerably less than the mean for 'all categories'. This, however, understates the true picture, for if the figures are adjusted for firms integrating forward into the shoddy and mungo manufacturing sector (figures in brackets) the rate of survival of firms established on or before 1870 compares favourably with wool merchants and 'all categories'. Indeed, between 1870 and 1875, 19 firms moved into manufacturing and of these, five firms who were rag merchants in 1870 had survived until 1912. But for the majority of merchanting firms who became manufacturers, profit expectations which had been good between 1870 and 1875 became progressively less easy to sustain, for by 1881 six had reverted to rag merchanting, two had ceased trading and three had become insolvent (1875, 1876 and 1879), of which only one continued as a manufacturer after the injection of new capital. Of those firms leaving the merchanting sector permanently, insolvency (discussed below) and retirement would seem to have been the most likely cause, although several of the larger firms passed into new ownership whilst retaining the original founder's name.¹

The replacement of firms leaving the sector was steady after 1881 (Table II(x)). By 1901 only 29 per cent of firms in existence in Batley, Dewsbury, and Ossett could claim origins prior to 1881 (not including those also who had become manufacturers) and in 1912 40.5 per cent of firms had been in existence in 1901. The slower indicated rate of replacement after 1901 was largely influenced by the very rapid expansion in domestic demand for shoddy and mungo which reached historically high levels between 1904 and 1912 and which is reflected

1. For example the Batley firm of William Brooke and Co., mungo and rag merchants, which had been established in ca. 1853 and sold by his family to new proprietors on his death in 1881. Industries of Yorkshire, I, op. cit., p. 344.

in the increase in merchants by 1908 (Tables II(vii and viii)) to levels approaching the 1867-70 figures.¹

The apparent growth in the number of firms (Table II(viii), line (a).) between 1917 and 1927, although marginal, is largely illusory. War-time military service necessitated the absence of about 40 to 50 of the younger rag merchants in 1917, leading to a temporary contraction in the number of firms until 1918-19 when these and new entrepreneurs entered the sector.² The actual number of merchants thus declined gradually on trend from ca. 1919-20 until 1927, accelerating rapidly in the nine-year period ending 1936.³

The late 1860s and 1870s witnessed a large expansion in fixed capital formation in the West Riding woollen manufacturing industry, particularly in the prosperous period during and immediately following the Franco-Prussian war of 1870-71.⁴ Although much of the albeit more modest additions to fixed capital formation by Heavy Woollen District rag merchants appears to have been self-financed, outside funds from either local woollen manufacturers or local building societies were used. Rag merchants were not unaware of the advantages to be gained from connections with a building society when their own working capital could be better employed financing stock. Within 14 months of the formation of the Dewsbury Benefit Freehold and Leasehold Land Building and Investment Society in February 1866 (later re-named the Dewsbury and West Riding Permanent Building Society), the directors resolved in May 1867

1. v. infra Table V(xvii), p. 447.

2. W.T.W., 6.1.1917, p. 24.

3. The reasons for this are discussed below.

4. W.T.W., 30.1.1915, p. 11.

' ... that the advance made to Messrs. George Kilburn and Henry Francis Hogg on their Rag Warehouse and shed at Ward Street, Bradford Road. of £576 on 9 shares, according to the surveyors report be confirmed'¹

Insurance records indicate that the Dewsbury building society continued to provide a small but consistent proportion of finance¹ for rag merchants' fixed capital, the new three storey 'Duke of Kent' warehouse in Batley of John Whitaker and Son built in 1881 and valued at £1,200 being the largest indicated single advance made by the Society in the period to 1900.² The larger proportion of fixed capital formation in the period to 1914 was undertaken between 1870-90 by the more well established rag merchants and varied from the small self-financed two storey warehouses valued at around £400 to the last major piece of construction in 1889, the 'Victoria Warehouse' and adjoining storage shed in Batley of Edwin Talbot valued at £2,000.³ The persistent occurrence of insolvency in Batley, Dewsbury, and Ossett in the 1880s, particularly from 1882 to 1886 when 36 rag merchants were either declared bankrupt or had to make arrangements with their creditors, ensured that premises were neither scarce nor expensive⁴ Whitaker had depreciated the 'Duke of Kent' warehouse by half of its 1881 valuation to £600 in 1889, for example.⁵

Stock valuation in the period 1870 to 1914 continued to fluctuate between £200 and £800 for the medium sized firms and from £1,000 to £4,500 for the larger firms.⁶ From ca. 1886 however, there was a

1. West Yorkshire Building Society, Dewsbury and West Riding Permanent Benefit Building Society, Minute Book 27.2.1866-3.3.1876. (I am indebted to Mr. John Butler of the University of York for this reference).

2. J.F.T.S. MSS., loc. cit., Policies 1880-1889, 17.2.1881, 2788475, John Whitaker and Son.

3. *ibid.*, Policies 1870-1880, 3.3.1873, 1539745, Joseph Ineson, Batley. Policies 1889-1897, 24.6.1889, 3128767, Edwin Talbot, Batley, (through a mortgage from J.J. Carter, a shoddy manufacturer). This refers only to those properties insured through the Batley/Dewsbury/Ossett insurance agency of Spiking.

4. W.T.W., 30.1.1915, p. 11.

5. J.F.T.S.MSS., loc. cit., Policies 1889-1897, 13.1.1889, 3257049, John Whitaker and Son.

6. *ibid.*, Policies 1870-1914.

marked tendency for insurance cover on stock to be reduced by between 10 and 20 per cent, valuations recovering their pre-1886 levels in 1891-1892. Several interrelated factors would seem to account for this. Rag prices had followed the downward movement of wool, shoddy, and mungo prices which had recommenced in 1881 after a brief respite in 1880, and thus the value of existing stocks of rags in warehouses would have had to have been lowered to reflect current market prices. In addition to this, demand for recovered wool had fallen back in 1885 to mid 1870 levels and continued to be weak until trade revived in the Heavy Woollen District in 1888-1889. As contemporary trade reports indicate, merchants were increasingly unwilling to buy more rags than were necessary to satisfy existing commitments to shoddy and woollen manufacturers, preferring instead to keep capital liquid and to carry minimum stocks in an uncertain market.¹ Thus, given a lag of one to two years to allow for the adjustment of expectations, the reduction and subsequent restoration of insurance valuation on merchants' stocks of rags and recovered wool would seem consistent with contemporary trade evidence and the static level of demand for shoddy and mungo exhibited by the woollen industry.

As Table II(x) indicates, between 1870 and 1912 the number of new firms entering the merchanting sector was high, capital entry costs being characteristically low for the man of limited means. Warehouses or mill space could be rented for as little as £10 p.a. in the 1870s and 1880s² and the cost of riddles, trestles, skips,

1. Rag prices in this period are discussed *infra* pp. 164-65.
2. Supplementary Valuation - Batley, loc. cit., 1866-73; Valuation List for the Township of Batley, loc. cit., 1881.

scales and other basic equipment for sorting could be acquired for as little as £5.¹ Certainly, the insurance records show a marked swing to rented warehouse accommodation from ca. 1886 to 1914 indicating that many new entrants were either men of modest capital resources, or were firms who preferred to keep their fixed costs as low as possible to allow the maximum use of working capital.² The growing number of German rag and shoddy agents typically rented railway warehouse accommodation for temporary storage until disposal at one of the weekly auctions.³

For those firms established in the period of prosperity ending in 1872-73, the expanding economies of Batley, Dewsbury, and Ossett provided ample investment opportunities for surplus capital. Rag merchants participated actively in financing the construction of working class housing which they then let off to mill and other workers. Frequently large blocks comprising whole streets were thus financed, the insurance records indicating that investment of this nature was being made consistently from 1868.⁴ The scale of investment varied between £800 for a row of twelve back-to-backs complete with butcher's shop and slaughter house in 1871⁵ to the commercial and domestic properties valued at nearly £12,000 on the death of William Brooke of Batley in 1880.⁶ In their personal expenditure, the more successful rag merchants were able to match their living style with that of the manufacturers. Brooke, for instance, possessing a 'small Brougham' as well as a 'large Phaeton', his five-bedroomed

1. Holroyd Sons and Pickersgill, Dewsbury, MSS., Valuation Books of William Coates, Vol. A, 26.7.1875 et seq. N.R.A. RO 016.

2. W.T.W., 30.1.1915, p. 11.

3. J.F.T.S. MSS., loc. cit., Policies 1865 et seq.

4. *ibid.*

5. *ibid.* 9.10.1871, 1531736, Abraham & Benjamin Fox, Rag merchant. The firm was established between 1861 and 1864.

6. William Coates MSS., loc. cit., Vol. F, 1880-1881. Brooke had established his business in ca. 1840, and from 1871 had been a town councillor in Batley.

property being valued at £1,750 for Probate purposes.¹

For the less successful rag merchant, however, insolvency by private composition with creditors, for which no records exist outside of a rare mention in the local press, or through a Deed of Arrangement or the bankruptcy courts could herald somewhat more reduced circumstances. In order to identify as far as possible the extent to which recorded insolvency in the Gazette between 1871 and 1910 may have been dependent on one or more of several variables, a correlation matrix comprising the following was calculated.²

(a) The number of liquidations or bankruptcies of West Riding woollen manufacturers.

(b) similar figures for shoddy and mungo manufacturers in Batley, Dewsbury, Heckmondwike, Morley, and Ossett.

(c) similar figures for rag, shoddy, and mungo merchants

(d) the Board of Trade textile fibre index

(e) the shoddy price index

and, (f) the mungo price index.³

The thirty year period was divided into three sub-periods, 1871-1880, 1881-1890, and 1891-1900, and correlation coefficients were also calculated for the high-mortality period 1873-1884. Only in the first sub-period is a low relationship implied between the decline in the price of shoddy (a major determinant of the price of soft rags) and failures of rag and shoddy merchants (0.5588). In the second sub-period, a marginally lower correlation between the insolvency of merchants and mungo prices (0.4543) is indicated, and is such that

1. William Coates MSS., loc. cit., Vol. F, 1880-1881.

2. The period 1870-1900 has been selected as bankruptcies and liquidations declined markedly with the onset of the trade revival commencing in 1899.

3. Sources - Appendix II-I to this chapter.

no firm conclusions can be made, although the trend towards declining relative demand for mungo outside of Ossett as well as declining mungo prices was becoming apparent at this time.

The lack of any implied statistical relationship between failures in the rag merchanting sector and the manufacturing sectors suggests strongly that, for the most part, rag merchants were better insulated from the inevitable 'ripple' effects of a major insolvency because of their traditional practice of conducting a large proportion of their business on cash terms.¹ Shoddy and mungo merchants, on the other hand, were bound by the customary trade credit terms established in 1858 and, as in the case of Day, were sometimes obliged to accept bills drawn for up to 90 days from manufacturers.² The greater proportion of small rag merchants made insolvent appear to have suffered from under-capitalisation, suggested by the appearance of registered Bills of Sale for small amounts in the Gazette, frequently prior to their insolvency, and also the very small dividends distributed to creditors. The creditors of James Wailes of Batley-declared bankrupt in 1880 - for instance, received $1^s/3^d$ in the £, and those of William Hardistry, a shoddy agent in Huddersfield, a first and final dividend of 3^d in the £ in 1882.³ Prior to 1884 however, most rag and shoddy merchants either chose or were persuaded by creditors to opt for 'liquidation by arrangement or composition', and in so doing were able to continue trading with, it was hoped, an intention to repay debts in full. Clearly, many creditors appear to have realised the

1. Some of the larger merchants allowed up to one month credit and were permitted one week's credit by the auctioneers in the early 1870s. Goodchild Loan MSS., loc. cit., Sorters' Weigh Book 1877.

2. 1858 Credit Terms, v. infra p.261. H.D. MSS., loc. cit. Day's records include six protested Bills of Exchange dated between 1860 and 1871.

3. T.M. 15.9.1880 (Gazette), 15.8.1882 (Gazette).

futility of formal bankruptcy proceedings against firms with meagre assets, the Cleckheaton Chamber of Commerce noting in March 1884 that there were 'more cases of private arrangements than formerly', a situation no doubt precipitated by forthcoming changes in the bankruptcy laws.¹

In February 1884 provisions under the Bankruptcy Act were considerably restricted, liquidations by arrangement or composition being abolished and replaced by receivership following a petition presented by or against a debtor. Until the Deeds of Arrangement Act in 1887 all insolvents were required to liquidate their assets, but it was not until after 1887 that creditors could prove against the private assets of insolvents. William Dews, a shoddy merchant of Ossett was adjudicated bankrupt in September 1884, paying a single dividend of $1^s/6\frac{1}{2}^d$ one year later. In 1889 his business was again put into receivership and, for the first time, his own and 15 other properties in Ossett were valued for bankruptcy purposes.²

Between 1884 and 1887 records of dividends paid by insolvent rag, shoddy, and mungo dealers varied between 4^d and a maximum of $4^s/6^d$ in the £, confirming evidence in obituaries and the large number of bankruptcy hearings following the 1920 slump that capital entry costs in the period ca. 1880-1914 continued to be very small.³ If under-capitalisation appears to have made a more direct contribution to insolvency in the merchanting sector, as the absence of any significant statistical relationship between this and the five variables previously referred to implies, then entrepreneurial weakness and inefficiency may sugges

1. Kirklees Chamber of Commerce, Huddersfield, Cleckheaton Chamber of Commerce MSS. Minute Book 1878-1893.

2. T.M. 15.9.1884 (Gazette), 15.9.1885 (Gazette), 15.4.1889 (Gazette); William Coates MSS., loc. cit., Vols. O-R, 1886-9.

3. Obituaries, W.T.W. 4.5.1912, p. 5, 16.11.1912, p. 7, etc.; Bankruptcy reports W.T.W. 7.8.1920, p. 17, 7.5.1921, p. 13, 28.7.1923, p. 12, etc.

a residual but not unconnected explanation.¹

The continued growth in demand by the West Riding woollen industry for recovered wool and the large tonnages of imported and domestic woollen rags handled by wholesale merchants in London and Liverpool, encouraged at least two firms to establish rag auctions independent of those held in Dewsbury. A firm of Liverpool brokers, J. Jowett and Co., were conducting rag sales in 1870 and advertising these in the local Dewsbury press,² and between 1890 and 1895 auctioneers W.C. Bacon and Co. of Mincing Lane established regular rag sales, chiefly to clear the large amount of dominion and colonial rags being landed at the Port of London. Conducted in a similar manner to the Dewsbury auctions, these sales attracted a large clientele, including many from the West Riding, mainly because of the large weights offered and the possibilities of purchase at competitive prices compared to those ruling in Dewsbury.³

The volume of rags and shoddies passing through local sales, however, continued to increase and began to attract regular press and trade comment from 1870, the Textile Manufacturer noting in 1876 that

'These sales have, within the last ten years, risen to great importance, many thousands of pounds (sterling) changing hands in an afternoon. Old rags from all parts of the world, German, Swedish, French, and Norwegian shoddy and mungo, all find their way to Dewsbury and pass under the hammers of the auctioneers'.⁴

1. The bankruptcy of G. Coates, rag merchant of Batley, was attributed to 'loss on stockings bought at auction sales as woollen stockings, containing a large quantity of cotton stockings' W.T.W., 4.5.1912, p. 16. A similar reason was given in the failure of Batley rag merchants Crawshaw and Co. - 'too much Angola stockings in "mixed"' (Angolas were a cotton/wool mixture and could comprise up to 85 per cent cotton). W.T.W., 15.2.1913, p. 10.

2. D.R., 8.1.1870.

3. W.T.W., 5.11.1955, pp.11-12. The London sales ceased in 1928-1930.

4. T.M., 15.1.1876, p. 12.

Although the auction firm of Nelson appears to have disappeared in the early 1870s, the firms of Cullingworth and Eastwood were joined by two others, Achille Ferrari in the late 1860s and F.W.Reuss in 1873, both of whom had previously been rag importers and merchants.¹ The exceptionally bad market conditions of 1873, however, forced Ferrari to file his own petition for liquidation by arrangement or composition with liabilities of between £6,000 and £7,000, the goodwill of the firm being taken over by the new firm of Robert Thornton in 1873 with Reuss acquiring the warehouse in 1874.²

Bad trade had little impact on Cullingworth's plans for expansion, and in 1873-4 a new three-storied warehouse and saleroom of 'ample' proportions was erected, his judgement confirmed by good sale attendances in 1876 and 1877.³ The auctioneers' practice of cash on acceptance of a bid, or a maximum of one week's credit granted to the larger rag merchants, appears to have insulated them from most trade insolvencies, as the bad debt figures for Eastwood indicate (Table II(xii)). Certainly, on at least one occasion Reuss chose to issue a writ of eligit over his creditor's assets rather than force liquidation.⁴ As a proportion of gross commission income, Eastwood's bad debts from 1881 rarely exceeded 4.5 per cent.

The relative immunity of the rag auctioneering firms from depressed prices or squeezed profit margins and the involvement of Cullingworth's son in meetings of the Dewsbury 'fair traders' in the mid 1880s

1. Industries of Yorkshire, I, op. cit., p. 330. Ferrari had met the prosperous Paris rag merchant Vandrand in London in the early 1860s and had been persuaded to establish a rag auctioneering firm in Dewsbury with Vandrand providing the capital to build the warehouse. F.W. Reuss, 'Old French Rag Merchants and Exporters', W.T.W., 28.6.1913, p. 8.

2. H.E., 4.10.1873. Willans (1881) discreetly observed that Ferrari had 'retired from the auctioneering business' (p. 33). F.W. Reuss, loc. cit., p. 8.

3. H.E., 30.12.1876, 31.12.1887.

4. William Coates MSS., loc. cit., Vol. II, 1882-1883. A writ of eligit allowed for delivery to the creditor of the debtor's chattels and half his lands to hold until the debt was satisfied rather than a writ fieri facias by which the debtors' goods were sold.

TABLE II(xii)

Commission Income and Bad Debts of Benjamin Eastwoodand Nephew, rag, shoddy, and mungo auctioneers,Dewsbury, 1870-1913.

	Commission Income (Gross) (£)	Bad Debts (£)		Commission Income (Gross) (£)	Bad Debts (£)
1870	1,357	N/A	1910	9,733	49
1	2,081	"	1	9,366	26
2	2,707	"	2	9,127	28
3	2,381	"	1913	9,534	160
4	2,144	"			
5	1,938	"			
6	1,874	"			
7	1,626	"			
8	1,600	"			
9	N/A	"			
1880	2,328	"			
1	3,466	152			
2	2,828	158			
3	2,361	47			
4	2,269	101			
5	1,975	58			
6	1,917	43			
7	2,201	23			
8	2,636	27			
9	3,006	67			
1890	3,276	17			
1	3,257	163			
2	3,126	1			
3	3,718	527			
4	3,490	16			
5	3,964	NIL			
6	4,841	135			
7	5,113	NIL			
8	4,973	124			
9	5,764	183			
1900	5,930	NIL			
1	5,759	52			
2	5,804	31			
3	6,343	37			
4	7,561	81			
5	9,121	22			
6	10,389	1,420*			
7	11,327	97			
8	8,241	329			
9	8,549	190			

Source:-

Benjamin Eastwood and Nephew Ltd.
MSS., loc. cit.,
Accounts Books 1890-1902 Cat. 7,
1904-1937 Cat. 8, 1879-1894 Cat. 10,
1895-1913 Cat 11.

* This included five bankruptcies,
the dividends of which varied
between $2^s/=-$ to $7^s/3^d$ in the £.

prompted a critical letter from 'Pennon' to the local press in December 1885.

'Think of all the wealth amassed by the gentleman who was chairman of the meeting and tell me whether there is any consistency in talking about the disastrous consequences of free trade ... had not the principles of free trade existed the strong probability is that circumstances would not have been as favourable for the development of such an immense business and the accumulation of so much wealth' ¹

Depressed conditions in the wool textile industry in the late 1880s and early 1890s did little to prevent the continued popularity of the Dewsbury auctions not only from overseas buyers, but particularly from the fast-developing Ossett 'Old Blue' mungo trade² as well as from domestic buyers farther afield, a trade commentator noting in 1891 that

'The Dewsbury rag sales are as popular as ever, and draw a much larger clientele. Flannel makers of Rochdale and contiguous parts of Lancashire and the Spen Valley are buyers³ - so too are shoddy manufacturers all over the riding.'

To accommodate the increased demand for woollen rags the auction sector again expanded considerably in the 1890s. In 1892 Cullingworth's moved into a specially built warehouse and office in South Street, Dewsbury and in 1903 the firm of Benjamin Eastwood and Nephew - Eastwood had admitted his son-in-law and nephew Edward Kilburn to the business in 1876 - built new warehouse premises adjacent to Bradford Street, also in Dewsbury.⁴ Indeed, such was the demand for woollen rags in the West Riding in the closing years of the nineteenth century that a fifth auction firm, Joseph Eastwood and Co., joined the existing firms

1. D.R., 5.12.1885.

2. F. Fenton (1881) loc. cit., p. 329; H.E., 29.12.1888. The 'Old Blue' trade in Ossett was principally concerned with military, navy, and police blue clothing, but with the advent of khaki in 1883, this had become 'almost extinct' by 1912. W.T.W., 14.9.1912, p. 1.

3. H.E. 24.12.1891, 29.12.1894; T.M., 15.2.1891.

4. W.T.W., 27.10.1917, p. 6. 12.7.1919, p. 11.

of Henry Cullingworth and Sons, Benjamin Eastwood, Reuss, and Thornton.¹

Indicative of this bouyant demand, Benjamin Eastwood's turnover increased markedly from 1896 (Table II(xiii)) as volume and prices rose, his percentage commission dropping slightly on a marginally increased turnover 1897-1898, possibly reflecting increased competition on the entry of the new firm.² Evident also was a tendency to reduce commission as the value of his sales rose, particularly for the peak years 1906 and 1907. By 1913 the volume of rags reaching Dewsbury was so great that at a meeting to discuss the new railway demurrage and storage charges it was stated that only two out of every 15 bales of rags could be accommodated in the auction rooms as samples for the sales.³ In the same year both the firms of Cullingworth and Thornton embarked on extensive plans for enlarged premises, and in 1915 Thornton's new single storey warehouse adjacent to Savile Bridge in Dewsbury was opened, followed by Cullingworth's in South Street in July 1919.⁴

Competitive trading conditions between the many small and independent rag, shoddy, and mungo merchanting firms between 1870 and 1914 were not conducive to the formation of a trade association to represent common interests. Those grievances that did arise, if deemed of sufficient importance, were articulated through the appropriate Chambers of Commerce in the Heavy Woollen District, but

1. W.T.W., 19.2.1927, p. 7. Joseph Eastwood was a native of Ossett and seems not to have been related to the firm of Benjamin Eastwood.

2. Cullingworth was charging E. Fox and Sons, the large Dewsbury shoddy manufacturers, 2½ per cent commission plus portorage of 2^d. per cwt. in ca. 1897-1899 - a standard charge common to all the auction houses by 1921. University of Leeds, Brotherton Library. E. Fox and Sons MSS. Sold Day Book - Mungo, July 1897-April 1905 (hereafter referred to as E.F. and S. MSS.); Wool Year Book (1921), op. cit., p. 71.

3. W.T.W., 15.2.1913, pp. 8-9.

4. Thornton's single-storey warehouse and auction room had a floor space of nearly 10,000 square yards, or sufficient to store 15,000 tons of rags. W.T.W., 16.1.1915, p. 6. Cullingworth's three storey warehouse had 2,950 square yards storage space in each 18 feet high chamber. W.T.W., 12.7.1919, p. 11.

TABLE II(xiii)

Sales, and commission (gross) as a percentage of
sales, Benjamin Eastwood and Nephew, 1890-1913.

Year	Gross Sales (£)	Commission as a percentage of sales	Year	Gross Sales (£)	Commission as a percentage of sales
1890	91,744	3.57	1902	152,411	3.81
1	87,677	3.71	3	169,885	3.73
2	87,655	3.57	4	212,345	3.56
3	100,382	3.70	5	259,962	3.51
4	92,701	3.76	6	313,946	3.31
5	102,732	3.86	7	331,430	3.42
6	128,115	3.78	8	227,876	3.62
7	135,746	3.77	9	239,888	3.56
8	136,151	3.65	1910	274,309	3.55
9	157,398	3.66	1	261,843	3.58
1900	164,630	3.60	2	262,223	3.48
1901	151,144	3.81	1913	274,697	3.47

Source:- Benjamin Eastwood and Nephew Ltd., MSS., loc. cit.,
 Accounts Book 1879-1894, Cat. 10.
 Accounts Book 1895-1913, Cat. 11.

other West Riding Chambers were not always sympathetic to requests for assistance or support. In July 1884, for example, the Dewsbury Chamber of Commerce wrote to the Cleckheaton and other West Riding chambers regarding the rents charged by the railway companies on the storage of goods in their warehouses,

'... and asked for the cooperation of this Chamber in an effort to obtain a reduction in such charges under certain given conditions'

As the larger proportion of railway warehouse space was utilised by Dewsbury rag merchants and the auction firms, the request clearly related to the storage of rags, and the reaction of the Cleckheaton Chamber proved less than sympathetic.

'The letter evoked considerable discussion in which all present took part ... and it was moved ... that the matter be not entertained which was carried unanimously'¹

The response of rag merchants to the prohibition on the import of rags by the Local Government Board during the continental cholera epidemic of 1892-93 was predictably ambivalent. Those specialising in domestic woollen rags enjoyed heavy demand and high prices in contradistinction to the importers, whose interests were represented very effectively by Reuss through the Dewsbury Chamber of Commerce.² In 1913 there were widespread trade complaints of the business methods of American dealers following the large and unprecedented importation of woollen rags from the United States which had begun in 1908, depressing profit margins and disrupting established business connections between West Riding rag merchants and woollen manufacturers, a Yorkshire Post commentator

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1. Cleckheaton Chamber of Commerce MSS., loc. cit., Minute book 1878-1893.
 2. D.R., 22.10.1892, also v. infrapp.167-73.

noting

'Many local rag merchants, after finding customers for American rags, lost a considerable amount of business owing to the astuteness of the exporters, who were not slow to recognise that while a large trade could be done it paid them to send agents over here and save the commission of the middlemen.'¹

No action other than loud complaints appears to have been taken, West Riding woollen manufacturers welcoming lower prices and increased competition amongst sellers whilst merchants in soft rags, which were not affected by the mainly mungo rag imports, experienced strong demand.

For the West Riding woollen rag merchanting sector the Great War marked a watershed in both the development of its internal organisation as well as in its relationship to the woollen branch of the industry in the interwar years. As indicated by Table II(vii) the years between 1912 and 1917 saw an increase of 26.2 per cent in the number of rag merchants listed in the directory for Batley, Dewsbury, Heckmondwike, and Ossett. There is little doubt that for nearly every branch of the woollen textile industry the War provided opportunities for sharply increased profits, the American Consul in Leeds reporting

'The prosperity of the woollen rag trade was much greater at the close of 1919 than could have been expected even six months before, and the rag and shoddy industries are still among the most lucrative in Great Britain.'²

Although the slump of 1920-21 eliminated a proportion of the weaker firms, the rise on balance in numbers of firms between 1917 and 1927 seems partly accounted for by the return of younger rag merchants from active service, as previously referred to, and the entry of new

1. W.T.W., 4.1.1913, p. 10. also v. infra, p. 181.

2. W.T.W., 24.7.1920, p. 15; H. Burrows, op. cit., p. 65.

firms attracted by the more bouyant conditions in the woollen rag market between 1924 and 1929.¹ This process was encouraged by the exit of firms from 1922 because of overcommitment to high-priced stock in the boom of 1919-20 as their principal creditors, mainly banks and the auction houses, refused to provide finance or further working capital.² Insolvency could be expensive to unsecured creditors including other rag merchants, the bankruptcy of Joseph and Abraham Hyman trading as the Albion Mills Co. of Batley, Heckmondwike, and London revealing unsecured liabilities of £139,989 against assets of £3,784.³ Between 1927 and 1936 numbers in the rag merchanting sector declined markedly, a reduction of 37.6 per cent in the four towns of the Heavy Woollen District (Table II(vii)) being consistent with the 36.2 per cent decline indicated in the sector as a whole (Table II(viii)), with the highest proportion of firms leaving the trade between 1929 and 1932. Summarising the experience of the 1920s, a trade reviewer noted

'... the elimination of tolerably weak firms which had come into being during the boom in the rag trade in the immediate post war years commenced. Others closed their doors in order to conserve their diminished resources rather than run the risk of seeing them frittered away altogether ... (including) some old and highly reputable raggars which the trade was sorry to see "pass out".⁴

An indication of the severity of the decline both in volume and prices is reflected in the gross sales figures of the auctioneering firm Eastwood and the single series of data surviving for a small Batley rag merchant (Table II(xiv)). Particularly noticeable is the sharp

1. Textile Argus Annual Review, 20.1.1930, p. 15.

2. The Woollen Gazette, 21.3.1922, 30.5.1922, 1.8.1922.

3. *ibid.*, 24.4.1923. W.T.W., 9.6.1923, pp.13-14. The firm had secured finance since 1920 mainly by accommodation bills in odd amounts in order to persuade their bank to discount them as trade bills.

4. Textile Argus Annual Review, 20.1.1930, p. 15; H. Burrows, *op. cit.*, p. 71; W.T.W., 31.12.1932, p. 11; Woollen Gazette, 1929, 1930, 1931, and 1932.

TABLE II(xiv)

Benjamin Eastwood and Nephew Ltd., rag, shoddy, and
mungo auctioneers, Dewsbury - gross sales 1915-1937.

1915	£	397.207	1927	£	323.992	(4.128)
6		436.277	8		348.143	(4.970)
7		474.537	9		343.003	(5.028)
8		582.092	30		186.393	(4.499)
9		571.903	1		135.172	(1.141)
20		430.455	2		99.164	(2.049)
1		87.396	3		151.316	(1.017)
2		213.177	4		181.161	(4.405)
3		254.848	5		131.075	(3.940)
4		439.484	6		155.772	(5.790)
5		408.207	1937		261.264	(8.000)
6		309.687				

N.B. figures in parenthesis relate to the gross purchases of F.S. Gladwin, rag merchant, Batley. Gladwin bought predominantly from the sales.

Source: (a) Benjamin Eastwood and Nephew Ltd. MSS., loc. cit., Accounts Book 1904-1937.

(b) Bagshaw Museum, Batley, F.S. Gladwin MSS., Bought Day Book 29.9.1926 -17.7.1958.

reaction in 1921, the recovery of 1924-5 and the sustained low levels between 1930 and 1936 before the brief recovery commencing in 1937.

To what extent was the characteristic structure of the multiplicity of small firms in the West Riding rag merchanting sector directly responsible for forcing producers prices down, as Shimmin has suggested, and contributing towards the marked exit from the trade between 1927 and 1937?¹ There can be little doubt that this provides a partial explanation for the fall in prices as correspondence and comment in the trade journals suggest.² The main cause, however, lay in factors outside the immediate control of the trade. On the demand side the two most powerful forces exerting an influence on woollen rag prices were to be found in the reduced domestic and export consumption of woollen cloth together with a sustained decline in the price of wool. For the specialised West Riding rag merchant, the selling price of most classes of rags was under the cost of production (ripping, sorting, baling, and packing), a state of affairs only marginally relieved by a reduction in the scale of sorters wages in 1933.³ A second and equally important factor was the development of a strong overseas demand for domestic woollen rags in the inter-war period which not only eroded the traditional price supremacy of Dewsbury over world woollen rag markets but also favoured the wholesale rag exporting firms at the expense of the specialist sorters and merchants in the West Riding, who found themselves catering to a narrow and progressively shrinking market.⁴

1. A.N. Shimmin, 'Distribution of Employment in the Wool Textile Industry of the West Riding of Yorkshire', J.R.S.S., LXXXIX, 1926, p. 107. and in the Yorkshire Post Trade Review, 12.1.1928, p. 18.

2. W.T.W., 1.11.1930, p. 3.

3. W.T.W., 29.12.1928; Yorkshire Observer Trade Review 5.1.1931, p. 22; H. Burrows, op. cit., p. 73.

4. W.T.W., 10.1.1925, p. 5, 20.11.1937, pp. 15-16, 19.11.1938, pp. 3-4.

The decline in number of rag merchants between 1927 and 1937 would thus seem to reflect both of these conditions; historically low wool prices and diminished foreign and domestic demand for woollen manufactures together with a possible lack of adaptation by firms to a market which had more in common with the mechanisms of international commodity markets than with the highly localised demand from West Riding manufacturers. The pre-war distinction between the larger importing and exporting merchant houses and those firms sorting to the requirements of manufacturers, by no means always clear, became more marked as the merchanting sector developed into two more clearly-defined branches; those servicing the needs of West Riding manufacturers, and those primarily concerned with the international market for rags. Whilst Reuss complained in 1914 that from his experience

'not one in twenty rag merchants you meet has the remotest knowledge of our fluctuating imports of rags'

a trade commentator in 1938 again urged for greater appreciation of the international factors influencing the price of rags -

'The time has arrived when it is essential for every rag merchant to make the most careful study of these problems which affect the demand side of his trade'

International developments, however, made little impact on the organisation of the collection of woollen rags, although war-time conditions induced many local authorities to devote more resources to

1. W.T.W., 7.3.1914, p. 7, 19.11.1938, p. 4. Indicative of the growth of domestic and international trading in woollen rags and other waste materials new journals were established in many countries dealing specifically with aspects of demand, supply, and price.

i.e., France - Chiffonier en Gros (1908); U.K. - The Waste Trade World (1912); Holland - Ons Bedrijf (1915); Germany - Der Rohproduktenhandel (ca. 1912); Spain - El Trapero Español (1926); U.S.A. - Waste Trade Journal (1905), International Waste Trade Journal (1928).

rag collection as part of the salvage effort, a practice which continued in many areas in the inter-war years.¹ Price acted as the final determinant of the size of domestic collection, as the contrasting experience of the years 1915-1918 and 1929-1934 indicate.²

Apart from the structural changes taking place within the rag merchanting sector the most significant development of the 1915-1939 period was the formation of the British Woollen Rag Merchants Association to represent the predominantly West Riding based trade. Founded in 1917 in response to Government moves to apply price controls to woollen rags and requests that the trade be represented on the Control Board for Textile Materials, the Association succeeded in the inter-war period in gaining a number of important concessions for its members, but, as the Report in 1933 complained

'... very many in the Trade fail to recognise the Association. In the face of the benefits of de-rating, reduced wages, the advantages of the trade exchange, and the help the Trade has received through the Association, it is, to say the least, unfair. If the work is to continue and the Association to survive, more fidelity will have to be shown by the Trade generally to the organisation that was originally formed, and is maintained by cooperative effort, to protect and insure the best interests of the trade'³

As in the nineteenth century, low entry costs and the proliferation of small firms continued to characterise the trade between 1920 and 1939. It was still possible to start a rag and shoddy importing agency in Dewsbury in 1934 using no warehouse space, or a rag merchanting business on £20 borrowed capital in 1935.⁴ Larger

1. H. Burrows, op. cit., p. 62. 2. v. infra, p. 187.

3. W.T.W., 2.12.1933, p. 5. The more important benefits obtained by the Association included the provision of indoor accommodation in Dewsbury Town Hall in 1924 for the traditional weekly out-door 'Rag Exchange' (W.T.W., 2.4.1924, p. 5), and the concession of de-rating on rag merchants warehouses under the Rating and Valuation Act 1928 (W.T.W., 15.12.1928, p. 6, 21.9.1929, pp.5-6, 14.3.1931, p.3; H. Burrows, op. cit., pp. 69-70).

4. Bagshaw Museum, Batley, M.F. Dyson MSS., letter 6.8.1939 to Campagnie Textile de Basle; W.T.W., 13.6.1942, bankruptcy of H. Hinchcliffe, Heckmondwike.

West Riding firms did exist outside of the extensive continental houses represented in Dewsbury such as Verdier Dufour et Cie or Etablissements Victor Galaup, but were in number, if not in capital, of less significance than the typical Heavy Woollen District rag merchanting firm.¹

Shimmin has suggested that the presence of so many small business units in rag merchanting has no logical explanation, the answer being found more in 'the force of the belief that the small firm discovers the skill of an individual that a large firm cannot.'² For those firms that persisted, as well as those that left the sector, this explanation would seem to be appropriate. A more orthodox economic explanation, however, is surely to be found by examining the nature of the functions of the rag merchant vis-a-vis his customers in the West Riding and the constraints this traditional relationship exerted on any tendency toward concentration in the hands of a few large firms. Thus the small West Riding rag merchant, typically employing from three to six sorters was well placed to adapt to rapid changes in demand for colours and blends or to meet consistently the exacting requirements of his customers.

Secondly, there appears to be little evidence to support Shimmin's suggestion that the existence of so many small firms in rag sorting and merchanting may have led to diseconomies in the supply of raw materials to the West Riding woollen industry.³ Whilst this may have been true to some extent in the case of wool merchants -

1. The loss of part of the warehouse and entire stock of S. Stross & Sons Ltd., Scout Hill Mills, Dewsbury in 1920 was estimated at £250,000. W.T.W., 18.9.1920, p. 2.

2. A.N. Shimmin (1926), loc. cit., p. 107.

3. *ibid.*

the number of firms in 1912 in the West Riding being comparable to those in the rag, shoddy, and mungo merchanting sector - rag merchants were selling a raw material with some hundreds of different variations and could produce new combinations of 'sorts' to meet any demand.¹ The development of this specialised sector in the West Riding between ca. 1820 and 1939 would seem to confirm this, for although a small number of the larger Colne Valley and Heavy Woollen District woollen manufacturers continued to maintain their own rag sorting and shoddy pulling departments, it is clear that as the consumption of recovered wool rose the separation of rag sorting from manufacturing commencing in the 1820s had resulted in the growth of a distinctive merchanting branch by the late 1840s.

Thirdly, examination of the background of many entrepreneurs in this sector for which census information is available, together with information from other sources, would tend to confirm Penrose's general explanation of those fields of economic activity where entry costs were low and the skills required accessible.

'It is in this type of field where we find a peculiar combination of circumstances characterizing the position of firms that cannot be expected to grow - a high rate of entry, and a high rate of exodus, low profit rates and a low level of technical progress'²

Whilst this would apply to many of the small firms entering or leaving the sector, there were clearly a significant number of exceptions - firms which persisted for long periods and accumulated sufficient capital for investment in housing, commercial property, and the woollen manufacturing sector, or as a means of entering the shoddy and mungo manufacturing

1. Waste and Scrap Trades Handbook (1948), op. cit., p. 81; W.T.W., 5.2.1927, p. 8.

2. E.T. Penrose, The Theory of the Growth of the Firm (Oxford 1963), p. 221.

branch itself. Rather, it would seem that an explanation of the persistent proliferation of small firms and the absence of any firm or group of firms dominating the sector is best seen as a combination of the high degree of specialisation required to satisfy a demand from an industry itself characterised by many manufacturing units together with a strong tradition of economic individualism exhibited by the West Riding entrepreneur.

CHAPTER III

The Supply of Raw Materials.

Introduction - The relationship between wool prices and the supply of woollen rags.

The most important characteristic of recovered wool to woollen manufacturers was the ease with which it could be substituted for virgin wool. The supply of woollen rags reaching the West Riding was thus primarily dependent on the continuity of two factors; short and long-run movements in the price of wool, and preservation of the differential price relationship between the pure and the substitute raw material. The degree of perfection in any market is determined by the responsiveness of both supply and demand to variations in price, and in this, the market for woollen rags exhibited markedly different characteristics to those of wool and cotton.

In theory the supply of woollen rags in any population is inelastic in the long run, the stock of wool goods representing both past and present consumption being finite.¹ Certainly, on two occasions in the period between 1892 and 1918, when non-price restrictions curtailed the importation of woollen rags to the West Riding, this ultimate constraint on the supply of woollen rags appeared. It was, however, the rapid response to short and medium-run price movements in the textile raw material market demonstrated by changes in the supply of woollen rags which gave the substitute material an advantage over cotton and wool, both of which were inelastic in the short-run. Philpott has argued that in the case of wool, a period of

1. E. Baines, op. cit., p. 109; Economist, 17.3.1860, p. 281.

more than five years can elapse before the market between the user (householders) and the rate of wool production by the grower (farmers) settles in partial equilibrium; the short-run price of wool being determined by current manufacturing demand and clothing consumption, and secondly, clothing prices, reflecting approximately a one year lagged effect on the original cost of the wool and production/distribution time.¹ It was in the intermediate period when clothing consumption, but not wool production, began to adjust to the price of wool that the relatively greater elasticity in the supply of woollen rags could be utilised most advantageously by woollen manufacturers. The reasons for this being the well-known ability of the woollen system, particularly those manufacturers producing low-priced goods for the mass market, to make rapid changes in the proportions of raw material in blends in response to small changes in the relative price level between different textile fibres. Short-run supply elasticity was facilitated by accumulated stocks in the hands of merchants and manufacturers in the specialist rag and shoddy sector, sufficiently marked upward movements accelerating the transfer of woollen rag stocks from the larger wholesale merchants in London and the provinces to the West Riding.² Wool supplies, on the other hand, demonstrated a marked short-run inelasticity, for whilst small sales were held in February/March and November/December at the beginning and ending of the season, the bulk of colonial wools

1. B.P. Philpott, Wool Prices, 1870-1950, unpublished University of Leeds M.A. thesis, 1953, p. 15. The shortest period in which the production of cotton could be partially increased in response to a rise in price was one year, with five years needed for production to adjust to price. D.A. Farnie, 'The Cotton Famine in Great Britain', B.M. Ratcliffe (ed.), Great Britain and her world, 1750-1914 (Manchester, 1975), p. 163.

2. H.E., 24.12.1892.

were disposed of in the two main sales of May/June and August/September each year.¹ Thus, for a period of approximately six months, accumulated stocks and supplies purchased at the August/September sales of manufacturers, brokers and merchants for domestic consumption, represented a stock of raw material which could not be replenished.² Moreover, as the following discussion suggests, the supply of imported woollen rags (for which figures exist) could sometimes display a high degree of elasticity in response to medium-run upward or downward movements in wool prices (approximately one year).

Whereas the woollen section of the West Riding wool textile industry traditionally used its own waste raw material, the worsted branch generated considerable quantities of combers' waste or noils - the short fibres separated in the combing process - which entered the woollen raw material market as a competitive and superior fibre to most grades of recovered wool. In the manufacture of low woollen cloth very close attention was paid to relative price levels of available raw materials, the Leeds manufacturer Varley explaining to the 1828 Select Committee for example, that in manufacturing 'duffils' or 'calmucks' for the export market

'... we introduce a proportion of the down sort into it, according as the market operates, to meet it in price. If noils and shorts are lower, and down sorts higher, we use them occasionally. If down sorts are lower, we introduce a portion of them which is an improvement to a certain extent, but that is regulated by the price of the raw materials'³

1. A. Hamilton, 'On Wool Supply', J.R.S.S., XXXIII, 1870, pp. 496-7, 510-513.

2. B.P. Philpott, op. cit., p. 20.

3. Select Committee, P.P. 1828 (515) VIII, 592.

As a competitive fibre to recovered wool, the price and availability of noils, as well as sorters' waste was closely related to the price of wool and intensity of activity in the worsted industry.¹ Noils possessed several significant advantages over the better grades of white shoddy. The colour was purer, thus facilitating dyeing, they were cleaner than the average grades of shoddy, and also exhibited a greater degree of reliability and uniformity in quality. These advantages, however, were only of use to the manufacturer of low woollen cloth when the price of noils coincided with that of the better quality shoddies, noils generally being of more value as a base from which to spin longer and firmer yarn when mixed with a proportion of cheaper recovered wool sufficient to reduce costs without compromising strength. Woollen rags, on the other hand, possessed the unique advantage of 'colour value' when carefully sorted to precise specifications to produce a shoddy capable of being spun into coloured yarns thus eliminating the cost of dyeing.

Other important factors on the supply side having a direct influence on the price of woollen rags were the range of different colour sorts available at any particular time, a direct function of past clothing consumption and fashion - price acting as a powerful stimulus to develop new sources of overseas supply - and the impact of rising living standards encouraging a more rapid disposal of worn-out apparel. Closely associated with this was the growing importance of 'new clips' or tailors cuttings from London and Paris workrooms, supplemented increasingly by material from the ready-made-clothing houses from ca. 1860.

1. K.G. Ponting, op. cit., p. 35.

Two innovations in the recovered wool sector made significant contributions to widening the potential supply of woollen rags. The first of these was the introduction of mungo in ca. 1836, whereby hard-felted or heavily milled cloth could be ground up on modified rag machines to produce a short but valuable fibre still possessing considerable felting properties when used with new wool. The second innovation, in the mid 1850s, was the application of dilute acid to cotton warped/wool weft 'unions' or 'linsey-woolsey' fabrics so destroying the cotton (or linen) to leave a wool 'extract'. Prior to these innovations, both mungo rags and unions were of value only as agricultural manure, the former being too strongly felted to be separated on the early rag machines, and the presence of cotton in unions producing a mixed cotton/wool shoddy incapable of satisfactory dyeing.¹

Price formation in the woollen rag market was thus primarily determined by current wool values acting on the price at which the shoddy manufacturer could market his output and still return a normal profit. At the other extreme, there was a minimum price for woollen rags beneath which the supply would cease. This represented the price obtained from the marine store by the itinerant rag collector for his 'mixed rags', the other components of which, in the form of cotton or linen rags, partly set the minimum price paid for the woollen rag content. Noting this interrelationship between the raw materials for the woollen and paper industries, a Huddersfield commentator observed in 1883, for example, that because both cotton and woollen rag prices were low

1. These innovations are discussed in Chapter IV, pp. 214-31.

'Continental rag dealers are not in a prosperous state owing to the low prices which rule the paper rag trade... collectors of rags can now scarcely make a living, and no doubt large quantities of rags are thrown away'¹

The high influence of price elasticity of supply operating at the level of 'mixed rags' could induce the primary sorter or marine store dealer to switch to other more remunerative commodities if the price of the immediately succeeding grades 'mixed softs' (shoddy rags) or 'hard woollens' (mungo rags) fluctuated downwards too sharply to allow profitable accumulation.² The lowest price of the categories 'mixed softs' or 'hard woollens' was therefore that price below which the marine store dealer could not go and still operate his business at a profit. Thus, an important factor explaining the frequent references to a 'scarcity' of woollen rags from the late 1870s was the level of prices established at the Dewsbury rag auctions in sympathy with low wool values, emphasising the overriding characteristic of rag supply - that price significantly determined the quantity marketed at any one time.

The following discussion examines the essential features of developments in the supply of woollen rags and imported shoddy and mungo to the West Riding. Aspects influencing the demand for recovered wool, whilst forming part of this discussion, are reviewed in greater detail in Chapter V.

1. H.E., 29.12.1883.

2. After ca. 1860 the terminology changed to distinguish between 'stockings' or 'knitts' and 'mungo rags' or 'cloth'.

II. ca. 1813-1850.

The extent to which the use of ragwool or shoddy had become an important fibre in the manufacture of the lower classes of woollen goods is well documented in the report of 1828 by the House of Lords Select Committee enquiring into the state of the British wool trade. This report furnishes the first reasonably detailed account of the early development of one aspect of the West Riding textile industry which had, until 1828, remained known only to those intimately connected with the trade. This development was of particular interest to both wool growers and manufacturers as the enquiry, closely following the proposals of the Duke of Richmond that 'all considerations' were to be noted and not just the interests of the wool growers, was examining three main propositions.¹ The drastic fall in the price of English wool since the peak years of 1814-15 and 1818, the alleged decline in the quality of English fleeces, and the rise in importation of foreign wools from which a major proportion of goods for the export trade were being manufactured.

Of those manufacturers volunteering information the evidence of Nussey is undoubtedly the most detailed and informative.² The use of shoddy in low woollen goods had, he thought, started between 1813 and 1818 with the first imports of foreign rags commencing between 1818 and 1821.³ Of his estimated 9,000 packs (2,160,000 lbs.) of

1. Hansards' Parliamentary Debates, 5.5.1828.

2. Glover sees the witnesses as being 'cautious and tentative' in answering questions on the use of shoddy in Yorkshire. A close reading of the report, however, conveys the impression that the four manufacturers (Nussey, Cook, Gott, and Varley) were remarkably candid both in providing information on their own use of shoddy and in suggesting the extent of the trade. F.J. Glover (1959) op. cit., I, p. 219.

3. Select Committee, P.P. 1828 (515) VIII, 700. Nussey qualified these dates by pointing out that it was 'a mere matter of belief'.

shoddy consumed annually in the West Riding about one seventh or one eighth were imported, mostly through Hull, although some were handled by London shippers.¹ The bulk of domestic woollen rags appear to have come from wholesale rag merchants in London - Cook, the Dewsbury blanket manufacturer, maintaining that he sometimes used shoddy from surplus government grey and white blankets which he considered to be of a higher quality.² Whilst the revelations of the West Riding manufacturers Cook, Gott, and Nussey were undoubtedly new to many in the wool trade outside of Yorkshire, the Committee appear to have evinced most interest in the import of woollen rags and particularly the possibility that manufacturers were attempting to evade the 15 per cent ad valorem duty chargeable on rags imported for re-manufacture by bringing them in under the lower rate of 7^s/6^d a ton for manure.³ Both Cook and Nussey, on being pressed, admitted that this practice was not unknown, but represented a 'small proportion' of the total.⁴ Tables supplied by the Custom House proved unhelpful, specifying only those rags being imported at the lower rate of 7^s/6^d a ton, those for remanufacture being merged under the general heading of 'woollen manufactures' and being charged the appropriate rate of duty.⁵ Nussey was adamant however, that the supply of domestic rags

1. J. Bischoff (1842), op.cit., pp. 180-81. Nussey based his estimate on 'a calculation I have made of the number of rag machines, and the number of pieces manufactured, and a comparison of what our goods consume, and also the number of carding and scribbling machines employed in that trade'. His estimate of the annual consumption of ragwool can be compared to Cooks' estimate of 9,000 packs of low German, Russian, Turkish, and other foreign wools used by the Dewsbury trade. (S.C., 661).

2. Select Committee, P.P. 1828(515), VIII, 849.

3. Select Committee, P.P. 1828(515), VIII. This was asked of Varley(596), Sutcliffe(179), Hubbard(653), Brook(676), Cook(661), Shepherd(751), Hughes(86), Cook(849), Swaine(855), and Nussey(699).

4. *ibid.* Cook(669). Nussey was more specific - 'An instance occurred to us of a parcel, bought of an importer, having been seized by the (Customs) officers. I believe that the lowest quality sometimes come in under the title of manure, but the better qualities not so' adding that working up manure rags 'would not be worth the labour'.

5. *ibid.*, 788 (Appendix to minutes of evidence).

was insufficient and that

'Without the importation of foreign rags we could not make articles at a sufficiently low price to answer the demands from abroad'.¹

Because woollen rags imported for remanufacture were entered under the heading of 'woollen manufactures' in the Customs records, it is not possible to estimate with any degree of accuracy the extent of their importation or the increase in their use by West Riding manufacturers. The figures in Table III(i), bearing in mind that a proportion of rags imported for manure were used by some manufacturers, should be seen as an approximate guide only.² From August 1836 all imports of woollen rags were classified under one heading and charged a flat rate of duty of 1^s/- per ton (reduced from 7^s/6^d a ton for manure rags in 1833/34).³ An indication of the probable previous weight of rags imported for remanufacture is that for the remaining five months of 1836 imports more than doubled. Comparing the figures of the two nearest complete years, the weight imported increased from 461 tons in 1835 to 1,083 tons in 1837.

The reasons for the reduction in duty are not clear, for the tariff on foreign wools, other than wool from British possessions which was imported free from 1825, continued until it was repealed in the wave of reforms of 1845. Similarly, the duty of 5^s/- per ton imposed on imported cotton and linen rags for the paper industry in 1825 remained until it was finally abolished in 1845, although the

1. *ibid.*, 699. Other witnesses were of the same opinion; Sutcliffe(636), Hubbard(653), Shepherd(751), and Swaine(855).

2. Prior to 1825 the duty on rags imported for remanufacture was 50 per cent ad valorem and those for manure 13^s/- per ton. It is plausible to suggest that in view of the very high ad valorem duty a proportion of the imports for remanufacture were designated in the latter category.

3. Customs Tariffs of the United Kingdom from 1800-1897. (H.M.S.O., 1897), p. 569.

TABLE III(i)

Woollen rags imported into the United Kingdom,
1819-1850.

Year	Weight(tons)	Year	Weight(tons)	Year	Weight(tons)
1819	116	1830	412	1840	1,052
20	134	1	170	1	886
1	186	2	500	2	1,103
2	151	3(ii)	470	3	1,472
3	351	4	552	4	1,141
4	342	5	461	1845	28
5(i)	617	1836	272	1845(iv)	970
6	425	1836(iii)	616	6	974
7	321	7	1,083	7	845
8	438	8	1,056	8	392
9	264	9	1,263	9	712
				1850	2,845

- Note
- (i) Duty reduced from $13^s/-$ to $7^s/6^d$ per ton.
 - (ii) Duty reduced from $7^s/6^d$ to $1^s/-$ per ton.
 - (iii) All woollen rags imported (including those for re-manufacture) classified under one category for duty purposes ($1^s/-$ per ton, entered after 13.8.1836).
 - (iv) Duty abolished from 4.8.1845.

Source:- P.R.O., CUST. 5, 7.70-71.

paper industry was still subject in 1847 to the

'... scandalous impolicy of taxing the manufacture of rags on their transformation into paper'

amounting to a claimed $1\frac{1}{2}^d$ per lb. on the finished product.¹ Whilst no evidence readily explains why the small but growing West Riding rag consuming trade should have benefited when the paper manufacturers did not - and a tacit recognition of this trade is apparent from the reclassification of all woollen rags under one category - it seems likely that the decision was dictated by purely administrative factors and a wish to remove an anomalous dual classification which was probably being evaded by many woollen manufacturers importing foreign rags.²

The impetus provided by the reduction in duty and reclassification is apparent from 1836 (Table III(i)), and as this would not have affected agricultural fertiliser demand, it would seem fairly certain that the increased level of imports reflected demand from the woollen manufacturing industry. Indeed, McCulloch noted in 1834 that whereas imports of woollen rags for agricultural use were 'considerable', those for remanufacture into shoddy were 'trifling'; in 1837, however, he observed that 'considerable quantities (of woollen rags) are imported' for use in the shoddy mills of Batley and Dewsbury.³ By this time the trade was also beginning to be noted by others outside Yorkshire, Porter, for instance, commenting in 1836 on the

'... curious trade (which) has of late years been introduced, that of importing foreign woollen rags into England for the purpose of re-manufacture',

1. Chamber's Edinburgh Journal, VII, 1847, p. 24.

2. A common practice with paper manufacturers who imported cotton and linen rags under Class II 'oldtarred ropes'. D.C. Coleman, op. cit., pp. 322-23.

3. J.R. McCulloch, A Dictionary ... of Commerce and Commercial Navigation (2nd edn., 1834), p. 968; ibid., A Statistical Account of the British Empire (1st edn., 1837), II, p. 51.

and by Ferrand in his speech to the House of Commons in April 1842.¹

A further reduction in the duty to 6^d per ton in 1842, abolished completely from August 1845, had no more than a short run impact as the figures indicate, for the price of most qualities of wool had begun to decline on trend from 1837 to 1849. In 1837, 1840, 1843, and 1847 the Heavy Woollen District experienced a sharp series of slumps which affected several sections of the wool textile industry, and although tariffs on imported wool were removed in June 1844, imports fell until 1849.² Reflecting this trend, woollen rags imported dropped to a low of 392 tons in 1848, beginning a recovery in 1849 as trade revived and wool prices moved sharply upwards. Whilst the Hull authorities seem not to have invoked their statutory powers under the Nuisances Removal and Diseases Prevention Act to restrict the import of rags from the cholera-stricken ports of Hamburg and Amsterdam, the very low level of imports in 1848 and 1849 undoubtedly reflect the dislocation of 1847, the effects of quarantine on shipping in continental ports, and the political unrest of 1848.³

The principal source of imported woollen rags in the period to 1850 were the German Hanseatic towns, a source long used by the English and Scottish paper making industry for cotton and linen rags.⁴ The larger proportion of these were landed at Hull or Goole from which they reached Dewsbury and the surrounding area on the Ouse, Aire, and Calder navigation system. By the early 1830s supplies were being received from many of the Baltic and Mediterranean ports - Riga, Pernau,

1. G.R. Porter, The Progress of the Nation (1836), I and II, p. 202; Hansard's Parliamentary Debates, 3rd Series, LXII, 19.4.1842, pp.833-34.

2. L.M., 12.2.1842, 2.7.1842; S. Jubb(1860), op. cit., p. 106; A Hamilton, loc. cit., p. 504.

3. Report of the General Board of Health, P.P. 1849 (1115) XXIV, 5.

4. A.G. Thomson, op. cit., p. 141.

Mandahl, Copenhagen, Rostock, Lubeck, Hamburg, Petersburg, Lisbon, Naples, and Palermo - the large number and geographical distribution indicating the extent to which the trade in all types of rags had grown.¹ Shipments of woollen rags formed part of regular consignments of fleece wool, particularly from Hamburg, although increasingly from 1832 they were shipped with other waste materials such as 'shank bones', 'old iron' and 'salted hides' destined for other predominantly waste-consuming industries. From this period too, the trade began to be monopolised by Hull-registered vessels, some covering the round trip to Hamburg and back in the space of one week. By 1838 the weekly volume of woollen rags being handled at Goole and Hull had risen to between 200 and 300 bales from the 20 to 160 bales landed weekly in 1832, and by 1842 the weekly volume frequently exceeded over 500 bales.² New sources of supply began to be utilised in the 1830s, increasingly Denmark (from 1833) and Belgium (from 1842) whilst small and irregular supplies were received from the United States, the East and West Indies, Russia, Sweden, and Portugal.³

By far the largest proportion of woollen rags consumed in the West Riding during this period were from domestic sources. Table III(ii) indicates the quinquennial means based on Nussey's and Hooper's estimate of United Kingdom shoddy consumption adjusted for imports.⁴ Between 1836 and 1849, when the import figures can be relied upon to include all woollen rags, domestic sources would appear to have provided

1. Humberside County Council-Central Library, Hull, Hull Bills of Entry, 1832, 1835-1850. H.M. Customs and Excise, Commissioner's Library, King's Beam House, Hull Bills of Entry, CL8, 1831-1834 (hereafter referred to as H.B. of E).

2. *ibid.* On occasions the daily landing of bales of woollen rags at Hull reached 550 in 1838.

3. Table III-II(a) Appendix, lists some of the larger shipments received annually from various countries.

4. See Appendix III-I to this chapter where these estimates and the tables derived from them are discussed.

TABLE III(ii)

Estimated weight of the collection of domestic
United Kingdom woollen rags, 1820-1849.

Years	Weight(tons)	Years	Weight(tons)
Av. 1820-24	410	1835-39	4,235
" 1825-29	1,129	1840-44	3,902
" 1830-34	3,080	1845-49	8,574

Source:- Appendix, Table III-I(h), p.604.

between 77 and 91 per cent of West Riding woollen rag requirements, a figure that would probably be marginally higher as a proportion of imported rags may have been used in agriculture. The indicated increase between 1830 and 1839 is consistent with the marked upturn in activity in both branches of the wool textile industry with rising wool prices reaching a peak in 1836, and recovering slightly from the depression year of 1837 in 1838 and 1839. An additional factor on the supply side exerting a strong pressure on prices of wool was the prevalence of sheep rot which recurred for several years and produced wild fluctuations in the price of low wool.¹ The high figure for the final quinquennium 1845-1849 would seem to reflect the concurrence of four important factors; the trade revival commencing in 1848, very low stocks of wool in the West Riding woollen manufacturing branch, interruptions in consignments of continental woollen rags, and the rapid growth in use of mungo, or hard felted

1. Price series Laid Highland and Laid Cheviot, Chapter V, Appendix V-I; Ministry of Agriculture and Fisheries, Report on Wool Marketing in England and Wales (H.M.S.O., 1926), p. 10.

rags, in the Morley, Batley, and Dewsbury districts.¹ Certainly, as the Census Abstracts for 1841 and 1851 indicate, this was accompanied by a large increase from 2.4 thousand to 6 thousand in those classified as 'marine store' and 'rag dealers'.²

Each source, whether domestic or overseas, produced distinctive types and qualities of woollen rags as well as the more common 'mixed' varieties. London, with its large population and rag wholesaling trade acted as a major source of domestic woollen rags, particularly in the higher qualities where 'London stockings' (knitted rags) and mungo rags commanded consistently high prices.³ Indicative of the high concentration of commercial and professional classes, new tailors' clippings from fine quality West of England cloth and Yorkshire broadcloth were sorted into a special class from the late 1830s for mungo users in the West Riding.⁴ Scottish woollen rags or 'Scotch stockings' were also highly valued for the quality and staple of the wool woven by domestic hand loom weavers and, for the duration of the period covered by this study, formed a distinct category in the Dewsbury rag market. The records of Batley manufacturer Thomas Taylor for the mid 1830s indicate the practise of grading different classes of rags by origin (Table III(iii)), manufacturers and merchants alike being able to identify accurately the likely quality and price range from any particular source.

1. Reports of the Inspectors of Factories, P.P. 1847-48 (900, 957) XXVI, 135 and 1849 (1017, 1084) XXII, 122; W. Smith, The History of Morley (1876), p. 213. Thomas Taylor was using large quantities of mungo in the late 1840s at his three Batley Mills. J.T.&J.T. MSS., loc. cit., Blend Book 26.7.1846-16.7.1851.

2. v. supra Table II(ii), p.27.

3. S. Jubb (1860), op. cit., pp. 32.33.

4. The first purchases of new broadcloth clips from London were said to have been at $\frac{1}{8}$ lb. in ca. 1838, which was their value as manure in the Kent hopfields. F. Fenton, 'Woollen Shoddy', T.M., 15.6.1881, p. 208.

In the period to 1850 the bulk of imported woollen rags were of the knitted 'stocking' variety used for manufacturing shoddy; Danish rags, 'Hamburg rags', and 'Berlin stockings' commanding high values, being manufactured from the best Saxony type wools. As with 'Scotch' and 'London' stockings, 'Hambro stockings' and 'Berlins' established themselves as categories for grades of a consistently high standard in the West Riding Heavy Woollen District.

Table III(iii) is a short price series for certain qualities quoted by McCulloch in 1834 and used by Taylor between 1836-1838 and including the cost of transport of imported rags from Hull of 10^s/- per pack or $\frac{1}{2}$ ^d per lb.¹ Because the quality of different but similarly-described classes of woollen rags was unlikely to be uniform, the prices indicated here were not necessarily comparable. Nevertheless, the percentage rise in 'white Hamburg' rags between 1834 and 1836 corresponds closely to that of Laid Highland (Scotch blackface) wool, confirming the observation of Sutcliffe, the Huddersfield wool stapler, to the 1828 Select Committee that a high degree of substitutability existed between rags and wool from the blackface sheep.² Price fluctuations of the coloured and mixed rags broadly follow movements in Southdown wool, but bear little relationship to variations in the price of Laid Highland, suggesting that particular grades of rags were more likely to move in sympathy with the wools for which substitution was possible.

A factor which was to play an increasingly important role in the supply of recovered wool to West Riding manufacturers was the development of a continental rag-pulling industry. The earliest ragwool

1. In 1838. J.T. and J.T. MSS., loc. cit., Waste Book 31.1.1834-31.12.1851

2. J. Bischoff (1842) op. cit., p. 180.

TABLE III(iii)

Prices of some imported and domestic woollen rags, 1834-1838

(shillings, pence (s.d.) per hundredweight).

Description	1834	1836	Rise %	1837	1838	Fall %
Coloured Hamburg	13 ^s /-to15 ^s /-	15 ^s /-to17 ^s /11 ^d	18%			
White Hamburg	18 ^s /-to20 ^s /-	34 ^s /6 ^d to37 ^s /-	88%			
London mixed	21 ^s /-				15 ^s /6 ^d	21% (1834-38)
Welsh white		32 ^s /6to34 ^s /-				
Irish white		21 ^s /-to28 ^s /-				
London white				34 ^s /6 ^d	32 ^s /6	6% (1837-38)
Coloured Lancashire		10 ^s /6 ^d				
Irish coloured		10 ^s /6 ^d				
WOOL (d.per lb)						% Rise
						% Fall
						(1834-38)
Southdown	19 ^d	20 ^d	5%	15 ^d to16 ^d	16 ^d	3%
Laid Highland	3.125 ^d	6 ^d	92%	3.625 ^d	4 ^d	10%

Rags

Source:- 1834, J.R. McCulloch, op. cit., p. 968.
 1836-1838 J.T. & J.T. MSS., loc. cit.,
 Waste Book 31.1.1834-31.12.1851.
 Mill Book 13.9.1838-23.2.1850.

Wool prices

Southdown - R.M. Hartwell, op. cit., p. 107
 Laid Highland - Chapter V, Appendix V-I.

TABLE III(iv)

Estimated weight of imported shoddy and mungo consumed
in the United Kingdom, 1825-1849.

YEARS	WEIGHT (000 lbs.)
Av. 1825-29	50
Av. 1830-34	100
Av. 1835-39	150
Av. 1840-44	500
Av. 1845-49	2,000

Source: Appendix III-I(1).

manufacturing facilities appear to have been established on a small scale by a Danish farmer, Marcus Bech, of Aarhus in 1827, using a machine imported from Batley or Dewsbury and powered by a horse-gin.¹ Both Nussey and Cook observed that by 1828 ragwool was being manufactured on the continent suggesting that other manufacturers may have joined Bech or that he had increased his capacity.² No details of the import of shoddy appear in the 'Ship's Reports' of the Hull Bills of Entry until April 1835 when a Hull-registered vessel is recorded as unloading '22 bales shoddy' from Hamburg.³ Whilst it is known that ragwool

1. F. Fenton, 'Woollen Shoddy', T.M. 15.7.1881, p. 252; S. Jubb (1860) op. cit., p. 24; F.W. Reuss, 'The Birth of the Mungo and Shoddy Industry', W.T.W., 12.4.1913, p. xii. Fenton noted that this Danish rag wool was imported by the Hull firm of Roberts and Trigg, one that was very active in the wool and woollen rag trade in the 1830s (H.B. of E. MSS., loc. cit., 1832-1840).

2. J. Bischoff (1842) op. cit., p. 181; Select Committee, P.P. 1828 (515) VIII, 669 (Cook).

3. H.B. of E. MSS, Hull, 18.4.1835.

manufacturing was established sometime before ca. 1850 in Berlin and other German towns, this and other consignments from 1835 may well have originated in Denmark having been transhipped through the entrepot of Hamburg.¹ The development of this trade in the 1830s is not clear, however, for until 1861 imported shoddy was classified as wool for duty purposes and many consignments may have been so described.²

From 1841 regular consignments from the ports of Antwerp and Hamburg were being landed at Hull, the volume of trade increasing rapidly from the second half of 1845 when a Hull-registered vessel commenced weekly round-trips from Antwerp with consignments of shoddy and other goods. The growth in imported ragwool is indicated in Table III(iv), estimates of the small quantities reaching the West Riding between 1825 and 1834 being based on Nussey's evidence to the 1828 Select Committee, and from 1835 to 1849 on the number of bales landed at Hull.³

The development of continental rag-pulling facilities is an interesting example of entrepreneurial response to the fast-growing demand for recovered wool from the West Riding, for as late as 1860 Jubb noted that

'... very little shoddy or mungo (is) used in the manufacture of cloth on the Continent'⁴

There were, however, two very good reasons for the initial growth of the industry so far from Yorkshire. Firstly, woollen rags imported for remanufacture attracted the same 15 per cent ad valorem duty between 1825 and 1833/4 as imposed on imported woollen goods. Whilst it seems clear that some manufacturers were prepared to evade this duty by

1. S. Jubb (1860) op. cit., p. 24.

2. Until ca. 1841 a variety of descriptions were used by the Hull Customs - 'shoddee', 'shoddie', 'shotty' or 'ragwool' - the first three possibly suggesting the exporter's phonetic equivalent of the Yorkshire term.

3. v. infra, Appendix III-I(i).

4. S. Jubb (1860) op. cit., p. 26.

importing their woollen rags as 'manure', there were, as Cook pointed out to the Select Committee, the dangers of seizure by Customs and this would almost certainly have been greater for the cleaner and higher quality Danish and Hamburg rags. Imports from these sources could frequently realise as much as £25.10^s/- per ton in the West Riding, and if similar values were entered on the Customs declarations then a rate of duty equivalent to the $\frac{1}{2}$ ^d per lb. on coarse foreign wool would have been levied.¹ This was before the rags were converted to shoddy, a process which Nussey's figures indicate resulted in 30 per cent wastage, effectively raising still further the costs to West Riding consumers. On the other hand, it would seem plausible that Danish, and later, German rag merchants saw increased profit potential in exporting ready-pulled shoddy, possibly achieving a higher fibre yield by careful sorting, which together with savings effected in lower unit transport costs would have more than offset the duty imported shoddy attracted when classified with coarse wool.²

The second reason can be explained by looking at constraints on the supply of continental woollen rags. In order to protect indigenous paper industries alarmed at the prices British paper manufacturers were prepared to pay for cotton and linen rags, many countries either prohibited the export of all types of rags or imposed punitive export duties.³ For all or most of the period prior to

1. J. Bischoff (1842) op. cit., p. 181 (evidence of Nussey). Duties on foreign wool imported between 1825 and 1844 were $\frac{1}{2}$ ^d per lb. on those valued at less than 1^s/- per lb. and 1^d per lb. on those valued above 1^s/- per lb. Customs Tariffs, op. cit., p. 417.

2. Nussey stated that the best qualities of shoddy realised 9^d per lb. *ibid.*, p. 181. It is interesting to note the reasons given by a Swedish rag and shoddy exporter 100 years later on why they chose to export shoddy and not rags

'Our mill prefers to export pulled and not in the rags, as the profit lays in pulling or carding the rags'. M.F. Dyson MSS., loc. cit., letters, 1934.

3. D.C. Coleman, op. cit., pp.327-331.

1850, France, Belgium, and Spain prohibited the export of all rags, and high export duties were levied in Berlin, Prussia, Austria, Switzerland, Norway, Sweden, Russia, Holland, Portugal, and Italy.¹ The high prices that Yorkshire was prepared to pay for a waste material that had minimal value elsewhere, and the universal practice of overseas governments in not extending export duties to ragwool, undoubtedly provided the major stimulus to a trade which had probably originated because of anomalies in British tariffs. Whilst it was later suggested that export duties on woollen rags were initially levied by overseas governments to encourage their own shoddy industries to export to Yorkshire - and this may have been the case in Germany, where duties were not finally removed until 1873 - this development, which was to be of great importance in the supply of recovered wool to Yorkshire from the mid 1850s, appears to have been autonomous, assisted by the removal of all British tariffs on imported wool from 1845.² It was not, however, welcomed by all West Riding manufacturers, one writing to Knaresborough M.P. Busfeild Ferrand in 1842,

'Some few years ago these rags were imported from Hamburg and other parts of the Continent; then, of course, this country derived some advantages in pulling them up; latterly they have come pulled up ready for use, they on the Continent having obtained from this neighbourhood the machines for pulling up the rags.'³

Nevertheless, by the 1840s the consumption of ragwool in the West Riding had reached small but significant proportions and was in itself eloquent testimony of the long-standing complaints of manufacturers on the quality of domestic clothing wool. With the successful innovation

1. Rags - Return of the names of those countries in Europe which permit the free export, or impose a duty; amount per ton of such duty, P.P. 1861 (376), LVII, 517; S. Jubb (1860) op. cit., p. 24; Chamber's Edinburgh Journal, 1847 op. cit., p. 23.

2. Reports respecting the export duty on rags in foreign countries, P.P. 1874 (c.994), LXVIII, 473; J. Willans (1880) op. cit., p. 16.

3. Hansard (1842) op. cit., p. 83.

of mungo rags in the late 1830s and the growth of overseas rag pulling facilities, the supply of woollen rags and shoddy, predominantly from domestic resources, appear to have been adequate and may well have played an important part in the marked expansion of the West Riding woollen trade after 1836.¹

1. Reports of the Inspectors of Factories, P.P. 1847/48 (900, 957), XXVI, 134.

CHAPTER III

III.1850-1914

Table III(v) indicates the relative proportions of imported wool and woollen rags/shoddy and mungo, adjusted for re-exports, together with the retained weight of the estimated domestic wool clip and woollen rag collection between 1850 and 1914. Both of these series represent the gross weight of raw material available for use by the United Kingdom wool textile industry, wool losing a significant percentage of its weight when washed and scoured of grease, and the various classes of rags in the ripping, seaming, extracting, and rag-pulling processes. This and the proportion of wool consumed by the worsted branch of the industry, which did not use recovered material, is discussed in Chapter V, the table set out here forming a quantitative basis for the following discussion. Two distinctive features, however, stand out. Net imports of woollen rags and recovered wool as a percentage of imported wool remained at approximately the same level over the 64 year period, fluctuations in the supply of wool appearing more unstable than those in woollen rags where imported tonnages between 1878 and ca. 1901 moved within much narrower limits. Secondly, the proportion of domestic woollen rags compared to the retained domestic wool clip rose steadily for the whole period, decisively eclipsing supplies of home grown wool in ca. 1902 as a source of raw material for the wool textile industry.¹

The absence of consistent price data on woollen rags until trade publication in 1911 precludes any attempt to measure their price elasticity of supply during this period. It is possible, however, to approach this problem in another way by calculating the cross-elasticity of supply of imported woollen rags to the price of wool,

1. W.A.G. Clark, Manufacture of Worsted, Woollen and Shoddy in France and England and Jute in Scotland (Washington, 1908), Special Agents Series no. 25, p. 99.

Year	(a)	(b)	(b) %(a)	(c)	(d)	(d) %(c)
1900	170,759	30,022	17.6	51,830	47,053	90.8
1	189,018	30,512	16.1	52,589	48,095	91.4
2	175,536	32,716	18.6	44,107	48,259	109.4
3	157,812	31,586	20.0	43,348	50,549	116.6
4	154,241	39,727	25.8	42,009	61,553	146.5
5	165,804	36,192	21.8	41,652	67,380	161.8
6	183,884	40,260	21.9	44,821	70,489	158.5
7	218,214	43,526	19.9	44,464	77,193	173.6
8	189,777	38,031	20.0	42,812	63,637	148.6
9	202,232	45,054	22.3	35,580	70,041	196.8
1910	224,687	54,824	24.4	47,277	73,682	155.8
1	234,554	53,834	22.9	47,634	66,409	139.4
2	229,330	50,755	22.1	38,214	62,071	162.4
3	238,973	53,912	22.6	43,080	65,002	150.9
1914	201,161	42,834	21.3	36,964	64,247	173.8

Source: (i) Columns (a) and (c)
F.J. Hooper, Statistics Relating to the City of Bradford and the Woollen and Worsted Trades of the United Kingdom (Bradford, 1903), pp. 10-11.

Bradford Chamber of Commerce, Statistics Relating to the Woollen and Worsted Trades of the United Kingdom (Bradford, 1940), pp.12-13.

(ii) column (b)
Trade Navigation and Commerce, Annual Accounts.

(iii) column (d), Table III-I(h), Appendix.

the figures for each variable being sufficiently accurate for this purpose. A price index of three types of wool, Lincoln half-hog, Port Philip average fleece, and Dorset Down fleece, has been constructed to represent the more important wools used in the wool textile industry for which long run price data are available during this period.¹ Furthermore, the noils of Lincoln wool resulting from the topmaking process were used extensively by the woollen section of the industry, their price fluctuating very closely with the price the topmaker paid for his wool and competing with the best grades of shoddy selling in the higher price range.² Whilst it is readily apparent that this is not a perfect measure of elasticity because of the assumption of a linear relationship between the two variables, which is clearly unrealistic, it does permit (i) the testing of the hypothesis that the price of wool acted as a major determinant on price formation and subsequent supply of woollen rags, and (ii) a tentative indication of the price elasticity of supply of imported woollen rags and shoddy.³ The choice of dates has been determined by the congruency of a perceptible fluctuation in the wool price index and a marked upward or downward movement in the importation of woollen rags, excluding the years 1883/4 and 1892/3 when special conditions exogenous to the normal operation of the rag market applied, namely cholera outbreaks on the continent of Europe.

With the exception of the last two cross-elasticity values, the indicated elasticities suggest that a strong relationship existed between the level of wool prices and an increase or decrease in the

1. Chapter V, Appendix V-I.

2. World Wool Digest, II, 6.9.1951, p. 10.

3. The aggregated figures of woollen rags and shoddy imported between 1871 and 1903 have been used (discussion v. infra Appendix III-I(1)).

TABLE III(vi)

Cross-elasticity values in the supply of imported woollen rags and shoddy (y) to the price of Lincoln half-hog, Port Philip and Dorset Down wool (x).

Years compared	DY (%+or-)	DX (%+or-)	Elasticity ($\frac{DY}{DX}$)
1860,1864	+49.89	+21.37	2.33
1870,1871	+40.74	+34.83	1.17
1871,1872	+20.85	+20.83	1.00
1872,1873	-15.11	- 6.21	2.43
1874,1875	- 3.81	- 2.44	1.56
1879,1880	+23.85	+16.67	1.43
1880,1881	-12.02	-10.68	1.12
1894,1895	+12.71	+ 4.61	2.76
1903,1904	+25.77	+10.14	2.54
1905,1906	+ 8.66	+ 8.14	1.06
1907,1908	-12.62	-18.60	0.68
1909,1910	+21.68	+ 5.00	4.34

Source: (i) Imports of woollen rags and shoddy/mungo, Table III(v), column (b).

(ii) Price data, Chapter V, Appendix v-I.

weight of woollen rags imported into the West Riding. In response to marked upward or downward movements in the price of wool, the elasticity in the supply of rags was greater than unity tending to support the hypothesis as well as indicating that rag supplies were highly sensitive to prevailing or expected wool price levels. The two final values were influenced by special factors in the American rag market, to be discussed shortly, which combined to override normal price and supply adjustments so cushioning an expected fall in the importation of woollen rags in 1908 and re-inforcing a rise in imports as wool prices advanced modestly

in 1910. Although the above figures suggest that rag supplies were elastic in response to mediumrun price fluctuations, and thus may have exerted some limiting influence on upward movements in wool prices, the long-run secular decline in wool prices coeval with an increase in the United Kingdom consumption of both wool and shoddy in the period ca. 1873-1902 indicates an inelastic and rising demand for raw material in the long run by the domestic wool textile industry.

Several important developments during the first phase of expansion from 1850 made a significant contribution to the supply of woollen rags to the West Riding: the introduction of carbonising which enabled recovery of the wool content in cotton-warped rags, the commencement of regular rag and shoddy auctions, and the 1860 Anglo-French Commercial Treaty which permitted, for the first time, access to the important French woollen rag market.

The rapid growth of imports of woollen rags and shoddy from 1850 suggests that domestic rag supplies were coming under increasing pressure from the West Riding woollen industry. Two interrelated factors would seem to account for this. Firstly, there is evidence that cheap cotton cloth and the generally low standard of living for many in the 1830s and 1840s had resulted in a declining per capita consumption of wool clothing, for whilst supplies of domestic rags continued to rise, it is clear from the accounts of Mayhew and others that in the years of hardship in the 1840s much of the potential supply of rags for the West Riding was being repaired and resold for further use.¹

1. Select Committee on Agriculture, P.P. 1833(612), v, 128. Engels made much of the substitution of wool by cheap cotton fustian and the use of second-hand clothes by the working classes. F. Engels, The Condition of the Working-Class in England in 1844 (1952 edn.), pp.66-67; H. Mayhew, op. cit., II, pp. 30-34.

A second problem facing rag merchants and pullers was the increasing proportion of mixed wool/cotton rags (known in the trade as 'linseys' or 'challies') which, with the exception of the lowest types of cloth, could not be blended with wool because the cotton 'ends' would not take the dye satisfactorily.¹ The introduction of carbonising in ca. 1851/2 as an attempt to solve this problem had met with some success and by the late 1850s and early 1860s a thriving export trade had developed in linsey rags to satisfy American and German demand for the carbonised 'extract' wool.² For West Riding low woollen manufacturers, however, this innovation was of little assistance in solving their supply problems. The process tended to be too harsh on the wool fibres by reducing the valuable felting and milling properties and consequently found little favour in the West Riding. Jubb complained of this in 1860, remarking that large quantities of union cloth rags would only become valuable when the carbonising process could be perfected.³ With the exception of the specialised export demand and the immediate benefit of this innovation to the rag merchanting trade, it seems clear that there is little evidence to support the suggestion that carbonising eased the immediate supply position of the West Riding in the late 1850s and 1860s.⁴ Unlike developments after 1860 which allowed a marked expansion in the sources of supply of woollen rags, extract wool was of more importance in

1. E. Baines, loc. cit., p. 74.

2. The innovation of carbonising is discussed v. infra p.p. 221-25. Reports of the Inspectors of Factories, P.P. 1864 (3309), XXII, 661; Report of the Medical Officer of the Privy Council, P.P. 1866 (3645), XXXIII, 620-21; S. Jubb (1860), op. cit., p. 27; J. Willans (1880), op. cit., p. 10; T.M., 15.6.1881, p. 209.

3. S. Jubb (1860), op. cit., p. 28.

4. O. Greeves, op. cit., p. 307.

the long run when improvements in the process and new demands for the product emerged in the 1880s.

The sustained upturn in the West Riding woollen industry which had commenced in the second half of 1848¹ together with a rise in wool prices and supply constraints in the woollen rag market stimulated higher rag prices. Between 1850/51 and 1854 wholesale rag prices (roughly classified rags from marine stores) appear to have risen by between 30 and 35 per cent (Table III(vii)) or slightly more than the 27 per cent rise in English white noils, both of which held their prices in 1854 as most wools fell from the short run peaks established in 1853.² The second section of this table shows price variations in different classes of woollen rags, sorted and seamed, and sold to various West Riding mungo and woollen manufacturers by Henry Day of Hanging Heaton.³ The range of prices between the highest and lowest values recorded here in any one year are particularly noticeable in the case of mungo rags, and whilst this would reflect to some extent differences in quality between similarly-named 'sorts', the year-by-year fluctuations would support Jubb's contention that the mungo market of the 1850s was characterised by rapid and large price movements.⁴ Also apparent, and consistent with Sanders' report of an 'extraordinary revival' in the woollen trade in 1849, is the marked rise in mungo 'black', 'new black', and 'green' between 1849 and 1850 as fashions began to favour fine and fancy mungo cloths, and also the increase between 1855 and 1858/9 of 'linceys', used in increasing

1. Reports of the Inspectors of Factories, P.P. 1849 (1017, 1084), XXII, 122.

2. v. infra Chapter V, Appdx. V-I.

3. It is assumed that despite a degree of product specialisation, these prices were generally representative of soft and mungo rags being sold in the West Riding at the time.

4. S. Jubb (1860) op. cit., p. 33.

TABLE III(vii) Wholesale and retail prices of various classes of woollen rags, 1848-1860

Description	1848	1849	1850	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860
<u>Wholesale (s.d. per cwt.)</u>													
Hard woollens			21/- -	20/6 -	24/6 -								
Skirtings			25/-	28/-	25/6		32/-			5/3			
Best White			4/6-5/3	6/6	26/- -		35/-						31/6
Linceys				22/6	28/-			3/-	3/6			6/-	5/6
<u>Retail (s.d. per stone of 16 lbs.)</u>													
(a) Mungo Rags													
Black	2/4	2/8	4/-	5/4	6/85/-	6/86/8-5/106/-	7/-	6/6-7/4		4/8	6/4		
New Black		4/8	5/8-7/-	6/4	7/-	7/47/-	7/48/-	9/2					
Brown			3/-	5/6	6/46/-	7/-	7/8	8/-	5/8-6/8		6/8		
Blue	6/4	6/4	5/4-8/4	6/6	6/8	6/6-7/108/8-2/-		11/8	5/4				
Drab	3/4		4/8-8/-			7/-	7/47/4-6/66/8-7/-	6/2-6/87/8-8/8			8/8		
Green		2/-	83/4-6/-	5/4-6/-	5/2	5/2-5/55/8-6/2		4/8	4/10	7/-			
Grey			3/2-4/8	4/4	4/2-3/10	3/10-5/-	5/4-5/84/4-3/104/4-5/-	6/2-7/4			5/8		
(b) Stockings													
Black			1/0-3/-	3/-	3/83/2-3/-	3/-	4/-	4/10-4/-					
Blue			2/6-3/8	3/4		3/4-4/4	4/10	3/4					
Grey	2/2	1/1	1/4-2/-	2/-	1/4	1/8							

Source:- H.D.MSS., loc. cit., Purchase/Sales Ledger, 28.9.1852-30.12.1855, Sales Ledger, 19.1.1848-30.1.1864.

quantities by the carbonising firms.¹

Implicit in Jubb's discussion of domestic sources of rags is the lack of supply of good quality all wool rags, for he cites only Scotland and Ireland as being important in the supply of stockings, mixed rags, and whites, and London for its 'highest quality' mungo rags from 'Old coats, vests, trousers and caps' and new tailors' clippings.² It was, therefore, to overseas suppliers that rag merchants and shoddy manufacturers increasingly turned for supplies of all-wool classes of rags.³ Important changes in the organisation of the rag market in Batley and Dewsbury, made possible by rapid developments in the railway transport system, resulted in the commencement of regular rag auctions at Batley railway station in the early 1850s to which growing quantities of domestic and imported rags and mungo were sent. By 1858 the auctions had moved to Dewsbury and were being conducted in several specially constructed auction warehouses.⁴ It seems fairly certain that this development provided a major stimulus to the growth in supplies of foreign rags by providing facilities whereby overseas consignors were assured of a wider market and better prices than under either the previous system of sending rags to the Hull importers for disposal or by private treaty arrangements subject to very imperfect knowledge of rag prices.⁵ The rapid

1. Reports of the Inspectors of Factories, P.P. 1850 (1239), XXIII, 314; S. Jubb (1860) op. cit., p. 30.

2. *ibid.*, p. 32.

3. J. Willans (1880) op. cit., p. 16; Chambers's Journal, XV, 1861, p.103.

4. *v. supra*, p. 63.

5. F. Fenton, 'Woollen Shoddy', Wool & Textile Fabrics, 15.1.1881, p.607. Fenton was quite clear on this, the auctions 'partly resulted from pressures of foreign rag and shoddy dealers to get good prices, better than those obtained by dealing direct with Yorkshire merchants'. This statement was deleted when his series of articles was published in the much more widely circulated 'Textile Manufacturer' from June 1881 (19.3.1881; p. 774).

widening of sources of imported woollen rags in the 1850s is apparent from Table III-II(b) (Appendix), supplies coming from as far afield as America (from 1852), the Turkish Dominions (1854), and Australia (from 1856). Jubb notes the wide variety in types of rags sent from these sources - grey and white knitted stockings and 'nons' from Germany, soft and mungo rags from Austria and Italy, low coarse cloths from Turkey and Russia, and high quality mungo rags from America.¹

It was, however, the successful conclusion of the Anglo-French Commercial Treaty in 1859-1860 which proved to be the most important factor in extending the potential supply of woollen rags to the West Riding in this period. Under the terms of this treaty British rag merchants and shoddy manufacturers were allowed exclusive and duty-free access to large supplies of woollen rags previously prohibited from export by the French authorities by a general restriction applying to rags made from any material.² French insistence on the protection of the paper industry resulted in the imposition of a very high duty on the export of vegetable-fibre rags of 12 francs per 100 kilos, and a lesser duty, reducing on a sliding scale, on cotton warped linsey rags.³ Whilst this concession to Yorkshire can be explained partly by the fact that very little remanufactured wool was used by the French woollen industry at this time, there is little doubt that the efforts of the Huddersfield Chamber of Commerce and their assistance to Cobden during the treaty negotiations ensured that he was made well aware of the importance

1. *ibid.*, p. 33.

2. C. Parry (ed.), The Consolidated Treaty Series (New York, 1969), 121, p. 243.

3. The Economist 17.3.1860, p. 281. It is interesting to note the Economist's complaints of this on behalf of British paper manufacturers. They had earlier observed that 'For the sake of the paper manufacturers and the intellectual wants they supply, more clothing should have been produced and worn...' (1.7.1854, p. 700).

of woollen rags to West Riding manufacturers.¹

Writing in 1881, Reuss, a prominent German-born Dewsbury rag importer and auctioneer, emphasised the importance of the 1860 Treaty to the woollen rag trade.

'What this district owes to Cobden for procuring under that Commercial Treaty free egress for woollen rags from France into England no man can tell; the quantity of rags, some of the very best to be got, which have been sent to us by France during the last twenty years are simply stupendous'²

Dewsbury rag merchants and shoddy manufacturers were quick to seize the advantages of the new French market, for immediately the Treaty had been signed a number of them went to Paris and bought 'large quantities' of stockings at low prices, securing sizeable profits by selling these in Dewsbury.³ One firm in Dewsbury was reported to have taken delivery of 'no less than twenty-five railway trucks of stockings at one time, forming a whole train'.⁴ An indication of the extent of the short run super-normal profits enjoyed by the rag merchants and shoddy manufacturers of the Batley and Dewsbury district can be seen by comparing the average import valuation of French rags for 1860/61 with those for 1862. (Table III-II(b), Appendix).

The Yorkshire monopsony of the French woollen rag market was broken in May 1861 with the satisfactory conclusion of the Franco-Belgian Commercial Treaty which permitted the shipping of rags between

1. S. Jubb (1860) op. cit., p. 25; Kirklees Chamber of Commerce, Huddersfield Chamber of Commerce Minute Book 14.5.1853-14.10.1868, entries 24/4, 17/5, and 6/7, 1860. Richard Cobden had strong sympathies with the West Riding having represented it for ten years. E.D. Steele, 'Leeds and Victorian Politics', The University of Leeds Review, 17, 1974-1975, p. 265.

2. Wool and Textile Fabrics, 19.3.1881, p. 774.

3. *ibid.*

4. *ibid.* Rapid and efficient collection of woollen rags in France was assisted by the development of roads and railways in the 1850s. A. Barnard, The Australian Wool Market 1840-1900, (Melbourne, 1958), p. 29.

the two countries.¹ Although this treaty prohibited the export of French rags from Belgium to other countries, German rag merchants and mungo manufacturers began to evade this restriction on a large scale. A typical arrangement was to consign rags to a firm of shippers in Valenciennes on the Belgian frontier ostensibly for onward transit to Dunkirk and Hull. These were then redirected to Cologne, Hamburg, and other centres of the German rag and mungo industry where there existed a large and expanding demand for good quality woollen rags.²

The extremely rapid growth of the French woollen rag market, which from 1860 occupied the foremost position in supplies of rags as distinct from rags and pulled shoddy and mungo, for which Germany was the principal exporter to the West Riding,³ was not based solely on the large quantities of cast-off clothing available. As Reuss had implied, it was the quality of French rags which made them particularly attractive to German and West Riding shoddy and mungo manufacturers.

'France supplied beautiful and clean rags such as no other country produced, ... (rags) not elsewhere obtainable'⁴

Amongst these were high quality mungo rags - fine 'Merinos' and 'Thybets' (a fine ladies worsted cloth similar to Merinos), 'Super new' and 'old white' flannels, superior 'light grey' cloth, military blues, blue, grey and red army trousers, and white 'dragoon' rags. In the soft varieties, an excellent quality of shoddy could be

1. Rags, return..., P.P. 1861(376), LVII, 517.

2. Wool and Textile Fabrics, op. cit; W.T.W., 31.1.1914, p. 10. Reuss writes of the impact of French rags in the German market - 'In '61 we began to get our first French rags, especially fine merinos, thybets, white flannels, and molletons. Nothing like them had been seen in Germany before. We made tremendous profits on these fine goods.'

3. v. infra, Table III-II(d), Appendix.

4. F.W. Reuss, 'Old French Rag Merchants and Exporters'; W.T.W., 28.6.1913, p. 8.

produced from the French white, blue-grey, and rose stockings, which, unlike stockings from many sources, were mended with worsted wool and not cotton. There was also a very strong demand for a type of rag found only in France, a woollen puttee known as 'molletons', and 'immense' quantities were shipped to Dewsbury.¹

Although the French woollen industry was at this time using little or no remanufactured wool it is clear that enterprising French rag merchants, wishing to expand their predominantly paper-stock business, were beginning to set up rag-pulling facilities in the 1850s, encouraged by the absence of French restrictions on the export of pulled ragwool. Rutre and Co. of Paris, possibly the first French mungo manufacturers, were, by 1856, producing mungo under exclusive contract to the German firm Mathias Stirn Söhne and sending this direct from Paris to the Hull importers Sykes and Sons for sale by the German firms' agent in Dewsbury at the auctions.² Souchet and Louvet, another Paris rag merchanting firm and the largest in France in the 1860s, were also sending considerable quantities of of mungo rags to a firm of manufacturers in St. Oen and then consigning the pulled material to the Dewsbury auctions.³

The growth of overseas rag-pulling facilities in the late 1820s, principally in Denmark, in response to West Riding demand and restrictions on the export of woollen rags undoubtedly received a powerful stimulus from the newly-established auction market at Batley, and by

1. *ibid.*

2. Wool & Textile Fabrics, *op. cit.*

3. F.W. Reuss, *op. cit.*, W.T.W., 28.6.1913, p. 8.

1851 several German firms had begun to specialise in mungo manufacture for Yorkshire as well as a small number of German and Belgian woollen manufacturers.¹ One of the first German manufacturers was Gustav Schoen, a paper-stock merchant of Worms, who realised the potential of the large quantities of cheap woollen rags passing through his sorting rooms, and persuaded a Mannheim manufacturer with previous rag-pulling experience in Leeds to commence production for the Yorkshire market in 1850.² Schoen was joined rapidly by other German mungo manufacturers in Berlin, Cologne, Hamburg, Mannheim, and Würzburg, including a Morley manufacturer at Wittenberge, and by W.J.D. Valckenberg whose shoddy manufacturing firm in Worms was to become the largest in Germany.³

Both Baines and Jubb commented on the large increase in imports of ragwool in the 1850s, but as this was still classified with imported wool by the Board of Trade no official records of the extent of the trade were made.⁴ Examination of the Hull Customs Bills of Entry however, confirms a sharp increase in the number of bales of shoddy and mungo landed at Hull commencing in the third and fourth quarters of 1852; the ratio of the number of bales of ragwool to those of woollen rags rising from approximately 1:4 in 1852 to nearly equal proportions in the first quarter of 1853.⁵ The absence of records from May 1853 to January 1858 prevents any firm conclusions on the rate of growth during this period, but it would seem likely that the proportions of 2:1 of 1858 were reached around 1856, or just prior

1. S. Jubb (1860) op. cit., pp. 30-32; F. Fenton, op. cit., T.M., 15.7.1881, p. 252; F.W. Reuss, op. cit., W.T.W., 12.4.1913, p.xii, 31.1.1914, p. 10.

2. W.T.W., 4.4.1914, p. 25.

3. F.W. Reuss, op. cit., W.T.W., 12.4.1913, p. xii.

4. E. Baines, loc. cit., p. 79; S. Jubb (1860), op. cit., pp.24, 30-32.

5. H.B. of E. (Hull), 1850-1853, 1858-1860.

to the 1857 commercial crisis.

Baines estimated that the annual weight of imported ragwool, principally from Germany, was between nine and ten million pounds in 1857/8, which compares very closely with estimates based on the Hull records in Table III(ix).¹ Since this amounted to approximately one quarter or one fifth of total estimated United Kingdom production of shoddy and mungo, the reliance of West Riding manufacturers on overseas producers would seem disproportionately large.² There were, however, two important reasons why continental shoddy and mungo manufacturers were able to maintain their strong position in the West Riding recovered wool market after woollen rag supplies eased from 1859/60, when, in theory, the competitive advantages of Heavy Woollen District ragwool manufacturers would have been expected to favour the domestic industry.

The first of these was that continental shoddy and mungo was consistently cheaper than the Yorkshire product, as a comparison between values for the ten year period when the Board of Trade collected detailed statistics and domestically-produced ragwool indicates (Table III(x)).³ Whilst the Board of Trade figures represent the average importers' declared valuation for all countries, and prices realised at the auctions were likely to have exceeded this, it is significant that the larger proportion of ragwool imported was mungo which commanded considerably higher prices than shoddy.⁴ Continental

1. E. Baines, loc. cit., p. 102.

2. S. Jubb (1860), op. cit., p. 22; E. Baines, loc. cit., p. 103. Jubb estimated that domestic production of shoddy and mungo was 38,880,000 lbs in 1858; Baines estimated that domestic consumption (including imported material) in the same year was 45,000,000 lbs.

3. Behrens valued the 52 million lbs. of domestically-produced shoddy in 1867 at 5^d lb. and the 22.4 million lbs. of imported ragwool at 4³/₄^d. Pollution of Rivers Commission, P.P. 1867 (3850), XXXIII, 248, Table B.

4. S. Jubb (1860) op. cit., p. 32. v. infra Appendix III-I(i) for a discussion of import valuations.

TABLE III(viii)

United Kingdom imports of woollen rags, 1850-1914,

YEAR	WEIGHT (TONS)	VALUE (£)	AV. PRICE PER TON(£)	YEAR	WEIGHT (TONS)	VALUE (£)	AV. PRICE PER TON(£)
1850	2,845	15,824	5.56	1883	30,213		
1	1,381	5,761	4.17	4	26,891		
2	1,395	4,412	3.16	5	28,833		
3	1,856	5,620	3.03	6	27,119		
4	2,249	16,634	7.40	7	28,283		
5	2,340	15,867	6.78	8	28,394		
6	2,343	24,370	10.40	9	28,242		
7	2,312	21,408	9.26	1890	31,367		
8	2,994	27,740	9.26	1	33,751		
9	3,761	31,065	8.26	2	23,131		
1860	5,934	126,370	21.29	3	30,399		
1	3,051	58,313	19.11	4	28,810		
2	4,136	102,098	24.68	5	34,974		
3	5,557	146,337	26.33	6	34,311		
4	5,605	148,296	26.46	7	31,260		
5	5,268	140,032	26.58	8	28,462		
6	5,599	131,184	23.43	9	30,689		
7	5,069	116,080	22.90	1900	29,178		
8	6,391	143,903	22.52	1	29,350		
9	5,899	130,312	22.09	2	31,692		
1870	7,738	160,932	20.80	3	30,641	587,909	19.19
1	12,049	N/A 1871-1902		4	38,943	730,438	18.76
2	15,736			5	39,338	726,244	18.46
3	14,212			6	43,351	904,556	20.86
4	15,589			7	49,159	1,026,356	20.88
5	15,932			8	39,059	764,794	19.58
6	18,508			9	46,414	899,380	19.38
7	21,888			1910	58,944	1,147,397	19.46
8	21,620			1	56,338	1,107,101	19.65
9	21,623			2	49,886	968,008	19.40
1880	28,483			3	52,793	1,050,338	19.89
1	27,064			1914	40,177	848,424	21.12
2	30,526						

Note:- gross weight exclusive of re-exports.

Source: Appendix III-I(i).

(1871-1902 estimated from combined woollen rag and shoddy import data in Trade and Navigation accounts).

TABLE III(ix)

Weight of imported shoddy and mungo consumed in the
United Kingdom, 1850-1914.

YEAR	WEIGHT (000s lbs.)	YEAR	WEIGHT (000s lbs.)	YEAR	WEIGHT (000s lbs.)
AV. 1850-54	5,400	1877	25,800	1896	5,300
AV. 1855-59	15,400	8	24,100	7	4,500
1860	16,600	9	23,900	8	3,800
1	17,028	1880	28,600	9	3,800
2	20,097	1	18,400	1900	3,400
3	22,100	2	15,600	1	3,200
4	22,483	3	12,400	2	3,300
5	20,868	4	9,300	3	3,002
6	22,844	5	8,500	4	3,543
7	21,224	6	7,600	5	3,816
8	21,797	7	7,600	6	2,786
9	24,192	8	7,300	7	3,306
1870	21,224	9	6,900	8	3,041
1	27,300	1890	7,400	9	4,512
2	30,400	1	7,400	1910	6,837
3	23,900	2	4,700	1	5,457
4	23,300	3	5,800	2	2,902
5	21,200	4	5,200	3	3,725
6	23,200	5	5,900	1914	6,257

Source:- Appendix III-I(i)
(1850-1860 estimated, 1871-1902 estimated from combined
woollen rag and shoddy data in Trade and Navigation accounts).

TABLE III(x)

Comparison of imported and domestic shoddy and mungo prices, 1861-1870 (pence (d.) per lb.)

YEAR	Imported Shoddy & Mungo (a)	U.K. Produced Shoddy (b)	U.K. Produced Mungo (c)
1861	3.4	5.0	6.8
2	4.0	5.0	6.8
3	4.4	5.25	6.62
4	5.3	5.5	7.08
5	5.0	5.87	7.33
6	4.2	5.5	7.3
7	3.2	5.25	7.29
8	2.5	5.0	7.43
9	2.4	4.7	6.85
1870	2.5	4.25	6.48

Source: (a) Table III-II(d), Appendix.

(b) and (c) Chapter V, Appendix V-I.

manufacturers appear to have enjoyed one major advantage over their West Riding counterparts, namely markedly lower raw material costs - initially a function of export prohibitions or duties on woollen rags, but, from ca. 1860 to ca. 1880 because of a lower domestic demand from continental woollen manufacturers and the effects on woollen rag price formation.¹ Reuss noted that when as a young man he joined the firm of Mathias Stirn Söhne in 1859, 'cut cloth' or prepared mungo rags ready for pulling were purchased at 20^s/- cwt., or 2^s/10^d per stone

1. Rags were exported free from the port of Hamburg but from any other port of the Zollverein or Austria an export duty of between £7.5^s/- and £9.3^s/- per ton was levied. Rags, return ..., P.P. 1861 (376), LVII, 517.

(16 lbs.).¹ Compared to the prices at which Day was selling similarly-prepared rags to West Riding manufacturers in 1858 (Table III(vii)), it is clear that whilst German mungo manufacturers could market their output at Dewsbury prices, their raw material costs were approximately half those of West Riding manufacturers whose costs were determined by the price of rags at the weekly auction sales.²

The second explanation of the high proportion of the West Riding recovered wool market enjoyed by German mungo manufacturers from the late 1850s to ca. 1880 was that their product rapidly acquired and maintained a reputation for high quality. A simple but effective modification to their rag machines in 1857 enabled German producers to manufacture consistently mungos free from rag 'bits' - a problem which Yorkshire did not surmount until the patent was sold to the Leeds machine-makers Joseph Rhodes in 1862.³ Jubb noted that mungo from a number of German firms was

'... excellent, both as regards colour, condition, evenness of fibre, and general character ... (and) superior to the run of the qualities got up in this country.'⁴

Rhodes would appear to have fought off potential Yorkshire infringements of the patent successfully and, perhaps, West Riding mungo manufacturers were not prepared to re-invest in new rag machines in sufficient numbers to effectively challenge German supremacy in mungos, for in 1876 Smith, a Morley manufacturer, could still echo Jubb's comment of 1860.⁵ Indeed, German manufacturers continued to dominate

1. F.W. Reuss, 'Milestones in my Life', W.T.W., 31.1.1914, p. 10.

2. No similar arrangement existed in Germany, and it would seem that in a trade characterised by middlemen with less than perfect knowledge of Dewsbury prices, woollen rag values were considerably less. Reuss notes, however, that from 80 to 90 per cent of Stirn's output in 1859/60 was sold at between 4^d and 1^s/- per lb. (ibid.).

3. This innovation is discussed in Chapter IV, pp. 220-21.

4. S. Jubb (1860) op. cit., pp. 31-32; Chambers's Journal, 1861 op. cit., p. 103.

5. W. Smith (1876), op. cit., p. 221.

the West Riding mungo market until the late 1870s, when an expansion in Yorkshire capacity, mainly in Ossett, and rising German and Austrian domestic demand combined with other factors to progressively substitute domestic for imported mungo.¹

The extent of the German trade in imported ragwool in the 1850s and the singular persistence of the Board of Trade in classifying this with raw wool imports prompted Baines to complain in his paper delivered to the British Association in 1858 that the tables of imported wool from Germany were highly misleading.

'I am assured by the ... Statistical Department of the Board of Trade that no distinction is made ... between the entries of the finest Saxon wool (at) 3^s/- per pound, and those of shoddy, which is only worth a few pence per pound. This is a distinction which ought to be forthwith introduced in the accounts, especially as shoddy, though inferior in value, has become a very important raw material in the woollen manufacture'.²

In 1861 Baines' criticism was met, and the Board of Trade established three classifications under the general heading 'Woollen Rags'; those 'torn up to be used as wool', those 'applicable to other uses', and those 'fit only for manure'.³ From this new classification it is clear that the proportion of woollen rags imported for agricultural use had declined by 1861 to an insignificant .238 tons, and to 173 tons in 1862. This can be explained by the rapid adoption of Guano since 1840 and the inevitable effect of the strong Dewsbury demand on the prices of all but the very lowest classes of woollen rags.⁴ There

1. T.M., 15.1.1882, pp. 9-10; v. supra p.74.

2. E. Baines, loc. cit., p. 79. From the estimates calculated from the Hull Customs records and Baines figure of 9-10 million pounds of shoddy imported from Germany in 1857/8, it would appear that actual imports of German wool were insignificant from ca. 1855.

3. Trade, Navigation and Commerce, Annual Accounts, P.P. 1862(3062), LVI, 1.

4. Trade, Navigation and Commerce, P.P. 1860 (2752), LXIV, 72 et seq. (imports of Guano).

was still an extensive trade in these classes for agricultural use, principally in domestic 'hospital rags', although, by this time, the flocking industry was beginning to utilise grades rejected by shoddy manufacturers.¹ It would therefore seem very probable that the woollen rag import figures for the period 1850-1860 reflect primarily rags purchased for the West Riding shoddy and mungo industry (Table III (viii)) and that those imported for agricultural use were an insignificant proportion of the total.

The reclassified Trade and Navigation figures for 1861-1870, for between 1871 and 1903 woollen rags and shoddy were not specified separately, confirm the conclusions of Baines and Jubb by revealing the extent to which the West Riding woollen trade was dependent upon imported ragwool, the ratio of this to imported rags for the ten year period being approximately 2:1 (Tables III(viii) and (ix)). Although the returns record only the country of shipment and not consignment they do indicate the wide distribution of overseas rag-pulling industries by 1860.² As it is known that Germany was the largest supplier of shoddy and mungo, and as the Hull customs records reveal that most shipments came from Antwerp and Rotterdam, the figures for Holland and Belgium would seem to overstate actual consignments produced in those countries by between 70 and 90 per cent.³

The successful conclusion of the Anglo-French Treaty of Commerce

1. A. Ure (1861) op. cit., p. 753. Report of the Medical Officer of the Privy Council, P.P. 1866 (3645), XXXIII, 619-20. R. Samuel (ed.), Village Life and Labour (Oxford 1975), p. 116. Simmonds (in Ure) observed, 'Instead of consigning old woollen rags to the soil as manure ... every shred is carefully collected and sorted ...'. Bristowe noted that only mixed woollen rags known as 'seams' or 'lands' - the rejected portions from rag sorting mills - were used for manure by 1866. Flock manufacturers pulled low grade wool and mixed cotton/wool rags on rag machines for mattress and upholstery stuffing.

2. Including small shipments from Poland (H.B. of E. (Hull), 1858-1870); Table III-II(d), Appendix.

3. Table III-I(i), Appendix.

in 1860 proved timely for the West Riding shoddy and mungo industry. Wool prices had resumed their upward movement in 1859 following recovery from the 1857 commercial crisis and by July 1860 there were widespread complaints of dear wool, and, in 1861, echoing the difficulties of the mid 1850s, scarce wool.¹ By November 1861, large orders for army goods from the Federal forces, together with bouyant overseas and domestic markets for low woollen goods, had resulted in boom conditions in the heavy woollen districts of Huddersfield and Dewsbury.² The continuing strong demand for all wool fibres as cotton became scarce and expensive brought further complaints of high raw material prices in 1864, including those of shoddy and mungo.³

Unlike their counterparts in the cotton rag trade 'sitting astride (an) inelastic supply line', rag and shoddy importers and domestic rag collectors were able to take advantage of the price-elastic supply of raw materials.⁴ The large demand for fancy unions, pilots, witneys, doeskins, and cheviots, all requiring fine short-stapled mungo, had stimulated rag merchants and mungo manufacturers to seek supplies from the American market.⁵ America supplied a particularly fine grade of mungo rags as well as pulled mungo, as Jubb had observed in 1858, and at least two rag merchants in Batley and Dewsbury had built up a good trade in new and old American mungo clips.⁶ The apparent paradox of large imports of pulled mungo from America during the Civil War⁷ at

1. H.E., 28.10.1859, 3.7.1860; Reports of the Inspectors of Factories, P.P. 1856 (2031), XVIII, 264; Huddersfield and Holmfirth Examiner, 23.2.1856; A. Ure (1861) op. cit., p. 753.

2. H.E., 16.11.1861.

3. H.E., 11.6.1864.

4. D.C. Coleman, op. cit., p. 338; Reports of the Inspectors of Factories, P.P. 1864(3309); XXII, 661; Reports of the Medical Officer of the Privy Council, P.P. 1866(3645), XXXIII, 618; Pollution of Rivers Commission, P.P. 1867 (3850), XXXIII, xx.

5. H.E., 12.3.1864, 1.7.1865; S. Jubb (1860), p. 32.

6. v. supra p. 52.

7. Table III-II(d), Appendix.

a time of severe pressure on American wool supplies can be explained by the fact that American civil and military production required predominantly the longer-stapled shoddy, and as Jubb noted, the long-stapled 'extract' fibres' which were exported in large quantities by British carbonising firms.¹

From 1864, however, the supply of new American mungo clips began to come under pressure, as a letter from O'Niell, a Philadelphia rag merchant, to Henry Day of Dewsbury, indicates.

'There is a great many of the manufacturers beginning to use the new cloth here now, so that leaves it very scarce ...'²

Nevertheless, the use of American mungo, the grades variously described as 'fine America grey', 'old America grey mungo' and 'America grey', became a standard ingredient in blends used by Batley and Dewsbury manufacturers until ca. 1870.³ This was assisted by an increase in imports of pulled material from America between 1866 and 1868, as New England shoddy manufacturers, faced with war-induced over-capacity in the wool textile industry, weak domestic demand, and massive tonnages of reclaimed military clothing, struggled to keep their rag machines running by supplying Yorkshire demand.⁴ With the revival of American demand in 1868/9, this unexpected source of supply ceased suddenly, but at its height it had represented about 10 per cent of total American output.⁵

The strong demand for mungo, indicated by the rise in price in the index, led to heavy stocks of shoddy rags accumulating in rag

1. A.H. Cole, The American Wool Manufacturer (New York, 1969 edn.) I, p. 315; S. Jubb (1860) op. cit., p. 28; T.M., 15.6.1881, p. 209.

2. H.D. MSS., loc. cit., letter 7.10.1864.

3. G. and J.S. MSS., loc. cit., Receiving Day Book, 18.4.48-31.7.1871; J.T. and J.T. MSS., loc. cit., Blend Book, 31.3.1857-10.3.1866.

4. A.H. Cole, op. cit., p. 316. This included more than two million overcoats, nearly one million blankets and over two and a half million articles of other wool clothing.

5. *ibid.*, p. 268. American production of recovered wool in 1864 amounted to 19,000,000 lbs. (Table III-II(d), Appendix).

merchants hands, particularly following the drop in American demand after 1865.¹ Trade reports are replete with the plight of soft rag dealers, the market for this class of rags improving only with the upturn in trade and outbreak of the Franco-Prussian war in March 1870.²

To what extent did West Riding woollen and shoddy interests promote the rapid growth in the supply of raw material in the 1850s and 1860s? There is little evidence that apart from the few trade connections which must have existed in the 1830s and 1840s any positive steps had been taken by West Riding manufacturers or merchants up to the 1850s. Such arrangements as existed were either transacted through the Hull import agents acting for the foreign consignor or as a result of entrepreneurial initiative from the small but growing rag-pulling industries of Denmark and Germany.³

Several Batley and Dewsbury rag merchants had started import commission arrangements with German manufacturers in the early 1850s⁴ and it is no coincidence that two of these merchants were the first to commence regular weekly rag and mungo auctions - Pearson and Rydill in ca. 1851, joined by Cullingworth and Eastwood by 1857.⁵ Commission business was actively sought by travelling to Germany and carefully building up business connections with continental mungo manufacturers and rag merchants.⁶

Mark Oldroyd and Sons, the largest vertically integrated woollen manufacturers in Dewsbury with, in 1857, a twelve-machine rag grinding department, recognised the possibilities of the French market and, at

1. Chapter V, Appendix V-I. Jubb noted in 1860 that the past predominance of soft rags was beginning to give way to hard woollen mungo rags (ibid., p. 29).

2. H.E., 6.1.1866, 5.1.1867, 4.1.1868, 2.1.1869, 1.1.1870, 7.1.1871.

3. F. Fenton, op. cit., T.M. 15.7.1881, p. 252; F.W. Reuss, op. cit., W.T.W. 12.4.1913, p. xii.

4. ibid. The German firm of Gustav Kober at Mannheim, for example, appointed Charles Fitton of Huddersfield as their agent (T.M., 15.7.1881, p.252).

5.v. supra p. 42.

6. F. Fenton, op. cit., 15.7.1881, p.252.

the same time, the need to secure a regular and cheaper supply of raw material than was available through West Riding rag merchants and the auctions. In 1857 Oldroyd sent the manager of his rag grinding department to supervise the installation and running of a subsidiary at Douai equipped with four rag machines, for which supplies of rags were obtained by regular journeys through France, Germany, and Denmark, the pulled ragwool being sent to Dewsbury and thus avoiding the French prohibition before 1860.¹ Earlier than this, however, a Batley master mason, Joshua Pyrah, was credited with establishing one of the first shoddy mills in Berlin in 1850 with the assistance of John Nussey of Carlinghow Mills and a Heckmondwike manufacturer, to supply them and other mills with pulled ragwool.²

Reuss was typical of the small but growing number of French and German rag merchants and agents who began to settle in the Dewsbury and Batley area in the 1860s 'attracting vast consignments from an ever increasing clientele'.³ Other continental rag merchants sent agents to Dewsbury regularly and 'booked orders to the extent of hundreds upon hundreds of tons for successive delivery'.⁴ Reuss himself travelled extensively in France from 1866 visiting rag merchants in cities and larger towns and

'taught scores of firms in the country who used to send their raw rags to Paris, how to prepare and sort them for the Dewsbury market'.⁵

There can be little doubt that these developments contributed markedly to lessening imperfections in knowledge of Dewsbury rag prices in

1. W.T.W., 12.4.1913, Supplement, p. xii.

2. J. Willans (1880) op. cit., p. 16. John Blackburn, shoddy manufacturer of Batley Old Mill, joined the enterprise sometime in the 1860s and later became the owner. See also S. Jubb (1860), p. 24.

3. F.W. Reuss, op. cit., W.T.W., 12.4.1913, p. xii, and in Wool and Textile Fabrics 19.3.1881, p. 774.

4. F.W. Reuss, op. cit., W.T.W., 28.6.1913, p.8.

5. ibid., and Report of the Medical Officer, P.P. 1866 op. cit., 618. Bristowe noted that a proportion of woollen rags were imported direct by West Riding manufacturers.

Europe, and in so doing maintained the steady growth of supplies to the West Riding at a time of very rapid expansion in the woollen sector.¹

From 1871, the Trade and Navigation accounts become far less detailed, subsuming both rags and shoddy under one category - 'Rags, woollen, applicable to other uses than manure, torn up or not' - the valuations of each being aggregated.² It has, however, been possible to attempt to separate the data for the period to 1903, when the returns again distinguish rag imports from those of rag wool. The method used, which is discussed more fully in Appendix III-I(i) to this chapter, establishes a simple ratio between bales of rags and bales of ragwool landed at Hull as itemised in the 'Ships' reports' section of the Customs Bills of Entry, the accuracy of this method being verified for sample years in those returns recording full information (between 1861 and 1870 and for 1903). It has not been possible to classify these totals under separate countries, and it is extremely doubtful if this exercise would prove illuminating in view of the Customs practice of recording only the port of shipment of all imported goods. The aggregated tables showing the country of shipment are therefore reproduced from the Trade And Navigation accounts.³

The disaggregated tables indicate imports in pounds weight for shoddy and tons weight for rags, but for purposes of comparison of the change in relative proportions over time, shoddy imports have been

1. In his 'Supplementary Account of the Woollen Trade to 1870' Baines makes this point 'There has been ... a great increase in the quantity used, and the increase has been mainly obtained by a more thorough ransacking of every country where woollen rags are to be found'. (p. 109). See also J.R. McCulloch (1882, op. cit.,) Supplement, p. 256.

2. Trade, Navigation and Commerce, Annual Accounts, P.P. 1872 (C.615, I to III), LVI, 55.

3. Tables III-II, (b) and (c), Appendix.

shown in tons in the accompanying graph (Fig. III (i)). From this it can be seen that commencing in ca. 1872 the import of rags began to increase absolutely and relatively, imports of shoddy and mungo peaking in 1872, and then rising again to ca. 1880 from whence a rapid descent commenced.¹ The graph has been adjusted to exclude the large re-export of woollen rags, principally to the United States, in the years 1877-85, 1895/6, and 1905-11.²

A rapid revival in the trade of the Heavy Woollen District in 1870, following several years of 'average' business since the depression year of 1866, had little immediate effect on wool prices, retained imports of wool only just falling short of the peak levels reached in 1866.³ Indeed, the abundance and cheapness of wool induced many union-goods manufacturers to shift production to all-wool goods.⁴ Demand for all classes of shoddy, however, began to rise, as French and German orders for blankets, overcoats, and other clothing for their armed forces started to flood in to Dewsbury and Batley on the certainty that the war would continue through the winter of 1870/71.⁵ In 1871, despite a 13 per cent increase in retained foreign and colonial wool, manufacturers complained widely of losses incurred in forward contracts as wool prices in some classes rose to historic peaks.⁶

Rag supplies proved highly elastic, the tonnage imported nearly doubling between 1870 and 1872, partly because of higher prices and partly owing to continental rag merchants switching supplies from

1. A short history of the Dewsbury auctioneering firm of Henry Cullingworth and Sons, from surviving records in 1919, confirms this, noting that 'up to 1880 the sales by auction consisted chiefly of mungo and shoddy, which came in large quantities from the Continent'. (W.T.W., 12.7.1919, p. 11).

2. Table III-III(a), Appendix.

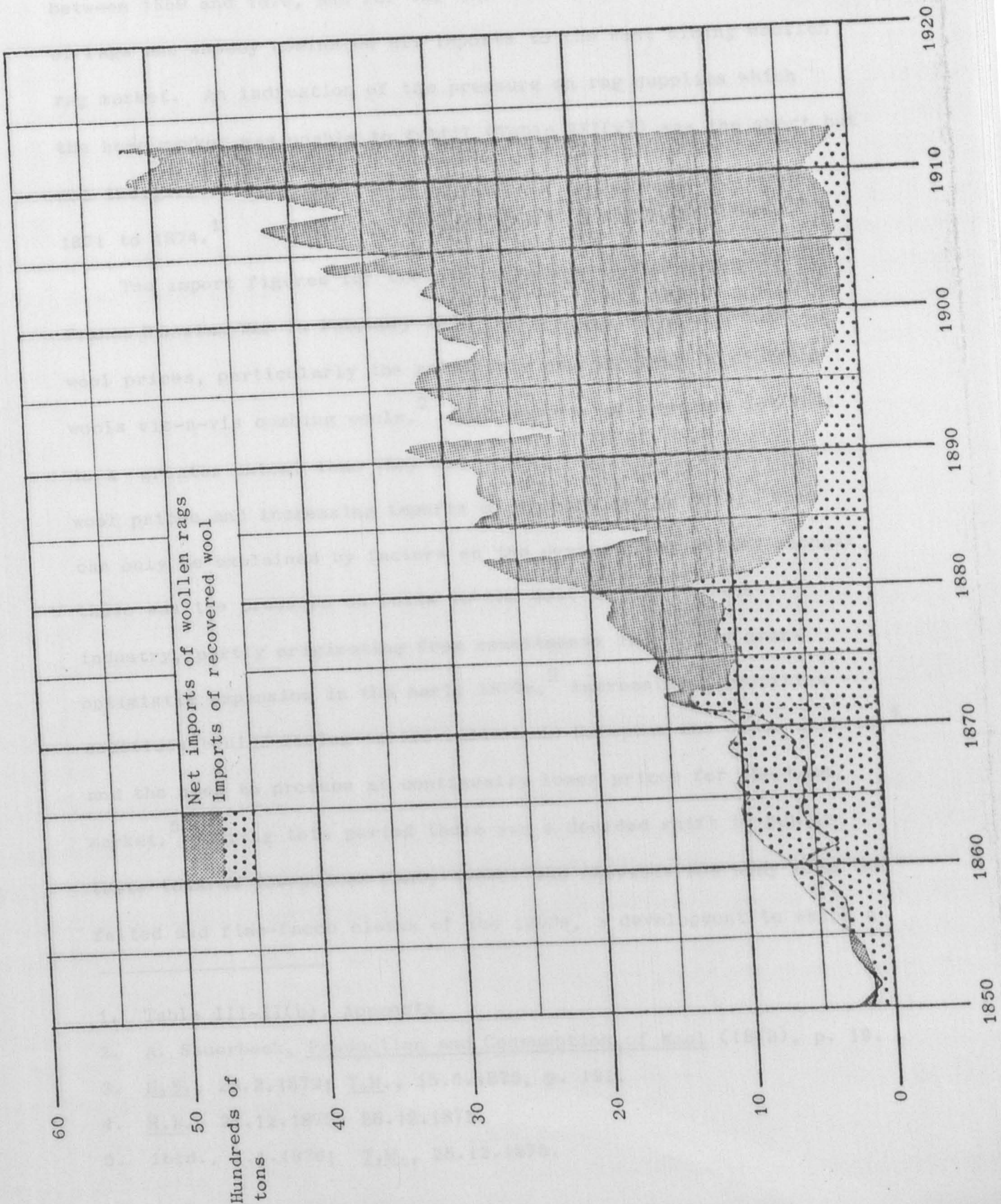
3. H.E., 4.1.1868, 1.1.1870.

4. ibid., 31.12.1870.

5. ibid.

6. ibid., 30.12.1871.

Fig. III(i). Net imports of woollen rags and recovered wool, 1850-1913.¹



1. Between 1855 and 1871 net imports of rags (indicated by lower line on graph) were less than imports of recovered wool.

German and French woollen industries, which, by this time, were producing large quantities of military clothing requiring only certain classes of rags. Imports of rags from France rose by over 72 per cent between 1869 and 1870, and for the next five years French supplies of rags and shoddy dominated all imports to the West Riding woollen rag market. An indication of the pressure on rag supplies which the home market was unable to fulfil (Table III(v)) was the short but not insignificant tonnage imported from the Channel Islands from 1871 to 1874.¹

The import figures for the period following the ending of the Franco-Prussian War in February 1872 reflect the marked fall in wool prices, particularly the relatively sharper fall in clothing wools vis-a-vis combing wools.² That imports of rags did not fall to a greater extent than they did during a period of declining wool prices and increasing imports of foreign and colonial wool can only be explained by factors on the demand side. Chief amongst these was the pressure on costs in the West Riding woollen industry, partly originating from commitments induced by over-optimistic expansion in the early 1870s,³ increasing competition - sometimes behind rising tariff walls - in European and other markets,⁴ and the need to produce at continually lower prices for the home market.⁵ During this period there was a decided shift in public taste towards low-priced fancy tweeds and cheviots and away from the felted and fine-faced cloths of the 1860s, a development to which a

1. Table III-II(b), Appendix.

2. A. Sauerbeck, Production and Consumption of Wool (1878), p. 19.

3. H.E., 28.2.1872; T.M., 15.5.1875, p. 191.

4. H.E., 27.12.1873, 28.12.1878.

5. ibid., 1.1.1876; T.M., 28.12.1878.

number of manufacturers from Huddersfield to Dewsbury responded with alacrity.¹

The effect of this on the rag market was to begin a movement towards soft rags and away from mungo rags. Trade reports of the 1870s contain a plethora of references to the strong demand for better class soft rags, especially best whites, and a relatively steady but 'quiet' demand for most mungo rags.² In 1875 and 1876 prices of all classes, with the exception of good quality soft and mungo rags, were low and many overseas consignors to the Dewsbury sales complained of unremunerative prices.³

Indicative of the narrow market in woollen rags and the characteristic response of this market to the demand for military clothing, threat of war between Russia and Turkey in 1877 had an immediate effect on prices and supply. Advances of 25 per cent in the prices of the better classes of softs⁴ and a 41 per cent rise in the price of light brown stockings from 24^s/- cwt. to 34^s/- cwt. between October 15th and November 11th brought a rapid response, as a trade report indicates.

'Prices ... have hardened in Germany, Austria, and France, and in consequence the supplies now being poured into this district are very great, and are likely to lead to a reduction in quotations'.⁵

For those rag merchants not specialising in the supply of materials for army cloth, and those concentrating in mungo rags, conditions were bleaker, ameliorated only by a rapidly growing trade in the re-export of rags to America commencing in 1876.⁶ Supplies of many

1. H.E., 1.1.1876, 30.12.1876, 28.12.1878; T.M., 15.3.1877.

2. H.E., 2.1.1875, 1.1.1876, 30.12.1876, 28.12.1877 etc.; T.M., 15.6.1875, 15.2.1876, 15.11.1877, 15.7.1879.

3. H.E., 1.1.1876; T.M., 15.1.1876, p. 12.

4. T.M., 15.11.1877, p. 362. 5. *ibid.*

6. T.M., 15.9.1879; Appendix, Table III-III(a).

classes of rags again became very elastic as American purchases, although subject to an import duty of 6^d per lb., reached over 4,000 tons in 1880.¹

The period from 1850 to 1880 was therefore one of very marked growth in supplies of woollen rags to the West Riding woollen industry. Gross imports of rags and ragwool rose from just over 4,300 tons in 1850 to 41,256 tons in 1880, an increase of nearly 800 per cent, and estimated domestic rag collections increased from an average of nearly 11,000 tons in the period 1850-54, to nearly 43,000 tons in 1880, a rise of 300 per cent. During this time factors on the demand side had elevated hard woollen or mungo rags to a pre-eminent position, but whilst this class of rags was to remain a staple in the Morley, Ossett, Batley, and Dewsbury union and pilot-cloth trade for the remaining period covered by this study, their dominance began to wane as fashions started to change in the 1870s.

Prices of woollen rags, as in the case of French and American rags in the 1860s, depended very much on their original quality and the condition in which they were in on arrival at the Dewsbury sales. As Jubb had observed in 1860, great knowledge was needed by rag merchants when purchasing at the auctions.² Fenton, a Batley woollen manufacturer, observed in 1881 that many classes of domestic rags, especially those from Ireland, Glasgow, and Manchester, were notorious for their 'worn and wretched' quality, and rags from the iron and coal districts whilst 'not worn to the seams' were 'thick and sooty'. Domestic

1. D.R., 1.1.1881.

2. S. Jubb(1860), op. cit., p. 33.

raggs of better quality, 'clean, large-pieced, and moderately worn' came, not unexpectedly, from London, as well as the agricultural districts, and were valued more highly for the superior quality of mungo and shoddy that could be produced from them. The best domestic raggs came from the seaport areas in the form of 'thick and unpatched stockings, Guernseys and flannel shirts, and indigo jackets and trousers' as 'clean as if washed before selling to the rag collector'.¹ It is clear from this trade source that by far the larger proportion of domestic raggs collected came from the first categories, the 'bulk of the manufacturing work people', and whilst the figures for estimated domestic rag collections indicate their predominance over imported raggs, the quality of much of the shoddy and mungo produced from them would, at best, go into the cheapest of cloths, and, at worst, into the flocking trade. The inelasticity of supply in the better classes of domestic raggs was to be of no small importance in 1884/5, and more particularly, in 1892/3 when imports of raggs from the continent were prohibited by the Local Government Board.

Raggs from Germany and Denmark still maintained their position as the best classes of softs and mungos, closely followed by Dutch raggs which were very similar in quality to English 'seaports'. Those from Italy and Spain varied in quality, but raggs from Egypt and Turkey were 'wretched'. The trade writer, however, drew forth a sharp response from Reuss by describing French raggs as 'from a population as deeply impoverished as those of Ireland or Glasgow'. Reuss, who specialised in importing French raggs and was well qualified to comment on them, replied that the writer had, 'no doubt for want of more intimate knowledge, cast a slur upon French

1. F. Fenton, op. cit., T.M., 15.7.1881, p. 252.

stockings, which I must remove', and pointed out that many districts of France 'supply this and other markets with a class of stocking far superior to any other country, and which command very high rates at our auction sales'.¹ A terse note in a Leeds woollen manufacturers' mill book in 1878 would seem, albeit qualitatively, to confirm this - 'French grey rags are better than English - English black and colours better than foreign'.² Unfortunately, the valuation of yearly imports of rags in the Trade and Navigation returns are less than helpful in comparing the relative quality of each country's rags. Firstly, the inclusion of shoddy in these valuations weights those imports designated from Germany, Holland, and Belgium disproportionately, and secondly, the valuations were based upon importers' declarations c.i.f. Hull, Liverpool, or London which did not necessarily reflect the market price when sold at Dewsbury. However, as the importation of pulled ragwool began to decline markedly from 1880, the returns are progressively more useful in indicating the relative differences in value between the various sources of woollen rags, the large tonnages from France and Germany being valued consistently above other significant sources.³

A distinctive feature of the second phase in the supply of woollen rags and shoddy to the West Riding was the relative stability of both imports and domestic supplies at a time of almost continually declining textile raw material prices and, between 1879 and 1906, an increase of over 100 per cent in the 'actual' weight of retained foreign and colonial wool.⁴ A major factor operating on the demand side is discussed in Chapter V below but can be identified as a structural inelasticity of demand for shoddy and mungo strongly associated

1. *ibid.*; Wool and Textile Fabrics, 19.3.1881, p. 774. Fenton's series of articles had originally been published in this journal.

2. Alfred Briggs and Sons MSS., *loc. cit.*, Mill Book 1858-1936.

3. Table III-II(b), Appendix.

4. Prior to scouring.

with the relative price levels between recovered wools and virgin wool, and the special properties belonging to recovered wools as supplementary rather than substitutable raw materials. On the supply side three factors would appear to suggest that apart from short-run supply elasticities stimulated by sudden and sharp increases in wool prices, the long-run supply of woollen rags to the West Riding tended towards inelasticity for the very reasons that had previously confronted the domestic paper industry before the introduction of wool pulp - the growth of overseas rag consuming capacity competing for a finite stock of raw material and the resulting gradual erosion of Yorkshire price dominance in the international rag market. Other factors exacerbating these difficulties for West Riding shoddy and woollen rag users were the growing problems of woollen rag quality and, indicative of demand inelasticity, the effect on prices of inclement weather delaying collection and transit of supplies to Dewsbury. The many comments in trade reports during this period of a 'scarcity' of rags do not, as the cross price elasticity values indicate, refer to an actual shortage of available rags, but to a scarcity of certain qualities at a particular time and, a very important consideration to the Yorkshire manufacturer, a scarcity of rags at a price the industry was prepared to pay.¹ Thus long-run supply inelasticities would seem to have been primarily a function of the ceiling prices ruling at the Dewsbury auctions.

The growth of competition for woollen rags from overseas manufacturers began to attract trade attention in 1880 as the upturn in prices, which had started towards the end of 1879, was sustained by steady demand from the Batley and Ossett trade and sizeable purchases from American houses.² A trade review of 1880 had few

1. W.T.W., 16.10.1915, p. 3.

2. D.R., 1.1.1881.

doubts that the reason for continued high prices and shortages in the better grades of rags was as a result of 'a growing demand on the part of German manufacturers who are now protected by heavier import duties on cloth (and who) now buy a considerable quantity of material in Holland, which country used to send its entire produce to England'.¹

Reuss, in 1881, observed that increasing price competition from German, French, Italian, and Spanish shoddy manufacturers had virtually closed the southern French market to Yorkshire, and was beginning to divert supplies of mungos and black stockings from Paris, where rag merchants had become 'less dependent upon England than they have been'.²

Trade complaints of European competition recur in 1889, when some continental purchasers were 'offering fairly good prices for English rags of the better quality' as well as 'depriving this district of the large consignments which used to arrive here'.³ These complaints were again made in 1895 and 1906, specifically of German manufacturers in the Belgian and Dutch markets.⁴ There is, however, one factor constant in the apparently random appearance of this theme in contemporary trade reports: on each occasion (1880, 1889, 1895, and 1906) wool prices were rising or high, and in all but one year, substantial re-exports of rags of between 8 and 10 per cent of total imports took place. The exception, 1889, experienced a marginal fall in imports compared to 1888 as the price of Lincoln, Port Philip, and Dorset wools advanced 9.5 per cent. Thus it would appear that contemporaries were correct in seeing a scarcity

1. *ibid.*

2. Wool and Textile Fabrics, 19.3.1881, p. 774; T.M., 15.1.1882, pp.9-10.

3. T.M., 15.8.1889, p. 386.

4. H.E., 28.12.1895; D.R., 29.12.1906.

of rags but that this scarcity reflected to a large extent the weakness of Dewsbury prices relative to those prevailing elsewhere.

A second problem on the supply side, again attracting growing trade comment from the early 1880s, was an alleged decline in the quality of woollen rags. A characteristically inescapable feature of the woollen rag market was that collection in any one year necessarily reflected the quality and nature of past clothing consumption. The problems arising from the growing incorporation of cotton warps in both worsted and woollen fabrics from the late 1830s were technically overcome with the introduction of the carbonisation process in ca. 1851. Indeed it could be argued that the incentive to perfect 'extract' wool, the quality of which did not endear itself to West Riding manufacturers for several decades, may have become less urgent when access to the French woollen rag market was gained in 1860. The new problem, however, arose from the adulteration of woollen garments by shoddy itself and could not be avoided so easily, the past exports of Yorkshire returning to Dewsbury with a vengeance, as Reuss noted in 1881.

'The French wear, now-a-days, cheap English cloth to a much greater extent than formerly, and this cloth being (perhaps to our benefit) of not over-long duration, the garments soon return to the rag-gatherers' baskets'¹

A trade source in 1881 went further

'... the proportion of "linseys" is becoming greater every year. All wool rags will be very scarce ere long, so universal has become the manufacture of cloth in which shoddy and mungo enter largely, and the question arises what is to take their place?'²

1. Wool and Textile Fabrics, 19.3.1881, p. 774.

2. D.R., 1.1.1881; H.E., 30.12.1882.

The difficulty in obtaining supplies of better quality woollen rags appears to have been most acute between 1880 and 1882, a trade commentator observing in January 1883 that 'almost every country under the sun is being scoured for them.'¹ As continental consignors began to restrict supplies of lower quality rags to the Dewsbury sales because prices realised would not meet transport costs, the prices of better grades began to rise sharply until checked by a downturn in demand in 1883.² This problem again recurred in 1895 and 1907 and, as with complaints of overseas competition in the woollen rag market, coincided with a short-run rise in the price of wool and increased activity in the European and Yorkshire low woollen industries.³

A third factor on the supply side, again occurring frequently in trade reports from the late 1880s, was the disruptive effect of bad weather on rag supplies.⁴ In the period preceding the end of boom conditions in the Heavy Woollen District the equilibrating function of West Riding rag merchants appears to have worked satisfactorily, for there is no evidence from trade sources that seasonal shortages occurred, or if they did, were of no more than a localised and temporary nature. Supplies of cheap rags were accumulated in the summer and early winter and those not needed for existing contracts were 'sorted to stock' to meet demands from manufacturers when supplies were scarce and the new season's production begun after the year-end stocktaking.

Comparison of the Trade and Navigation monthly accounts and the

1. T.M., 15.1.1883, p. 27.

2. D.R., 1.1.1881; H.E., 29.12.1883.

3. H.E., 28.12.1895; D.R., 28.12.1907.

4. H.E., 28.12.1886; T.M., 15.5.1889, p. 233, 15.10.1889, p. 488, 15.1.1890, p. 28; D.R., 7.12.1889.

Hull Customs records with records of monthly commissions of Benjamin Eastwood, a Dewsbury firm of rag auctioneers, confirms this. Imports of woollen rags and shoddy were usually sharply reduced in January and February, rising from March until mid December with a peak generally occurring in July and August.¹ Commission income was characteristically high in January, April, and November, and low in December, and whilst an allowance must be made for the influence of prices on gross commission, it seems clear that the volume of rags reaching the market in normal circumstances was evened out by rag merchants liquidating previously-acquired stocks.² Production and distribution lags in consignments of German and other European produced shoddy and mungo appear to have assisted in this, sometimes large imports being landed at Hull in December and January at a time when rag imports had dropped markedly.³

The most plausible explanation of the regular trade complaints of bad weather affecting supplies, particularly between 1886 and 1890, is that rag merchants had become reluctant to carry more than small stocks during this period. References to 'stocks in first hands low' or 'buying has been from hand to mouth' reflect the generally very low level of rag and wool prices and a preference for capital liquidity rather than the perceived risks of stock investment in an uncertain and declining market.⁴ Classes of mungo rags, for example, in blacks, dark greys, brown, blues, mid-greys, and light

1. Benjamin Eastwood and Nephew MSS., loc. cit., Account Books 1890-1937.

2. In normal circumstances, purchases of woollen rags and other raw materials tended to be low in December because of stocktaking.

3. H.B. of E., (Hull), loc. cit., 1858-1903.

4. H.E., 1.1.1887, 31.12.1887. It was noted in 1888, for example, that the failure of West Riding rag merchants had 'thrown a lot of stock onto a poor market'. (Textile Recorder, VI, 15.6.1888, p. 44).

greys selling at between 40^s/- and 60^s/-percwt. in 1883/4 were selling at 12^s/-percwt. in December 1889, even after a revival of prices in October.¹ Rag merchants were also well aware of the record number of bankruptcies and deeds of arrangement registered between 1884 and 1886 as evidence of the heavy penalties of stock holding in a bad market.²

A sudden change in fashion to lighter weight worsted cloth, assisted partly by the two exceptionally mild winters of 1882 and 1883, ended the period of high rag and shoddy prices which had commenced in 1877 with the growth in popularity of Colne Valley and Dewsbury imitation Scotch Tweeds.³ Whilst good mungo rags remained in steady demand, prices of old stockings fell 25 per cent, low whites 15 to 20 per cent, and flannels 25 per cent, causing overseas rag merchants, particularly those in Holland, to reduce consignments considerably.⁴ The continued demand for mungo rags until 1885/6, at a time when the old 'staple' pilot overcoating trade was coming under considerable pressure, was assisted by the activity in the specialised military cloth section of the Heavy Woollen District and, in 1883 and 1884, by the re-export of nearly 20,000 tons of rags to meet American demand.⁵

The first internal constraint to affect supplies of rags to the West Riding came in the form of various orders by the Local Government Board from June 1884 prohibiting the import of all rags from France, Spain, and Italy, where serious cholera outbreaks had resulted in

1. D.R., 30.12.1889.

2. H.E., 31.12.1887; v. *infra* p. 570.

3. H.E., 30.12.1882, 29.12.1883; D.R., 31.12.1881.

4. H.E., 29.12.1883.

5. *ibid.*; and v. *infra* pp. 461-69.
Table III-III(a), Appendix.

considerable argument at Westminster to limit the importation of certain articles thought to carry infection.¹ Whilst imports of rags from Italy and Spain were insignificant (107 tons and 42 tons respectively in 1883), the cessation of supplies from France in July 1884 until early 1885 resulted in a drop of 27½ per cent from the 1883 level.² Although there were complaints that the prohibition had 'greatly interfered with trade', the short duration of the Order and a sharp decline in wool prices appears to have had little effect on rag prices.³ Indeed, a trade report in December 1884 noted that soft rags were 'lower now than for a number of years' because of the limited demand for them from manufacturers, and evidence suggests that if American buyers had not taken one third of all imported rags off the market, prices may have slumped still further.⁴

Between 1885 and 1890 the developing three-cornered battle between tweeds, worsteds, and the staple heavy cloths for a share of a very competitive market was reflected by sharp rag price fluctuations in an under-stocked situation.⁵ Whilst 1885 was lamented as 'the worst year for the present generation of mungo dealers and manufacturers', particularly as demand from the Morley trade for new clips was virtually non-existent, dealers in soft rags saw prices advance sharply between July and September in response to London and Liverpool wool prices - London Merinos for example, rising from 18^s/- to 34^s/- cwt., and super whites from 40^s/- to 68^s/-.⁶ Net imports of rags rose

1. Fourteenth Annual Report of the Local Government Board, P.P. 1884/5 (C. 4515), XXXII, 121. 2. Table III-II(b), Appendix.

3. H.E., 27.12.1884; Sixteenth ... Report, P.P. 1887 (C.5131) XXXVI, 143; Seventeenth ... Report, P.P. 1888(C.5526), XLIX, clix. The order prohibiting the import of rags from Spain lapsed in 1886 and was rescinded in 1888 for Italy.

4. H.E., 27.12.1884.

5. ibid., 26.12.1885, 28.12.1886, 31.12.1887.

6. ibid., 28.12.1886.

Victor Galaup, founder of a large Paris rag merchanting and exporting firm who had maintained a warehouse in Dewsbury since the late 1870s, drew attention to the large trade in new clips (new cloth or mungo tailors' cuttings) between France and Yorkshire which he alleged exceeded £1 million annually,

'Stop immigrants, stop beddings, do not allow old cotton or linen rags in England, but do not deprive one of the most important branches of industry of its necessary raw material, as it has never been known to convey cholera'¹

Reuss, whose import and auction business depended to a large extent on the French woollen rag market, organised a petition of West Riding woollen and mungo manufacturers and rag importers, collecting over 150 signatures. This was sent to the Local Government Board in late October 1892 with a covering letter from the Dewsbury Chamber of Commerce and was given wide publicity in trade journals and the local press.² The tenor of the letter strongly indicates West Riding irritation at the apparent lack of official knowledge of the extent of the rag and shoddy industry, emphasising that well over 1,000 tons of domestic and foreign rags were consumed weekly by the woollen textile industry. Drawing attention to the scarcity of certain classes of rags and the 'utterly insufficient' supply of domestic rags, the Chamber commented that it was 'able to furnish particulars of a case where a Leeds manufacturer had to refuse an order for 10,000 yards of cloth for export because neither he nor anybody else could find the rags of the peculiar class to make the cloth', adding that there were 'abundant similar instances'.³ Certainly, other evidence

1. *ibid.*, p. 224.

2. *D.R.*, 29.10.1892; *T.M.*, 15.12.1892, p. 529; *T. My.*, 5.11.1892, pp. 336-7.

3. *ibid.*

50 per cent from the low level of 1884 as trade began to revive in 1888 and 1889, with worsteds and cheap tweeds gaining at the expense of heavy woollens.¹ Indeed, in 1887 one trade commentator was moved to write that 'there is now little hope that the old pilot trade (of Batley) will return'.²

Imports of woollen rags as well as domestic collections, which had risen in 1890 and 1891, received a sharp setback in 1892. A second and far more serious outbreak of cholera in Europe again raised fears of infection being transmitted by woollen rags, and in July the Local Government Board issued an order prohibiting the import of all rags from France which was rapidly extended to cover imports from all continental sources.³ By early September fears were being openly expressed that if the prohibition continued for very much longer many Dewsbury mills would be forced to curtail their production.⁴ Perhaps, an editorial in the Textile Mercury observed,

'such an event would not be such a bad thing after all, if it forced the public to see how much in the way of cheap clothing they owe to the enterprise of the Shoddy manufacturers of Yorkshire'⁵

1. H.E., 29.12.88. Worsteds used large quantities of black cotton and carbonised mungo for the backing yarns. (T.M., 15.6.1883, p. 212).

2. H.E., 31.12.1887.

3. Twenty Second ... Report, P.P. 1893/94 (C.7180), XLIII, 160. The initial order prohibited imports from France from 11.7.1892 and was progressively extended in August to include all European countries, as well as Russia, Turkey, and Asia - but excluding Norway, Sweden, and Denmark. Under the Public Health Act 1875 supplemented by the Infectious Diseases (Prevention) Act of 1890, power to force disinfection or destruction of rags rested solely with local sanitary authorities, who issued instructions to the Customs House officials to take the necessary steps. What alarmed Yorkshire manufacturing interests in 1892/3 was the absolute, not selective, prohibition imposed by the Local Government Board. (T.M., 15.9.1893, p. 407).

4. T.My., 10.9.1892, p. 181.

5. ibid.

suggests that a number of spinners, weavers and dyers in Dewsbury suffered unemployment as a direct result of the scarcity of raw materials.¹ Concern over a possible 'flood' of imports and loss of overseas markets to cheap German goods, a favourite hobby-horse of a number of Dewsbury manufacturers, was heightened by the knowledge that German manufacturers had quickly taken advantage of cheaper rag prices in the absence of Yorkshire buyers.²

The efforts of the Dewsbury Chamber of Commerce in publicising the deterioration in local trade succeeded in prompting The Times to write a leader in early December drawing attention to the 'extensive and important' section of the woollen industry using rags as a staple raw material, and arguing the case for allowing importation of mungo rags (subject to carbonising) and new clips. Shortly after a visit to Dewsbury by an inspector from the Board in which a tour of the extensive works of shoddy manufacturers E. Fox and Sons had been arranged, the supply situation was partially eased when all restrictions on new clips were lifted in December 1892.³

The effects of this were limited, however, and within a week two separate conferences organised by rag merchants and shoddy and mungo manufacturers were calling for an end to the prohibition and protesting strongly that the Customs, on the orders of the Board, were rejecting consignments of new clips 'on the most flimsy grounds'.⁴ In its annual meeting in January 1893, the Ossett Chamber of Commerce emphasised growing unemployment and idle machinery

1. D.R., op. cit.

2. Third Report of the Royal Commission on Depression of Trade and Industry, P.P. 1886 (C.4797) XXIII, 288-89 (Oldroyd); D.R. 29.10.1892; T.M. 15.11.1892, P.555.

3. Twenty-second ... Report, op. cit., 160.

4. T.My., 24.12.1892.

in the Leeds and Morley districts 'whilst Continental producers of mungo and shoddy were said to be running night and day'.¹ Later the same month the combined interests of the Batley, Dewsbury, and other Heavy Woollen District Chambers sent a deputation headed by Dewsbury manufacturer Sir Mark Oldroyd to press the Board for immediate revision of the prohibition on imported woollen rags. The Board appeared impressed when Mathew Walker, a Pudsey woollen manufacturer, produced a pattern book containing 60 different cloths produced by his mill, nine-tenths of which, he claimed, could not be made to meet export orders because Belgian, Dutch, and French rags were unobtainable.² The outcome of these efforts, together with the installation of a large boiler to disinfect rags on Hull docks by a Batley firm and the decline in fresh outbreaks of cholera on the Continent, was to persuade the Board to relax temporarily the restrictions, and immediately large quantities of woollen rags were landed at East Coast ports 'sufficient to meet all requirements up to the end of June'.³ The rapid re-adjustment of supply to demand was such that a re-imposition of the order from March 25th to August 5th resulted in little more than faint protests from the industry, for by this time a reduction in demand for woollen textiles was causing widespread short-time.⁴

What effects did the restrictions of 1892/3 have on prices of woollen rags? As late as mid-November 1892 a Leeds report was able

1. *ibid.*, 12.1.1893.

2. F.W. Reuss, *op. cit.*, W.T.W., 1.11.1913. pp. 5-6.

3. Twenty-third ... Report, P.P. 1894 (C.7500), XXXVIII, 163. The Board noted, 'In view of the temporary disappearance of cholera at the end of 1892, we found ourselves able to yield to the representations made to us on behalf of various industries in the country affected by our restrictions on the importation of rags ...'; D.R., 23.12.1893.

4. Twenty-third ... Report, *op. cit.* The eventual abrogation of the orders relating to rags was a direct result of the international conference held at Dresden in early 1893 at which 'an international agreement was arrived at ... which enabled us to make considerable relaxations in our Order relating to the importation of rags'; T.M., 15.8.1893.

to state that the restrictions were not having 'such a serious effect' and although certain classes of mungo rags had risen 10 to 15 per cent in price, dealers were experiencing difficulty in realising higher prices for ordinary mungos.¹ Grades moderately affected were old mungo cloth and dark greys, rising from between 10 to 20 per cent in price until relaxation of the order in January 1893, but 'famine prices' were quickly reached in light grey and blue mungos.² Not unexpectedly, the rise in price of new clips was checked when importation was permitted from mid-December 1892. Prices of all rags on the continent had begun to rise from the low levels following the initial Order of July 1892, causing Yorkshire trade sources to declare that there was little danger of a large accumulation depressing prices on the ultimate rescission of the prohibition.³ This, however, did not occur, and in January 1893 large quantities of all classes of rags (Table III(x)) soon depressed prices to the levels of June and July 1892.⁴ Market prices during the second period of prohibition appear not to have fluctuated very much, for rag merchants and woollen manufacturers had bought sufficient supplies in anticipation that such an eventuality might occur.⁵ Country and West Riding rag merchants specialising in domestic collections 'greatly benefited by the prohibition order' and higher prices brought increased collections of English and Scottish rags as well as previously accumulated stocks onto the market.⁶

The reaction of the West Riding low woollen trade to the first important restriction on its supply of raw material would seem to confirm suggestions made earlier in this chapter, that for many mills

1. T.M., 15.11.1892, p. 506.

3. ibid.

5. ibid.

2. H.E., 24.12.1892.

4. D.R., 23.12.1893.

6. ibid., and 24.12.1892.

TABLE III(x)

Imports of woollen rags and shoddy and mungo
1891-1893 (in lbs. weight).

	1891	1892	1893
JAN	5.337.920	5.048.960	(D)3.828.160
FEB	6.563.200	5.302.880	14.934.080
MAR	8.028.160	6.569.920	(E)16.081.200
APR	6.890.240	7.268.800	1.482.880
MAY	6.923.840	7.300.160	2.278.080
JUNE	8.294.720	6.323.520	2.744.000
JULY	6.475.840	(A) 5.994.240	2.119.040
AUG	7.383.040	(B) 5.638.080	(F)9.452.800
SEPT	6.899.200	701.120	5.680.540
OCT	7.129.920	1.420.160	5.976.320
NOV	7.129.920 (sic)	1.075.200	4.814.400
DEC	3.908.880	(C) 3.776.640	4.892.800

A - Prohibition on import of woollen rags (13.7.1892) from France, Black sea ports, Sea of Azov ports, Turkey, and Asia.

B - Remaining European ports north of Dunkirk, other than those of Norway, Sweden, and Denmark (11.8.1892).

C - Re-definition of the term 'rags' to exclude new clips and pulled shoddy and mungo from the Order (14.12.1892).

D - Temporary revocation of Order (21.1.1893).

E - Order re-imposed (25.3.1893).

F - Order finally removed with the exception of certain types of flocks (5.8.1893).

Source: Trade Navigation and Commerce, Monthly Accounts
Twenty-second and twenty-third Annual Reports of the
Local Government Board, op. cit.

woollen rags acted as a supplementary fibre with limited substitutability for wool. Commenting on the exclusion of Denmark and Norway from the original Order, the Dewsbury Chamber of Commerce observed that Europe supplied 'classes of rags which can absolutely not be found (elsewhere) ... the particular kinds of colours of cloths not being found in those countries'.¹ Trade sources also noted, with some surprise, that the severe restriction in rag supplies until January 1893 had no effect on wool prices, even those of the lowest sorts,² indicating that many manufacturers were unable to adjust to a break in the supply of what had become a highly differentiated raw material.³

Both 1893 and 1894 were difficult years for the Yorkshire woollen rag trade, as the effects of the 1893 coal strike,⁴ stagnant demand,⁵ and price cutting by manufacturers⁶ drove rag prices down - white flannels falling in 1894 from 62^s/- to 43^s/- per cwt., and stockings from 65^s/- to 44^s/- per cwt.⁷ Expectations of rag merchants and shoddy and mungo manufactures that the McKinley tariff would be replaced by more favourable duties were fulfilled in January 1895 with the passage of the Wilson tariff.⁸ Demand for recovered wool immediately rose as Heavy Woollen District manufacturers prepared to re-enter a market all but denied them since the Morrill tariff of 1861, with further pressure being exerted on woollen rag supplies by increasing re-exports to the United States, rising from 534 tons in 1893 to 2,644 tons in 1895.⁹ Rag supplies, however, proved highly

1. T.My., 5.11.1892, p. 337.

2. H.E., 24.12.1892.

3. Reports of the Inspectors of Factories and Workshops, P.P. 1894 (C.7368) XXI, 422.

4. H.E., 29.12.1894.

5. T.M. 15.4.1893, 15.12.1893, 15.4.1894.

6. H.E., 29.12.1894.

7. ibid.

8. D.R., 23.12.1893; F.J. Hooper (1903) op cit., p. 52.

9. Trade, Navigation and Commerce, Annual Accounts, op. cit., 1894/5, 1896.

elastic in weak European markets (Table III(vi)), and the predicted large rise in prices, with the exception of certain qualities, did not materialise.¹

It was, however, the concurrence of a revival in domestic demand together with the effects of the sheep drought in Australia² that led to a marked increase in the demand for woollen rags and shoddies. Trade complaints of a scarcity of rags in 1899³ are confirmed by the low price cross-elasticity of supply of imported rags and shoddy to Lincoln, Port Philip and Dorset wool (0.49) as well as the supply price-elasticity calculated from Table III(xi) of three types of woollen rag (0.15). Consequently, the rag market was characterised by very sharply rising prices, superfine white flannels in merino qualities rising 80 per cent above their 1898 levels, with large rises in other

TABLE III(xi)

Woollen rag prices, 1898-1899 (shillings per cwt.)

Description	1898	1899
French White Flannels	48 ^s /-	90 ^s /-
New super-white Flannels	110 ^s /-	140 ^s /- to 150 ^s /-
Superfine comforters	20 ^s /-	30 ^s /-

Source: D.R., 30.12.1899.

classes as indicated in the table. Because prices of English long wools were little affected by the increase in Australian wools

1. H.E., 28.12.1895

2. J.H. Clapham, The Woollen and Worsted Industries (1907), p. 86.

3. D.R., 30.12.1899.

(reflecting their dissimilarity) it seems clear that the superfine grades of rags were being used in substitution for Australian clothing wool, for when wool prices fell in 1900, trade sources noted that the grades of superfine that had led the 1899 price boom fell directly in proportion to wool prices.¹

Imports of woollen rags and shoddy in 1902 and 1903 reflect the low level of wool prices and the by-now familiar problem of poor quality European rags, notably new mungo clips from German ready-made clothiers.² The small rise in domestic collections in 1903 is indicative of a growing demand by West Riding manufacturers, as well as rag merchants in the export trade, for English and Scottish rags, particularly in the manufacture of imitation Scotch tweeds, a change in public taste which was causing much concern to the Bradford stuff trade.³

Consistent with complaints by the trade of inadequate supplies of rags, especially in the all-wool qualities, the Board of Trade import tables from 1881 show a considerably wider range of countries consigning rags to the West Riding; newly classified sources included Australasia, Egypt, Norway, Sweden, and Turkey.⁴ Because the method of compilation aggregated imports of woollen rags and pulled shoddy under one classification, the valuations of annual imports from Belgium, Holland, and Germany - from which the largest proportion of pulled material was shipped - make a country-by-country comparison of woollen rag quality difficult. Nevertheless, from ca. 1890 imports of continental shoddy had declined markedly, and after this date import valuations would seem to reflect more accurately sources of the highest quality woollen rags. The annual import valuations for the 1890s thus suggest that

1. D.R., 29.12.1900.

2. D.R., 24.12.1903.

3. ibid.; T.M., 15.1.1904; Report of the Tariff Commission, op. cit., 2, Part 2, 1336, 1347.

4. Tables III-II, (b) and (c), Appendix.

France, the Scandinavian countries, and Australasia clearly provided the highest quality material, and Turkey and Egypt the lowest classes.

A distinctive feature of this second phase in the growth of raw material supplies to the rag and shoddy trade of the West Riding was the sharp absolute and relative decline in the proportion of imported ragwool from ca. 1880 (Table III(ix)). Between 1870 and 1900 most imported ragwool appears to have originated from the Hamburg and Berlin shoddy and mungo mills.¹ Smaller, but regular shipments were received from Norway, Denmark, Sweden, Russia, and Holland.² In 1901 the first trade comment on the decline in the importation of ragwool was made;

'... whereas formerly thousands of bales were imported into Yorkshire, now shoddy and mungo manufacturers in Yorkshire export considerably more to Germany than the Germans export to England'³

- a view confirmed by the revised Board of Trade Classification from 1903.

Several reasons would seem to account for the contraction in foreign ragwool imports, for even as late as 1913 there appear to be no trade comments on the causes of this decline.⁴ A major factor on the supply side was undoubtedly the very rapid growth in the use of shoddy and mungo in Europe from the early 1870s.⁵ A random examination of German trade statistics indicates an increasing concentration of German ragwool exports in the Austrian market, and a decrease in the amount transhipped through Holland and Belgium to

1. H.B. of E. (Hull) loc. cit., 1870-1900.

2. ibid.; T.M., 15.1.1876, p. 12; Report of the Tariff Commission, op. cit., 2, Part 2, 1883.

3. D.R., 28.12.1901; Statistik des Deutschen Reichs (Berlin), 1899, Band 122.

4. W.T.W., 25.1.1913, p. 6.

5. A trade source commented in 1872 that 'French manufacturers... are making pretty large quantities of low goods, and getting their mungo from Germany' (H.E., 28.12.1872); see also the statement by the Dewsbury Chamber of Commerce in T.M., 15.8.1889, p. 386.

the Yorkshire trade.¹ Another factor influencing supply was the relatively static nature of demand compared to the years of growth before the 1870s, and, increasingly, the tendency of low prices at the Dewsbury sales to act as a disincentive to exporters, as a trade report of 1876 notes.

'... many consignors of lower classes of shoddy and mungo from the Continent have ... found that the prices realised at the local sales were not remunerative'²

It was, however, decisive changes of both a quantitative and qualitative nature on the demand side which provide the most plausible explanation for the decline. The most important of these was the already noted trend towards fabrics requiring longer stapled and coarser shoddy, 'one that has told heavily against mungo' as a commentator noted as early as 1877.³ As the predominantly German imports of ragwool comprised a high proportion of mungo, and as the trend away from the old Batley and Dewsbury heavy pilot-type cloths was not of short duration,⁴ the demand for mungo could logically be expected to contract from its previously high levels. It is also apparent that qualitative changes were taking place in the West Riding demand for pulled mungo. The practice of using cheap, scoured Buenos Aires wool on the continent required mungos and shoddies with different characteristics from those used in the West Riding for blending with fine Australian merino wools.⁵ Consequently, many European shoddy manufacturers pre-washed their rags prior to pulling

1. Statistik des Deutschen Reichs, op. cit., 1874-75, Bd. 9-11, 1875-76 Bd. 15-16, 1880 Bd.43, 1881 Bd. 48, 1883 Bd. 60-61, 1899 Bd. 122. Annuaire Statistiques de la Belgique (Brussels), 1880, 1890, 1900, 1904.

2. H.E., 1.1.1876, 29.12.1883, 31.12.1887, etc.

3. H.E., 30.12.1877.

4. ibid., 31.12.1887; D.R., 1.1.1898.

5. H.E., 17.1.1874.

and either pulled them 'dry' or with the addition of a little oil to produce the dryer qualities liked best by continental carders.¹ The Yorkshire product, however, was typically pulled with oil in varying quantities to produce the material most in demand by West Riding woollen manufacturers, and it appears that from the early 1880s this difference was becoming apparent, as an 1881 trade source indicates.

'Commission agents representing German houses are offering the pulled article to our manufacturers in pretty large quantities, but it is found to be sophisticated.'²

Adulteration of continental shoddy and mungo appears to have been a growing problem, Das Deutsche Wollengewerbe complaining in 1883 that excessive weighting by the admixture of 'all manner of refuse grease' had become 'very common' practice amongst some producers.³ Yorkshire manufacturers, particularly the growing number of vertically-organised woollen mills, would appear to have begun to display a preference for selecting and pulling a known quality of raw material, and to rely less on purchasing a foreign-pulled product prepared from an unknown sorting of woollen rags.⁴ Finally, trade sources and evidence of the growth in exports of Yorkshire ragwool would appear to confirm the suggestion that by the turn of the century English shoddy and mungo manufacturers had become highly price competitive

1. In his evidence to the Pollution of Rivers Commission, Batley shoddy manufacturer John Jubb commented 'washing is an unnecessary process and only adds to the expense of the article when made' (3rd Report, P.P. 1871 (C.347), XXV, 405). Reuss observed in 1881 that, with the exception of the best class of shoddies, French ragwool pulled 'dry' was 'not liked in this country' (Wool and Textile Fabrics, 19.3.1881, p. 774).

2. D.R., 1.1.1881.

3. T.M., 15.5.1883, p. 184.

4. Wool and Textile Fabrics, op. cit.

in both domestic and foreign markets.¹ The degree of price and product-differentiation between Yorkshire and continental ragwool explains to a certain extent the apparent failure of overseas manufacturers to exploit the shortage in certain grades of shoddy and mungo during the prohibition on the import of woollen rags in 1892/93, a potential threat feared by Dewsbury and Batley shoddy manufacturers which did not, however, materialise.²

The final phase of the period 1850-1914, beginning ca. 1903/4, is characterised by a marked increase in imported and domestic woollen rags comparable to the rates of growth in rag supplies achieved between 1870 and 1880 (Table III(v)). By 1902 woollen rags retained for remanufacture into shoddy and mungo were nearly double the weight of the retained domestic clip, and the predominance of domestic supplies, a trend apparent from the 1890s, became more marked.³

Demand for the products of the recovered wool sector, which had been in a depressed state for most of 1903 accelerated sharply as 'immense orders' were received in the Heavy Woollen District for Japanese army cloth and blankets.⁴ Those grades of rags most in demand for either khaki blankets or Japanese blue cloth rose to high levels, particularly light grey stockings and Berlins, and, despite

1. W.T.W., 25.1.1913, p. 6, 12.4.1913, p. xviii; Wool and Textile Fabrics, op. cit. Reuss observed in 1881, for instance, that French shoddy and mungo was 'much too dear for us' and consequently was little used by West Riding manufacturers. The price differential between oiled and dry shoddy is evident from the records of E. Fox and Sons, who produced for the domestic and export markets. Dry shoddies averaged 30 per cent more in price than the oiled shoddies preferred by West Riding manufacturers. E.F. and S. MSS., B.L., Sold Day Book 'Shoddy', November 1896-May 1902.

2. T. My., 24.12.1892; H.B. of E. (Hull), 1892-93. The Hull port books indicate that there was no discernible increase in imports of German ragwool, although consignments from Denmark and Norway rose slightly.

3. W.A.G. Clark, op. cit., pp. 30, 99-100.

4. D.R., 24.12.1903, 31.12.1904; G. Ogawa, Expenditures of the Russo-Japanese War (New York, 1923), p. 40.

strong German demand, increased consignments were received from continental exporters as many grades rose more than 30 per cent in price (Table III (xii)).¹

TABLE III (xii)

Woollen rag prices, 1903-1904 (shillings per cwt).

Description	1903	1904
Best black stockings	26 ^s /-	36 ^s /-
Ordinary black stockings	19 ^s /-	27 ^s /- to 28 ^s /-
Best white blankets	32 ^s /-	42 ^s /-
White stockings	38 ^s /-	50 ^s /- to 52 ^s /-
Brown stockings	18 ^s /-	27 ^s /-

Source: D.R., 31.12.1904.

Prices of all qualities of woollen rags continued strongly through 1905, 1906 and 1907 as the West Riding heavy woollen sector experienced a heavy and chiefly domestic-based demand for fancy tweeds, black and blue suitings, serges, and heavy overcoatings.² Rising raw material prices and recurring complaints of poor quality foreign rags, together with German price competition in rag markets, resulted in record prices for certain grades of woollen rags.³

An abrupt end of the world-wide boom in textiles, initiated by a sharp recession in the U.S. towards the end of 1907 depressed prices in most classes of rags with the exception of fine all-wool varieties.⁴ More importantly however, the United States recession created

1. D.R., 31.12.1904.

2. D.R., 28.12.1905, 29.12.1906, 28.12.1907, 24.12.1908

3. D.R., 28.12.1905, 29.12.1906. The trade report for 1905 noted that in the case of black stockings 'men who had been in the trade for fifty years do not recollect such a high figure having previously been equalled'.

4. D.R., 24.12.1908.

conditions on the supply side of the woollen rag trade of a distinctly different nature to the historic demand-induced growth in imports and domestic rag supplies. The most remarkable feature indicated by the import tables is the sudden and rapid growth in imports of woollen rags and shoddy from America between 1907/8 and 1911/12.¹ Coinciding with rising wool and cotton prices rag supplies briefly regained an elasticity not experienced since the early 1870s.² Indeed, so profound was the effect of this influx of supplies on the West Riding that it became widely known in the trade as the 'American invasion'.³

American rag merchants and shoddy manufacturers had turned to the Yorkshire market after 1907 for two reasons. Faced with a dramatic fall in demand for woollen rags and shoddy from domestic manufacturers, price-collapse in the woollen rag market, and widespread bank failures, American merchants began to sell into European rag markets, principally Dewsbury, from 1908.⁴ Secondly, the prolonged and sharp nature of the American recession, growing problems of liquidity in American rag merchanting houses, and very low freight rates, storage, and demurrage charges, encouraged imports of American rags to reach a peak of over 19,000 tons in 1911, approximately 50 per cent more than the annual average imports from France or Germany.⁵

This unprecedented and rapid increase in supply met with a differing response from manufacturing and rag merchanting interests in the West Riding.⁶ For manufacturers, the low price and ready

1. Table III-II(c), Appendix; V.S. Clark, History of Manufactures in the United States (New York, 1949), III, p. 194.

2. D.R., 31.12.1910.

3. D.R., 30.12.1911; W.T.W., 18.5.1912.

4. W.T.W., 18.5.1912, 26.10.1912, 4.1.1913; W.R., 4.7.1912.

5. W.T.W., 18.5.1912.

6. Federal Trade Commission (1920) op. cit., p. 50. A comparison of American export figures with Table III-II(c) (Appendix) indicates that approximately 85 per cent of American woollen rags were shipped to the United Kingdom, the balance being sold in the Belgian and German market.

availability of many classes of rags at a time of relatively high wool prices and trade revival proved highly profitable.¹ Rag merchants, particularly European consignors, experienced great difficulties as apparently unlimited quantities of American rags, mainly in the lower mungo and worsted classes, depressed prices of many grades; German and Belgian dark worsteds, for instance, which had sold at 24^s/- and 21^s/- cwt. in 1907 had become 'unsaleable' in 1910, and similar complaints were many and widespread.²

Imports fell off rapidly however, as the American economy and domestic demand for woollen goods revived in 1911. Other factors contributing to the decline in American rag imports, halted to some extent by the outbreak of war in 1914, were sharp increases in sea and land freight rates, the sudden withdrawal of concessionary storage charges by British railway companies and a marked reluctance by West Riding manufacturers to offer more remunerative prices.³ The sudden withdrawal of American selling pressure from Yorkshire and European rag markets led to immediate rises of up to 30 per cent in the corresponding classes of rags, demand from German manufacturers being sufficiently powerful to divert supplies from Dewsbury until all prices approached partial equilibrium towards the end of 1912.⁴ There were no doubt many in the West Riding rag trade who could agree with the Waste Trade World editorial that the 'American rag invasion' had been 'one of the most sensational epochs in the history of the woollen rag trade'.⁵

1. D.R., 1.1.1910 and v. infrapp.485-86.

2. *ibid.*, American selling methods were also much criticised by West Riding rag merchants (v. suprapp.91-93.).

3. W.T.W., 18.5.1912. So rapid was the reverse in relative prices between Dewsbury and American rag markets that American dealers were able to arbitrage by simultaneously selling in America and buying in Dewsbury baled unsold stocks of American rags, which were allowed duty-free re-import if still in their original packing (1909-1911, Table III-III(a), Appendix).

4. W.T.W., 4.1.1913, p. 10.

5. *ibid.*, 18.5.1912, p. 13.

The period 1850-1914 can be seen as one of great change in the Yorkshire woollen rag trade, characterised by several important factors on both the demand and the supply side. Predominant amongst the former was the progressive decline of mungo, as the old 'staples' of Batley and Morley - pilots, witneys, presidents, and naps - began to fall from fashion from the 1880s. The sustained popularity of Yorkshire tweeds and cheviots, a demand that was increasingly centred on the United Kingdom domestic market, had proved instrumental in reversing the relative values between hard and soft rags.

On the supply side two developments contrast 1850 with 1913. The dominance of domestic rag collections compared to imports of woollen rags, a reflection of the rapid increase in mass consumption of woollen and worsted goods, and, to a lesser extent, a reflection of growing inelasticity in external rag supplies as Yorkshire lost its leading position as price leader and consumer of ragwool.¹ Secondly, the absolute and relative decline in imports of continental ragwool which, accompanied by a rapid rate of import substitution by expanding West Riding rag pulling capacity, accounted for only 3 per cent of aggregate rag and shoddy imports in 1913 compared to 70 per cent in the 1860s.²

1. W.A.G. Clark, op. cit., p. 100.

2. A point not missed by the trade, Reuss observing in 1913 that 'in years gone by hundreds of rag machines were busy pulling for England ..., the quantity shipped now requires less than a dozen machines at the utmost'. W.T.W., 25.1.1913, p. 6.

CHAPTER III

IV. Developments, 1914-1939.

For the West Riding woollen manufacturing sector, the three year period ending in 1913 had witnessed an 'exceptional trade boom' accompanied by intense activity in the rag merchanting and pulling branches of the Heavy Woollen District.¹ Domestic demand for fashionable and 'well got up' Yorkshire imitation Scotch tweeds and cheviots had sustained the high prices of 1912 in those classes of rags yielding long-stapled shoddy such as mixed stockings and berlins.² By 1913 regular complaints were being made of shortages in many of the old 'staple' classes of rags - fine Dutch flannels or 'baies' in shades of scarlet, blue, purple, brown, and other colours, and French light and coloured stockings and 'molletons' - all victims of the progressive erosion of traditional national costume by new fashions and fabrics in rural Europe.³

With the outbreak of War in 1914 it soon became apparent to the West Riding trade that although accumulated stocks in merchants' hands were high, supplies from Germany, France, Russia, and Belgium would either cease or decline sharply.⁴ Fears that the continuation of supplies from neutral or friendly countries would be affected by the Board of Trade prohibition in December 1914 on United Kingdom exports of woollen rags and recovered wool to Europe and Scandinavia proved accurate and met with immediate reprisals from France, Holland, Norway, and Sweden.⁵ Following strong representations by trade interests in Dewsbury, this policy was reversed in February 1915 and imports recommenced, supplies from France remaining at consistently high levels for the duration of the war.⁶ Woollen rags from other

1. W.T.W., 4.4.1914.

2. ibid., 26.10.1912; W.R., 4.7.1912.

3. W.T.W., 4.1.1913, 7.3.1914. 4. ibid., 8.8.1914.

5. ibid., 19.12.1914.

6. Table III-II(c), Appendix.

sources, however, began to decline sharply from 1916/17, the expected large shipments from America being restricted by high insurance rates and scarce shipping space and, from November 1917, a partial embargo imposed by the War Trade Board in an effort to conserve United States wool stocks.¹

The rapid deterioration in the import supply position (Table III (xiii)), a decline of nearly 82 per cent from pre-war levels by 1918, appears not to have caused undue concern to the trade for although there were shortages in specific classes of rags, general complaints of scarcity were few.² Two factors appear to have been responsible for this. On the demand side, civilian clothing manufacture was progressively replaced by military clothing production, particularly from 1916, the former typically using large quantities of rags and the latter initially using much less. Until January 1917 when the War Office permitted up to 50 per cent shoddy in the weft for khaki cloth, recovered wool was allowed only in great-coat cloth, blankets, and horse rugs.³ Military cloth produced for various overseas governments and the British Territorial Associations, on the other hand, could use considerable quantities of shoddy and mungo,⁴ and the decreasing proportion of wool allocated to civilian production necessitated a largely non-price substitution of pure by recovered wool. Moreover, official policy encouraged many mills to reserve their production of better quality cloths for the export market⁵ which, together with overseas military orders, increased the exported output of the woollen section from 81.9 million yards in 1914 to 122.9 million yards in 1917.⁶ The second and crucial factor lessening the impact

1. W.T.W., 26.6.1915; Federal Trade Commission (1920) op. cit., p. 51.

2. W.T.W., 5.1.1918. 3. W.R., 24.1.1918, p. 10 and v. infra.p.5/4.

4. The colours of woollen rags most in demand for these contracts were light blue (France), dark blue-grey (Belgium), and drab green-grey (Russia).

5. W.R., 22.2.1917, p. 6.

6. ibid., 17.1.1918, p. 6. Exports of worsted tissues declined from 70.3 million yards in 1914 to 42.7 million yards in 1917.

TABLE III(xiii)

Comparison of the retained weight of imported and domestic wool (greasy and unwashed weight), and imported and domestic woollen rags in the United Kingdom, 1914-1939 (tons weight).

	(a) Foreign & colonial wool retained	(b) Foreign & colonial woollen rags retained	(b) as a percentage of (a)	(c) Estimated domestic clip retained	(d) Estimated domestic woollen rags retained	(d) as a percentage of (c)
1914	201,161	42,834	21.3	36,964	64,247	173.8
5	368,259	24,017	6.5	40,357	83,903	207.9
6	264,732	18,962	7.2	49,732	94,324	189.7
Av.						
1917-						
19	286,384	22,388	7.7	48,705	54,186	111.2
1920	299,330	28,512	9.4	38,303	35,362	92.3
1	199,911	5,461	2.5	29,866	22,886	76.6
2	310,491	19,633	6.4	18,705	19,670	105.1
3	158,973	24,197	15.1	19,643	52,146	265.5
4	191,250	39,738	20.9	23,348	54,310	232.6
5	182,098	32,331	17.6	25,045	34,374	137.2
6	216,205	25,711	12.0	26,875	26,712	99.4
7	225,982	20,750	9.3	25,223	22,637	89.7
8	207,098	20,122	9.7	31,920	39,372	123.3
9	224,554	23,567	10.7	29,420	31,794	108.1
1930	229,821	21,173	9.1	38,036	28,818	75.8
1	268,170	20,818	7.8	38,437	32,604	84.8
2	273,259	10,731	3.7	38,705	41,612	107.5
3	275,045	14,427	5.1	31,027	48,041	154.8
4	237,902	13,710	5.9	37,053	49,918	134.7
5	266,339	10,473	3.7	28,884	52,507	181.8
6	290,134	17,982	6.2	33,482	44,557	133.1
7	251,071	24,824	9.9	39,420	48,368	122.7
8	279,821	13,818	5.0	36,428	56,936	156.3
1939	315,580	14,629	4.4	36,964	59,203	160.2

source: (i) columns (a) and (c), Bradford Chamber of Commerce, op. cit.
(ii) column (b), Annual Statements of the Trade of the United Kingdom.
(iii) column (d), Table III-I(h), Appendix.

of a sudden fall in the gross imports of overseas rags was a rapid and unexpected response by the domestic woollen rag market to war-time conditions. A sharp and sustained rise in most rag prices, particularly in coarse softs for approved military use, began to attract larger than normal supplies of domestic rags and, as the war progressed, the absence of a much-predicted decline in domestic rag collections was viewed with evident surprise by experienced West Riding merchants.

'The greatest cause for comment has been the fact that the British Isles have proved themselves to be self-supporting in the supply of rags. What everyone regarded as an impossibility, to be dismissed as needing no discussion, has proved to be an actuality.'¹

Early fears of labour shortages at the primary collection stage proved to be groundless as the volume of country rags consigned to Dewsbury and Batley continued to increase.² Accumulated stocks of previously 'unsaleable' rags began to reach the market as prices of all classes rose; Reuss, for instance, noting in April 1915 that 'locally kept foreign rags which were bought ten to twelve years ago' had recently come under his hammer, and in 1916, a trade writer observed that bales of rags bought in the 1890s were appearing on the market.³ Supply constraints were further eased by a well-organised War Office scheme commencing in December 1916, for the collection and consignment of all worn military clothing from the front to a central government sorting depot in Dewsbury.⁴

An indication of the timing and extent of price movements in the woollen rag market during the 1914-1918 period can be seen from

1. W.T.W., 1.1.1916.

2. ibid., 26.6.1915.

3. ibid., 24.4.1915, 1.1.1916.

4. D.M. Zimmern, loc. cit., p. 28; N.C. Gee, Shoddy and Mungo Manufacture; its development, ancillary process, methods, and machinery. (Manchester, 1950), p. 3. By 1917, approximately 45 million separate woollen articles had been recovered from the front lines.

Tables III-IV(a) and (b) (Appendix). Commonly, a rise in the value of a particular grade would affect the adjacent lower grades as rag pullers and woollen manufacturers sought to substitute one for the other in a progressively narrow market, the 'ripple' price movements influencing the prices of many classes of rags.¹ A second characteristic of war-time price movements was the effect of the high cost and scarcity of all chemicals on the 'colour value' of woollen rags, previously of declining importance as techniques for 'stripping' (bleaching) and redyeing had become cheap and effective from the turn of the century.² Unlike coloured rags, mungo union rags slumped sharply in price following a 500 per cent rise in the price of carbonising acids between 1914 and 1916.³

It was the threat of speculative price movements getting out of hand, such as those of early 1916 on fears of a rag shortage and the 'reckless inflation of prices' in November 1917, that moved some of the larger Batley and Dewsbury rag merchanting firms to call for some form of control, preferably on shoddy prices.⁴ In July 1918 the War Office issued a 'Rags and Shoddies Order' limiting the prices of over 180 different classes of rags to their values at the end of March, a control which was to remain in force for the remaining months of the war.⁵ A major reason for the lack of government control until

1. W.T.W., 19.8.1916.

2. ibid., 12.4.1913, 6.1.1917.

3. ibid., 19.8.1916.

4. ibid., 5.1.1918. This move was made necessary by the increasing amount of capital needed to finance stock - for example, 20 tons of black berlins cost over £13,000 by the end of 1917 - and tended to affect the business of larger rather than the smaller merchants.

5. W.T.W., 27.7.1918. The reasons given for the Order were:-

(a) the growing importance of woollen rags required for national purposes, and (b) to prevent an increase in clothing prices to the public.

mid-1918 - an almost unique situation in the war-time textile industry - was that from 1914 used khaki cloth and new clips had been almost exclusively handled by London dealers and sold direct to users in the Heavy Woollen District who were producing cloth on agreed-price contracts.¹ Secondly, from October 1916 the market in all khaki rags had been brought under Government regulation, an arrangement strengthened by the establishment of the Army Clothing Salvage Department at Dewsbury at the end of 1916, giving the War Office effective control of over one third of all shoddy produced in the United Kingdom in 1917.²

The very high level of rag prices at the beginning of 1919 attracted large consignments of French, Belgian, and American rags as soon as transport facilities had improved. There were, however, signs that the inflated values of some classes of rags were beginning to be questioned, mungo rag merchants in the Morley and Ossett districts for example, being forced to put as much as 70 per cent of their purchases to stock as mungo prices began to decline suddenly at the end of 1918.³ By June 1919 it was noted that the Dewsbury woollen rag market was entering a slump and 'Continental rags (were) not wanted because of the absolute glut on the market'.⁴ Moreover, many of the foreign consignments were of very poor quality from years of prolonged use and the unrealistically high reserve prices set by European rag merchants resulted in the return of large quantities to the continent.⁵

1. W.T.W., 26.8.1916.

2. W.T.W., 7.10.1916; D.M. Zimmern, loc. cit., p. 28.

3. W.T.W., 28.12.1918; Table III-IV(a), Appendix.

4. ibid., 19.6.1919.

5. ibid., 14.7.1920, 24.7.1920; Table III-III(a), Appendix.

Although the full force of price-collapse in the woollen rag market came in the Spring of 1920, when the prices of most major commodities began a sharp downward movement, it needs to be explained why prices in many classes began to weaken concurrent with the quickening pace of the domestic price-led boom of 1919-20.

Firstly, rag prices undoubtedly reflected an additional speculative element above their 'normal' price relationship with wool - new black worsteds (tailors' clips) at 44^d per lb. in 1919 were approximately double the price of Lincoln Half Hog fleece, the noils of which were a directly competitive fibre of the pulled material. Indeed, even the Waste Trade World questioned the apparent acceptance by firms of this anomaly, by asking

'Why do cloth manufacturers persist in using certain shoddies now when they could buy low-grade wools for the same purpose much cheaper?'¹

Also related to the very high level of rag prices in 1919 was a marked reluctance on the part of merchants to continue buying for stock - as distinct from 'in-and-out' speculative purchases - because of the high costs incurred in financing stocks from borrowed capital and the risks of diminished liquidity.²

Secondly, domestic demand in 1919 and 1920 shifted decisively towards a preference for higher quality all-wool goods, at best using only superior grades of shoddy.³ In addition to this, a rapid fall in the price of dyewares reduced the comparative costs between the use of virgin and remanufactured wool as well as narrowing the 'colour value' between many classes of rags, contributing to a

1. W.T.W., 19.6.1919.

2. ibid., 24.7.1920.

3. W.R., 1.4.1920. This change in consumption patterns was also a feature of the immediate post-war period in the U.S.A. (A.H. Cole, op. cit., II, p. 67).

general weakening of all rag prices in 1919.¹ As the index of rag prices indicates, the collapse was severe, demand contracting sharply (Table III(xiii)) and leaving West Riding rag merchants with heavy stocks particularly in those classes for which there was no demand.²

The liquidation of BAWRA stocks of wool at low prices in 1922-1923, a large proportion of which was carried over by woollen manufacturers into 1924, continued the gradual but discernible movement towards the substitution of shoddy and mungo by wool.³ The multiplier effect of this substitution on the production of wool waste, together with an increase in consumption of wool by the worsted section, was such that competition between cheap sorters' waste, noils, and recovered wool was fierce.⁴ Because the costs of rag production were depressed by low wool prices and a collapse in demand from rag consumers, domestic rag collections in 1920-1922 remained small (Table III(xiii)). Contributory factors on the supply side included a large exit of smaller provincial marine store dealers from active business following the sharp price collapse of 1920,⁵ the low price of cotton rags,⁶ and, according to trade opinion, a tendency for many to wear their clothes for a longer period as a result of growing unemployment.⁷

1. W.R., op. cit.; W.T.W., 2.4.1921.

2. W.T.W., 18.11.1922, 13.1.1923. Purchases of rags by Eli Townend & Co., a subsidiary company of the Extract Wool & Marino Co. Ltd., fell from £147,366 in 1919/20 to £10,472 in 1920/21. Extract Wool Holdings Ltd., MSS., Leeds City Council, Archives Department, Eli Townend and Co., Nominal Ledger 2, 1.4.1915-31.3.1927. (Extract Wool Holdings hereafter referred to as E.W.H. MSS.)

3. Committee on Industry and Trade (1928) III, Ch. II, p. 170. (BAWRA - British Australian Wool Realisation Association Ltd.).

4. W.R., 1.4.1920; W.T.W., 13.1.1923. 5. W.T.W., 18.11.1922.

6. ibid., 13.1.1923. The consumption of cotton rags by the paper industry had, by this time, diminished considerably. Cotton rags were valued largely for their use in the 'wiper' trade - i.e., for industrial machine cleaning etc.

7. ibid., 12.1.1924.

A second major development in the domestic woollen rag market, and one which was to dominate the inter-war period both in its effect on relative price levels of wool and rags and also as a factor important to the survival of the trade itself, was the rapid growth of overseas demand for domestic woollen rags.¹ During the 1920s the United States became the major market for domestic woollen rags, demand being so strong that the punitive Fordney-Macomber tariff of September 1922 of 7½ cents per lb. caused only a momentary check in 1923 and 1924, notwithstanding the brief revival of West Riding demand and a narrowing of the price differentials between Dewsbury and Boston.² American buyers concentrated predominantly on those classes of rags unavailable in the domestic market, but produced in considerable quantities by the United Kingdom - white flannels, white and light coloured knitts, and English mixed stockings.³ Price competition for woollen rags by North American and European buyers, particularly in the United Kingdom, increasingly became an issue attracting both favourable and adverse comment, the Yorkshire Observer conceding in 1929 that the historical dominance of the West Riding was waning, and Dewsbury

'... while still the most important rag centre,... cannot claim to be the controlling centre it once was'.⁴

1. Table III-III(b), Appendix.

2. W.T.W., 30.12.1926.

3. ibid., 10.1.1925.

4. ibid., 29.1.1923, 2.4.1924, 10.1.1925, 21.1.1928, etc; Yorkshire Observer Trade Review, 7.1.1929, p. 24. There were two major reasons for strong overseas demand for woollen rags in the 1920s and 1930s. The development of domestic woollen textile industries producing cheap clothing for the mass market, supplied previously by the West Riding, German, and Belgian low woollen manufacturers. Secondly, lower relative tariffs on the importation of woollen rags compared to wool, as in the case of the United States, or, in the case of Germany, Poland, and the Soviet Union, the allocation of scarce foreign exchange for the purchase of woollen rags in place of raw wool. A frequent occurrence in the woollen rag market of the 1930s was the unpredictable timing of these allocations, momentarily forcing up prices before being withdrawn without warning. (I.E.C., 'Wool Production and Trade', W.T.W., 20.11.1937, pp.5-6.).

The growth of overseas buying stimulated further the transfer of demand from recovered to virgin wool; prices of those classes commonly substituted for certain qualities of wool such as white flannels or mixed stockings were raised relatively or absolutely to the price of the raw material,¹ and because Yorkshire was unable to match continental prices in the better classes of rags,² foreign consignments became increasingly of such a low quality as to be nearly unusable.³

With the exception of 1923-1924, when a revival of trade in the Heavy Woollen District coincided with a reduced supply and higher prices of colonial wool,⁴ West Riding influence over the price of woollen rags was restored, and then only partly, during the brief upturn in demand for heavy woollens in 1936-1937.⁵ A distinctive feature of price-movements in the woollen rag market during the inter-war period, reflecting the influence of overseas demand, was the relative volatility of soft rag prices.⁶ This, and the acceleration in growth of rag exports from 1932 which had, for the first time, established Britain as a net exporter of rags in 1934, became a subject of much complaint by West Riding manufacturers.⁷ Both the Leeds Chamber of Commerce (in 1935) and the Batley and Birstall Chamber of Commerce (in 1937) convened special meetings to discuss complaints of an alleged scarcity of woollen rags, a representative of the large

1. Table III-IV(a), Appendix. The price of white flannels (12 $\frac{3}{4}$ ^d lb) for instance, exceeding Lincoln Half-Hog fleece (9 $\frac{3}{4}$ ^d lb.) in 1922.

2. W.R., 26.1.1928. For two (unspecified) classes of rags, the highest Yorkshire prices were 65^s/- and 115^s/- cwt.; continental buyers were prepared to offer 112^s/- and 130^s/- respectively.

3. W.T.W., 20.11.1928.

4. Yorkshire Post Trade Review, 12.1.1923, p.14.

5. W.T.W., 21.11.1936, 2.1.1937.

6. Imperial Economic Committee, World Consumption of Wool 1928-35, (H.M.S.O., 1936), p. 274.

7. Imperial Economic Committee, 'Survey of International Trade', W.T.W., 21.11.1936.

Batley shoddy manufacturing firm of John Blackburn proposing that the export of domestic rags be controlled to assist domestic woollen manufacturers to keep the price of their cloth low in overseas markets. Reflecting the increasing divergence of interest between the rag merchanting sector and West Riding woollen manufacturers, the Batley Chamber noted tersely

'If people would not pay the prices that existed for certain qualities in the open market, they could not expect to get them'.¹

Two additional factors contributed to the relative attractiveness of the British woollen rag market to continental and American buyers. Firstly, the devaluation of sterling after the Gold Standard had been abandoned in October 1931 had made British rag prices extremely competitive with foreign market values, and conversely, acted as a strong constraint on the import of continental rags (Table III(xiii)).² Secondly, the movement towards the substitution of shoddy and mungo by wool progressively improved the quality of domestic rag supplies, and, hence, their value to rag consuming countries. By the late 1930s the emergence of Britain as a net exporter of woollen rags was still a subject for comment, a trade source noting in 1936 that

'not so many years ago this would have been regarded as impossible, and it indicates the vast change that has taken place in the woollen rag trade of this country'.³

Imports of pulled shoddy and mungo closely followed the declining trend of woollen rag imports (Table III(xiv)). Supplies had largely

1. W.T.W., 27.3.1937.

2. W.T.W., 23.11.1935.

3. Yorkshire Post Trade Review, 9.1.1936, p. 16.

TABLE III (xiv)

Weight of imported shoddy and mungo consumed
in the United Kingdom, 1914-1935.

Year	Weight (000s lbs.)	Year	Weight (000s lbs.)
1914	6,257	1925	1,247
5	3,570	6	2,201
6	3,138	7	1,400
7	1,020	8	1,324
8	1,204	9	763
9	888	1930	421
1920	1,820	1	642
1	272	2	107
2	2,961	3	54
3	4,122	4	10
4	3,396	1935	0.3

Source: Annual Statements of the Trade of the
United Kingdom.

ceased on the outbreak of World War I (with the exception of consignments from France) but rose to a peak of nearly 4 million lbs. in 1924, possibly because of shortages in certain qualities,¹ and possibly because exchange rates and rising Yorkshire shoddy prices made foreign-pulled shoddies more competitive.² From 1925 imports declined rapidly, ceasing entirely in 1935, overseas manufacturers finding that exchange rates and competition from Batley and Dewsbury pullers made the Yorkshire market unremunerative.³

The decrease in woollen rag consumption by the West Riding woollen textile industry in the inter-war period was rapid and unprecedented, estimated consumption declining to the levels attained between 1860 and 1890. World woollen rag supplies were relatively elastic and supported the growth of old-established as well as new rag-pulling industries in the United States, Germany, France, Soviet Russia, Czechoslovakia, Poland, Italy, and other countries.⁴ There appears to be little evidence to support suggestions made in 1924 and 1929 that supply constraints were responsible for the sharp decline in consumption of imported woollen rags to the West Riding.⁵

The decisive factor facing the United Kingdom woollen industry during much of the interwar period was the low and competitive price of crossbred wool and noils. 'Firms that did best', a 1934 trade review noted,

1. France prohibited the export of rags for a period after March 1924 (W.T.W., 1.3.1924).

2. Wool, cotton, shoddy, and mungo price series, Chapter V, Appendix V-I.

3. M.F. Dyson MSS., loc. cit., correspondence 1934, and v. infra Table III-II(e), Appendix.

4. Yorkshire Post Trade Review, 10.1.1935, p. 15; Yorkshire Observer Trade Review, 25.1.1937, p. 26, 24.1.1938, p. 24.

5. Final Report on the Third Census of Production of the United Kingdom, 1924, I, p. 78; Committee on Industry and Trade, 1928, op. cit., III, p. 170. Both saw the decline in production of shoddy and mungo as 'due largely to reduced importation of rags from Russia, Germany, and other Continental countries' (Committee on Industry and Trade).

'were those engaged in the manufacture of better class goods, wool for the greater part of the year being better value than rags. Manufacturers employing any quantity of rags undoubtedly had their production costs increased ... the very large export of woollen rags resulting in, and maintaining, higher prices to the domestic user'.¹

Abundant supplies of cheap wool from ca. 1929 and the effect on woollen rag prices of international demand led to the progressive substitution of recovered wool by the virgin raw material as the historic price differential between the two narrowed markedly, a trend temporarily arrested in 1936-37 when 'prices of rags and wool more nearly accorded than had been the case for a long time'.²

Contributory factors on the demand side, discussed more fully in Chapter V below, were the loss of overseas markets, accompanied until 1932 by increasing imports of cheap woollen textiles, and changing consumer preference in the domestic market towards lighter fabrics, worsteds, and knitted hosiery goods. Only in 1939 with the outbreak of war was this movement reversed, the high priority given the recovered wool sector by the Wool Control bringing the return of a scale of activity not experienced since 1919.³

1. Yorkshire Post Trade Review, 10.1.1935, p. 15.

2. A.N. Shimmin (1938), loc. cit., p. 463; Yorkshire Observer Trade Review, 25.1.1937, p. 26.

3. W.T.W., 9.12.1939; W.R., 29.2.1940.

CHAPTER IV

The shoddy and mungo manufacturing sector

CHAPTER IV

1. Definition and function of the shoddy and mungo manufacturing industry.

1. - Definition and function of the shoddy and mungo manufacturing industry.

In order to identify the production unit referred to in this study as either a 'shoddy and mungo manufacturer' or a 'shoddy mill', all firms included in this category were those whose principal activity was the mechanical or chemical conversion of woollen rags into shoddy, mungo or extract which was then marketed to manufacturers of cloth, carpets, blankets and other woollen goods. Whilst the major characteristic of all firms so defined was the operation of one or more rag grinding machines, it has been found necessary to apply the second requirement somewhat less rigidly so as to include the small number of firms whose main operation was the grinding or pulling of rags on a commission basis. At the other extreme, the definition encompasses the fully integrated shoddy manufacturers whose high volume production justified large rag-sorting departments and where the bulk of their rag purchases were often made by direct contract with domestic or overseas wholesale rag merchants, thus by-passing to some extent the specialised services of the West Riding rag merchant. Very often these firms carded their shoddy or mungo so that their product could be either spun or else undergo the minimum of further preparation prior to spinning, but as some firms possessed spindle capacity or marketed a small proportion of their output as spun yarn using the services of a commission spinner, they are included within this definition by reason of their principal activity - that of pulling rags. It is hoped that this will avoid the sometimes confusing criteria determining a 'shoddy factory' present in the Factory Returns from 1867 (acknowledged in 1904) and, on the other hand, the meaning

of the term 'shoddy mill' in the North American context.¹

As the following discussion is concerned with the emergence and development of a distinctive horizontally-integrated shoddy manufacturing industry chiefly in the Heavy Woollen District, the growth of manufacturing capacity within the cloth producing industry as an adjunct to blending, spinning, weaving, and finishing is assumed to be excluded although by reason of its growing importance in the nineteenth century it will be referred to both here and in Chapter V.

The shoddy and mungo manufacturer occupied an unusual position in the raw material market of the wool textile industry, combining to some extent the economic functions of the wool stapler, dealer, or merchant, with those of yarn spinner or topmaker. Unlike the latter, however, product differentiation and not standardisation was a marked characteristic of shoddy and mungo, a difference that can best be seen as a reflection of the processes in and demand for raw material by the woollen as compared to the worsted branch of the industry. Thus whilst an examination of the records of nineteenth century West Riding 'heavy woollen' manufacturers will often reveal the use of a similarly-described ragwool supplied by the same shoddy or mungo manufacturer in their blends for pilots, meltons, or twills, the type and proportion of other raw materials used in the blend could vary markedly between each manufacturer.

1. Return of Woollen, Worsted, and Shoddy Factories ... 1904, P.P. 1904 (293), LXXXVII, 1121. The Return notes that 'The distinction of manufacture ... is that of the principal material employed, but this distinction is far from absolute, and hence the Return of woollen factories includes certain particulars of rag grinding (a shoddy process)...'; W.A.G. Clark, *op. cit.*, pp. 107-11. Clark was surprised to find 'few fully-integrated shoddy mills' in the West Riding, i.e., those carrying out all processes from rag pulling to finished shoddy cloth, indicating the marked difference in the organisation of the American and West Riding woollen industries apparent by 1908.

Having decided on the design, colour, texture, and quality of the new season's goods, the cloth manufacturer needed to be certain of obtaining a supply of raw material at a cost sufficient to determine a standard price per yard at which the various qualities were to be marketed. Because each woollen manufacturer required sometimes minute variations in the quality and blend of shoddy it was axiomatic that the successful shoddy and mungo manufacturer needed to possess great skill in both buying the cheapest qualities of rags for the blend and in knowing exactly how the material would pull, card, and spin in subsequent manufacturing processes. It will be seen from the following brief discussion of rag pulling that great attention to quality-control was necessary at all stages for all but the lower classes of ragwool. In addition, those firms possessing carbonising and dyeing plants were further able to treat a wider range of raw material to give greater flexibility and control over input costs for a particular blend. Thus although the medium and larger shoddy and mungo manufacturers maintained rag sorting departments it can be seen that there was a high degree of interdependence between them and the specialist rag sorting and merchanting sector.

Given variations in working capital between firms and the well-known ability of wool prices to fluctuate - sometimes to a great extent - from one auction to the next, the price and supply of shoddy and mungo in relation to wool stocks and prices placed the manufacturer of ragwool in a unique position. On the one hand rags, his own raw material, also fluctuated in price, and on the other, the price at which he could market his output was determined by the relative price level of wool and arrangements with his customers for the future delivery of material at prices consistent with contracts entered into at the beginning of each season. In addition, the shoddy or mungo manufacturer had to be prepared to fulfil at short notice orders for

small or large weights either from stock or from supplies of the required blend of rags from the specialist West Riding rag merchants. Thus, for large orders he would have to arrange for regular successive rag deliveries at, as far as possible, fixed prices, and allow for short-run price fluctuations when calculating actual production costs and gross profit margins. Unlike other raw material producers in the wool textile industry, the manufacturer of shoddy and mungo was making a product which, under certain conditions, could be substituted by raw wool. That long-run structural changes in the demand for and supply of wool did not occur until the third period considered here, 1914-1939, is apparent from the previous discussion of rag supplies. Nevertheless, the industry margin of profit, representing in gross terms between 50 and sometimes upward of 100 per cent above the cost of the sorted rag, reflected to a large extent the risks of their dual manufacturing function and the necessity to cushion the often marked fluctuations in the price of woollen rags. That the industry achieved this with some success is clear from the relative stability of shoddy and mungo prices indicated by the price series in Chapter V, which, with the exception of certain periods (i.e., 1860-66, 1915-20, 1924-25), largely belie the short-run price movements in the woollen rag market discussed in Chapter III.

The typical Heavy Woollen District shoddy mill in the 1880s could be either a fully self-contained purpose-built unit or one which had been adapted for the purpose and subsequently enlarged. On the other hand, it was not uncommon for manufacturers to rent part of a mill, install their own plant or rent it, and contract for power and light on an annual basis. The accompanying plan indicates a representative fully-integrated shoddy mill, built in the late 1870s or early 1880s and, assuming a power requirement of 10 to 15 H.P. for each rag machine in addition to auxiliary machinery, containing a total power capacity

in the region of 75 to 100 h.p.¹

The discussion following the next two sections on processes in the industry and their development will examine the growth of the Heavy Woollen District shoddy and mungo industry in three sub-periods, ca. 1813-1870, 1870-1914, and 1914-1939.

Key to Fig. IV(i) - John Speight and Sons.

1. One-storey office and sample room.
2. Two-storey rag sorting and storing department, with steam-operated crane.
3. Two-storey building with steam fire pump and mechanic's shop on ground floor.
4. Two-storey building containing boiler-house and firing-place, with a drying-house for carbonised rags in the upper storey.
5. Roofless building containing a Green and Son's economiser, mill chimney adjoining.
6. Roofless building containing dyeing vats for dyeing rags (heated by steam).
7. One-storey building containing small engine and hydro-extractor.
8. and 9. One-storey building containing small steam engine and two carbonising compartments.
10. Two-storey building containing small steam engine and rag-drying compartment (upper floor).
- 11, 12, 12a, 13a, Engine house rope driving drums, and overhead belts.
13. to 18. Six one-storey rag grinding sheds containing one machine in each.
- 19, 20. Two one-storey compartments containing a rag-shaker in each.
21. to 23. Two-storey buildings used as stables and hay-lofts.
24. One-storey building for storage of rags, shoddy, and mungo.
25. Dust chamber for 19 and 20.
26. Proprietor's dwelling-house.

1. Alfred Briggs and Sons MSS., loc. cit., Mill notebook, 1858-1936, entry ca. 1872. This notes that from 8 to 12 H.P. was necessary to drive a rag machine pulling ordinary rags, mungo rags requiring slightly more power.

II - Processes in the manufacture of ragwool.¹

Prior to sorting, many of the larger rag merchanting firms as well as the shoddy and mungo manufacturers, treated their rags in a 'rag shaker' (Fig. IV(ii)) to free the material from dust and other particles - a process used less for the better classes of used and new rags. The rag shaker, a simplified development of the traditional 'shake-willey' used for cleaning wool and fud as well as a preliminary process in blending, consisted of a coarse-toothed swift which beat the rags against projections in the casing, the dust being extracted by a flue venting outside the mill or warehouse and the dirt falling into a compartment below the machine.

In the rag grinding room the bales of sorted rags were opened and spread evenly over an area approximately ten feet square, an assistant sprinkling oil over them from a watering-can type container with a 'T' shaped spout, traditionally known as a 'lecking can'. Each pack of rags would have from two and a half to five gallons of olive, cloth, or black oil added, heated to improve viscosity, and an equal volume of boiling water. This process would be repeated until the required blend of rags in different layers and colours approached some six feet in depth. Although the blend was ready for pulling in a rag machine after a short interval, it was common practice to leave the stack to 'steam' overnight to ensure maximum penetration of the oil and water into all the fibres.² The addition of oil assisted in the pulling

1. The processes described here are covered in greater detail in many technical works on the wool-textile industry. A particularly good account of the methods used in the Heavy Woollen District appears in a series of articles by H. Priestman, 'The Heavy Woollen Trade', W.R., 1.4.1920, p. 816 et seq.

2. Some manufacturers preferred to steep the rags in a bath or pit filled with a quantity of oil.

process by reducing friction in the rag machine so that the staple and quality of the product would not be unduly impaired.

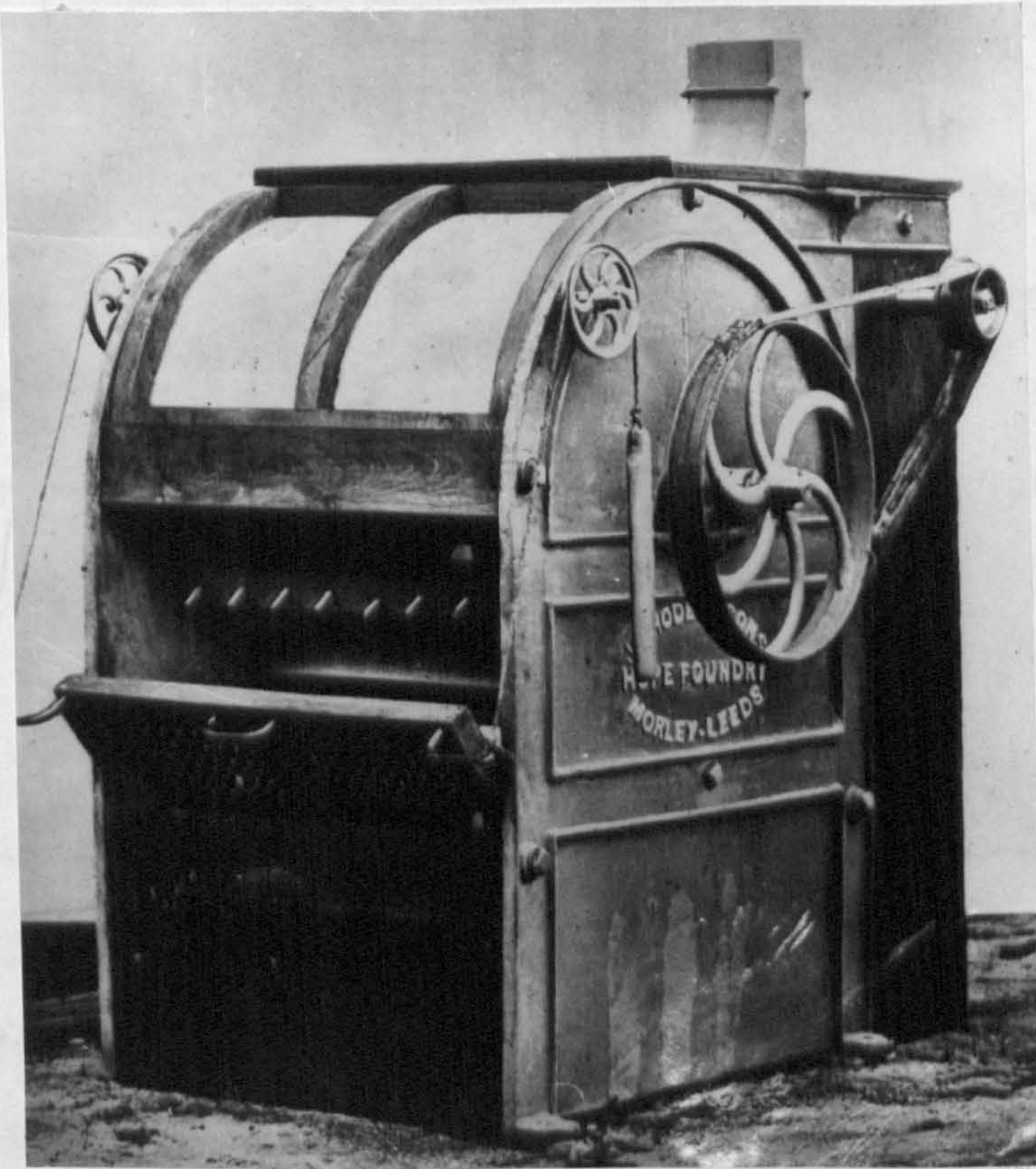
The rags were then placed on the feed sheet of the rag machine carefully preserving their sequence by working at one side of the pile from top to bottom so that the mixture of the blend went forward to the machine in approximately equal proportions.

The rags were spread by hand on the travelling feed-sheet or lattice ((a) in Fig. IV (iii)) coming into contact with the two feed rollers (b). These feed rollers, constructed of strong fluted steel and weighted (c) in order to grip the rags tightly, held the rags closely to the rapidly revolving cylinder or 'swift' (d) which, being clothed in many thousands of sharp teeth burst or 'pulled' the protruding rags as they were presented to it.¹ The upward motion of the swift and the draught created by its high speed within the casing (e) was sufficient to ensure that the liberated fibres of wool clung to it until centrifugal force and, at slower running speeds, a fan(f), delivered the material under the feed sheet(a). Although Yorkshire practice favoured forward delivery of the pulled shoddy or mungo, many continental and American machines were designed to deliver the material into a chamber at the rear of the machine.

To prevent pieces of untorn material from mixing with the pulled fibres, a small doffing fan or 'bit' roller' (g) caught the heavier material as centrifugal force separated it from the swift and threw it back onto the travelling feed sheet. A second 'bitter' in the form of a steel blade (h) deflected lighter pieces of untorn material onto the bitter roller, whilst any material passing under both bitters

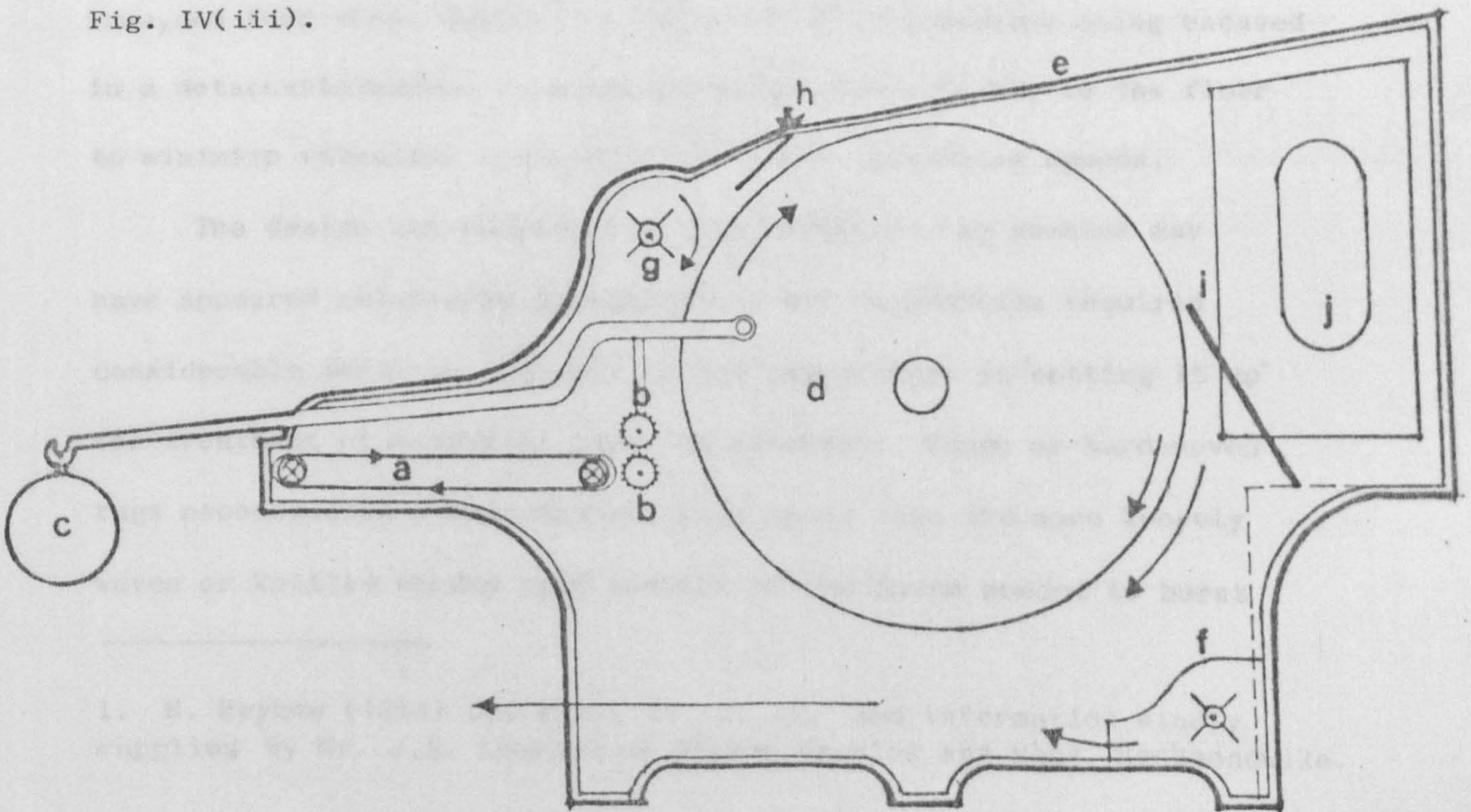
1. All swift widths referred to here relate to the working width 'on the tooth' of the cylinder.

Fig IV(ii)



Joseph Rhodes and Sons, Rag-shaker - ca. 1876.

Fig. IV(iii).



SECTIONAL VIEW (SIMPLIFIED) OF A RAG-PULLING MACHINE ca. 1890

were deflected by the adjustable steel plate (i) into the 'bit box'(j). The partly opened material in this was collected periodically and passed through the machine again.

Although the action of the toothed swift on woollen rags was initially seen as one of teasing out the fibres and latterly as a 'pulling' action, the accepted nineteenth century explanation was that of a 'grinding' action whereby the fibres were liberated by a controlled loss of metal from the teeth.¹ Thus, the strength and quality of the teeth on a swift revolving at between 350 and 800 r.p.m., depending on the hardness of the material being treated, was of critical importance to the quality of the pulled shoddy or mungo - teeth that were too hard tended to 'glaze' the rags and pull badly, whilst those that were too soft merely bent and severely reduced the efficiency of the machine.

The machine itself consisted of a stout iron frame upon which the 42 inch diameter 14 or 18 inch wide swift was mounted together with driving pulleys and cogs for operation of the various rollers, fans, and feed sheet mechanism, the whole of the machine being encased in a detachable wooden or metal cover and fixed firmly to the floor to minimise vibration induced by the high operating speeds.

The design and operation of the Yorkshire rag machine may have appeared relatively uncomplicated but in practice required considerable skill on the part of the rag grinder in 'setting it up' for treatment of different types of material. Mungo or hard-woven rags necessitated a much higher swift speed than the more loosely woven or knitted shoddy rags because of the force needed to burst

1. H. Mayhew (1851) op. cit., II, p. 34, and information kindly supplied by Mr. J.S. Knowles of Wilson Knowles and Sons, Heckmondwike.

the material. Consequently, mungo swifts were fitted with a far higher population of teeth to withstand a working speed of between 500 and 800 r.p.m.; shoddy swifts had a lower density of teeth so that at speeds of 350 to 500 r.p.m. the action of the teeth more closely approximated a 'pulling' of the fibres. The rag grinder was thus responsible for fitting as quickly as possible the appropriate swift in the machine according to the type of material to be processed, and ensuring that the adjustment of the feeder rollers to the teeth of the swift or 'nip' was as close as possible consistent with pulling the highest quality of material from the rags.¹ In addition, the relative speeds of the swift, feed rollers, and travelling feed sheet had to be adjusted so that both output and quality could be maximised.

The actual loading of the machine from the blend of rags was carried out by an attendant and even this operation required constant vigilation to ensure that the rags were evenly spaced over the whole width of the feed sheet to present a constant thickness to the two fluted feed rollers. Any 'lumps' in the two to three inch rag layer, particularly in the middle, resulted in the rags being snatched by the revolving swift instead of being burst - persistent bad feeding not only affected output because partly pulled material had to be re-processed, but also accelerated uneven wear at the middle of the feed rollers and swift necessitating more frequent and expensive repair. A traditional saying in the West Riding trade was that it was 'more important to look after the edges and let the middle take care of itself'.

Having passed through the rag machine, the fibrous mass of ragwool

1. A trade writer noted in 1912 that

'An expert rag-puller can turn out the mungo or shoddy in such a condition that its value is double that of material produced by an inexperienced hand'. W.R., 18.4.1912, p. 5.

was then baled under pressure or simply packed in 'sheets' if material of a 'lofty' consistency was required. Certain types of hard material were frequently subjected to a further opening process on the Garnett or Droussette thread-opening machine. This consisted of one, two, or three revolving cylinders assisted by a number of stripper, worker, fancy, doffer, and licker-in rollers somewhat resembling in appearance the carding engine, but clothed with the characteristic and very strong 'saw-tooth wire form' patented by P. and C. Garnett in 1850.

A second important process used in the rag and shoddy industry was the carbonising method for producing 'extract', the term applied to the wool fibres remaining after treatment of mixed wool/cotton unions and linseys of both worsted and woollen fabrics. The rags were steeped in a wood or lead-lined vat containing heated dilute sulphuric acid which converted the solid cellulose of the vegetable cotton fibres into brittle hydro-cellulose, the material then being placed in a hydro extractor to recover the acid. Following the application of dry heat in a carboniser the rags were delivered to a large shaker or crushing machine for extracting the dust-like residue of the cotton, which, although leaving the wool free of vegetable matter, required further washing to neutralise the acid prior to dyeing. An alternative method, innovated in the 1880s, subjected the rags to heated dry hydrochloric acid gas in a revolving cylinder in an enclosed chamber for about three hours, the material then being shaken and needing no further drying before dyeing. Both methods were used in the industry, the 'wet' process being cheaper although not producing a universally-liked extract, until raw material, labour, and heating costs began to

favour the 'dry' process from the early 1900s.¹ Subsequently, the material could be opened by a willey and then scribbled and carded to produce very fine grades of shoddy and mungo.

A third process, and one which only began to be used on any scale from ca. 1910, was the stripping and dyeing of rags. Previously a process concentrated in the hands of a few old-established firms, the application of more scientific methods enabled an extension in the use of rags independent of their colour value - an important innovation in the years prior to World War I until shortages of both acid and dyes reasserted the colour value of different classes of rags. Until the process was further refined, the stripping and dyeing of rags tended in some cases to reduce the strength of the shoddy and to contribute to lower production weights when pulling.²

1. The Textile Journal, 7.4.1903, pp. 203-5.

2. 'The Stripping and Dyeing of Rags', W.T.W., Supplement, 12.4.1913, pp.xv-xvi; also J.G. Jenkins (ed.) The Wool Textile Industry in Great Britain (1972), p. 121.

III. An Outline of the technological innovations and their significance
in the development of rag-pulling machines and wool extracting.

In 1801 three instrument makers from Glasgow, Thomas Parker, William Telfer, and Alexander Affleck, took out a patent for the 'Preparation and Manufacture of Flax, Hemp, etc.' by means of a machine constructed

'... to prepare or reduce articles made from flax, hemp, silk, wool, cotton, and other materials, after the same have been in use, or otherwise, into the best state of which they are capable in order that they may be recovered and again made use of as materials of manufacture ...'

There is some evidence that they used this machine (Fig. IV(iv)) for teasing down rags for they advised that

'... articles made of wool seem to tease best when heated to a moderate degree'.

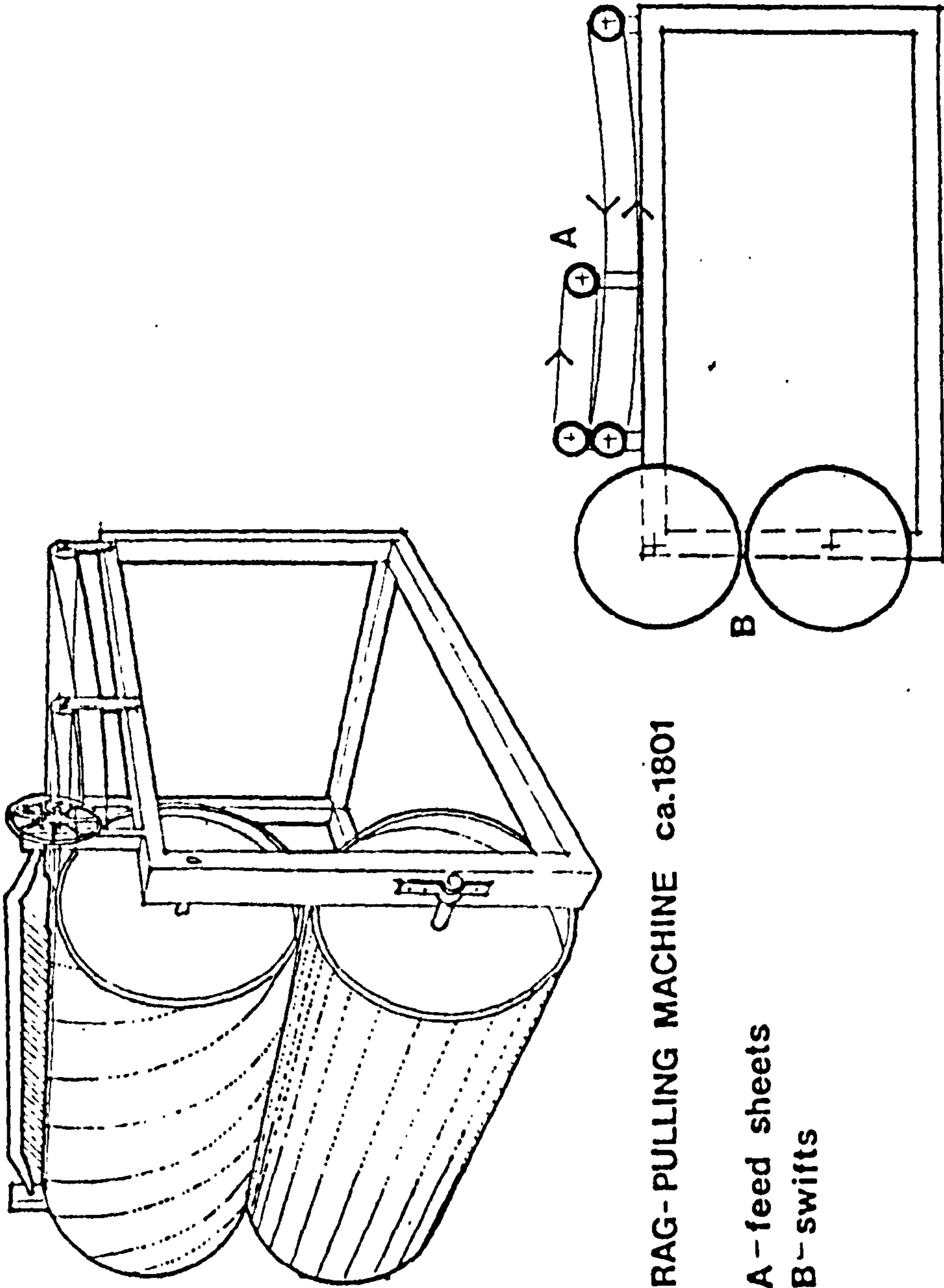
and in the following year took out a further patent for an improved machine with a 19 inch wide swift.¹

There is, however, little to suggest any direct connection between this patent and the innovation of the first rag machines in the West Riding in ca. 1809-1813. The wool used by the London flockmakers in the eighteenth and early nineteenth centuries appears to have been torn from old blankets stretched over a 'duffing cushion' and combed with sharp iron curry-combs, and although the early users of shoddy may have used this method for a time, it would have been a long and laborious process.² It would therefore seem, from oral and other

1. T.My., 5.4.1913, pp. 279-80; W.T.W., Supplement, 12.4.1913, p. v. Patent no. 2,469 of 1801 and 2,607 of 1802. J.T. Lewis, The Development of the Machinery used in the Preparation of Wool for Woollen Spinning. Unpublished dissertation, Huddersfield College of Technology, Dept. of Civil and Mechanical Engineering, May 1964.

2. Jubb, however observes that it was 'an ascertained fact that rag machines were in use in London prior to their being so in this part' for flock making in the saddling and upholstery trades. Jubb was unaware of the patents of 1801 and 1802, suggesting that the machines were copied from existing ones used in the West Riding (1860, pp. 18-19).

Fig. IV(iv).



RAG-PULLING MACHINE ca.1801

A-feed sheets

B-swifts

evidence cited by the protagonists in the previously referred to 'Origin of Shoddy' debate of 1880, that the development of the West Riding machine was achieved without knowledge of the patents of 1801 and 1802.

Indeed, it has been claimed that such a machine may have been in use outside Yorkshire as early as 1811. John Coxeter, cloth manufacturer of Greenham Mills near Newbury and of the 'Throckmorton coat' fame, was reported to have declared on that occasion

'So great are the improvements in machinery which I have lately introduced into my mill that I believe that in twenty-four hours I could take the coat off your back, reduce it to wool, and turn it back into a coat again'.¹

The early Yorkshire machine used by Parr and Law appears to have been developed from the single swift carding engine using similar framework but more narrowly constructed to take a one foot wide and two foot diameter swift of considerably smaller proportions than that used for carding. Strong currycomb blades were screwed to the swift working against other combs diagonally set on smaller fluted rollers. The rags were fed in at both ends of the machine and a rapidly revolving brush swept the shoddy off the cylinders.² The operation of the machine was cumbersome and far from perfect, the strong force needed to disentangle the rags necessitating frequent replacement of broken currycomb blades, and between 1815 and 1818, Jonas Haley, an apprentice of the Dewsbury machinist Joseph Archer, re-built the iron swift using conical iron teeth mounted in wood bearers or lags located on its

1. W.T.W., 12.4.1913, p. xi. The original appeared in the Strand magazine of 1899. A letter written by the editor of the Waste Trade World in 1913 to the grandson of Coxeter produced a reply which confirmed, although not entirely satisfactorily, that cloth-pulling machinery had been operating some time previous to 1811.

2. T.M., 15.5.1881, p. 172. Fenton notes that this description of an early machine was 'furnished to us verbally by a son of its contriver, and one or two other gentlemen who can remember it'. The description is approximately consistent with that of Jubb (p. 19). Edwin Law claimed in 1880, however, that the first Yorkshire rag machine was built by Gibson of Cleckheaton. W.T.W., 12.7.1913, p. 17.

periphery.¹ The development of the machine appears to have been a success for a number of them were constructed and put into use in the Batley and Brighouse area, powered by water or horse-gin, and in 1822 the first purpose-built shoddy mill, Hick Lane Mill, began operating using a second-hand steam engine.²

From Head's description of a rag machine in Batley Carr in 1835, the design appears to have undergone some modification, the machine resembling

' ... Cook's agricultural winnowing machine ... (being) ... thoroughly encased in wood that nothing was to be seen' ³

His account closely compares with that of the Factories Inquiry Commission of 1833 in their description of the wool-opening 'Devil' or plucker with spiked or toothed feed rollers and a spiked swift

' ... revolving in a closed box with great rapidity. Some ... at the rate of 300 r.p.m. ...' ⁴

Rags were fed in from one point on the machine and delivery was 'at the bottom' assisted by the draught created by the rapid movement of the swift.

1. *ibid.* A more detailed description of this machine was outlined in correspondence to the Batley Reporter, 24.12.1880, p. 3. See also W. Smith (1876) *op. cit.*, p. 220.

2. T.M., 15.5.1881, p. 173. This is discussed below.

3. G. Head, A Home Tour through the manufacturing districts of England in the summer of 1835 (1836), p. 145.

4. Factories Inquiry Commission. First Report ... as to the Employment of Children, P.P. 1833 (450), xx,3. This description closely follows that of a rag machine of ca. 1842 in The Manufacturers', their System, and their Operations - a letter to Busfield Ferrand, 1842 p. 7.

'This machine consists of a very strong, firmly-made cylinder, on the surface of which are firmly screwed a large quantity of iron spikes, in diagonal lines; in front of this cylinder are two rollers, called feeding rollers, also fitted with teeth of a different description. These rollers work into each other in such a manner as to hold the rags firmly between them, and as they revolve they present the rags gradually to the teeth of the cylinder. The cylinder performs many hundreds of revolutions per minute, and in consequence of the very slow motion of the feeding rollers, can almost be said to "split a hair".'

The relatively late introduction in ca. 1834 of mungo, the short fibrous material produced from grinding hard-milled cloth, would seem to be explained by a number of factors. Traditional explanations suggest that the presence of cotton 'bits' from the seams, button holes, and lining stitches marred the final product, which was used in the early 1830s in the bed-flocking trade. Secondly, the coarse card clothing then in use in the Batley area, although well adapted to processing short wastes such as fudd, appeared unsuitable when put to work on the fine fibres of mungo.¹ Whilst both of these difficulties appear to have been quickly surmounted after the introduction of seaming and ripping processes in rag sorting and some adjustments to carding machinery, a third factor, that of problems facing prospective mungo-pullers in the design and power of the contemporary rag machine, may have delayed successful grinding of mungo rags in the 1820s and early 1830s.

Because of the extreme force needed to unravel hard-felted woollen rags from cloth that had originally been subjected to continuous pounding in the fulling stocks for half a day it seems unlikely that the rag machine of the 1820s possessed a swift of sufficient strength and with the correct density of tooth population to meet the extra demands of cloth rags.²

Secondly, although mill shafting running at about 100 r.p.m. could be geared to produce the 300-400 r.p.m. necessary to power a rag machine pulling soft-woven rags, the power needed to maintain the

1. E. Law, in the W.T.W. 5.7.1913, p. 22 et seq. This article appeared first as a pamphlet in Batley in 1880.

2. A surviving machine made by Jonas Haley of Dewsbury, probably ca. 1830-40, is at the Welsh Folk Museum, Cardiff and has a swift diameter of 32 inches, 24 inches wide and with teeth 2 inches long. J.T. Lewis, op. cit., p. 11.

necessary 600-700 r.p.m. for pulling mungo rags would have posed a number of difficulties. Unless the swift could be made to sustain this speed consistently the material would tend to be 'cut' and not ground rendering it of little value to the manufacturer. The low horse-power capacity of water and steam power in Dewsbury and Batley as evidenced by the 1833 and 1834 reports of the Royal Commission on the Employment of Children indicates the problems facing rag machine operators, it being fairly common, according to one report in 1836, for rag machines to be run at night when the other machinery was silent.¹ Certainly, the two horse-power let by Sheard, Spedding and Co. of Batley for rag pulling would have been insufficient for mungo-rag pulling.² The rapid growth of mungo as a raw material from the mid 1830s thus appears to have coincided with innovations of ca. 1835 permitting higher shaft speeds of 120 to 150 r.p.m. from a 50 h.p. engine coupled with the earlier innovations of Archer and Haley's sharp conical teeth and the admixture of oil with the rags to permit easier pulling.³

It seems clear from descriptions of the rag machine of the 1820-1840s period and also from manufacturers' comments that one of the major problems was the contamination of pulled shoddy and mungo by pieces of imperfectly torn rag.⁴ Whilst Jubb noted that by 1860 rag machines tore the material 'at the front of the swift only' in comparison with the two feeding points of the older machines, there

1. Factories Inquiry Commission, P.P. 1833 (450), xx, 3. Report CI, North Eastern District; Supplementary Report ..., P.P. 1834 (167), xx, Part I, CI, North Eastern District; Reports of the Inspectors of Factories, P.P. 1836 (353), XLV, 221, Correspondence relative to the Firm of Taylor, Ibbotson, and Co. William Smith, also, notes that the speed of the 1820 rag machine was much slower than at present' (1876, op. cit., p. 220).

2. Supplementary Report, op. cit., 87.

3. A. Ure, The Philosophy of Manufacturers (1835), pp. 34-36; W.T.W., 19.7.1913, p. 19.

4. W. Smith (1876), op. cit., p. 220; S. Jubb(1860), op. cit., p. 20.

had been 'no material alteration in the principle of the machine' although swift speeds had increased to 600-700 r.p.m.¹

Although improvements to the machine may have appeared slight - a higher tooth density on the swift and a fan to extract the dust during the grinding process - output per machine was four times as great and the price of the pulled material had fallen to one third of its previous level by 1860.² Jubb, however, openly admitted that mungo produced in Germany was 'superior' to Yorkshire-pulled material and whilst he failed to provide a more detailed explanation of the reasons for this, other than German 'skill and painstaking labour', it seems clear that he refers to the common problem of 'bits', or pieces of untorn rag, contaminating Yorkshire produced ragwool.³ Although these could be opened out by the coarser-clothed cards processing shoddy, the presence of rag bits severely reduced the value of mungo destined for the fine cards of Morley.

The innovation responsible for the consistently high quality and price of German mungo appears to have been made at the works of Mathias Stim. Söhne, Kunstwolle Fabrik, Oberursal, in 1857 by the foreman grinder, Johann Gross.⁴ Unsatisfied with the traditional practice of hand-picking pulled mungo for untorn pieces, he added an extended cover to the rear of a rag machine after observing from an uncovered machine that centrifugal force threw off the rag-pieces before the pulled material. The 18 inch cover he constructed thus deflected the untorn rag pieces which could be collected and returned to the feed sheet.

1. *ibid.*, p. 19.

2. *ibid.*, p. 20.

3. *ibid.*, p. 32, also *v. supra* p. 145.

4. This was the factory where Reuss was first employed in 1859 (W.T.W., 12.4.1913, p. xii).

As Reuss observed in 1913

'The result was magical; after that the firm of Messrs Stirn Söhne offered mungos and shoddies free from "bits" and the mark of M.S. sold in Belgium and England at better prices than any other mark'.¹

The advantage gained by Stirn Söhne Kunstwolle Fabrik excited much interest amongst continental mungo manufacturers until ca. 1860-61 when a competitor, Badische Wolle-Manufactur of Mannheim acquired details under the pretext of a joint patent agreement and sold it to the Morley machine makers, Joseph Rhodes and Sons, via a Swiss firm, in 1862. The German monopoly ceased soon after this when Gross was persuaded to join a large firm of German mungo manufacturers.²

Rhodes were quick to ensure that their newly-acquired innovation would not meet with the same fate in Yorkshire and registered a patent in 1862 for the device, which became known as the 'Rhodes cover'

'... in order to prevent tufts of untorn rags from passing forward with the wool or fibre (by means of) an adjustable slide plate ... placed in an opening at the back of the cover ...'³

A comparison of the Rhodes machine with a patent the following year by Reid and Rydill for an improved swift indicates the superiority of this innovation, the 1863 patent specifying only a knife-edge to deflect pieces of untorn rag from passing into the pulled material.⁴

With the exception of material for the flocking trade, mechanical innovation alone was insufficient to cope with the increasing proportion of union, linsey, and cotton-warped worsted rags being collected in the late 1840s and early 1850s. The invention of the carbonising process - of great importance to the wool textile industry in the elimination

1. *ibid.*

2. *ibid.*

3. J.T. Lewis, *op. cit.*, p. 77; T.M., 15.7.1881, p. 252. Rhodes, who commenced making rag machines at Hope Foundry in Morley in 1834, appears to have appreciated the potential of mungo at an early stage. Reuss notes that he 'did remarkably well' from his 1862 patent (W.T.W., 12.4.1913, p. xii, also W. Smith (1876) *op. cit.*, p. 229).

4. J.T. Lewis, *op. cit.*, p. 76.

of the troublesome trefoil and clover spiral burrs - appears to have been made in the early 1850s.¹ Its application in the West Riding was still a novelty in the late 1850s, Jubb observing in 1860 that extracting was 'a new feature in the shoddy trade'.² From the surviving evidence it would appear that carbonisation - the destruction of cotton and other vegetable fibres in mixed wool rags by the action of dilute sulphuric acid - was successfully innovated simultaneously by Aldred, Fenton, and Crone of Manchester and Höber in Germany in 1851-2.³ A London manufacturer of extract tersely commented in 1881 that

'no invention or discovery ever had so many claimants for precedence as extracting ... , sometimes we see Germans, Belgians and Frenchmen laying claim to being the first inventors, all of which were copied from the original'⁴

Two Batley men, Henry Wildsmith, head cloth finisher in Nussey's mill, and James Carter, a Batley toll-bar keeper and dealer in low wools, established one of the first West Riding extracting plants in 1859 after several years of experiment and, as Fenton observed,

'... with the outbreak of the American war a golden shower of profits burst over them as well as others, and extract works arose through the West Riding in regiments ... '⁵

In Germany, this innovation only 'came into general use in the seventies, after twenty years of secrecy in certain factories', one of the largest manufacturers being H. Shirp of Unter-Barmen.⁶ Although

1. S. Jubb (1860), op. cit., pp. 26-27; T.M., 15.6.1881, p. 209, 15.7.1881, p. 248.

2. S. Jubb (1860) op. cit., p. 26. Jubb notes that cotton-warped worsted rags had been successfully carbonised but no wool from fine union cloth rags had yet appeared on the market (p. 28.).

3. T.M., 15.7.1881, p. 248; J. Zipser, Textile Raw Materials and their Conversion into Yarns (1921), p. 29.

4. T.M., *ibid.*

5. T.M., 15.6.1881, p. 209.

6. From an article by Fritz Knoll in Produkten-Markt in W.T.W., Supplement, 12.4.1913, p. vii. also H. Shirp, in The Textile Journal, 7.4.1903, p. 203.

probably the largest firm specialising in the production of extract wool in the Heavy Woollen District, Wildsmith Carter appear not to have introduced further innovations in the process, possibly owing to the death, in his late forties, of Wildsmith in ca. 1878-9. The introduction of a successful 'dry' carbonising process in 1884-5 by Duke Fox, a partner in the large shoddy manufacturing firm of E. Fox and Sons, and John Illingworth, another shoddy and flock manufacturer, marks the beginning of the decline of the old 'wet' process as the cost-saving benefits of using dry gas were appreciated.

A trade journal, commenting on Fox's carboniser in 1884 noted that it performed

' ... its work in every respect in a very effectual manner, bringing out the worsted or woollen material in all its tensile strength after removing all vegetable matter ... '

and extracting some 1,000 lbs. of 'shallies' or between 2,000 to 2,500 lbs. of cloth rags per day.¹

Illingworth's carboniser produced a similar output 'at a cost of 15^s/- per ton including both material and wages'.² Further improvements to Illingworth's machine in 1888 claimed a reduction in costs of 5^s/- to 10^s/- per ton, and the following year the addition of automatic feeding and delivery mechanisms enabled continuous running and replacement of the male attendant by a boy who could 'fill the hopper and proceed with other work'.³

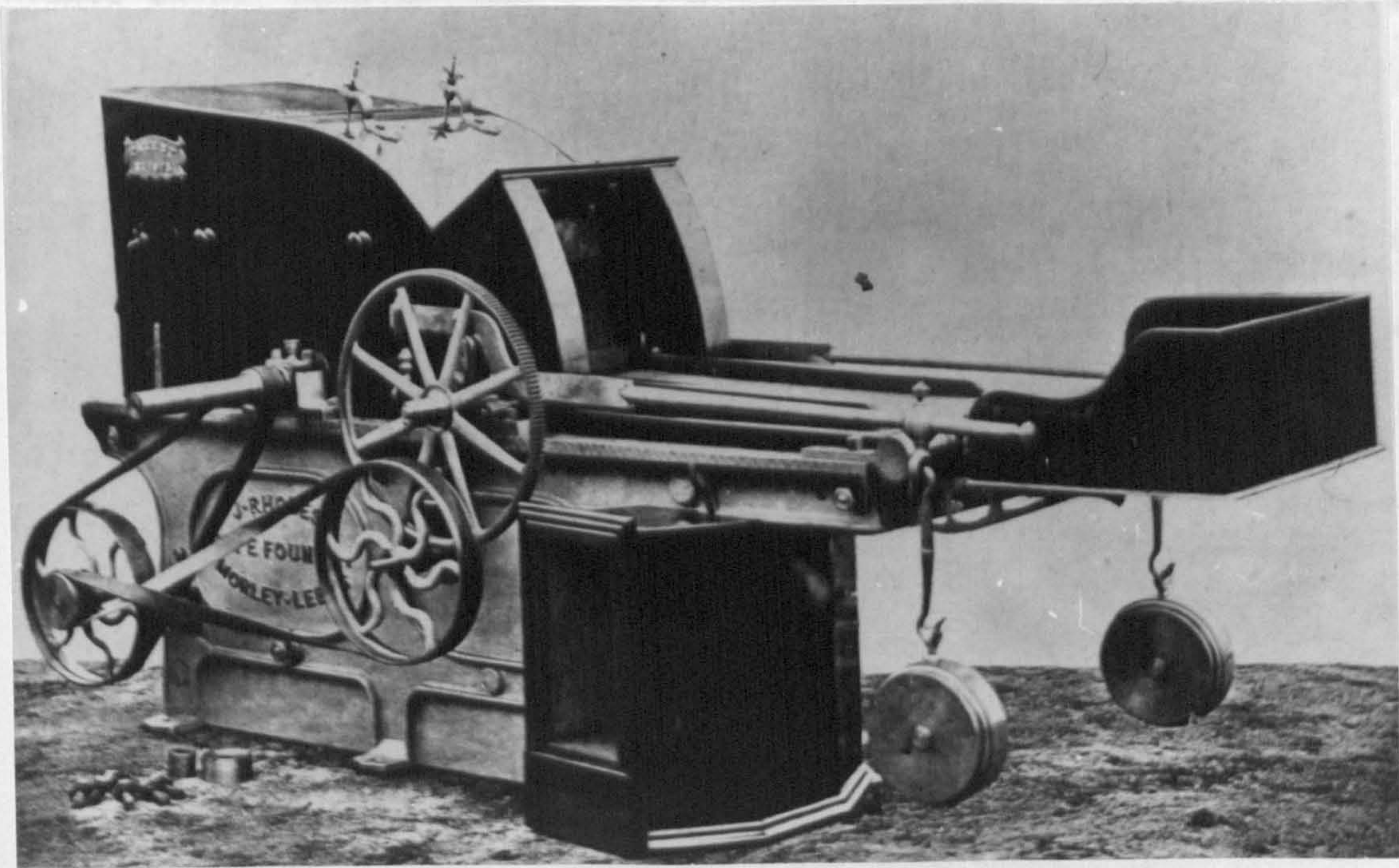
These claimed output figures for a 12 hour working day compare well with those of the German firm of Shirp in 1903 (1,000 kilos in 12 hours), his machine requiring two male operators in order to sustain

1. Journal of Fabrics, 12.9.1884, p.33.

2. Journal of Fabrics Industries, 12.2.1885, p. 6.

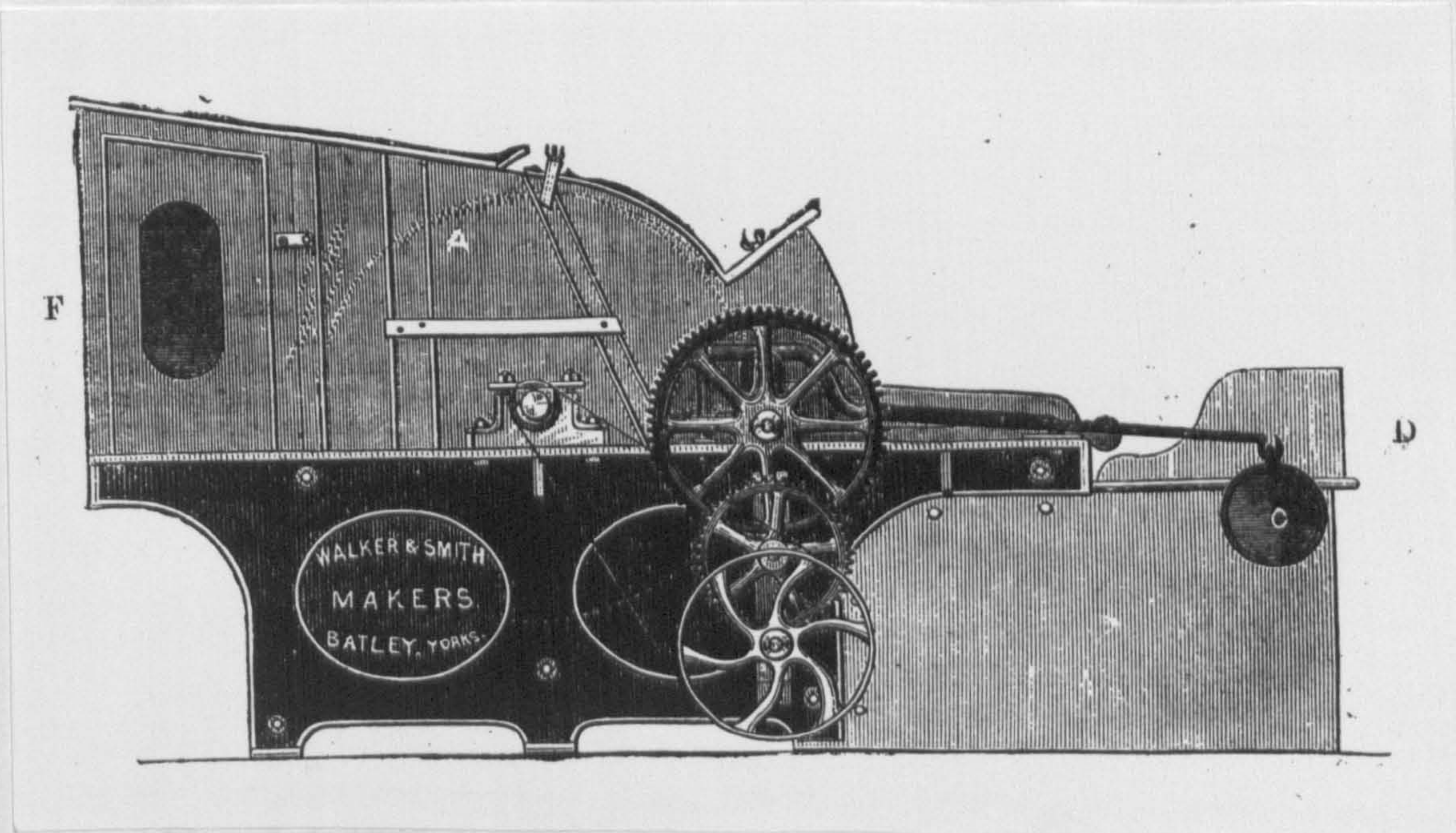
3. Journal of Fabrics and Textile Industries, 12.4.1889, p. 46.

Fig. IV(v).



Joseph Rhodes and Sons Rag Machine - ca. 1876.

Fig. IV(vi).



Walker and Smith Rag Machine - 1881.

maximum output of carbonised rags.¹ By the early twentieth century many of the larger shoddy and mungo manufacturers possessed carbonising plants which, even as late as 1914, could cost as little as £92.8^s/-.²

Not all firms who moved into this field as specialist wool and rag carbonisers, either on their own account or as commission agents, were successful. The Batley Carbonising Co. Ltd. was formed in 1897 with a new machine made by Moss and Sons of Ossett 'similar to those supplied to Wildsmith Carter and Co.' Notwithstanding the influential directorships of Thomas Cook Taylor and John Stublely and an agreement from Moss in exchange for 'preference' in ordering new machinery 'not to make carbonising and drying machinery except to our orders', the company was wound up in 1902.³

Between 1870 and 1880 continued small improvements were made to the rag machine by the specialist West Riding machine makers, including a doffing fan to assist in the delivery of the pulled material, and the option of an 18 inch swift to the standard 14 inch swift which had been customary since the 1820s. Walker and Smiths' rag machine, displayed at the 1881 Crystal Palace Exhibition (Fig. IV(vi)) was particularly noted by The Textile Manufacturer correspondent as 'a handsomely got up and well-finished exhibit' and 'well worth a careful examination'.⁴ In 1889, Ingham and Sons machine (Figs IV(vii) and (viii)), also fitted with an 18 inch or 'broad' swift, was mounted on a patented adjustable iron bed so that 'standing time' was minimised when machine speed had to be changed for different classes of material, a frequent operation previously consuming much

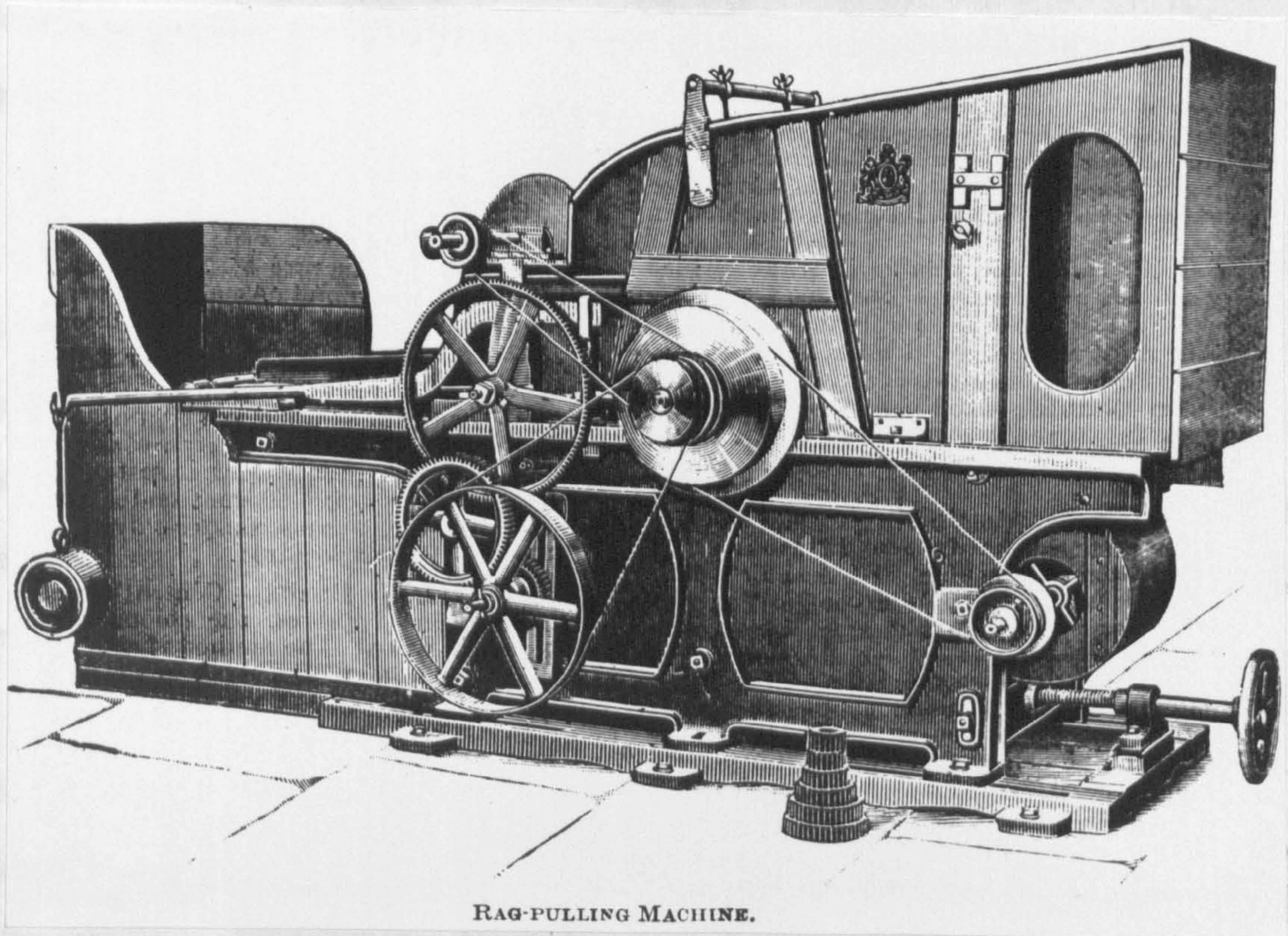
1. The Textile Journal, 7.4.1903, p. 204.

2. E.W. and H. MSS., loc. cit., Eli Townend and Co., Purchase Ledger No. 3, 20.4.1913-31.3.1922.

3. J.T. & J.T. MSS., loc. cit., Minute Book of Batley Carbonising Co. Ltd., 5.1.1897-1.11.1902.

4. T.M., 15.5.1881, pp. 9-10.

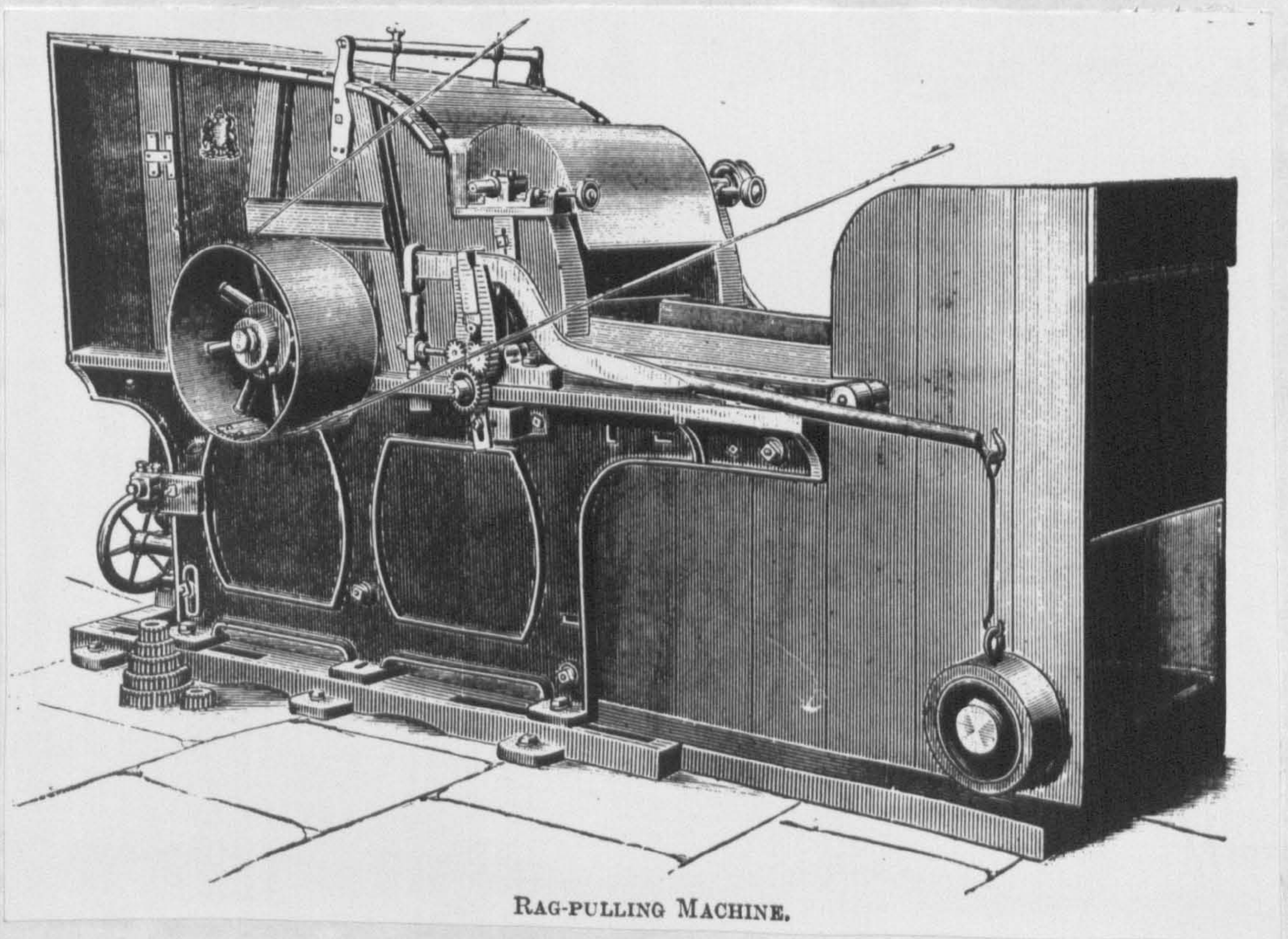
Fig. IV(vii).



RAG-PULLING MACHINE.

Ingham and Sons, Clover Works, Dewsbury - 1889.

Fig. IV(viii).



RAG-PULLING MACHINE.

Ingham and Sons - 1889.

time when driving pulleys and the length of the shafting strap needed to be adjusted.¹ Both machines incorporated patent 'biting appliances' and feeder-roller carriages to prevent rag pieces from mixing with the pulled shoddy or mungo.

In 1887 a 'Patent Rag Oiler', manufactured by Brigg and Dixon of Leeds, was designed to be attached above the feed sheet of a rag machine. Its makers claimed that their modification dispensed 'with the necessity of making a blend of rags' and the frequent expense and spoilage of material by 'flocking' caused by dry rags overheating the feed rollers and swift. The device was, apparently, 'taken up by many Yorkshire mills'.²

A major proportion of the costs of operating a rag machine - and, indeed, the most important source of profits for the rag machine makers - was the regular need to have swifts repinned.³ Worn pins, or teeth, not only produced an inferior 'pull' and heightened the ever-present danger of ignition in the rag machine, but also increased power costs markedly. David Dixon, owner of three woollen mills in Leeds, had found by careful testing that at 550 to 600 r.p.m. a worn swift required 13 h.p. to pull rags but only 6 h.p. after new teeth had been fitted.⁴ Whilst the larger woollen and shoddy manufacturers maintained a millwright and mechanics shop to attend to the frequent repairs and repinning of swifts, the great majority of rag machine operators returned their swifts to the machine maker for repair - a laborious and complicated

1. T.M., 15.7.1889, pp. 344-45.

2. T.M., 15.11.1887, pp. 629-30.

3. There was a limit to the number of times the beech lags could be re-pinned because of the exacting requirements of pulling shoddy and mungo, but a strong demand existed from flock makers for used lags fitted with worn teeth.

4. Alfred Briggs and Sons MSS., loc. cit., Mill Notebook 1858-1936, entry May 1886. As Dixon let-off power and a number of rag machines at a fixed annual rental it was in his interest to ensure the efficient operation of the machines by his tenants.

job when as many as 14,000 teeth had to be inserted individually into beech lags, the lags bolted onto the iron drum of the swift, and 'trued' for balance.

Although the original iron pins had been replaced by steel, the early conical shouldered design of Archer and Haley had remained virtually unchanged for some sixty years. However, because of their design, in operation they became progressively more blunt as wear approached the shoulders of the pins, even though the swift was frequently turned around to present the sharp edge to the feed rollers. It was only when a satisfactory method of boring square holes in the lags had been perfected in the late 1870s that a firm of card, comb, and pin manufacturers, Harding, Richardson and Rhodes of Leeds, were able to offer their patented flat teeth to the shoddy and mungo manufacturers of the West Riding. Because of its design, the pin possessed a thinner working surface of great strength which reduced friction and remained constantly sharp over its whole length. This enabled the swift to be used until wear approached the surface of the cylinders thus extending significantly the working life of the swift without decreasing the quality of the material being pulled.

Walker and Smith of Batley secured the sole manufacturing rights under Harding's patent and began to supply their customers with the 'new patent flat teeth' from 1881.¹ The monopoly of Walker and Smith, who were the sole suppliers of the teeth to other West Riding rag machine manufacturers, lasted until 1902 when a number of patent

1. Leeds City Council, Archives Department, Walker and Smith MSS., Sales Ledger No. 3, 5.6.1876-11.3.1884. It is interesting to note that one of the first firms supplied with the 'patented flat-headed lags and teeth' was the German firm of Jancke and Co. of Grünberg.

infringements could no longer be resisted by Hardings.¹

Further improvements in the 1880s and 1890s included supplying smaller-sized machines fitted with a 20 inch wide swift for pulling high quality worsted 'merino' rags, the more general provision of iron covers enclosing the swift, and all-steel swifts which, because the pins were fitted directly into the drum and not to wooden lags, could be re-pinned in the mill mechanics shop.²

A major innovation but one which appears to have received no publicity in the trade journals, was the construction of two 'double-swifted' or 28 inch machines for E. Fox and Sons by machine makers Morton Son and Co., of Heckmondwike in 1885.³

1. A letter to Wilson, Knowles and Co. of Heckmondwike dated 30.9.1902 was not followed by the implied threat of legal proceedings

'We are surprised after your last interview with us and the concession which has been made in price in consequence of your visit, to hear today that you are ordering Machines for making Flat Pinned Rag Lags.

This we look upon as a Declaration of War and you will of course understand that you will have to fight us on the matter, as we cannot allow a patent to be infringed.

We have instructed Messrs. Walker and Smith to stop supplying you with any lags on our system.

We think you will understand that these are the only courses open to us, but should you wish to see us to discuss the matter in a friendly spirit, we shall be ready to receive you.'

Wilson Knowles and Sons MSS., Chapel Lane, Heckmondwike.

2. This innovation by Jackson's Patent Rag Machine and Swift company was not popular with all manufacturers despite its obvious cost-saving features, as the all-metal swifts tended to run at a higher temperature than those on the traditional wooden lagged machines. Wilson Knowles and Sons MSS., loc. cit., handbill 2.8.1893 for the Yorkshire Agricultural Society Show, Dewsbury.

3. Walker and Smith MSS., loc. cit., Morton Son and Co., Sales Ledgers, 1.1.1877-25.8.1885, 7.7.1885-7.6.1895.

There is evidence that Machell Bros of Cloth Hall Mills in Dewsbury may have been operating one of these machines in 1881, but as they were constructed to special order and not offered as a standard factory option it seems likely that those who bought the machines intended to gain a considerable cost advantage over their West Riding competitors. In August and September of 1885 two 28 inch swift rag machines were constructed from four older 14 inch machines with the addition of 'new strong side gear wheels', servers, feed rollers, and other strengthening. Although some minor repairs were needed when operation exposed certain weaknesses, the machines appear to have been used frequently but the expected increased output may not have been without problems. Writing to a woollen manufacturer in 1905, Walker and Smith observed.

' ... we note that our one machine is not capable of dealing with the quantity of rags you have at your command. Your machine is 18" wide and we have made them as wide as 28" but they are more or less unsuccessful. The reason for this is on account of the great width, the feed rollers have too much spring and they do not grip the rag. There is no such thing as a machine to do four times the output of this machine and the only way we see is to put down sufficient machines to cope with your trade. Even if it were possible to make a machine large enough it would take the same number of men to follow it as putting in more machines'.¹

From the surviving records of three rag machine makers it appears that this innovation - an innovation that would be considered only by the larger shoddy and mungo manufacturers possessing sufficiently powerful engines - was not taken up by Fox's competitors, although the two machines were still in regular use 27 years later in 1912.²

1. Walker and Smith MSS., loc. cit., Letter Book 1905, letter 9.11.1905 to Robert Craig and Sons Ltd.

2. E.F. and S. MSS., loc. cit., Bought Ledger, March 1906-February 1913.

Between 1914 and 1939 a number of small improvements were made to the rag machine - a positive top roller drive in 1916 patented by shoddy manufacturers Joe Kaye and Sons, Wilson Knowles patent fibre lags in 1926, and four-speed, stop, and reverse motions to the feed mechanism by two Batley machine makers, Asquith Brothers in 1938 and Walker and Smith in 1939.¹ J. Redgwick and Sons of Ossett patented new feed roller housings in 1939 making possible an increase in the width of the swift from 18 to 24 inches, the makers claiming 30 per cent greater output.² Other improvements were made as textile machine technology advanced after 1918 - the application of electric power and the fitting of Hoffmann roller and ball bearings in place of the plain brass bushes on the swift, bitter, and fan shafts from ca. 1921.³

1. N.C. Gee, 'Shoddy and Mungo Manufacture', W.T.W., 3.5.1952, p. 72.

2. *ibid.*, p. 73.

3. Wool Year Book (Manchester, 1929), p. 617. Eli Townend and Co., for example, fitted new roller-bearings to their machines in 1924 at a cost of £25.5^s/- for each machine.

The Significance of Technological Change.

Surviving evidence permits a brief examination of some of the more important aspects of the process of innovation and improvement just outlined. Table IV(i) indicates the potential output of one rag machine at various times between ca. 1820 and 1935. Although these figures are based on data provided by manufacturers or those closely connected with the wool textile industry they are by no means strictly comparable, requiring some qualification of the assumptions of the number of hours in a working day. Thus Jubb's 12 hour six-day working week of 1858 had given way to a 56 hour week in 1875 and a 48 hour working week by 1912. With this reservation in mind, the weekly and annual output figures reflect to some extent the decline in hours worked per week (overtime and shift work has been ignored), but those for daily output are proportionately less affected.

It seems clear that over the whole period actual potential output did not increase markedly, although, as can be seen, the figures vary fairly widely. Clark's carefully-measured output figures for 1907 compare closely with those of Jubb some 50 years earlier. Whilst Hardy's mean output figures for 1935 show an approximate 34 per cent increase over those of Jubb, the attempt by E. Fox and Sons to operate 28 inch machines and other evidence in the Walker and Smith letter book for 1905 indicates that, as far as output was concerned, the design of the 18 inch rag machine of the 1870s was sufficiently advanced to offer little scope for any significant improvement in productivity. Those improvements subsequently made, however, were of great importance in contributing towards a marked refinement in the quality of Yorkshire pulled shoddy and mungo. To the manufacturer, potential maximum output was only of interest at times of exceptional activity, the figures of actual output

TABLE IV(1)

Output of a rag machine, ca. 1820-1935

YEAR	SOURCE	TYPE OF MATERIAL	lbs. PER DAY	lbs. PER WEEK	lbs. PER ANNUM
ca. 1820-					
30	S. Jubb	Shoddy	270	1,615	84,000
1858	S. Jubb ¹	Shoddy	960	5,760	336,000
"	R. Baker ²	All	743	4,457	260,000
		"	720	4,320	225,360
1872	A. Briggs ³ & Sons	Shoddy	785	4,320	235,636
1876	W. Smith ⁴	All	873	4,800	240,000
1881	F. Fenton ⁵	"	900	4,950	270,000
1905	Walker and Smith ⁶	Shoddy	1,544	8,492	447,760
		Mungo	882	4,851	255,780
1906	L.A.W. Tomson ⁷	Shoddy	1,080	5,940	313,200
		Mungo	720	3,960	208,800
1907	W.A.G. Clark ⁸	Berlins	1,456	7,280	364,000
		New Cloth	784	3,920	196,000
		Old Cloth	896	4,480	224,000
1907	Eli Townend & Co. ⁹	All	865	4,755	247,280
1912	"	"	1,067	5,870	305,238
1935	H. Hardy ¹⁰	Shoddy	1,232	6,160	320,320
		Mungo	1,008	5,040	262,080

Note:

- (i) With the exception of the figures for 1872, 1905, 1907, and 1912, the output figures are based upon published trade and other estimates.
- (ii) The figures for 1872 and 1905 originate from trade primary sources.
- (iii) The figures for 1907 and 1912 are from the Census of Production returns completed by Eli Townend and Co. and relate to actual production figures of the nine rag machines operated.

Sources:

1. S. Jubb (1860) op. cit., pp. 20-21.
2. R. Baker, 'On the Industrial and Sanitary Economy of the Borough of Leeds, in 1858', J.R.S.S., 1858, XXI, p. 436.
3. A. Briggs & Sons MSS., loc. cit., Mill Notebook 1858-1936.
4. W. Smith (1876) op. cit., p. 221.
5. F. Fenton, T.M., 15.9.1881, p. 329.
6. Walker & Smith MSS., loc. cit., Letter book, letter 20.12.1905.
7. L.A.W. Tomson, T.M., 15.2.1906, p. 40.
8. W.A.G. Clark, op. cit., p. 107.
9. E.W.H. MSS., loc. cit., Eli Townend and Co., miscellaneous documents in Wage Book 16.8.1912-31.12.1915. Output for years ending 31.3.1908 and 1913, Census of Production return.
10. H. Hardy, W.T.W., 9.12.1935, p. 8.

for Eli Townend and Co. indicating that even in fairly bouyant market conditions output could vary or be considerably below design potential.

If potential gross output figures increased only marginally between 1858 and ca. 1880-1890, rag grinding costs (Table IV(ii)), indicated by the price per pack charged as mill costs or for commission work, fell dramatically from 1827 remaining virtually stable in money terms from ca. 1837 to 1910. Although these figures necessarily reflect market forces to a large extent they also suggest that rag machine improvements contributed significantly to greater efficiency of operation over an extended period, at a time when other direct manufacturing costs were rising.

For those manufacturers whose business was expanding the solution was, as Walker and Smith had advised, to invest in additional plant. The initial cost of a rag machine, as shown in Table IV(iii), was, even by nineteenth century standards, remarkably low. The table indicates fairly clearly that the ex-works price of a new rag machine fell, on trend, from the early 1870s until the late 1890s, and ignoring the temporary rise between 1904 and 1906, the price of an 18 inch machine in 1912 compared very closely with that of a 14 inch machine in 1873. The small increase in the cost of rag machines between 1904 and 1906 met with some criticism from one Batley manufacturer in 1905, prompting Walker and Smith to reply

'We have to point out to you that material and wages is something like 20 per cent higher now than what it was seven to eight years ago, and £39 at that time was quite equal to £44 the price quoted today.'¹

1. Walker and Smith Mss., loc. cit., Letter Book, letter 22.6.1905 to James W, Blackburn. That West Riding shoddy and mungo manufacturers purchased new machinery on the influential criterion of cost was well known to machine makers, sometimes very small price differences determining the addition of a machine of another make to those already installed. An inventory of 1885 of machinery let at Clark Green Mill, Batley, for example, indicates two rag machines made by Wilson Knowles of Heckmondwike and one by Joseph Rhodes of Morley. Valuation Books of William Coates, loc. cit., Vol. N, 1884-85.

TABLE IV(11)

Price charged for rag-pulling, per pack,
1827-1935.

YEAR	FIRM	TYPE OF MATERIAL	PRICE PER PACK (240 lbs.) (Shillings, pence)
1827	Thomas Taylor & Sons	Skirting	12/-
		Common	8/-
		White	10/-
1828	do (Standard charge introduced)	Shoddy	9/-
1837	Spedding and Co.	-	6/-
1844	Benjamin Preston	-	5/-
1851	D. Phillips & Sons	Mungo	6/6
1858	John Marsden	"	7/-
1874	G.&J. Stubley	"	8/-
1884	E. Fox & Sons	Mungo	6/-
		Shoddy	4/-
1894	do	Mungo	5/9 $\frac{3}{4}$
		Shoddy	4/5 $\frac{1}{2}$
1897	Henry Day & Sons	Mungo	7/- to 9/-
	"	Shoddy	4/6 to 5/-
"	E. Fox & Sons	Mungo	5/8 $\frac{5}{8}$
		Shoddy	4/8 $\frac{5}{8}$
1910	E. Fox & Sons	Mungo	5/9
		Shoddy	5/9
1916	Henry Day & Sons	Mungo	9/- to 10/-
		Shoddy	6/- to 6/6
1918	do	Mungo	£1 to £2
		Shoddy	9/- to 11/-
1923- 35	do	Mungo	15/-
		Shoddy	12/6

Source: (i) 1827-1851 J.T. and J.T. MSS., loc. cit.
(ii) 1858 H.D. MSS., loc. cit.
(iii) 1874 G. and J.S. MSS., loc. cit.
(iv) 1884-1935 E.W.H. MSS., E. Fox and Sons, loc. cit.
H.D. MSS., loc. cit.

TABLE IV(iii)

Ex-works cost of rag pulling and other machines used

in the West Riding, 1858-1937.

DATE	RAG MACHINES DESCRIPTION: COST (£.s/-)	COST OF SWIFT RE- LAGGING (£.s/-)	OTHER MACHINES DESCRIPTION: COST (£.s/-)
1858(G)	14" Rag Machine 21-		(1851) New rag machine swift-lagged (G) 9.15 ^s /-
1861(G)	" 21-		
1873(WS)	" 33-		
1875(WS)	" 30-32-	7	4'6" Tenter Hook Willey (WS) 78
1876(WS)	" 27.8 ^s /- " (reconditioned) 19-	7.10 ^s /-	Shake Willey (WS) 42 Rag shaker (WS) 18-22 New rag machine swift-lagged (WS) 12 Condenser(WS) 36-38
1877(WS) (HSB)	" (reconditioned) 14.10 ^s /- 21	7-	
1878(WS)	" 20		Double doffer condenser (WS) 50
1879(M)		6 Shy. 7 Mgo.	4'6" Tenter Hook Willey (WS) 78 Condenser (WS) 38 48" Tenter Hook Willey (M) 60
1880(WS) (M)	" 25-27 " 26		48" Rag shaker (WS) 23 42" Rag shaker (WS) 18

cont.

TABLE IV(111) cont.

1881(W.S)	14" Rag machine	28-31.10 ^s /-		Shake Willey (WS) 40 Tenter Hook Willey (WS) 79 Rag shaker(WS) 28 New rag machine swift- lagged 15 Rag shaker(M) 24
1882(W.S)	"	25		Extract shake willey (WS) 50
1884				New rag machine swift-lagged(M) 11.10 ^s /-
1885(M)	18"	33.10 ^s /-	7	Rag shaker ('First class' (M) 28.10 ^s /-
1886(M)			5	
1888				42" Rag shaker (M) 15
1889(M)	"	28-32	4.15 ^s /-	48" Extract shake willey (WS) 56 48" Tenter Hook Willey " 85 48" Rag shaker (WS) 24 New rag machine swift- lagged (M) 13.5 ^s /-
(M)	14" rag machine	25.10 ^s /-		
1890(W.S)	18" rag machine	28		
1891(W.S)	"	30		
(M)	" (recon- ditioned)	20	7 mgo	
(M)	" (all iron)	31.10 ^s /-	6 soft	
(M)	14" "	26.10 ^s /-		
1893(W.S)	18" Rag machine	30	7	48" rag shaker (M) 33 60" Two- swift Garnett (M) 150
(M)			6.15 ^s /round	
(M)			8.15 ^s /flat	

TABLE IV(iii) cont.

1894(M)	18" rag machine	31.10 ^S /-		New rag machine swift- lagged (M) 13.10 ^S /-
(M)	14" "	26.10 ^S /-		48" Breast willey (WS) 140-
1895(M)			8.10 ^S /-	New rag machine swift- lagged (WS) 12.10 ^S /-
(WS)	18" rag machine	26-37		
(WS)	20" rag machine (small cylinder)	26		
1896				Rag washer (WS) 45
1898(WS)	20" rag machine	30		
1899(WS)	20" " (iron swift)	32		4'6" rag shaker (WS) 44 4'6" Breast Tenter-Hook willey (WS) 62
1902(WS)	14" rag machine	31.10 ^S /-	9-10 ^S /-	Patent rag shaker(WS) 47.10 ^S /- Spurr patent rag shaker (WS) 62
1904(WS)	18" rag machine	40		
1906(WS)	18" "	52		4'6" Auto- matic Pat. Rag shaker (WS) 72
1907(WS)	18" "	31.10 ^S /-		
1908(K)	14" "	32	8	48" Tenter Hook willey (K) 90
1909(K)	18" "	36		
1910(K)	18" "	32-34		48" rag shaker (K) 32 48" Tenter Hook Willey (K) 78

cont

TABLE IV(iii) cont.

1911(K)	18" rag machine	33.10 ^s /-		48" rag shaker (K) 34-38 (with three speed server)
(K)	" (reconditioned)	28		
1912(K)	18" "	33.10 ^s /- 35		48" Tenter Hook Willey (K) 85
1915(W.S)	20" "	46		
1922(W.S)	18" "	130-137.10 ^s /-		New rag machine swift-lagged (WS) 38
1923(H)	"	101.7 ^s /6		
1924(W.S)				Automatic rag shaker (WS) 140
1928(W.S)	18" (with Hoffman ball-bearings)	125		New rag machine swift -without lags (WS) 18.2 ^s /6
1936(EFS)			£13-17	
1937 "			£15-17	

Note: The prices indicated are not strictly comparable, reflecting to some extent individual specifications such as type of swift supplied (for soft or mungo rags), type of teeth specified (round or flat) and population of teeth on swift (number of rows and number of teeth per row).

Symbol

Source

EFS

E.W.H. MSS., loc. cit., E. Fox and Sons, Purchases . Day Book no. 4, 1.1.1931-30.1.1934.

G

Leeds City Council, Archives Department, Gill Royds Company Mill, Committee Book 1835-1861, entry 16.9.1859 (supplied by Joseph Rhodes and Son).

H

E.W.H. MSS., loc. cit., Eli Townend and Co., Purchase Ledger 1.4.1922-14.9.1932 (supplied by J. Halstead and Son).

HSB

Leeds City Council, Archives Department, Hudson, Sykes and Bousfield MSS., Private Ledger, 1874-1885.

K

Wilson Knowles and Sons MSS., loc. cit., Sales Ledger 3.1.1908-12.4.1912.

M and WS

Walker and Smith MSS., loc. cit. Sales Ledgers 1.4.1870-7.3.1929, including Morton, Son and Co., Sales Ledgers 1.1.1877-7.6.1895.

Re-lagging costs, of considerably greater importance to rag machine operators than the initial capital cost of a machine, also remained stable if falling until ca. 1893 when the costs of repinning, albeit with the improved patented flat teeth, began to rise slightly.¹

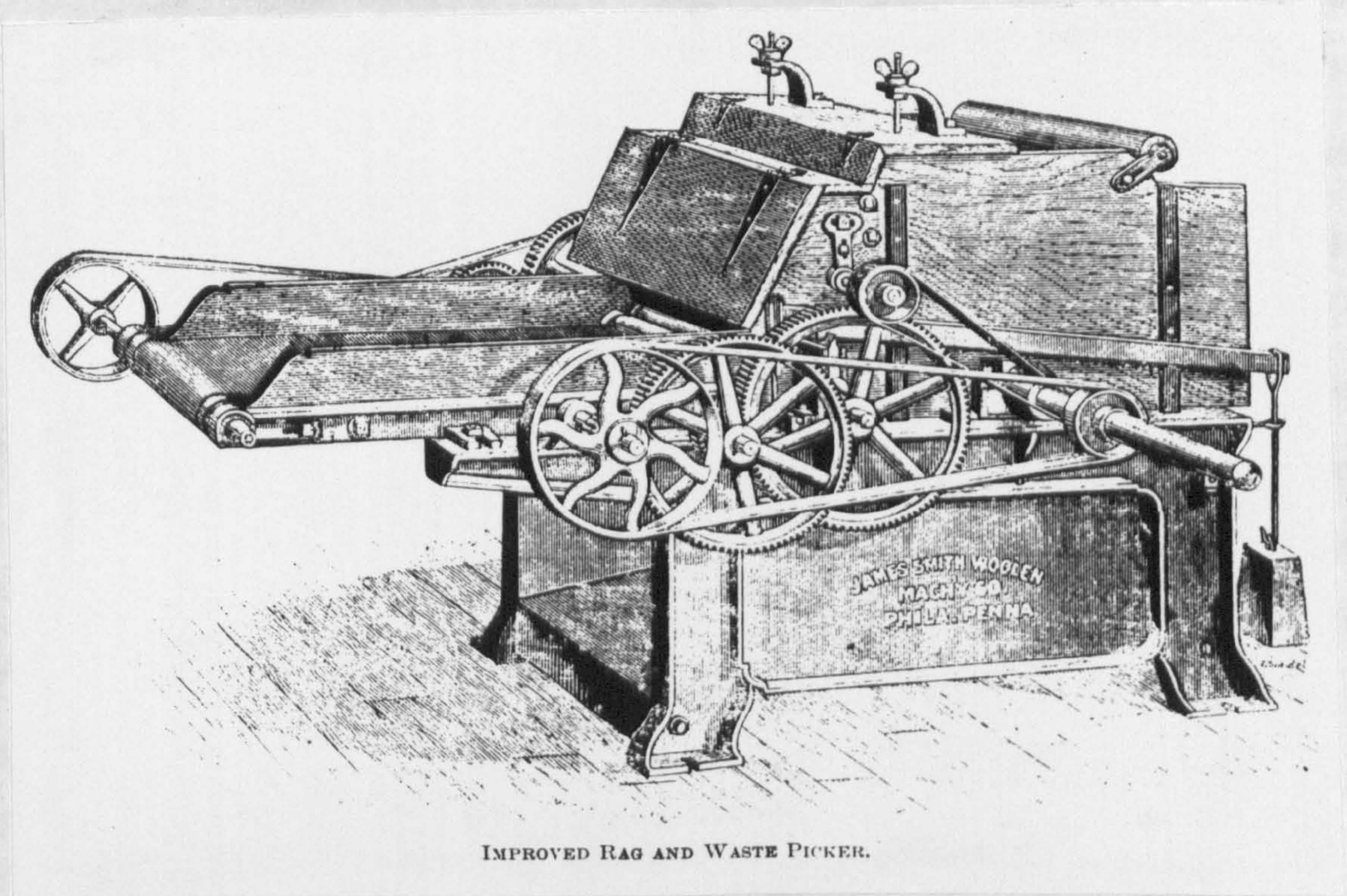
It would thus seem that in providing both stable costs and improved technology, Yorkshire rag machine makers significantly assisted the rapid growth in the shoddy and mungo manufacturing sector in the period to 1914. Secondly, from available evidence there is little to suggest that overseas textile machinery industries had developed more advanced machines. An 1890 review of an 'improved' rag machine manufactured by a Philadelphia firm in the Textile Manufacturer (Fig. IV(ix)) with teeth made from 'the best English steel' indicates a far less substantially-built machine than Ingham's of 1889 (Figs IV (vii) and (viii)). A markedly lower rate of production is suggested by the 16½ inch wide swift compared to the standard Yorkshire 18 inch width, a conclusion supported by the lower annual output of American 'shoddy pickers' (rag machines) in 1914/5 and 1917/18 of 131,403 lbs. and 162,026 lbs. respectively per machine.²

Other evidence suggests that Yorkshire rag machine makers had maintained a technical superiority over their German counterparts at least until 1939. The reports of the British Intelligence Objectives Sub-Committee on the German recovered-wool industry in Allied-occupied

1. In justifying the increased cost of these, Walker and Smith advised a Scottish woollen manufacturer that 'although the flat teeth are more costly they do their work far superior to the round teeth'. MSS., loc cit., letter 27.6.1905 to George Burns and Sons, Galashiels.

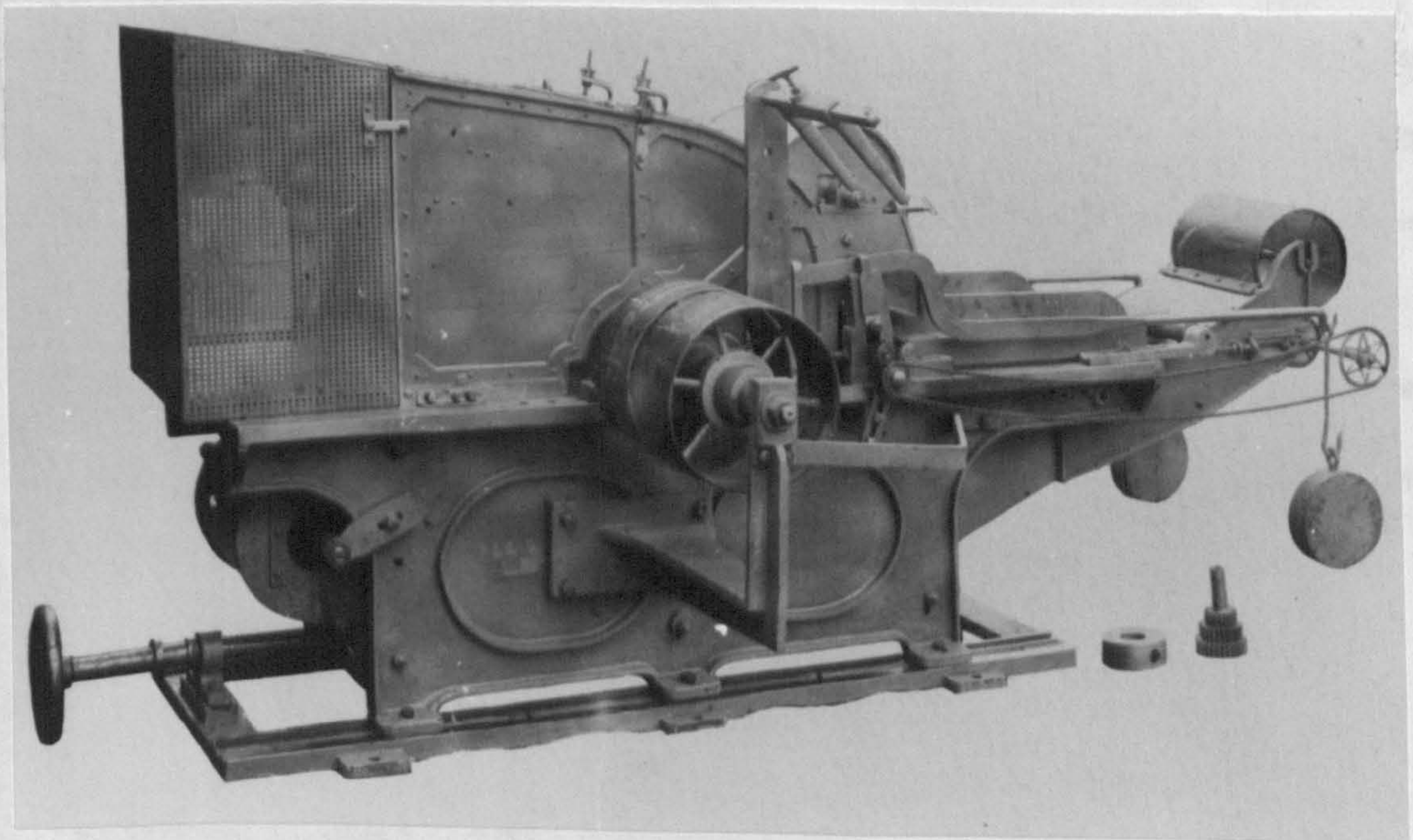
2. Wool Year Book (1921), op. cit., pp. 84-86. The 1948 edition of the American Wool Handbook noted that the daily production of mungo by a Davis and Furber 36 inch machine varied between 500 and 750 lbs. - less than Walker and Smith's figures of 1905 for the output of an 18 inch machine and comparable with the output of shoddy and mungo on a 14 inch machine quoted by Jubb in 1860. W. von Bergen and H.R. Mauersberger, American Wool Handbook (New York 1948), p. 274.

Fig. IV(ix).



James Smith Machine - 1890.

Fig. IV(x).



areas in 1946 is worth noting, particularly in view of the acknowledged superiority of German rag machines in the 1850s and 1860s. Their first report observed that

'From a thorough examination of the plant, methods and products of two German rag machine makers, and of their machines in operation, it seemed to be conclusive that there was little to be learnt from German industry in respect of shoddy and mungo manufacture.'¹

Machines made by Shirp, one of the oldest established surviving German rag machine makers, indicated that the greater part of their output concentrated on 14 inch machines with only the largest-sized machine being equivalent to the standard 18 inch Yorkshire product, the Committee observing that the 14 inch machine was

'... a veritable toy by comparison with any British machine'

The second firm inspected 'revealed an unsuccessful attempt to manufacture flat teeth'.

In May 1947 a delegation nominated by the Woollen and Worsted Trades Federation, including several manufacturers from the West Riding woollen textile industry, examined a large number of woollen mills in the Allied sector. The rag machines made by Schwalbe and employed in a Neumunster woollen mill were somewhat similar to their British counterparts but had no lapping on the top feed rollers, and because of their 14 inch width had a significantly lower output.² The report concluded that although machines in the Russian zone may have been more advanced

'No waste reclamation machines were discovered in the British zone equal to British types employed by the industry of this country ...'.³

1. W.R., 11.7.1946, p. 87.

2. E.W. Pasold, Ladybird, Ladybird (Manchester, 1977), p. 536. Pasold regarded highly the Schwalbe cotton-waste reclamation machines.

3. W.R., 6.2.1947, pp. 324-26.

CHAPTER IV

IV - Early development and growth,
ca. 1813-1870.

IV - Early development and growth, ca. 1813-1870.

Although the original introduction of ragwool into cloth manufacture in the West Riding may date from 1809, the first mill adapted specifically to convert woollen rags into shoddy seems to have commenced operation in ca. 1818. Using a rag machine constructed by Dewsbury machine maker Archer and his apprentice Haley from the pattern of one already in use in Brighouse, five Batley men - Joseph Jubb, John and Phineas Fox, George Newsome and John Burnley - installed it in Howley Mill, an old water-powered corn mill, and began to pull rags for their own use.¹ In 1818 Burnley, a farmer as well as a weaver, set up another machine on his farm powered by a horse-gin, but it was not until 1822 that the first mill appears to have been built for the exclusive purpose of manufacturing shoddy for the local trade. Fenton, writing in 1880, and using information supplied by descendents of the original partners of the mill, Hick Lane Mill, identified these as Joseph Jubb, John Burnley, S. Spedding, John and Phineas Fox, George Newsome, and Benjamin Parr - men whose names were to become synonymous with the rag, shoddy, and woollen industry of Batley over several generations.²

Whilst Reuss claimed in 1913 that it was 'known that there were several rag machines going in Eastbro', Dewsbury, in 1815', Fenton places the date of the first machine in Dewsbury as 1820 at Aldams Mill, owned by Halliley, Brooke and Hallileys, flushing and druggat manufacturers.³ No additional evidence survives to substantiate these claims, but it seems clear that more machines were

1. F. Fenton, T.M., 15.5.1881, p. 172; E. Law (1880), W.T.W., 12.7.1913, p. 17.

2. T.M., 15.5.1881, p. 173.

3. *ibid.*; J. Pigot, National Commercial Directory, 1834; W.T.W., 12.4.1913, p. xi. Joseph Jubb's sons were Joseph Jubb (jnr.), Samuel Jubb, and John Jubb.

installed in the 1820s, mostly by woollen manufacturers, such as the firm at Batley Old Mill and by Thomas Taylor in Clark Green Mill.¹ Certainly, as Taylor's records indicate, a regular scale of charges had been established by 1827 for rag-pulling, ranging from 8^s/- to 12^s/- for pulling one pack (see Table IV(ii) above), subsequently standardised at 9^s/- per pack for 'shody poling' in 1828.² The extent of rag pulling in the West Riding by 1828 was confirmed by John Nussey who informed the Lords' Select Committee that local manufacturers had

' ... put up a great deal of machinery and employed a great deal of capital in erecting machinery for the purpose of tearing up the rags'³

The entrepreneurs providing the major impetus to the expansion of rag-pulling in the Batley and Dewsbury area were predominantly of local origin although not all were connected by trade to the wool textile industry. The company formed to operate the rag pulling, scribbling, and carding machinery at Batley Old Mill drew entrepreneurs from a wide variety of local trades such as maltsters, farmers, and tradesmen as well as several manufacturers.⁴ Although the West Riding trade directories fail to specify rag grinders or shoddy manufacturers separately until Pigot in 1841, examination of Thomas Taylor's records indicate that he was using a number of commission grinders in the 1830s and 1840s.⁵ Amongst these were Samuel Hargreaves of Heckmondwike Low Mill, Spedding and Co. of Batley, Benjamin Parr (who had taken over the lease of Howley Mill in 1825) and the 'Hick Lane Rag Grinders'.⁶

1. Batley Reporter, 24.12.1880. Letters from Fenton and Law. J. Willans (1880) op. cit., pp. 8-9; J.T. and J.T. MSS., loc. cit., Day Book 15.8.1827-4.11.1831.

2. J.T. and J.T. MSS., loc. cit., Day Book, op. cit.

3. J. Bischoff (1842), op. cit., p. 181.

4. S. Willans (1880), op. cit., pp.8-9.

5. In addition to pulling his own rags, Taylor obtained his more specialised requirements from outside suppliers.

6. J.T. and J.T. MSS., loc. cit., Waste Book 31.1.1834-31.12.1851, Day Book, op. cit., Cash Book 28.3.1836-14.12.1848. Parr, the innovator of mungo in 1834, was still supplying Taylor with this material in 1844.

Further elucidation of the extent and growth in number of rag grinders in the West Riding from the trade directories or the census enumerators' notebooks in this early period reveals little. Pigot, in 1841, lists three 'rag grinders' in Wakefield, who persist until 1849 when they are replaced by John Earnshaw and D. Phillips and Son of Ossett and David Ramsden of Batley Carr.

The location of the three firms in Wakefield (Fearnshides and Speight, Amos Rhodes, and Wilby and Harrop) in the 1840s is interesting, particularly as no reference connecting Wakefield with the rag and shoddy trade, however fleeting, is mentioned in the accounts of Jubb or his contemporaries, Law and Fenton. Hubbard, the Leeds woolstapler, indicated to the 1828 Select Committee that a few months previously there had been a meeting at Wakefield calling on the government to control the growing use of shoddy in the West Riding.¹ The Wakefield and Halifax Journal, which had followed the proceedings of the Committee with interest, chose, under the heading of the 'Wool Question', to

'... begin with the ... evidence of Mr. J. Nussey as particularly referring to the shoddy branch of the industry'

by reprinting the rigorous questioning he had been subjected to on the importation of foreign rags, and somewhat disingenuously asking in an editorial comment for 'further information' and the 'correction of mistakes'.²

It would thus appear that a number of Wakefield woollen manufacturers were already using ragwool by the late 1820s, an expedient assisted to some extent by the accessibility of Wakefield by canal and river transport to the increasing importation of

1. Select Committee, P.P. 1828 (515), VIII, 658.

2. Wakefield & Halifax Journal, XXVII, 8.8.1828, 5.9.1828.

An examination of subsequent issues indicates that this invitation failed to draw further comment from West Riding woollen manufacturers.

continental woollen rags at East coast ports. As the Hull port books indicate, Hamburg woollen rags were frequently consigned with shipments of German fleece and chalk wools and, following improvements in 1828 to the Aire and Calder Navigation system allowing ships of up to 100 tons to reach Wakefield from Goole in eight hours, frequent transshipment and handling of rags would have ensured adequate and regular supplies.¹ The gradual change in the nature of the class of goods manufactured in Wakefield together with further improvements in water and rail transport favouring the increasing dominance of nearby Ossett as well as Batley and Dewsbury in rags and shoddy in the late 1840s and early 1850s, offers the most plausible explanation for the disappearance of rag-grinding capacity in Wakefield between 1849 and 1853.

Table IV(iv) indicates the growth in numbers and concentration of shoddy and mungo manufacturers and rag grinders in the Heavy Woollen District between 1841 and 1870 from information in the West Riding trade directories. As a quantitative indicator of growth in this sector the figures here reproduced cannot be relied upon to enumerate with reliable accuracy all those actually pulling rags or manufacturing shoddy as a full-time occupation, but, as an indication of the timing and location of growth, their accuracy is, as far as can be ascertained, fair.² Although Jubb notes that two mills in Dewsbury 'exclusively' produced shoddy and mungo in 1858, the small number of rag grinding firms known to have been in operation at this time are included in the directory figures in Table IV(iv).³ Evidence from primary sources indicate that some firms evolved from commission rag grinding into manufacturing,

1. J. Priestley, Historical Account of the Navigable Rivers, Canals, and Railways throughout Great Britain (1831, Cass edition 1967), p. 19.

2. Information from the trade directories has not been adjusted to include the early partnership mills or the small number of rag grinders known to exist from evidence in Taylor's records. No supporting evidence has been found to indicate how long these firms persisted or at what date mills were adapted for other purposes. For a discussion of the accuracy of the directories see Chapter II.

3. C.P.E.N., 1851, 1861, op. cit.

TABLE IV(iv)

Shoddy and Mungo manufacturers and rag grinders/pullers in

the West Riding Heavy Woollen District 1841-1870.

	1841	1849	1853	1857	1861	1866/7	1870
Batley] 3		4	4	8	8
Dewsbury				7	6	6	5
Heckmondwike					1	1	2
Ossett			4	9	9	16	11
Total		3	4	20	20	31	26
Leeds					2	4	4
Morley							
Huddersfield			2	-	6	12	7
Wakefield	3	3	-	-	2	-	-

Source: Trade directories, op. cit.

whilst others, such as Day, entered the manufacturing sector through rag and shoddy merchanting.¹

The table appears to confirm several characteristics of the emergence and early growth of the shoddy and mungo manufacturing sector noted by writers such as Jubb. The first is that the greater proportion of rag-pulling capacity was situated in woollen mills either as an adjunct to the primary manufacturing process (for instance Nussey's Carlinghow Mills), and secondly, if there was spare capacity this was utilised by commission work as at Taylor's. Although some mills, such as Sheard, Spedding and Co. of Batley had begun to 'let off' power to small commission grinders by the mid 1830s, the majority of rag machines continued to be operated in woollen mills until the 1850s.² Baker, in his report to Lord Russell in 1836 on the firm of Taylor, Ibbotson and Co., observed that rag machines had

' ... been added to the ordinary machinery of the mills in most instances, after the power had been calculated ... '

necessitating frequent night running, for, as Taylor and Ibbotson had themselves pointed out,

' ... the whole body of operatives in each mill are dependent on each other for the necessary material.'³

In answer to the parliamentary criticisms of shoddy in Yorkshire woollen cloth by Busfield Ferrand, M.P. for Knaresborough, the Whig Leeds Mercury stated that the 40 rag machines used in the West Riding in 1842 were situated

' ... one, or at most two of them, in each large woollen mill'⁴

1. v. supra Chapter II.

2. Supplementary Report of the Royal Commission on the Employment of Children in Factories, P.P. 1834 (167), XX, 87.

3. Reports of the Inspectors of Factories, P.P. 1836 (353), XLV, 221.

4. L.M., 19.3.1842.

Similarly, commentators and visitors to the West Riding such as Head(1835), McCulloch (1837), Reach of the Morning Chronicle (1849), and White (1858), described vertically-integrated mills where the manufactured shoddy was used in subsequent processes.¹ It would therefore seem that the requirements of West Riding woollen manufacturers for ragwool were met adequately from their own resources or the growing number of rag and shoddy merchants who either had their rags ground on commission or sold imported shoddy to meet demands for a more differentiated material. Conditions conducive to the growth of a distinctive shoddy and mungo manufacturing sector appeared in 1849-50 with an upturn in demand for cheap woollen textiles and rising wool prices. New investment in rag-pulling capacity such as that of the GillRoyds Company at Morley to purchase for commission work two new rag machines in 1858 to supplement their 1842 model, is supported by the concentration of growth in the shoddy manufacturing sector between 1853 and 1857 Table IV(iv) and the growth in number of rag machines between 1842 and the estimates of Jubb and Baker of 1858 (Table IV(v)).² A factor which may have inhibited growth in this sector until after 1860 was the large importation of continental ragwool, particularly from Germany, which comprised just over one quarter of total estimated United Kingdom consumption of shoddy and mungo in the period 1855-1859. A firm of Liverpool wool brokers noted in 1861, for example, that imported ragwool

'... may be seen in city broker's offices as often, if not to the same extent, as raw wool.'³

1. Willans provides a detailed account of the changing ownership of the Batley and Dewsbury Mills from ca. 1820 to 1880/1. J. Willans (1880 & 1881). op. cit. Thomas Taylor was sending sheets of shoddy to his brother, James W. Taylor of Manchester, in 1834. J.T. and J.T.MSS., loc. cit., Waste Book 1834-1851.

2. Gill Royds Company Mill MSS., loc. cit., Committee Book 1835-1861, entries 23.2.1842, 18.10.1858, 31.8.1859. Jubb's output and production estimates suggest that his figures for the number of rag machines may have understated the actual number in operation by as much as 40 per cent, particularly as a proportion of the older machines with lower output would still have been in use. The Gill Royds Mill Company, for instance, were using their 1842 rag machine as late as 1861.

3. A. Ure (1861) op. cit., p. 753.

TABLE IV(v) '

Estimates of the number of rag machines in the
West Riding, ca. 1835-1858.

Year	Location	No. of machines
ca.1835-1840	West Riding	50
1842	"	40
1858	Batley	50
	Dewsbury	20
	Elland	3
	Morley	12
	Ossett	40
	Leeds	16
		141

Source: 1835-40, 1842 - L.M., 19.3.1842
 1858 - S.Jubb (1860) op. cit., pp. 21, 116-135.
 1858(Leeds) - A.Ure (1861) op. cit., p. 704
 (Baker's estimate)

Between 1861 and 1866/7 the number of individual firms producing ragwool in the Heavy Woollen District expanded markedly, possibly contributing to the decline in size of the specialised shoddy and mungo merchanting sector, for by 1866 the existence of a horizontally - integrated ragwool manufacturing industry was sufficiently distinctive to receive comment from Bristowe in his report on the Yorkshire 'Rag Trade'.¹

A second feature of the growth in size of the Heavy Woollen

1. v. supra Table II(viii). Report of the Medical Officer of the Privy Council, P.P. 1866(3645), XXXIII, 620. The rate of expansion may have been more marked than the trade directories indicate. In 1858 Baker counted 12 'factories' or rag grinders, operating 16 rag machines with a nominal H.P. of 128 and employing 348 sorters and machine attendants. This capacity was 'capable in full work of producing 3,605,760 lbs' of ragwool or about 10 per cent of the estimated United Kingdom production. Baker did not identify these firms and it is very likely that they were listed under the 'rag, shoddy and mungo merchants' category in the trade directories. A. Ure (1861) op. cit., p. 704.

District rag wool sector (Table IV(iv)) is the rapid emergence and numerical predominance of firms located in Ossett from ca. 1850. The generally superior class of goods made in Ossett - fine beavers, witneys, and pilots - lent themselves well to the recently innovated mungo, Jubb noting that by 1860 Ossett had become

'... the most important market in the trade for the purchase of mungo rags and the sale of their product.'¹

It would appear that Parr's innovation of 1834 contributed significantly to the growth of the ragwool sector by opening up profitable opportunities for the manufacture of short-stapled mungo to supply increasing demands from manufacturers of cheap but well-finished cloths from Batley to Huddersfield. Jubb had few doubts that

'The discovery of mungo forms a remarkable era in the history of the shoddy manufacture, and has led to the most beneficial consequences to the trade of the district'.²

Secondly, the manufacture of mungo required a greater degree of skill than needed for shoddy, particularly in the removal of all cotton stitching in new and old cloth rags, the setting of the teeth on the rag machine swift, and the addition of the best grades of Gallipoli oil to facilitate the grinding process. These factors together with the widening differential between the price of shoddy and mungo from ca. 1847/8 provided sufficient technical reasons and profit incentive to encourage the shift of ragwool manufacture from being merely one process in cloth manufacture towards the growth of separate manufacturing units.³ Indeed, so attractive did opportunities for profit appear in

1. S. Jubb (1860) op. cit., p. 124. By 1870, White's 'Clothing District Directory' could note that 'Ossett has much increased in wealth and population during the last ten years, and contains many large mills, where shoddy, mungo, and flocks are made' (p. 482).

2. ibid., p. 31; Chambers's Journal, XV, 1861, op. cit., p. 103.

3. This suggestion is strongly supported by evidence in Taylor's records which indicates that whilst shoddy and some mungo was being ground on the premises in the 1840s, from 1850 most, if not all, mungo used in their blends was obtained from specialist merchants or manufacturers.

this sector in the 1850s that several Ossett manufacturers ceased production of cloth and installed new plant solely for the manufacture of mungo.¹ It was not, however, until the possibilities demonstrated by Rhodes' 1862 patent began to be appreciated and new plant acquired or modifications to old plant made, that the dominance of German mungo in the West Riding began to be challenged seriously in the second wave of expansion from ca. 1870.

In view of the comparatively smaller size and later development of the shoddy and mungo manufacturing sector in the Heavy Woollen District in the period to 1870, the quantity and quality of information available on individual firms is somewhat less plentiful than that of the rag merchanting sector discussed in Chapter II. Those manufacturers noted in the census enumerators' books examined for certain parishes of Batley, Dewsbury and Ossett in 1851 and 1861 indicate that all were born in the locality in which they carried on business.² A large proportion of these had, as previously noted, progressed from being flushing and drugget manufacturers to rag and shoddy dealers and then moved into manufacturing and merchanting. There were, as Jubb noted, a number of firms entering the sector from woollen manufacturing, and his brother, John Jubb, a 'ragwool merchant' employing 17 girls and two men in 1851 had become a cloth manufacturer just prior to 1860.³ Both John Blackburn and Ephraim Fox, to become

1. S. Jubb (1860) op. cit., p. 123.

2. The size of the sample 1851-1871 was 17. The relative absence of shoddy and mungo manufacturers from the enumerators' notebooks for the more populous areas of Batley, Dewsbury and Ossett implies, as with many local woollen manufacturers, that they lived in the sparsely populated residential areas overlooking the manufacturing districts. Batley shoddy manufacturer John Blackburn, for example, purchased the spacious Carlinghow New Hall from woollen manufacturer John Nussey in the 1870s. J. Willans (1880) op. cit., p. 8.

3. C.P.E.N., 1851, HO 107 2322-83-END; Thomas Jubb, Diary, op. cit.; J. Willans (1880) op. cit., p. 13.

the two largest shoddy and mungo manufacturing firms in the West Riding between 1880 and 1900, were rag merchants in the 1850s, Blackburn being amongst the smaller dealers in terms of employees (five girls) in 1851. He appears, however, to have been an energetic and progressive entrepreneur, for in 1852 at the age of 30 he embarked upon a series of land and property deals, initially financed by the Leeds Building and Investment Society, selling the land in 1854 to Batley woollen manufacturer George Sheard and the properties to various tradesmen and a rag merchant. Acquiring further land and property from two defaulting debtors in 1857, Blackburn was able to purchase additional land from his own resources in 1857/8 and between 1860 and 1867 had bought the shoddy and yarn spinning business of Batley Old Mill as well as constructing a new warehouse, insured for £2,200 with stock valued at £2,900.¹ By 1871 he had increased the capacity of his mill to eight rag machines and handed over its management to his son, a valuation of the plant and machinery being £4,735 with an additional £10,250 for stock; Blackburn was also providing finance of £1,200 for Morley woollen manufacturer, Marshall of Perseverance Mill.²

Blackburn's interest in property was not atypical of his contemporary rag merchants, but his ability to channel this investment into prime industrial sites rather than housing indicated an early appreciation of the potential growth that was to take place in Batley in the 1850s and 1860s.

Ephraim Fox, whose shoddy and mungo firm Willans was to describe

1. Wakefield County Records Office, Deeds Registry, Entries under John Blackburn 1851-1860; J.F.T.S. MSS., loc. cit., Policies 1865-1870.

2. *ibid.*, Policies 1870-1880; J. Willans (1880), *op. cit.*, pp. 16-17.

in 1880 as 'the most extensive of any in the Heavy Woollen District', appears to have integrated forward into the manufacturing sector between 1853 and 1858, when the firm began trading under the title of Ephraim Fox and Sons at Providence Mill, Chapelfold.¹ Moving to a new mill at Staincliffe in Batley in 1866, the land for which was financed by a group of local businessmen including manufacturers, rag merchants, and builders, the firm additionally diversified into cotton spinning and doubling to meet the strong local demand for cotton warps.² The insurance valuation of £350 on the rag machine department indicates that the firm was probably operating between eight and twelve machines, a capacity somewhat similar to that of the large woollen manufacturers Mark Oldroyd and Son of Dewsbury, and although Fox's fixed capital/stock investment of £1,350 and £1,650 was not considerable, in terms of potential output Willans' statement of 1880 may well have applied as early as 1866. Indicative of the rapid expansion of the late 1860s, a new five storey warehouse valued at £1,000 with additional cover of £1,000 for stock was insured in 1867.³

By 1866, John Jubb, who maintained interests in other family manufacturing concerns, had decided to let-off the top four floors of his Providence New Mill and concentrate on shoddy manufacture, informing the Pollution of Rivers Commission in 1867 that

'I have been a manufacturer of cloth myself, but I gave it up some years ago, and I now follow the business of importing and manufacturing rag-wool'.⁴

1. W. White 'Directory ...' op. cit., 1853; Township of Batley Rating Book, 1858, loc. cit.

2. Deeds Registry, loc. cit., Entries under Ephraim Fox, 11.11.1864. Township of Batley, Supplementary Valuation, 1866, loc. cit. This mill was also given the title Providence Mill. There is some evidence that the cotton spinning and doubling activity was insured separately, as the rating valuation of the whole mill indicates fixed capital of approximately £8,080; no mention of the cotton spinning department appears in the surviving insurance records.

3. J.F.T.S. MSS., loc. cit., Policies 1865-1870.

4. *ibid.*, P.P. 1867 (3850), XXXIII, II, 403.

A decision that may have been made in view of his advancing years (he was 59), his extensive outside financial interests, and an active participation in the local community. Nevertheless, two years later he acquired the old company Albion Mill, which had achieved fleeting notoriety in Reach's Morning Chronicle article of 1849 (subsequently edited and reprinted by Mayhew in 1851), so that he could further extend his rag grinding capacity.¹

The occupational background of other shoddy and mungo manufacturers in this early growth phase reveals similar origins - John Speight, one of the first mungo manufacturers in Ossett had been a rag merchant in 1841, integrating forward into manufacturing between 1847 and 1853; others included John Westerman of Ossett, John Clegg of Heckmondwike and Machell Bros., later of Cloth Hall Mills Dewsbury.² This last firm was initially working Fox's old mill, Providence Mill in Batley, as woollen manufacturers, scribbling millers, and rag grinders in 1867 prior to becoming shoddy and mungo manufacturers in ca. 1870.³ Of those entrepreneurs for whom information is available, all were born in the locality in which they established their firms, and with the exception of Day, Fox, and the Machells, who all subsequently moved to Dewsbury, most appear not to have relocated their businesses other than to move to larger premises.⁴ From available census information for 1851, 1861, and 1871, the age of entrepreneurs in this sector ranged from 31 to 60 with a modal tendency in the 40s group, a

1. J.F.T.S. MSS., loc. cit., Policies 1865-1870.

2. J. Willans (1881) op. cit., p. 33.; W. White, Directories 1847, 1853.

3. J.F.T.S. MSS., loc. cit., Policies 1865-1870. Both brothers had commenced rag grinding in their early 20s in 1857. W.T.W., 2.9.1920.

4. J. Willans (1881) op. cit., pp. 32-33; C.P.E.N., op. cit., Batley, Dewsbury, and Ossett 1851, 1861, 1871.

predictable distribution in view of the preponderance of those with rag-merchanting origins. Less predictable, but not improbable in view of the handful of female rag merchants recorded in the directories in the late 1860s and early 1870s was the shoddy manufacturing firm of Mary Kaye, capitalised at about £1,160 in 1866, and the mungo, shoddy, and flock manufacturing firm of the 'Misses G. and M.A. Chadwick' which flourished in Batley between ca. 1875 and ca. 1881.¹

Between 1865 and 1870, when more insurance information becomes available, the fixed capital formation of a typically-sized two or three rag machine-mill, with steam engine, rag shaker, and sorting and storage space, varied from £650 to £950 with stock valuation fluctuating between £500 and £1,500.² Size, in terms of numbers employed, appears to have varied between 10 to 30 rag sorters and from five to 10 males for attending the rag machines. Although rag machine manning levels were not uniform, partly because of the different varieties of material being pulled, the most common arrangement appears to have been for either one skilled grinder and two boys attending one machine, or three attendants operating two machines.³

In comparison with the indicated capitalisation of the conventional rag-pulling firm, the Batley partnership of Wildsmith, Carter, and Co., specialising in 'extract' or carbonised wool from chemically-treated 'union' rags, had insured Fountains Mill (built in ca. 1850-1855) and its contents for £2,300 in 1869.⁴ It seems highly probable that Bristowe visited this mill in 1865-66, his description of it as 'one of the largest' of its type in the West Riding being consistent

1. Supplementary Valuation of Batley, 1866, loc. cit; W. White, Directories, 1875, 1881.

2. J.F.T.S. MSS., loc. cit., Policies 1865-1870; Supplementary Valuation of Batley, 1866, loc. cit. Newspaper reports of fires indicate that at this time the majority of firms operated from two to three machines.

3. L.M., 19.3.1842; W. White, op. cit., p. 354; F. Fenton, T.M., 15.9.1881, p. 328.

4. J.F.T.S. MSS., loc. cit., Policies 1865-1870; J. Willans (1880) op. cit., p. 13.

with other evidence of the firm's expansion and influence over the extract wool market in Batley and Dewsbury from the early 1860s.¹ The more highly labour-intensive method of producing extract wool is indicated from the 70 operators employed in the mill, 18 of whom were female sorters, processing from 12 to 20 tons of wool/cotton 'challies' per week.² In 1870 the firm expanded further by acquiring the three storey Batley 'New Mill' equipped with three or four rag machines and two rag shakers, with a fixed capital/stock valuation of £1,775 and £1,325, employing in all 60 male and 80 female operatives.³

The years between 1860 and 1870 in this first period of expansion thus appear to have seen not only the most marked growth in numbers of shoddy and mungo manufacturers but also a rapid growth in fixed and current capital formation, particularly in the years immediately following the end of the American Civil War - a development which has been noted elsewhere and which will be discussed more fully in Chapter V.⁴ Although the level of capitalisation could not be described as large, it was sufficiently high to restrict entry to most, if not all, of those who had not accumulated sufficient capital through rag merchanting or cloth manufacturing. It is significant that the few bankruptcies which did occur indicate that the 'early starters' had carefully consolidated their dominance of the market in the 1860s. William Jubb, a Dewsbury mungo manufacturer and yarn spinner (and unrelated to the Batley Jubbs) was declared bankrupt in 1862, although subsequently re-emerging briefly in Batley as a 'shoddy manufacturer' in 1871.⁵ The Batley firm of C. and A. Fisher, 'rag grinders and

1. F. Fenton, T.M., 15.6.1881, p. 209.

2. Report of the Medical Officers of the Privy Council, P.P. 1866(3645), XXXIII, 621.

3. J.F.T.S. MSS., loc. cit., Policies 1865-1870; C.P.E.N., Batley 1871, RG 10 4584 1-48.

4. O. Greeves, op. cit., p. 444 et seq.

5. Perry's Bankrupt Weekly Gazette, XXXV, 1862; C.P.E.N., op. cit., RG 10 4580 1 END.

doffing plate manufacturers' went bankrupt in 1866, but in both cases it would appear that a lack of specialisation may have been a contributory factor to failure.¹ Undercapitalisation, however, was common to the failure of this last firm again in 1869, and Henry Wilson, a mungo manufacturer of Ossett. The final failure of C. and A. Fisher, who had been in business since 1860, revealed liabilities of £1,260 and no assets, the buildings and stock being lost in a fire for which no insurance was carried, the reason for failure given to the receiver as 'losses on trade'.² Wilson, who had commenced in business on his own account in March 1869, taking over his father's firm, survived one month only on a £50 advance from his brother before failing with liabilities of £617, £217 of which was for accommodation bills.³ That the weaker firms, particularly those in shoddy manufacture, appear to have been undergoing difficulties in 1866 and 1869 is indicated by contemporary press reports. The Huddersfield Examiner noting in 1866 that

'The panic in the money market has had the effect of curtailing the sales of shoddies ...'⁴

and in January 1869,

'... some debts of pretty large amount have been made in this trade'⁵

On February 4th 1858 the merchanting and manufacturing interests in the shoddy and mungo trade took an important step to reduce the risks of failure from over-long credit terms, and issued a joint statement setting out strict limits to credit.

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1. Perry's, op. cit., XXXIX, 1866.
 2. Dewsbury Chronicle 25.9.1869.
 3. ibid., 10.7.1869.
 4. H.E., 12.5.1866.
 5. ibid., 2.1.1869.

'At a meeting of the principal Shoddy or Rag Wool Merchants of this District, held on Thursday, the 28th day of January last, to take into consideration the present system of long Credits and heavy Discounts, which of late have become so unsatisfactory. After considerable discussion, it was thought necessary for the mutual good of the Trade, that an alteration in the present system be made, and it was unanimously resolved "That the undermentioned Terms be the Rule of the Trade, on and after the 15th day of March next ..."'

Credit terms on shoddy and mungo were reduced on a sliding scale from 6^d in the £ discount for cash (up to 14 days), 4^d for one month's credit (or not exceeding a three month bill), 3^d for two months' credit (or a two month bill subsequently in lieu of credit) and that 'no discount be allowed after four clear months' credit'.¹ From the tenor of the resolution - the first record of trade co-operation - it seems clear that the expansionary period ending in ca. 1857 had been one of intense competition in the ragwool market. The rapid increase in numbers of rag and shoddy merchants between 1849 and 1857, assisted by the reduction of market imperfections made possible by the new auction arrangements for the large and growing imports of German and Danish ragwool, had exacerbated the general effects of the financial crisis when it came in 1857 with the resultant large scale bankruptcies amongst wool staplers. Indeed, it is significant that this resolution was taken within three days of the important meeting of merchants, top makers, and yarn spinners in Bradford at which it was noted that

'... the present commercial crisis is the result of undue speculation facilitated by the present system of credit ...'²

1. E. F. and S. MSS., loc. cit., framed notice.

2. Quoted in A.J. Topham, The Credit Structure of the West Riding Wool-Textile Industry in the Nineteenth Century, unpublished M.A. thesis, University of Leeds, 1953, p. 93.

Although little evidence survives of the extent of trade terms prior to 1858 in shoddy and mungo, Day's records indicate that his discount for cash sales of mungo widened from 1.3 - 1.4 per cent in 1854/5 to 2.5 per cent from 1856, suggesting that he was being obliged to concede more generous terms to compete with credit granted by other merchants and manufacturers.¹

In the local chambers of commerce, established in Batley in 1856 and in Dewsbury in 1860, representation of the trade seems to have been more by proxy than direct participation - John Jubb was the only member of the Batley chamber in 1860 who had previously been a shoddy manufacturer. Recognition of the importance of adequate rag supplies was, as has been noted, given much attention by the Huddersfield Chamber of Commerce at the time of the 1859-1860 treaty negotiations, the Chamber passing a resolution at a 'special private meeting' that

'... Messrs. Brierley and Brooke be requested to obtain fluctuations in the prices of Mungo, Shoddy, Flocks etc.'

to assist Cobden in Paris.² There is no indication that further collaboration by the trade took place between 1860 and 1870, nor, indeed, that trade conditions necessitated the degree of co-operation witnessed in 1858 and 1860.

Information on operational costs in this period is unavailable, although the scale of pulling charges per pack (Table IV(ii) above) indicates that they were relatively stable, if rising slightly, between 1844 and 1874.³ Jubb, in 1860, suggested that the greater proportion

1. H.D. MSS., loc. cit., Sales Purchase Ledger 1853-1863.

2. Huddersfield Chamber of Commerce Minute Book, loc. cit., entry 17.5.1860. Both were mungo merchants in Huddersfield.

3. S. Jubb (1860) op. cit., pp. 22-23. (see p. 85 for a comparison of weekly wage rates in Batley in 1858).

of the selling price of shoddy and mungo was accounted for by labour costs, 'the value of the uncollected rag being less than half its final cost' - information which is supported to some extent by Day's production costs using a commission grinder.¹

Insurance costs, however, were probably the highest per unit of capital invested of all branches of the wool textile industry owing to the immanent risks of fire in the process of rag grinding and hydro-extracting/shaking after carbonisation. Concessions on annual premiums were granted by insurance companies to all woollen manufacturing firms not storing or blending oiled shoddy and mungo and also for those not possessing rag machines or 'pluckers'. The temptation for undercapitalised firms to forego insurance must have been great, and that some yielded is evidenced by the bankruptcy of C. and A. Fisher in 1869. The dangers of rag-grinding could be both expensive and spectacular, a fire at the woollen manufacturers Colbeck Bros. causing £8,000 of damage of which £2,000 only was covered by the Royal, a press report of 1868 graphically describing the event.

'... it is supposed that some hard substance came in contact with the rapidly revolving teeth, for the material in the machine burst out into a blaze, and soon the whole apartment was one sheet of flame, which in a very short time took possession of storey after storey, and licked up the immense amount of rags and shoddy with which it was stored'²

Although the damage to machinery in this particular fire was not great - two rag machines, one shaker, two willeys and one scribbler were destroyed - it is indicative of both the extent of capital invested in stock and the tendency to undervalue this for insurance purposes that

1. v. supra, pp.49-50. By ca. 1904, the value added in the pulling department by E. Fox and Sons was approximately 50 per cent.

2. H.E., 11.7.1868, see also ibid, 26.5.1860, 3.8.1867 etc.

the larger proportion of this loss was on the 'exceedingly heavy' stock of shoddy.

Costs could be minimised in other ways, particularly in the early period when juvenile labour was frequently used in rag grinding departments.¹ Conversion losses on the weight of rags to shoddy of between 15 and 25 per cent were reduced by selling the better class of one-colour material to flock wallpaper manufacturers and the more oily refuse to the southern hop grounds. Head, in 1835, observed that this was sent to Kent as 'tillage muck' and sold for 47^s/- a ton.² By 1867 the local price had declined to 10^s/- a ton or £1 delivered at Batley station, a rate which seems to have remained stable until 1902 when Fox's, who produced from two to four tons every one to two months, raised their 'local' price to 12^s/6^d per ton.³ Indeed, the 'principles of economy (so) pleasingly illustrated' by the West Riding shoddy manufacturers, made a strong appeal to Victorian commentators, White noting in 1858 that

'... we get shoddy in our beer as well as in our broadcloth'⁴

By 1881 the vast amount of refuse shoddy and waste being generated in the Heavy Woollen District had enabled this market to be exploited by a number of firms specialising in collection and disposal, for example the West Riding Shoddy Manure Co. Ltd. of Dewsbury whose insurance valuation suggests a stock holding of about 1,000 tons.⁵ The Batley 'Albion Mill' and other firms specialised in sorting, grading, and re-selling the thousands of brass and other buttons and linen

1. The implications of this are discussed in Chapter VI below.

2. G. Head (1836) op. cit., p. 148.

3. S. Jubb (1860) op. cit., pp. 23-24; Chambers's Journal, 1861, op.cit., p. 104; All the Year Round, 1872, op. cit., p. 247 etc. E.F. and S. MSS., loc. cit., Sold Day Book 'Shoddy', Nov. 1896-May 1902.

4. W. White, op. cit., p. 355; Pollution of Rivers Commission, P.P. 1867 (3850), XXXIII, 404-5.

5. J.F.T.S.MSS., loc. cit., Policies 1879-1892.

pockets produced from the seaming and ripping rooms of shoddy and mungo manufacturers and rag merchants.¹

Table IV(vi) shows the estimated output of shoddy, mungo, and extract wool produced in the United Kingdom between 1820 and 1870, the greater proportion - probably well over 90 per cent - being manufactured in the West Riding, with only small quantities produced by a handful of firms in the West of England.² Consistent with the growth in number of specialist manufacturers in the sector between 1853 and 1857 (Table IV(iv)) output increased markedly in the 1850s and again, largely from the stimulus of the American Civil War, in the period to 1866. It seems fairly clear that the initial phase of growth in output was located within the West Riding woollen manufacturing sector, assisted by the early development of the rag merchanting trade to meet the progressively more differentiated needs for raw materials by each mill. Spare capacity appears to have been increasingly utilised by the shoddy and mungo merchants, the scale of whose operations were widened by the handful of commission grinding firms from the 1840s and 1850s (such as those in Wakefield and the firms used by Day) and by the growth in continental supplies of ragwool. Even in the final ten years of the period ending in 1870 it is likely that over 50 per cent of total recovered wool production originated from West Riding vertically-integrated woollen mills.³ In value terms, the peak prices and production of recovered wool in 1865/6 represented approximately 18 per cent of the value of imported retained wool, or about 7 per cent of the value of retained foreign and domestic wool in

1. E.W.H.MSS., loc. cit., Eli Townend and Co., Sales Ledger no. 2, 15.4.1905-17.10.1910.

2. Illustrated Catalogue of the International Exhibition, 1862, pp.28, 33. Two West of England firms exhibited their products - locally known as 'millpuff' - Grist Sons and Co. of Gloucester (shoddy and mattress wools) and Henry Grist and Son and Tabram of Nailsworth (shoddy and bedflocks).

3. Chambers's Journal, 1861, op. cit., p. 104.

TABLE IV(vi)

Estimated total United Kingdom production of shoddy,
mungo, and extract wool, 1820-1870 (000s lbs)

Year	(a) Production	Value (000s £)	(b) Exports	Value (000s £)	(b) as a % of (a)
Av. 1820-24	1,000	8			
" 1825-29	2,500	21			
" 1830-34	7,000	131			
" 1835-39	9,850	164			
" 1840-44	9,500	111			
" 1845-49	18,000	210			
" 1850-54	24,600	379			
" 1855-59	36,600	671			
1860			4,686	82	
1			3,813	77	
2	46,000	1,092	5,552	139	11.4
	(av. 1860-64)				(av. 1860-64)
3			5,240	164	
4			6,912	193	
5	65,824	1,755	7,692	189	11.7
6	66,909	1,701	6,753	171	10.1
7	53,146	1,307	3,370	78	6.3
8	55,580	1,343	2,377	59	4.3
9	53,855	1,077	4,047	84	7.5
1870	58,467	1,291	4,691	113	8.0

Source: column (a), Table III-I (f), Appendix Chapter III. Value calculated from the shoddy and mungo price series, Appendix, Chapter V; 1820-1850 shoddy, 1850-1870 mean of shoddy and mungo. column (b) Trade, Navigation and Commerce, Annual Accounts. The return includes 'wool flocks' with ragwool.

1865.

Surviving records, such as those of Day, indicate that the market for shoddy and mungo was distributed widely through the West Riding outside the Heavy Woollen District. Although few rag-pulling firms in Huddersfield are indicated by the directories until after 1861 it would appear that several of the larger shoddy and mungo merchants possessed their own machinery to supply local woollen mills.¹ In 1864 an Ossett ragwool manufacturer was regularly supplying sheets of mungo to mills in Huddersfield, Honley, Kirkburton, Slaithwaite, Lindley, Horbury, and Wakefield as well as to mills in Batley, Dewsbury, and Ossett.² The degree of product differentiation noted by Jubb is confirmed by frequent delivery to firms such as Mark Oldroyd and Sons of Dewsbury who possessed rag sorting and grinding departments of their own.³ Within the Heavy Woollen District itself, competition between shoddy and mungo manufacturers and merchants in the 1850-1870 period is evident from the wide range of suppliers recorded in woollen manufacturers' surviving purchase ledgers and, also, the growing number of young 'shoddy salesmen' and travellers between 1861 and 1871 representing the larger ragwool manufacturers.⁴

Exports of recovered wool, comprising approximately 11 per cent of United Kingdom production in the quinquennium 1860-64, were mainly

1. Industries of Yorkshire, op. cit., II, 72; Kirklees Libraries and Museum Service, Huddersfield, John Taylor and Sons MSS., Bought Ledger 6.1.1852-30.1.1862. Taylor regularly purchased mungo from A. Brierley and Jabez Brooke in the 1850s (v. supra, p.262.).

2. J. Willans (1881), op. cit., p. 34; Unidentified Ossett manufacturer, loc. cit., Sorters' Weigh Book 2.4.1864-23.4.1914. This ledger was used by a number of rag merchants later in the century and probably relates to Royds Mill, Ossett.

3. *ibid.*, and S. Jubb (1860), op. cit., p. 30.

4. G. and J.S. MSS., loc. cit., Receiving Day Books 1864/5, 1865/6 etc; J.T. and J.T. MSS., loc. cit., Blend Book 8.7.1852-23.3.1857, 31.3.1857-10.3.1866 etc; C.P.E.N., op. cit., 1861, 1871, Batley and Dewsbury.

to America (until 1867) and Belgium, with small but growing markets in France and Germany.¹ The larger proportion of exports appear to have been of extract wool, particularly to America and the continent, where the long fibres from carbonised mixed worsted goods were made into blankets and other cloths not requiring good felting properties.²

Whilst Jubb, Fenton, and other contemporary writers in the West Riding observed that extract wool found little favour in the Heavy Woollen District, although meeting with moderate success in the West Of England, Halifax, and the Bradford stuff trade, it was used for 'special effect' yarns by several Batley manufacturers from 1860.³

Finally, it seems clear that the major impetus to the development of a distinctive ragwool industry in the 1860s was the strong and growing demand for short-stapled mungo, a trend previously referred to in Chapters II and III. Qualitative constraints on the supply side would appear to have been alleviated by the innovation of the German-invented 'Rhodes' cover in 1862, and that the possibilities this offered were appreciated is evidenced by the rapid growth in numbers of mungo manufacturers in Ossett. Although a more detailed explanation of the reasons for the growth in demand for mungo will be discussed in the following chapter, it is suggested here that the

1. v. infra, Table IV-I, Appendix. American duty on imported extract wool was raised slightly in 1864, but the Wool and Woolens Act of 1867 raised the rate of duty to 32 cents per lb. on all clothing wools, including extract, and effectively halted further export (A.H. Cole, op. cit., II, p. 6).

2. S. Jubb (1860) op. cit., pp. 27-28; F. Fenton, T.M., 15.6.1881, p. 209.

3. ibid. Fenton states that his 'authority' was 'a West of England woollen manufacturer'. (Wool and Textile Fabrics, 15.1.1881, p. 559); J.T. and J.T. MSS., loc. cit., Blends 31.3.1857-10.3.1866; G. and J.S. MSS., loc. cit., Receiving Day Book 1.7.1864-4.8.1865. Wildsmith, Carter and Co. appear to have enjoyed a monopoly of this material in the 1860s and had sufficiently developed the process to be able to supply 'Super Alpaca Extract' at the relatively high price of 7½^d lb.

'great attention to this branch of the business' given by the Ossett mungo manufacturers enabled them to play a significant, if not a major part in the emergence of the shoddy and mungo manufacturing industry of the Heavy Woollen District in the period to 1870.¹

1. S. Jubb (1860) *op. cit.*, p. 124.

CHAPTER IV

Expansion and maturity,

1870 - 1914.

V. Expansion and maturity, 1870-1914.

The period 1870 to 1914 was one of extremely rapid growth and consolidation in the shoddy and mungo industry of the West Riding, whether judged in terms of numbers of firms or by gross output. Table IV(vii) shows the classified number of firms as listed by various directories, the three main phases of growth indicated being 1867-1877, 1877-1889, and 1897-1904. The accuracy of the directories in this period is still, however, of uncertain reliability in attempting to quantify the exact number of firms in operation at any one date.¹ The numbers of 'shoddy factories, unenumerated' (i.e., without spinning or weaving capacity) in the Factory Returns from 1867 is, again, less than helpful but is included here as a very approximate indicator of the size of this sector compiled by a source independent of the directories.² The margin of error in the directories 1901-1904 is implied by lines (c) and (d) - although to what extent this would apply to other years it has not been possible to ascertain. The classification 'Mungo and Shoddy Manufacturers, and Waste Pullers' in Worrall's detailed 1900 directory has been adjusted to eliminate the latter category, and although the resultant figure of 138 ragwool manufacturers may contain a number of firms whose primary process is unspecified, it further suggests that the West Riding commercial directories should be approached with care. Line (d) indicates the

1. This is apparent from a comparison of the total number of classified shoddy and mungo manufacturers and commission grinders in Table IV(vii) with the number of firms indicated for various towns in the West Riding on or near to different years in Table IV(viii). Thus, until ca. 1904 the number of firms classified is less than those listed in Table IV(viii); from that date the methods of classification would appear more accurately to reflect the actual number of firms in operation.

2. v. *infra*, Chapter III, Appdx.III-I(ii).

Table IV(vii)

Classified shoddy and mungo manufacturers and rag grinders/
pullers in the West Riding, 1861-1912.

Trade Directories

	1861	1867	1877	1881	1889	1897	1901	1904	1908	1912
Shoddy manufacturers	8 (3)	8 (2)	6 (1)	23 (9)	25 (10)	38 (21)	37 (22)	48 (25)	42 (20)	34 (4)
Mungo manufacturers	13	15	34	41	55	62	71	72	66	47
Rag grinders/ pullers	7	9 (1)	6	3	1	-	1	1	2	7
(a) Total classified firms	25	29	45	58	71	79	87	96	90	84

Factory Returns

	1867/8	1871	1875	1878/9	1884/5	1889	1904
(b) Shoddy factories unenumerated	42	49	37	59	39	56	
(c) Rag grinding only							106
Rag grinding and carding							<u>21</u>
							127
(d) Mungo and shoddy manufacturers, 1900							<u><u>138</u></u>

- Source: (a) Trade directories, op. cit.
 (b) Factory Returns. The figures relate to 'Shoddy
 Factories, unenumerated' and exclude those with
 spinning and/or weaving capacity.
 (c) Return of Woollen, Worsted, and Shoddy Factories,
 and of Machinery, P.P. 1904 (293) LXXXVII, 1118.
 (d) John Worrall Ltd. (1900) op. cit., pp. 302-5.

Note: The figures in parenthesis indicate the number of mungo
 manufacturers who also produced shoddy and who are included in the
 former category; the figures for the total number of firms have been
 adjusted to show this.

number of firms enumerated in the last Factory Return of 1904 and would seem to confirm the 1900 figures in Worrall, who may have included some firms with spinning capacity.

As far as has been possible, Table IV(viii) has been adjusted consistent with evidence from other sources to reflect more accurately the number of firms fluctuating over time in the four principal shoddy and mungo manufacturing towns of the Heavy Woollen District.¹ These figures broadly confirm the trends indicated in Table IV(vii), narrowing the first period of expansion to between 1870 and 1875, widening the second period to between 1881 and 1894, but showing a small decline in the population of firms between 1894 and 1908. A diminution in the number of firms is also evident in Leeds and Morley, whilst those in Huddersfield in the period from 1875 to 1912 remained fairly stable.

The most accurate and detailed information on the West Riding wool textile industry is undoubtedly contained in the 1904 Return of Factories and Machinery. From this it is possible to establish that 106 firms specialised in rag grinding as a primary process with a further 21 possessing carding machinery in addition to rag machines. Re-classifying those enumerated as shoddy factories who possessed spinning and weaving capacity as outside the strict definition of a 'shoddy and mungo manufacturer' as adopted here, it would appear that actual rag-grinding capacity in terms of machines operated was slightly higher in the vertically integrated woollen manufacturing

1. For a number of reasons it has not always been possible to extract information for Tables(vii) & (viii) from the same directory - the quality of intra-directory trade classification, for example, is not universally consistent.

TABLE IV(viii)

Shoddy and Mungo manufacturers and rag grinders/pullers in
the West Riding Heavy Woollen District, 1870-1912.

	1870	1875	1881	1887/9	1894	1901	1904	1908	1912
Batley	8	15	10	7	10	9	9	12	14
Dewsbury	5	10	15	14	22	19	21	18	20
Heckmondwike	2	2	2	4	2	2	2	3	3
Ossett	11	23	17	17	30	32	29	28	30
Total	26	50	44	42	64	62	61	61	67
Leeds	4	4	14	16	15	9	3	7	6
Morley	-	-	-	8	5	8	3	3	2
Huddersfield	7	9	9	12	12	12	13	10	10
Wakefield	-	-	2	1	2	2	2	1	2

Source: Trade directories, op.cit.

sector (Table IV(ix)).

TABLE IV(ix)

Distribution of rag machines in the West Riding, 1904

	Firms	Machines
Shoddy and mungo manufacturers	127	419
Woollen manufacturers and 'shoddy factories' carrying out spinning and weaving	598	449
		868

Source: Return of Factories and Machinery, op. cit.¹

The persistence of firms between 1853 and 1912 as an indication of the 'age' of the industry is shown in Table IV(x). To some extent these figures reflect a number of rag merchants established in earlier periods and integrating forward into shoddy or mungo manufacture. This movement was particularly noticeable between 1870 and 1875 when 14 of the 23 manufacturers listed in the 1875 Ossett directory had previously been in the merchanting sector, and of the 32 manufacturers in 1901 at least eight had moved from merchanting after 1881.

A comparison of the net-number of firms leaving the sector and the number of failures recorded in the gazette indicates that in the period 1870 to 1881 approximately one third of the firms became insolvent, rising to about two thirds in the period 1881-1901, of which the seven years to 1889 witnessed the highest proportion of failures.²

1. Although it is known that the number of machines operated by shoddy and mungo manufacturers was returned in the 1907 and 1912 Census of Production, this information was not reproduced in the final reports until 1924. E.W.H. MSS., loc. cit., Eli Townend and Co., Returns in Wages Book No. 3, 1912-1915.

2. The actual rate of failure would be slightly less than indicated here as a small number of new entrants who were not included in the directories because of their short existence are recorded as becoming insolvent.

TABLE IV(x)

Shoddy and mungo manufacturers and rag grinders - persistence of firms over time,1870-1912.

		Number of firms established on or before -					(Cumulative Totals)	
No. of Firms		1853	1870	1875	1881	1901	Number leaving sector 1870-1881	Number of failures 1882-1889
1870	Batley	8	3				1870-1881	
	Dewsbury	5	2					
	Ossett	11	5				32	11
1875	Batley	15	3	5			1881-1901	1882-1889
	Dewsbury	10	2	2				
	Ossett	23	3	5				13
1881	Batley	10	3	4	7		28	
	Dewsbury	15	2	2	4			1890-1901
	Ossett	17	2	4	13			6
1901	Batley	9	2	3	3	3	1901-1912	1902-1912
	Dewsbury	19	2	3	7	7	9	5
	Ossett	32	-	8	19	19		
1912	Batley	14	2	3	3	8		
	Dewsbury	20	2	3	7	12		
	Ossett	30	-	7	10	26		

Source: Trade directories, Perry's Gazette, T.M., Journal of Fabrics, op. cit.

The period from 1901 to 1912 indicates a marked diminution in the rate of exit from the sector and that conditions would appear to have been far less traumatic would seem to be supported by the small number of manufacturers (six) who were able to move back into the merchanting sector rather than become insolvent.¹ Also evident is the growing number of partnerships in the industry from 1870, indicating that capital and entrepreneurial requirements were becoming more necessary in a period of increasing competition amongst shoddy and mungo manufacturers and merchants.

An analysis of those firms leaving the manufacturing sector in the West Riding between 1870 and 1913 confirms that the highest rate of mortality was amongst those specialising in the manufacture of mungo, this branch coming under pressure particularly between 1875-79, 1889-94 and 1908-13 (Table IV(xi)) - the indicated proportion of failures of shoddy manufacturers to those of mungo manufacturers being 1:1.75, suggesting that the marginal and under-capitalised firms were meeting periods of severe competition from both the longer-established firms in the sector and the increasing rag-pulling capacity in the woollen sector as evidenced by the 1904 Return. Notwithstanding this however, the actual number of firms manufacturing mungo increased over the whole period, peaking in 1904 as domestic and overseas orders for khaki and other cloth produced a strong demand for mungo. Evident also, is the large number of firms producing mungo (approximately one third between 1897 and 1908) who also produced shoddy, the figures for 1912 indicating that these firms had either left the sector or had opted to specialise in either shoddy or mungo manufacture after 1908.

1. Kelly's Directories Ltd., op.cit., 1901, 1912.

TABLE IV(xi)

Failure of West Riding shoddy and mungo manufacturers by
Deed of Arrangement or Bankruptcy, 1870-1913.

YEAR	(a) Shoddy mfrs.	(b) Mungo mfrs.	Firms mfg. both, included in (a) and (b)	YEAR	(a) Shoddy mfrs.	(b) Mungo mfrs.	Firms mfg. both, included in (a) and (b)
1870							
- 74	-	-	-	1893	1	1	-
1875	-	1	-	4	-	2	-
6	3	2	2	5	1	-	-
7	3	6	2	6	-	-	-
8	1	1	-	7	-	1	-
9	1	2	-	8	1	-	-
1880	-	-	-	9	1	1	1
1	2	-	-	1900			
				-01	-	-	-
2	3	-	-	2	2	2	2
3	-	2	-	1903			
				-05	-	-	-
4	3	2	1	6	1	-	-
5	-	-	-	7	-	-	-
6	-	1	-	8	-	1	-
1887							
-88	-	-	-	9	2	2	2
9	-	5	-	1910	-	1	-
1890	-	2	-	1	-	-	-
1	-	1	-	2	-	1	-
2	1	-	-	1913	-	1	-

Total failures 54
 Shoddy and mungo manufacturers 10
 Shoddy manufacturers only 16
 Mungo manufacturers only 28

Source: Perry's Gazette, XLIII, 1870-LXXXVI, 1913.
T.M. (gazette), 15.1.1875-15.9.1906.

The survival rate of shoddy and mungo manufacturers in the Batley, Dewsbury, and Ossett areas is compared in Table IV(xii) to that of rag, shoddy, and mungo merchants and to West Riding woollen and worsted manufacturers. Whereas the survival rate between 1870 and 1875 of ragwool manufacturers in this area compares well with manufacturers in both branches of the wool textile industry, it should be noted that a proportion of the decline amongst woollen manufacturers was accounted for by the disappearance of many of the small single-proprietor type firms which had persisted until the early 1870s.¹

To some extent the strong survival rate of shoddy and mungo manufacturers in this five-year period was assisted by an abnormally high degree of prosperity in the sector following disruption of the European textile industry during the Franco-Prussian war together with a high demand for cloth from continental armies. The marked disparity between the figures in the two final columns of Table IV (xii), particularly in relation to the woollen manufacturing branch, clearly indicates that the older-established firms were able to survive the effects of the 'Great Depression' remarkably well and that their small proportionate representation of total firms in 1912 indicates that this sector, unlike the woollen manufacturing branch, had experienced a high degree of entry by new firms.²

The degree of interdependence between the shoddy and mungo manufacturing sector and the five variables discussed in Chapter II

1. E.M. Sigsworth and J. Blackman, loc. cit., p. 131.

2. Seyd's commercial list of 1915 indicates that of the 38 West Riding shoddy and mungo manufacturers given a credit rating, 16 could trace their origins prior to 1870. Compared to the total number of firms in existence in Kelly's 1912 directory, this shows a marginally higher survival rate for the sector in the whole of the West Riding of 19 per cent. Seyd and Co., The Yorkshire (Woollen District) Commercial List (1915-1916).

TABLE IV(xii)Proportion of shoddy and mungo manufacturers in Batley, Dewsbury, and Osset surviving between 1870, 1875, and 1912.

<u>Percentage of firms in</u> <u>1870 surviving to 1875</u>	<u>Percentage of firms in</u> <u>1870 surviving to 1912</u>	<u>Percentage of firms in</u> <u>1912 surviving from 1870</u>
<u>Batley, Dewsbury and</u> <u>Ossett</u>		
Shoddy and mungo manufacturers 50.0	33.3	12.5
Rag, shoddy and mungo merchants 32.6	7.2	8.6
<u>West Riding</u>		
Woollen manufacturers 50.7	8.8	31.6
Worsted manufacturers 37.0	7.0	8.0
All categories 49.1	9.0	16.8

Source: Rag, shoddy, and mungo merchants, Chapter II, Table II(xi).
West Riding,
E.M. Sigsworth and J.M. Blackman, loc. cit., p. 130.

indicates a more positive, if temporally confined, relationship. Between 1871 and 1880 there is a low but significant correlation (0.5588) between the fall in price of shoddy and the bankruptcy of shoddy and mungo manufacturers, but no significant correlation between this sector and the other variables. In the immediately succeeding sub-period 1881-1890 the correlation between insolvency and a decline in the price of textile raw materials is stronger, 0.6640 for the shoddy price series and 0.7208 for the textile fibre index. There is also a low but significant correlation (0.5983) between the failure of shoddy and mungo manufacturers and insolvency amongst West Riding woollen manufacturers. Finally, there are no meaningful correlations between the six variables in either the remaining sub-period 1890-1900 nor in the special sub-period 1873-1884. The relationships implied by these correlations would thus appear to suggest that in the period 1870-1890 the large percentage decline in the price of wool exerted a steady pressure on the profitability of ragwool manufacturers forcing the more inefficient or undercapitalised firms out of the sector - a situation exacerbated to some extent by failures amongst woollen manufacturers in the period 1881-1890. Some aspects of these correlations will be discussed below in relation to capitalisation in the industry.

Variations in capital formation of some representative firms in this sector over a 24 year period is shown in Table IV(xiii).¹ From this it can be seen that the smallest viable manufacturing unit possessed, with the exception of one firm, a minimum of two rag machines - the initial investment in a second-hand 14 inch machine, for example, could be as low as £15 to £20 in rented mill accommodation.² For those manufacturers

1. J.F.T.S. MSS., loc.cit. Policies for the period ca. 1897 to 1912 are missing.

2. v. supra Table IV(iii).

TABLE IV(xiii)

Fixed capital and stock valuations of some shoddy
and mungo manufacturers, 1878-1892.

Date	Firm	Product	Rag machines	Fixed Capital (£)	Stock (£)
1878	Joseph Ward, Bottomfield Mill, Ossett	M	3	1,670	2,000
1879	Thomas Hall, Brights Mill, Batley	M	4 plus 2 Garnett m/cs	2,000	1,600
1880	Joseph Metcalf & Son, Flushdyke, Ossett	S & M	2	80 (mcy. only)	170
1881	Samuel Fothergill, Perseverance Mill, Dewsbury	S	2	75 (mcy. only)	500
1881	S. & H. Broadhead, Ford Mill, Horbury	S & M	7 (+1 1883)	210 (mcy. only)	1,790
1882	David Giggall, Northfield Mills, Ossett	E	-	200 (mcy. only)	200
1882	Fawcett, Firth, & Jessop, Chickenley Heath	M	4	2,750	865
1882	Alfred Wildsmith, Cheapside Mills, Batley	S	3	170 (mcy. only)	130
1882	Machell Bros., Cloth Hall Mills, Dewsbury	S & M	5	1,800	1,600
1884	Thomas Purdy & Son, Albert Mill Batley Carr	S	3	945	440
1885	William Taylor, Spring Mill, Carlinghow	RM & M	3	362 (mcy. only)	2,000
1886	Giggall & Clay, Healey New Mill, Ossett	E	-	700	300
1886	Joseph Ward, Bottomfield Mill, Ossett	M	6 (approx)	3,830	7,720
1887	Fawcett, Firth, & Jessop, Calder Vale Mills, Ossett	RM, M & E	6 (approx)	4,485	1,320
1887	George Hutchinson, Calder St. Mills, Wakefield	F & M	1	130 (mcy. only)	250
1888	Hanson & Wormald, Ossett	M	4 (approx)	2,400	2,350
1889	Walter Lister, Branch Rd. Mills, Batley	S & M	2	50 (mcy. only)	50

cont.

TABLE IV(xiii) cont.

Date	Firm	Product	Rag Machines	Fixed Capital (£)	Stock (£)
1891	Benjamin Squires, College Mill, Birstall	S & M	4	40	350
1892	George Blackburn & Son, Providence Mill, Birstall	S & M & D	5	1,910	3,000
1892	John Speight & Son, Northfields Mill, Ossett	S, M, E & D	6	6,065	9,700

Note: D - Dyer
 E - Extract wool manufacturer
 F - Flock wool manufacturer
 M - Mungo manufacturer
 S - Shoddy manufacturer
 RM - Rag merchant

Although insurance cover on plant and machinery would appear to reflect their replacement cost in view of the typically high risks of fire in the industry, stock valuations appear to be more arbitrary and can only be taken as an approximate guide. It is clear from many of the policies that both the fire insurance companies and manufacturers agreed on valuations of plant and stock to arrive at a round figure for overall cover. Valuations for the larger firms such as E. Fox and Sons and John Blackburn were much more detailed, and, because of the larger potential loss, can be taken as reflecting more accurately yearly stock fluctuations.

Source: J.F.T.S. MSS., loc. cit., Policies 1870-1880, 1880-1889, 1879-1892.

entering the sector and whose resources were committed to stock, the costs of renting a rag machine and power on a yearly basis appear to have fallen slightly in the period 1878-1888. Joseph Rhodes and Son of Morley let off a rag machine at £120 p.a. in 1878 and in September 1888 David Dixon, owner of three mills in Leeds, was prepared to rent 14 inch rag machines at £100 each p.a.¹ The apparent higher cost of renting compared to the lower initial costs incurred in purchasing new or second-hand machinery would have been offset to some extent by the fixed annual power charge and the responsibility of the owner to maintain and repair machines - an important consideration to a modestly capitalised manufacturer exposed to the risk of 'standing' from mechanical breakdown.

The cross-section of small to medium-sized firms indicated by these insurance valuations suggests that the smaller manufacturer operated from two to three machines with a capitalisation of between £100 and £1,000, whilst those occupying their own or a rented mill possessed capacity of between three to six rag machines with an overall fixed capital/stock valuation of between about £1,500 and £5,000. The largest of the medium-sized firms, such as the expanding firm of Fawcett, Firth, and Jessop in 1887 or John Speight and Son in 1892, indicate fixed capital formation of between £5,000 and £7,000, although stock valuations appear to have varied widely as a proportion of investment in plant and machinery.²

Little evidence is available in this period on the size of firms in terms of numbers employed, however it is known that in ca. 1873.

1. Alfred Briggs and Sons MSS., loc.cit., Mill notebook 1858-1936.

2. Fawcett, Firth, and Jessop were established in April 1875, buying two new rag machines, a rag shaker and sundry spares totalling £120. They were granted eight months' credit by machine makers Walker and Smith, but this was not typical, the more usual period of credit granted being about three months. In 1889, capacity was increased by the addition of two 18 inch 'merino' type rag machines Walker and Smith MSS., loc. cit., Sales Ledger No. 2, 6.1.1873 - 2.5.1876; Sales Ledger No. 4, 23.1.1889-10.4.1895.

Speights were employing 100 hands, and John Westerman and Sons of Ossétt 40 hands, with an indicated fixed capital investment in plant and machinery of approximately £2,500 and £1,700 respectively, both firms possessing nominal horse power of 28-30.¹ Of three shoddy and bed flock manufacturers enumerated in the West Country, the largest, Grist Sons and Co. of Brimscombe, a branch of the family firm of mungo manufacturers Grist Bros. of Huddersfield, employed 175 hands with indicated fixed capital based on rateable value of about £3,600. The firms of G.F. Tabram and Samuel Grist of Stroud and Woodchester employed 55 and 32 hands respectively, fixed capital being approximately £1,500 and £1,100.² In 1888, Blackburn was employing between 400 and 500 hands, Joseph Preston of Wheatcroft Mill in Batley over 70 and the Machell Brothers about 100.³ No detailed and consistent information on numbers employed in the industry appear outside the Factory Returns, and these can be taken only as a very rough guide in view of the problems of definition recognised in the 1904 Return. With the exception of the 1871 Return, which has come under criticism elsewhere, most recently by Jenkins, the mean indicated employment varied between 25 and 32 per firm (Table IV(xiv)), or approximately one third of Clapham's 'average' of 95 per firm in the woollen and shoddy industry in 1889.⁴

1. Pollution of Rivers Commission, P.P. 1873 (c. 347), XXXVI, 203. The Commission noted that out of 4,990 questionnaires sent to wool textile and other manufacturers, only 611 were received 'and these after many applications'. It is significant that replies were received from only two West Riding mungo manufacturers, but three from shoddy and flock manufacturers in the Gloucester/Stroud area, a disproportionate return confirming the well-known reticence of the West Riding industry to divulge information.

2. *ibid.*, 235-238.

3. Industries of Yorkshire, *op. cit.*, I, pp. 327, 343, 347.

4. J.H. Clapham, 'Industrial organisation in the woollen and worsted industries of Yorkshire', E.J., 16, 1906, p. 516; D.T. Jenkins, 'The Factory Returns: 1850-1905', Textile History, 9 (Reprint series, 1978), pp. 65-71.

TABLE IV(xiv)

Numbers employed in unenumerated shoddy factories
in Yorkshire, 1867/68 - 1889.

Date	Number of Firms Unenumerated	Total Workforce
1867/68	81	2,662
1870	49	3,816
1879	59	1,823
1884/85	39	1,244
1889	56	1,434

Source: Factory Returns.

The firms of John Blackburn and Ephraim Fox and Sons of Batley and Dewsbury appear to have been the most heavily-capitalised of the West Riding shoddy and mungo manufacturers in the period prior to the formation of the Extract Wool and Merino Company Ltd. in 1900. Blackburn's firm at Old Mill, run under the title of John Blackburn Son Company by his son John William Blackburn, had increased its fixed capital/stock cover from £10,775 in 1872 to £14,640 in 1876, Blackburn senior operating independently the rag and shoddy merchanting firm in adjoining premises with a capital/stock valuation of £7,520 and £3,255.¹ Indicative of the bouyant conditions in the West Riding in the five year period 1870-1875, John Jubb again took over part of his mill to manufacture heavy goods in addition to ragwool, employing some 200 hands in both processes in 1873.²

1. J.F.T.S. MSS., loc. cit., Policies 1870-1880.

2. Pollution of Rivers Commission, 1873, op. cit., 192.

In 1871 the mungo and shoddy section of Ephraim Fox and Sons of Staincliffe had been re-valued to reflect additional investment in fixed assets, the new valuation of £5,000 for plant and machinery and £3,000 for stock, although lower than that on Blackburn's Old Mill, having a marginally greater rag-pulling capacity of approximately 10 machines to the eight at Old Mill. The increase in fixed capital formation in this period of 'above normal' profits is also evidenced by the expansion of the extract and shoddy manufacturer Wildsmith, Carter, and Co. By 1872, the shoddy and mungo pulling operations at their Carlinghow mill had been further enlarged with additional buildings and a new engine with a fixed capital valuation of £8,550 and stock of £2,300 which, together with a £1,000/£1,000 valuation on their first mill (Fountains Mill) indicated a total insured valuation of £12,850.¹ Indeed, so marked was the evidence of prosperity in the Heavy Woollen District that a visitor in 1871 commented on the

'... numerous good new buildings (that) meet the eye (and) the many large and good places of business ...'²

A trade commentator, recalling this period in 1913, observed

'First one mill made an extension, then the next made a greater extension, until there arose a regular epidemic of rivalry amongst otherwise level-headed businessmen as to who could afford the most extensive, elaborate, or sumptuous business premises'³

Warehouses were extended and built for the storage of shoddy and mungo, particularly near the railway stations, and sample rooms 'contained an extensive wine chest', of which, 'if a customer left the premises without indulging freely, the fault was entirely his own'.⁴

1. Royal Commission on the Depression of Trade and Industry, P.P. 1886 (c. 4621), XXI, 95; J.F.T.S.MSS., loc. cit., Policies 1870-1880.

2. W.S. Banks, Walks in Yorkshire: Wakefield and its Neighbourhood (1871), p. 458.

3. W.T.W., 30.1.1913, p. 11.

4. *ibid*; Oldroyd informed the Royal Commission on the Depression of Trade and Industry that mill valuations reached a peak in 1876, the values of 1864 being comparable to those of 1884 (*op. cit.*, 14.241).

It seems clear, however, that the onset of worsening trade conditions after 1876 exerted increasing pressure on firms whose overheads had become disproportionately overburdened in this period of optimistic expansion, the rate of insolvency of shoddy and mungo manufacturers being particularly severe between 1876 and 1884. The larger firms progressively reduced insurance cover in line with written-down fixed capital and stock valuations. Blackburn, for instance, reduced his overall cover on Batley Old Mill to £13,640 in 1877, £12,865 in 1881 (raised to £14,165 with a revival in trade in 1881/2), and then depreciated both plant and stock by 20 per cent to £11,332 in 1885.¹

Although little direct evidence has been found to support the low but significant correlation between failures in the woollen manufacturing sector and those of shoddy and mungo manufacturers in the sub-period 1880-1890, that a connection existed is suggested by the large number of shoddy and mungo manufacturers present amongst lists of creditors of woollen manufacturers in the gazette. In a number of cases, for example the winding-up of the Batley Manufacturing Co. Ltd. in 1881, the initial petition was presented by a shoddy manufacturer (in this instance, Thomas Purdy and Son of Dewsbury), and in other bankruptcies or deeds of arrangement of woollen manufacturers a shoddy or mungo manufacturer was appointed trustee.² The insolvency in 1877 of Abraham Wilson, a shoddy manufacturer of Dewsbury, with gross liabilities of £15,300 was, as a trade commentator noted,

'... caused solely by the stoppage of houses that owed him large accounts ...'

including debts owed in the bankruptcy of the large but 'badly run' firm

1. Similarly, a number of firms wrote down fixed and circulating assets in the early 1890s. George Blackburn and Son, shoddy manufacturers of Birstall with a capacity of five rag machines, wrote plant and machinery down 36 per cent from £1,910 in 1890 to £1,290 in 1894, and stock from £3,000 to £2,000. J.F.T.S. MSS., loc. cit., Policies 1880-1889, 1889-1897.

2. T.M., 15.7.1881, Perry's op. cit., LXIV, 1891, LXX, 1897.

of blanket manufacturers, John Lee and Sons of Earlsheaton.¹

Undercapitalisation continued to be the most likely primary reason for insolvency amongst the smaller firms unable to meet emergencies from their own limited resources. The explosion of a second-hand agricultural steam engine being tested to power a rag machine of Alfred Crowther, a shoddy grinder and waste dealer of Elland, caused three fatalities and his bankruptcy in 1872.² Under-insurance or absence of any insurance cover in the event of a fire whilst rag-pulling, a risk enhanced for small firms when using cheap black oil with a low flashpoint and swifts with worn teeth, could also lead to the bankruptcy court. A fire at the Dewsbury Moor mill of J.R. Street, which destroyed three rag machines and £1,000 of stock in 1882, was not covered by insurance, resulting in the bankruptcy of both his shoddy business in Dewsbury and his woollen manufacturing firm at Victoria Mills in Leeds.³ Another reason for insolvency stemming from low capitalisation was the temptation of 'kiting' or dealing in accommodation bills, a practice blamed for the failure of Ossett mungo manufacturers, Greaves Bros., in 1884.⁴ Dividends following bankruptcy proceedings, although not as low as those for rag merchants, appear to have varied between 3^s/- in the £ (John Firth, 1884) to 7^s/5½^d in the case of Wharton Bros. of Ing Mills, Dewsbury - of whom one partner's personal estate was made liable two years later in 1886.⁵ Both the firms of Joseph Metcalf and William Taylor (Table IV(xiii)) were declared insolvent in 1899,

1. T.M., 15.7.1877; H.E., 30.12.1877. 1877 was a particularly bad year for bankruptcies in the Heavy Woollen District, the firm of Oldroyd Bros., carpet manufacturers, of Dewsbury, valued at £300,000 in 1873-4, collapsed with gross liabilities of £250,000, primarily because of Oldroyd's outside speculations in tea, the stock market, and mines, and 'many local people were heavily hit'.

2. ibid., 20.12.1872; Perry's op. cit., XLV, 1872.

3. T.M., 15.6.1882; Perry's op. cit., LV, 1882. The tendency for some shoddy and mungo manufacturers to under-insure received sporadic attention from the trade and local press; i.e., Levi Mitchell, mungo mfr., Ossett, loss not covered £150 (T.M., 15.7.1891); Eli Townend, mungo mfr., Ossett, loss not covered £600 (Yorkshire Factory Times, 5.7.1889); J.W. Smith, mungo mfr., and scribblers, Ossett, £10,000 (partly insured) (Textile Journal, 7.12.1904).

4. The Morley Observer, 25.10.1884. 5. T.M., 15.9.1884, 15.1.1885, 15.3.1886.

indicating that firms of small and medium initial capitalisation could equally fail following a period of prolonged trade depression.¹ In the period 1887-1900 the ratio of secured and unsecured liabilities to assets seems rarely to have fluctuated outside 3:1 and 5:1, an upper limit no doubt disciplined to a large extent by warning signs from the credit-rating lists, such as Seyds, published annually for subscribers from 1870 onwards.²

From ca. 1885 the rate and intensity of formal insolvencies, as distinct from private arrangements for which no records exist, began to decline markedly indicating that those firms who were unable to service large overheads from the expansionary period in the early 1870s had either left the sector or found access to new sources of capital. Certainly, from the records examined, capital appears to have been mainly of local origin. The Cloth Hall Mills of Machell Bros., whose warehouse design a later commentator noted as 'suggestive of solidity, like a bank', was financed by a mortgage in 1880 from Henry Day continued by his executors from ca. 1886.³ The Batley Carr Mill of Thomas Purdy and Son was owned by a local resident and both Carter, of Wildsmith, Carter and Co., and John Jubb maintained wide interests in local rag merchanting and shoddy and mungo manufacturing firms.⁴ Evidence in the gazette indicates that in a small but growing number of instances banks were providing finance for working capital requirements, usually secured on the fixed and floating assets of the firm.⁵ Renting their mill from the auctioneering firm of Cullingworth,

1. *ibid* , 15.2.1899, 15.6.1899. It should be noted that the majority of shoddy and mungo manufacturers declared insolvent after 1887 did so under the Deeds of Arrangement Act of that year.

2. Seyd and Co., (1915-1916) *op. cit.*

3. *W.R.*, 3.9.1959, p. 285; S. Willans (1181) *op. cit.*, p. 24; J.F.T.S. MSS., *loc. cit* , Policies 1880-1889. Henry Day's eldest daughter had married another member of the family.

4. *ibid.*, Policies 1879-1892. Jubb provided mortgage capital to a number of local firms, amongst whom were shoddy and mungo manufacturers Simon Cooper, Samuel Ibberson Walker, and Edward Richardson. Valuation Books of William Coates, *loc.cit.*, Vols. M and N, 1884-1885.

5. Perry's, *op. cit.*, LXVI, 1893, LXVII, 1894, LXX, 1898 etc.

Crabtree and Company of Spring Mill, Staincliffe, appear typical of moderately-sized firms entering the sector from 1880. With fixed capital of £123 for three new rag machines and a rag shaker from Walker and Smith in 1880 and a further £150 on a small steam engine and two patent Tolson fire-proof carbonising machines, the total insured valuation was £1,070 including £800 for stock.¹

Other firms, such as John Ward and Fawcett, Firth, and Jessop of Ossett (Table IV(xiii)) and Machell Bros. of Dewsbury, continued to increase their fixed capital and stock valuations in this period, and by 1892, on the death of his father, John William Blackburn had insured Batley Old Mill, the adjacent warehouses and stock, for £20,813.² What appears to have been the largest single addition to gross fixed capital formation in the shoddy and mungo sector in the period 1870-1913 was the building of Calder Bank Mills in Dewsbury by E. Fox and Sons, into which they moved in 1884, leaving the cotton spinning and doubling business in Staincliffe. Exclusive of machinery, but inclusive of expenses of removal, the mill cost £26,377.17^s/3^d with provision for letting out some mill space to a firm of woollen manufacturers, who used power from the 300 H.P. engine.³ Whilst no insurance information is available from agency records for the period 1897-1912, valuations of fixed capital and stock in 1912-13 show no significant variations from the levels established in the last decade of the nineteenth century, suggesting that for the companies for which insurance records exist, little new investment took place between

1. Walker & Smith MSS., loc. cit., Sales Ledger no. 3, 5.6.1876-11.3.1884; J.F.T.S. MSS., loc. cit., Policies 1879-1892.

2. *ibid.* Policies 1879-1892, 1889-1897.

3. E.W.H. MSS., loc. cit., E. Fox and Sons, Departmental Ledger 28.9.1880-30.6.1910.

ca. 1900 and 1913.¹ From this source and evidence elsewhere, the major proportion of new fixed capital investment appears to have been concentrated in the period 1870-1884.²

There is, however, some suggestion that current and future investment plans required access to capital outside the traditional internal and local sources. In common with the woollen section of the West Riding wool textile industry, ownership of firms was vested in either family or partnership hands, and although the directories indicate additional partners joining firms in this period, the growing number of partnership dissolutions from 1880 suggest a fluid situation in which capital was either entering or leaving a not inconsiderable number of firms.³ Whilst this appears not to have affected the smaller firms, apart from one or two subsequent failures, it could raise future liquidity problems for the larger firms in this sector. In 1898, following the partnership dissolution of Fawcett, Firth, and Jessop, Fawcett and Firth Ltd. became one of the first companies in the industry to take on limited liability, with capital of £40,000 in £10 units 'to acquire the business of J.S. Fawcett and C. Firth at Calder Vale Mills', Jessop having previously left to set up his own business with his brother in Ossett Spa.⁴ In 1900, the firm of Hanson and Wormald Ltd. (Table IV(xiii)) was formed 'to adopt an agreement with H. Wormald and Ellen Hanson 'to take over the previous shoddy and mungo manufacturing business with nominal capital of £20,000 including £6,000 6 per cent cumulative preference shares.'⁵

1. J.F.T.S. MSS., loc. cit., Policies 1912-1919.

2. Industries of Yorkshire, op. cit., I, 1888, II, 1890, passim. A. Raistrick (ed.), The Century's Progress, Yorkshire Industry and Commerce (1893, 1971 edn.), passim.

3. T.M., gazette 1880-1903.

4. *ibid.*, 15.4.1898.

5. *ibid.*, 15.10.1900.

Two other firms with interests in the manufacture of shoddy and mungo also took on limited liability - Shillito Bros. with nominal capital of £30,000 and J. and T. Brook to acquire the scribbling, spinning, carding, and rag pulling operations at Brook's Mill, Ossett with nominal capital of £25,000 in £5 shares.¹

The largest concentration of manufacturing capacity in the industry was undoubtedly the formation of the holding company Extract Wool and Merino Co., Ltd. in July 1900 to 'take over the business of mungo, shoddy and merino manufacturers, extractors, dyers, scribblers, carders and merchants' of seven companies, all of whom had entered into a joint agreement in 1896.² Whilst no evidence survives to suggest the motives of the various firms in forming such a group, it seems highly probable that it was an attempt to counter the diminished trading conditions and fierce competition in the ragwool market in the early 1890s by enabling the participating firms to exercise greater control over their market share. The firms comprising the company at the date of registration are shown in Table IV(xv), below, together with their costs of acquisition.

With a total quoted capitalisation of £230,000 in units of £10 the company was provided with capital of nearly £116,000 to purchase fixed and current assets of the seven firms, but acted quickly to wind up the loss-making firm of Giggal and Clay in 1901, the goodwill of which had been purchased for a nominal £100 six months before.³ In 1905, following two dividends of 6 per cent in 1902 and 1903 and none in

1. *ibid.*, 15.1.1900, 15.2.1900.

2. *T.M.*, 15.8.1900.

3. *T.M.*, 15.1.1901.

TABLE IV(xv)

Firms in the Extract Wool and Merino Co. Ltd.
holding group as at 16.7.1900.

Firms	(a) 'Goodwill' (£)	(b) Purchase Price (£)
Fitton and Sons Ltd., Pildacre Mills, nr. Dewsbury	26,626	47,238
Giggall and Clay Ltd., Healey New Mills, Ossett	100	N/A
George Hirst and Son, Birstall	8,422	29,725
Jessop Bros., Ossett Spa	13,377	31,654
Lee Nephew and Sons, Low Mills, Ravensthorpe	2,136	20,125
J.G. Roper and Sons, Low Fold Mills, Leeds	33,123	N/A
Eli Townend Ltd., Healey Low Mills, Ossett	19,072	58,836
Costs of acquisition	11,200	
Total	114,059	

Source: (a) Wakefield and District Archives, Accounts of the Extract Wool and Merino Co. Ltd., 1896-1900.¹ (b) E.W.H., loc. cit., miscellaneous letters ca. 1933.

1. Jessop Bros. of Springfield Mills, Ossett, had been established in 1892 by W.S. and A. Jessop, previously partners in the firm of Fawcett, Firth, and Jessop of Calder Vale Mills. Capital equipment costs were £350 between October 1892 and December 1893, the partners purchasing new machinery comprising three rag machines (two of which were for merino pulling), a 4 foot rag shaker, a washing machine, a wool shaker and a 4 foot tenter hook willey from Walker and Smith. Fitton and Sons was established by James Fitton in 1878. Eli Townend and Co. had been established in ca. 1883 when Townend and John William Smith had dissolved their partnership as mungo manufacturers. Ossett and its Industries (ca. 1921), pp. 35-36; Walker and Smith MSS., loc. cit., Sales Ledger no. 4, 23.1.1889-10.4.1895.

1904, the capital was adjusted to provide greater leverage to the ordinary shares in order to improve the Stock Exchange quotation, by creating £83,150 6 per cent Preference shares, £59,292 4½ per cent First mortgage debentures, and 90,670 ordinary shares.¹ From 1905 until 1913 the dividend on the ordinary shares remained at 7½ per cent.

From ca. 1904 a number of other companies in the shoddy and mungo manufacturing sector began to establish limited liability. The firm of John William Smith, mungo manufacturers of Healey Old Mills, Ossett, were forced into a Deed of Arrangement in 1902 following damage of £10,000 in a fire for which they were not fully covered.² With remaining assets of £12,546 to cover unsecured liabilities of £18,437, creditors agreed to accept a composition payment of 10^s/- in the £, and in February 1904 the company took on limited liability with a nominal capital of £20,000 but with no public issue.³ The majority of firms however, continued to remain in family hands or as partnerships, and those that sought limited liability appear not to have issued shares to the general public.

Few records appear to survive which will permit a comparison of individual firms' output, either at particular dates or over a period of time. From evidence supplied to the Pollution of Rivers Commission in 1873 it is possible to estimate annual gross output of ragwool from information provided of the weight of oil consumed or

1. Wool Year Book (1921) op. cit., p. 535.

2. v. supra p. 289n. Smith, who had previously been in partnership with Eli Townend, had carried on his mungo manufacturing business in rented accommodation in Calder Vale Mills between 1883 and 1891, when he purchased Healey Old Mills in Ossett. Ossett and its Industries, op. cit., p. 36.

3. Perry's op. cit., LXXIV, 1902; T.M. op. cit., 15.3.1904.

manufacturers' figures of the value of sales.¹ The annual output of John Speight & Sons of between 900,000 to 1,000,000 lbs clearly exceeded that of the medium-sized firms of John Westerman and Sons (approx. 320,000 lbs), Samuel Grist (approx. 450,000 lbs) and G.F. Tabram (approx. 360,000 lbs). Although no information on the number of rag machines is given, in numbers of employees Speights exceeded the other manufacturers by about two to one, but this can be taken only as a very broad guide as many manufacturers with a high output would not necessarily have maintained large rag-sorting departments.²

It is possible, however, to compare gross output figures of two Dewsbury manufacturers - E. Fox and Sons and Henry Day and Sons - between 1896 and 1910, a period for which data from both firms is available (Table IV(xvi)). From this it can be seen that the timing and degree of fluctuation in output of each firm (column (b)) generally corresponds, variations being accounted for by the differential nature of the raw material being pulled, the demand curve facing each manufacturer, and the balance between shoddy and mungo in each firms' output (Table IV(i) indicates the lower output when pulling hard mungo rags compared to softly-woven or knitted shoddy rags). Whereas Fox concentrated mainly on shoddy rags (Table IV(xvii) below), Day

1. One gallon of oil weighed 6 lbs, and between 4 to 4½ gallons of oil were added to each pack (240 lb) of rags prior to pulling. The value of output in 1873 has been taken as 6^d per lb. P.P. 1873 (c.347), XXXVI, 203, 237, 238. The remaining manufacturer, Grist Sons and Co., pulled the major proportion of their output as flocks and mattress wools.

2. Pollution of Rivers Commission, 1873, op. cit., 177, 203, 235, 237-8. John Speight and Sons, Ossett, 100 hands (mungo manufacturer); Speak and Normanton, Halifax, 50 hands (shoddy manufacturer); John Westerman & Son, Ossett, 40 hands (mungo manufacturer); Grist Sons and Co., Brimscombe, 175 hands (shoddy accounted for approximately 50 per cent of output); Samuel Grist & Sons, Woodchester, 32 hands (shoddy and flock manufacturer); George Tabram, Stroud, 55 hands (shoddy and flock manufacturer).

specialised in mungos - army, navy, police, and livery cloths - although from 1900, the firm began to pull more shoddies in response to depressed conditions in the mungo market.¹ The surprising fact that emerges from the figures in column (a) is the far higher output per machine consistently achieved by Day notwithstanding that the material being pulled was predominantly mungo. Although Fox's output does not infer that each of the 20 rag machines was operating simultaneously, it would suggest, in conjunction with the discussion below, that Fox's had over-expanded in the 1880s and were suffering from internal diseconomies of scale, for their wage books from 1901 onwards indicate sufficient staff employed to operate each machine.² Secondly, it is very apparent from a comparison with Table IV(i) that, in conditions of buoyant demand such as 1904/5 and 1910-14, Day's were capable of operating each machine at or beyond normal output levels assisted by a policy of frequent night-running.

The proportion of shoddy to mungo pulled by E. Fox and Sons between 1884 and 1910 (Table IV(xvii)), whilst showing no significant change on those dates, displays with the figures for gross output variations consistent with contemporary trade reports. The decline in continental rag imports during the cholera prohibitions of 1884-85 and 1892-93 is evident, together with the depressed market for all shoddies and mungos in 1893-94. The rapid increase in American demand for West Riding woollen cloth allowed by the more permissive Wilson Bill of 1895-97, and Japanese orders together with strong domestic demand in

1. Industries of Yorkshire, I, op. cit., p. 321.

2. E.F. and S. MSS., loc. cit., Wage Books 22.3.1901-7.12.1906. Fox & Sons were employing 23 full time 'grinders' (rising to 29 in 1904), 19 'assistants', and three part-time 'assistants'.

1903-1907/8, indicates the very marked swings that could take place within a short period of time in the ragwool market.

Production costs in each rag-pulling department (shoddy and mungo) were calculated finely and, from evidence in both Fox's and Day's ledgers, it would appear to have been accepted practice to cost all direct expenses - such as wages, power, repairs, mechanics, rent, purchases - in order to arrive at the production cost of grinding each pack which would then appear as a debit in both the 'soft' and 'mungo' rag departments. Although no figure for depreciation of the rag machines appears in Fox's 'Department Ledger' this would not seem to have been regular practice.¹ In the period 1884 to ca. 1900 grinding costs per pack show a marked tendency to fall as annual output increased, a feature which is not so evident in the ten year period to 1910.

A comparison of the relative proportion of the three major expenses incurred by the shoddy and mungo departments of E. Fox and Sons between 1884 and 1909 is shown in Table IV(xviii).² From this it can be seen that the direct cost in wages declined markedly in relation to that of

1. Depreciation of rag machines may have appeared in the annual accounts, none of which have survived. Day's charged 10 per cent depreciation on their rag machines ca. 1894-6. Hudson, Sykes and Bousfield raised depreciation from 5 per cent in 1874 to 10 per cent from 1885 in their rag grinding department. H.D. MSS., loc. cit., Ledger 1.10.1893-31.5.1937. Leeds City Council, Archives Department, Hudson, Sykes and Bousfield MSS., Private Ledger 1874-1885.

2. From the records of G.& J. Stubbley between 1874 and 1879, and E. Fox and Sons 1884-1910, the proportion of pulling costs to the cost of the rags varied between 23 to about 40 per cent.

TABLE IV(xviii)

Comparison of costs of production, E. Fox & Sons,

1884-1909 (selected years)

	<u>Shoddy (% of all costs)</u>			<u>Mungo (% of all costs)</u>		
	Wages	Grinding	Oil	Wages	Grinding	Oil
1884	39.0	29.9	31.1	31.2	32.7	36.1
1889	37.5	42.2	20.3	26.4	43.0	30.6
1894	36.2	43.3	20.5	28.2	29.0	42.8
1899	34.1	48.3	17.6	24.8	51.4	23.8
1904	33.4	43.9	22.7	18.6	28.2	53.2
1909	29.4	42.9	27.7	26.4	27.5	46.1

Source: E.W.H. MSS., loc. cit., E. Fox and Sons, Department Ledger.

oil and grinding.¹ Fox's used three types of oil in grinding; olive or 'best', cloth oil, and black oil, and whilst all oils fell in price on trend between 1884 and 1900, cloth and black oils began to rise slightly from 1900-1910. The price ratio between each type followed a close relationship of 3:2:1 (in 1895, for example, the cost of each type per gallon was 2^s/9, 1^s/7 and 8^d/₄ respectively) and it is clear from their records that over the whole period cloth and black oil were increasingly being substituted for olive oil - the consumption of olive oil in the shoddy and mungo departments of 7,546 gallons and 5,857 gallons in 1884 had declined to insignificant proportions by 1899 and from 1907 none was used even though the price in 1905 of 2^s/10^d per gallon was less than the price of 3^s/1^d in 1884. Clearly, this strategy was successful in reducing the proportionate cost of oil in grinding shoddy (Table IV(xviii)), but was offset by the greater quantity of cloth and black oil needed to provide satisfactory pulling, the volume per pack increasing from 1.8 gallons

1. Weekly wage rates for rag grinders remained fairly constant until ca. 1909.

	<u>Year</u>	<u>Weekly rate</u>
Rag grinders, Dewsbury	1870	20 ^s /-
" " district (wage census)	1886	20 ^s /-
" " " (Labour Commission)	1891	16 ^s /- 21 ^s /-
" " "	1893	22 ^s /6 ^d
" E. Fox & Sons	1901	22/- - 24/-
" Eli Townend & Co.	1901	20/- - 30/-
" E. Fox & Sons	1908	22/- 23/-
" Eli Townend & Co.	1908	20 ^s /- - 30 ^s /-
" E. Fox & Sons	1913	23 ^s /- 27 ^s /-
" Eli Townend & Co.	1913	20 ^s /- 30 ^s /-

Source: 1870-1893 A.L. Bowley, 'Wages in the Worsted and Woollen Trades of the West Riding of Yorkshire' J.R.S.S., LXV, 1902, p. 121. 1901-1903 E.F. and S. MSS., loc. cit., Wage Books 1901-1916; E.W.H. MSS., loc. cit., Eli Townend and Co., Wage Books 1901-1915. See also, B. Turner, The Rise and Progress of the Heavy Woollen District Branch of the General Union of Textile Workers (Yorkshire Factory Times, 1917). The wage rate of adult and juvenile rag machine feeders was fixed in 1911 at 24^s/6d and 18^s/- per week (p. 23).

in 1884 to 3.03 gallons in 1908, although that for mungo remained a constant 3.6 to 3.8 gallons.¹

Table IV(xix) summarises the output of carbonised or extract wool produced by the firm, the marked reduction in costs per pack being apparent after the previous carbonising machine (which was out of operation in 1887-88) had been replaced by investment in a new carbonising shed (£522) and the installation of Duke Fox's patented dry carboniser (£159) in 1888. Table IV(xx) indicates the mean price of shoddy and mungo sales by the firm, certain grades of which are components in the price series in Chapter V.

From the evidence shown in these tables and the profit and loss figures in Table IV(xxi) a number of conclusions can be suggested, some of which may have been common to other firms in this sector in the West Riding. Although the largest single firm in the shoddy and mungo industry, in terms of output Fox's indicated share (pulled and extract material) of United Kingdom gross output (Tables IV(xxiii) below) appears to have fallen from about 3 per cent (1884) and 3.5 per cent (1890) to 2.1 per cent in 1907, when Census of Production figures establish an accurate basis for comparison.² As a proportion of output of the West Riding shoddy and mungo manufacturing sector, the number of rag machines specified in the 1904 Factory Return operated by the ragwool as compared to the woollen manufacturing branch suggest that Fox's probably contributed between 5 and 6 per cent of total sector output. Thus, during the period covered by the firms' accounts, it would appear that their market share was declining, particularly after ca. 1905.

1. The increase in grinding costs in 1889 is confirmed by a local press review claiming that higher coal, chemical, labour, and maintenance costs had 'substantially' added to the costs of making shoddy and 'caused a restriction on this hitherto growing business' D.R., 27.12.1890.

2. Walker and Smith MSS., loc. cit., Letter Book 1905, letter 5.10.1905. It is interesting to compare the output of Valckenberg and Schoen of Worms, the largest German manufacturer, in 1881 of 4.480.000 lbs. to the gross output (shoddy, mungo, and extract) of E. Fox and Sons T.M., 15.7.1881.

TABLE IV(xix)

Output and commission carbonising, E. Fox & Sons

1884-1910.

Packs (240 lbs.)						
	<u>Soft Rags(a)</u>	<u>Mungo Rags(b)</u>	<u>Commission Work (c)</u>	<u>Cost per pack (s.d.)</u>	<u>Ratio of (a)and(b) to(c)</u>	<u>Total (a)+(b) lbs.</u>
1884	728	559		7/6		308,880
5	1,218	360		10/-		378,720
6	608	658		8/8		303,840
7	-	-		-		-
8	-	-		-		-
9	1,011	1,158		4/8 $\frac{3}{4}$		520,560
1890	983	1,538		5/3 $\frac{11}{16}$		605,040
1	1,196	1,384		5/2 $\frac{1}{16}$		619,200
2	1,062	1,516		5/- $\frac{1}{2}$		618,720
3	1,312	1,220		4/10 $\frac{1}{2}$		607,680
4	1,138	931		5/10		496,560
5	1,710	633		5/1 $\frac{1}{2}$		562,320
6	1,017	419		5/6 $\frac{3}{4}$		344,640
7	1,393	458		5/11 $\frac{1}{8}$		444,240
8	1,622	373		5/6 $\frac{1}{2}$		478,800
9	1,466	528		5/2 $\frac{1}{2}$		478,560
1900	1,380	565	1,156	5/10 $\frac{7}{16}$	1:0.59	466,800
1	2,159	486	1,802	5/5 $\frac{5}{16}$	1:0.68	634,800
2	2,572	923	1,275	4/11 $\frac{3}{16}$	1:0.36	838,800
3	1,408	1,111	608	6/1	1:0.24	604,560
4	2,133	623	1,698	5/2 $\frac{3}{8}$	1:0.62	661,440
5	3,113	259	3,021	6/- $\frac{15}{16}$	1:0.90	809,280
6	1,905	246	2,234	6/4 $\frac{1}{2}$	1:1.04	516,240
7	2,049	294	1,449	7/6	1:0.62	645,120
8	1,764	482	1,630	6/8	1:0.72	608,160
9	1,697	279	1,215	6/8	1:0.61	486,000
1910	2,491	126	2,146	6/8	1:0.82	679,920

Source: E.W.H. MSS., loc. cit., E. Fox and Sons, Department Ledger.

TABLE IV(xx)

E. Fox & Sons - Sales of Shoddy and Mungo and Average

Price per lb. - 1884-1910.

	Shoddy £	d. per lb.	Mungo £	d. per lb.
1884	38,926	4.59	21,499	4.51
5	34,057	4.14	14,749	3.82
6	35,140	3.78	14,913	3.76
7	35,377	4.34	18,060	4.30
8	37,064	4.52	20,239	4.52
9	38,741	4.36	23,552	4.76
1890	46,573	4.55	29,793	4.81
1	42,318	4.35	28,781	4.74
2	37,739	4.09	23,463	4.51
3	35,221	4.08	21,551	4.52
4	31,692	3.97	20,092	4.39
5	30,154	4.06	23,050	3.91
6	38,518	4.17	18,068	4.28
7	32,764	3.86	17,653	4.45
8	32,588	4.13	15,745	3.56
9	29,483	4.23	15,793	3.77
1900	33,498	4.38	22,583	4.43
1	35,431	3.99	19,562	4.01
2	32,779	3.96	20,485	3.69
3	36,396	4.15	21,711	3.54
4	41,118	4.29	22,160	3.35
5	63,541	5.12	23,530	3.70
6	62,283	5.99	26,126	4.08
7	61,352	6.25	28,995	4.53
8	55,779	5.86	30,684	4.82
9	40,413	4.77	27,705	5.24
1910	30,441	5.63	27,092	5.29

Source: E.W.H. MSS., loc. cit., E. Fox and Sons,
Department Ledger.

TABLE IV(xxi)

E. Fox and Sons - Gross profit as a percentage of

Partners' Capital Employed and Gross Sales,

1881-1910.

Year	(a) £ Gross Profit or Loss (-)	(b)£ Partners' Capital account	Gross Profit (a) as a % of Capital (b)	£ Gross Sales	Gross Profit as a % of Sales
1881	7,042	108,339	6.50	N/A	N/A
2	10,238	112,007	9.14	N/A	N/A
3	4,574	118,871	3.85	N/A	N/A
4	(-) 2,892	58,096	-	60,425	-
5	(-) 1,334	56,367	-	48,806	-
6	(-) 755	55,252	-	50,053	-
7	3,038	55,634	5.46	53,437	5.68
8	3,809	56,386	6.75	57,303	6.65
9	5,395	59,388	9.08	62,293	8.66
1890	5,327	59,084	9.02	76,366	6.98
1	4,716	49,861	9.46	71,099	6.63
2	3,296	48,861	6.75	61,202	5.38
3	3,295	49,319	6.68	56,772	5.80
4	1,566	50,843	3.08	51,784	3.02
5	3,791	58,564	6.47	53,204	7.12
6	2,806	56,140	5.00	56,586	4.96
7	1,655	57,641	2.87	50,417	3.28
8	1,047	55,441	1.89	48,333	2.17
9	803	54,798	1.46	45,276	1.77
1900	3,781	49,798	7.59	56,081	6.74
1	3,884	51,060	7.61	54,993	7.06
2	856	49,482	1.73	53,264	1.61
3	3,646	56,939	6.40	58,107	6.27
4	4,334	59,550	7.28	63,278	6.85
5	4,986	59,386	8.40	87,071	5.73
6	5,529	64,654	8.55	88,409	6.25
7	3,796	59,471	6.38	90,347	4.20
8	3,586	57,360	6.25	86,463	4.15
9	4,283	57,551	7.44	68,118	6.29
1910	4,130	59,932	6.89	57,533	7.18

Note: The profit and loss figures for 1881-1883 include those of the cotton spinning and doubling department. Those for 1884 onwards relate to shoddy and mungo manufacture at Calder Bank Mills, Dewsbury.

Source: E.W.H. MSS., loc. cit., E. Fox and Sons, Department Ledger.

In response to this, and being unable to influence more than marginally the price at which their output could be marketed, the firm was increasingly forced to adopt cost-reducing measures, which may or may not have affected the quality of their production. The two 28 inch rag machines installed in 1885, although seen as 'more or less unsuccessful' by machine makers Walker and Smith, may have been an early attempt to reverse the losses of 1884-86 by increasing productivity.¹ Certainly, the marked substitution of lower grade oils and the increase in weight of oil used for pulling shoddy, which constituted the larger proportion of their annual output, indicates a conscious effort to reduce costs, and, perhaps, an attempt to add to the weight of pulled shoddy without adjusting rag input. On the other hand, it is just possible that West Riding and other mills were demanding a more oily shoddy.

No information appears to have survived on fixed asset valuation of E. Fox and Sons, although an incomplete policy document of 1895 indicates an insurance valuation of £14,370 on plant and machinery and £22,930 on stock.² However, adjusting for outside investment (the firm owned four woollen mills which were let to a number of manufacturers), the cost of Calder Bank Mills in 1884 and stock, the fluctuating balance in column (b) (Table IV(xxi)) appears to have reflected approximately fixed and current assets.³ This indicates that the restored profit

1. A note in the records states that losses for 1887 were 'partly occasioned by the excessive repairs during the year' E.W.H. MSS., loc. cit., E. Fox and Sons, Department Ledger.

2. *ibid.*, policy document Commercial Union Assurance Co. Ltd., Leeds. The business policy documents of the Commercial Union for this period have not survived. H.A.L. Cockerell and E. Green, The British Insurance Business, 1547-1970 (1976), p. 83.

3. The reduction in partner's capital between 1883 and 1884 represents the withdrawal of capital by George Fox who continued to manage cotton doubling at Staincliffe and cloth manufacture at Sowerby Bridge Mills. Duke, Joe, and Chaley Fox were the principal partners of E. Fox and Sons, paying £2,000 in 1883 as the 'amount agreed to be allowed to George Fox and Sons in consequence of the three other partners in E. Fox and Sons retaining the name of that firm'.

level of 1887 began to come under severe pressure from 1894, alleviated to some extent by the brief opening of the American market in 1895-96, and recovering with the return to more bouyant domestic and overseas demand from 1903-4.

Whilst some of the problems indicated by Tables Iv(xvi-xxi) relating to Fox's were experienced by the trade generally, and these will be discussed with reference to gross output figures shortly, the evidence would seem to support the suggestion made earlier - that Fox's had exceeded optimal plant size for the industry, or at least, that size sufficient to meet efficiently the nature of the demand curve facing the industry between ca. 1876 and 1913, and were incurring fluctuating but persistent internal diseconomies of scale. Secondly, little attempt appears to have been made by the two controlling partners, Duke and Chaley Fox (Joe Fox had died in 1894) to diversify effectively outside mungo and shoddy production; investment in three woollen mills indicates a net loss after rental, and a loss on the family-related woollen manufacturing firm of Howgates, Day, and Holt of £20,000 was, following the bankruptcy of that firm, written-off in 1887.¹ Thirdly, the firm appears also to have suffered from external diseconomies arising from the general growth in this sector as evidenced in Tables IV(vii) and (viii) and was, given the established price level at which output could be sold, unable to reduce costs to the level of existing smaller, more competitive firms, or new firms entering the sector. The impression gained from an examination of the firm's internal private records is that the fundamental problem was one of overcapacity and although a number of measures were taken, the controlling partners, who both died in 1909, seem to have been satisfied with the 5 per cent interest on their

1. E.W.H. MSS., loc. cit., E. Fox and Sons, Department Ledger; Textile World, III, 133, 15.3.1881.

outstanding capital accounts paid out of gross profits, and an annual half share of net profits.¹

That the profitability of E. Fox and Sons was not representative of other firms in the industry is suggested by figures of Eli Townend Ltd. and Fitton and Sons between 1897 and 1899 (Table IV(xxii)).

Table IV(xxii)

Gross profit as a percentage of (a) total assets employed and (b) sales, Eli Townend Ltd., and Fitton and Sons,

1897-1899

	(a) Total Assets £	(b) Sales £	(c) Gross Profit £	(c) as % of (a)	(c) as % of (b)
E.T. & Co. 1897	32,210	60,900	6,257	19.42	10.3
1898	34,546	55,920	3,510	10.16	6.3
1899.	40,193	63,409	6,196	15.41	9.8
F. & Sons 1897	16,911	21,808	6,199	36.66	28.42
1898	18,287	25,546	7,301	39.92	28.58
1899	20,533	24,163	8,015	39.03	33.17

Source: Accounts of the Extract Wool and Merino Company Ltd. loc. cit.

Note: In order to attempt comparability with the figures for E. Fox and Sons, 'total assets' includes all items on the asset side of the balance sheet - plant and buildings, stock, sundry creditors, and bank balances. Gross profit is before income tax and directors' emoluments.

Although the exact rag pulling capacity of these firms on the above dates is not known, evidence in their ledgers from ca. 1900 indicates that with nine and ten machines respectively, their capacity

1. And, as the records suggest, a strong enthusiasm for Scottish shooting trips.

was approximately half that of E. Fox and Sons. From these figures and the evidence of Day's output it would appear that, depending on the degree of specialisation of the product and capital available, the optimal size of firms in this sector in terms of pulling capacity and profitability was somewhere between four to ten rag machines.

Total estimated production of shoddy and mungo in the United Kingdom between 1870 and 1913 rose spectacularly, as Table IV(xxiii) indicates, reaching an historical peak for the period covered in this study in ca. 1907-1910. From Jubb's evidence, and the disposition of rag-pulling capacity between the woollen manufacturing and shoddy manufacturing sectors in 1904, it would seem that rarely did the capacity of the shoddy sector exceed approximately 50 per cent of total West Riding pulling capacity. Certainly, surviving primary material of West Riding woollen manufacturers, rag machine makers, auctioneers, and insurance records point to an existing and growing backward integration into rag pulling by this sector from 1870 onwards.¹ Thus the proportion of ragwool exported by the specialist shoddy and mungo manufacturers may well have accounted for between 10 to 30 per cent of their total output during this period.

Although many West Riding woollen manufacturing firms possessed

1. G. and J. Stubleby, for instance, were operating eight rag machines and two rag shakers by 1897. Smith suggests that the 30 rag machines operating in woollen mills in Morley in 1876 (there were no independent shoddy manufacturers) produced an annual output of 7,200,000 lbs. of rag wool, or about .8 per cent of total estimated output for 1875-76. The Census of Production figures for 1907 and 1912 indicate that the ragwool sector produced 57.5 and 62.4 per cent respectively of total production, but these figures were distorted to some extent by the large influx of American rags. J.F.T.S. MSS., loc. cit., Policies 1889-1897; W. Smith (1876) op. cit., pp. 215, 221; Final Report on the Third Census of Production of the United Kingdom, 1924, p. 78.

TABLE IV(xxiii)

Estimated total United Kingdom production of shoddy,
mungo, and extract wool, 1870-1914 (000s lbs.)

Year	(a) Production	Value(000s£)	(b) Exports	Value(000s£)	(b) as a % of (a)
1870	58,467	1,291	4,691	113	8.0
1	66,106	1,487	8,367	253	12.6
2	72,629	1,634	8,016	221	11.0
3	75,744	1,799	4,678	133	6.2
4	84,226	1,790	7,504	201	8.9
5	90,184	1,804	11,426	353	12.7
6	83,285	1,735	6,444	208	7.7
7	87,994	1,907	8,799	250	10.0
8	92,633	1,968	11,726	456	12.6
9	97,528	2,113	11,442	439	11.7
1880	124,357	2,539	12,968	547	10.4
1	116,375	2,182	14,746	556	12.7
2	124,085	2,430	14,731	469	11.9
3	119,795	2,246	12,236	374	10.2
4	113,478	2,080	12,730	331	11.2
5	108,555	1,854	12,088	289	11.1
6	108,472	1,898	16,104	334	14.8
7	108,461	1,808	16,047	327	14.8
8	111,565	1,766	18,843	398	16.9
9	115,603	1,734	22,531	516	19.5
1890	128,696	1,930	16,070	407	12.5
1	136,403	1,989	13,764	354	10.1
2	109,533	1,780	14,239	345	13.0
3	130,993	2,129	16,788	396	12.8
4	131,029	2,020	16,197	374	12.3
5	149,679	2,308	15,597	359	10.4
6	149,614	2,307	14,936	338	10.0
7	139,795	2,388	14,273	330	10.2
8	134,664	2,413	13,450	315	10.0
9	134,890	2,417	13,700	344	10.2
1900	139,540	2,675	12,938	328	9.3
1	142,528	2,435	10,745	244	7.5
2	146,504	2,503	9,783	216	6.7
3	149,273	2,737	12,275	279	8.2
4	184,248	4,222	7,790	200	4.2
5	189,186	3,942	13,001	349	6.9
6	202,848	4,564	15,634	457	7.7
7	221,000	4,972	14,189	452	6.4
8	185,565	3,866	8,606	269	4.6
9	208,734	4,523	8,246	246	3.9
1910	231,120	5,008	11,957	350	5.2
1	215,965	4,769	11,421	400	5.3
2	204,000	4,420	13,442	399	6.6
3	214,731	6,442	13,456	413	6.3
1914	192,411	6,414	8,668	279	4.5

Source: Column (a), Table III-I(f), Appendix, Chapter III. Values calculated from the shoddy and mungo price series, Appendix, Chapter V; 1870-1899, mean of shoddy and mungo, 1900-1914, shoddy weighted 2, mungo 1.

Column (b), Trade, Navigation and Commerce, Annual Accounts, and Annual Statements of the Trade of the United Kingdom.

Note: Exports include 1871-1881 - wool flocks and dressed wool. 1882-1902 - wool flocks. From 1903 figures relate to shoddy and mungo only.

one or two rag machines there is plenty of evidence to show that they relied upon the specialised blends of shoddy and mungo merchants and, increasingly, manufacturers, for a large proportion of their ragwool consumption. The surviving records of G. and J. Stubley and J.T. & J. Taylor of Batley, John Lockwood and Sons of Golcar, Hudson, Sykes and Bousfield of Leeds and Morley, and other firms, indicate regular and sometimes large purchases of shoddy and mungo in addition to rags processed by their own rag pulling departments. With the exception of the very large fully integrated mills such as Mark Oldroyd and Sons of Dewsbury (employing about 1,500 persons in 1871), the resources of a small sorting and rag pulling department were not always sufficiently flexible to meet the needs of design and blending departments, and concentrated instead on certain stock blends for traditional pilot or witney type cloths.¹ The growth in demand for imitation Scotch tweeds, produced in increasing volume by Colne Valley manufacturers from the mid-1870s, required a wide range of qualities and colours of shoddy and mungo with frequent and sudden changes to compete with new designs brought out by Scottish woollen mills. Both Stubleys and Lockwoods purchased large quantities of shoddy and mungo in a constantly changing variety of colours and classes, an examination of their purchase and blending records strongly suggesting that recovered wool manufacturers were meeting a highly differentiated demand from the woollen sector during this period. Although specialisation and the cultivation of long-standing arrangements for the supply of particular grades undoubtedly assisted shoddy and mungo manufacturers in formulating future investment decisions geared to the certainty of a minimum level of production, it seems clear that there were both costs and benefits

1. W.S. Banks, *op. cit.*, p. 459.

accruing to manufacturers whose business was more speculative. The short price series from 1865 to 1871 between A. Fox and Brothers and G. and J. Stubley (Table IV(xxiv)), which was placed in a separate section of their Receiving Day Books and is indicative of just such a long-term contract, reveals that whilst the price level declined slightly on trend, the degree of fluctuation was less than that of the mungo price series and far less than that of the wool price series over the same period. On the other hand, some manufacturers employing travellers covering the West Riding, were prepared to accept more profitable but less certain contracts with woollen manufacturers. Lockwoods, for example, purchased at regular one to three month intervals from £200 to £250 of shoddy from E. Fox and Sons between 1883 and 1887, but substituted supplies from other manufacturers after that date so that by 1892 Fox's were supplying very small quantities.¹ It must be borne in mind, however, that risks were inherent in both methods of trading, particularly if a manufacturer relied to a disproportionate extent on one or two major customers and one of these failed, such as in the bankruptcy of Abraham Wilson in 1877.

TABLE IV(xxiv)

Mungos supplied by Abraham Fox and Brothers (Batley)
to G. and J. Stubley, 1865-1871 (d. per lb)

	1865	1866	1867	1868	1869	1870	1871
New grey	7¼	7⅜	7	6¾	6½	6	5¾
Old grey	4⅞	4¼	4⅞	4⅞	4¼	4	3¼
New black	7	7	7¼	7	6	6	6⅞
New blue	9	9	9	9	-	-	-
Old blue	7¼	7¼	7¼	7¼	-	-	-
Mungo price series	7.33	7.3	7.29	7.43	6.85	6.48	6 33

Source: G. and J.S. MSS., loc. cit., Receiving Day Books, 8.8.1865-28.8.1866, 18.4.1868-31.7.1871. (Prices for 1867 are the mean of the last and first prices of 1866 and 1868); Mungo price series Appendix, Chapter V.

¹ Kirklees Libraries and Museums Service, Huddersfield, John Lockwood and Sons Ltd Mss, B/JL, Bought Ledger 31.3.1884-2.1.1889, Bought Day Book 3.11.1890-31.12.1895. As it was highly unlikely that Fox's were unable to supply particular blends of shoddy required, it would seem that their prices were less competitive. A comparison of the average price of their shoddy (Table IV(xx)) with the shoddy price series, indicates that from 1887 their prices began to diverge, and, by 1892, were approximately 26 per cent higher than the general level of shoddy prices reflected by the series.

The sales ledgers of E. Fox and Sons from 1899 onwards show that the practice of securing regular contracts with a small number of large customers would seem characteristic of the industry - from 1894 to 1896, for example, Henry Day and Sons supplied mungo under a special arrangement with the family-related firm of woollen manufacturers Mark Day which accounted for over half of their gross output.¹ That this type of arrangement could lead to sometimes large swings in output is evident from Table IV(xxv). Although the unique situation of the shoddy and mungo industry as supplier of raw materials to the woollen textile sector made such fluctuations an unavoidable business risk, these figures serve to emphasise the choice facing existing and new entrants when deciding on the scale of investment in rag-pulling and related capacity - the possibility of profits foregone when orders had to be refused because existing plant was insufficient, or costs incurred by idle or under-utilised plant when demand was weak.

TABLE IV(xxv)

Value of gross sales by E. Fox and Sons to Wormalds
and Walker Ltd., Dewsbury Mills, 1899-1911

Year	Value(£)	Year	Value(£)
1899(July-Dec)	(1,774)	1906	2,588
1900	4,244	1907	4,281
1901	4,858	1908	2,514
1902	3,008	1909	2,989
1903	3,077	1910	4,432
1904	12,833	1911(Jan-June)	(2,851)
1905	13,151		

Source: E.F. and S. MSS., loc. cit., Sold Ledgers, July 1899-Feb. 1906, March 1906-June 1911.

1. H.D. MSS., loc. cit., Ledger 1.10.1893-31.5.1937.

An indication of the degree of acceptance of recovered wool by domestic woollen manufacturers is suggested by the sales records of E. Fox and Sons, for whilst the bulk of their output was not unexpectedly consumed by West Riding mills, the distribution of their market was wide, ranging from several firms in Gloucestershire and Kidderminster to a number of mills in Kendal, Selkirk, Galashiels, Alloa, Peebles, Jedburgh, and Cork. Although Fox's were the largest firm in the sector and may have possessed an unrepresentative number of customers in the British Isles, it would not seem unreasonable to assume that many of their competitors also sold into West Country and Scottish markets during this period.

The distribution of overseas markets in recovered wool exports is shown by the tables in Appendix IV-I to this chapter, gross exports when compared to imports (Chapter III, Table III-I(c), Appendix), indicating that the United Kingdom became a net exporter from ca. 1884. Although a trade commentator in 1883 lamented the loss of the hitherto Yorkshire-dominated Hungarian ragwool market to domestic and Austrian shoddy manufacturers who 'undersold' the Yorkshire producers, the same journal noted with some satisfaction six years later that

'During the past year the shoddy export trade has grown to a surprising extent (and) large quantities of shoddy have been shipped from this district to the Continent.'¹

The lifting of the McKinley tariff in 1895 provoked an American journal to comment sharply on the increase in importation of rags and shoddies from 4 million lbs. in 1894 to 21 million lbs. in 1895.

'One of the most striking effects of the Wilson Bill has been the increase in the imports of rags and shoddy. The figures conclusively show that the American public, if it is getting its clothes any cheaper, is certainly getting less value for money'²

1. T.M., 15.10.1883, p. 481, 15.10.1889, p. 488. John Blackburn Son and Co., Henry Day and Sons, and Machell Bros., were amongst those who had built up active trading interests in continental, colonial, and North American markets. Industries of Yorkshire (1888) op. cit., I, pp.321, 327, 347.

2. T.M., 15.11.1896, p. 153. Under the McKinley Tariff of October 1890, the import duty on shoddy was raised from 10 cents to 30 cents lb., mungo remained at 10 cents lb T.M., 15.10.1890, p. 491.

The Huddersfield Examiner noted, too, that a number of West Riding shoddy merchants and manufacturers had sent their representatives to the United States with 'the idea of appointing agents' and

' ... not a few American manufacturers and merchants have sought information as to where to buy shoddy and mungo through this journal'.¹

The extent to which the West Riding ragwool industry was able to directly exploit this market between 1895 and 1897 appears, however, minimal, the temporary rise in American demand affecting more the rag merchanting sector, and, possibly, some continental ragwool manufacturers.²

From an analysis of the distribution of exports of shoddy and mungo (the volume and value between 1871 and 1881 is, to some extent misleading, as re-exports of foreign dressed wool were included by the Board of Trade) it is clear that the most important market for the whole of the period 1871-1913 was Germany - the change in the balance of trade in shoddy and mungo between the two countries being noted by a trade commentator in 1901.³ Evident also is the growth in exports of high grade shoddy and mungo to Scandinavia and, from 1901, to Portugal. E. Fox and Sons, for example, were selling to 18 different mills in Sweden between 1899 and 1906, 22 in Belgium, 32 in Holland, four in Austria, and a number in France, Luxembourg, and Finland.⁴ From 1910 the Canadian

1. H.E., 29.12.1894.

2. v. infra Appendix to this chapter. German exports of ragwool were also relatively unaffected. Statistik des Deutschen Reichs, op. cit., 1899, Band 122.

3. v. supra, p. 176. German trade statistics for 1897-8 indicate that British exports of approximately 7 million lbs. were exceeded only by those of Belgium of 10 million lbs. German and British exports to Norway and Sweden were comparable, but Britain dominated in the Russian (but not in 1873 and 1874), Danish, and Portugese markets, and Germany in the Belgian, French, Dutch and Austrian markets. Statistik des Deutschen Reichs, op. cit., 1874-75, 1876-75, 1875-76, 1880, 1899.

4. E.F. and S. MSS., loc. cit., Sold Ledger, July 1899-Feb. 1906.

market, in which domestic mills were engaged in fierce competition with Yorkshire goods, began to take small quantities, Fox's supplying about 12 Ontario and Quebec mills with both shoddy and mungo.¹

The reason for the gradual decline in exports to the Russian market was suggested by a trade commentator, critical of the Yorkshire rag and shoddy trades in 1912;

'... the German exporter adapts himself to the customers of the country and supplies the different sorts as required by the Russian firms ... , further, he allows credit.'²

Trade cash and credit terms appear to have widened since the agreement of 1858 of 2½ per cent discount for cash (14 days) to 3½ per cent (14 days) in ca. 1900.³ Commonly, the more extensive domestic woollen manufacturers whose orders comprised a large and steady proportion of the shoddy manufacturers' output were granted 3½ per cent discount on cash sales - for example, Wormalds and Walker Ltd. by Fox's and Cook Sons and Co. by Eli Townend - or 3½ per cent on bills paid within three weeks of despatch of order.⁴ Discounts allowed to overseas buyers varied, Fox's allowing 3 per cent on 30 day demand drafts to most, or, to Swedish buyers, six months net cash or 30 days with a 4 per cent discount, and to Belgian buyers, three months net cash from month end or 3 per cent discount on a 30 day demand draft. Clearly, the accusation of poor credit terms losing markets does not appear to be borne out from the records of these two firms, and other factors, such as tariffs or the credit-worthiness of Russian buyers, may,

1. D.R., 1.1.1910; E.F. and S. MSS., loc. cit., Sold Ledger, March 1906-June 1911.

2. W.T.W., 4.5.1912, p. 7.

3. Fox's were still allowing 2½ per cent discount in 1889.

4. E.F. and S. MSS., loc. cit., Sold Ledger 1899-1906; E.W.H. MSS., loc. cit., Eli Townend and Co., Sales Ledger no. 2, 15.4.1905-17.10.1910. 'Cash sales' were bills cleared at the end of each month.

in this instance, provide a more adequate explanation. Certainly, John Smith, of J.W. Smith Ltd., Healey Old Mills in Ossett, gave the former reason as being the greater constraint on his export trade when submitting evidence to the 1905 Tariff Commission.

'My export trade suffers from very heavy tariffs. In some countries, notably Russia, some of my products have to compete with a tariff higher than the price of the goods. It has suffered in a very high degree until half my trade, or, say, to the value of £15,000 per annum, has been destroyed'¹

Whilst no single explanation is readily available for the consistent if moderate export performance of the industry between 1871 and 1914, a feature which received only infrequent comment in contemporary trade reviews, it would seem that Yorkshire had assumed the role of the German ragwool industry in the 1850 to 1880 period in meeting demand insufficiently accommodated by overseas rag-pulling capacity, particularly in the more specialised grades of machine-pulled and extract wool.² A residual, if perhaps a not insignificant reason, suggested in 1913 by Reuss, was that West Riding shoddy manufacturers were 'able to pull rags much cheaper than elsewhere', and this may well have applied from the last decade of the nineteenth century.³

Although the years 1871-1880 were to witness the highest rate of insolvency amongst shoddy and mungo manufacturers in the period 1870-1913, it is clear from Tables IV (vii) and (viii) that this sector achieved an indicated net gain in numbers of firms. Whilst factors on the demand side relating to the woollen textile industry are discussed

1. Report of the Tariff Commission, 1905, 2, 2024. The tariff on imported shoddies to the U.S. in 1913 was 25 cents per lb., noils 20 cents per lb., and mungo 10 cents per lb. W.T.W., 3.5.1913.

2. A comparison of the United Kingdom and German census of production figures of recovered wool output (both for 1907) and excluding material processed by woollen manufacturers, indicates that at 127.2 million lbs. the Yorkshire industry produced nearly twice the German output of 64.7 million lbs. (ibid., 18.5.1912).

3. ibid., 12.4.1913, Supplement, p. xviii, 11.10.1913, p. 8.

more fully in the following chapter, it would appear that the highly qualitative nature of the demand for ragwool in this period offered sufficient inducement in terms of profit expectations for new firms to enter the sector. A consistent feature of contemporary trade reports was the strong demand for better class shoddies and mungos at the expense of inferior types - in 1874, 1875, 1876, 1877, and 1879, for example - one which was closely connected to the growth in complaints of poor quality domestic and imported rags.¹ That these conditions favoured the more adequately capitalised firms would seem probable and it may explain the large number of presumably well-capitalised rag merchants moving into the sector between 1870, 1875, and 1881. The substitution of new, more efficient firms would also have been assisted by the general depreciation in the cost of fixed capital and plant as those firms with high overheads acquired in the period of rapid expansion up to 1875 were either forced out of business or to accept the injection of new capital and entrepreneurs. Certainly, pullers benefited from higher prices in 1880, although not to the same degree as rag merchants, and, with a revival of trade in the West Riding in 1881, a press commentator could note that shoddy and mungo had sold 'uncommonly well'.²

For most manufacturers, however, the years 1881-1885 were, as Fox's accounts indicate, ones of diminished profits or actual loss, a situation made worse to some extent by declining rag supplies in 1884-1885 because of cholera prohibitions.³ To compensate for the bad trading conditions of 1886, which bore particularly hard on mungo manufacturers, the years 1887 to 1889 provided plenty of opportunity for both shoddy and mungo manufacturers to share in the 'general

1. H.E., 2.1.1875, 1.1.1876, 28.12.1877; T.M., 15.10.1875; Huddersfield Chronicle, 27.12.1879.

2. D.R., 1.1.1881, 31.12.1881.

3. H.E., 28.12.1886.

prosperity' of the West Riding woollen industry.¹

The early 1890s were years of declining gross output and diminished profits, exacerbated by the serious dislocation of supplies from the continent by the Local Government Board cholera prohibitions of 1892-1893, a trade report of 1893 noting that many rag machines were 'standing idle', with

'... shoddy and mungo manufacturers complain(ing) that 1893 was one of the worst they have experienced'²

Whilst the industry appears not to have participated to the extent that rag merchants did in exporting raw material to the American market in 1895-96, the brief burst of activity in the Heavy Woollen District stimulated by the Wilson Bill and coinciding with rising wool prices, led to a marked upturn in output, checked, however, by the quick saturation of the depressed American domestic market and the re-election of McKinley. Although Ossett mungo manufacturers enjoyed bouyant conditions in 1896, those specialising in shoddies were less jubilant, a reviewer noting laconically that

'There is much "cutting" by pullers, and this leads to a soreness of feeling among them. Manufacturers, of course, do not complain.'³

Higher wool prices and trade revival in 1899 and 1900 proved 'remarkably good' years for most shoddy and mungo manufacturers, and although 1903 provoked complaints from Ossett mungo manufacturers of a 'hand to mouth' trade, both sectors moved into profitability and successive years of record gross output to ca. 1908, a trade report representative of several in this period noting in 1905 that

'Shoddy enjoyed a capital year's trade, a large amount of business being transacted at remunerative prices'.⁴

1. H.E., 31.12.1887, 29.12.1888, 28.12.1889.

2. D.R., 23.12.1893

3. H.E., 24.12.1896.

4. D.R., 30.12.1899, 29.12.1900, 28.12.1901, 24.12.1903, 28.12.1905, 28.12.1907; T.M., 1905, p. 2.

The large expansion of output between 1909 and 1913 in response to strong domestic demand for cheap woollens and fuelled in its early stages by massive imports of American rags resulted in the historically high production of shoddy and mungo in 1910, an output volume which was never to be exceeded by the industry. Although raw material input costs were low, the large amount of noils and wastes entering the market from both branches of the wool textile industry effectively limited maximum prices of shoddy and mungo, a trade reviewer noting in 1910, that, despite brisk trading conditions,

' ... competition in the rag and shoddy industry is locally becoming more keen, and consequently the profits are being distributed over a wider area'¹

Higher wool prices in 1912 and 1913 appear not to have alleviated this as woollen manufacturers, seeing that the prices of all textile raw materials were slowly rising, were attempting to control input costs by buying shoddy and mungo at 'slightly reduced' prices

' ... but the present prices of rags will not admit of this, and the shoddy firms are compelled to hold for their prices, or let the orders go by'.²

An analysis of trade reports between 1870 and 1913 suggests a partial explanation of the considerable increase in number of firms in the shoddy and mungo manufacturing sector by the simple conclusion that, on balance, the years of prosperity and their periodicity exceeded the years of fierce competition, meagre or non-existent profits, and heavy failures. The underlying and necessary condition of this expansion has, however, been suggested in the preceding chapters. This was the substitution of the very high volume of imports of shoddy and mungo - constituting

1. D.R., 31.12.1910.

2. W.T.W., 31.8.1912, p. 7.

approximately one third in the 1860s and one quarter in the 1870s of estimated domestic ragwool consumption – by the entry of new firms and the expansion of established firms, beginning in the 1870s and quickening in pace after 1880. The effect of this trend towards import substitution was to reduce competition from the specialised shoddy and mungo merchanting sector, hitherto relying for the greater proportion of its material on continental supplies, a movement accelerated by the greater degree of control that domestic manufacturers could exercise over their input costs. Although two German firms, Valckenberg and Schoen of Worms on Rhine and Weinheim and Pollack of Freiburg, were awarded the only silver medals in classes VI-VIII of the raw materials section at the Crystal Palace 'Wool and Woollen Manufacturers Exhibition' in 1881, the importance of German ragwool in the West Riding was on the point of waning until by 1897-1898 3 million lbs. only were imported, falling to just over 600,000 in 1903.¹

To assess the vigour of the West Riding shoddy and mungo industry within the context of the current debate concerning the alleged shortcomings of British entrepreneurship in the period from ca. 1870 is not easy. Few industries of a comparable size were in the unique position of manufacturing a product which not only competed with a superior raw material but also depended solely on the marketing success of a closely related but distinctly separate industry. From the limited documentary evidence available, the performance of individual firms appears to have varied considerably. The experience of the largest firm in the sector, E. Fox and Sons, would not seem representative when compared to the high rates of profit of Fitton and Sons or the

1. T.M., 15.7.1881, Supplement, p. 1; Wool and Textile Fabrics, 3.9.1881, p. 134; Statistik des Deutschen Reichs, op. cit., 1897-99, Band 122; Appendix to this chapter.

efficient utilisation of plant indicated by Day's output figures. There are good reasons to suggest that the controlling partners, Duke and Chaley Fox, were less enterprising than their close rival, John Blackburn senior of Batley Old Mill, who had diversified outside the sector to increase his ownership of heavy woollen mills in Berlin between 1880 and 1885 from one to three, a not unremarkable achievement for one who had been a rag merchant in 1851.¹ Blackburn's example was not unique, the House of Commons being informed in 1895 that an American government representative had 'found shoddy manufacturers from Batley and Dewsbury established in Aachen, Prussia' in a survey of the continental wool textile industry.² On the other hand, the two partners could not be accused of technical complacency in their innovation of 'dry' carbonising plant or the installation of large rag machines - a development which was only to achieve scale economies when modern metallurgical and machine making techniques permitted the design of machines with 1 or 1½ metre wide swifts in the 1950s and 1960s.³ For the sector as a whole, it seems clear that notwithstanding the high rate of failure between 1870 and 1890, the net increase in numbers of firms was marked from the late 1870s as new firms sought to realise profit opportunities missed by their less successful counterparts. An overall assessment of the West Riding recovered wool industry in this period, however, can only be made adequately in terms of its contribution to the competitiveness of the woollen manufacturing branch in domestic and overseas markets which, as the following chapter will suggest, was considerable.

1. W.T.W., 12.4.1913, Supplement, p. xii; J. Willans (1880) op. cit., pp. 16-17; Industries of Yorkshire (1888) op. cit., I, p. 347; Walker and Smith MSS., loc. cit., Sales Ledger no. 2, 6.1.1873-2.5.1876, no. 3 5.6.1876-11.3.1884.

2. W. Page (ed.), Commerce and Industry (1919), p. 353.

3. Information kindly supplied by Mr. S. Shaw, Fred Singleton (Huddersfield) Ltd., 15.5.1975.

CHAPTER IV

VI - Decline and Contraction,

1914-1939.

VI - Decline and contraction, 1914-1939.

The pattern of development in the shoddy and mungo industry between 1914 and 1939 follows a course closely related to the fluctuating and declining level in demand for remanufactured woollen fibres. The war-induced growth in numbers of firms both in the West Riding and the Heavy Woollen District (Tables IV(xxvi) and (xxvii)) reversed the declining trend apparent from ca. 1904 (vii) and ca. 1894 (viii), a trend which then continued, only more sharply so, from 1917. Particularly noticeable in Table IV(xxvi) is the much greater relative decline in the number of mungo manufacturers, a branch of the trade which had contributed considerably to the growth of the sector from 1861 to ca. 1908, falling by 34.5 per cent between 1917 and 1936 compared to 17.5 per cent in the shoddy manufacturing branch.¹ The majority of firms leaving the sector appear to have done so for reasons of insolvency, the number of failures increasing from a low level of approximately one per annum between 1919 and 1924 to a consistently higher incidence after 1925.² The experience of those firms surviving between 1915 and 1936 was patchy in terms of credit standing in the 'commercial lists' - Blackburns' moving down

1. The demand for mungo had contracted to the extent that E. Fox and Sons discontinued their separate 'Mungo Order Book' in March 1919, noting 'from this date all orders are entered in "Shoddy Orders Book"'. In September 1920, all mungo rag pickers were laid off and the department was closed, a number being taken on again in 1921 when the shoddy and mungo departments were amalgamated. The Yorkshire Observer Trade Review noted in 1929 that depressed conditions in the mungo trade since 1921 had left Ossett 'as hard hit as any town in the country'. (7.1.1929, p. 24). E.W.H. MSS., loc. cit., E. Fox and Sons, Wages Book 9.10.1919-16.6.1922; E.F. and S. MSS., loc. cit., Mungo Order Book 24.10.1913-27.3.1919.

2. Other firms left the sector by going into voluntary liquidation, such as the old-established firm of John Jubb and Sons of Phoenix Mills, Batley. At an auction of the firm bidding reached £2,500 only, and the mill and machinery were withdrawn by the vendors. W.T.W., 18.7.1925, p. 3.

TABLE IV (xxvi)

Classified shoddy and mungo manufacturers and rag
pullers in the West Riding, 1912-1936.

	1912	1917	1927	1936
Shoddy manufacturers	34 (4)	40 (5)	33 (2)	33 (2)
Mungo manufacturers	48	55	47	36
Rag pullers	7	9	7	7
Total classified firms	85	99	85	74

Source: Trade directories, op. cit.

Note: The figures in parenthesis indicate the number of mungo manufacturers who also produced shoddy and who are included in the former category; the figures for the total number of firms have been adjusted to show this.

TABLE IV (xxvii)

Shoddy and Mungo manufacturers and rag grinders/pullers
in the West Riding Heavy Woollen District

1912-1936.

	1912	1917	1927	1936
Batley	14	14	9	7
Dewsbury	20	20	18	18
Heckmondwike	3	3	3	-
Ossett	30	32	25	16
	<hr/> 67	<hr/> 69	<hr/> 55	<hr/> 41
Leeds	6	5	2	2
Morley	2	2	2	2
Huddersfield	10	10	12	15

Source: Trade directories, op. cit.

a classification from 'undoubted standing' to merely 'good', whilst others, such as the Extract Wool and Merino Co. Ltd., and smaller companies such as Henry Day and Sons, succeeded in maintaining their 'highest standing' and 'undoubted standing' classifications established in 1915.¹

There is little doubt that the numerous failures amongst woollen manufacturers commencing in 1922 began to exact severe losses on many firms in the shoddy and mungo manufacturing sector, the gazette lists of creditors including many rag merchants, shoddy manufacturers, and the principal rag auctioneering firms.² The spectacular failure in 1921 of Fenton Textiles Ltd. of Batley, a group comprising two mills and a colliery and built up by the controversial local entrepreneur Harry Fenton, disclosed total liabilities of £1,128,399 with many local firms in the list of unsecured creditors for large amounts - for example, Wildsmith Carter and Co. Ltd. with claims totalling £12,079.³ Failures outside the West Riding also contributed to the pressure on Heavy Woollen District ragwool manufacturers, Blackburn's being unsecured creditors in the bankruptcy of a London firm of mantle manufacturers in 1924 and a Leicester woollen yarn merchant in 1930.⁴ The extent of bank participation in providing secured and partly-secured circulating capital in the 1920s is evident, ranging from about £600 in the bankruptcy of Smith and Taylor of Golcar in 1926, to £8,100 in 1925

1. Seyd and Co., The Yorkshire (Woollen District) Commercial List (1915-1916, 1936).

2. Woollen Gazette, 1.8.1922. For example, the voluntary liquidation of woollen manufacturers James Banks and Sons of Pudsey in 1928, a large customer of mungos produced by Henry Day and Sons, paid a first and second dividend of 7^s/9^d leaving £1,334 to be written off, mitigated to some extent by Day's being allowed raw materials by the liquidator. H.D. MSS., loc. cit., Sales Ledger 1.10.1906-20.9.1936.

3. Perry's Gazette, XCIV, 3.6.1921; Woollen Gazette, 4.12.1923. This bankruptcy features in the novel Shoddy Kingdom (1955) by Derrick Boothroyd.

4. Woollen Gazette, 10.6.1924, 7.10.1930.

for Charles Lumb of Savile Town, Dewsbury, and £10,324 for the firm of William Parker of Staincliffe in 1928.¹

Although it was still possible to enter the sector with modest capital resources in 1914 - Arthur Healey of Wheatcroft Mills, Batley for example, began operating four rag machines with fixed capital/stock insurance cover of £250 and £150 - the rapid growth in profitability during the war years inevitably inflated both fixed capital and stock values.² Typical of the larger firms, the 1918 valuation of Jessop Brothers indicated fixed capital of £11,830 and stock £10,905 and that of Frank Townend and Sons of Carlinghow a fixed capital/stock valuation of £8,170 and £15,870.³ The exceptionally profitable trading conditions of 1918-1919 and the enhanced value of all textile plant led the companies in the Extract Wool and Merino group to revalue upwards their fixed assets in line with an increase in capital and the issue of bonus shares (Table IV(xxviii)).⁴ The insurance valuations indicate that most firms wrote down both fixed assets and stock after 1921 and, again, in the period 1930-33. The extent of the depreciation of capital for the five companies in the Extract Wool Holdings group in 1933 is indicated at the foot of Table IV(xxviii), when large write-offs were necessary because of a reduction in capital of the holding company. Insurance information available for the late 1930s suggests that both fixed assets and stock cover was again being revalued by most firms to levels approaching those in the pre-1919 period.⁵

1. *ibid.*, 27.10.1925, 6.7.1926, 27.3.1928.

2. J.F.T.S. MSS., *loc. cit.*, Policies 1912-1919.

3. *ibid.* In 1919, Wildsmith Carter and Co. took on limited liability with nominal capital of £100,000, and in 1920 Henry Day and Sons moved into their own mill at Savile Bridge Dewsbury, constructed at a cost of £9,139 and with an enlarged capacity of six rag machines. WT.W., 25.10.1919; H.D. MSS., *loc. cit.*, Savile Bridge Mills construction file, 30.9.1920.

4. It is interesting to note that the insurance valuation on Jessop Bros' fixed assets in 1918 was approximately 36 per cent higher than the pre-revaluation amount shown in the holding company's books in 1918. J.F.T.S. MSS., *loc. cit.*, Policies 1912-1919.

5. *ibid.*, Policies 1924-1938.

TABLE IV(xxviii)

Valuation of fixed assets of the Extract Wool andMerino Co. Ltd., 1919 and 1933.

	Fitton&Sons Ltd. £	G.Hirst & Son £	Jessop Bros £	Lee, Nephew & Sons £	Eli Townend Ltd. £
1919					
(a) Buildings & Motive Plant	7,467	11,360	6,705	5,234	8,726
(b) Plant & Machinery	2,698	3,031	1,966	1,615	1,803
Fixed assets prior to revaluation	10,165	14,391	8,671	6,849	10,529
(a) Revaluation	8,338	13,852	8,975	10,542	13,455
(b) Revaluation	13,368	20,991	11,438	8,191	12,125
Total Fixed assets	21,706	34,843	20,413	18,733	25,580
1919 Profits as a percent- age of above	147.2%	114.3%	71.2%	23.3%	81.6%
1933					
(a) Revaluation	713	3,635	713	796	722
(b) Revaluation	1,887	2,587	2,652	1,626	781
Total fixed assets	2,600	6,222	3,365	2,492	1,503

Source: E.W.H. MSS., loc. cit., Miscellaneous documents.

Rag-pulling capacity, measured in terms of the number of rag machines employed in the United Kingdom ragwool industry, clearly reveals the extent of the contraction after the First World War. This fell from 1,289 machines in 1918 to 835 in 1924, and although the latter figure overstates the rate of decline because the production census enumerated only those machines operated by larger firms, the overall decline in the 20 year period to 879 rag machines in 1938 indicates a reduction of nearly 32 per cent.¹ Against this, however, was the increasing phasing out of the old 14 inch machine and replacement by 18 inch machines.²

Although output hovered around the 1907 levels between 1913 to ca. 1916-1917, the growing problems of rag supplies in the final stages of the war undoubtedly explains the decline in total production, whilst the high level of rag prices and a marked shift of domestic consumer preference to virgin wool goods in 1919 and 1920 contributed further to the falling demand for ragwool.³ The extent of the contraction in gross output in the period 1920-1937 is apparent from Table IV(xxix), the years between 1921-22 and 1926-32 experiencing output levels comparable to the early growth phase of the industry in the 1870s. Not revealed by these figures of gross output was the decline in the actual market share produced by the shoddy and mungo manufacturing sector, which fell disproportionately compared to that of the vertically-integrated woollen mills. The proportion of gross output attributed to the

1. 1918 - Bradford Chamber of Commerce (1917-1919) op. cit., p. 82; 1924 - Final Report of the Third Census of Production of the United Kingdom, 1924, p. 106; 1938 - Board of Trade Working Party Report, Wool Working Party (H.M.S.O., 1947), p. 219.

2. Batley and its Manufacturers, Official handbook of the Corporation (ca. 1920), p.58.

3. v. infra, p.515.

TABLE IV (xxix)

<u>Estimated total United Kingdom production of shoddy,</u>					
<u>mungo, and extract wool, 1914-1939 (000s lbs.)</u>					
Year	(a)	(b)		(b) as a percentage of (a)	
	Production	Value(000s £)	Exports		
1914	192,411	6,414	8,668	279	4.5
5	201,099	9,133	4,769	193	2.4
6	213,231	12,350	6,369	362	3.0
7)			3,815	248)	
8)	138,735	11,792	149	13)	3.2
9)			9,454	948)	
1920	115,550	14,973	8,868	956	7.7
1	53,550	1,785	3,022	136	5.6
2	68,908	1,981	8,870	327	12.9
3	139,131	3,768	10,165	471	7.3
4	165,311	9,023	13,714	802	8.3
5	120,584	4,874	9,831	560	8.1
6	94,541	2,718	6,342	272	6.7
7	78,119	2,181	7,419	312	9.5
8	110,000	3,575	7,132	326	6.5
9	100,950	3,786	6,813	309	6.7
1930	90,617	2,416	4,161	168	4.6
1	98,000	2,368	3,005	76	3.1
2	99,000	2,640	4,408	108	4.5
3	117,773	2,993	9,849	223	8.4
4	120,258	3,107	11,927	351	9.9
5	119,869	3,197	9,239	272	7.7
6	117,000	3,023	9,043	321	7.7
7	135,833	4,528	8,755	401	6.4
8	134,101	4,279	4,110	169	3.1
1939	139,895	4,106	4,895	208	3.5

Source: Column (a), Table III-I(f), Appendix, Chapter III. Values calculated from shoddy and mungo price series, Appendix, Chapter V; 1914-1919, shoddy weighted 2, mungo 1, 1920-1939, shoddy weighted 3, mungo 1.

Column (b) Annual Statements of the Trade of the United Kingdom.

recovered wool sector of 57.5 and 62.4 per cent in 1907/1912, declined to 47 and 49.4 per cent in 1924 and 1930, suggesting that woollen manufacturers were substituting their own rag-pulling capacity at the expense of the recovered wool sector.¹ Indeed, in 1928 the Wool Record noted that the West Riding shoddy and mungo industry was operating at half its capacity of approximately 2,000 tons of rags a week established in the First World War, and the Fourth Census of Production in 1930 estimated a decline of nearly 42 per cent in the quantity of ragwool produced by firms with over ten employees since 1924.² From 1933 to 1935 the ragwool sector began to increase its proportion of gross output (sales plus commission grinding) to 49.6, 51.2 and 53.2 per cent, dropping slightly to 48.6 per cent in 1937.³

Little relief was provided by the export market as either tariffs or, more importantly, overseas rag-pulling capacity increased substantially during and after the War. This marked shift in the position of the United Kingdom as a major consumer of rags and shoddies and referred to in the previous chapter is illustrated by Table IV(xxx). The effect of this shift, and the implications of it on the West Riding woollen industry, and indirectly on the shoddy and mungo sector, is clear - the world market for low and medium quality woollen yarns and tissues previously open to and exploited by the West Riding was being progressively closed as overseas manufacturers of low woollen goods increasingly substituted for imports. Cole, for example, noted in

1. The proportion for 1924 has been calculated from the larger firms enumerated as producing 116,363,000 lbs., contributing some 71.7 per cent of total output. Of the 835 rag machines operated by these firms, 143 or 17.1 per cent were 'idle'. The proportions for 1930 relate to those firms with more than 10 employees and producing 91 per cent of total output. Third Census of Production, 1924, op. cit., p. 106; Fourth Census of Production, 1930, op. cit., p. 79.

2. W.R., 26.1.1928; Fourth Census of Production, 1930, op. cit., p. 79.

3. Fifth Census of Production, Final Report, 1935, op. cit., pp.66-72; Final Report on the Census of Production for 1948, op; cit., pp. 6-12.

TABLE IV(xxx)

Estimated total weight of recovered wool-fibre content
in British and foreign rags exported by the United
Kingdom, 1913 and 1920-1929 (000s cwt).

Year	Germany	Netherlands	Belgium	France	Czecho- slovakia	U.S.A.
1913	57.9	8.4	13.2	25.1	-	-
1920	15.9	13.1	11.8	17.0	-	14.0
1921-3	27.0	4.0	3.5	4.5	-	38.1
1924	58.9	5.2	4.7	6.8	-	97.1
1925-7	62.2	5.3	6.7	8.4	3.8	136.5
1928	72.5	10.1	10.8	20.9	6.9	146.2
1929	73.8	6.0	9.6	14.1	10.7	108.6

Source: G.H. Wood, loc. cit., p. 509.

Note: Wood assumed a fibre reclamation rate of 90 per cent.

1925 that the horizontally integrated 'shoddy factory' sector in the United States had become 'larger than ever before', stimulated by high tariffs on new wool and shoddy and low tariffs on rags, effectively reversing differential price movements in world markets for these raw materials.¹ The increase in output of this sector in the U.S.A. of 248 per cent between 1921 and 1925 represented, to a large extent, a potential market loss to the West Riding ragwool industry (Table IV(xxxi)).

TABLE IV(xxxi)

Number of 'shoddy factories' and output in the U.S.A.,
1921-1925.

Date	Number of factories	Output (lbs.)
1921	53	27.000.000
1923	59	55.000.000
1925	67	67.000.000

Source: W.T.W., 16.1.1926, p.2.

The proportion of exported shoddy and mungo manufactured by the recovered wool sector in the United Kingdom fell from approximately 15 per cent of net output in 1924 to 8 per cent in 1930, rising slightly to between 15 and 19 per cent in 1933-35, and then falling

1. A.H. Cole (1926), op. cit., II, p. 205. A similar situation applied in Germany from ca. 1928. Imperial Economic Committee (1936), op. cit., p. 274.

to approximately 12 per cent in 1937.¹ As a trade reviewer noted in 1938, the major proportion of these exports were in special classes of shoddy and mungo prepared for overseas buyers and not used in the West Riding.²

For those firms surviving between the wars, the impact of declining demand for shoddy and mungo forced a prolonged period of under-utilisation of plant and machinery as output was curtailed, until, in 1933-34, activity in the Heavy Woollen District began to stage a recovery (Table IV(xxxii)). Typical commission pulling charges per pack, which had risen to between 9^s/- and 11^s/- for soft rags and £1 to £2 for mungo rags in 1918, fell to 15^s/- and 17^s/6^d in 1921 and to 12^s/6^d and 15^s/- in 1923, at which level they remained until ca. 1936.³

TABLE IV (xxxii)

Gross output and output per rag machine of
H.D. Day and Sons, 1914-1936 (lbs.).

Year	Gross output	Output per machine	Year	Gross output	Output per machine
1914	1,809,840	452,460	1926	1,093,920	182,320
5	1,715,280	428,820	7	1,096,800	182,800
6	1,525,920	381,480	8	1,062,000	177,000
7	1,479,120	369,780	9	908,160	151,360
8	1,453,440	363,360	1930	1,030,800	171,800
9	1,102,080	275,520	1	926,160	154,360
1920	994,080	248,520	2	773,040	128,840
1	408,000	68,000	3	894,960	149,160
2	529,440	88,240	4	1,125,440	187,573
3	795,600	132,600	5	1,069,440	178,240
4	1,118,400	186,400	1936	1,318,080	218,680
5	962,640	160,440			

Source: H.D. MSS., loc. cit., Ledger 1.10.1893-31.5.1937

Note: 1914-1920, four rag machines, 1921-1937, six rag machines.

1. Calculated from the Censuses of Production for 1930, 1935, and 1948, op. cit.

2. Yorkshire Observer Trade Review, 24.1.1938, p. 24.

3. H.D. MSS., loc. cit., Ledger 1.10.1893-31.5.1937.

Profitability in the West Riding sector varied, as indicated by Table IV(xxxiii) showing the figures for the five firms in the Extract Wool and Merino group between 1916 and 1933. With the exception of one firm, all moved into loss in the slump of 1920/21, and all suffered varying losses in 1931. Whilst it could be suggested that the experience of firms in this group was not necessarily representative of the majority of firms in the sector, it should be noted that each company enjoyed considerable autonomy, and in several cases were managed by the original owners or their descendents. Indeed, the singular absence of direct control by the holding company (the nominal head office was maintained at a Dewsbury firm of solicitors) provoked a strong intra-boardroom controversy in 1949, details of which clearly indicate the lack of co-ordination amongst member firms in the group.¹ However, the short series for Eli Townend and Co. Ltd. does indicate that in the period 1917 to 1920 rising rag prices provided an opportunity to increase profit margins (Table IV(xxxiv)).² From the evidence suggested by firms within this group, there would seem little reason to doubt that the return on assets increased markedly during the First World War for the majority of firms in the sector, providing some substance to the observation by the American Consul in Leeds in 1919 that the rag and shoddy industry was one of 'the most lucrative' in the country.³

1. E.W.H. MSS., loc. cit., letters from George W. Hirst to shareholders of the E.W. and M.Co. Ltd., dated 2.8.1949, 5.8.1949, 20.8.1949, and letter to board of directors 9.7.1949. In his letter of August 5th to shareholders, Hirst pointed out that 'each branch of the E.W. and M. Co. Ltd. is managed as a completely separate unit by a Director - manager or a Manager'.

2. This can be compared to an average profit on sales for the eight West Riding woollen tweed manufacturers investigated by the sub-committee on Profiteering in 1920; 'prewar' 10.1 per cent, 'postwar' 19.7 per cent. The firms claimed that the figures for pre-war profits represented 'lean years' and that 12.5 per cent was nearer the industry norm. Profiteering Act - Findings of the Wool, Tops, and Yarns sub-committee, P.P. 1920 (Cmd. 858), XXIII, 661.

3. v. supra, p. 43. An indication of the past profitability of this sector is suggested by the estate of shoddy manufacturer Fred Lyles of G. Lyles and Sons Ltd. who died in 1937, aged 82, leaving assets valued for probate of £128,598. W.T.W. 31.7.1937, p. 16.

TABLE IV(xxxiii)

Extract Wool and Merino Co. Ltd. - schedule of
Profits and Losses 1916-1933 and dividends paid
on Ordinary shares 1913-1935 (£).

Year	(a) Fitton & Sons	(b) George Hirst & Son	(c) Jessop Bros	(d) Lee, Nephew & Sons	(e) Eli Townend & Co.Ltd.	(f) E.W. and M. Co. Ltd., ordinary dividend - %Nom.. Capital £260,000
1913	N/A	N/A	N/A	N/A	N/A	7½
4	"	"	"	"	"	"
5	"	"	"	"	"	" + 10 ^s /-
6	19,118	22,218	8,907	11,114	11,155	10 + 10 ^s /-
7	20,632	29,441	9,267	5,973	9,941	20
8	28,231	34,139	14,681	14,084	17,065	15
9	31,954	39,835	14,541	4,366	20,869	15
1920	29,697	67,233	23,328	13,723	28,607	16½
1	(-)8,427	10,279	(-)7,713	(-)19,709	(-)10,858	10
2	979	(-)293	(-)2,395	(-)2,360	(-)2,901	NIL
3	1,366	2,028	160	1,095	3,468	"
4	(-)454	(-)176	2,868	2,903	3,173	5
5	9,030	10,035	2,990	3,898	4,979	10
6	5,434	1,218	663	(-) 1,287	(-)1,263	2½
7	2,468	(-)701	(-)132	370	(-)2,843	"
8	917	3,005	1,928	3,403	1,789	"
9	1,085	2,573	(-)1,375	1,875	1,291	"
1930	1,975	2,027	(-)1,792	(-)2,640	(-)2,705	NIL
1	(-)2,564	(-)1,841	(-)3,789	(-)5,873	(-)5,306	"
2	2,705	3,631	949	340	(-)1,521	5
3	1,124	432	(-)786	(-)302	(-)1,529	NIL
4	N/A	N/A	N/A	N/A	N/A	5
1935	"	"	"	"	"	7½

Note: Losses = (-)

Source: Columns (a) - (e) E.W.H. MSS., loc. cit., miscellaneous documents.

Column (f) 1913-1920, Wool Year Book (1921), op. cit., p. 535.

1921-1935, Seyd and Co. (1936) op. cit.

TABLE IV(xxxiv)

Sales, and net profit as a percentage of sales,Eli Townend and Co. Ltd., 1916-1927.

Year	Sales (£)	Net profit as % of sales	Year	Sales (£)	Net profit as % of sales
1916	82,029	13.6	1922	19,572	Loss
7	93,741	10.6	3	33,366	10.4
8	146,126	11.6	4	34,785	9.1
9	182,360	11.4	5	53,021	9.4
1920	216,218	13.2	6	40,397	Loss
1	86,583	Loss	1927	36,947	Loss

Source: E.W.H. MSS., loc. cit., Eli Townend and Co. Ltd., Nominal Ledger no. 2, 1.4.1915-31.3.1927.

The severity of the contraction borne by the shoddy and mungo industry in the period 1920-1939 can best be seen in terms of its interstitial position as an industry in relation to the suppliers of primary textile raw materials and the demand for these from the woollen manufacturing sector. Two major and historically unprecedented changes confronted it in the inter-war period. The first of these was the structural adjustment undergone by the United Kingdom woollen textile branch to meet the loss of traditional export markets, high tariff barriers, and foreign competition in low priced woollen goods together with fluctuating demand in the domestic market.¹ Secondly, the secular decline in wool prices and an increase in supply of both foreign and domestic wools from 1923 seriously undermined the historic price relationship between virgin and recovered wool, as conversion costs became uneconomic, stimulating a growing substitution of wool for shoddy.² In addition to these two structural changes affecting the

1. v. infra Chapter V.

2. W.T.W., 13.1.1923, p. 15, 12.1.1924, p. 17.

shoddy and mungo sector, the manufacturer of ragwool found himself squeezed between the maximum price at which he could market his output and the export-induced price rise of woollen rags as the initiative determining price-formation at the Dewsbury auctions progressively passed to European and American buyers. Trade reports of the late 1920s and early 1930s confirm the difficulties in which manufacturers of ragwool found themselves, an observation typical of these noting in 1931 that

'No section of textiles was hit harder in the past year than shoddies and mungos ...'¹

Even when activity in the Heavy Woollen District began to increase together with an advance in wool prices in 1933-34, complaints were voiced that woollen manufacturers were attempting to resist price rises of shoddy and mungo necessitated by enhanced rag values.²

The final years of the 1930s did bring some consolation, a trade report of 1936 commenting that

'... shoddy manufacturers were working to capacity to execute orders not only for the home market but; also for overseas markets that had been closed to them in recent years'.³

In common with other indicators of the national economy, however, there is evidence to suggest that the downturn in both domestic and overseas markets again experienced by this sector from the final quarter of 1937 may have worsened but for the influence of large orders for khaki and blankets from government buyers in the summer of 1939.⁴

Thus, in conclusion, it is clear that whilst the years of diminished profitability between 1920 and 1939 forced the departure of some of the more inefficient firms from the recovered wool sector, the major reasons explaining the exit of firms were to be found in the changing pattern of demand in domestic and overseas markets for West Riding woollen goods and the sustained erosion of price differentials between recovered and virgin wool.

1. Yorkshire Observer Trade Review, 5.1.1931, p. 22.
2. W.T.W., 29.9.1933.
3. Yorkshire Observer Trade Review, 25.1.1937, p. 26.
4. ibid., 24.1.1938, p.24, 23.1.1939, p.24; Yorkshire Post Trade Review, 26.1.1939, p.19; W.T.W., 17.6.1939.

CHAPTER V

The Contribution of Recovered Wool to
the Growth and Development of the
West Riding woollen industry,
ca. 1813-1939.

Introduction.

The aim of the following discussion will be to assess the importance of recovered wool as a major supplementary raw material to the West Riding woollen industry in the three sub-periods ca. 1813-1870, 1870-1914, and 1914-1939. Central to this discussion is the changing pattern and distribution of demand for low woollen textiles in domestic and overseas markets and the response to these variables by West Riding manufacturers in their utilisation of the considerable cost-reducing properties of recovered wool. It is not intended however, to provide a general overview of the industrial development of the Yorkshire woollen cloth industry in the period to 1939, for whilst a number of studies have and are being made an account of this nature is outside the scope of the present study.¹

The chapter is divided into four sections. The first outlines the methods used in the construction of the long-run shoddy and mungo price series from primary sources, and a brief note on the five and nine year moving averages, index numbers, and price relatives of the recovered wool and the five other components of the series - U.S. Uplands Cotton, Lincoln halfhog, Port Philip, Dorset Down, Laid Cheviot, and Laid Highland wool. All are reproduced in computer print-out form as Appendices I to IV at the end of the text. The second section describes the method adopted to deflate the actual weight of wool retained annually in the United Kingdom in order to estimate the clean (i.e., scoured) weight of wool prior to the initial manufacturing

1. See, R.M. Hartwell (1955), op. cit.; E.M. Sigsworth (1958) op. cit., Chapters I-III; F.J. Glover (1959) op. cit., I, Chapters I-III; K.G. Ponting, The Wool Trade (1961), pp. 140-178; E.M. Sigsworth and J. Blackman (1968) loc. cit., pp. 128-157; and a forthcoming study by D.T. Jenkins and K.G. Ponting to be published in 1979.

processes and the reason why this calculation has been attempted.

The third section outlines briefly the way in which shoddy and mungo was used when blended with wool in the manufacture of woollen cloth and also provides an account of the significant technological developments that assisted in this. The final section then considers the contribution of recovered wool to the West Riding low woollen industry between ca. 1813 and 1939.

CHAPTER V

- I - Construction of the shoddy and mungo
price series and notes on the cotton and wool series.

I - Construction of the shoddy and mungo price series, 1828-1939.

Unlike wool, cotton, and other textile raw materials, the market in remanufactured wools was one in which price formation was primarily determined by private contractual agreement between merchant or producer on the one hand, and consumers of shoddy and mungo on the other. The absence of a formalised market with published prices does not imply, however, that imperfections in knowledge of shoddy and mungo prices existed to more than an insignificant extent. As the purchase records of woollen manufacturers and the sales ledgers of shoddy merchants and manufacturers indicate, each side of the market knew the maximum prices of any particular class and had no hesitation in switching to a new supplier if prices or quality moved out of line.¹ Although price information was available during the period ca. 1850-1880 owing to the large quantities of continental ragwool, especially mungo, being cleared through the various Dewsbury rag auction firms, no published series or primary material appears to have survived. For a number of reasons noted previously in the text, export valuations cannot be used with confidence until 1904 (with the exception of the period 1860-1870) when shoddy and mungo exports were enumerated separately from other textile fibres. In any case, the greater proportion of exports appear to have been produced for specific markets, and as continental users preferred 'dry' shoddy and mungo (i.e., pulled with water and not oil) the values would not appear to be representative of the qualities used in the West Riding woollen cloth sector. The following price series has therefore been constructed from primary sources, and, with the qualifications

1. v. supra p.313.

discussed below, is intended to provide data supplementary to existing published material on textile raw material prices.¹

1828-1860 (a) Shoddy price series.

The first primary information on the price of shoddy is contained in the 'Waste Book' of Thomas Taylor and Sons of Batley for the years 1834-6 and 1838. The prices here selected are those of 'ground stockings' and are consistent with prices quoted by Nussey to the Select Committee (1828) and Fenton (1830) for the more common classes of shoddy.² Because data are scarce for most of the 1830s, the series relies on scattered price evidence of woollen rags interpolated with values based on the percentage fluctuations of South Down wool (Table V(i-a)).³ With the exception of 1834-5, when the two qualities of shoddy in Taylor's books indicate a price $3/4^d$ less than the estimated values, the fluctuations appear consistent with those years for which data exist. The range of shoddy prices which appear in 1838 in Taylor's records compare very closely

1. Both Philpott (1953, op. cit., p. 63) and Rainnie (1965, op. cit., p. 21) have noted the absence of rag price and shoddy data. In their estimate of the total value of raw materials consumed by the domestic wool textile industry, Deane and Cole met this problem by using Jubb's average value for the period prior to 1854 and the mean import values subsequently. The former almost certainly overstates the value of recovered wool used in this early period, but as the quantity consumed was not large, the error factor is relatively insignificant. As import valuations aggregated woollen rags with shoddy and mungo their figures from 1854 understate the value of recovered wool, a comparison of the import valuations with the mean price in the index between 1870 and 1900 suggesting that the understatement was approximately 50 per cent. Thus in their estimates, the value of all wool raw materials consumed between ca. 1855 and 1900 would appear to be about 3 to 5 per cent less than the values shown in the index here would indicate. P. Deane and W.A. Cole, op. cit., pp. 196-97.

2. Select Committee P.P. 1828 (515), VIII, 699. The lowest price has been chosen in the range $2\frac{1}{2}^d$ - $9\frac{1}{2}^d$ lb. furnished by Nussey as being representative of the larger proportion used. F. Fenton, T.M., 15.7.1881, p. 252.

3. From evidence given to the 1828 Select Committee there appears to have been a high degree of substitutability between coarse South Down wool and shoddy. This also applied to Scotch Blackface wool, to which shoddy was a complementary fibre in certain types of low woollen cloth. J. Bischoff (1842) op. cit., II, pp. 147, 153, 155, 180.

TABLE V(i-a)

Price of South Down wool, 1820-1860 (pence (d.)
per lb.).

Year	Price	Year	Price	Year	Price	Year	Price
1820	17-18	1830	10-12	1840	15	1850	11 $\frac{3}{4}$
1	15-18	1	13-14	1	12-13 $\frac{1}{2}$	1	12 $\frac{1}{2}$
2	15-18	2	12	2	11 $\frac{1}{2}$ -12	2	12-12 $\frac{1}{2}$
3	15 $\frac{1}{2}$ -18	3	15-16	3	11 $\frac{1}{4}$	3	15-15 $\frac{1}{2}$
4	14-18	4	19	4	12 $\frac{3}{4}$ -14	4	17-17 $\frac{1}{2}$
5	12-16	5	18	5	13 $\frac{1}{2}$ -16	5	12 $\frac{1}{2}$ -13
6	10-12	6	20	6	13	6	15
7	9-10	7	15-16	7	12 $\frac{1}{2}$	7	18 $\frac{1}{2}$
8	8-9	8	16	8	11 $\frac{1}{2}$	8	14 $\frac{1}{2}$
9	6-8	9	16	9	11	9	18-18 $\frac{1}{2}$
						1860	18 $\frac{1}{2}$

Source: 1820-1850, R.M. Hartwell (1955)op. cit., p. 107.

1851-1860, A. Hamilton, 'On Wool Supply', J.R.S.S., XXXIII, 1870, pp. 517-19.

with those given by Nussey ten years before, the commoner types of shoddy selling at between 2^d and 4^d per lb., whilst Taylor was buying the highest class, 'stockings shoddy', at just over 9½^d lb.¹

Between 1839 and 1848, when price information from Day's records can be used, the series is an extrapolation of the last price in 1838 based on percentage fluctuations in the price of South Down wool; the final extrapolated value of 2¾^d in 1847 coinciding with Day's price of 2¾^d for pulled black stockings in 1848.² Between 1848 and 1855 the main component of the price series is the mean value of black and blue stockings, the values for 1856-58 again being extrapolated from percentage changes in the price of South Down wool, whereas those for 1859 and 1860 are for black stockings used by Taylor in various blends.³ In this series, and its continuation in the period from 1861 below, the inclusion of black stockings or 'black Berlins' has been attempted wherever possible as this class was perhaps the most consistently used of all shoddies in the nineteenth and early twentieth centuries.

(b) Mungo price series

Taylor commenced using mungo in his cloth in 1838, two years after Parr had successfully innovated it, and it is clear from his records that he bought both pulled mungo and sorted and seamed cloth rags from a number of rag merchants, having the latter ground by one of the local commission grinders. Only two prices

1. J.T. and J.T. MSS., loc. cit., Blend book 1835-1843.

2. H.D. MSS., loc. cit., Purchase and Sales Ledger 19.1.1848-30.1.1864.

3. J.T. and J.T. MSS., loc. cit., Blend book 1857-1866.

appear in 1838, for sorted and seamed 'drab rags' and 'skirtings', and these have been adjusted for the cost of pulling, amounting to approximately $\frac{1}{2}^d$ lb. - the first price in the mungo series of $3\frac{1}{4}^d$ then being extrapolated until 1843, when the values of various grey mungos appear in a blend book.¹ The extrapolated value of 1842 of $2\frac{1}{4}^d$ agrees closely with the mean value of 2^d for the three mungos recorded in 1843. From 1848, Taylor's data are amalgamated with those of Day, the mungo price series until 1860 being the mean value of between five and ten types including 'new grey', black, brown, and drab.²

Clearly, it would be difficult to suggest that the series from 1828 to 1848 is representative, being based on a small number of observations from one source and extrapolations of these from price movements in SouthDown wool. However, the ragwool values so obtained compare very closely with those of the laid Highland or blackface wool during this period, with the exception of the years 1835-36 and 1846, and, assuming Nussey's comments of 1828 on the substitutability between the two still applied, it would appear that the constructed price series reflects actual values and price movements of the more commonly used classes of shoddy and mungo with an acceptable degree of accuracy. A comparison of the series constructed here for 1858-9, for example, indicates that Jubb's 'average' values for those years of 4^d for shoddy and 6^d for mungo bear a very close resemblance to the values calculated from the primary sources of 3.875^d and 5.88^d respectively.³

1. J.T. & J.T. MSS., loc. cit., Blend and finishing book 7.1.1839-16.6.1858. Taylor paid 6^s/- per pack (240 lbs.) for grinding.

2. H.D. MSS., loc. cit., Purchase and sales ledgers, 1852-1855, 1853-1863.

3. S. Jubb (1860) op. cit., p. 22; Appendix V-I, mean 1858-9.

1861-1913 Both series

From 1864, when Day's records finish, the purchase ledgers of G. and J. Stubley, woollen manufacturers of Batley, yield detailed price information for a number of shoddies and for a wide variety of mungos, blend books from Taylor's and scattered values from Coates' auction valuations supplementing and continuing from those of Stubley from 1872 to 1880. The shoddy price series is weighted by the inclusion of black stockings with the addition of other colours, reflecting to some extent changes in demand and supply in response to past and current fashion preferences, the computed value comprising an average of one to two classes in addition to black. Both Stubley and Taylor used considerable quantities of grey mungo consistently in this 20 year period and the mungo price series largely reflects movements in these together with between four to eight other colours, such as black, new black, blue, brown, and claret - again, the additional colours reflecting qualitative changes in demand and supply.¹

Between 1881 and 1890 both series rely on the types and colours purchased by G. and J. Stubley, the shoddy series containing between three to four classes including new white flannels, light steel, brown, green, and grey stockings, and that for mungo between six and seven different colours such as bronze yellow and white cheviot, but being weighted by new light grey, old grey, and black.

From 1890 to 1913 the records of John Lockwood and Sons (woollen manufacturers) Golcar (to 1895), E. Fox and Sons, Dewsbury (1896-1904),

1. J.T. and J.T. MSS., loc. cit., Blend books 1857-1866, 1871-1877, 1872-1878; Valuation books of William Coates, loc. cit., A to F, 1875-1880; G. and J.S. MSS., loc. cit., Receiving Day Books 1.7.1864-31.7.1871, Stock Book 1873-1892, Wool Book 30.5.1880-29.9.1890 and 6.4.1880-11.8.1883, Mill Book 12.2.1876-28.2.1879, and Blend books 1870-1874.

W. and E. Crowther (woollen manufacturers) Slaithwaite (1900-1939), and Eli Townend and Co. (1905-1932) have been used - approximately eight classes including black and white flannels in the shoddy series, and from three to four classes in the mungo price series.¹ Particularly noticeable from these records is the decline in the variety of mungos being purchased and sold in this period.

1914-1939

Much price information for this last period is available and both price series use data from three shoddy and mungo manufacturers - Eli Townend and Co., Henry Day and Sons Ltd., and Crabtree and Co. - and one firm of woollen manufacturers, W. and E. Crowther of Slaithwaite. Each series reflects the large-scale use of khaki in the 1914-18 period and comprises approximately ten classes of shoddy and mungo including black, blue, white, and steel grey shoddies, and black (fast and superfine), green, blue, and 'P.O. grey' mungos.²

The intention of the constructed price series is to reflect, as closely as the surviving material permits, the trend and amplitude of price movements of those classes of shoddy and mungo most commonly used by West Riding woollen manufacturers during the period covered by this study, and to omit those qualities - typically the more expensive - for which a much narrower market existed. This would not be to ignore that marked price variations did occur between different classes and, indeed, within certain classes of recovered wool. G. and J. Stubley,

1. John Lockwood & Sons, MSS., loc. cit., Bought Day Book 3.11.1890-31.12.1895; E.F. and S. MSS., loc. cit., Sold Day Book 'Shoddy' 1896-1902, Sold Day Book 'Mungo' 1899-1906; Kirklees Libraries and Museums Service, Huddersfield, W. and E. Crowther Ltd., B/WEC, Lot Books 1.1.1900 et seq.; E.W.H. MSS., loc. cit., Eli Townend and Co. Ltd., Sales Ledgers, 15.4.1905-21.1.1933.

2. H.D. MSS., loc. cit., Sales ledgers 1.10.1906-25.8.1949; University of York (temporary location), Crabtree and Co. MSS., Sold Day Books 1.1.1932-30.10.1943.

for instance, were buying 'new light grey' mungo at 7^d lb. as well as very small quantities of 'super new light grey' mungo at 15^d lb. in 1866. In 1868, a year in which most wool prices had fallen to their lowest levels since 1860, the prices of the two qualities were 6³/₄^d and 12³/₄^d lb., but by 1876 the price differential had widened to 4^d and 14^d lb. respectively.¹ Very commonly, the more colourful varieties of shoddy, and particularly mungo, tended to cost from twice to three times the value of the much-used standard qualities in drab, black, dark blue, and grey - examples of the former were 'super claret' and 'army red' mungo at 8^d and 10^d lb. in 1865, prices comparable only to the finest white stockings or new light grey mungo from unused tailor's clippings. Thus, at the upper limits of the price range, material pulled from fine cloth in pure, bright, colours, approached the 'premium' values of high quality shoddy and mungo in white or very light colours which could be piece-dyed. From the early 1880s these wide differentials appear to have begun to narrow, partly because declining wool prices were exerting pressure on all classes of recovered wool and partly because past fashion and colour preferences had altered the supply position. New colours emerging in the 1880s included 'new' and 'light steel' cheviot qualities, shades of pale blue, and a wide range of yellow, red, green, olive, and brown varieties typically selling from 4¹/₂^d to 8^d per lb.

The selection of particular classes of shoddy and mungo in the price series has therefore been determined consistent with indicating as far as possible (a) the price movements of a small number of standard grades over time, (b) the addition of other grades whose frequency of occurrence for a period indicates prevailing colour preferences

1. G. and J.S. MSS., loc. cit., Receiving Day Books 1.7.1864-31.7.1871, Stock Book 1873-1892.

and fashion (texture and weave of finished cloth) and, (c), those grades in the middling to lower price range, which in every case, predominate in the purchase and sales ledgers of the firms examined.

There remains the ever-present problem of the representativeness of the surviving sources from which the price series has been constructed. As a large proportion of the early data relies on the purchasing records of two Batley woollen manufacturers, J.T. and J. Taylor and G. and J. Stubley, it should be noted that by the final decades of the nineteenth century these firms were probably the largest in the Batley district, although not in the Heavy Woollen District as a whole, where Mark Oldroyd and Sons of Dewsbury clearly predominated in both size and its influence on local wage rates.¹ Taylor's acquired their second mill, Cheapside Mill, in 1872 and the Stubley brothers bought Calder Mills in Wakefield in 1875.² Prior to this however, both were probably representative of many of the expanding firms in Batley such as Joseph Jubb and Sons in which Samuel Jubb was a partner. Indeed, in 1857 the Stubley brothers were forced to come to a private arrangement with their creditors and only began their period of rapid expansion in the 1860s. Their cloths were well-known as typical of the heavy fabrics which comprised the bulk of the output of the Heavy Woollen District in the nineteenth century, a judgement confirmed by a comparison of their sales and blend books with contemporary sources and trade reports.³ There seems little reason to suggest that their purchasing policies differed materially

1. Controlling five mills by the mid 1870s, Oldroyds were notorious for their firm stand on wage negotiations and were frequently mentioned in the trade and local press for their lock-outs in response to strikes. H.E., 6.1.1866; Journal of Fabrics, 12.5.1883, etc.

2. P. Hudson, op. cit., p. 449; G. and J. Stubley Ltd., A Century of Cloth making (1950), p. 7.

3. *ibid.*, p. 17; S. Jubb (1860) op. cit., pp. 41-55 etc.; also v. *infra* Chapter I, Appendix I-II.

from those of their competitors, for whilst they sometimes relied on one or two suppliers for certain grades, the greater proportion of their purchases were drawn from the many shoddy and mungo manufacturers and merchants in the West Riding. For similar reasons Day's price information would not seem to be unrepresentative. Although he provided a high- quality product, the range of classes and price of his output suggests that he was prepared to meet most market demands, particularly for mungo, and as his records indicate, he was competing with other Batley firms in purchasing 'American grey' rags. Moreover, it has been possible to compare his prices where surviving records have overlapped; with Taylor in the late 1840s and Stubleys from 1864, in each case similar classes of recovered wool showing no significant deviation. From the 1890s the archival sources become considerably richer and concurrent price information has been drawn from as large a number of shoddy and mungo manufacturers and West Riding woollen manufacturers as has been possible in order to diminish the possibilities of unrepresentativeness.

Finally, it should be noted that existing published price series for different types of wool, with which the constructed recovered wool series is compared, are, as Hartwell has observed 'only particular prices of particular fleeces at particular sales'.¹ As all who were connected with the wool textile industry were aware, the fleeces at any wool auction were a collection of distinct commodities although classed, for example, as merino or crossbred, and thus annual price changes cannot be taken as statistically uniform, far less a series over a long period of time which could reflect important changes taking place in the quality of wool. Nevertheless, for purposes of comparison the current prices of recovered and virgin wool reproduced here provide an indication of broad price trends over time and a suggestion

1. R.M. Hartwell, op. cit., p. 98.

of the influence that differential price movements exerted on the decisions of manufacturers in their raw material purchases.

The cotton and wool price series

1. U.S. middling uplands cotton

This price series is reproduced from Mitchell and Deane (continued in Mitchell and Jones) who note that the term 'middling American' was

'... an anachronism for the first half of the nineteenth century until the establishment of the Liverpool Universal Standards. The contemporary designation 'upland' or 'bowed Georgia' does, however, correspond to the later 'middling American' reasonably closely'.¹

Mitchell and Deane obtained their series for the period 1801-1902 from Wholesale and Retail Prices (P.P. 1903, LXVII) which, in turn, was based on prices supplied by the Annual Circulars of the Liverpool Cotton Association. Two series were printed, 'middling American' and 'Fair Pernambuco', the latter tending to be marginally higher in price after 1808. From 1854 it is possible to compare the price of 'middling American' with the mean price of all imported cotton as recorded in the Annual Statements of Trade, and these correspond very closely until 1870 (when 'declared value' replaced 'computed value'); after this date 'middling American' prices were generally only slightly less than the mean price for 'all kinds'. Subsequent to 1903, Mitchell and Deane continued their series from the J.R.S.S. and The Statist from data supplied by Sauerbeck and others.²

As a textile fibre, 'middling American' lay between short-stapled

1. B.R. Mitchell and P. Deane, op. cit., p. 491. B.R. Mitchell and H.G. Jones, Second Abstract of British Historical Statistics, (Cambridge 1971), p. 194.

2. Pasold notes the importance to which European manufacturers attached to the price of 'middling American'. E.W. Pasold, op. cit., pp.230-31, 251-52.

cotton of up to 1 inch and of low quality, and long-stapled cotton with an average length of $1\frac{1}{4}$ inches and possessing sufficient strength and fineness to be spun to high counts.¹ The spun yarn of 'middling' cotton was used in medium class cotton goods and, after doubling, commonly used for the warp thread in woollen 'union' type cloths.

2. Lincoln half-hogg (or half hog).

The series has been reproduced from Hartwell (1801-1813) and Mitchell and Deane (continued in Mitchell and Jones) and originally appeared in Wholesale ... Prices (1903) from material compiled by the Bradford Observer and the Yorkshire Daily Observer in their Annual Wool Tables. From 1903 the series was continued as for 'middling American'.²

The fleece of the Lincoln sheep weighed between 8 and 9 pounds, the staple averaging over 10 inches, and was used almost exclusively in the worsted branch of the industry.³ The term 'half-hogg' described the wool mixture comprising one half Lincoln hogg sheep (i.e., sheep at clip day, 16 months old and clipped for the first time) and the other half of ewe or wether fleeces. Although the present United Kingdom output of noils to the weight of tops produced is just over 9 per cent, it could vary between 15 and 20 per cent in the nineteenth century until improvements in the combing process after the 1860s gradually reduced the proportion of noils.⁴ The noils, sold under the category of 'English noils', tended to be thick in the hair and

1. W.S. Murphy, The Textile Industries (1911), I, p. 48.

2. R.M. Hartwell, op. cit., p. 107; B.R. Mitchell and P. Deane, op. cit., pp.495-96; B.R. Mitchell and H.G. Jones, op. cit., p. 197.

3. W.S. Murphy, op. cit., p. 47.

4. Encyclopaedia Britannica (8th edition, 1860), XIV, p. 906; J.R. McCulloch, A Dictionary ... of Commerce and Commercial Navigation (New edition, 1882), p. 1537; W.R., April 1977, p. 63.

were widely used in the better classes of heavy woollen goods and tweeds. At times of low wool prices or active conditions in the worsted trade they competed with the better shoddies but were more generally used with shoddy to give the yarn strength and body. Bradford noils from Noble combs were approximately two thirds the price of the scoured wool, whilst noils from the French system were just over half the scoured wool price.¹

3. Port Philip average (washed) fleece

Reproduced from Mitchell and Deane and Mitchell and Jones, the series originally appeared in Wholesale ... Prices (1903) being based on data published by London wool brokers Helmuth Schwartze and Co. in their Annual Wool Reports.² Until 1871 all were year-end prices and subsequently the annual mean of prices at the London wool sales; from 1896 the prices were those quoted for washed and scoured fleeces. Continuation of the series after 1903 as for 'middling American'.

Originating from a Victoria grown merino/Leicester cross with an average fleece weight of 6 pounds, Port Philip was considered an excellent clothing wool because of its fineness and whiteness, and being of medium staple, possessed very good spinning properties.³ It was used extensively in the Heavy Woollen District with mungo and was commonly substituted for English, Spanish, and Botany wool, and English noils, depending on the relative price levels of each and the quality or effect desired. In its scoured form it was very successful in 'carrying' the very short-stapled and fine mungos in the carding and spinning process.

1. W. Von Bergen and H.R. Mauersberger, op. cit., p. 554.

2. B.R. Mitchell and P. Deane, op. cit., p. 496; B.R. Mitchell and H.G. Jones, op. cit., p. 197.

3. W.S. Murphy, op. cit., p. 47.

4. Dorset Down fleece

Known as a medium quality wool with an average staple of $1\frac{1}{2}$ inches Dorset Down was used extensively in the manufacture of fine livery cloths in the West of England, and to a lesser extent, in the Yorkshire trade.¹ This price series was compiled by English wool merchants R. Waterhouse and Co. and published in the Wool Record and Textile World in 1920; the prices were those paid for the best washed clips on clip-day in July.² The series has been extended using quoted prices in the Wool Record and Textile World for the last week in July annually.

5. Laid Cheviot (Lowland) wool

Another wool of the medium stapled variety, although, with an average staple of $4\frac{1}{2}$ inches, being somewhat longer than the Dorset Down. Fleece weight too, was heavier at 4 pounds compared to $3\frac{1}{2}$ for the Dorset Down. Cheviot wool was used extensively in the manufacture of tweeds and other woollen goods requiring a soft-textured but strong and sound fibre.³ The term 'laid' described the unwashed and 'smeared' state of the fleece as sold - 'smearing' referring to the common nineteenth century practice of applying a composition of tar and butter to protect the sheep from harsh winter weather.⁴ Smearing ceased in 1906, when all cheviot fleeces were sold 'white', but for the period after 1860 when both laid and white were quoted the price differential was approximately 25 per cent more in the case of white fleeces. This, and the following price series, was published

1. W.S. Murphy, op. cit., pp. 48, 59. 2. W.R., 8.1.1920, p. 92.

3. W.S. Murphy, op. cit., pp. 49, 59.

4. A. Hamilton, loc. cit., p. 489; W. Youatt, Sheep, their Breeds, Management, and Diseases (1869), pp. 282, 286, 291, 295.

in 1926 by the Highland Society of Scotland.¹

6. Laid Highland fleece²

Highland wool commonly originated from the Blackfaced sheep, the fleece averaging 6 pounds and having a staple of about 5 inches. A coarse wool with excellent strength and felting properties it was used to manufacture heavy woollens, blankets, and carpets where the harsh quality of the wool was relatively unimportant.³ The value of the white or unsmeared fleeces was approximately 25 per cent above that of the laid fleece: smearing of Highland fleeces ceased in 1907.

The fibres comprising this series have been selected to provide (a), a long-run basis on which the price fluctuations of shoddy and mungo may be compared, and (b), a representative series reflecting as wide a range as permitted by surviving price series of the fibres most commonly used by the United Kingdom wool textile industry. Some degree of substitutability was possible between Lincoln half hog noils and shoddy, as well as the long fibres of Lincoln wool recovered from the carbonised cotton-warped Bradford 'lustre' goods from the 1860s. Whilst Port Philip wool and mungo were considered good complementary fibres, the proportions blended were varied depending on the price at which the cloth was to be sold as well as relative price levels between the two fibres. There is no evidence in surviving records that any degree of substitutability existed between Dorset Down wool and

1. Transactions of the Highland Society of Scotland, 1926 5:5.38, pp.301-3. The series for laid Cheviot and Highland fleeces have been included rather than those for white fleeces, as the former spans a far longer period, the series for white Cheviot and white Highland commencing in 1860 and 1880 respectively.

2. Prices for the years 1842, 1844, 1847, 1861, and 1867 were not quoted: these have been inserted as the mean of the immediately preceding and succeeding prices for the moving average and index series.

3. W.S. Murphy, op. cit., pp. 49, 59.

recovered wool - the fine cloths produced in the West of England from this wool were, however, imitated by the cheap reproductions of the West Riding using recovered wools. Finally, the two Scottish wools were complementary and competing fibres with shoddy and mungo, particularly from the 1860s when increasing quantities of pulled cheviot rags were being used in the Heavy Woollen District¹ (Appendix I).

In order to smooth price fluctuations of an essentially short run nature from medium run cyclical movements and longer-run trends, each price series is additionally presented in five and nine year moving average form, assuming for this purpose that the nineteenth and twentieth century (up to 1938) British economy generally experienced a seven to ten year business cycle.² Current prices have been retained as more adequately reflecting the basis upon which business decisions were made at any particular time (Appendix II).

The third set of data indicates the price series in index number form with the base year of 1839 being selected as the first year in which all series run concurrently (Appendix III). The final series (Appendix IV) are the price relatives of the six raw materials to shoddy and mungo, calculated from the index numbers of the previous Appendix.

Appendix V reproduces graphically the estimated consumption of clean wool and shoddy and mungo for the period 1800-1937, the graphs for each sub-period appearing separately with the discussion.

1. These appear first in the 'Wool Book' of G. and J. Stubley (30.5.1880-29.9.1890) in 1880 but imitation 'Cheviot' suitings were noted by Jubb as 'recently' introduced in the Batley area in ca. 1860. S. Jubb (1860) op. cit., p. 54.

2. R.C.O. Mathews, The Trade Cycle, (Cambridge), 1959. pp. 216, 223; W.C. Mitchell, Business Cycles (New York, 1928), pp. 291-3. Jubb noted in 1860 that 'There seems to be a periodicity about these panics; the decennial ones of 1837, 1847, and 1857, have impressed a belief on the public mind that a recurrence of them may be expected every ten years. (P. 114.)

CHAPTER V

II - The deflated wool series.

II - The deflated wool series

In order to obtain a more realistic basis on which to compare the consumption of virgin and recovered wool by the United Kingdom wool textile industry during the period covered by this study, it was apparent that published statistics of the 'actual' weight of wool consumed needed to be deflated in order to show the 'scoured' or net weight free from grease and other impurities. This is because wool, as will be seen, can sometimes contain more than half its own weight in suint, yolk, dirt, and other substances, all of which must be removed by washing and scouring before the opening and blending operations were performed prior to carding and/or combing. Shoddy and mungo, on the other hand, were ready for blending largely in the form that they left the rag machine (although tightly-packed bales sometimes required opening) and the estimated weights consumed annually in the United Kingdom represent the 'real' weight of recovered wool available to the wool textile industry, unlike the Board of Trade and other published figures of 'actual' weights of retained foreign and domestic wool. Thus, the reproduction of statistics from official and trade sources would seem at best an approximate indicator of domestic wool consumption or the relative rate of growth in the use of foreign and domestic wool, and at worst misleading, unless qualified by the caveat that important changes were taking place in the nineteenth and twentieth centuries in the proportion of greasy, washed, and scoured wool retained for domestic manufacture.¹

1. The Board of Trade figures have been used, as published, in many reports and studies - see, for instance, Board of Trade Working Party Reports - Wool (1947), op. cit., p. 32; E. Sigsworth (1958), op. cit., p. 114; A. Barnard (1958), op. cit., pp. 218-19, etc.

Unlike the wool manufacturing industries in certain countries, particularly the United States, the domestic industry gained access to foreign wool free from all import duties from 1845. Consequently, the need to establish criteria of compensatory payments based on the shrinkage of different qualities of wool was unnecessary and so, also, was the need to accurately distinguish the proportion of imported wool shipped to the London (and, later, the Liverpool) sales in a washed, partly-washed, or scoured condition. As is generally known, success in keeping raw material costs as low as possible rested primarily with the buyer for each mill and his skill in bidding no more than his estimate of the weight that a particular lot would yield in clean scoured wool.¹ Statistics of the weight of imported wool and estimates of the domestic clip thus provide no illumination of these variables.

The extent to which figures for the actual weight of raw wool are misleading is shown by the following table relating to the total quantity of wool available for consumption by the European and North American wool textile industry between 1850 and 1886 (Table V(i-b)).

Thus whereas the actual weight of raw wool consumed increased between 1850 and 1886 by 141.9 per cent, Sauerbeck's estimates indicate that the clean weight—i.e., that weight available for production—increased by only 102.5 per cent. The discrepancy, to be discussed shortly, arose from the increased quantity of American and Australian wool being shorn in the grease.

One early solution to this problem, attempted by James, was to

1. The initial processes in the preparation of wool for manufacture are covered in a variety of technical and other publications. See, for example, E. Baines (op. cit.) for the processes at Gott's mill in the 1850s (pp. 71-3) or W.S. Murphy (op. cit.) for those in ca. 1911 (Vol. 1, pp. 130-155). The fleece from the bale was first sorted into different fibre qualities, the wool then being scoured by steeping and washing in a solution of potash, soap, and heated water in a series of troughs or bowls, the scourer or scouring machine agitating the wool gently. After drying, the wool was then ready for opening or teasing, burring, and then blending.

TABLE V(1-b)

Actual and clean weight of wool consumed by the European
and North American wool textile industry, 1850-1886

(millions of lbs.).

		┌ Clean wool after washing ───────────┐				
		Raw wool	European & North American Production	Imports	Total	Average yield per cent
	1850	790	459	55	514	65.1
	1860	955	497	113	610	63.9
Av.	1861-65	1,053	502	152	654	62.1
"	1866-70	1,293	534	232	766	59.2
"	1871-75	1,414	525	297	822	58.1
"	1876-80	1,532	530	335	865	56.5
"	1881-85	1,743	560	392	952	54.6
	1886	1,911	564	477	1,041	54.5

Source: A. Sauerbeck (1887)op. cit.

estimate the clean scoured weight of retained wool from figures maintained by the Board of Stamps and Taxes which indicated the drawback allowed on the amount of soap used by wool manufacturers, and from which the total quantity of scoured material could be estimated.¹ This method, however, cannot be used after 1852 for the excise duty on soap was repealed in 1853, and, for the purposes of this study, the importance of shoddy and mungo as an alternative fibre was relatively small prior to 1850. A second approach could utilise information specifying the origin of imported wool in the Customs (Import) Ledgers or the Board of Trade annual returns supplemented by trade reports of the quarterly London sales to establish the types of wool imported and the proportions which were washed, scoured, or greasy - the data being deflated to reflect the known grease content of fleeces from different sources. Whilst some information contained in trade reports has been used in the following calculation of 'real' weights, it has not been possible to establish from the Board of Trade figures the country of origin or type of wool re-exported, the annual statements merely indicating under 'Foreign and Colonial Produce' the countries to which 'sheep's or lamb's' wool was shipped or consigned. Because a large proportion of imported wool was re-exported, from one third to one half from ca. 1855, any calculation based on the grease content of retained foreign wool, in the absence of reliable and consistent information on the types of wool retained or exported, would yield a less than useful indicator of the real weight of wool consumed in

1. J. James, History of the Worsted Manufacture in England (1857), p. 515.

the United Kingdom.¹

The following calculations are therefore somewhat tentative, being based on the percentage of washed and scoured wool to total wool exports of the colonies, which was noted by Klein as declining from 35-40 per cent in the 1860s to 25-30 per cent in the 1890s, and to less than 20 per cent by 1914.² Of the 21 West Riding woollen manufacturers returning information to the Pollution of Rivers Commission in 1865, 11 washed and scoured all their wool and a further four washed and scoured between 75 and 90 per cent of their wool, indicating from this small sample, that the larger proportion of manufacturers were buying their wool in the grease.³ In 1876 the Textile Manufacturer noted that most colonial wools needed scouring prior to willeying, confirming Ogden and Macaulay's observation that

'... in the earlier years of the period (1870-1902) ... the import wool arrived in larger proportion than in the later years in a "washed" condition, on which ground some allowance should be made from the later year's figures on account of the greater average waste in washing'.⁴

1. France predominated in the re-export of Australian wool until 1881, although, as Barnard observes, after 1875 there was a growing diffusion of Australian wool exports. Whilst France and Germany used large quantities of Australian crossbred and merino wool in the last quarter of the nineteenth century, both they and Belgium were utilising increasing quantities of Cape and South American wools for worsted and woollen manufacture. By 1900 France was consuming twice as much South American as Australian wool and from 1881 all three countries were purchasing a growing proportion of their Australian wool direct. Thus, although it is possible to estimate the probable destination of United Kingdom re-exported wool from what is known of the European wool textile industry (bearing in mind that until 1904 the Board of Trade specified countries to which exports were shipped and not consigned), the greater diffusion of re-exports from ca. 1875 and lack of information on what proportion of these were in scoured, washed, or greasy form, would make such a series of calculations on an annual basis somewhat speculative - see A. Barnard (1958) *op. cit.*, pp. 26, 43, 171.

2. H.V. Klein, International Trade in Apparel Wools 1914-1948, unpublished M.Sc. thesis, University of London, 1950. Sauerbeck noted that 70 per cent of Australian wool was washed prior to shearing in 1869 (i.e., 30 per cent were shorn in the grease); this had declined to 3 per cent by 1888 (1887, *op. cit.*, p. 1; T.M., 15.6.1889, p. 275).

3. P.P. 1867 (3850), XXXIII, Appdx. VI, 300-05. A trend, Jubb noted in 1860, which had 'become general as regards fine foreign and colonial wools' (p. 60).

4. T.M., 15.3.1876; C. Ogden and P.T. Macaulay, *op. cit.*, p. 18.

For domestic wool, Archer (1877) and McCulloch (1882) thought that the bulk was pre-washed, but this was often accomplished 'imperfectly'.¹ By 1881, the journal Wool and Textile Fabrics observed that greasy wools formed the 'bulk of wools' at the London wool sales and in 1906 Clapham noted that about two thirds of imported wools were in the grease.² In 1920, when the Annual Statements of Trade first specified greasy and scoured wool imports, the proportion of scoured wool imported had fallen to 14 per cent of gross imports and to 9 per cent by 1925.³

The major reason for the growing proportion of greasy wools imported would seem to rise from a combination of several factors. On the demand side, users in the worsted section of the industry had long preferred their wools to be shipped in the grease so that the fleeces could be sorted to their own standards, an operation that was difficult to perform with pre-scoured wools. Although Ure maintained in 1835 that wool should be washed immediately after being shorn 'otherwise it will produce a fermentation in the wool heap, and render it hard and brittle', Swaine in 1829 was adamant that 'the best judges' considered that the natural grease should be 'left in the wool until it is immediately wanted for use, in order ... to preserve it in the

1. Professor Archer, 'Wool and its applications', G.P. Bevan (ed.), British Manufacturing Industries (1877), p. 30; J.R. McCulloch (1882) op. cit., p. 1537; Encyclopaedia Britannica (9th edition, 1888) XXIV, p. 656. The Pollution of Rivers Commission (P.P. 1871 (c. 347), XXV, 722) noted that less than half the domestic clip was washed prior to shearing and the T.M. in 1889 that sheep washing was on the decline in Scotland (15.6.1889, p. 275).

2. Wool and Textile Fabrics, 10.12.1881, p. 464; T.M., 15.4.1881, p. 119, 15.4.1883, p. 146; Reports of the Inspectors of Factories and Workshops, P.P. 1881 (c. 2825), XXIII, 132; J.H. Clapham (1907) op. cit., p. 91; H.V. Klein, op. cit., p. 10. To some extent the concern of the Factory Inspectors over the increase in wool sorter's disease in 1880-81, contracted through handling unwashed and unscoured fleeces, would reflect the growth in importation of greasy wool. Until 1914 nearly all South American wools were shipped unwashed and unscoured (Klein). Hamilton noted in 1870 that 9/10ths of River Plate wool was imported in the grease, with a clean yield of between 45 and 50 per cent (op. cit., p. 495).

3. This had declined to 8.73 per cent by 1935. Bradford Chamber of Commerce (1936), op. cit., pp. 20-23.

same state of elasticity and softness in which it is on the sheep's back'.¹ A writer in 1842 noted that whilst most dominion wools were washed before shearing, the grease or yolk remained in the fleece, the grower wishing to lose as little of this as possible in order to keep a 'good weight'.² By the second half of the nineteenth century opinion seems to have favoured Swaine's view of 1829, many manufacturers and buyers preferring to buy their wool in the grease, sometimes washed or half-washed, as in this condition the 'handle' of the wool was best preserved.³ This was particularly apparent from ca. 1860, when the introduction of more sophisticated machinery and the need to produce cheap but higher quality cloths from available raw materials necessitated greater control by manufacturers over the sorting and scouring processes and, an important consideration, the extra income to be gained therefrom by treating the scouring liquors for recovery of the grease.⁴

On the supply side, several developments (especially in Australia and New Zealand) permitted stricter control over the quality of fleece-washed, scoured, and greasy wools being shipped to the United Kingdom.

1. A. Ure (1835), op. cit., p. 129; J. Bischoff (1842) op. cit., p. 239.

2. Encyclopaedia Britannica (7th edition, 1842), XXI, p. 921. This could also be 'deliberately contrived' as the T.M. noted in 1894 of the high grease and sand content of River Plate wool. Growers and flockmasters were alleged to have chased the sheep with 'men and dogs' at summer shearing time until the sweat content of the wool was high, and then to roll the sheep in sand. (15.5.1894, p. 201).

3. ibid., 9th edition, XXIV, p. 656; T.M., 15.6.1889, p. 275; Chambers' Encyclopaedia (Edinburgh, 1891), 10, p. 727. The Pollution of Rivers Commission (P.P. 1871 (c. 347), XXV, 722) observed that one third to one half of the grease remained after washing and 'as this material protects the fibres from the attacks of moths, it is not desirable that it should be removed long before the process of manufacture commences'. This opinion was by no means unanimous however, the T.M. noting in 1880 that wool shipped in the grease gave more difficulty in procuring bright colours and had a harsh quality (15.12.1880, p. 425, 15.10.1881, p. 367). McLaren, a Keighley manufacturer, succinctly set out the advantages and disadvantages to both growers and users in fleece washing and prescouring wool (op. cit., pp. 25-26). The increasing importance of scouring by manufacturers was evident by 1890, the T.M. for example, reviewing in detail five newly-patented machines between March and July.

4. T.M., 15.3.1889, p. 121. A paper read to the Society of the Chemical Industry of Manchester drew manufacturer's attention to this valuable by-product.

Greater care in the washing and scouring of fleeces made possible by technological advances of the late 1860s in Australia produced fleece and scoured wools of acceptable quality to buyers.¹ Secondly, the falling cost of transport and rapid development of railways in the hinterland of Australia and at the ports of Melbourne and Sydney reduced the time taken between shearing and loading for export, and the opening of the Suez Canal in 1869, reducing by 10 per cent or approximately 1,200 miles the old Melbourne/Liverpool Cape route, markedly eased the risks of fermentation taking place in baled fleeces.²

The percentage of fleece-washed and/or scoured wool as a proportion of retained imported wool consumed in the United Kingdom in the period 1800-1939 has therefore been based on figures indicated in Table V(ii).³ In estimating the yield on retained domestic wool, it was assumed that the common practice of fleece washing prior to shearing applied to the greater proportion of the domestic clip.

Table V(iii) sets out the clean yield of all wools of different classes of wool from contemporary trade and other sources in the nineteenth and twentieth century. From this it can be seen that estimates could vary appreciably between authorities on the wool textile industry at any one time. Indeed in 1880, the Textile Manufacturer suggested

1. A. Barnard (ed.), The Simple Fleece (Melbourne, 1962), p. 431. The scouring machines were probably shipped from the United Kingdom where they were beginning to be used in ca. 1843 (S. Jubb (1860) op. cit., p. 60).

2. T.M., 15.4.1881, pp. 133-34, 15.10.1881, p. 367. Fermentation or 'sweating' of greasy baled wool generally did not take place until the eighth or ninth week of packing. For a discussion of the importance of declining freight rates to Australian wool growers see A. Barnard (1958) op. cit., p. 191, and F.J.A. Broeze, 'The Cost of Distance: Shipping and the early Australian Economy, 1788-1856', E.H.R., 2nd series, XXVIII, 1975, pp. 587, 594.

3. After Klein (p. 9) and adjusted where necessary from evidence in contemporary sources previously discussed.

TABLE V(ii)

Estimated proportion of retained dominion, colonial,
and overseas wool, fleece-washed and/or scoured.

Proportion			Yield		
Prior to 1860	-	40%	Prior to 1860	-	75%
1860-1875	-	40%	1860-1900	-	85%
1875-1890	-	35%	1900-1910	-	90%
1890-1914	-	30%	1910-1920	-	95%
1914-1920	-	20%	After 1920	-	100%
1920-1925	-	15%			
After 1925	-	10%			

Source : see text.

TABLE V(111)

Estimates of the clean yield of various wools after
washing and scouring, 1820-1948.

Year or period	Source	Type of wool	Clean yield %
1820	Wool Tax Committee ¹	German (greasy)	70
	"	Spanish (washed)	85
1835	A. Ure ²	All (greasy and washed)	55-65
1845	J. James ³	Combing wool (greasy)	66
1852	"	All (greasy and washed)	72
1860	Encyclopaedia Britannica ⁴	Coarse (minimum yield)	80
	"	South Down (greasy)	50-55
1867	Pollution of Rivers Commission ⁵	Colonial (greasy)	50
	"	" (washed)	75
	"	" (scoured-min. yield)	95
1870	A. Hamilton ⁶	Domestic (unwashed and greasy)	70
1871	Pollution of Rivers Commission ⁷	All (greasy and washed)	60-67
	"	Merino lamb's wool (greasy)	33-50
1880	Textile Manufacturer ⁸	Australian (washed)	59
	"	" (greasy)	38
1881	" ⁹	All (greasy)	75
	"	Merino (greasy)	50
1882	" ¹⁰	Sydney "	48.5
	"	Port Philip (greasy)	49.5
	"	New Zealand "	56
1882	J.R. McCulloch ¹¹	Domestic (partly washed)	71
	"	Spanish " "	80
1884	W.S.B. McLaren ¹²	Merino (greasy)	33
1889	Textile Manufacturer ¹³	Half-bred hog (washed)	80-85
	"	" (greasy)	60
1894	" ¹⁴	River Plate (greasy)	30-40
1872- 1900	F.J. Hooper ¹⁵	Buenos Aires (greasy)	30
1890/95/ 1900	"	Port Philip (greasy)	57-69
1901	Wool Record ¹⁶	All (greasy)	58-72
1902	Congressional Document no. 413 ¹⁷	North American (greasy)	39
1903	F.J. Hooper ¹⁸	Domestic (greasy)	70-80
	"	Australian (greasy)	45-55
	"	American territory (greasy)	30-35
1907	J.H. Clapham ¹⁹	Colonial and overseas "	45-50
1911	W.S. Murphy ²⁰	All (greasy)	66
1916	Statist ²¹	Austr., S. African, S. American (greasy and washed)	50
1917	Bradford Chamber of Commerce ²²	Imported (greasy)	56.25
	"	Domestic "	78
1922	B.A.W.R.A. ²³	All (greasy)	50
1948	W. Von Bergen & H.R. Mauersberger ²⁴	Fine (greasy)	30-70
		Medium (greasy)	50-80
		Long "	70-90
		Carpet wool (greasy)	60-80

Sources:

1. P.P. 1820(56), XII, 77.
2. (1835) op. cit., p. 129.
3. (1857) op. cit., p. 489.
4. (8th edition, 1860) op. cit., XIV, p. 905.
5. P.P. 1867 (3850), XXXIII, 476.
6. loc. cit., p. 501.
7. P.P. 1871 (c. 347), XXV, 722, 725.
8. 15.8.1880, p. 875.
9. 15.7.1881, p. 253, 15.10.1881, p. 367.
10. 15.3.1882, pp. 33-34.
11. (1882) op. cit., p. 1537.
12. op. cit., p. 25.
13. 15.6.1889, p. 275.
14. 15.5.1894, p. 201.
15. (1903) op. cit., p. 32.
16. 84, 1953, p. 567.
17. op. cit., p. 13.
18. loc. cit., (W.J. Ashley), p. 101.
19. (1907) op. cit., p. 30.
20. op. cit., I, p. 141.
21. 22.1.1916, p. 155.
22. W.R., 16.8.1917 (supplement - Wool Trade Control).
23. British Australian Wool Realisation Association (1924), p.14.
24. op. cit., p. 269.

that the yield on washed Australian wool commonly held by manufacturers to be 71 per cent was, in fact, considerably lower at 59 per cent.¹ The same journal in 1882 carried out a series of carefully measured tests on a number of dominion greasy wools claiming that the 'more drastic measures' frequently used by manufacturers in washing and scouring resulted in an avoidable loss in weight of at least 5 per cent and that greater care exercised in this process could increase the value of clean wool by between 10 and 16 per cent.² The only significant attempt to deflate the actual weight of wool to clean weight was made by London wool brokers Helmuth Schwartz and Co. for the period 1850-1886. The percentage yield of wool from the major wool growing areas has been calculated from their data and is shown in Table V(iv). The overall decline in yield (excluding River Plate and 'other sorts') reflects the growing proportion of wool marketed in greasy form. Whilst the yield of all wool (final column) is some 10 to 20 per cent less than the estimates in the following table of wool consumed in the United Kingdom (V(vi)), it should be noted that the figures here shown are considerably weighted by the very low yield on River Plate wool which was used in only very small quantities by the domestic wool textile industry until the beginning of the twentieth century.³

In order to reflect the gradual substitution of washed by scoured wool from the 1880s, the percentage yield on the proportions shown in Table V(ii) has been increased in increments from 75 to 100 per cent (after 1920) when the two categories 'greasy' and 'scoured'

1. T.M., 15.8.1880, p. 875.

2. T.M., 15.3.1882, pp. 33-34.

3. v. *infra* pp. 499-500.

TABLE V(iv)

Yield of wool consumed in Europe and North America,
by area of origin, 1850-1886.

		Percentage yield of raw wool									
	<u>U.K.</u>	<u>Australasia</u>	<u>Cape</u>	<u>River Plate</u>	<u>Other Sorts</u>	<u>All*</u>					
1850	75.4	(16.6)	59.0	(4.9)	66.7	(0.7)	31.6	(2.4)	61.1	(4.5)	65.1
1860	75.0	(14.7)	58.3	(6.3)	53.8	(2.7)	32.5	(4.5)	65.8	(8.0)	63.9
1865	75.3	(13.1)	58.2	(9.6)	60.6	(2.9)	33.6	(12.0)	65.1	(7.5)	61.2
1870	75.3	(11.6)	58.3	(13.5)	65.1	(3.3)	33.5	(15.2)	62.3	(5.3)	59.1
1875	74.7	(11.1)	52.8	(17.0)	64.7	(3.5)	33.2	(15.0)	63.8	(7.9)	57.5
1880	75.2	(9.1)	50.0	(18.9)	60.0	(3.7)	35.2	(15.7)	65.4	(8.1)	57.6
1886	75.0	(7.1)	48.9	(22.4)	60.6	(3.5)	37.1	(18.2)	66.7	(7.7)	54.5

Note: the figures in parenthesis denote the percentage proportion of the total actual weight of wool consumed in Europe and North America.

* Includes production of North American and Continental wool (not shown).

Source: Based on a table compiled by Helmuth Schwartz and Co. in A. Sauerbeck (1887) op. cit., p. 2.

became delineated in the Annual Statements of Trade.¹ For retained imported wool in the grease a flat clean yield of 65 per cent has been used which, although somewhat more generous than most estimates for colonial and overseas wool, is intended to offset the smaller shrinkage of other fibres imported under the general heading of wool (i.e., mohair, alpaca, vicuna, and angora wool) as well as the increasing importance of imported crossbred wools having a lower shrinkage (25 to 35 per cent) than the fine merino wools (50 to 75 per cent).² As can be seen from Table V(v) below, the bulk of wool imported into the United Kingdom between ca. 1850 and 1913 originated from Australasia, whose greasy fleeces tended to yield somewhat more than those from South Africa and South America.

TABLE V(v) Numbers of bales of wool imported into the United Kingdom 1800-1913, selected years.

Source	1800	1830	1850	1880	1900	1913
Spain & Portugal	39,940	10,537	9,466	28,959	6,138	25,090
Germany	1,170	74,496	30,491	28,119	9,126	15,669
Australasia	658	8,003	138,679	863,816	1,118,895	1,289,113
Cape	-	-	19,879	190,614	102,268	395,114
South America	-	-	3,841	14,552	50,861	150,383
East Indies	-	-	9,704	112,716	142,518	207,689
World Totals	42,440	98,818	291,161	1,484,581	1,680,869	2,346,005

Source: A.F. Barker, 'Recent Progress in the Wool Industries', in the Royal Society of Arts, 1925, p. 4.

The clean yield of retained British wool has been taken as 80 per cent, or close to the maximum yield of the coarsest domestic wools (estimates of 1860 and 1903, Table V(iii)).

1. By 1950, the practice of dominion growers of scouring their lower yielding wools was well established. The clean yield of 100 per cent assumed here is slightly above the published clean yields for 1950 of scoured wools, which varied from 91 per cent for Australian merino and crossbred wool, to 95 per cent for Argentinian merino and crossbred and English fleeces. World Wool Digest, V, 1954, p. 62.

2. C. Ogden and P.T. Macaulay, op. cit., p. 18.

Table V(vi) shows the deflated series of retained overseas and domestic wool consumed in the United Kingdom between 1800 and 1939 compared to the actual weights retained as recorded by the Bradford Chamber of Commerce. Whilst the percentage shrinkage begins to rise to approximately 30 per cent from ca. 1914, reflecting the large proportion of wool imported in the grease from this period onwards, the deflated figures for the period 1850 to 1900 concur closely with the estimate of the London wool brokers, Helmuth Schwartz and Co., that the loss on washing and scouring averaged 25 per cent.¹ The mean of the years 1850-54 of 155 million lbs. is acceptably close to James' figure for 1852 using the drawback method, which indicated a total weight of wool after washing and before manufacture of 147.498.218 lbs.² It should be stressed however, that the deflated weights here suggested are tentative. Firstly, the intention has been to deflate the figures conservatively for, as Hoffmann has pointed out with regard to Schwartz's allowance and as the estimates in Table V(iii) indicate, other authorities have suggested higher losses.³ Secondly, the figures for the domestic clip and those for the domestic consumption of shoddy and mungo with which column(c) will be compared, are themselves based upon estimates - in the case of the former those of Helmuth Schwartz and Co., and in the case of the latter from data compiled by Hooper of the Bradford Chamber of Commerce.⁴

1. W.G. Hoffmann, op. cit., p. 261. 2. J. James, op. cit., p. 515.

3. It is interesting to note the approach of the American authorities in imposing duty on imported wool. The 1867 Wool and Woollens Act assumed that 4 pounds of greasy wool was required for every 1 pound of cloth manufactured, and in 1902 the proponents of the 'Grosvenor Shoddy Bill' noted that in 1900 the Agricultural Yearbook gave the total loss on scoured American fleeces as 61.1 per cent. The 1922 tariff was based upon a 'clean content' which fixed shrinkage at the high rate of 65 per cent. A.H. Cole, op. cit., II, pp. 8, 17; Congressional Document no. 413, op. cit., pp. 12-13.

4. It should be noted that Schwartz's estimates of the domestic clip were highly respected in the trade and were reproduced in a number of authoritative sources. See, for instance, Statistical Tables and Charts relating to British and Foreign Trade and Industry, P.P. 1909 (Cd. 4954), CII, 162-63, and Hooper op. cit.

TABLE V(vi)

Retained foreign and colonial wool and domestic clip
consumed in the United Kingdom, 1800-1939 - estimated
clean yields (000s lbs.).

Year	(a) Foreign and colonial - estd. clean wt.	(b) Domestic clip - estd. clean wt.	(c) Total wool ret'nd. - estd. clean wt. (a+b)	Total wool rethd - actual wt.	% deflated
Av. 1800-19	6,900	80,000	86,900	110,000	21.0
1820-24	17,300	88,000	105,300	135,000	22.0
1825-29	19,900	91,500	111,400	143,300	22.26
1830-34	23,900	93,100	117,000	151,100	22.57
1835-39	36,300	92,300	128,600	167,900	23.41
1840-44	37,300	96,000	133,300	174,000	23.39
1845-49	43,900	96,800	140,700	184,500	23.74
1850-54	56,600	98,400	155,000	205,000	24.39
1855-59	64,900	101,000	165,900	220,300	24.69
1860-64	89,500	107,600	197,100	257,100	23.34
1865	98,400	112,700	211,100	275,700	23.48
6	129,200	108,200	237,400	312,200	23.96
7	106,200	123,300	229,500	299,500	23.37
8	112,600	130,000	242,600	316,800	23.42
9	106,700	122,100	228,800	298,800	23.42
1870	126,500	119,100	245,600	322,200	23.77
1	143,700	112,000	255,700	336,800	24.07
2	128,600	118,700	247,300	324,600	23.81
3	147,200	126,400	273,600	359,600	23.91
4	152,000	125,500	277,500	365,200	24.01
5	143,800	121,200	265,000	351,200	24.54
6	160,500	117,000	277,500	369,100	24.82
7	165,900	114,000	279,900	372,900	24.94
8	149,300	116,300	265,600	352,800	24.72
9	131,000	109,800	240,800	320,200	24.80
1880	172,700	105,400	278,100	371,700	25.18
1	140,500	99,900	240,400	319,900	24.85
2	174,000	92,200	266,200	356,800	25.39
3	167,000	86,900	253,900	340,500	25.43
4	191,200	91,100	282,300	379,200	25.55
5	181,500	90,000	271,500	364,500	25.51
6	217,300	91,000	308,300	415,500	25.80
7	198,900	91,500	290,400	390,600	25.65
8	230,000	88,300	318,300	429,800	25.94
9	255,900	89,000	344,900	466,600	26.08
1890	217,300	94,800	312,100	424,600	26.49
1	250,900	105,000	356,900	484,700	26.37
2	234,800	108,100	342,900	465,800	26.38
3	240,900	108,000	348,900	483,500	27.84
4	266,500	103,200	369,700	504,400	26.70
5	276,900	90,600	367,500	503,200	26.97
1896	283,800	94,400	378,200	517,700	26.95

Year	(a) Foreign & Colonial - estd. clean wt.	(b) Domestic clip - estd. clean wt.	(c) Total wool ret'nd - estd. clean wt. (a+b)	Total wool ret'nd - actual wt.	% deflated
1897	278,900	79,100	358,000	491,700	27.19
8	310,900	101,400	411,300	564,600	27.15
9	286,000	93,900	379,900	520,200	26.97
1900	277,300	92,900	370,200	498,600	25.75
1	307,000	94,200	401,200	541,200	25.87
2	284,100	79,000	363,100	492,000	26.20
3	256,300	77,700	334,000	450,600	25.88
4	250,500	75,300	325,800	439,600	25.89
5	269,300	74,600	343,900	466,700	26.31
6	298,600	80,300	378,900	512,300	26.03
7	354,300	79,700	434,000	588,400	26.24
8	308,500	76,700	385,200	521,000	26.06
9	320,900	63,800	384,700	532,700	27.78
1910	372,500	84,700	457,200	609,200	24.95
1	388,800	85,400	474,200	632,100	24.98
2	380,100	68,500	448,600	599,300	25.14
3	396,200	77,200	473,400	631,800	25.07
4	319,900	66,200	386,100	533,400	27.62
5	584,600	72,300	656,900	915,900	28.28
6	421,100	89,100	511,200	704,400	27.42
Av. 1917-19	455,500	87,300	542,800	787,900	31.11
1920	471,000	68,600	539,600	756,300	28.65
1	314,600	53,500	368,100	514,900	28.51
2	488,600	33,500	522,100	737,400	29.20
3	256,700	32,800	289,500	400,100	27.64
4	300,000	41,800	341,800	480,700	28.90
5	279,400	44,900	324,300	464,000	30.11
6	331,700	48,200	379,900	544,500	30.22
7	346,700	45,200	391,900	562,700	30.35
8	317,800	57,200	375,000	535,400	29.96
9	344,600	52,700	397,300	568,900	30.16
1930	352,000	68,200	420,200	600,000	29.97
1	411,500	68,900	480,400	686,800	30.05
2	419,300	69,400	488,700	698,800	30.06
3	422,000	55,600	477,600	685,600	30.34
4	365,000	66,400	431,400	615,900	29.96
5	408,700	51,800	460,500	661,300	30.36
6	445,200	60,000	505,200	724,900	30.31
7	385,200	70,600	455,800	650,700	29.95
8	429,400	68,000	497,400	708,400	29.79
1939	484,200	69,000	553,200	789,700	29.94

Source: 1800-1937

Based on series in F.J. Hooper (1903) op. cit., pp. 10-11,
Bradford Chamber of Commerce (1938) op. cit., pp. 12-13.

1938-39

B.R. Mitchell and H.G. Jones, op. dt., p. 93.

CHAPTER V

III - An outline of manufacturing processes
in the use of recovered wool and some
of the more important innovations in
the low woollen sector.

III - An outline of manufacturing processes in the use of recovered wool and some of the more important innovations in the low woollen sector.

The admixture of recovered wools in the manufacture of woollen cloth followed a long tradition in the methods of use of various wool wastes by which the adulterants were introduced either in the early stages of wool blending prior to carding and spinning or at the finishing stage. During the period covered by this study by far the greatest proportion of shoddy, mungo, and extract was utilised in the woollen system at the initial stages of manufacture, but it is worth noting the manner in which the manufacturers of 'low' heavy cloth endeavoured to bring a piece to the required weight and thickness after it had left the loom.

Latimer, whose sermons on social and ecclesiastical matters achieved some notoriety in 1548-9 observed of the 'northern cloth maker' that

'If his cloth be 18 yards long he will set him on a rack and stretch him out with ropes ... till he hath brought him to 27 yards. When they have brought him to that perfection, they have a pretty feat to thicken him again. He makes me a powder ... they call it flock powder, and they do so incorporate it to the cloth that it is wonderful to consider ...'¹

It is not clear to what extent this method of 'flocking' cloth was practised in the West Riding in the nineteenth century, but from contemporary trade sources it appears to have been more frequently found in the manufacture of low woollen cloth in the United States. In 1883, G. Kittredge, editor of the Boston Journal of Commerce, informed a West Riding audience that a typical low American cotton-

1. T.M., 15.10.1886, p. 477.

warped union beaver, the weft of which contained 85 per cent shoddy and 15 per cent wool, would be 'well filled with flocks' of wool-waste or ragwool ground up into a fine powder and

' ... forced into the cloth in the fulling mill during the process of felting, the large rollers doing the pounding in ...'

and producing a cloth of handsome finish which,

'... unless you were an adept, you would probably be deceived in its purchase.'¹

A series of detailed technical articles submitted by an American manufacturer on woollen cloth finishing to the Textile Manufacturer in 1890 noted that it was a fairly common expedient amongst some manufacturers to use the flocking method to make up the weight of cloth that should have been made in the loom, a piece weighing 25 ounces per yard and 20 yards long requiring 5 ounces of flocks to each yard.² Although this method of utilising very short-stapled mungo fibres or 'cropper's dust' was introduced to Leeds by a returning emigrant from the U.S.A., and for a time was popular for very heavy fabrics woven loosely in the loom, it was not mentioned in a comprehensive technical volume of 1911, indicating that by this date the practice may have ceased.³

It was in the initial blending and willeying operations of the woollen system that the various proportions of shoddy, mungo, or extract were mixed with wool, cotton, or other fibres. Blending, sometimes seen by those both in and outside the trade 'as if it were only the instrument of fraudulent adulteration', was, with the operations of carding

1. The Textile World (Incorporated with the Yorkshire Inventor) III, 31, 15.1.1883, p. 502. Kittredge noted, however, that 'their tenancy is unreliable'; see also, T.M., 15.10.1888, p. 467.

2. T.M., 15.9.1890, p. 423.

3. F. Fenton, T.M., 15.6.1881, p. 209; W.S. Murphy, op. cit., VIII, pp. 101-22.

and spinning, a process in which the success and profits of a manufacturer was critically determined.¹ An Ontario manufacturer, submitting an article to the Textile Manufacturer in 1889, noted the importance of blending;

'In these days of keen competition, manufacturers devise all sorts of mixtures of stock in order to produce cheap goods, and by skilful manipulation in the blending of the different fibres, endeavor to make them appear of much finer quality than they really are. Cheap goods and adulteration of stock always go hand in hand; they are inseparable, one being the cause of the other.'²

The principles of blending remained virtually unchanged for the period here discussed, and were similar to the operation previously described in the blending of rags prior to being passed through the rag machine - alternate 6 to 7 inch layers of scoured wool and shoddy were built up, each layer being oiled, until a stack was formed, the material then being raked down in thin vertical slices to be more fully intermixed on the floor - an operation performed several times if done by hand.³ More commonly, the oiled and stacked material was passed through a 'Fearnought' or tenter hook willey machine which accomplished the mixing process thoroughly as a preliminary to the scribbling and carding operations. The subsequent processes in the manufacture of heavy woollen cloths differed little from those in the making of fine

1. W.S. Murphy, *ibid.*, I, p. 148. It was for this reason that blends were commonly recorded by code in the blend books of many manufacturers (i.e., G. and J. Stubley, John Lockwood and Sons, *loc. cit.*). The proportions of wool, cotton, shoddy or mungo were calculated using a simple formula. If weights x, y, z and w-x-y-z at prices a, b, c, d respectively made a blend weighing w at price m, then the relationship was $x(a-d)+y(b-d)+z(c-d) = w(m-d)$. Thus given x and y values, the blender could determine z. Wool Year Book (1921), *op. cit.*, p. 265.

2. T.M., 15.5.1883, p. 168, 15.4.1889, p. 155.

3. The amount of oil added to the blend varied, but was given to the Pollution of Rivers Commission as 10 lb. to each 100 lb. of wool. P.P. 1871(c. 347) XXV, 726. McLaren (*op. cit.*, p. 184) noted that the greater the proportion of shoddy and mungo in the blend, the more oil was required to assist in the spinning operation, but in 1915 the Wool Record took the opposite point of view (1.4.1915). This may have been because Yorkshire shoddy and mungo manufacturers were using more oil in their blends (v. *supra* Table IV(xviii), p. 301.).

woollen goods but with some important detail differences.¹ It was axiomatic that however poor were the constituents of the blend, a proportion had to be 'good enough to carry its own waste' in spinning, a bad spin resulting in considerable loss of material and producing a yarn with doubtful weaving characteristics as well as being wasteful in scouring and milling.² In the carding operation, unlike the arrangement used for processing longer stapled wool where the wires between the workers and the swift were set progressively closer but never touching, the cards were finely set to run into one another³ to avoid the danger of 'clogging' by short-stapled shoddy and mungo.⁴ Manufacturers of the staple heavy cloths such as pilots and witneys typically used a heavy over-swung power loom running at a slow speed of between 50 to 60 picks per minute (a measure of the number of weft threads) to provide the least possible strain on the warp thread and to give a good weft.⁵ In the fulling or felting operation, cloths with a large proportion of shoddy and mungo milled easily to begin with but thereafter somewhat more slowly than all-wool goods, and, an important characteristic for manufacturers of low goods utilising large quantities of cotton mixed with shoddy, the width frequently increased rather than decreased when undergoing this process.⁶

1. For a description of the processes involved in the manufacture of woollen cloth in ca. 1858, see Baines, loc. cit., pp. 71-73.

2. McLaren warned of the diseconomies of spinning beyond the capabilities of a blend, advising the use of better material mixed in the proper proportions with recovered wool to produce a yarn as inexpensively as one from cheaper materials producing greater waste (p. 186). It was fairly common for manufacturers in the low woollen trade to rely on the spinning department for their profit. D.R.H. Williams, Costing in the Wool Textile and other Industries, (1946), p. 76.

3. A.F. Barker, Textiles (New York, 1919), p. 139.

4. J. Zipser, Textile Raw Materials and their Conversion into Yarns (1921), p. 439.

5. ca. 1878, Committee on Industry and Trade (1928) op. cit., III, p.167. Baines gave a typical speed of 40 to 48 picks per minute in ca. 1858 for power weaving of broadcloth (loc. cit., p. 71); The Wool Year Book (1921), op. cit., p. 320. The warp threads were frequently dressed with animal or vegetable size to ensure strength in the weaving process.

6. *ibid.*, p. 389.

There were, however, a number of developments and innovations introduced in the West Riding woollen textile industry with important implications on both the quality of cloth produced containing recovered wool and the rapid way in which these fibres were utilised from the 1850s.

It seems fairly clear that in the manufacture of shoddy, an operation which, as previously mentioned, was commonly carried out as a subsidiary process in West Riding woollen mills until ca. 1850, the standard of supervision in rag grinding was frequently poor.

The descriptions of rag grinding by Head (1835) and Baker (1836) indicate that this process was typically performed by juveniles between the age of 12 and 15, strongly suggesting that the attention given to feeding early rag machines was of a rudimentary nature, a practice not conducive to the production of high-quality shoddy free from 'bits' and with a relatively undamaged staple.¹ The Gill Royds Company, for example, specified in 1836 that

'... no ground rags ... be scribbled except all the small pieces of cloth are previously taken out.'²

By 1842, technical improvements in the construction of the rag machine together with a more adequate appreciation by many manufacturers of the potential of well-pulled material had ensured that supervision of the loading and feeding operations was under more expert guidance, a development reinforced by the establishment of independent shoddy manufacturing firms.³ The later introduction of mungo in 1836 and its rapid price ascendancy over shoddy would seem to suggest that although

1. G. Head, op. cit., p. 146; Reports of the Inspectors of Factories, P.P. 1836 (353), XLV, 221.

2. Gill Royd Mills Company, loc. cit., Committee Book Jan 1835-Feb 1861.

3. L.M., 19.3.1842. Writing of the period before 1850, a West Riding manufacturer observed that the manipulation of 'shorts' (i.e. fibres other than pure wool) 'was very imperfectly understood' (T.M., 15.12.1879, p. 427).

the quality of the Yorkshire manufactured product was not to reach continental standards until after Rhodes' rag machine patent of 1862, the greater attention paid to mungo rag grinding was superior to that in many vertically integrated woollen mills in the early years of shoddy manufacture.

Between 1820 and 1850 great strides were made in perfecting the initial blending and willeying of recovered wools with new wool, Jubb observing in 1860 that

'Twenty or thirty years ago, it was common practice for the weavers and spinners to be called from their proper occupations to assist in 'blending' ... without any remuneration excepting a largess of beer ... thus these men had not such a direct interest ... or aptitude ... to enable them to do it well'.¹

Progress in the carding operation however, appears to have been gradual, for as late as 1860 Jubb could note, as did other authorities, that the replacement of the slubbing billy by the powered condenser for shoddy cloth production was rare as the machines were not 'well adapted to any but long wools'.² By the 1880s West Riding manufacturers had so improved this process that a visitor was told when observing a shoddy blend at a Pudsey mill,

'How could this job be done at all without a condenser? There is not a bit of pure wool in it, and no man on earth could card this blend so as to make a good yarn.'³

1. S. Jubb (1860), op. cit., pp. 60-61.

2. S. Jubb (1860) op. cit., p.62; W.R., 18.4.1912, p. 4. The application of Apperly's patent feeder and condenser, which made the scribbling, carding, and slubbing operations a continuous process in woollen cloth manufacture, was said to have been of 'comparatively recent introduction' in 1868 (Chambers' Encyclopaedia (1868) op. cit., X, p. 265). The difficulties of producing a good slubbing from blends containing a large proportion of 'fud' and ragwool without incurring additional labour costs is clear from the Gill Royds Company 'Committee Book' in the late 1830s and early 1840s.

3. J. Lawson, 'Progress in Pudsey During the Last Sixty Years' (1887), E. Baines, loc. cit., pp. 187-88.

The slow progress of mechanisation in the woollen branch of the West Riding industry prior to ca. 1850 is well known and received much contemporary comment.¹ Buckman sees the late response by the Leeds trade as 'due to resistance on the part of labour rather than to the lack of perception of opportunity by mill owners', whilst Philpott questions the orthodox explanation of a lack of new inventions and suggests that constraints in the supply of raw material was the major reason prior to 1850.² Although these factors were undoubtedly of some influence the most acceptable explanation would seem to be that given by Baines in 1858

'... woollen yarn, both for the warp and weft, is spun into a much feebler, looser, and less twisted thread, than other kinds of yarn.'³

Thus, yarns containing large proportions of short-stapled shoddy and mungo were even less capable of being submitted to the strains imposed by power looms.⁴ The introduction of cotton warps in the worsted trade in 1837 and their spread into the woollen branch in the manufacture of cotton-warp/wool weft 'union' cloths provided the major stimulus in the substitution of hand loom weaving by power loom weaving in the

1. The Select Committee on the Exportation of Machinery (P.P. 1841 (400), VII, 1) noted that because the woollen branch was still a 'domestic industry', the export of woollen machinery was considered unimportant. Writing on the 1855 Paris Exhibition, the Leeds Intelligencer observed '... it is notorious that somehow or other the woollen manufacturers are behindhand in the general march of improvements', particularly in the use of steam powered machinery and factory organisation (22.9.1855). See also Reports of the Inspectors of Factories (P.P. 1856 (2031), XVIII, 275) for Redgrave's comments on the relatively more advanced state of the French woollen cloth industry, especially in the 'early use' of the powered condenser in place of the slubbing billy.

2. J. Buckman, 'Later Phases of Industrialisation, to 1918', M.W. Beresford and G.R.J. Jones (eds.), Leeds and its Region (Leeds, 1967), p. 157; B.P. Philpott (1953), op. cit., p. 33.

3. E. Baines, loc. cit., p. 70.

4. J.R. McCulloch (1834), op. cit., p. 661. He noted that 'no power looms are employed in the manufacture (of shoddy cloth)'.

Heavy Woollen District, although the process of change was to span a period of approximately 20 years from the early 1850s.¹ The 1851 census indicates a small number of power loom weavers in the mills of Batley and Dewsbury, a situation which had changed significantly by 1861; the firm of J.T. & J. Taylor of Batley, for example, had installed their first power looms by 1856.²

A manufacturer, writing in 1879, noted that the period 1850 to 1865 saw 'the most marked progress' in the adoption of power machinery in the West Riding woollen trade - the addition of Tatham's 'hopper feed' to the scribbler, Blairmire's feed for the carder, the self-acting mule, and looms capable of weaving 'every variety of cloth imaginable' enabling the processing, spinning, and weaving of very 'low' materials.³ These technical improvements not only provided manufacturers with the means to utilise fully the potential of recovered wools but also contributed to a significant reduction in labour costs in all operations, as indicated by Table V(vii). Indeed, a Yorkshire manufacturer 'of great experience' claimed that the large number of patented improvements made to woollen machinery in the late 1870s ranked second or third place amongst all textile patents taken out and confidently asserted that

1. Jubb was quite certain of this; 'Cotton warps and power looms have gone hand in hand: the use of both have been simultaneously developed, which is accounted for by the fact that they are well adapted to each other'. S. Jubb (1860), op. cit., p. 57. See also, E. Baines, loc. cit., p. 110; J.H. Clapham (1906) loc. cit., p. 517. Domestic weaving of shoddy cloth continued to be important. See H. Mayhew (1851) op. cit., II, p. 35; J. Sykes, Slawit in the Sixties (1926), pp. 95-96.

2. C.P.E.N., Batley and Dewsbury 1851, 1861, op. cit.; J.T. & J.T. MSS., loc. cit., Wages Book April 1856-June 1857.

3. T.M., 15.12.1879, pp. 427-8. 'Most of these improvements were not generally adopted till 1857, and not until 1870 in some places ...'. The piecing machine (a large billy known as the 'horse') was introduced in this period superseding the old slubbing billy, but was replaced after a short time by the condenser.

TABLE V(vii)

Comparison of wages paid in the manufacture of
60 yards of cloth, 1847 and 1879.

	£	s	d
<u>1847</u> Wool scouring, willeying and fettling for 240 warters* (or 1,440 lbs. of yarn in the bobbin)	2	0	0
Overlooking for same	1	0	0
Fillers for scribbler and carder	1	1	0
Hand billy-piecers	1	4	0
Slubbing for same	3	0	0
Spinning	6	0	0
Weaving 60 yds. of cloth		15	0
	<hr/>		
	£15	0	0
	or 2½ ^d per lb.		
<u>1879</u> Scouring, willeying and fettling for same	1	4	0
Overlooking		10	0
Superintending the 'feeds'		12	0
Spinning (self-acting mules)	1	15	0
Weaving 60 yds. of cloth by power looms, tuning and beaming etc.		10	0
	<hr/>		
	£ 4	11	0
	or ¾ ^d per lb.		

Source: T.M., 15.2.1879, p. 428.

* 1 wartner = 6lbs.

'Yorkshire may be said to contain the best carding machines in the world, both as regards efficiency and production; and for most grades of work, whether all wool or mixed with shoddy, such a set of machines ... has not been surpassed'.¹

Those innovations making the most important contribution to the rapid growth in the manipulation of recovered wool in the West Riding in the period ca. 1870 to 1914 within the general context of technical development in all processes in the woollen branch were the Blairmires (or Blamires) feeding mechanism and the 'Scotch' feed whereby the rovings were prepared for the second card and condenser, and which were, by 1886, in 'popular' use.² In the weaving section, the adoption in the 1880s of the Dobcross in place of the Danby loom provided manufacturers of heavy woollens with a 60 to 85 or 90 inch loom specially adapted to weaving cloths from tender yarns and which was to remain, with modifications, a standard item of equipment in the Heavy Woollen District for the period to 1939.³

1. T.M., 15.1.1880, p. 15. He was somewhat critical, however, of the ability of overlookers to exploit more fully the capacity of modern carding machines. Bryden and Wilkinson's patent of 1878-9 for new carding arrangements for blending and blowing was among one of the more important innovations, saving a claimed 40-50 per cent of labour costs. E. Sigsworth, 'History of the Local Trade at Morley', Journal of the Textile Institute, 40, 10, 1949, p. 967.

2. W. Smith (1886), op. cit., p. 289; Industries of Yorkshire (1890) op. cit., III, p. 85; H. Spibey (ed.), The British Wool Manual (Buxton, 1968), p. 168. An advertisement for Blamires 'patent feeding machine for condensers' of 1876 claimed that it was 'adapted for delicate mixtures of short material; is a great improvement upon the Scotch feed; (and) is designed to work material in imitation (as nearly as possible) of worsted yarn.' (H.E., 1.1.1876). By ca. 1908 it was common practice to use the Scotch feed for finer qualities of material of less than 100 yards per ounce, the Blamires feed being used for heavier qualities (W.A.G. Clark, op. cit., p. 108).

3. ibid., p. 111; A.F. Barker op. cit., p. 228; Ossett and its Industries, op. cit., p. 24. The Dobcross loom appears to have been a development of a number of patents of loom makers Hutchinson, Hollingworth, and Knowles from ca. 1874, the firm subsequently changing its name to Dobcross. The loom was commonly run at between 80 to 105 picks per minute (p.p.m.). It should be noted, however, that higher loom speeds in the manufacture of low woollen cloth did not necessarily result in increased production, the tenderness of some woollen warps (containing up to 100 per cent recovered wool) actually assisting in the production of more cloth if the loom was run at 80 p.p.m. than at 105 p.p.m. Cotton warps allowed higher speeds of between 110 to 120 p.p.m.

CHAPTER V

IV - ca. 1813-1870.

There would seem little doubt that the high price of domestic wool experienced in the first two decades of the nineteenth century, particularly the short run peaks of 1809-10, 1813-15, and 1818, provided the initial impetus to the introduction of wool recovered from old blankets and loosely-woven garments as a low-cost substitute for virgin wool.¹ In 1812, Abraham Rhodes, partner in a Leeds merchanting and manufacturing firm had complained that the rise in price of low woollen cloths of about 50 per cent had resulted in a scarcity so severe that there were 'hardly any to be had for money'.² Seven years later, a petitioner before the Wool Tax Committee, in what appears to be the first recorded reference to the use of shoddy in the West Riding, noted that

'Such was the demand for coarse wool, that old coats are sent to the mills in great numbers, to be torn and worked up again'.³

Competition in the North American market was said to be so intense that an increase in the cost of cloth of 6^d a yard (or 5 per cent on cloth selling at 10^s/- per yard) was sufficient to stimulate the substitution of British by foreign low woollen goods, and that in an effort to mitigate the low quality and high price of domestic coarse wool, the import of cheap foreign wool by the industry had risen to one third of all imported wool between 1815 and 1819.⁴ In certain types of low

1. J. Bischoff (1828) op. cit., p. 96; J.H. Clapham, An Economic History of Modern Britain (Cambridge, 1938), II, p. 38; R.M. Hartwell, op. cit., p. 98; F.J. Glover (1961) loc. cit., p. 14.

2. R.G. Wilson, 'Fortunes of a Leeds Merchant House, 1780-1820'; R.H. Campbell and R.G. Wilson (eds.), Entrepreneurship in Britain 1750-1939 (1975), p. 62.

3. Examination of Petitions before the Privy Council against the Tax on Wool imported, P.P. 1820 (56), XII, 76.

4. *ibid.*, 78, evidence of Bischoff and Gott. This did not imply that it was necessarily of low quality, as was the case in 1838-40.

woollens, particularly the heavy well-fulled flushings and duffils characteristic of Batley, Dewsbury, and the surrounding villages,¹ the proportion of cheap foreign wool entering the blends alongside domestic wool had reached nearly 50 per cent as the price of South Down and Highland wool rose to 30^d and 10^d a lb. in 1818.

By 1828, however, reasons other than the price of domestic clothing wool, which had declined almost continuously since 1818, were being debated before the Lord's Select Committee. This was the concern of domestic short wool growers that increasing imports of low foreign wools were primarily responsible for the low prices offered by woollen manufacturers for their fleeces. This reflected two major developments; the trend towards increased carcase weight characterised by the long-woollen sheep and the relative decline in number of the finer short-wooled varieties, a movement which had favoured the supply position of the growing West Riding worsted trade since the late eighteenth century.² Secondly, the increasing proportion of domestic clothing wool which was of such poor quality that many manufacturers of low woollen cloths had been obliged to meet their requirements from overseas sources. It seems clear from the evidence of Batley, Dewsbury and Leeds manufacturers, Cook, Gott, Nussey, and Varley, that although shoddy was seen as an important cost reducer when substituted for the coarser qualities of domestic wool, it had also come to be regarded as a supplementary fibre indispensable in the manufacture of certain low cloths. Nussey, for example, pointed out that in manufacturing calmucks and duffils

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1. J. Bigland, The Beauties of England and Wales (1812), XVI, p. 768.
 2. E. Parsons, The Civil, Ecclesiastical, Literary, Commercial, and Miscellaneous History of Leeds ... Dewsbury, Otley ... and the Manufacturing District of Yorkshire (1834), II, p. 199. Parsons notes that in ca. 1815-20 it was claimed that the fleece comprised about one fifth of the total value of a sheep. R.M. Hartwell, op. cit., p. 38; K.G. Ponting (1961) op. cit., p. 143.

' ... this Scotch Wool would not make a close-bottomed cloth without those rags. The goods fetch a better price by the use of a proper proportion of Wool made from rags, a better article being produced both for appearance and wear ... these goods could scarcely be produced without the use of Wool made from rags, and certainly not at equal prices'.¹

The low price level of laid Cheviot and Highland wool between 1826 and 1830 (Price series, Appendix V-I) would seem to confirm Nussey's contention that, irrespective of price, the quality of the coarse wools was such that certain heavily-milled cloths, for example calmucks, which comprised an estimated 38 per cent of the manufacture of low cloths, could not be made without the admixture of shoddy.² The proportion of shoddy mixed with wool, probably Down wool selling at two to four times the price of 'common' shoddy ($2\frac{1}{2}^d$ lb.), was stated by Varley to be 50 per cent in 'low duffils' and was used in varying amounts in the manufacture of other low goods such as strouds, flushings, druggets, bearskins, blankets, and carpets.³ Two important points were made by the manufacturers from the Heavy Woollen District. Firstly, that a degree of complementarity existed between ragwool and English wool to the extent that 'there would be no English wool called for' unless shoddy were used in the manufacture of many low goods.⁴ Secondly, that cheap cloths containing shoddy, of which approximately one third or more were exported,⁵ had become very successful in overseas markets such as Germany, Flanders, and North America, for, as Varley observed

'If we had not these (duffils) at so low a price, the Foreigners would work up their own wool, as it was in 1820, 1821 and 1822. In 1822, when the prices got low, we began to meet it in competition, and now we can beat them in almost every article.'⁶

1. Select Committee, P.P. 1828 (515) VIII, 699.

2. ibid., 699.

3. ibid., 592.

4. J. Bischoff (1842) op. cit., p. 182. Evidence of Gott.

5. Select Committee, op. cit., 699, Nussey.

6. ibid., 593. See also Cook (863), Nussey (699) and Hubbard (658). The duty on foreign wools had been reduced to $\frac{1}{2}^d$ per lb. for those valued under 1s/- lb. and 1d per lb. for those exceeding 1s/- lb. from 1825. Colonial wools were admitted free of duty.

The American tariff 'abomination' introduced in June 1828 represented a formidable barrier to Yorkshire manufacturers, duties being increased from 33½ per cent to 45 per cent ad valorem on woollen cloth, except on the cheapest cloths invoiced at under 50 cents a square yard.¹ West Riding manufacturers at the low end of the market were quick to respond with the device of the 'minimum valuation' whereby the invoice price was based on the average price of the pieces comprising each bale, and, with close attention paid to manufacturing costs, the trade in cloths under 50 cents and those in the 51 cents to one dollar per square yard range rapidly reached 'large quantities'.² It would seem unlikely that the success and dominance of the West Riding in the American market for cheap cloths until the Morrill Act of 1861 could not have been achieved without the marked cost reductions made possible by the use of shoddy.³ It can only be assumed that domestic American manufacturers were unable to meet Yorkshire in neither price nor quality in these low goods, for although the first American 'shoddy mill' (i.e., vertically-integrated woollen mill) was recorded as early as 1831 in Ulster County, New York, the use of recovered wool in the United States was of

1. *ibid.*, 751. H. Heaton, 'Yorkshire Cloth Traders in the United States 1770-1840' in Thoresby Society, Miscellany, 1941, p. 275. Also excluded from the tariff rise were blankets and worsteds.

2. *ibid.*, p. 275.

3. Varley stated that labour costs represented about 5^d per lb. of wool manufactured in cloth, which was proportionately higher for low cloths than fine cloths. J. Bischoff (1842) *op. cit.*, p. 193.

insignificant importance until the outbreak of the Civil War.¹ Nevertheless, although the United Kingdom share of American wool textile imports fell from 95 per cent in the early 1820s and 80-85 per cent in 1830 to 77.5 per cent in the period 1869-1881, West Riding blankets and low cloths still constituted an important element of all imports to 1861, when the domestic American woollen industry began a rapid programme of expansion reinforced by the additional protective measures of the Wool and Woollens Act of 1867.²

There appears little of the 'shamefaced' attitude to the use of shoddy in the replies of the West Riding manufacturers Cook, Gott, Nussey, and Varley to the 1828 Select Committee - whilst Cook and Nussey used a certain proportion in their mills, Gott and Varley customarily bought their low cloths from small clothiers and the cloth halls for subsequent finishing to supplement their range of cloth sold in export markets.³ Several factors would seem to suggest why their position changed in the 1830s and 1840s, for both Gott and Cook

1. The 1828 Committee of the House of Representatives, responding to the wishes of the New England woollen manufacturers protective association for higher duties, was informed that 'the American manufacturer could produce at as low prices as the English if he could obtain his wool at as low prices as his foreign competitor'. Cloths of the calmuck, flushing, and witney type were conspicuously absent from a list of the principal goods manufactured by the New England mills submitted to the Committee (F.W. Taussig, Protection to Young Industries (Cambridge, Mass., 1883), pp. 45-46). V.S. Clark (op. cit., I, p. 571) suggests the reasons for the late introduction of shoddy in the United States - (i) technological - the type of textile machinery in use, (ii) the high cost of labour, and (iii) the 'sensitiveness of home buyers to impositions by local factories prevented the saving thus effected from compensating higher manufacturing costs and risk to market reputation'. He also makes the (unsubstantiated) claim that 'shoddy machines were invented in this country, and the manufacture was not difficult to introduce from abroad' (p. 571).

2. A.H. Cole, op. cit., I, pp. 336-47. This was also encouraged by the cheap wool tariffs of 1833-1842.

3. Factories Inquiry Commission, First Report, P.P. 1833 (450), C1, 124. Evidence of Hopps. Although there is little doubt that Cook was later to cease using shoddy, Glover's assertion that 'during Thomas Cook's lifetime the partners would have nothing to do with shoddy at Dewsbury Mills' would not appear consistent with Cook's evidence before the Select Committee in 1828. F.J. Glover (1959), op. cit., p. 574 and (1961) loc. cit., p. 15.

firmly disassociated themselves from the use of shoddy in this period. Although it is clear that fustian and cotton textiles had captured approximately two thirds of the domestic mass clothing market by 1828 and were to retain their dominant position until the 1860s, the price relative between cotton and shoddy (and mungo from 1838) provided manufacturers of coarse woollen cloths with an important competitive edge with which to begin to challenge this supremacy.¹ There was, however, a powerful incentive to substitute shoddy for wool in the manufacture of coarse woollens as manufacturers, faced by a general increase in wool prices from 1827, had to additionally contend with rising consumption by continental mills of their own wool and deficient supplies of domestic wool because of recurring sheep rot in the 1830s.² Complaints were voiced in the West Riding press, particularly in the active trading conditions of 1836, and again in 1838, of inadequate supplies and high prices.³ Noting the inelasticity in the supply of wool as growers gave primacy to the demand for mutton, a trade commentator observed that the rise in the price of wool was limited 'only (by) the power of the consumer, or the comparative cheapness of other fabrics'.⁴ By September 1838 the 'notoriously' high price of domestic wool was threatening to 'compel the manufacturers to raise prices by a full five per cent', a prediction fulfilled in November as the price of coarse cloths reached record levels.⁵

1. J. Bischoff (1842) op. cit., p. 178. Evidence of Hubbard; Select Committee on Agriculture, P.P. 1833 (612), V, 128; G.R. Porter (1836) op. cit., I and II, pp. 202-3.

2. Report from the Select Committee on Manufactures, Commerce, and Shipping, P.P. 1833 (690), VI, 70. Evidence of Henry Hughes. German wool had advanced from 16^d / 19^d lb. in 1827 to 28^d / 31^d in 1833; Report on Wool Marketing in England and Wales (1926) op. cit., p. 10.

3. The Leeds Mercury in 1836 noted the 'continued extravagant price of English wool'. 16.1.1836, 3.2.1838.

4. *ibid.*, 3.2.1838.

5. *ibid.*, 1.9.1838, 10.11.1838.

Thus, the growth in use of recovered wool in the West Riding between the 1820s and 1840 would seem to have been strengthened by three major factors. Firstly, the need to meet high tariff barriers and foreign competition in North American and other overseas markets, a challenge which West Riding manufacturers appear to have faced remarkably successfully. Secondly, the fluctuating and adverse conditions in the quality, supply, and price of domestic wool, which, as the trade writer 'Mercurius' observed in 1835

' ... paralyses manufacturing operations betwixt the seasons of principal demand and induces anxious and almost breathless haste during seasons.¹

Thirdly, the relative price levels between cotton and shoddy (and mungo from ca. 1836) enabling the manufacturers of very low cloths to achieve marked cost reductions in the home market.² Reinforcing this trend was the growing elasticity in the supply of both domestic and foreign rags, particularly after 1836, and the very real relief this cheap raw material offered to the smaller manufacturers typical of the Heavy Woollen District who, unable to finance large stocks of wool at lower prices, were forced to buy from the staplers at increasing prices in times of inadequate supply.

Qualitative changes in the types of cloth using recovered wool began to manifest themselves, partly in response to changing tastes in domestic and overseas markets, but principally following the successful innovation of mungo by Parr in 1836. Thomas Taylor, for example, was selling considerable quantities of flushings in blue, olive, brown, and drab for export through his brother's merchanting

1. Leeds Mercury, July 1835, quoted in H. Heaton, 'An Early Victorian Business Forecaster in the Woollen Industry', Economic History, II, 1930-33, p. 56.

2. This was, however, a slow process. The Select Committee on Agriculture was informed that fustian was approximately half the price of woollen cloth and agricultural labours could not 'afford to wear their own native wool'. P.P. 1833 (612), V, 128.

house in Manchester in 1835; by 1840 single milled and fine-faced blue pilots predominated in the blend and finishing books, reflecting Taylor's response to the trend noted by a trade commentator in 1838 that 'pilots and beavers are especially in request.'¹ Colour preference was also changing, single milled cloths in woaded blacks, blues, and greens being in brisk demand both on the home market and in the United States, whilst olives and browns had become 'an extinct article in the catalogue of national wants'.² By 1840, with the exception of special Admiralty orders for flushings, Taylor's staple Batley goods of flushings, druggets, and paddings made with varying proportions of shoddy had given way to the superior finished fine mungo mixtures.³

The 1830s, as Heaton has observed, saw the emergence of Yorkshire woollen cloths as direct competitors not only with the finest West of England products but also in the low and medium price range, where the ability of West Riding manufacturers to mix proportions of good wool with recovered wool in imitation of more expensive cloths was beginning to be felt.⁴ Hughes, the Blackwell Hall wool broker, explained to the 1833 Committee on Manufactures, Commerce, and Shipping that

'... the reason why the Yorkshire manufacturers have stolen a march upon the West of England people is that they have found the means of manufacturing cloth through the present facility of machinery to appear something like the West of England cloth at a great deal less price, but not so good in quality and substance.'⁵

1. J.T. and J.T. MSS., loc. cit., Mill Book 1835-1843, Finishing Book 7.1.1839-16.6.1858; L.M. 4.8.1838.

2. *ibid.*, 1.12.1838.

3. The directory classification for Dewsbury and Batley reflected this change, albeit somewhat more slowly. The classification of 'Flushing, padding and drugget manufacturers' of 1837 (White) and before had become 'Flushing, drugget manufacturers' in 1841 (Pigot) changing to three sub-divisions under the heading of 'Woollen manufacturers', none of which specified flushings or druggets, in 1847 (White).

4. H. Heaton (1933), loc. cit., p. 572.

5. P.P. 1833 (690), VI, 72. In 1844 Dodd observed that 'the previous reputation of Yorkshire cloths as being coarser and cheaper' was no longer true. G. Dodd, The Textile Manufactures of Great Britain (1844), p. 87.

Certainly, by 1840, confidence in this ability to meet competition in the home market was such that the Board of Trade Select Committee on Import Duties noted that it had received no request from woollen manufacturers for protection.¹

Evidence suggests, however, that the rapid growth in the use of shoddy in the 1820s, and particularly in the 1830s,² was exploited by a number of manufacturers seeking to maximise short-run profits by supplying both overseas and domestic markets with goods of inferior quality, as a manufacturer candidly admitted in 1889.

'There can be no doubt that at first the goods which were composed of wool and shoddy were represented as pure woollens, and fortunes made on that representation.'³

Whilst Sutcliffe had hotly denied Legge's allegation, re-stated in the questions of the 1828 Select Committee, that woollen rags were worked up in goods 'to sell rather than to use', it seems clear that the generally buoyant demand of the 1830s together with high wool prices and public ignorance tempted some manufacturers to adulterate their cloths with excessive amounts of shoddy, much of which was of a poor quality.⁴ Undoubtedly only too aware of this development, manufacturers such as Gott and Cook underwent a volte-face from their previous acceptance of shoddy as a legitimate raw material in the manufacture of cheap blankets and cloths to one of outright opposition

1. P.P. 1840 (203) X, 11.

2. Baker described Dewsbury in 1836 as 'entirely employed in the manufacture of shoddy cloths and blankets'. Reports of the Inspectors of Factories, P.P. 1836 (353), XLV, 221. See also William White (1837) op. cit., 'this trade has become extensive, especially at Batley and its neighbourhood' (p. 50).

3. T.M., 15.5.1889, p. 217.

4. P.P. 1828(515), VIII, 636. Examining a sample of a blanket submitted to the government by competing manufacturer Jeremiah Carter of Ossett, Cook observed to his London agent in 1838 'but you will note in his weft there is not only worsted garments not fully pulled up, but actual shoddy torn from flannels and stockings ... he will, if the goods pass, make a fair profit - the weft wool would not make our common Witneys'. Quoted in F.J. Glover (1959) op. cit., p. 703.

in the late 1830s and 1840s.¹ The well-publicised criticisms in 1842 of Busfeild Ferrand, Tory M.P. for Knaresborough, against the 'frauds of manufacturers' and, particularly, those using shoddy or 'devil's dust' was not without some justification, and did little to enhance the reputation of West Riding cloths in the period to 1860.²

The depression following the short-lived trade revival of 1838 hit the Heavy Woollen District with varying intensity. Although unemployment amongst weavers and blanket manufacturers in Dewsbury was rising in 1840, the Leeds and Huddersfield trades were enjoying 'ready sales' especially in the new styles of fancy woollens of checked design.³ An innovation of 1842 met with 'much excitement and alarm' by both manufacturers and operatives in the West Riding clothing districts who saw their livelihoods threatened by a felting process which claimed to replace the spinning and weaving operations by utilising the well known felting properties of wool.⁴ Whilst Jubb saw this innovation as 'predicating ill to the shoddy manufacturer', a trade commentator in 1875 took a different view

'Some believed that ... new wool only could be used in this process and shoddy could not, the shoddy workers taunted the workers in pure wool "YOUR occupations are doomed, but shoddy is our saving element".'⁵

Although the new felting process was claimed to have been but a 'nine days wonder' it appears to have adversely affected a small number of manufacturers producing tailor's paddings and very low-priced cloth for carpet underlays which might otherwise have been fabricated by

1. F.J. Glover (1961) loc. cit., p. 15; H. Heaton, 'Benjamin Gott and the Anglo-American Cloth Trade', Journal of Economic and Business History, II, 1, Nov. 1929, p. 162. This policy was continued after Gott's death in 1840. Other manufacturers, such as John Nussey of Carlinghow New Mill in Batley, a competitor of Cook, continued to use shoddy. Batley Valuation Book, 1837, loc. cit.

2. This is discussed more fully in the following chapter.

3. L.L., 19.12.1840.

4. S. Jubb (1860) op. cit., p. iii. This process appears to have been innovated by the well-known but failed manufacturer William Hirst, who was attempting to raise £8,000 capital to develop his 'patent Felted cloth' from readers of the Northern Star (2.7.1842).

5. T.M. 15.9.1875, p.361.

conventional methods.¹

Of crucial importance to the development of the West Riding low woollen trade in the difficult period to 1850 was the introduction of the cotton warp in ca. 1838 and the potential it offered combined with the use of short-stapled mungo in the new finer pilot-type cloths. Shoddy, being pulled from knitted or loosely-woven fabrics composed of the longer-stapled but coarser wools, tended to exhibit variable felting characteristics which were easily accommodated by manufacturers of coarse druggets, flushings, or Huddersfield 'tags'. Mungo, on the other hand, was pulled from new and worn cloths containing best quality fine felting wools, and the resultant shortness of staple necessitated by the force needed to separate the fibres impaired only marginally these felting characteristics when mixed with Port Philip merino wool.

The innovation of both cotton warps and mungo was taken up with particular enthusiasm by Morley manufacturers in the closing years of the 1830s following the successful breakthrough achieved by Parr and Morely woollen manufacturer John Watson between ca. 1834 and 1836.² The

1. *ibid.* Baines noted in 1858 that the felting process, located mainly in Leeds, promised 'considerable extension' in the manufacture of low druggets, horse-cloths, table cloths and boiler-coverings, some of the fabrics being 'handsomely printed'. The limitations of this process, however, were such that it presented little competition to manufacturers of low apparel cloth. E. Baines, *loc. cit.*, p. 102.

2. E. Law (1880), W.T.W., 19.7.1913, p. 19; W. Smith (1886) *op. cit.*, p. 157. Smith cites Hodgson as the first innovator of cotton warps in 1838 (p. 305), but they had been used in the manufacture of Rochdale woollen baize and flannel as early as 1828. A.P. Wadsworth, 'The History of the Rochdale Woollen Trade', Transactions of the Rochdale Literary and Scientific Society, XV, 1923-25, p. 108.

ability of Morley goods to compete with finer all-wool cloths in the depressed period to 1848,¹ when falling incomes, unemployment, and an ascendant worsted industry (itself using cotton warps) was severely felt by all but the high quality woollen cloth manufacturers, was later seen as a 'turning point' in the recovery of Morley from the depression of 1838-1842.²

A comparison of the estimated consumption of shoddy and mungo with that of the estimated clean weight of wool consumed in the United Kingdom in the period 1800-1870 (Table V(viii)) suggests the extent of use of recovered wool in the first early growth phase between 1830 and 1844. Column (c) expresses the proportion of shoddy and mungo consumed (i.e., retained domestic production and net imports) as a percentage of all woollen fibres consumed (clean weight) and column (d) indicates the percentage by which recovered wool augmented retained supplies of pure wool. Ironically perhaps, in view of the subsequent importance of shoddy and mungo, the quantitative significance of recovered wool at the time of the much-publicised criticism of 'Devil's dust' by Ferrand and others in 1842 was not large when compared to the total input of virgin wool to the domestic industry, a point much emphasised by the Leeds Mercury, under Baines' editorship, at the time.³

The marked increase in estimated consumption of recovered wool in the period 1845-1854 reflects to some extent problems in the domestic supply of the lower qualities of clothing wools as well as relative

1. Reports of the Inspectors of Factories, P.P. 1840 (218,261), XXIII, 27, 1847-48 (900), XXVI, 105. Between 1838 to 1840 the high price of food and the 'inability of the mass of our population to purchase their usual quality clothing' had forced manufacturers to dump goods in foreign markets (L.M., 12.2.1842). A marked decline in demand for low woollen goods in favour of medium and fine quality in 1845 very probably reflected further pressure on working class disposable incomes and a rise in those of the middle classes (L.M., 22.3.1845).

2. Whereas the increase in output of Yorkshire woollen cloths was suggested to have been 40 per cent between 1836 and 1847, worsted stuffs had increased by 74 per cent. Reports of the Inspectors of Factories, P.P. 1847-48(900), XXVI, 134. G. Wood, The story of Morley (1916), p. 233; S. Jubb (1860) op. cit., pp.125-26; W. Smith (1886)op. cit., p. 305. 3. L.M., 19.3.1842.

TABLE V(viii)

Estimated United Kingdom consumption of shoddy and mungo
and wool fibres, 1800-1870. (000's lbs.)

Year	(a) Shoddy & Mungo retained	(b) Total Clean Weight of wool, mohair etc. & shoddy & mungo	(c) (a) as a % of (b)	(d) (a) as a % of clean wool
Av. 1800-19	500	87,400	0.6	0.6
1820-24	1,000	106,300	0.9	1.0
1825-29	2,500	113,900	2.2	2.2
1830-34	7,000	124,000	5.7	6.0
1835-39	10,000	138,600	7.2	7.8
1840-44	10,000	143,300	7.0	7.5
1845-49	20,000	160,700	12.5	14.2
1850-54	30,000	185,000	16.2	19.4
1855-59	52,000	217,900	23.9	31.3
1860-64	66,000	263,100	25.1	33.5
1865	79,000	290,100	27.2	37.4
6	83,000	320,400	25.9	35.0
7	71,000	300,500	23.6	31.0
8	75,000	317,600	23.6	31.0
9	74,000	302,800	24.4	32.3
1870	75,000	320,600	23.4	30.5

Sources: (a) Chapter III, Appendix I, Table III-I(f).

(b) and (d), v. supra Table V(vi).

price levels between wool and shoddies. In 1842 a trade source drew attention to the large increase in importation for home consumption of low quality wool (subject to the lower duty of $\frac{1}{2}^d$ per lb.), particularly in the period 1838-1840 when such wools comprised approximately one third of wool retained compared to one twelfth in 1821-1823 and one ninth between 1829 and 1831.¹ By 1844 one writer could observe that English wool was rarely encountered in the manufacture of woollens, the best German wools being used for fine cloths whilst the majority of manufacturers were using Australian wool, the importation of which doubled between 1836 and 1839 to over ten million pounds and had doubled again by 1845-1846.² With the worsted industry accounting for an ever-increasing proportion of domestic 'long' wool and experiencing worsening supply constraints in the 1850s, it would appear that manufacturers of low woollens were progressively relying on an increase in the supply of recovered wool, particularly with the trade revival commencing in 1848.³ The third major growth period, from 1855 to 1870, emphasises this trend, the estimated proportion by which recovered wool contributed to the retained weight of clean wool fluctuating between 30 and 35 per cent as imports of pulled shoddy and mungo and woollen rags supplemented the rapid increase in domestic rag-pulling capacity.⁴ Indeed, it seems clear that the extent of consumption of recovered wool surprised

1. *ibid.*, 12.2.1842. Accounts of the Quantity of sheeps and lambs wool, subject to a duty of one $\frac{1}{2}^d$ per lb., imported ..., P.P. 1843(280), LII, 345.

2. G. Dodd, *op. cit.*, p. 95; A. Hamilton, *loc. cit.*, p. 504. Saunders, in his report for 1843, was much in favour of increasing the amount of fine foreign wools used in the manufacture of woollens in order to stimulate the demand for English short wool. Reports of the Inspectors of Factories, P.P. 1843(523), XXVII, 374.

3. E.M. Sigsworth (1958) *op. cit.*, pp. 58-62.

4. From ca. 1855 the importation of wool from Germany had been largely substituted by pulled shoddy and mungo although the Board of Trade continued to classify this as wool until 1860. E. Baines, *loc. cit.*, p. 79 and *v. supra* p. 146*n*.

otherwise well-informed contemporaries. Baines, in 1858, informed the British Association that his estimate was conservatively based on the 'judgement of two of the principal manufacturers of Batley' and the Rivers Pollution Commission noted that the 'enormous weight' of shoddy figured in their tables 'conspicuously'.¹

That the attitude towards the use of recovered wools in lower-priced woollens was beginning to change is suggested by response to the exhibits of West Riding manufacturers at the Great Exhibition of 1851. The Jurors' report strongly commended a number of firms from the Heavy Woollen District and Huddersfield- amongst whom were John Jubb, Hargreaves and Nussey, and Oldfield and Co.- on their 'general excellence of manufacture and great ingenuity in the application of new materials', and, somewhat removed from the Parliamentary criticisms of nine years previously, saw shoddy as 'a striking illustration of the adaptive ingenuity of the present day'.²

The ability of Batley and Dewsbury manufacturers to produce cloths with an appearance of quality at low prices, and to maintain or reduce those prices over a long period of time by varying the proportions of recovered wool to wool (for both the warp and weft, or, in the case of union goods, for the weft alone) is suggested by Table V(ix). As far as has been possible, cloths representative of those commonly manufactured during this period have been selected and, from the descriptions appearing in the 'Sold Day Books' and available information on blends, the nearest equivalent cloth of each type has been chosen.³

1. E. Baines (1858) op. cit., p. 104; 1867 (3850). XXXIII, XX.

2. Great Exhibition of the Works of Industry of all Nations, 1851, Official Descriptive and Illustrated Catalogue, II, p. 485; Exhibition of the Works of Industry of all Nations 1851, Reports by the Juries (1852), I, p. 769.

3. v. *infra* Chapter I, Appendix I-II, p. 566 for a list of the more common Heavy Woollen District cloths. The cloths chosen here were those in the price range for which Taylor's sales records indicate the most demand.

TABLE V(ix)

Prices per yard of some West Riding narrow cloths

utilising shoddy and mungo, 1828-1869 (shillings, pence)

Date	Description	Manufacturer	Cost Price (CP) or selling price (SP)	Price per yard*
1828	Drugget	John Nussey	CP	2/3
1834	Pilot cloth	Thomas Taylor	SP	3/9-4/-
1842	Medium pilot	"	"	2/6-3/-
1848	Blue pilot	J.T. and J. Taylor	"	3/- 3/8
	Blue flushings	"	"	2/1
	Logwood Blue pilot	"	"	2/3
1849	" " "	"	"	2/5
	Indigo Blue Super			
	Mungo Pilot	"	"	4/5
1850	Mungo pilot	"	"	3/5
	Logwood mungo (low)			
	Pilot	"	"	2/4
	Blue pilot	"	"	2/4
1851	Black pilot	"	"	3/4
1852	Logwood blue Pilot	Henry Day	"	1/1½
	Blue Pilot	"	"	1/1½
	Brown and white marble	"	"	2/6
	Brown mixed Whitney	"	"	2/6
	Brown Egyptian marble	J.T. & J. Taylor	"	2/4
1853	Pilot	Henry Day	CP	1/9½
	Black Marble	J.T. & J. Taylor	SP	3/10
1854	Logwood Pilot	"	"	3/3½
1855	" "	"	"	2/11-3/4
1859/60	Blue Union	"	"	2/10-3/4
	" " Devon	"	"	4/2½
	Brown Union	"	"	2/11
1860	Blue union pilot	S. Jubb	"	3/-
1865	Blue medium Pilot	J.T. & J. Taylor	"	2/4
1867	Blue/white/black union tweed	Alfred Briggs and Sons	CP	3/3
ca. 1868	Union cloth	"	"	2/2
1869	Low Pilot	(from <u>Huddersfield Examiner</u>)	SP	2/-

* Note - approximately 36 inches wide.

Sources:

- John Nussey - Select Committee, P.P. 1828(515) VIII, 699
- Thomas Taylor - J.T. & J.T. MSS., loc. cit.
Waste Book 31.1.1834-31.12.1851
Departmental Account Book 7.1.1839-16.6.1858
Blend Book 26.7.1846-16.7.1851
Day Book 5.1.1848-31.12.1853
Sales Day Book 23.11.1852-13.1.1865
- Henry Day - H.D. MSS., loc. cit.
Sales Day Ledger 19.1.1848-30.1.1864
Sales Ledger 28.9.1852-20.12.1855
- S. Jubb - (1860) op. cit., p. 47.
- Alfred Briggs & Sons - MSS., loc. cit.
Mill Notebook 1858-1936
- Huddersfield Examiner - 1.1.1870.

Particularly noticeable is the reduction in price achieved by J.T. & J. Taylor in their medium pilot between 1842 and 1865 when the price of all wools as well as shoddy and mungo (see price series and index, Appendix V(1)) were appreciably higher than in 1842.¹ Even allowing for adjustments in quality and specification over time, it is clear that Taylor's were able to achieve significant economies between the two dates - partly by manipulation of the raw material inputs and partly by the economies of scale derived from technological advances in the carding/condensing process and, from ca. 1856, power loom weaving. Day, who was still selling handloom woven cloth to the Leeds firm of Hargreaves and Nussey and local Batley manufacturers until 1854, noted of his low-priced pilot in 1853 that

'This blend is very good, pieces, spins and mills very well...'

indicating that a good cloth could be cheaply manufactured from waste materials using the traditional methods.²

The revival of trade in the Heavy Woollen District commencing in 1848 is clearly reflected by the strong advance in the price of shoddy and mungo and in the coarse 'laid' Cheviot and Highland wools, checked only by the commercial crisis of December 1857. Originating in America, this precipitated a severe depression amongst Batley and Dewsbury manufacturers whose goods had been in great demand following the low tariffs of 1846 and 1857.³ Whilst the fall in the price of shoddy of 23.5 per cent between 1857 and 1858 concurs with Jubb's observation that raw material prices fell by 'upwards of 20 per cent', the

1. v. infra p. 430 where an analysis of blends between 1843 and 1879 is discussed.

2. v. infra Table V(xi). H.D. MSS., loc. cit., Sales Day Ledger 19.1.1848-30.1.1864.

3. S. Jubb (1860) op. cit., p. 133; D.H. Cole, op. cit., I, p. 339.

reduction in the price of mungo was less severe although recovery to the levels of 1857 was delayed until ca. 1861.¹

Trade reports of the 1850s are characterised by comments on the strength of domestic and overseas demand for low woollens, London buyers showing a marked preference for 'cheap lots' and little interest in the better qualities in 1855, whilst Canadian buyers of low woollens, unions, checks, twists, and mixtures, were regular visitors to the Huddersfield Cloth Hall in 1856.² The Leeds Intelligencer however, was critical of West Riding woollen manufacturers, not only in their slow adoption of modern machinery and methods but also of their presentation at the 1855 Paris Universal Exhibition.

'It is a remarkable fact connected with the woollen and worsted trades of England, as illustrated in the exhibition, that while the woollen manufacturers have been content to show their goods in a very slovenly and imperfect manner, the worsted manufacturers have been at great pains to³ make a proper and worthy display of their industry'.

Redgrave, the new Factory Inspector whose district included the West Riding, took a more penetrating view of the Yorkshire industry in his report of the exhibition, observing that whereas the cloths of France, Austria, Prussia, and Belgium 'outshone the less pretending, though no less serviceable, productions in the Leeds woollen district', the supremacy of the cloths from the Leeds area in quality and price was such that 'no foreigners can approach'.⁴ It was in the production of cloth for the mass market, the demand for which had 'given an immense impulse to this kind of manufacture', that the West Riding manufacturers exhibiting in Paris excelled, an achievement gained 'not

1. S. Jubb (1860) op. cit., p. 133, and v. infra Appendix V-I.

2. LM., 25.10.1855; Huddersfield and Holmfirth Examiner, 16.2.1856, 23.2.1856. These were selling at between 1^s/3^d to 3^s/- per yard and black unions from 10^d to 1^s/6^d per yard.

3. L.I., 22.9.1855.

4. Reports of the Inspectors of Factories, P.P. 1856 (2031), XVIII, 273-74.

so much in improved machinery and labour-saving processes, as in the employment of an inferior staple and woollen rags'.¹ Moreover, the lack of technological innovation appeared to be of little hindrance to actual and potential output, for Redgrave saw the Heavy Woollen District as fully capable of producing 'in enormous quantity'.

There is some evidence to support both viewpoints; that a technological lag was constraining the development of the West Riding woollen sector, not only compared to the worsted branch, but also compared to continental competitors such as France and Austria;² or that the existing capacity of woollen manufacturers was fully able to meet domestic and overseas demand. The Factory Inspectors' reports indicate that in times of good trade, for example in 1853, convictions for the employment of juveniles under the age of 18 after 6 p.m. rose markedly, the large Dewsbury woollenmanufacturers Mark Oldroyd being 'in the habit of running a large portion of their machinery ... uninterruptedly ... daily for twenty-four hours' by employing considerable numbers of Irish operatives to work the night shift.³ Again, in 1859, the popularity of doeskins - a firm, milled, and well dressed cloth using considerable quantities of mungo in the cheaper qualities and which had been introduced just prior to the Great Exhibition - was such that manufacturers could 'do (no) more than barely keep pace with the large and increasing demand'; and nine months later, a trade report noted that '... Dewsbury and Batley heavy goods have not been supplied fast enough to meet the demand.'⁴

1. *ibid.*, 274.

2. *v. supra* p.386.

This was particularly so in the adoption of the condenser in place of the slubbing billy.

3. Reports of the Inspectors of Factories, P.P. 1854(1712), XIX, 363. A practice facilitated by the difficulty facing the Factory Inspectors in verifying the age of young Irish-born workers.

4. Reports by the Juries, *op. cit.*, I, p. 765. Huddersfield and Holmfirth Examiner, 1.1.1859, 19.10.1859.

On the other hand, it is clear that whilst some sections of the West Riding woollen sector were operating at full capacity in times of active trading conditions, others could be experiencing sluggish demand. The traditional Leeds broadcloth trade was coming under increasing pressure as competition from fancy woollens manufactured in the Heavy Woollen District as well as from Germany, shipped in bulk to Huddersfield for finishing, began to oust the 'old-fashioned plain goods'.¹ Although the Leeds Chamber of Commerce blamed the bad harvest of 1853 for depressed demand for broadcloths in 1855, manufacturers in the Batley and Dewsbury districts were experiencing great activity from government army and navy contracts for the Crimean War. J.T. & T. Taylor, for example, diverted a large proportion of their capacity in 1855 to supplying the Admiralty with 'Baltic Flushings', the Board of Ordnance with 'Artillery Blue' and 'Grey Kersey', and the East India Company with 'Cavalry Grey'.² There is also evidence to suggest that manufacturers in other areas were prepared to respond to rapid changes in consumer preference, particularly to meet the demand for doeskins, which had risen by between 1^d and 3^d a yard in 1859, a Huddersfield trade reviewer observing that

'Several of our large manufacturing houses who have hitherto made this department a subordinate part of their business, are now going wholly into it, and the result is an immense increase in the supply of these goods'.³

In the first place there would appear to have been some truth in the

1. *ibid.*, 28.3.1857, 15.5.1858, 25.6.1859. The 1858 report noted 'little call for black broadcloth or superfines', a trend which the Leeds Mercury had commented on in the early 1840s. H. Heaton (1933) *loc. cit.*, p. 573 (6.8.1842).

2. L.M., 7.5.1855; Reports of the Inspectors of Factories, P.P. 1856 (2031), XVIII, 264, 285; J.T. and J.T. MSS., *loc. cit.*, Pieces Stock Book 1.1.1854-25.10.1860, Blend Book 8.7.1852-23.3.1857. A comparison of the blends in these records indicates that 'French Blue Cloth' and 'Baltic Flushings' contained medium to high grade shoddy, but that 'Artillery Blue' and 'Cavalry Grey' were made only from English and Spanish wool with a small proportion of brokes and locks. The expansion of the Batley firm of G. and J. Stubley from commission spinners to manufacturers in 1853, for example, was assisted by large government contracts for army blankets. G. and J. Stubley., *op. cit.*, p. 6.

3. Huddersfield and Holmfirth Examiner, 1.1.1859.

criticisms of the Leeds Intelligencer of technological backwardness in the West Riding woollen cloth industry in the 1850s, but these comments may well have been coloured by the problems of the Leeds broadcloth trade which were primarily a symptom of changing tastes not to be reversed by the simple panacea of increased mechanisation. Although Redgrave acknowledged that in certain processes the Yorkshire woollen trade lagged technologically behind French and Austrian competitors, he rightly stressed that the superior capacity of West Riding manufacturers generally enabled them to execute far larger orders than the continental industry.¹

Secondly, in meeting short-run fluctuations in demand, the low woollen manufacturers appear to have been able to cope, Baines noting in 1858 that even the small clothiers still found themselves 'able to compete with the factory owners' in production costs.² Although the supply of clothing wool in 1855 was seen as insufficient for 'current demands' because of the discovery of gold fields in Australia,³ this appears to have been a temporary phenomenon, unlike the experience of the worsted industry which culminated in the foundation of the Wool Supply Association in Bradford in 1859.⁴ Indeed, the apparent absence of further complaints on the supply of clothing wool in the West Riding press⁵ and the extent to which cotton warps and the consumption of domestic and imported ragwool began to supplement this supply from ca. 1855 (Table V(viii)) strongly suggests that technological innovation in the woollen sector was not held back by

1. Reports of the Inspectors of Factories, P.P. 1856, op. cit., 274.
2. E. Baines, loc. cit., p. 100.
3. L.I., 6.1.1855; A. Barnard (1962) op. cit., p. 476.
4. F.J. Hooper (1903, W.J. Ashley loc. cit.), p. 115; E.M. Sigsworth (1958) op. cit., p. 61.
5. Huddersfield and Holmfirth Examiner, 1856-1860.

constraints in raw material supplies.¹ For manufacturers of low woollens utilising large proportions of recovered wool, the cotton warp and the facility with which it allowed power to be applied to weaving tender yarns was of undoubted importance in assisting the transition from clothier to factory in the 1850s.²

Whilst woollen manufacturers were able to meet the export boom of 1851-53 by expanding capacity, and in 1856-57 by taking up slack capacity,³ it would appear that developments in the domestic market, partly stimulated by the ability to produce very low priced goods in imitation of more expensive cloths and partly by the growth of the ready-made clothing system, was beginning to encourage a move towards the substitution of cotton by low woollen goods in the mass market. The development of the slop system between 1810 and 1820 had resulted in the location of cheap clothing establishments in the larger centres of population, supplemented to some extent by the growth of rural slop-work where ready-cut garments were sewn together.⁴ For the mass of the rural population, however, the itinerant cloth dealer provided the essential link between merchant and consumer, possibly half of the population buying on credit or exchanging old clothes or woollen rags in this way.⁵ For those unable to purchase new shoddy

1. Cf. B.P. Philpott (1953) op. cit., p. 33 and v. supra p. 396.

2. E. Baines, loc. cit., pp. 102, 109; Chambers' Encyclopaedia (1868), X, p. 266. Baines noted in 1858 that cotton warps had been 'extensively introduced' in the woollen trade, and, in his Supplementary Account of 1870, that this expansion had been particularly rapid since 1857. Why the innovation of cotton warps in the woollen branch, unlike the worsted section, did not spread more rapidly before the late 1850s is not clear. Smith, a Morley manufacturer, suggested that this was because of 'strong prejudice and active opposition on the part of merchants and public' to cotton-warped mungo unions (1866, op. cit., p. 60). Although this may have been true, the slower innovation of cotton warps was undoubtedly linked to the late development in the application of power loom weaving, as Jubb implied in 1860 (p. 57).

3. J.R. Hughes, Fuctuations in Trade, Industry, and Finance - A study of British economic development 1850-1860 (Oxford, 1960) pp. 113-14.

4. P.K. Newman, 'The early London clothing trades', Oxford Economic Papers, IV, 3, Oct. 1952, p. 248; R. Samuel, op. cit., p. 119.

5. Select Committee on Manufactures, Commerce, and Shipping, P.P. 1833 (690), VI, 621; F. Fenton, T.M., 15.7.1881, p. 251.

cloth for making up into garments, a well developed and extensive market existed for buying and selling old clothes either through the local equivalent of the Tower Hill 'Rag Fair', the London Old Clothes Exchange, or by means of second-hand clothes shops.¹ Singer's patented sewing machine of 1851, shown at the Great Exhibition, assisted by strengthening domestic demand as living standards began to rise, and provided the technological means by which the manufacturers of cheap clothing could furnish ready-made garments from 20 to 25 per cent cheaper than hitherto.² From 1853, the ready-made clothing trade began to grow in cities such as London, Glasgow, and Norwich, and in particular in Leeds, where Barran had introduced the band-knife in 1858.³ An indication of the rapid rate of growth in the manufacture of made up 'slop' garments, a large proportion of which were sold in colonial markets, is suggested by Table V(x). The towns in the Batley and Dewsbury neighbourhood concentrating on low goods, as well as those in the Huddersfield district which were noted by the Jurors in 1851 as producing low and middle quality cloths 'principally for home consumption', were ideally situated to supply the growing demand from Leeds and other ready-made clothing centres; of particular significance to Leeds was the potential of the large men's and boy's wear markets of industrial Lancashire, Yorkshire, and the surrounding area.⁴

The introduction of power looms in the Heavy Woollen District between 1850 and 1860, a decade in which 'hundreds upon hundreds of power looms (had) been set to work in the township of Batley',⁵ would

1. H. Mayhew (1851), op. cit., II, pp. 30-34; E. Moses and Son, The Growth of an Important Branch of British Industry (1860), p. 4; J.B. Jefferies, Retail Trading in Britain, 1850-1950 (Cambridge, 1954), pp. 292-95; D. Alexander, Retailing in England during the Industrial Revolution (1970), p. 75.

2. J. Strang, 'The Sewing Machine in Glasgow, and its Effects on Production, Prices and Wages', Journal of the Statistical Society of London, XXI, 1858, p. 465.

3. J. Thomas, 'A History of the Leeds Clothing Industry', Y.B.E.S.R., Occasional Paper no. 1, 1955, pp. 9-11; H. Heaton, 'Benjamin Gott and the Industrial Revolution in Yorkshire', E.H.R., III, 1931, p. 65.

4. Reports of the Jurors, (1852), op. cit., I, p. 766.

5. S. Jubb(1860), op. cit., p. 69; and v. supra, p.327.

TABLE V(x)

Exports of United Kingdom manufactured 'Apparel and Slops'
1850-1870, by value (£000s).

Year	Value	Year	Value	Year	Value
1850	909	1857	2,159	1864	2,579
1	998	8	1,943	5	2,639
2	1,247	9	2,183	6	2,877
3	2,767	1860	2,156	7	2,206
4	2,266	1	2,168	8	2,314
5	1,286	2	2,558	9	2,392
1856	1,816	1863	2,809	1870	2,205

Note: Included in these figures were a number of sundry apparel items, i.e., hats and dressed furs.

Source: Statistical Abstracts for the United Kingdom, 1850-1870.

thus appear to have been largely a corollary of factors on the demand side, facilitated by greater efficiency in the application of steam power, loom improvements for handling tender yarns, and cotton warps. The extension in the use of cotton, shoddy, and mungo in the woollen sector in this period together with a more rigorous approach to technological and production methods was clearly a significant factor in enabling manufacturers to maintain the price of finished cloth at a time of rapid inflation in raw material costs.¹ Whilst the rise in price of shoddy between 1850 and 1860 of about 100 per cent overshadowed the rise in price of wool - from 27 per cent for laid Highland, to 66 per cent for Dorset Down and laid Cheviot, and 83 per cent for Lincoln half-hog - cotton fell in price by nearly 11 per cent, and Port Philip wool rose by only 10 per cent. However, both shoddy and mungo retained their price relatives to most of the classes of wool in the index, so that the levels attained by 1860 were approximately comparable to those of 1850.²

Of undoubted significance to the expansion and prosperity of the West Riding low woollen industry in the 1860s was the direct and indirect effects of the 1860 Anglo-French Treaty of Commerce and Civil War in the United States. The importance of both countries as suppliers of recovered wool and woollen rags, particularly France, has previously been noted; indeed, without the large and growing tonnage of woollen rags imported from France in the 1860s the consistent proportion of over 30 per cent by which shoddy and mungo supplemented

1. J.R.T. Hughes, *op. cit.*, p. 121.

2. *v. infra* Appendix V-I and V-IV.

the retained domestic and foreign clip, itself increasing in actual weight by 25 per cent between 1860 and 1870, would very probably have declined. Expectations of future trade with France were high as Weiss, a representative of the Huddersfield Chamber of Commerce, noted in his report of the meetings with Cobden in Paris in 1860. Observing that whilst the better classes of French woollens were competitive in cheapness, quality, and finish to similar British goods, the lower woollen fabrics and unions were

' ... not yet made in large quantities in France, and where they are made do not equal those manufactured in Yorkshire; and it is in these useful and cheap goods, suitable for the million, where a large trade may be expected.'¹

The immediate effect of a 15 per cent tariff on a previously protected market proved as alarming to some French manufacturers as had been predicted - French merchants quickly sold off stocks on hand and withheld purchases of French woollens to assess the price and quality of English goods.²

West Riding trade press comments in the 1860s, however, tend to support the conclusions of Dunham that the effects of Yorkshire competition were not so severe as the 1870 Enquête had maintained; only the Roubaix and Elbeuf districts appear to have suffered most from large scale imports of cheviot type cloths described as 'an imitation of seal cheviots made of poor wool and exported chiefly from Huddersfield' through the Paris merchanting houses.³ Whereas 'some French buyers' were

1. H.E., 24.11.1860.

2. ibid.; R. Price, The Economic Modernisation of France (1975), p. 163.

3. A.L. Dunham, The Anglo-French Treaty of Commerce of 1860 (Ann Arbor, 1930), p. 232. A large proportion of the output from Dewsbury manufacturers was sold through the Huddersfield Cloth Hall and Huddersfield shipping houses, prompting the Huddersfield Chamber of Commerce to note in 1860 that 'the trade of the two districts might be considered one'. H.E., 28.4.1860.

noted in Huddersfield in 1861, trade reports for the decade made only passing reference to the importance of this trade, reserving more comment to the virtual closure of the American market in 1866-1867 and strong Canadian buying from 1866.¹ Indeed, Thomas Jubb, a partner in Branch Road Mills, Batley, noted in his diary in June 1861 that

'The French buyers are making their visits, but not buying much, merely pattering'

and, one year later,

'The French Treaty has not increased trade so much as expected'²

The effects of the American Civil War on the Heavy Woollen District were twofold. The immediate impact served once more to reinforce the specialised development of productive capacity which had expanded between 1853 and 1856 when large orders for military cloth and blankets for the British, French, and Turkish forces had been placed. The ability of manufacturers in the Heavy Woollen District to shift production from the civil market to execute at short notice large orders from foreign governments was to become a distinctive feature of the shoddy-using trade from the 1860s. A large proportion of the expansion among heavy woollens was stimulated by the nature of this often contracyclial trade which, in a decade witnessing the frequent occurrence of political crises overseas, kept the mills of Batley and Dewsbury busy with military orders.³

In its early stages the war in America had little effect on the

1. H.E., 12.1.1861. The experience of the West Riding worsted trade was somewhat different. Reports of the Inspectors of Factories, P.P. 1862(2933), XXII, 232-33.

2. Thomas Jubb MS, loc. cit., entries 13.6.1861, 21.6.1862. Gladstone, however, was alleged to have observed in 1862 that 'the woollen trade ... seemed to have been created by the treaty'. W. Page, op. cit., p.233.

3. J.T. & J.T. MSS., Sales Day Book, 23.11.1852-13.1.1865; H.E., 5.1.1867.

Heavy Woollen District which was experiencing moderate to depressed conditions, exacerbated by concern over high wool prices.¹ This ceased abruptly following a public outcry in the United States when it became clear that the domestic woollen industry was incapable of supplying the military requirements of both sides, particularly the Confederate forces, causing much hardship amongst opposing troops lacking warm clothing and blankets in the winter of 1860/61.² Large orders began to flow into the West Riding, some mills needing small adjustments only to produce the Confederate 'Blue Mixture Army' cloth in place of previous orders for 'Blue Mixture' executed for the Italian army in 1860-61, both using large amounts of blue and grey shoddy.³ Growing appeals in the North to 'patronise home industries' and the rapid expansion of New England woollen productive capacity - the annual military and civil consumption in 1863-64 was approximately 200 million lbs. - saw a rapid diminution in orders placed with West Riding mills.⁴ Of greater importance to manufacturers of Yorkshire low woollens, however, was the new situation in which domestic American manufacturers found themselves and their desire, with the foundation of the influential National Association of Wool Manufacturers in 1865, to protect the considerable capital investment funded by high wartime profits

1. H.E., 3.7.1860, Thomas Jubb Ms, loc. cit., entry 1.1.1861.

2. E.D. Fite, Social and Industrial Conditions in the North during the Civil War (New York 1910, 1963 edition), p. 83.

3. Reports of the Inspectors of Factories, P.P. 1862 (2923), XXII, 233; Thomas Jubb MS, loc. cit., entries 1861-63. The rapid fluctuation in demand for military and civil cloth and the facility with which this could be accommodated is indicated by the following entries in Jubb's diary on activity in his brother's firm, John Jubb and Sons of New Ing Mills, Batley (who was later to become a shoddy manufacturer).

'21.4.1863. J.J. & S. received orders for about 10,000 yards Blue Mixt. Army's, for quick delivery supposed for the Southerners'

'9.5.1863. J.J. & S. very busy making Blue Mixt. Army Clos.'

'20.8.1863 J.J. & S. principally Home market, Witneys in Mixt. and Blue and Black have a great demand.'

4. E.D. Fite, op. cit., p. 83.

from future incursions by large quantities of cheap Yorkshire woollens. In addition, high wool prices and lax official clothing specifications by the ordnances of both sides had stimulated the growth of a predominantly New England shoddy industry, the productive capacity of which began to substitute for low Yorkshire goods as protection increased with the successive tariffs of 1862, 1864, and 1867.¹ The Huddersfield Chamber of Commerce was unconvinced by American explanations that the higher tariffs were necessary as a measure to raise revenues to rebuild the economy, claiming instead that they arose from the self-interest of American woollen manufacturers in securing protection from overseas competition.

'Under the present artificial protection, the manufacture of woollen cloth in the New England States has been stimulated to an enormous extent. New mills have been springing up in all directions, and an immense capital has been diverted from the import trade to home manufacture.'²

The sceptism of the Chamber was confirmed in 1891, when the journal of the National Association of Wool Manufacturers in an attempt to rebut attacks on American-made shoddy cloth, justified their actions of 1867 by pointing out that

'The National Association had in view, in the tariff law of that year, high duties on shoddy-made cloth, on the grounds that otherwise the adulterated fabrics of Batley ... would pour into this country and destroy the home market for sound American cloth'.³

Nevertheless, the closure of what had until 1866 been the 'best market' for the goods of Batley, Dewsbury, and Heckmondwike, was offset by record trade with Canada, assisted by American buying along the border,

1. ibid., p. 84; A.H. Cole, op. cit., I, pp. 315-16, II, p. 6; Congressional Document No. 413 (1902), op. cit., p. 11.

2. H.E., 28.1.1865.

3. Bulletin of the National Association of Wool Manufacturers (Boston), XXI, IV, 1891, pp. 356-57.

and a booming continental and home market.¹

The second and probably most important effect of the American Civil War was the chain of reactions which followed from the disruption of cotton supplies to Lancashire and the impact this had on destabilising the established price relationship between cotton, combing, clothing, and recovered wools. Greeves has argued that the rapid rise in cotton prices in the summer of 1862 initiated a broad movement in which cotton goods (with the exception of certain fabrics for which demand was inelastic) were substituted by linen, worsted, and woollen goods. More specifically, the short and long-run effects of differential price movements in textile raw materials supported and initiated changes in consumer preference, particularly in the home market. In worsteds this moved against the cotton-warped lustre goods of Bradford in favour of the softer all-wool merino worsted fabrics, and in woollens from traditional broadcloths to fancy woollens and tweeds.² There seems little doubt that the breakdown of a hitherto fairly stable relationship between cotton and wool prices together with a sharp restriction in the supply of cotton, combined with factors on the supply side in the wool textile industry to create conditions conducive to changes in established textile consumption patterns. Whilst the price of cotton warps and lustre wools rose to high levels for the Bradford trade, the price of better quality clothing wools rose much less between 1860 and 1864; for example, Port Philip by 5 per cent and Dorset Down by 23 per cent compared to a 36 per cent rise in Lincoln half-hog wool.³ A major reason for the proportionately lower rise in clothing wools was, as Greeves has suggested, the ability of woollen manufacturers

1. H.E., 5.1.1867.

2. E.M. Sigsworth (1958) op. cit., pp. 73-75; O. Greeves, op. cit., pp. 172-77, 185-87.

3. Price series, Appendix V-I.

to substitute increasing quantities of shoddy and mungo, and the corresponding inability of Bradford mixed stuff manufacturers to substitute the traditionally cheaper cotton.¹ A second factor encouraging the substitution of virgin by recovered wool, particularly mungo produced from good quality milled cloth, was the proportionately higher rise in coarse domestic wool (laid Highland, for example, by 78 per cent between 1860 and 1864) in response to continuing strong American demand for blankets and rugs.² That the rise in price of the better clothing wools was not greater and the upward movement in the price of recovered wool was not more marked, can only be attributed to the rapid increase in the collection of domestic and overseas woollen rags, facilitated to a significant extent by access gained to the French woollen rag market in 1860.³ As Table V(viii) indicates, this was sufficient to ensure a relatively higher growth in the proportion of recovered wool vis-a-vis the growth of imported and domestic wool consumed in the United Kingdom between 1860 and 1866.

1. O. Greeves, op. cit., p. 187, also E.M. Sigsworth (1958) op. cit., p. 75. The high price of cotton warps did not have the same effect on the production of woollen unions as this could be offset by increasing the proportion of recovered wool. Although Jubb complained that cotton was 'expensive' in 1862 it was 'not yet at a starvation price and they (Batley manufacturers) could still afford to buy it for their warps' (S. Jubb addressing a meeting convened to assist unemployed Lancashire textile workers, H.E., 8.11.1862). No diminution in the proportions of union pilots and other union cloths manufactured by J.T. and J. Taylor is indicated from an inspection of their records, although prices appear to have been adjusted upwards slightly to reflect higher cotton warp prices. J.T. and J.T. MSS., loc. cit., Day Book 9.9.1859-31.12.1863, Sales Day Book 23.11.1852-13.1.1865. See also F.J. Glover (1958) op.cit., I, p. 247.

2. H.E., 21.1.1865, and v. infra Table V(xvi).

3. Whilst Greeves correctly points out that there was not a 'dramatic' increase in the price of shoddy, the addition of the French market in 1860 and a rise in the price of all rags appears to have been sufficient to increase domestic and overseas collections (v. supra Chapter III; Appdx. Tables III-I(h), III-I(k)) including the development of new sources of supply (i.e., the United States). Discussion in the previous chapters suggests that there is no evidence to support his contention that price rises were constrained by the 'unsophisticated state of the trade in 1860' nor by the innovation of carbonising, the product of which was little used in the West Riding during the Civil War period (op. cit., pp. 306, 413).

Although it is possible to see the impact of the cotton famine on the woollen branch of the industry as supporting and accelerating changes that had begun to take place in consumer preference before 1862, it is less easy to argue convincingly that subsequent fashion changes were initiated during this period.¹ The move away from traditional Leeds broadcloth had been noted by the Leeds Mercury as far back as 1843, and, as the previous discussion has suggested, the growing popularity of fancy woollen unions and cheviot-type cloths at the expense of broadcloth was clearly apparent by the late 1850s. Similarly, cheap tweeds had been introduced in ca. 1842 and had been enjoying increasing popularity in the late 1850s as, in emulation of new patterns produced by the Scottish tweed mills, designs became bolder and the texture rougher.² Whilst there is little doubt that the demand for cheap tweeds in the domestic market increased during and after the cotton famine, the degree to which the high price of cotton initiated this movement over and above the substitution effect would seem less than Greeves has suggested.³ Indeed, the popularity of cheap tweed 'tourists' suits' containing shoddy and mungo appears to have become established by 1860 and was experiencing 'great demand' in both overseas and domestic markets by the middle of 1862.⁴ By 1869, however, competition amongst manufacturers who had devoted an increasing proportion of their output to producing low tweeds was said to be 'very severe', with little relief offered by the previously buoyant Canadian market which had been 'swamped' with the growing output of Canadian-made shoddy tweeds.⁵

1. *ibid.*, pp. 183-87.

2. H. Heaton (1933) *loc. cit.*, p. 573 (Leeds Mercury, 6.8.1842); R. Beaumont *The Woollen Industry, 1837-1897 - A Contrast*, Yorkshire College Textile Magazine, V, 1897-98, p. 95.

3. O. Greeves, *op. cit.*, p. 187.

4. Chambers's Journal (1861) *op. cit.*, p. 104; H.E., 7.6.1862.

5. H.E., 21.1.1869, 1.1.1870.

Similarly, it would seem arguable that new fabrics introduced in the 1860s, such as the 'St. Knights' cloths of a Batley firm in 1867 which were taken up by other houses in 1868, or the new fancy woollen coatings of Huddersfield seen by Greeves as 'a completely new feature of domestic demand originating in the 1860s', were necessarily initiated by the effects of the Civil War on the West Riding woollen industry.¹ Certainly, the 'St. Knights' cloths received no further mention in the trade press and do not appear in the sales records of the Batley firms Stubley or Taylor. The development of the 'fancy woollen coating' trade, or, more properly, the fancy worsted coatings of the Huddersfield district, dated from the 1867 Paris Exposition and were aimed specifically at the traditional broadcloth or cassimere coating market.² Worsteds coatings, made in the best qualities from all worsted yarns and in the low qualities with a worsted weft and a wool and mungo warp, were being produced by at least one manufacturer, John Taylor and Sons of Huddersfield, alongside their competing cassimere cloths.³ Cole argues that in both Huddersfield and Bradford fancy worsted coatings were 'slow to catch on', nevertheless although this may have been so for the domestic market, consumer preference in the American market was less restrained and a healthy export trade had developed in these fabrics by 1870.⁴ Whilst Greeves' conclusions are persuasive, the introduction of new types of fabric, as opposed to the sometimes rapid vacillations between stripes and checks which so characterised fancy trouserings, may well have indicated the more pressing concern of woollen manufacturers of the highly competitive conditions in

1. *ibid.*, 2.1.1869; O. Greeves, *op. cit.*, p. 187.

2. A.H. Cole, *op. cit.*, II, p. 48.

3. *H.E.*, 16.9.1871; John Taylor and Sons Ltd., MSS., *loc. cit.*, Sales Ledger 1865-1870.

4. *H.E.*, 16.9.1871; A.H. Cole, *op. cit.*, II, p. 48.

their own industry in the period 1866-70, a squeeze on profit margins,¹ and the need to retain their gains in the domestic market in the face of a rapid revival of competition from the cotton textile industry. There is much evidence, however, to suggest that woollen manufacturers, particularly those in the Huddersfield and Heavy Woollen Districts, profitably exploited the fashion trends apparent before the Civil War years and the opportunities provided by the imbalance between textile raw material prices to consolidate a market position in cheap clothing to the detriment of the cotton textile industry that was to persist until the inter-war period.² For, as Watts observed in 1866

'... fashion dictates the wearing of woollen garments, and if the price of the cotton jacket be materially raised, the advantage which secures the preference is lost; and the woollen garment will naturally be substituted.'³

Although cotton prices fell by 48 per cent between 1864 and 1870, a fall only approached in the price series by the 39 per cent decline in Dorset Down wool, the relative price of cotton was to remain higher than either wool, shoddy, or mungo for the remaining years of the decade. A new feature of domestic and overseas demand for woollen goods from 1865 was a preference for higher quality cloths which, whilst stimulating demand for the more expensive grades of shoddy and mungo, was sufficient to sharply reduce consumption of all recovered wools by 10 per cent between 1866 and 1870 (Table V(viii)).⁴ Whereas producers of cheap union cloth were able to resist passing on the increased cost of the frequently 'violent' fluctuations in cotton warp prices

1. H.E., 4.1.1868, 2.1.1869, 1.1.1870.

2. R.E. Tyson, 'The Cotton Industry', D.H. Aldcroft (1968), op. cit., p. 103.

3. J. Watts, The Facts of the Cotton Famine (1866), p. 393.

4. H.E., 7.10.1865, 9.12.1865, 5.1.1867, 4.1.1868.

in 1866, demand for low unions and mungo cloths selling at under 2^s/- a yard was clearly flagging by 1869 as

'... the ready-made clothiers, who formerly consumed most of these goods, have now to a great extent substituted a better class article',

under the combined influence of rising real incomes and a more 'developed' taste amongst the public.¹ Wool supplies, responding to the high prices of the early 1860s, increased markedly, further reinforcing the fall in prices following the 1866 commercial crisis and the relative substitution of recovered by virgin wool - a trade review noting with some surprise in 1870 that a number of manufacturers previously producing low unions had begun to make all-wool goods for domestic and overseas markets.²

There is some evidence that the stronger preference towards better quality low woollens indicated a reaction against the type of goods being sold in domestic and foreign mass-markets in the early 1860s. The first of several press comments on this appeared in 1866 -

'... a better class of goods, up to 2^s/- per yard was asked for both by English and foreign buyers and there has been no disposition whatever evinced to go back again to the low-priced but worthless fabrics which sold so largely for the export trade in former years'.³

The low priced 'tags' or unions had become 'virtually unsaleable' by 1867, and quality was clearly the reason

'... it has now become a first necessity that the low-priced fabrics, in order to sell, must have some pretensions to durability',⁴

Huddersfield manufacturers, in particular, were being urged in 1866 to improve the 'dull and defective' colouring of their cheap tweeds compared to the products of Scotland, whilst trade with Italy increased

1. B.R. Mitchell and P. Deane, op. cit., p. 343; H.E., 2.1.1869.

2. ibid., 31.12.1870.

3. ibid., 6.1.1866.

4. ibid., 5.1.1867.

only when manufacturers had responded to harsh criticism from Italian merchants in 1865 of inferior goods; by 1867 it was estimated that shipping houses were ordering one-tenth of the previous level of cheap unions, scathingly referred to as 'this low rubbish'.¹

To what extent were these criticisms justified? Firstly, it seems clear that a section of the Huddersfield woollen manufacturing trade was anxious to see Huddersfield-made goods more firmly associated with medium to fine-quality cloths and away from the production of low cloths upon which so much of the expansion since ca. 1850 had been established.² The Juror's report of the 1862 International Exhibition, whilst pointing out at some length the value of recovered materials to the woollen trade, was careful to caution that shoddy should be 'judiciously used' by manufacturers.

'It is necessary to warn manufacturers that if they employ this material without a sufficient admixture of new wool to give a perfect strength to the fabric, they will ultimately bring it into disrepute, and inflict upon themselves and the export trade of the country an injury and a prejudice which it will take years to remove.'³

Huddersfield manufacturers were also very much aware of long-standing criticism levelled at their imitation tweed cloths and emanating, not unexpectedly, from Scotland.⁴ With some satisfaction, the North British

1. H.E., 5.1.1867.

2. v. supra, Table II(iii), p. 43 ; and Table IV(iv), p. 249. indicating the growth and size in numbers of rag, shoddy, and mungo merchants and manufacturers in Huddersfield. Reports by the Juries (1852), op. cit., I, p. 766.

3. C. Tomlinson (ca. 1862), op cit., p. 59. The exhibition included a number of entries from shoddy manufacturers and of mungo unions from woollen manufacturers such as Robert Barran of Gill Royd Mill, Howgate, Holt, and Co. of Dewsbury, and M. Sheard and Sons of Batley. Illustrated Catalogue of the International Exhibition (1862), op. cit., pp.27-40.

4. C. Gulvin, The Tweedmakers - a History of the Scottish Fancy Woollen Industry 1600-1914 (1973), p. 132. Letter to Hawick Advertiser, 27.10.1858; D. Bremner, The Industries of Scotland (1869, reprinted 1969), p. 157. The Scotsman noted in 1868 that 'a good style is often no sooner brought out than it is reproduced by Yorkshire makers in a lower quality; and beyond a doubt those "Yorkshire Scotch Tweeds" interfere considerably with the sale of their more costly but, in the end, cheaper and more honest originals'.

Daily Mail in its annual review of the Scottish tweed trade for 1869, noted that,

'While such a town as Huddersfield is drooping and desponding in its shoddy trade, the tweed districts, working upon a more costly raw material, are flourishing,'¹

prompting a vigorous rebuttal by the Huddersfield Examiner trade commentator James Drake.

'The writer is evidently drawing upon his imagination rather than from carefully-ascertained facts, or he would have known, what we should have supposed to be patent to most people, that a great change has been going on in this busy and industrious district for a number of years past, and that it is no longer the emporium of shoddy, comparatively little indeed now being used, the great bulk of our goods being produced from colonial wools - it being a notable and ascertained fact that more wool is brought to Huddersfield than to any other town in the kingdom.'²

Drake was undoubtedly correct in his view of the changing nature of the Huddersfield trade in the 1860s, the manufacturers of the district having begun to specialise in products for two distinctly different sections of the market; the fine woollen cloths and worsted coatings of Huddersfield itself, and the cheap imitation tweeds and suitings using large quantities of recovered wool located in the Colne Valley, increasingly referred to as the 'Colne Valley trade'.³

Secondly, it would be disingenuous to lay the blame for the production of allegedly poor cloth solely on West Riding low woollen manufacturers. The critical relationship between price and quality was not always appreciated outside of the West Riding manufacturing and merchanting sector, and even less so by the consumer of the end-

1. H.E., 1.1.1870.

2. ibid.

3. Report of the Tariff Commission, op. cit., 2,2, 1774 (evidence of Thomas Hirst of C. and J. Hirst and Sons, Longwood, Huddersfield).

product in the form of made-up suits or the wide variety of overcoats, capes, and trouserings.¹ Mayhew in 1849, Ure in 1861, and Heavy Woollen District manufacturers Jubb and Smith in 1860 and 1866, saw the 'rage for cheapness on the part of the public' as determining to a large extent the quality of low cloth turned out by West Riding mills.² Both Jubb and Drake were at pains to point out that manufacturers were too often blamed for poor quality cloth specified by merchants. In 1869, commenting on the good demand but 'too fine' prices for low velvets, Drake warned of the repercussions of the fall in quality that had taken place.

'... the reason was that manufacturers met the wishes of the merchants and got out a cheaper article. It is important that this should be known lest it be thought that our manufacturers are of themselves lessening the quality of the fabrics that they make.'³

Indeed, partly to gain a greater degree of control over production runs and distribution costs as well as to avoid the much disliked and frequent countermands of commission houses, particularly in 1866, the number of Dewsbury manufacturers shipping direct to the continent increased from two or three in 1866 to 16 in 1868.⁴ On the other hand, given that the cost of labour was proportionately higher in the manufacture of low cloth and that raw materials could comprise some 50 per cent of the cost of finished cloth, rapid upward movements in the price of wool, or, after 1866, severe competition amongst manufacturers,

1. The costs added to the price of cloth sold by a manufacturer in merchandising, distribution, and making-up were not inconsiderable. Sigsworth has estimated that as little as one half of the cost reduction made in the price of cloth by the manufacturer may have been reflected in the final price paid by the consumer if wholesaling and retailing margins remained the same. E.M. Sigsworth (1969), loc. cit., p. 30.

2. v. *infra* p. 539; E.P. Thompson and E. Yeo, The Unknown Mayhew (1971), p. 227; S. Jubb (1860), op. cit., p. 3; A. Ure (1861), op. cit., p. 753; W. Smith (1866), op. cit., p. 58.

3. H.E., 2.1.1869. Velvets were grey or brown union mixtures used for making-up coatings and mantle cloths.

4. The Dewsbury and Batley Chambers of Commerce issued a joint statement at the end of 1866 on the sudden countermanding of orders for the German market - 'The manner in which the countermands were made caused a good deal of comment in commercial circles. It was urged that manufacturers ought not to be at the mercy of the merchant ...'. H.E., 5.1.1867.

provided circumstances conducive to the admixture of higher proportions of recovered wool than was prudent. That the use of shoddy and mungo was still regarded with much opposition, even in Batley and Dewsbury, seems clear from the reactions of those present at a special meeting convened by Dewsbury Chamber of Commerce in 1865 to receive a delegation from the Batley Chamber 'to confer ... on the subject of Government contracts not to use shoddy or waste in army cloths'. The meeting was considered sufficiently sensitive to warrant press exclusion, and, no doubt reflecting the opinions of Thomas Cook, president of the Dewsbury Chamber, 'the views upon the question of the Dewsbury and Batley gentlemen were widely different'.¹ Nevertheless, the skill of Batley manufacturers in the production of cheap but well finished pilots, witneys, elysians, presidents, naps, and sealskins, displayed by the Batley Chamber at the 1867 Paris Exhibition, was specially commended with a silver medal for goods 'not approached for excellence by the heavy woollens of any other country in the world'.²

An analysis of some blends used principally by J.T. and J. Taylor and G. and J. Stubbley of Batley in the period 1843-1879 (Table V(xi)) indicates the consistently large proportions of mungo utilised by manufacturers with established reputations.³ In each case the proportion of shoddy or mungo in the blend has been underlined (column (a)), the cost in pence per lb. of the various raw materials being indicated in column (b). From the necessarily small selection of firms for which detailed records survive a number of conclusions can be made when

1. H.E., 1.7.1865. McCulloch would appear to be incorrect in his claim of 1854 that shoddy was allowed in the manufacture of cloth for the British Army, although it was permitted in horse and other blanket cloths. J.R. McCulloch (4th edition, 1854)op. cit., p. 661, also v. infra p.463.

2. H.E., 4.1.1868.

3. Although the types of cloth selected are representative of typical Batley and Dewsbury products it must be emphasised that over a long period the quality and finish of these cloths improved considerably.

TABLE V(xi) Blends of some typical Heavy Woollen District cloths, 1843-1871.

Date	Manufacturer	Blend	Raw Materials	(a) % Proportions	(b) Cost per lb. of raw materials, in pence. (d).
1843	Thomas Taylor	Medium Pilot	Fine noils : Common Mungo	34.87/65.13	14 / 2½
1844	"	"	Noils : Best Picklock : Mungo	22.51/12.91/64.58	15 / 14 / 2½
1846	J.T.&J. Taylor	"	Eng. Noils:Eng.Wool:Grey Mungo	18.32/14.66/67.02	14½ / 2½
1849	"	Pilot-Mungo			
"	"	Weft	Botany Wool:New & Old "	33.33/66.66	16 / 3
"	"	"	Botany Wool:Nippings: "	23.53/35.29/41.18	17½ / 6 / 3
"	"	Pilot Mungo	Bty.&Sp.Wool:New&Old "	33.33/66.66	20 / 3
"	"	Warp			
"	"	Pilot Mungo	Port Philip Wool:Grey Mungo	34.58/65.42	13½ / 3
1852	"	Weft			
"	"	Brown Mxd.			
"	"	Whitney	Brown Lisbon wool:Fine Brown Mgo.	28.57/71.43	17 / 5½
"	"	Fine Plain			
"	"	Union	Bty. shorts:Bty. Noils:Fine Grey Mgo.	21.40/13.62/64.98	20 / 25 / 3½
1853	"	"	Super Eng. Wool:Bty. Scd.:Lt.& Fine Grey Mungo	12.36/21.90/65.74	20½ / 29/5¼
"	Henry Day	Pilot Blend	Eng. Brokes:Wsd. Waste:Common Stckgs. & Skirtings	3.88/18.6/77.52	17 / 6¾ / 2½
1855	J.T.&J. Taylor	Frenchblue-army	Sp. Wool:Eng. Wool:Waste: Foreign Shoddy	5.26/54.42/8.82/ 31.50	26 / 22 / 11 / 9½
1856	"	Sample blend	Scd. Bty.:Dark Grey Mungo	23.90/76.10	34 / 4
1858	"	Fine Union	Bty. Scd.: "	20.63/79.37	35 / 4½
1860	"	Union Devon-Weft	" : Bty.Noils:Grey Mungo	13.13/6.83/80.04	38 / 32½ / 5
1860	"	Plain Union	" : Nippings:Lt. Grey Mgo. & Shawls	16.45/2.0/81.55	38 / 6 / 6½
1866	"	Fine Plain	Scd.Lamb's Wool:Fine Slubbing & Waste:Fine America Grey, Blue Grey, Grey	11.94/24.26/63.8	28½ / 6 / 5

TABLE V(xi) cont.

Date	Manufacturer	Blend	Raw Materials	(a) % Proportions	(b) Cost per lb. of raw materials, in pence (d.).
1869	G.&J. Stubley	2nd Victoria	Scd.Wool:Fine Nippings/Flocks:Mgo.	29.73/11.89/58.38	14 / 3½ / 2⅞
1871	David Dixon	Union Cloth	Scd.Port Philip:Mxd.Fud:Good Mxd.	10.0/44.15/46.85	28 / 1¼ / 5

Mungo

Sources: Blend books and sales ledgers of

J.T. & J. Taylor, H.D. Day, Alfred Briggs & Sons, and G. & J. Stubley; loc. cit.

compared to the price series in Appendix V-I. From Taylor's records it seems clear that the maximum proportion of recovered to virgin wool fluctuated consistently between 1843 and 1853 at from two thirds to one third, the single blend made by Day indicating that smaller manufacturers were prepared to exceed this limit to produce very inexpensive cloth from cheap materials. Although the price relatives to mungo and shoddy (Appendix V-IV, (a) and (b)) suggest that price differentials were rarely constant, and in the case of mungo tended to move in favour of wool as the former underwent a sustained advance in price, the proportions used in the blends confirm contemporary evidence that a major criterion was the quality and price at which the finished cloth was to be marketed.¹ The long-run price peak of all textile raw materials commencing about 1860 (Table V(xiii) below) and lasting until 1870-74 dictated a more rigorous approach to final costs, the blends from ca. 1858 indicating a marked increase in the proportion of recovered wool or the substitution of better by lower quality virgin wool. Although wool prices moved downwards in 1858 in the aftermath of the commercial crisis, their still relatively high level together with intense competition in domestic and overseas markets induced Taylor to increase the proportion of the cost-reducing raw material mungo. However, as wool and cotton prices began to decline between 1866 and 1869, coinciding with a shift of consumer preference towards better quality cloths, the ratio of pure to recovered wool began to favour the former forcing a greater relative fall in mungo prices. Nevertheless, the most marked feature

1. S. Jubb (1860), op. cit., p. 55; Chambers's Journal (1861), op. cit., p. 104.

indicated by Table V(xi) and the price series (Appendix V-I) is the very wide difference between the actual price of wool on the one hand, and shoddy and mungo on the other - a factor, which it will be readily appreciated, presented tempting opportunities to the more unscrupulous or financially-unsound manufacturers to use excessive amounts of the inferior raw material. That contemporary spinning and weaving technology had advanced sufficiently to permit this is evidenced by Taylor's sample tweed blend (which appears not to have been subsequently marketed) of 1874 containing 100 per cent 'lincey' shoddy.¹

The short price series of English white noils between 1849 and 1861 (Table V(xii)) suggests the ceiling prices at which the best white shoddies became directly substitutable by the virgin material, although this distinction was by no means clear-cut as the felting properties of noils could exhibit somewhat different characteristics to shoddy. Because price data for the superior grades of shoddy are sparse - a reflection of their narrower market - it is not possible to compare the better qualities of white shoddies to this series, but the records of J.T. and J. Taylor indicate that shoddy from best white flannels at 13^d per lb. was being used in 1860, and in 1865 and 1866 the Stubbley brothers were purchasing small quantities of best white stockings at 10 $\frac{1}{4}$ ^d and 9 $\frac{3}{4}$ ^d per lb. respectively. The wide price differential between Botany noils and mungo in the blends of 1852 and 1860 indicates that the relationship between the two was not one of direct substitutability, indeed it was only in the lower classes of wool waste and hippings' that any suggestions of substitutability on the criterion of relative price is apparent. A very important characteristic of

1. v. infra Table V(xxii).

TABLE V(xii)

English White Noils, in pence per lb.

1849	d. 11	1853	d. 16	1857	d. 13½
1850	11½	4	14	8	13
1	11	5	15	9	13½
1852	11	1856	14	1860	14
				1861	13

Source: Wakefield District Archives, Goodchild Loan MSS.,
Richard Poppleton (Woollen and worsted spinner,
Horbury),
Stock Books 1849-1854, 1854-1861.

recovered wools not common to wool wastes, unless from previously dyed wool, was their 'colour value' obtained from the carefully sorted grades and colours of the specialist rag merchant. This was commonly utilised in two ways. The coloured shoddy or mungo was mixed with a proportion of dyed wool to produce a blend which, when spun, woven, and finished, did not require the additional expense of dyeing. Secondly, the use of light grey mungo, particularly apparent in Taylor's blends and from the wide distribution of manufacturers supplied by Day in the 1850s and 1860s, enabled manufacturers to produce either the popular grey cloth of the period or to piece-dye the woven cloth in traditional dark logwood or blue colours. Thus, the adaptability of recovered wool and its ability to reduce the costs of subsequent processes together with the practice of most West Riding mills of consuming all their own wool wastes suggests that the degree of mutual substitutability was limited - the 'colour value' and the ready availability of both shoddy and mungo ensured that their market relative to wool wastes (sometimes of indifferent classification), was of a distinctly different nature. That large proportions of mungo were used by Taylor in preference to pure wool wastes can only be explained by the special properties possessed by the recovered material which, in addition to its price advantage, facilitated the manufacture of cheap cloth exhibiting characteristics of weight, texture, handle, and finish commonly found in only the more expensive pure-wool cloths.

For the period 1830-1870 the nine year moving averages of the eight textile raw material price series reveal a remarkably similar pattern in their long-run peaks (Table V(xiii)), most entering their price plateau in ca. 1860 and moving off it from 1865, the clustering of the moving average peaks between 1863 and 1865 (with the exception of U.S. Uplands cotton) confirming the disruptive effects of the American Civil War and continuing a price trend which had been noted as early as the summer of

TABLE V(xiii)

Long-run and indicated actual peaks and troughs in the
nine year moving average textile raw material price
series, 1830-1870.

<u>Fibre</u>	<u>Long run peaks</u>	<u>Actual peaks</u>	<u>Long run troughs</u>	<u>Actual troughs</u>
U.S. Uplands cotton	1860-70 (10^d+)	1866	1841-53(-6^d)	1845
Lincoln half hog	1860-73 (20^d+)	1836, 1863	1844-48(-12^d)	1846
Port Philip av.	1869-79 (20^d+)	1876	-	-
Dorset Down	1860-65 (18^d+)	1835-36, 1863	1844-48(-12^d)	1845
Laid Cheviot	1861-68 (12^d+)	1835-37, 1864	1845-47(-7^d)	1845
Laid Highland	1860-74 (6^d+)	1863	1844-46($-3\frac{1}{2}^d$)	1845
Shoddy	1862-69 (5^d+)	1834-35, 1864	1843-51(-3^d)	1845-46
Mungo	1859-72 (6^d+)	1865	1873 - (-6^d)	-

Source: Nine year moving averages,
Appendix V-II(b).

1860.¹ The major exception to this plateau of long run peaks is the delayed and extended peak of Port Philip average fleece, the growth in the use of which, with Botany wool, is apparent in the blends of Taylor from 1849. Both of these classes of wool were much favoured by West Riding manufacturers of low woollens for their 'carrying' properties when mixed with waste or short-stapled mungo. The sustained upward price movement of Port Philip wool and mungo would thus appear to suggest that a strong complementary relationship existed between them until 1866/7 when mungo prices began their long secular decline, Port Philip fleece reaching peak prices a decade later. With the exception of these two series, all experienced the long-run depression in prices between 1844 and 1848, that for cotton and shoddy commencing in the early 1840s and persisting until the early 1850s.

A quantitative assessment of the contribution of recovered wool to total retained wool consumed by the woollen section of the wool textile industry is less than easy given the absence of any statistics on the proportion of wool consumed by both sections of the industry.² A number of contemporary estimates were made, however, and although these must necessarily be regarded as little more than informed guesses, they indicate that during the period 1834-1879, the woollen section consumed a fluctuating but consistently greater proportion of virgin wool than the worsted section.³ These estimates are set out in Table V(xiv), and where an estimate relates to the consumption of one section of the industry only, for example James' of 1834 or Baines' of

1. H.E., 3.7.1860.

2. E.M. Sigsworth (1958), op. cit., p. 79.

3. The estimate by James (1845) based on the soap drawback figures and Behrens (1864) for the Pollution of Rivers Commission were probably the most accurate. Baker, the Factory Inspector, for example, used James' estimate of 1857 for worsted consumption in his estimate of 1862, clearly an untenable assumption in the light of developments taking place in the worsted industry in the intervening five years.

TABLE V(xiv)

Estimates of the proportion of wool consumed by the

United Kingdom woollen and worsted industries,

1834-1879 (lbs. actual weight).

Year	Woollen section	%	Worsted section	%	Total Retained (Actual weight) (U.K. only)
1834	60.700.000	57	45.000.000	43	105.700.000
Av. 1830-4	106.100.000	70	45.000.000	30	151.100.000
1840	115.000.000	70	50.000.000	30	165.000.000
1845	114.000.000	60	76.000.000	40	190.000.000
1851			75.000.000		
Av. 1850-4	130.000.000	63		37	205.000.000
1857			100.000.000		
Av. 1855-9	120.300.000	55		45	220.300.000
1858	156.000.000	62	95.000.000	38	251.000.000
1862	218.260.890	69	99.705.175	31	317.966.065
1864	173.000.000	54	149.700.000	46	322.700.000
1879	200.000.000	62	120.000.000	38	320.200.000

Source: 1834 - J. James, op. cit., p. 448 - worsted consumption
 1840 - ibid. p. 489 - " "
 1845 - ibid. p. 498 - " "
 1851 - E. Baines, op. cit., p. 139 - " "
 (Forbes' estimate)
 1857 - ibid. p. 140 - worsted consumption
 (James' estimate)
 1858 - ibid. p. 103 - woollen consumption
 (Baines' estimate)
 1862 - Reports of the Inspectors of Factories, P.P. 1863
 (3076)XVII, 267 (IUP series, Factories 11)
 (Baker - using James' estimate for worsted 1857)
 1864 - Pollution of Rivers Commission (Second Report),
 P.P. 1867 XXXIII, 248, 249. - Both (Behrens'
 estimate)
 1879 - T.M., 15.12.1879, P. 428 - woollen consumption

Note: Total retained wool consumption (i.e., exclusive of shoddy and mungo) for the years 1830-34, 1850-54, 1855-59 and 1879 are the estimates of Hooper in Bradford Chamber of Commerce, (1908), op. cit.

1851, Hooper's quinquennial figures have been used to establish very approximately the proportion consumed by the other section.

Table V(xv) shows the estimated percentages by which recovered wool supplemented the consumption of virgin wool in woollen manufacture as a proportion of both the actual and clean weight of wool, the latter conservatively estimated by using a flat yield of 75 per cent of the greasy wool input. Whilst these proportions can only be regarded as approximate indicators of the importance of recovered wool to the United Kingdom woollen industry, they strongly support suggestions made earlier that, unlike the experience of the worsted section which was undergoing acute supply problems in the late 1850s, woollen manufacturers were increasingly relying on recovered wool to augment domestic and overseas supplies of clothing wools. Contemporary estimates would seem to confirm this; Ure (1861) and Baker (1862) suggested that recovered wool supplemented the total (or actual) weight of wool used in woollen manufacture by one third, the Juror's Report on the 1862 International Exhibition going one step further by observing

'Stop the supply of shoddy and you will close one third of the woollen mills of the kingdom, and bring distress on the West Riding of Yorkshire as great as that now suffered in Lancashire from want of cotton'.¹

Indeed, given the concentration of rag-pulling capacity in the West Riding- for the Pollution of Rivers Commission returned only three shoddy and flock manufacturers in the Stroud area in 1873 - the proportions of recovered wool used in Yorkshire woollens may well have equalled the consumption of clean virgin wool in the peak years of the mid 1860s boom.² That contemporaries were aware, if only

1. A. Ure (1861) op. cit., p. 753; Reports of the Inspectors of Factories, P.P. 1863 (3076), XVIII, 267; C. Tomlinson (ca. 1862), op. cit., p. 60.

2. Pollution of Rivers Commission, P.P. 1873 (C. 347), XXXVI, 235, 237, 238. The West of England trade also consumed a large proportion of 'extract' wool, the total production of which was estimated by Behrens at 5 million lbs. in 1864.

TABLE V(xv)

Estimates of the extent to which recovered wool augmented
the consumption of wool by the United Kingdom woollen
manufacturing sector, ca. 1830-1879.

Year	Shoddy and mungo as a % of actual wt. of wool	Shoddy and mungo as a % of clean wt. of wool	Year	Shoddy and mungo as a % of actual wt. of wool	Shoddy and mungo as a % of clean wt. of wool
1830-34	6.6	8.7	1857	43.2	57.7
1840	8.7	11.6	1858	33.3	44.4
1845	17.5	17.6	1862	30.3	40.2
1851	23.1	30.9	1864	38.2	61.2
			1879	55.0	75.3

Note: 'clean weight' assumes a flat yield of 75 per cent.

Source: Tables V(viii) and V(xiv).

vaguely, of the extent to which recovered wool consumption had grown seems apparent from scattered evidence; a firm of Liverpool wool brokers noting for example, the 'gigantic proportions' of the shoddy trade in 1861, and the 1867 Pollution of Rivers Commission commenting that the figures of shoddy consumption supplied by Behrens featured 'so conspicuously' in their tables.¹ Export figures for the period 1850 to 1870 (Table V(xvi)) indicate that the rising consumption of virgin and recovered wool by the woollen manufacturing sector was mainly concentrated in the domestic market, suggesting that reductions in the price of cloth and fashion changes in the 1850s had begun the movement towards the substitution of cotton by low woollen goods that Greeves has rightly seen as being accelerated by the cotton famine.²

The contribution of recovered wool to the industrial expansion of the West Riding woollen sector in the period to 1870 would thus appear to have been crucial in providing manufacturers of low woollens with the means by which they could exploit the imbalance between cotton and wool prices created by the American Civil War, the effects of which in turn served to reinforce growth in the use of recovered wool. Those who chose to ignore or resist this development were

1. A. Ure (1861), op. cit., p. 753; Pollution of Rivers Commission, P.P. 1867 (3850), XXXIII, xx. Chambers Encyclopaedia, also, noted the 'startling amount' of recovered wool in these estimates. op. cit., 1868, x, p.264.

2. It should be noted that the relatively static yardage of woollen cloth exported between 1850 and 1870 conceals the greater weight of wool used to produce a yard of cloth than was the case for worsted stuffs, and also the proportion of 'broad' to 'narrow' cloths exported.

TABLE V(xvi)

Exports of woollen and worsted fabrics, 1850-1870

(000s linear yards).

	Cloths, Coatings, Stuffs etc., all wool & mixed yds.	£(000s)	Worsted Stuffs, £(000s) all wool & mixed yds.	£(000s)	Flannels & blankets £(000's)
1850	27,355	2,692	112,001	4,795	605
1	25,052	2,572	115,297	4,721	586
2	26,407	2,683	127,799	4,993	571
3	27,106	2,923	123,632	5,419	882
4	30,516	3,089	105,989	4,441	739
5	21,930	2,371	100,061	3,962	539
6	27,352	2,762	112,917	4,738	751
7	30,036	3,031	129,633	5,551	911
8	23,760	2,548	127,397	5,531	693
9	24,118	2,906	150,433	6,910	952
1860	23,968	2,996	148,685	7,013	848
1	24,371	2,998	122,556	6,123	1,031
2	35,401	4,425	118,812	5,882	1,389
3	27,762	3,675	165,835	8,337	1,413
4	29,787	4,546	187,567	10,802	1,505
5	25,616	4,024	233,078	13,361	1,203
6	32,514	5,304	227,275	13,294	1,161
7	31,189	5,327	200,470	12,145	860
8	24,622	3,761	224,367	13,076	964
9	28,218	4,276	250,063	15,130	1,099
1870	32,405	4,749	235,937	13,789	1,079

Source: Statistical Abstracts for the United Kingdom, 1850-1870.

to run the real risks of declining orders and profitability, as one of Gott's travellers forcefully pointed out in 1861.

'You must make up your mind to do as the first people in the trade do; put a certain quantity of shoddy in your black cloths up to 11^s/- a yard, but not so much as will interfere materially with the strength. This you must do or you cannot compete with good houses ... I know the use of shoddy is very objectionable to you, but if the spirit of competition drives you to it you must do it or be driven out of the market ... I see no other course.'¹

1. H. Heaton (1931), loc. cit., p. 66. There is no evidence, however, that Dewsbury Mills were using shoddy in this period. Glover mistakes 'grinding frames' specified in the valuations of 1858 and 1878 for rag grinding machines and is thus led to draw conclusions other than those he supports in his analysis of the operations of Dewsbury Mills. Grinding frames were used to grind and sharpen the cards of the scribbler, a skilled operation upon which the quality and mixing of the blend in the scribbler depended. F.J. Glover (1959) op. cit., pp. 487, 494N; W. Smith (1886) op. cit., pp. 288-89.

CHAPTER V

V - 1870-1914

1870-1914

The period 1870-1914 is distinguished by a marked increase in the consumption of all textile raw materials. Between 1870 and 1913 retained foreign and domestic wool consumption rose by 96 per cent (actual weight), retained imports of cotton by 102 per cent and the estimated United Kingdom consumption of shoddy and mungo by 173 per cent.¹ This rise in the use of recovered wool was accompanied by a rapid rate of import substitution, principally of German produced mungo, partly by an expansion in the specialist ragwool sector, the capacity of which in terms of numbers of firms doubled between 1877 and 1908, and partly through backward integration into rag-pulling by the larger West Riding woollen textile mills.

Table V(xvii) indicates that for the whole period the actual and relative contribution of raw material by the shoddy and mungo sector rose on trend until, in the period 1904-1914, recovered wool supplemented the clean weight of retained wool by approximately 50 per cent. The importance of this sector as a domestic supplier of raw material to the wool textile industry is emphasised by its dominance over the estimated clean weight of the retained domestic clip from ca. 1879-1880 (Table V(vi) above) and its contribution, weight-for-weight, of over two and a half times the United Kingdom consumption of domestic clean wool by 1913. It must be noted however, that whilst this largely resulted from factors affecting the demand side for woollen textiles, the absolute decline in the retained domestic clip commencing between 1873 and 1875 reflected a number of factors

1. 1913 has been chosen to avoid distortion in raw material supplies caused by the outbreak of World War I.

TABLE V(xvii)

Estimated United Kingdom consumption of shoddy and
mungo and wool fibres, 1870-1914 (000s lbs.).

Year	(a) Shoddy and Mungo retained	(b) Total Clean weight of (a) as a wool, mohair, etc., & % of (b) shoddy & mungo	(c) (a) as a % of clean wool	(d) as a % of clean wool
1870	75,000	320,600	23.39	30.54
1	85,000	340,700	24.95	33.24
2	95,000	342,300	27.75	38.41
3	95,000	368,600	25.77	34.72
4	100,000	377,500	26.49	36.04
5	100,000	365,000	27.40	37.73
6	100,000	377,500	26.49	36.04
7	105,000	384,900	27.28	37.51
8	105,000	370,600	28.33	39.53
9	110,000	350,800	31.36	45.68
1880	140,000	418,100	33.48	50.34
1	120,000	360,400	33.30	49.92
2	125,000	391,200	31.95	46.96
3	120,000	373,900	32.09	47.26
4	110,000	392,300	28.04	38.96
5	105,000	376,500	27.89	38.67
6	100,000	408,300	24.49	32.43
7	100,000	390,400	25.61	34.43
8	100,000	418,300	23.91	31.42
9	100,000	444,900	22.48	28.99
1890	120,000	432,100	27.77	38.45
1	130,000	486,900	26.70	36.42
2	100,000	442,900	22.58	29.16
3	120,000	468,900	25.59	34.39
4	120,000	489,700	24.50	32.46
5	140,000	507,500	27.59	38.09
6	140,000	518,200	27.02	37.02
7	130,000	488,000	26.64	36.31
8	125,000	536,300	23.31	30.39
9	125,000	504,900	24.76	32.90
1900	130,000	500,200	25.99	35.12
1	135,000	536,200	25.18	33.65
2	140,000	503,100	27.83	38.55
3	140,000	474,000	29.54	41.92
4	180,000	505,800	35.59	55.25
5	180,000	523,900	34.36	52.34
6	190,000	568,900	33.40	50.14
7	210,000	644,000	32.61	48.39
8	180,000	565,200	31.85	46.73
9	205,000	589,700	34.76	53.29
1910	226,000	683,200	33.08	49.43
1	210,000	684,200	30.69	44.28
2	193,500	642,100	30.13	43.13
3	205,000	678,400	30.22	43.30
1914	190,000	576,100	32.98	49.21

Sources: (a) Chapter III, Appendix I, Table III-I(f).
(b) and (d), Table V(vi).

operating on the worsted industry. The bulk of the retained domestic clip comprised by 1870 long-stapled and somewhat coarse wool used almost exclusively by the combing branch,¹ which in this period experienced an intensification of the changing pattern of demand for its products. The movement away from the Bradford lustre fabrics largely initiated by the cotton famine of the mid 1860s in favour of softer handling all-wool merino qualities imported in increasing quantities from France, stimulated the substitution of English long wool by the finer dominion merino wools, and, from the 1880s, by crossbred wools.² Thus it would seem that the policy of domestic wool growers of concentrating a large proportion of their output on long wool and mutton - the subject of much complaint by woollen manufacturers in the first half of the century - had left little flexibility with which to meet demand conditions after the 1870s. Manufacturers of low and medium woollen goods, faced with inadequate domestic wool supplies, had increasingly come to rely on new sources of raw material, and the shift of consumer preference towards new worsted fabrics effectively removed the most important consumer of English long wool.

Sigsworth and Blackman, in an assessment of the performance of the woollen and worsted industries in the period 1870-1913, have drawn attention to a number of important developments contributing to the relative success enjoyed by the woollen sector during the so-called 'Great Depression'.³ As Table V(xviii) shows, the experience of the woollen sector in export markets was not only markedly different to that of the worsted sector but also to its

1. E. Baines (1870) loc. cit., p. 106.

2. E.M. Sigsworth (1958) op. cit., p. 127; A. Barnard (1958) op. cit., p. 24.

3. E.M. Sigsworth and J. Blackman (1968) loc. cit., pp. 128-157.

TABLE V(xviii)

Exports of woollen and worsted fabrics, 1870-1914(000s linear yards)

	Cloths, coatings, stuffs etc. all wool & mxd. yds	£(000's)	Worsted stuffs all wool & mxd yds	£(000's)	Flannels and blankets £ (000's)
1870	32,405	4,749	235,937	13,789	1,079
1	35,583	5,563	302,235	17,953	1,030
2	40,734	6,991	344,968	20,905	1,104
3	38,633	6,599	282,884	14,277	1,089
4	40,331	6,642	261,135	11,888	1,318
5	42,058	6,850	251,845	11,159	1,239
6	40,479	6,451	221,561	9,141	1,014
7	44,125	6,567	194,777	7,725	1,176
8	43,529	6,263	192,482	7,443	1,070
9	46,258	6,145	186,646	6,921	806
1880	50,000	6,736	189,940	7,241	897
1	55,679	7,552	192,106	7,237	972
2	54,129	7,708	182,444	7,332	1,091
3	46,068	7,351	185,565	7,687	837
4	45,959	7,931	217,121	8,718	911
5	45,954	7,702	198,764	7,741	936
6	51,241	8,446	198,602	7,652	942
7	56,158	9,370	200,984	7,424	964
8	58,568	9,653	176,880	6,359	1,094
9	62,767	10,604	178,042	6,547	1,135
1890	56,486	6,016	172,420	10,326	1,097
1	55,914	6,032	144,530	8,711	966
2	51,189	5,711	142,590	8,982	801
3	46,610	5,216	129,929	8,128	758
4	40,922	4,570	110,674	6,665	702
5	57,657	6,205	164,039	10,219	864
6	60,247	6,275	136,775	8,358	998
7	52,117	5,390	129,667	7,491	719
8	46,308	4,893	95,481	5,725	696
9	48,954	5,276	102,525	6,251	656
1900	50,502	5,906	102,173	6,468	718
1	44,879	5,199	93,979	5,846	648
2	47,140	5,500	102,616	6,367	608
3	50,732	5,872	106,426	6,440	619
4	67,121	7,491	103,931	6,535	1,183
5	72,288	9,163	106,523	6,663	703
6	79,957	9,735	99,231	6,828	620
7	84,881	10,311	99,012	7,393	690
8	75,660	9,645	74,181	5,933	524
9	78,699	10,207	85,131	6,578	562
1910	95,274	12,546	95,370	7,874	770
1	97,717	13,303	78,495	7,124	827
2	100,530	14,104	72,136	6,714	810
3	105,884	14,104	62,490	6,186	796
1914	81,997	11,574	70,304	6,204	848

Notes: (i) Prior to 1882, some woollen stuffs were included with worsted stuffs.

(ii) Prior to 1884 large quantities of piece goods of mixed materials in which wool predominated were erroneously entered as cotton manufactures.

(iii) From 1890 a new classification was introduced. See A.L. Bowley (1905), loc. cit., pp. 585-588 for a discussion of the imperfections of the 1890 classifications.

Source: Bradford Chamber of Commerce (1915), op. cit., p. 40.

previous performance in the period 1850-1870 (Table V(xvi)).¹ The volume of exports of woollen tissues rose by approximately 227 per cent between 1870 and 1913, the linear yardage of exports in 1913 being 327 per cent of the figure for 1870. Exports of worsted tissues, on the other hand, declined by 74 per cent between the two dates, those of 1913 having fallen to 26 per cent of the 1870 total. Particularly noticeable is the relative decline in value of woollen tissues as compared to the increase in yardage exported, strongly suggesting that one of the main reasons responsible for the success of the woollen branch was its ability to stabilise or reduce for long periods the price of its output. The worsted branch, faced with growing consumer resistance to its 'mixed stuffs' (i.e., cotton-warped worsteds) upon which 'the full force of the decline in exports fell', was increasingly obliged to undertake expensive reinvestment to produce the new all-wool goods and to progressively abandon its major cost-reducing raw material, cotton.² Thus the approximately comparable values of its exports in 1879 and 1900 largely reflect the compensatory movements of a decline in yardage exported of 45 per cent and the substitution of all-wool in place of cotton-warped goods, assisted by falling prices of combing wools - Adelaide greasy for example, declining on trend between 1879 and 1900 from 8½^d lb. to 7^d lb., and Lincoln half-hog from 12½^d lb. to 7^d lb.

The experience of both branches of the wool textile industry in meeting foreign competition in the home market was not markedly dissimilar to their relative performance in export markets. Whereas

1. As the figures are in linear yards they obscure to some extent the substitution of broad-woven fabrics taking place from the 1870s, although the detailed reclassification of 1890 clarified this (ibid., p. 137).

2. ibid., pp. 137, 143-44.

imported woollen tissues rose from the very low levels of 1882 to reach peak figures for the period between 1894 and 1903 (Table V(xix)), the domestic woollen industry was able to mount a sufficiently vigorous attack on import penetration to reduce the level between 1909 and 1913 to half that of 1894-1899. The worsted branch, on the other hand, was only able to achieve a reduction in the 1894-1899 levels of just over 20 per cent by 1904-1913 in the face of fierce competition from French worsted fabrics. Sigsworth and Blackman have noted that the success of the woollen sector in reversing the previous downward trend in export performance in the period 1870-1900 and in coping with increased raw material costs between 1900 and 1913 rested primarily on its 'response to price changes' by the utilisation of shoddy and mungo.¹ The following discussion will examine this proposition in greater depth, particularly the overall increase in the weight of recovered wool consumed during a period when wool prices experienced a protracted secular decline approaching historically low levels to 1900. Secondly, it is intended to indicate that the options open to the woollen cloth sector in its ability to exploit raw material substitutability based solely on the criterion of relative price levels does not provide a completely satisfactory explanation for its success during this period. Of secondary importance was the ability in both domestic and overseas markets to maintain or increase demand for its products by responding to the major non-price variable - fashion.

The quinquennial means of estimated United Kingdom consumption of clean and recovered wool between ca. 1857 and ca. 1912 are illustrated in Fig.V(i). From this, and the annual figures in Tables V(vi) and

1. *ibid.*, p. 153.

TABLE V(xix)

Annual Average Imports(000s Linear Yards)

	Woollens	Worsted
1882	848	35,066
1884-88	1,873	56,182
1889-93	2,439	75,208
1894-99	4,827	80,963
1899-1903	4,789	68,152
1904-08	3,698	80,495
1909-13	2,420	63,881

Source: E.M. Sigsworth and J. Blackman, loc. cit.,
p. 139.

(xvii), it can be seen that the estimated consumption of recovered wool moved into a declining trend between the mid-points of the quinquennia 1880-84 and 1885-89 and only began to exceed the levels of consumption of the late 1870s from ca. 1900. As suggested previously, the price elasticity of supply of woollen rags could exceed unity given a sufficiently large upward or downward movement in wool prices, but for much of the period 1872-1900 low and declining prices of wool exerted a long-run constraining influence on woollen rag supplies, the price relatives indicating that both wool and cotton prices fell at a faster rate than shoddy or mungo. Nevertheless, a comparison of shoddy and mungo consumption (Fig. V(i)) with the summary of price relatives (Table V(xx)) suggests that differential price movements unfavourable to shoddy and mungo appear to have exerted less influence on the consumption of recovered wool (with the exception of the quinquennia ca. 1882-ca.1887) than would be expected. That the secular decline in cotton and wool prices was reflected in the price of recovered wool is apparent from the price trends indicated by the actual series and the five and nine-year moving averages (Appendix V-I, V-II (a) and (b)). All moved into their long run plateau of high prices between 1913 and 1916 (Table V(xxi)) but exhibited different characteristics at the trough of their respective price movements, shoddy and Laid Highland experiencing a longer period of depressed prices than the other components of the series with the exception of mungo, which underwent a prolonged depression between 1880 and 1911.

A number of factors in addition to low wool prices would seem to explain the lower rate of consumption of recovered wool in the mid 1880 to mid 1890 period. Firstly, between 1882/3 and 1888/9 consumer preference in the home market, encouraged by low wool prices, moved towards worsted fabrics and away from the heavy 'staples' of

Fig. V(i) Estimated United Kingdom Consumption
of Clean and Recovered Wool, 1857-1912
(quinquennial means).

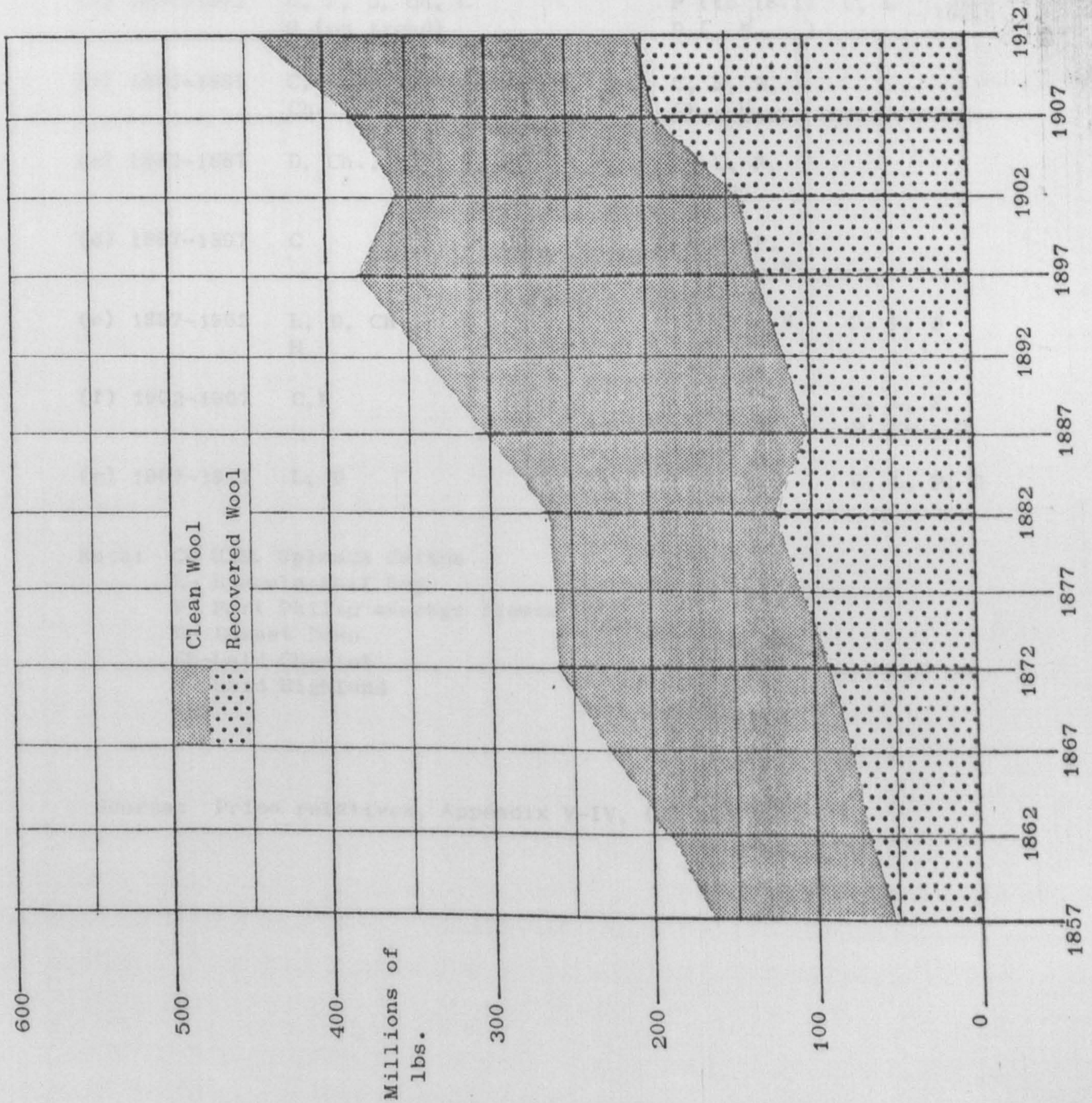


TABLE V(xx)

Summary of price relatives of Cotton, Lincoln, Port Philip,
Dorset Down, Cheviot, and Highland wools to shoddy and
mungo, 1857-1912 (1839 = 100)

Period	Price move- ments against shoddy	Price move- ments in favour of shoddy	Price move- ments against mungo	Price move- ments in favour of mungo
(a) 1857-1872	L, P, D, Ch, C H (on trend)		P (to 1871) D (")	C, L
(b) 1872-1882	C, L, P, D, Ch., H.		C, L, D, Ch., H	
(c) 1882-1887	D, Ch., H	L, P	C, L, P, D, Ch.	
(d) 1887-1897	C	D, Ch., H	C, L, P, D, Ch., H.	
(e) 1897-1902	L, D, Ch., H	C	L, Ch., H	C, P, D
(f) 1902-1907	C, P	L, Ch., H		C, L, P, D, Ch., H
(g) 1907-1912	L, D			C, L, P, D

Note: C- U.S. Uplands Cotton
L- Lincoln half hog
P- Port Philip average fleece
D- Dorset Down
Ch-Laid Cheviot
H- Laid Highland

Source: Price relatives, Appendix V-IV, (a) and (b).

TABLE V(xxi)

Long-run and indicated actual peaks and troughs in
the nine year moving average textile raw material
price series, 1870-1914.

Fibre	Long-run peaks	Actual peaks	Long-run troughs	Actual troughs
U.S. Uplands cotton	1915-(1926)(11 ^d +)	1921	1891-1901(-5 ^d)	1895
Lincoln half hog	1915-(1922)(16 ^d +)	1916	1895-1906(-10 ^d)	1900
Port Philip av.	1913-(1931)(23 ^d +)	1921	1890-1900(-15 ^d)	1894
Dorset Down	1915-(1927)(21 ^d +)	1920	1892-1902(-11 ^d)	1898
Laid Cheviot	-	-	-	-
Laid Highland	Small recovery 1903	-	1885-1901(-4 ^d)	1898-99
Shoddy	1914-(1924)(10 ^d +)	1917	1887-1899(-4 ^d)	1893
Mungo	1916-(1922)(10 ^d +)	1919-20	1880-1911(-5 ^d)	1909

Source: Nine year moving averages, Appdx. V-II(b).

Batley and Dewsbury.¹ Secondly, contemporary trade complaints of a shortage of rags at various times in the 1880s suggest that price levels ruling in Batley and Dewsbury were not always high enough to attract supplies of a sufficient quantity or quality, mainly because of strong German buying in Dutch and French markets.² Exacerbating the supply position was the sharp and progressive decline in imported recovered wool as continental woollen manufacturers began to utilise their own supplies of woollen rags on a large scale. Finally, although of short term influence, were the effects of the prohibitions on imports of woollen rags of 1884/5 and 1892/3.

The survival of primary records of West Riding woollen manufacturers for the critical period 1879-1900 is such that a detailed analysis of the varying proportions of recovered to virgin wool and cotton is not at present possible, although some evidence indicates that at least one Batley firm had taken advantage of lower wool prices to increase slightly the proportions of wool to recovered wool in their blankets.³ Table V(xxii) shows that from ca. 1876 the rapid fall in price of most types of wool from the high levels of 1873/4 was being utilised by Taylors to decrease slightly the amount of recovered wool in some of their blends, although this movement was by no means general as the sample blend for low tweed weft in 1874 indicates, the blends of 1876 and 1877 being atypical inasmuch as they met certain specifications for government contract. The blends produced by G. and J. Stubble

1. v. infra pp.479-80, also supra p.165.

2. v. supra pp.161-62.

3. G. and J.S. MSS., loc. cit., Stock Book 1873-1892, Wool Book '1883' 30.5.1880-29.9.1890. A number of blend books (undated) survive to 1891, but the coded blends cannot be compared with yarns or cloth produced as sales and other records have been destroyed.

TABLE V(xxii) Blends of some typical Heavy Woollen District Cloths, 1873-1879.

Date	Manufacturer	Blend	Raw Materials	(a)		(b) Cost per lb. (pence)
				% Proportions		
1873	J.T.&J. Taylor	Regular face-lt grey	Supr. Boty. Scd:Fine Mxd Grey Mgo	11.87/88.13		42/4½
1873	G.&J. Stubbley	Plain Union	Scd. P.P.:Pulled Paisley Waste & Thrumbs:Mungo	15.54/23.93/60.53		28½/7½/7½
"	"	Thick Deerskin	Scd.P.P.:Mxd.Fud:Lt.Grey & Foreign Mungo	9.79/7.46/82.75		27½/2½/5½
1874	"	Melton	Scd. Sydney & P.P.:Lt. Grey Mgo	9.82/90.18		N/A
"	J.T.&J. Taylor	Fine Plain	Scd.Sydney:Fine Grey Nippings: Fine French Grey Mungo	8.84/7.68/83.48		34/3/3
"	"	Blue Grey Fine	Scd.Cape Wool:Army Blue Grey	9.58/90.42		26/3½
"	"	Swansdown	Mungo & New & Old Lincey	100		1½
"	"	Sample Low Tweed-Weft	New Lincey Shoddy			
1876	"	Blue Army-Weft & Warp	Washed Mogadire Indigo Blue: Seamed Danish Blue Flannel	30.33/69.67		18/5½
1877	"	Admiralty Flushing Warp	Fine Washed N.Z. Lambs: Grey Egyptian Shorts:Best Seamed Light Grey Stockings	27.87/17.82/54.31		14/7½/5
"	G.&J. Stubbley	Black Mixture Pilot	Blackwool:Black Cashmere & Mohair:Blk Nippings:Black Mgo	13.37/4.05/ 5.40/77.18		26/28/6½/5½
"	"	Queensland-Weft	Scd. Sydney:Mungo	19.71/80.29		27/3½
1878	"	Claret Mixture	White Wool:Claret Angola & Mgo	7.21/92.79		24/6½
"	"	Oxford	Scd. & Black P.P.: Black & Indigo Fud:Black Mungo	10.11/11.24/78.65		26/1½/3½
"	"	"	Black Wool:Black & Indigo Fud: Black Mgo & Dk Grey Angola	1.22/9.76/89.02		26½/1½/2½
"	"(for Paris	Ordinary Fine Mix.	[Fine Boty.Dyed Blue/Black: New Black Mungo	55.56/44.44		N/A
"	Internation Exh)	2nd Mixture Lt. Grey	Black Boty & Fine White Wool: New Black Mgo	40.4/59.6		"
"	"	1722 Blend	Fine Black Boty Dyed & Super/ Fine White:Ord Black Seamed & New Blue Pilots	24.41/75.59		"

TABLE V(xxii) cont.

Date	Manufacturers	Blend	Raw Materials	(a)	(b)
1879	G.&J. Stubbley	Blue Mixed Grey	White Wool:Black Fud:Black Mungo	8.97/10.26/80.77	24/14/31

Source: Blend books and sales ledgers of J.T. and J. Taylor and G. and J. Stubbley, loc. cit.

demonstrate more clearly a movement towards the substitution of recovered by virgin wool; for all but the lowest cloths the proportion of mungo decreased from the 90 and high 80 per cent levels of 1873/4 to a 75 to 80 per cent range in the closing years of the 1870s.

The blends of two Huddersfield manufacturers between 1900 and 1912 producing typical Colne Valley tweed type cloths indicate that their use of recovered and virgin wool followed more or less closely the relative price levels between the two classes of material (Table V(xxiii)). Whereas John Lockwood and Sons manufactured all-wool yarns, W. and E. Crowther specialised in wool/cotton/mungo or shoddy yarns, the admixture of low priced cotton strengthening the yarn and permitting considerably lower proportions of recovered wool to be used.¹ Crowther's blends suggest that the percentage of recovered wool increased as wool prices rose relative to mungo from 1901 (Table V(xx)) but that the rise in price of most types of wool from 1910 was resisted by substituting lower classes of wool, rather than recovered wool, in order to maintain yarn quality.

Before turning to a discussion of the response of the West Riding woollen sector to changes in the domestic and overseas markets in the period 1870 to 1914, it is first proposed to examine one aspect of the demand for the products of the Heavy Woollen District which, whilst of less significance in terms of output than fabrics produced for the domestic and overseas mass market, constituted an important factor in the use of recovered wool. The early specialisation of manufacturers in the Batley, Dewsbury, and Huddersfield districts in

1. The Tariff Commission were informed by a manufacturer from the Colne Valley that 'To make a decent yarn the pulp made from the rags is mixed with a proportion of either cotton or wool, and it makes a remarkably good imitation of Scotch tweeds'. (Report of the Tariff Commission (1905) op. cit., 2, 2, 1741). It is interesting to compare the proportions in the blends of Crowther with the 'safe' proportions recommended by an Ontario manufacturer in 1889 - 40-50 per cent cotton, 25-30 per cent 'good, live wool' and 30-35 per cent shoddy. T.M., 15.4.1889, p. 157.

TABLE V(xxiii) Blends for some Cheviot and Saxony Tweed type suitings & cloths, 1900-1912

Date	Manufacturer	Blend	Raw Materials	% Proportions	Cost per lb. (pence)
1900	W. & E. Crowther Ltd., Sraithwaite Hudd.	Blue Weft	Bright Blue NZ Wool: Black Peru Cotton : Blue Mungo & Wsds	<u>41.97/7.27/50.75</u>	18/9/5½
"	"	Black Warp	Blk Peru Cotn:Blk Serge	10/90	9/3
1901	"	Dark Olive Green Spr	Olive Wool:Blk Peru Cotton:Deep Green Mungo	<u>30.86/9.87/59.25</u>	19/9/3½
"	"	Smoke Lavender Twist	Indigo Laps:Peru Cttn:Mungo	<u>10/10/80</u>	19/9/4
"	"	Olive Warp	Moss Green XBred Wool:Black Fly Cotton:Moss Green Serge	<u>18.9/6.9/74.19</u>	8½/7/2½
1903	John Lockwood & Son, Golcar, Hudd.	Woollen Piece Goods (TweedSuitings etc)	Warp Wool:Stocking Shoddy	<u>13.59/86.41</u>	6/3½
"	"	"	Warp Wool:Waste:Low stgks & Flannel	<u>3.92/8.62/87.46</u>	6/1½/2½
"	"	"	Warp Wool:Stocking Shoddy	<u>12.81/87.19</u>	8¼/3¼
"	"	"	Waste:Shoddy	<u>34.05/65.95</u>	1½/2½
1905	W.&E. Crowther Ltd., Sraithwaite Hudd.	Black Warp	Black XBred, China, Peru & Lambs' Wool:Blk Peru Cotton:Blk Serge	<u>18.46/4.64/76.90</u>	13/8/3
1907	"	Blue Cheviot Wp.	Navy Blue XBred:Blk Strip Cotton: Navy Blue Serge	<u>47.01/11.19/41.79</u>	18/8/5½
1910	"	Black Warp	Black Otem Greasy Wool:Blk Rings Cotton:Blk Wsd	<u>25.57/21.75/52.68</u>	26½/10¼/5
"	"	Lovatt Cheviot Warp	Yellow & Fawn XBred:Lt & Dk Green Cotton:Lt. Grn Serge	<u>69.06/6.92/24.02</u>	20/9/3½
"	"	Black Angola Twist	Blk Strip Cotton:Super Blk Mgo	<u>40/60</u>	10¼/4
1912	"	Oxford Cheviot WP.	Pink & Blk XBredwool:Blk Strip Cotton:Black Stgs.	<u>66.94/4.82/28.24</u>	15/8½/5½

Source: W. and E. Crowther MSS., loc. cit., Lot Books 1.1.1900-1912; John Lockwood and Sons Ltd., MSS,
loc. cit., Lot Book 26.2.1903-4.10.1904.

the production of cheap but sound fabrics for merchant shipping and similar occupations as well as for naval and military use had become an important and growing feature of the trade of the West Riding in the 1850s. Although the Admiralty only had allowed the use of shoddy and mungo in the manufacture of heavy flushings and other cloths, the ability of Heavy Woollen District mills to produce army and navy cloths to any specification and in large quantity at short notice had resulted in an increasing trade with overseas military buyers since the Crimean conflict of 1853-56. An added impetus, and indeed status, to this branch of the trade was gained in 1871, when, under pressure from the Dewsbury and Batley Member of Parliament on the exclusion of shoddy and mungo from British army cloths, the War Office was obliged to reverse its policy established in the early 1840s by permitting the admixture of recovered wool in all future contracts for specified cloths.¹

Coinciding with a strong revival of trade in low-priced woollens in the Spring of 1870, the outbreak of hostilities between France and Prussia resulted in large orders being placed in the Heavy Woollen District by both countries, principally blankets for the Prussian forces and cloth and blankets for the French military authorities,² causing rapid depletion in domestic stocks of medium and low wool and contributing to strong price rises in most wools and shoddies in the

1. D.R., 7.10.1871. This was at the instigation of the Batley and Dewsbury Chambers of Commerce, the War Office communiqué noting '... that it has already been determined to omit the clause prohibiting the use of shoddy and mungo in the manufacture of these cloths, and the specification about to be issued has been altered accordingly'. The Chambers also gained a concession which had for long been a cause of friction between manufacturers and Government buyers in an agreement to submit rejected cloth to independent arbitration. (F.J. Glover (1961) loc. cit., p. 15).

2. H.E., 31.12.1870.

following year.¹ Batley manufacturers, whose sympathies towards the French were expressed at a specially-convened meeting of the Chamber to 'consider the Distress in France', viewed with some ambivalence the opportunity of greater trade with Russia as French capacity was diverted to the War effort, but welcomed the possibility that 'national feelings' in a post-war France would curtail the previously active exploitation of the French market by German manufacturers of cheap woollen cloths.²

A close examination of contemporary trade reports strongly suggests that the Heavy Woollen District had, by 1870, gained a considerable comparative advantage over similar sectors in other countries to the extent that in the period to 1914 it enjoyed a reputation unmatched elsewhere as a major producer of military and naval cloths. In this the manufacturers of low woollen cloths were both fortunate and enterprising. Their skill in manipulating recovered wool and readiness to rapidly change production runs to military cloth was assisted by the ease with which woollen machinery could be adapted to different cloth specifications³ and the highly-developed state of the Batley, Dewsbury, and Ossett recovered wool sector. The frequency and intensity of conflict between international interests which characterised the period to ca. 1905 can be seen as affecting the Heavy Woollen District in three ways - as an important factor in initiating, and secondly, reinforcing a revival in civilian demand, and as a major influence in inducing activity of a contracyclical nature.

1. D.R., 4.2.1871. Price rises were particularly marked in white and coloured shoddies for hospital use and in darker qualities for use in blankets for garrisons in the field.

2. H.E., 31.12.1870.

3. The Tariff Commission noted that khaki cloth made in the Huddersfield district was manufactured in exactly the same way as cheap tweeds, pure wool of medium quality being substituted for rags and other shoddy materials. op. cit., 2, 2, 1347.

Thus, the strong civilian revival in demand for low-priced woollen textiles in 1871, supported by the effects of a good harvest and increased wages, was preceded by very active trading conditions in Batley and Dewsbury in the final quarter of 1870 'almost wholly in connection with the demand for army goods required by the Franco-German war'.¹ Manufacturers in Batley, Dewsbury, and Ossett experienced sustained military orders in the depressed years of 1874-1878 as large contracts were placed by Spain (1874), Turkey, Servia and Bulgaria (1876-1877), Greece, Italy, and Prussia (1877) and, for the whole period, from the Admiralty and War Office.² The contracyclical influence of this demand was noted in 1877.

'War, which causes so much misery where it is waged, brings blessings to Dewsbury and district. The manufacturers are, to a considerable extent, glutted with army orders, and the consequence is that there is activity where a few weeks ago something like stagnation prevailed.'³

Evidence from the trade reports for this period thus strongly suggests that the sustained level in the value of blankets and flannels and the increasing yardage of woollen fabrics exported between 1874 and 1878 (Table V(xviii)) together with the relative strength of low wool, shoddy, and mungo prices (Appendix V-IV, (a) and (b)) owe much to the success of Heavy Woollen District manufacturers as world suppliers of military woollen goods.⁴ This success, however,

1. H.E., 7.1.1871.

2. ibid., 2.1.1875, 1.1.1876, etc.; T.M., 15.10.1877. A major stipulation of orders placed by overseas government agents was immediate delivery - manufacturers in Batley, Dewsbury, and Ossett appear to have met this condition with great success. (T.M., 15.8.1877). See also D. Boothroyd, Shoddy Kingdom (1953), pp. 23, 98, 137, etc.

3. T.M., 15.10.1877. Two months later, the writer noted that 'This special demand for these special fabrics had proved of the greatest benefit to the entire district ... had it not been for the call of these goods, short time must have been resorted to. The demand will cease very shortly and then the district will feel the effects of a depression in trade'. (ibid., 15.12.1877), also H.E., 28.12.1895.

4. Although it is not possible to estimate the proportion of total output or exports devoted to military contracts in any one year, the prominence given to war and its effects on the Heavy Woollen District in contemporary reports imply that the significance of this trade was considerable.

received some trade criticism in 1883, a manufacturer deprecating the poor quality of some of the cloth produced, particularly blue navy cloth made from mungo containing cotton - the method of extracting or carbonising out the cotton in the finishing process for cheapness of production imparting undue 'tenderness' to the cloth.

'And yet ... this actually represents a cloth made and sold for purposes of the navy, happily not for British "tars", but for those of some other country, ... doing much to bring English goods into bad repute.'¹

This no doubt reflected a genuine concern felt by some West Riding manufacturers, but it should be noted that it was extremely rare for military contracts not to include minimum strength or raw material specifications, and all cloth produced was required to pass acceptance tests before payment - the risks of rejection of an order preventing all but the more speculative manufacturers from attempting to widen profit margins by the excessive admixture of inferior raw materials.²

Between 1879 and 1900 the military cloth trade of the Heavy Woollen District made a significant contribution to the profitability and development of the West Riding woollen industry, the fairly inelastic home demand and fluctuating overseas demand for specialised cloths and blankets enabling productive capacity to be utilised when demand for civilian goods was weak. Activity in the Dewsbury rag market and the shoddy sector was frequently influenced by demand from military cloth manufacturers, prices sometimes vacillating wildly in response to actual and expected conflicts between different national

1. T.M., 15.11.1883, p. 453.

2. A 'Bradford Merchant' writing on 'Fraudulent Cloth' in 1884 observed that 'if foreign nations buy such goods for their navy they know what they are getting' - a clear statement that the reasons for the production of inferior cloth were more likely to be found in the pricing policies of government buyers than in deliberate deception on the part of the producers. T.M., 15.2.1884, p. 65.

interests.¹ The range of colours so affected, particularly in the finer shoddies and mungos, was widened in 1883 when a Parliamentary Committee recommended in favour of khaki for army uniform cloth in place of the traditional crimson.² A direct contribution to the range of cloths produced for domestic and overseas civilian markets was made by the new woollen 'serge' army cloths produced from the 1880s, the specification being subsequently adopted for the production of blue serge 'army cloths' for the civilian market and exploited by West Riding manufacturers in the 1890s using varying proportions of recovered wool.³ Indeed, Batley manufacturers who had secured sizeable contracts to supply the War Office with cloth for the Southern African war in 1899-1900, were highly optimistic that 'khaki serge' would meet with acceptance in the domestic market and so enable production runs to be maintained.⁴

The onset of the Russo-Japanese war in 1904 immediately stimulated intense activity in the Heavy Woollen District in marked contrast to the moderate trading conditions experienced since the boom of 1899-1900. Japanese orders for 'immense' quantities of khaki blankets and blue cloth were reflected in a sharp rise in the price of low wool and shoddy (Appendix V-I).⁵ So great was the demand for Japanese military cloth⁶ that by late 1904 many mills in the West Riding had

1. The T.M. noting for example, that British involvement in the Natal had stimulated a brisk demand for 'anything of a quality suitable for army goods' (15.2.1879). See also, D.R., 31.12.1881, 30.12.1899, 29.12.1900; H.E., 28.12.1886, 29.12.1894, 28.12.1895; T.M., 15.11.1883, 15.2.1884, 15.12.1889, 15.3.1890, 15.4.1892.

2. T.M., 15.4.1883, pp. 138-9.

3. H.E., 28.12.1895, 24.12.1896

4. The Dewsbury Reporter noted, however, that 'such has not been the case, the khaki colour being an ugly one' (29.12.1900)

5. Dewsbury rag merchants were quick to appreciate the irony in the sustained and strong demand for white Russian stockings for use in the manufacture of Japanese blankets. T.M., 15.1.1905, p. 2.

6. Ogawa has estimated that 25.9 per cent of total Japanese war expenditure was devoted to purchasing clothing and food. G. Ogawa, Expenditures of the Russo-Japanese War (New York, 1923), p. 40.

ceased producing for the civilian market and had diverted capacity to meet army contracts, a trade commentator cautioning of the 'danger of past experience' in the 'neglect of home customers for outside orders' - an understandable sentiment but one which was less easy to heed when the profit margin on these contracts was wider than that allowed by the domestic wholesale clothing houses.¹ For the majority of manufacturers producing woollen fabrics for domestic and overseas markets, the war-induced rise in wool prices coinciding with the persisting scarce supply of Australian wool since the drought of 1899, necessitated an increased substitution of wool by shoddy. Complaints of high raw material prices by West Riding manufacturers were frequent, many responding to higher input prices by increasing the price of their cloths, or, where this was not possible, by achieving the greater production economies of 24 hour shifts.² Batley and Dewsbury manufacturers appear to have enjoyed additional trading advantages created by the war, particularly in exploiting the Japanese civilian market.³ Trade with China, assisted by a rise in silver prices, also increased, with a strong civilian demand emerging for dark blue serge 'army cloths' enabling production runs to be extended with minor adjustments to machinery, a situation which would not have been possible in the home market where fashion had moved decisively away from dark serges and vicunas.⁴

The effects of the Russo-Japanese war thus exerted an important influence on the trade of the Heavy Woollen District, not only by the

1. D.R., 31.12.1904; T.M., 15.1.1905, p. 2. Batley and Birstall manufacturers had successfully exploited the domestic market in 1901 to the detriment of Scottish manufacturers who had committed a sizeable proportion of their capacity to the production of khaki goods for the War Office. D.R., 28.12.1901.

2. T.M., 15.1.1905, p. 2, 15.12.1905, p. 398. 3. D.R., 29.12.1906.

4. T.M., 15.1.1906, p. 2.

contracyclical activity induced in what had been a 'generally depressed' home market, but also in stimulating a sharp expansion in productive capacity which enabled low woollen manufacturers to take full advantage of the export boom beginning in 1904 and bouyant domestic markets in 1905 and 1906.¹ Although the importance of the military cloth trade of the West Riding appears to have diminished in the period preceding re-armament in 1914,² the overall impact between 1870 and 1905 was of considerable significance to the Heavy Woollen District both in sustaining demand for recovered wool (and, in the case of Ossett, actively encouraging the entry of new mungo manufacturing firms), and also in allowing manufacturers to retain their competitive advantage in difficult domestic and overseas markets by smoothing cyclical fluctuations in demand.³

In addition to the military cloth market, the low woollen industry possessed several important advantages which contributed significantly to its success in meeting the challenge of cheap imported woollens, particularly from Belgium and Germany, and increasing the annual yardage of cloth exported in the period 1870-1913; the nature of the market, adaptable machinery, and skill in the use of raw materials. Firstly, the bulk of the output of low woollen cloths was

1. D.R., 31.12.1904; Reports of the Inspectors of Factories and Workshops, P.P. 1905 (Cd. 2569), X, 410; T.M., 15.1.1906, pp. 1-2. Bowley noted that the 'special demand' from Japan accounted for about 50 per cent of the excess of woollen cloth exports of 1904 compared to 1903. A.L. Bowley (1905), loc. cit., p. 589.

2. The only large orders noted in the trade press for this period were those for khaki cloth for the new Turkish government in 1909. D.R., 1.1.1910.

3. The rapid entry of firms into the specialised military clothing sector from the time of the Boer War, and the increasingly inelastic demand for cloth as British and Colonial official contracts came to dominate this market between 1905 and 1913, caused the formation of two cartels; the Uniform Cloth and Serge Manufacturers Group (comprising eight cloth and eight serge manufacturers) and, in 1913, the Uniform Clothing Manufacturers Group. These cartels appear to have exerted a stabilising influence on the price of certain qualities of mungo, as the records of Days indicate. Profiteering Acts 1919 and 1920. Uniform Clothing, Standing Committee on Trusts, P.P. 1921(Cmd. 1339), XVI, 641, 646.

for the male market, a large proportion of the heavier milled cloths being made for working and outer wear characteristically exhibiting a regular and high rate of replacement. Of growing importance, as both population and real working class incomes rose, was the leisure clothing market, one which as early as the 1840s had begun to be influenced by fashion and, from the 1850s, by the cost-reducing effects of the ready-made clothing industry. Unlike the West Riding worsted industry which had concentrated on the production of women's dress goods, a market which became increasingly competitive as fashions began to favour the soft-handling all-wool merino worsteds of France,¹ the low woollen industry could rely on a relatively inelastic demand for many of its traditional heavy cloths as well as the widening potential of changing consumer preference towards fancy woollens and cheap tweeds in place of medium and heavy cotton cloths. Secondly, the 'woollen system' of manufacture possessed a far greater ability to adapt machinery to meet new demands for different types and textures of cloth than was possible in the worsted section, whose combing and spinning machinery was designed specifically for long stapled lustrous English wools and where expensive re-equipment could only be justified if manufacturers were certain that major changes in fashion were more than ephemeral.² Thirdly, and closely connected to this last characteristic was what many West Riding contemporaries saw as the essence of low woollen manufacture - the art of producing 'something out of nothing' to give a cheap cloth a particular handle, texture, and appearance by means of skilful blending.³ Yorkshire manufacturers were

1. E. Sigsworth (1958), op. cit., pp. 110-11. The response of worsted manufacturers in Huddersfield and Bradford was to expand the worsted coating and mens' outerwear and trousering trade.

2. *ibid.*, pp. 88-94, 112-14.

3. T.M., 15.8.1875, p. 316; A. Marshall, Industry and Trade (1919), p. 231; J. Brook, A Rational System of Woollen Yarn Costing (Batley, ca. 1925), pp. 33-34.

justifiably proud of their expertise in blending any combination of raw materials to produce a cloth at any given price possessing certain characteristics, an expertise of long standing and one which, as noted previously, had received official mention at the exhibitions of 1851 and 1862.¹

Again, at the International Exhibition in Paris in 1878, the cloths displayed by Heavy Woollen District and Colne Valley manufacturers drew favourable comment as 'marvels of cheapness' in imitating 'very well cloths of much better quality'.² In particular, the display of Batley manufacturers G. and J. Stubley, to whom a gold medal was awarded, was singled out as 'about the best show in the Exhibition in the heavy coating trade' for their range of naps, faced cloths, chevots, and low fancies.³ Although the majority of these came from their regular production for domestic and overseas markets, the blend books indicate that a small number of cloths were specially made for the exhibition, an analysis of these blends showing, however, that the proportion of mungo varied from 44 to 75 per cent (Table V(xxii)). Three years later a trade writer, lamenting on the absence of Stubleys from the 1881 Crystal Palace Wool and Woollens Exhibition, observed

1. It is worth recounting the following anecdote which appeared in an article on wool blending by 'a Yorkshireman' in the Textile Manufacturer, 15.8.1883 (p. 168.). 'There is a very old story current in the trade of a manufacturer hailing from a very noted neighbourhood, who, on his way to Leeds, in the middle of a conversation with a friend, suddenly and without any apparent cause uttered an ejaculation much more forcible than elegant, and on being asked the reason, explained that the wool which ought to have been put in a job then in his willey house had been forgotten, at the same time producing from his waistcoat pocket as much of that precious material as he could conveniently carry there'.

2. Paris Exhibition, Artisan's Reports (Huddersfield, 1878), pp. 27, 45. The opinions recorded in this report appear reasonably objective, most concurring that whilst the West Riding clearly excelled in the lowest class of woollens, continental manufacturers ran 'a very close race' in the medium and better class fancy woollens.

3. *ibid.*, pp. 26, 36. J.T. and J. Taylor's exhibits were also noted.

'We painfully miss that grand display from the heavy woollen district that attracted the attention of all eyes in Paris, and that was a marvel as the product of one firm.'¹

West Riding competitiveness in the manufacture of cheap woollen goods was recognised by American manufacturers, if less so by economists associated with United States tariff policy. Taussig, for example, writing in 1891, was confident that if the specific and ad valorem duties amounting to 150 per cent on imported low woollens were removed together with the duty on raw wool 'these goods would be made in the United States without fear of competition from foreign manufacturers'.² This view was not shared by all American manufacturers however, one writing in 1890 that

'... in some parts of Europe, especially in Yorkshire, manufacturers are enabled to get more poor material into yarn than in any other part of the world, for the simple reason that³ they are highly skilled in the art of combining'.

In 1903, the American journal Textile World Record observed that protection had ensured a 'fairly prosperous' woollen industry when compared to the experience of their lesser-protected Canadian counterparts because

1. T.M., 15.7.1881 (Supplement), p. 3. There is some evidence that the plethora of exhibitions since the 1871 International Exhibition at the Crystal Palace - Vienna, Paris, Sydney, Philadelphia, and Melbourne - was beginning to pall as manufacturers questioned the wider benefits of increased trade with the costs of mounting displays. Behrens had informed Simmonds, secretary to the 1881 Exhibition, that the Bradford Chamber of Commerce was 'becoming tired of exhibitions' and, as Beaumont later observed, of having their designs pirated. T.M., 15.1.1881, p. 20; R. Beaumont, Woven Fabrics at the World's Fair (1894), p. 9.

2. F.W. Taussig, 'The McKinley Tariff Act', E.J., I, 1891, p. 337.

3. T.M., 6.10.1890, p. 493; Bulletin of the National Association of Wool Manufacturers (1891), op. cit., pp. 346-47.

'... Yorkshire knowledge and skill in making woollen, worsted and shoddy goods is one of the factors which makes it impossible for American manufacturers ... to compete with the Yorkshire product on even terms. Yorkshire woollen workers are more skilful than we are, especially in that art of converting waste woollen products, called shoddy, into useful and serviceable fabrics.'¹

It was the application of this skill to meet fashion changes in mens', and increasingly, ladies' wear, that suggests the residual explanation of the contribution made by the West Riding rag and shoddy sector to the performance of the United Kingdom woollen industry in domestic and overseas markets. In addition to the price advantage of recovered wool the 'colour value' provided an important cost-saving element in the development of the Yorkshire fancy tweed trade, which was to become a distinctive feature of the West Riding low woollen trade in this period. The production of tweed type cloth enabled manufacturers to exploit two major cost-reducing advantages; the colour of the yarn was determined by an admixture of pre-dyed wool, cotton, shoddy, and mungo thus eliminating the dyeing and drying processes² and secondly, the fabric needed little or no finishing unlike the highly finished and close fabrics that had been so popular in the 1850s and 1860s.³

1. Textile Journal, III, 1, 7.12.1903, p. 288. The trade press frequently noted American admiration of West Riding skill in the use of shoddy and mungo, an article from 'an American contemporary' journal reprinted in the Textile Manufacturer quoting a New England manufacturer. 'How do the manufacturers of cheap woollens in England manage to get them up in such good style? We get many samples of very low-priced yet really handsome goods, but when we dissect them we find little or no good wool fibre, but the shortest and poorest of stock. How is this - how do they manage to put so good a finish on goods made of such inferior stock?' (T.M., 15.8.1875, p. 316). As late as 1919 Barker observed that American woollen manufacturers 'cannot yet treat these materials quite so efficiently as the Dewsbury men'. A.F. Barker, op. cit., p. 28.

2. R. Beaumont, Woollen and Worsted Cloth Manufacture (1899), pp.24-27; G.C. Hirst, History of C.J. Hirst and Sons Ltd. (Huddersfield, 1942), p. 57.

3. D.R., 31.12.1881.

The prominence given by the trade press to changes in design, texture, and weight of cheap West Riding tweeds in the period 1870 to 1914 indicates the importance to which this trade had grown both in domestic and overseas markets. A decisive factor in this growth was the structural change in the demand for woollen cloth as overseas markets declined relative to the domestic market. Although Behrens estimated that 54.6 per cent of wool and worsted manufactures were retained for home consumption in 1884,¹ the more frequent appearance of references in the trade journals to the growth of domestic demand clearly indicates the awareness of contemporaries that expansion was not necessarily dependent on the traditional export markets.² By 1898 an observer could assert confidently that, for woollen manufacturers at least, the home trade was 'the most important of all', an opinion repeated often, although not without some reservation, by the West Riding manufacturers giving evidence to the Tariff Commission.³

1. Royal Commission on the Depression of Trade and Industry (Second Report), P.P. 1886 (C. 4715-1), XXII, 494. The various Heavy Woollen District Chambers gave the proportion of their output in the domestic and export market as; Batley ($\frac{2}{3}$ - $\frac{1}{3}$), Birstall ($\frac{1}{3}$ - $\frac{2}{3}$), Dewsbury ($\frac{1}{3}$ - $\frac{2}{3}$), Heckmondwike ($\frac{1}{2}$ - $\frac{1}{2}$). The Morley and Ossett Chambers were, however, 'unable to define' the relative proportions. See also E. Sigsworth (1958), op. cit., pp. 107-110.

2. A.L. Bowley (1905), loc. cit., p. 585. The sales records of Hudson, Sykes and Bousfield, a large firm of woollen and worsted manufacturers with mills in Leeds and Morley, confirm the growing importance of the 'home' compared to the 'shipping' market. Declining profit margins on the heavier woollen cloths, such as coatings, meltons, and criterions, between 1876 and 1883/84 were only offset when the firm began to expand production of plain and fancy worsteds and woollen tweeds and 'victorias' (in which large quantities of mungo were used) from 1879/80 - the latter being sold almost exclusively in the domestic market. Hudson, Sykes and Bousfield MSS., loc. cit., Private Ledgers 1876-1888.

3. H.E., 31.12.1898; Report of the Tariff Commission, op. cit., 2, 2, 1772-3. Many manufacturers stated that production had been diverted from piece goods for the overseas market to wool-dyed goods for the domestic ready-made clothing industry. (1361, 1449, etc.)

Rapid developments in the ready-made clothing trades and in retailing assisted this movement and stimulated still further the demand for cheap woollen fabrics and tweeds. In Huddersfield the ready-made clothing industry had been established by Bairstow in 1869 and by 1894 was employing nearly 1,000 workers, mostly making up the low Colne Valley tweeds in the 'ready made' and 'special orders' departments,¹ a proportion of which were exported with made-up garments manufactured in Leeds and London (Table V(xxiv)). Hine, the Factory Inspector for the Leeds district, noted the rapid increase in both numbers of firms - from seven or eight in 1881 to 54 in 1892, 35 of which had entered the sector from 1887 - and in the productive capacity of existing firms, total employment in 1892 of approximately 15,000 dwarfing the smaller Huddersfield industry.²

Table V(xxv) indicates the labour and trimming costs charged by a ready-made clothing house in Leeds in 1891 for various men's and youth's garments. In order to meet a selling price of between 14^s/- and 24^s/- for a typical tweed or low serge working class suit, including retailing and distribution costs, a manufacturer needed to produce cloth 50 to 54 inches wide to retail at not more than 3^s/- a yard for the lowest quality or 5^s/- for the highest quality, a target

1. H.C., 27.12.1879; H.E., 29.12.1894, 24.12.1897.

2. Reports of the Inspectors of Factories and Workshops, P.P. 1892 (C. 6720), XX, 482-83. Confirming Hine's dating of the period of most rapid expansion, the Textile Manufacturer noted that the turnover of the Leeds industry had increased by 20-30 per cent between 1887 and December 1888 (15.1.1889, p. 26). For detailed discussions of the connections between cloth manufacturing, the ready-made clothing industry, and retailing see, for example, J. Thomas, (i) 'The early history of the clothing industry. Leeds and its industrial growth, 6', Leeds Journal, 25, 7, 1954, pp. 259-62; (ii) 'Later developments in the clothing industry. Leeds and its industrial growth, 7' loc. cit., 9, pp. 337-40; (iii) 'A history of the Leeds clothing industry', Y.B.E.S.R., Occasional Paper 1, 1955, pp. 62; J.B. Jefferies, Retail Trading in Britain, 1850-1950 (Cambridge, 1954), pp. 292-352; W.G. Rimmer, 'The Woollen Industry in the Nineteenth Century', Leeds Journal, 30, 1, 1959, pp. 7-11; J. Buckman, loc. cit., pp. 157-65.

TABLE V(xxiv)

Exports of United Kingdom manufactured 'Apparel
and Slops', 1870-1903, by value

	£.000s		£.000s		£.000s
1870	2,205	1881	3,712	1892	4,847
1	2,707	2	4,169	3	4,260
2	3,112	3	3,634	4	4,123
3	3,437	4	3,936	5	4,525
4	3,201	5	4,161	6	5,229
5	3,185	6	3,902	7	4,980
6	2,962	7	3,947	8	4,696
7	2,834	8	4,659	9	4,636
8	3,176	9	4,797	1900	5,287
9	3,209	1890	5,036	1	5,571
1880	3,212	1891	5,151	2	6,297
				1903	6,376

Note: Included in these figures were a number of sundry apparel items, i.e., hats, and dressed furs. This category was reclassified from 1904, from which date the figures are no longer comparable.

Source: Statistical Abstracts for the United Kingdom, 1870-1903.

that could only be achieved by precise blending of the raw materials to the price of the cloth.¹ Profit margins had thus to be calculated with great care by West Riding manufacturers and knowledge of the costs of making-up, as evidenced by Briggs' detailed notes, was of great assistance when negotiating prices with wholesale merchants for finished cloth.

Following the exceptionally prosperous years of 1870-1872, the sharp decline in demand for the traditional products of the Heavy Woollen District in 1873 - seen as 'one of the worst for business that (had) been experienced for nearly twenty years' - was interpreted by the more enterprising manufacturers as a stimulus to diversify away from a narrow range of goods dependent to a large extent on the vicissitudes of overseas demand.² Their response took the form of an allocation of additional capacity to the manufacture of cheap tweeds and cheviots, initially as an attempt to counteract the strong seasonal demand for heavy goods,³ but as the bad trading conditions of 1873 progressively worsened in 1874 and 1875, it soon became apparent that firms who had so diversified were enjoying a rising domestic trade in these goods.⁴ Trade fears in 1872 and 1873 of the growing competitiveness of cotton goods as scarce and expensive wool began to

1. T.M., 15.7.1889, p. 344. Between 1900 and 1914 most suits sold between the popular price range of 20^s/- to 30^s/-. J.B. Jefferies, op. cit., p. 299.

2. H.E., 27.12.1873.

3. *ibid.*

4. *ibid.*, 1.1.1876, 30.12.1876.

TABLE V(xxv)

Costs of making and trimming various garments(exclusive of cloth) by a Leeds ready-madeclothing house, 1891.

Garment	Length of material required (yds)	Quality (shillings, pence)			
		'A'	'B'	'C'	'D'
<u>Trousers</u>					
Men's trousers	1½	10½	1/-½	1/2	1/4¾
<u>Suits</u>					
Men's suits	3½	4/2	4/11½	5/5½	6/3¾
Youth's suits	2 ⁵ / ₈	3/6¾	4/-½	4/3¾	5/2½
" Harrogate suits	1½	2/-½	2/2¾	2/6¾	3/-
Youth's Norfolk Suits	1 ³ / ₈	2/5½	2/7½	2/10½	3/3
Youth's Sailor Suits	1½	2/6½	3/-¾	3/2½	4/3
Youth's Naval Suits	1½	2/7½	2/10	3/-	3/4
<u>Tweed Overcoats</u>					
Men's Ulsters	3 ³ / ₈	4/6¾	7/4½	8/4½	10/-½
Youth's "	1½	2/1½	2/5½	2/7½	3/2¾
<u>Nap and Pilot Overcoats</u>					
Men's Reefers	1 ⁷ / ₈	3/5½	4/10½	5/8½	7/4
Youth's "	⁷ / ₈	1/8½	1/11¾	2/-¾	2/6½
<u>Meltons and Beavers</u>					
Men's Chesters	2 ¹ / ₈	-	-	6/3	7/10½
Youth's "	1 ¹ / ₈	-	-	4/4½	6/1

Source: Alfred Briggs and Sons MSS., loc. cit.,
Mill notebook, 1858-1936.

decline in price more slowly and from higher relative levels than raw cotton, diminished as fashion moved decisively to all-wool and wool union goods of the tweed type and away from the close and fine finished mungo cloths.¹ So rapidly did the trade in cheap tweeds and cheviots develop, stimulated by frequent changes in design and texture, that a trade commentator noted in 1878 with some surprise

'Never within recent years has there been so decided a demand for low priced goods, and never was a demand more completely or promptly responded by our manufacturers...'²

Manufacturers of better class all wool tweeds in Galashiels, Hawick, and Selkirk, whose goods had benefited from lower wool prices, began to feel increasing competition from West Riding imitation Scotch tweeds, claimed in 1882 to 'belong almost exclusively to Huddersfield'.³ Manufacturers in Batley and Dewsbury, who had experienced a revival in home and export demand in 1881 and 1882 for their staple nap and pilot cloths, were faced with the realisation that the renegotiated treaty with France had all but closed a once lucrative market for heavy cloths.⁴ Thus, the absolute and relative decline in consumption of recovered wool in the 1880s would seem to have been influenced more by fashion changes than relative price levels between virgin wool, a trade commentator noting in 1881, for example, that

'... it is believed by practical men that where one piece of heavy overcoating is made now, five were woven ten years ago'.⁵

Heavy Woollen District manufacturers also miscalculated the strength of demand for brighter coloured medium weight worsteds for mens'

1.. ibid., 30.12.1876.

2. ibid., 28.12.1878.

3. Reports of the Inspectors of Factories and Workshops, P.P. 1877 (C. 1794), XXIII, 181; H.C., 27.12.1879; H.E., 30.12.1882; T.M., 15.9.1881, p. 339.

4. D.R., 31.12.1881.

5. H.E., 29.12.1883.

suitings and outerwear, seen in 1883 as 'merely of temporary character', the eventual revival in popularity of heavy goods of 1889/90 being welcomed as

'... one of the most encouraging signs of the times to the local manufacturer, who, a year ago, had thought that the original staple trade of Dewsbury was dying out'.¹

The only bright spot in an otherwise depressing eight years of trade was provided by the market in low fancy tweeds, which whilst consuming large quantities of recovered wool, were considerably lighter in weight than the staple close-milled fabrics. Although home and overseas demand for heavy cloths revived in 1892 and in the brief but intense boom in trade with the United States during the first year of the 1895 Wilson tariff, the century closed with pessimism on the future of the heavy pilot and witney cloths of the Dewsbury district and optimism on the continued strong demand for tweeds.²

To what extent did the West Riding shoddy and mungo industry contribute to the performance of the domestic woollen cloth industry, particularly that of Yorkshire, in home and overseas markets in the period 1870-1900? Firstly, it seems clear that in manufacturing a substitute for wool that possessed both a price advantage and the cost reducing facility of colour, the rag and shoddy industry provided a source of raw material that was consistently cheaper than and relatively independent of the supply of the virgin raw material. Indeed, the reliance of the West Riding trade on an uninterrupted supply of rags was clearly demonstrated by the effects of the 1892/3 prohibition on imports from the continent. Ultimately however, the

1. *ibid.*, 29.12.1883, 29.12.1888; T.M., 15.3.1890, p. 136.

2. H.E., 24.12.1892, 28.12.1895, 24.12.1896, 30.12.1899; D.R., 1.1.1898.

growth in consumption of recovered wool, which between 1870 and 1896-1900 rose by approximately 80 per cent, rested primarily on the response of the West Riding woollen industry to the challenges so often repeated to the 1886 Royal Commission on the Depression of Trade and Industry and the privately-convened 1905 Tariff Commission - intense foreign competition in the home market and high tariff barriers in overseas markets.

There is no evidence lacking that manufacturers in Huddersfield, Batley, Dewsbury, Ossett, and Morley were, if sometimes with reluctance, prepared to adapt their machinery to accommodate the production of tweed and cheviot cloths, serges, and worsted-type cloths. An early development necessitated by the intensity of failures following the boom of 1870-72 was the formation of the Yorkshire Woollen Home Trade Association in 1877 to 'overcome mutual jealousies and mistrust', and which by 1882 was seen to have been 'very successful' in facilitating the exchange of financial and other information of 'mutual advantage'.¹ Whilst the rapid extension of the trade in cheap tweeds may have been assisted by this, or the frequent monthly reports in the local and trade press, or the growing awareness that the profit margin on these goods was more generous than on the majority of the heavy staples,² there seems little doubt that without this innovation the experience of the woollen sector may well have been similar to that of the Bradford worsted trade. Certainly, the feeling in Leeds and Huddersfield that the woollen cloth industry had adapted with vigour to the difficult trading conditions of the 1870s was evident when the Textile Manufacturer delivered a sharp reproof to the Bradford-inspired 'Bective Movement'

1. H.E., 28.12.1877, 30.12.1882.

2. D.R., 31.12.1881; H.E., 27.12.1884; T.M., 15.1.1885, p. 27. Profit as a percentage of sales on tweeds manufactured by Hudson, Sykes and Bousfield rose from 10 to nearly 15 per cent between 1879-1884, worsteds declining from 9 to 6 per cent, and 'cloths and finished unions' from 10.7 to 9.4 per cent. Hudson, Sykes and Bousfield MSS., loc. cit., Private Ledger 1879-1884.

which, under the leadership of Lady Bective, had begun a much-publicised campaign in 1881 to influence fashion away from merino worsteds and 'shoddy' woollens and back to the old Bradford goods made of English lustre wools.¹ Noting that the 'well intentioned but ill-advised efforts of Lady Bective and her lady colleagues (had) not been successful to any appreciable degree' the editorial, in marked contrast to the criticisms of woollen manufacturers in 1855, blamed the more conservative of the Bradford manufacturers for 'plodding on' in producing the traditional Bradford goods and, in so doing, providing Leeds with an opportunity 'to administer a well merited rebuke without thrusting itself forward into an interference with its neighbour's affairs'.²

The success of the Colne Valley, Batley and Dewsbury tweeds in overseas markets, especially South America, Australia, and New Zealand, was, however, unmatched by their ready acceptance in the domestic market, to the justifiable dismay of Scottish manufacturers³ - a trade commentator remarking in 1882 that

'Dewsbury tweeds, which are good imitations ... of Scotch fabrics, are sold as such retail, even in the district in which they are made'.⁴

1. A.M. Taylour (Countess of Bective), The British Woollen Trade, (1881). Lady Bective observed 'The poorer classes do not now use Woollen Fabrics properly so called... In order to follow the change of fashion of 1874 they wear "shoddy", a reproduction of miscellaneous torn stuffs ... which is just mixed with enough wool to hold it together' (p. 6). See E.M. Sigsworth (1958) op. cit., pp. 116-17, for a discussion of the relationship between the Association for the Encouragement of British Woollen Manufactures (the 'Bective Movement') and the Bradford manufacturing community.

2. T.M., 15.8.1881, p. 284, 15.11.1881, p. 395.

3. C. Gulvin, op. cit., p. 146.

4. H.E., 30.12.1882.

Assisted by ever bolder and more colourful designs,¹ West Riding manufacturers appeared undeterred by the Merchandise Marks Act of 1887 by launching imitation Harris Tweeds in 1891,² and by 1898 Scottish manufacturers were complaining that three quarters of the 'Scotch Tweeds' produced in Britain originated from England.³ What had been a 'comparatively new' branch of the West Riding low woollen trade in 1876 had become a low cost and ruthless competitor to the traditional Scottish tweed industry as rising overseas tariffs and resistance to the heavy staples concentrated the productive capacity of the Heavy Woollen District on the domestic market. The costs to the Scottish industry, indicated by the census returns of 1891 and 1901, was a decrease from 40,000 to 29,000 in numbers employed, and a realisation by some manufacturers that to compete with Yorkshire they too had to adulterate their cloth with shoddy and mungo.⁴

West Riding entrepreneurial response to the decline in demand for traditional heavy cloths was either to introduce new types of

1. A typical comment noted that 'There was never more latitude in design, and never did designers more thoroughly avail themselves of the opportunity'. *ibid.*, 28.12.1886.

2. *ibid.*, 24.12.1891. This may have been in response to severe competition from Scottish tweed manufacturers in 1888/9. (T.M., 15.1.1889, p. 26).

3. C. Gulvin, *op. cit.*, p. 146. Sensitive of the growing criticism of West Riding infringement of the 'Scotch Tweed' trademark and the use of shoddy, a 'Leeds Gentleman' wrote to the Hawick News in 1898 that Yorkshire produced 'as good cloths as the regular Scotch makers, at less price, and in as good design and colours'.

4. W.R., 4.7.1912; Census of Production 1907, P.P. 1909 (Cd. 4896), CII, Part I, 678. A very small proportion of shoddy manufactured in the United Kingdom was prepared in Scotland. Giving evidence to the 1905 Tariff Commission, a merchant dealing in English and Scottish tweeds observed of Canadian-made tweeds 'but it may be stated that they were splendid value as compared with Scotch, as they were all wool goods, no mungo' (*op. cit.*, 2, 2, 1920). This was perhaps less than fair comment on the Scottish industry, for the majority of firms refused to use recovered wool. There was much complaint from travellers of Scottish mills in 1904 of unfair West Riding competition, the Dewsbury Reporter candidly revealing that 'Yorkshire goods are now being merchanted through houses in the South of Scotland as made in the neighbourhood of Hawick' (31.12.1904). Similar attempts to meet Yorkshire competition by lowering raw material quality in the West of England were seen as 'industrial suicide'. T.M., 15.11.1904, p. 362, also J.H. Clapham (1907), *op. cit.*, p. 120.

overcoating with novel design or finish, such as Stubley's beavers, broadcloths, witneys, fancy-cut velours or their special 'diagonal witney' using a new napping machine innovated in 1870, or to diversify into new fabrics other than tweeds.¹ Batley and Dewsbury manufacturers were quick to exploit the move away from Bradford worsteds in female wear by introducing light and colourful mantles in 1881, and the manufacture of Scottish shawls using fine merino mungos which had been established in Dewsbury in 1889 had expanded so successfully that manufacturers in Batley Carr were producing them in 1891.² A marked change in the character of the traditional heavy union cloths of Morley was noted in 1890

'When the union trade declined as it did a few years ago, makers cast about to see with what it could be replaced, and the result was naturally the production of miscellaneous fabrics, some of the Dewsbury and Batley and others of the Leeds classes ... most of the local manufacturers (producing) a comparatively new article'.³

The new light woollen goods of Morley, selling at 'a few pence per yard' were specifically aimed at displacing cheap cottons for underwear and met with some success in the Turkish and Indian markets. By 1894 a widened range of lighter-weight woollen goods was enjoying strong demand from the domestic wholesale clothing houses for the manufacture of pyjamas and other light clothing for home and export markets.⁴

The period 1900 to 1914 was one of rising raw material prices in the woollen branch of the industry, particularly following the Australian sheep drought of 1902, the record consumption of wool of

1. G. and J. Stubley Ltd., op. cit., p. 22.

2. D.R., 31.12.1881; H.E., 28.12.1889, 24.12.1891.

3. D.R., 27.12.1890.

4. H.E., 24.12.1891, 29.12.1894.

1898 being exceeded only in 1907. With the strong revival of demand from 1904 and the twin pressures of competition in domestic and overseas markets and resistance of wholesale merchanting and ready-made houses to a rise in prices, woollen manufacturers were increasingly obliged to turn to shoddy and mungo in an effort to keep costs down and to cover the shortfall in world wool supplies.¹

A sudden change of fashion in 1905 from serges, vicunas, and stripes to tweeds proved timely for Colne Valley and Heavy Woollen District manufacturers as military orders from the Japanese authorities, which had kept many mills on day and night running since 1904, ceased suddenly, the reason for this change being succinctly noted by a trade commentator.

'Scarcely anything else but the sombre coloured serges and vicunas had been worn since the death of the late Queen, but at present tweed manufacturers cannot keep abreast of the demand for fancies'.²

1906 and 1907 were 'record years' for Batley and Dewsbury manufacturers, the former heavy pilots and presidents 'giving way to an immense variety' of plain and fancy light-weight woollen cloths³ but the sudden decline of demand in all markets in 1908, following the financial crisis in the United States of the previous year, was seen as the worst since 1898.⁴ Although one Batley manufacturer estimated a 30 per cent fall in production compared to 1907, most were not so badly affected having diversified their cloths and being 'prepared to make almost anything' that home and shipping wholesale merchants demanded.⁵ Trade began to revive again towards the end of 1909, the

1. Reports of the Inspectors of Factories and Workshops, P.P. 1905 (C. 2569), X, 410, P.P. 1906 (C. 3036), XV, 534; T.M., 15.1.1906, p. 1.

2. ibid., 15.1.1906, p. 2.

3. D.R., 28.12.1907.

4. ibid., 24.2.1908.

5. The trade reviewer delivered a rebuke to an old established but un-named Dewsbury manufacturer 'still clinging tenaciously to its original products and methods' noting that those firms who had installed the latest machinery were fully able to take advantage of the trade revival in 1909. D.R., 1.1.1910..

yardage of cloth exported approaching the levels of 1906 with domestic consumer preference moving towards tweeds in bright patterns and away from traditional plain goods in shades of black and dark blue.¹ For Heavy Woollen District and Colne Valley manufacturers, 1910 would appear to mark the peak of peace-time production, the estimated consumption of shoddy and mungo reaching 226 million lbs. and shoddy prices exceeding those established during the American Civil War. 'Probably never in the history of the staple industry of this district has a more prosperous year been experienced' noted the Dewsbury Reporter, as a major programme of investment in capital equipment, particularly fast looms, was undertaken.² Although 1912 and 1913 ended on a somewhat more hesitant note, the level of exports of woollen fabrics in linear yards reached historically high levels (Table V(xviii)) as prices of nearly all classes of wool continued their upward movement begun in 1909.³ Again manufacturers complained, as they had done in 1906, that they were not being allowed to pass on rising raw material costs in the price of finished cloth. Aware of the possible effect of this as greater quantities of shoddy and mungo were substituted for wool, the Wool Record commented in 1912

'If merchants, wholesale clothiers and shipping houses can be induced to pay sensibly increased prices, the future of wool values can be regarded as safe ...'⁴

A major reason for these complaints, a corollary of the effects on raw material costs of the world expansion in trade in the decade preceding 1914, was the trade practice of sending out patterns in April and October at fixed prices for the subsequent six months.⁵

1. *ibid.*, 31.12.1910.

2. D.R., 31.12.1910.

3. W.R., 12.12.1912, p. 7, 27.3.1913, pp. 249-50.

4. *ibid.*, 12.12.1912, p. 7.

5. D.R., 30.12.1911.

Although contracts were commonly covered by wool stocks amounting to four months normal production, bouyant demand for wool clothing could exhaust these stocks more rapidly than planned, forcing manufacturers to cover current and future production commitments with more expensive wool and so reducing profit margins.¹ The sudden and unprecedented influx of woollen rags and recovered wool from the United States beginning in 1909 exerted a strong downward and contracyclical influence on mungo prices (Appendix V-I) and was thus welcomed by many low woollen manufacturers in the West Riding as a means by which they could maintain both their profit margins and prices to the wholesale clothing houses.²

Competition in the home market was felt by the West Riding low woollen trade on two fronts, firstly from imported yarns and secondly from imported cloth. The introduction of Angola yarns in the 1860s, originally a mixture of wool and cotton which was blended, carded, and spun, had become a profitable feature of the Huddersfield trade in the 1870s, using large quantities of cotton waste, shoddy, and mungo.³

1. Report of the Tariff Commission, op. cit., 2, 2, 2145; Profiteering Act, P.P. 1920 (Cmd. 858), XXIII, 661.

2. D.R., 30.12.1911; W.R., 12.12.1912, p. 7; see also E.M. Sigsworth and J. Blackman, loc. cit., p. 155.

3. In order to press for a reduction in the very high insurance rates levied on Angola yarn spinners, the Huddersfield Chamber of Commerce had defined an 'Angola Mill' for the Committee of Northern Insurance Offices in 1869 as 'A mill in which the principal material used is Cotton waste or pulled-up cotton from the different processes and in which such material is Scribbled and spun only in combination with Wool, Flocks, Blanket and Flannel Flocks, Noils and pulled Scotch waste and sometimes with Mungo, no other than Olive oil being used'. (loc. cit., Minute Book 11.11.1868-9.5.1883, entry 11.8.1869). By 1880 Angola yarns contained little or no wool being made almost entirely from recovered wools and cotton or 'cotton shoddy'. T.M., 15.5.1883, p. 169.

By 1883 complaints were loud in the West Riding that Belgian and German spinners had so successfully 'imitated' the Huddersfield trade that they had become the largest suppliers of these yarns, criticism being levelled particularly at the Verviers spinners who were accused of importing the lowest yarns under German labels.¹ Competition from Verviers was also keenly felt in low priced all-wool yarns, especially in the Scottish market, the reason being given in each case that the Belgian manufacturers enjoyed the unfair advantage of 'cheaper labour and longer hours'.² Not all Yorkshire manufacturers were so easily persuaded by this reasoning however, some drawing attention to the failure of the West Riding industry to emulate continental manufacturers in their use of Buenos Aires wool which could be bought at consistently lower prices than Australian wool even in its scoured state.³ The slow adoption of Buenos Aires wool in the period to ca. 1900 would seem to suggest that the West Riding industry, long eminent for its ability to 'spin yarn from anything with two ends', was indeed flagging in refusing to exploit this cheaper source of raw material.⁴ There were technical differences between the West Riding and the Verviers carding systems, the latter having 'stiff cards which stand up to their work' in manipulating the coarse and burry Buenos Aires wool, unlike the finely-toothed more densely populated West Riding cards adapted for processing the fine and short fibres of shoddy and mungo. That these differences were known and well-publicised would tend to support contemporary criticisms of the West Riding trade that

1. T.M., 15.8.1883, pp. 306-7.

2. ibid. John Riley of Marsh Mills Cleckheaton, had complained in a letter to the Huddersfield Examiner (17.1.1874) that for this reason and despite installing the most modern machinery his cheapest yarns at 2^s/11^d lb. could not compete with continental yarns sold c.i.f. in Glasgow at 2^s/8^d lb.

3. H.E., 17.1.1874; see Report on Wholesale and Retail Prices ... for a series of years, P.P. 1903 (C. 321), LXVIII, 56, for River Plate Buenos Aires wool price series 1860-1902.

4. Second Report of the Royal Commission on Technical Instruction, P.P. 1884 (C. 3981), XXIX, 358-64; S. Smith, 'The Woollen Industry', H. Cox (ed.), British Industries under Free Trade (1903), p. 33.

their carders 'did not want to cope' with the burry fibres and were not prepared to employ chemists, as the Belgians had done, to devise a satisfactory method of removing them.¹ Other evidence, however, strongly suggests that the seemingly stubborn refusal of West Riding manufacturers to exploit Beunos Aires wool did little to damage the competitive position of the industry in the long run. From the mid 1880s no further complaints of cheap Belgian yarns appear in the trade press and two factors would seem to explain this. Firstly, the demand for these yarns from Yorkshire was generally low, with the possible exception of temporary capacity constraints in times of good trade or for special orders, West Riding woollen mills being typically vertically integrated and preparing their own blends and yarns.² Secondly, Belgian yarns were used mainly in the manufacture of unmilled tweed fabrics and were thus effectively limited to the Galashiels and Hawick tweed trade, a market very dependent on the fortunes of that industry.³ The demand for these cheap yarns was thus strongly influenced by the growing competition of Yorkshire tweeds and the decline this inflicted on a Scottish tweed industry so long opposed to the use of recovered wool in its fabrics. Writing in 1912, an experienced West Riding manufacturer observed

1. Paris Exhibition 1878 - Artisans' Reports, op. cit., p. 5; T.M., 15.2.1879, p. 86; Technical Instruction, P.P., 1884 (C. 3981), XXIX, 363.

2. Hirst (of C. and J. Hirst and Sons, Longwood) informed the Tariff Commission that 'We often have yarns submitted by agents of foreign spinners, but though in some cases we could perhaps buy it as well as we could make it, we have never found that we could buy better or cheaper than we can spin ourselves' (op. cit., 1775). Another reason was that Yorkshire looms and practice did not favour weaving with Beunos Aires wool, unlike those of the Scottish industry (W.R., 18.4.1912, p. 4).

3. Belgian yarns were also sold extensively to the flannel and shirting manufacturers of the Glasgow district whose products competed with the Rochdale flannel trade; buyers from the latter district were frequently noted by the trade press as attending the Dewsbury rag auctions. H.E., 24.12.1891.

'With all their skill, the Belgians have never excelled in the use of shoddy. Their system of carding, although so well suited to the strong and harsh fibres of Buenos Aires wool, does not compete successfully against the British system of treating shoddy or the softer wool from the Colonies. The writer has studied the Belgian system at Verviers, as well as the English methods in his native county of Yorkshire, and thinks the latter are far superior.'¹

Although much was made of competition in the home market from low Belgian, French, German, and Italian goods at various times by West Riding manufacturers, these complaints were consistent by their irregularity during this period. In his evidence to the 1886 Royal Commission on Depression of Trade and Industry, Mark Oldroyd, the largest manufacturer of low woollen goods in the Heavy Woollen District and spokesman for the Batley and Dewsbury Chambers, was particularly critical of cheap German mungo mantlings sold in London, but noticeably evasive when asked the question

'But if you could produce these mantles in London at the same cost as the Germans produce them at, you might compete with them in the London market in spite of them refusing to take your goods in, except at a prohibitory duty?'²

There was, of course, little that Oldroyd could say in reply to this, the actual level of imported woollen fabrics in linear yards, although doubling in the period 1884-88 compared with the levels of 1882-83 (Table V(xix)), was only 3.6 per cent of the average yardage exported in the same period (Table V(xviii)). Indeed, while the Commission was questioning its witnesses a trade journal had noted in 1885 the 'immense improvement' in the quality of Yorkshire low tweeds for men's 'Newmarket' suitings as well as for ladies' mantlings and children's wear which had all but stopped the hitherto successful

1. W.R., 18.4.1912, p.4.

2. Royal Commission on the Depression of Trade and Industry (Third Report), P.P. 1886 (C. 4797), XXIII, 288, Ques. 14, 153.

importation of Belgian and Prussian fabrics, previously preferred 'because of the bad colours of English goods'.¹ There seems little reason to doubt, as Oldroyd observed in his closing statements to the Royal Commission, that the effects of the highly competitive trading conditions of the 1880s had

'... caused the manufacturers in our district to devote more attention to woollens generally, and that it has necessitated and enforced upon us a large extension of our technical knowledge and experience, and that we are better qualified... to adapt ourselves to any change of fashion that may arise than we were five years ago'.²

Three years later the trade press could observe that Oldroyds, in common with other manufacturers in the Heavy Woollen District 'have for some time past had an extraordinarily good run of trade' in 'tweeds, serges, worsteds and mantle cloths' as well as in the traditional heavy goods.³

Complaints of competition from continental manufacturers of cheap woollen fabrics in the domestic market were few and far between until the Tariff Commission published its predictably pessimistic findings in 1905. There were good reasons for West Riding manufacturers to feel justified in their complaints of overseas competition in the domestic market for imports of all woollen fabrics had nearly doubled in the decade 1894-1903 compared to the immediately preceding quinquennium 1889-1893 (Table V(xix)). This was reflected in the increased proportion of imports as a percentage of yardage exported - from 7.9 during 1894-1899 to 9.9 in the period 1899-1903 - the smaller figure of the earlier period tending to understate the actual level of

1. Journal of Fabrics Industries, 12.11.1885, p. 49.

2. Depression of Trade and Industry, op. cit., 293, Ques. 14, 252.

3. T.M., 15.10.1889, p. 488. The reviewer noted that Oldroyds were the 'most enterprising firm in the district'.

imports because of the sharp but short growth in exports to the United States under the Wilson Tariff between 1895 and 1897. Summarising the views of many of the manufacturers giving evidence, the Commission noted in its introduction

'Overcoating are said to be "dumped" from Germany, Holland, and Belgium, and compete with the trade in the Dewsbury and Batley districts. These low-priced overcoatings do not come into competition with the better class, but the shoddy-makers suffer severely. They are sold in all the large centres at very low prices'.¹

Allegations of dumping, particularly of low tweeds at 20 to 30 per cent 'less than the prices at which they are usually sold' and under the cost at which West Riding mills could manufacture them, were numerous and appear persuasive.² Whilst this undoubtedly happened and had affected some manufacturers in the home market, the experience was by no means general to all manufacturers nor were the sentiments expressed consistent with the more objective contemporary trade reports. Indeed, these indicate that from the mid 1890s the export trade in woollen cloths was particularly bouyant to the four 'principal' markets of France, Germany, Belgium, and Holland - the very same countries whose products were alleged to be the cause of distress to West Riding low woollen manufacturers.³ The evidence strongly suggests that entrepreneurial response by manufacturers of low woollens to continental competition in the domestic market differed markedly between firms or districts, a trade report remarking that 1903, for example, had been 'one of the worst years for German mantle manufacturers' because of fierce competition from Batley mills.⁴ In the same year that the Commission published its report, the Textile Manufacturer, in an

1. Report of the Tariff Commission, op. cit., 2, 2, 1347.
2. *ibid.*, 1336, 1343, 1356, 1358, 1372, 1374, 1384, 1404 etc.
3. T.M., 15.1.1896, 15.1.1898.
4. D.R., 24.12.1903.

editorial on 'The Low Woollen Trade', observed that it was 'not so many years ago since the great outcry from the woollen districts of Yorkshire' over the importation of large quantities of cheap woollen and shoddy goods from Germany, some of which had been made up from shoddy yarns bought in the West Riding. These cloths 'although somewhat doubtful as regards durability, were tasteful in appearance and low in price' and, it appears, this lesson was quickly noted by West Riding manufacturers.

'The stumbling block in Yorkshire was the finish, but since this was overcome the shoddy and low woollen district have had an enviable time. It has become recognised, as the Germans found years before, that a low cloth will sell even if its flimsiness is known, so long as it can be made to look equal to a more expensive article for a time.'¹

Both the 1886 and 1905 reports thus largely reflected the views of certain West Riding manufacturers and could not be claimed to be representative of the experience of the majority, even though each report was being prepared at a time of a sustained depression of profits in the industry (1884-1886) or of increased competition from continental manufacturers in the home market (1899-1903). That these were of short duration is evident from trade and other sources; and that this was so would seem to confirm, as American manufacturers had frequently pointed out, the skill of the West Riding low woollen trade to utilise fully the potentialities of recovered wool, enabling them to maintain a secure position for their products in the domestic market.

Complaints of high tariffs in export markets in both these reports

1. T.M., 15.12.1905, p. 398. See also The Textile Journal, 7.11.1904, which noted that large quantities of cotton-warped mungo beavers, Moscows, and Eskimos previously imported from Germany were meeting increased competition from West Riding manufacturers.

were supported, unlike the complaints of cheap imported woollens, by trade writers in the technical and local press. The mechanism of specific tariffs, first adopted by the United States and subsequently by other countries, was introduced primarily to render cheap shoddy woollens from the West Riding uncompetitive to domestically produced cloths by levying a duty on the weight of the cloth, past experience strongly suggesting that ad valorem tariffs were easily circumvented either by under-valuation¹ or by the admixture of even greater proportions of cost-reducing raw materials. A number of tariffs, such as the Morrill Tariff of 1861, combined specific and ad valorem duties which manufacturers of heavy woollens found particularly difficult to surmount. The exported linear yardage of woollen fabrics between 1880 and 1903, which had fluctuated fairly constantly around 50 million yards (Table V(xviii)), clearly reflects the problems of the woollen industry during a period in which the yardage of worsted goods exported declined by 44 per cent.

American tariffs rose from an average ad valorem equivalent (specific plus ad valorem) of 65 per cent between 1867-1875, 71 per cent 1876-1883, 97 per cent 1891-1894 (cloths valued at over 40¢ lb.) and between 93 and 95 per cent in the period 1898-1914 (cloths valued at over 70¢ lb.).² West Riding manufacturers, through their respective chambers of commerce, were active in attempting to present a united front to Westminster and overseas governments when new or renegotiated treaties threatened to damage their interests. The Huddersfield Chamber, concerned that a new Franco-Italian treaty would raise Italian duties, noted in 1875

1. Huddersfield Chamber of Commerce MSS., loc. cit., Minute Book 11.11.1868-9.5.1883, entry 4.4.1881.

2. A.H. Cole, op. cit., II, p. 25. The tariff on low woollens was as high as 150 per cent in 1891, v. supra p.472.

'The terms on which that renewal was proposed ... had specific duties on the light and comparatively costly textures of France for a basis and a table prepared to show the operation of that scale of duties on the current staple articles of export from the Yorkshire Woollen District, Batley, Dewsbury, Huddersfield and Leeds, showed that it would prove the annihilation of the trade in our heavy and comparatively low-priced productions raising the rate of duty from 10 per cent at which it now stands to 20, 30, 40 and even 50 per cent.'¹

Some of these attempts met with success, the deputation from the Huddersfield Chamber including representatives from Dewsbury (Mark Oldroyd), Batley (Thomas Taylor), and Leeds (John Barran junior) meeting the Foreign Secretary in Vienna and secured a re-classification of fulled goods, previously classed as unfulled at a high rate of duty, resulting in 'large parcels' again being shipped in 1875.² Similarly, representations to London and Paris succeeded in prolonging, with minor concessions, the favourable terms of the Anglo-French treaty from 1877 until May 1882, when it was finally re-drawn.³ National interests and political pressure from overseas domestic woollen manufacturers, unable to compete with the productive capacity and cheapness of Yorkshire shoddy cloths at a time of depressed profits and fierce international competition, began increasingly to prevail from the late 1870s to the detriment of the Heavy Woollen District export trade. In 1879 the Zollverein tariff was increased 225 per cent to £3.8^s.7^d per hundredweight on woollen cloth and the Canadian tariff, following the election of a protectionist government under MacDonald in 1878, was raised in 1879 to 20 per cent ad valorem plus 7½ cents per lb., thus effectively excluding all the lower classes of woollen goods.⁴ A similar increase in Russian tariffs in 1883 reduced exports of low woollen goods, and particularly low shoddy yarns in which there had

1. Huddersfield Chamber of Commerce MSS., loc. cit., Minute Book (op. cit.), entry 11.8.1875.

2. H.E., 1.1.1876.

3. Huddersfield Chamber of Commerce MSS., loc. cit., Minute Book (op. cit.), entries 14.7.1876, 4.4.1881.

4. Depression of Trade and Industry (Third Report), P.P. 1886 (C. 4797), XXIII, 287. Ques. 14, 120, 14, 124-128; H.C., 27.12.1879; Journal of Fabrics, 12.8.1883, p. 21; T.M., 15.1.1885, p. 27.

previously been a good trade.¹

The response of West Riding woollen manufacturers to increased tariffs was twofold - firstly, to exploit new markets for their goods, for instance Japan,² South America,³ Turkey and India,⁴ Rumania and Bulgaria,⁵ and, in addition, to maximise output to all markets when favourable trading conditions permitted (1889-1890, 1895-1897);⁶ and, secondly, to develop new types of cloth. The changing balance of overseas trade in woollen textiles was increasingly towards colonial markets, in particular Australia and Canada, where, from 1891, a large market in Yorkshire low woollens had been built up.⁷ This was not achieved without some opposition from manufacturing interests in these countries, especially in Canada where preferential tariffs had been granted in 1897 enabling British woollen textiles to be imported at 30 per cent ad valorem, or 5 per cent less than on goods from other countries.⁸ Under the heading 'Shoddy and Ignorance', an editorial in the Textile Manufacturer in 1905 claimed that the Australian Royal Commission on the Commonwealth Tariff was sympathetic to criticisms of Yorkshire shoddy goods and requests that these should be discouraged from entering the Australian market.⁹ Three years later the Canadian Manufacturers Association, in their

1. H.E., 29.12.1883.

2. D.R., 31.12.1881.

3. H.E., 28.12.1889.

4. ibid., 24.12.1891.

5. T.M., 15.3.1895.

6. ibid., 15.10.1889, 15.1.1890, 15.3.1890, 15.1.1896, 15.1.1898; H.E., 28.12.1889, 28.12.1895. During the Wilson tariff, for example, one third of the output of C. and J. Hirst and Sons was taken by a single American buyer, dropping to 1 per cent after the imposition of the Dingley tariff. Report of the Tariff Commission, op. cit., II, II, 1778 (evidence of Thomas Hirst). In 1891, the American manufacturers' association noted that sales of Yorkshire shoddy cloths in international 'open markets', exceeded by a small margin those of Germany, 'a strong competitor'. Bulletin of the National Association of Wool Manufacturers, op. cit., p. 346.

7. H.E., 24.12.1891; D.R., 30.12.1899, 31.12.1904; E. Sigsworth and J. Blackman, loc. cit., pp. 156-57; Committee on Industry and Trade, op. cit., III, pp. 172-74.

8. T.M., 15.1.1898.

9. ibid., 1905, p. 182.

journal Industrial Canada, launched a fierce attack on British low woollen textiles firmly based on claims that the cloth was manufactured from 'disease-infected' woollen rags - a theme common to the comments of an Australian witness in 1905.¹ The allegations were seen to be of a sufficiently serious nature by the Leeds Chamber of Commerce that a special conference was convened with 11 other West Riding chambers at which it was 'deduced that the attack was of political origin to attempt to raise tariffs against British goods'.² Notwithstanding the publicity surrounding this opposition, exports to Canada of well patterned low tweeds and other goods moved strongly upwards with a revival of trade in 1909, and a number of Canadian mills, in order to compete with these goods, were obliged to come to Yorkshire for their shoddy.³ The continued strong trade upturn from 1910 to the outbreak of war in 1914 saw a great expansion of the markets for West Riding low woollens, not only in the colonies but in South America, Europe, the Near and Far East, and the American market with the reduced Wilson tariffs of 1913, although high protective tariffs imposed by Japan in 1911, previously Britain's largest piece-goods market, was viewed with concern in the trade press.⁴

The second response by West Riding low woollen manufacturers to high and prohibitive tariffs was to develop new types of cloth utilising

1. v. infra p.550.

2. D.R., 24.12.1908. The 1905 Tariff Commission had noted that a number of Canadian mills had closed allegedly because of low priced shoddy goods from Yorkshire, but it thought a more likely reason was to be found in 'bad management' (op. cit., 1438).

3. D.R., 1.1.1910. The records of E. Fox and Sons indicate substantial sales to Canadian woollen manufacturers from 1910 (v. supra, p.317.) and the records of machine makers Walker and Smith of Batley and Wilson Knowles of Heckmondwike note a number of eastern Canadian mills purchasing 14 and 18 inch rag machines from ca. 1895. (v. infra p.550).

4. D.R., 1.1.1910, 30.12.1911; W.R., 4.7.1912; The Statist, 28.6.1919, pp. 1202-4.

shoddy and mungo - a response to a large extent closely connected to fashion changes in the domestic market and the need to produce different cloths for new markets. The Colne Valley and Batley/Dewsbury tweeds found ready acceptance in the preferential Canadian market, because, as the 1905 Tariff Commission observed

'... it has a climate where they wear the class of goods we make, namely, tweeds, which are not fitted for hot countries'.¹

The change in the Ossett and Morley union trade towards lighter fabrics, partly to compete with cottons in the domestic market but more importantly to substitute for the loss of traditional markets in heavy woollen and union cloths, was being noted in the 1880s and had expanded rapidly after the Russo-Japanese war.² By 1909 a number of mills in Batley and Dewsbury, some of whom had previously produced rugs and blankets, were exporting 75 per cent of their production in lighter cloths, particularly to Japan, China, and Turkey.³ The large quantities of cheap rags reaching the West Riding from the United States from 1909 were utilised in the manufacture of 'nice cloths' with cotton warp stripes and shoddy wefts and exported in large quantities to the Mediterranean countries, the Balkan provinces, and the Far East, the trade only being curtailed by war between Italy and Turkey in 1911-1912, though not for the manufacturers of army cloth.⁴

In order to overcome the very high tariffs on woollen cloth exported to Italy and France, Batley and Dewsbury manufacturers developed

1. Report of the Tariff Commission, op. cit., 2,2, 1440, and in the French and Spanish markets from 1892; T.M., 15.8.1892, p. 363.

2. In 1918 it was noted that Morley was 'most known' for light-weight dress mantles comprising shoddy and cotton costing between $2^s/6^d$ to $2^s/9^d$ per $5\frac{1}{2}$ yards. F. Ormerod, Wool (1918), p. 156.

3. D.R., 1.1.1910.

4. ibid., 30.12.1911; W.R., 4.7.1912.

a new type of cloth with a distinctive cotton warp,- unlike the conventional union with the cotton warp obliterated by a wool and shoddy weft - which attracted the same rate of duty as an all-woollen cloth.¹ By 1904 'large quantities' of another special union worsted cloth were being manufactured specifically for the French and continental market by Heavy Woollen District mills using single or doubled cotton warps, a worsted weft for the face, and a low mungo backing weft, the design in twill, stripes, or checks giving the appearance of a worsted cloth.² Table V(xxvi) indicates that the policy of developing the new lighter-weight union cloths ((b), 'broad, mixed' category) proved very successful, nearly matching the overall growth in exports of 'broad, all wool' heavy cloths, but undergoing a more marked expansion in the competitive conditions of 1895 to 1899, years in which imports of woollen goods were to reach their peak for the period between 1882 and 1913 (Table V(xix)).

Although the introduction of new types of cloth signified an important change in the nature of the traditional goods produced by low woollen manufacturers in the West Riding in the period 1870-1914, the range of heavy fabrics produced in 1904 was very similar to the staples of the Batley and Dewsbury district noted by Jubb in 1860.³ Piece-dyed 'pilots' in blues, browns, blacks, and greens, the lowest qualities being manufactured for the shipping trade with the better qualities used for domestic army, navy, police, and railway uniforms; a wide range of cloths in the 'witney' class (such as 'naps', 'elysians',

1. Journal of Fabrics Industries, 12.1.1885, p. 6; Second Report of the Royal Commission on Technical Instruction, P.P. 1884 (C. 3981), XXIX, 256. French manufacturers had conceded that they were unable to match the skill of the Yorkshire industry in dyeing union goods. Smith noted in 1886 that this resulted from the innovation of 'burl dyeing' which had 'proved to be a great boon to the union trade' of Morley and other districts. (W. Smith (1886), op. cit., p. 299).

2. Textile Journal, 7.4.1904, p. 188.

3. v. infra Chapter I, Appendix I-II.

TABLE V(xxvi)

British Exports of Woollen Tissues, 1890-1913(Annual averages, 000 linear Yards)

<u>Woollen Tissues</u>	1890-94	1895-99	1900-04	1905-08	1909-13
<u>(a) Heavy</u>					
Broad, all wool	8,582	9,328	10,736	17,673	22,418
" mixed	14,093	15,645	14,706	19,223	25,964
Narrow, all wool	1,254	795	433	513	559
" mixed	711	475	551	431	539
Total-Heavy Tissues	24,640	26,243	26,426	37,840	49,480
<u>(b) Light</u>					
Broad, all wool	6,369	6,900	6,413	9,306	11,100
" mixed	8,771	11,430	10,602	17,858	22,106
Narrow, all wool	3,220	3,008	3,045	3,794	4,611
" mixed	7,224	5,476	5,589	9,399	8,324
Total-Light Tissues	25,584	26,814	25,649	41,357	46,141
Total-All Tissues	50,224	53,057	52,075	78,197	95,621

Source: Balfour Committee on Industry and Trade, Survey of Textile Industries, E.M. Sigsworth and J. Blackman, loc. cit., p. 137

and 'petershams') with a heavily raised finish, sent in large quantities to continental and South American markets; 'downs', 'flushings', and 'duffels' made in both union and all-wool, piece-dyed with a raised 'lofty' appearance, mainly destined for overseas markets; 'kerseys', 'tartans', 'meltons', and tweeds, the kersey-type cloth with a raised and dressed pilot finish being used almost exclusively in Post Office and similar uniforms, the other cloths having a close, firm, and 'dry' finish and going to domestic and overseas markets; 'beavers', Moscows, and Eskimos - heavy-faced union goods for mantles, using fine grey mungo and being piece-dyed fawn, crimson, light and navy blue, and black; and, finally, 'army' cloths, commonly manufactured from wool, waste, and coarse rags and having a raised pilot-type finish.¹

As Sigsworth and Blackman have suggested, the success of the United Kingdom woollen manufacturing sector in domestic and export markets in the period 1870-1914, and particularly from 1900, rested to an important extent on its ability to maintain low prices by skilful manipulation of recovered wool. In an assessment of this success the contribution of the West Riding would seem to have been crucial. Whilst price played an undoubtedly large part in enabling imports to be resisted and export markets to be expanded, it has been suggested here that West Riding manufacturers demonstrated equally as importantly a willingness to meet changing consumer preference in fashion and an ability to diversify production into new types of

1. *ibid.*, 7.12.1903, 8.2.1904, 7.5.1904, 7.7.1904, 7.9.1904, 7.11.1904, 7.12.1904, 7.2.1905.

cloth for the mass market.¹ By concentrating the larger proportion of output on the manufacture of cheap but attractive cloths, and assisted by the development of the ready-made clothing industry, the West Riding low woollen sector continued to exploit the movement accelerated by the cotton famine in the substitution of cotton by woollen goods.²

It is only when the capacity of the West Riding woollen manufacturing sector is compared to that of the United Kingdom as a whole that the significance of recovered wool to the industrial development of the Yorkshire industry can be seen in perspective. The 1904 Return of Machinery indicates that just over 72 per cent of total United Kingdom woollen spinning capacity was located in the West Riding, a proportion which had increased from about 55 per cent in 1870.³ Assuming that this changed little in the period 1905 to 1914, for although the 1918 census of machinery indicates a decline

1. C.A. Foley, 'Fashion', E.J., 3, Sept. 1893, pp. 458-74; J.H. Clapham (1907), op. cit., p. 182. Hirst told the Tariff Commission 'Our activity is purely a matter of fashion' (op. cit., 2, 2, 1774). There is evidence that although West Riding manufacturers responded to fashion change, this was not without some misgivings. The Textile Manufacturer noted during the trade revival of 1889 that 'demand for the old class of goods, pilots, presidents, naps, etc., has greatly increased ... manufacturers are hopeful that it will continue, as the old class of goods runs more uniformly on the machinery than the tweeds and worsteds which have of late been so much in vogue'. 15.12.1889.

2. In their review of the 'Changed conditions in British Industry', the Tariff Commission observed that there had been 'a considerable substitution during the last 30 years of cheap woollen garments for linen and cotton, and also for slop manufacturers and workmen's garments ...', op. cit., 2, 2, 1450.

3. Yorkshire and United Kingdom spindles were 1,477,763 and 2,664,883 respectively in 1871. In 1904 the figures were 1,530,889 and 2,125,439 (including 'shoddy factories' but excluding doubling spindles). Return of Mills and Factories, ... 1870, P.P. 1871 (440), LXII, 112-4, 119; Return of Woollen, Worsted, and Shoddy Factories, and of Machinery, 1904, P.P. 1904(293), LXXXVII, 1111, 1113, 1119. A far higher degree of concordance between yarn spinning and wool weaving was present in the woollen section. A very high proportion of woollen manufacturers spun their own yarn, and as Brierley and Carter have pointed out, activity in the weaving section was the main determinant of the demand for yarn. S. Brierley and G.R. Carter, 'Fluctuations in the woollen and worsted industries of the West Riding', E.J., 24, Sept. 1914, pp. 381, 384.

to 66.2 per cent¹ this would have been offset by the installation of more efficient mules, it is possible to extend the estimates in Table V(xix) of the percentage of clean wool consumed by both branches of the industry using Census of Production data for 1907 and 1912 of the weight of tops (Table V(xxvii)).² Compared to the estimated total clean weight of wool available to the United Kingdom woollen sector, the Census of Production figures for consumed recovered wool for 1907 and 1912 suggest that shoddy and mungo supplemented the supply of virgin wool by approximately 110 and 134 per cent respectively (Table V(xxviii)).³ Allowing for a maximum of 10 per cent of recovered wool consumed outside Yorkshire, the spinning capacity indicates that of the total weight of clean wool consumed in the United Kingdom woollen sector the West Riding accounted for approximately 91 and 62 million lbs. in 1907 and 1912. Thus, in each year, the weight of recovered wool used exceeded the virgin raw material by 2.1 and 2.8. times respectively, or, alternatively, West Riding woollen cloth comprised about 67 and 74 per cent shoddy and mungo. Moreover, it is possible that these figures may understate the proportion of recovered wool used in Yorkshire in the manufacture of cloth, for part of the balance of wool available after deducting the weight of tops produced was used in a number of non-apparel

1. Bradford Chamber of Commerce, op. cit., 1925, p. 120.

2. This includes the weight of oil, but is approximately compensated for by exports of noils, retained noils being automatically included in the proportion of virgin wool consumed by the woollen sector.

3. No allowance has been made for possible stock carry-over in raw wool. The top production figures suggest that part of the large import of wool in 1911 may have been held over in the form of stocks, a situation that was less likely in the boom conditions of 1906 and 1907.

TABLE V(xxvii)

Proportion of clean wool consumed by the United Kingdom woollen and worsted industries, 1907 and 1912
(000's lbs.)

Year	Woollen section	%	Worsted section (tops or slubbing)	%	Total retained (estimated clean weight) ²
1907	190,500	44	243,500	56	434,000
1912	144,058	32	304,542	68	448,600

Source: 1. Third Census of Production of the United Kingdom, op. cit., p. 77; 2. Table V(vi).

TABLE V(xxviii)

Estimate of the extent to which recovered wool augmented the consumption of clean wool by the United Kingdom and West Riding woollen manufacturing sectors, 1907 and 1912.

Year	Shoddy and mungo as a % of clean weight of wool (U.K.)	(a) Estimated weight of clean and recovered wool consumed (U.K.) (000s lbs)	(b) Estimated weight of clean wool consumed in W.R. (000s lbs.).	(c) Estimated weight of recovered wool consumed in W.R. (000s lbs)	(c) as a % of (b)
1907	110.2	400,500	91,350	189,000	206.9
1912	134.3	337,558	62,041	174,150	280.7

Note: (b) Calculated as 70 per cent of (a), less (c).

Source: Tables V(vi), V(xvii), V(xxvii).

related industries, such as carpet manufacture,¹ and, as previously noted, the actual or greasy weight of wool consumed in the United Kingdom has been deflated conservatively.

It would seem that the change in fashion away from the Bradford cotton-warped lustre fabrics to all-wool fabrics using shorter stapled merino and crossbred wools had greater implications on the woollen manufacturing sector than has hitherto been suggested. The relative proportions of wool consumed by both branches of the industry clearly underwent a marked reversal between the estimates of ca. 1850-1879 (Table V(xiv)) and the Census of Production figures for 1907/1912. That the worsted sector was having to substitute more expensive wool for cotton is confirmed by the concurrent decrease in yardage and rise in value of its exports, the corollary of which was that the woollen sector was left with a progressively smaller share of virgin raw material.² Thus, assuming that West Riding low woollen manufacturers were either unwilling or unable to bid up the price of wool in world markets, it would appear that they had little option but to rely increasingly on wool recovered from rags. In fact, there is no evidence that the

1. Including soft-spun knitting wool. Encyclopaedia Britannica (1888), op. cit., XXIV, p. 655.

2. A similar trend was observed in the United States wool textile industry. The proportion of virgin wool consumed by the woollen sector as a percentage of total raw materials consumed fell from 54.2 per cent in 1879, to 37.6 per cent in 1899 and 27.8 per cent in 1914. For the worsted section the figures were 70.9, 78.7 and 83.6 per cent respectively. A.H. Cole, op. cit., II, p. 71. In both the United Kingdom and United States industries this was achieved by the increasing ability of worsted combing machinery to manipulate fibres as short as 2 inches in staple from ca. 1860. Encyclopaedia Britannica (1860), op. cit., XIV, p. 906. It should also be noted that a proportion of worsted yarn was used in the production of woollen cloths.

woollen sector was concerned about the supply situation in wool but was, however, quite prepared to exploit fully the cost-reducing properties of the inferior raw material. Indeed, given the commitment of the West Riding low woollen sector to the production of very cheap goods for the mass market, it would seem that from ca. 1875 the demand for recovered wool displayed a marked tendency towards inelasticity, a suggestion supported by the price relatives, the rapid substitution of domestic for imported shoddy and mungo, and the reaction to the import prohibition on woollen rags of 1892/3.¹ There is thus little doubt that without the very significant contribution of recovered wool as a supplementary raw material the growth of the West Riding woollen trade in the period 1870-1914 would not have been capable of achieving the primacy that it did, and the performance of the United Kingdom woollen sector in domestic and overseas markets would have presented a very different picture.²

1. The Huddersfield Examiner noting that the shortage of rags had 'no effect on wool prices, even the lowest sorts'. 24.12.1892.

2. Board of Trade Working Party Reports - Wool, op. cit., I, p. 5. It was estimated in 1929, for example, that 66 per cent of Batley and Dewsbury goods were exported in the period prior to 1914. Yorkshire Observer Trade Review, 7.1.1929, p. 24.

CHAPTER V

VI - 1914-1939

1914-1939

The period 1914-1939, particularly from 1920, contrasts markedly with the years of expansion experienced by the shoddy and mungo manufacturing sector from 1900. As shown in Table V(xxix) absolute levels of consumption of recovered wool fell to figures comparable to the 1870s and 1880s, whilst as a percentage of clean wool consumed the decline was even more precipitous, approximating proportions reached in the early to mid 1850s. The charted consumption of clean and recovered wool between the mid point of each quinquennial mean in Fig. V(ii) can be broadly interpreted as follows;

Period (a) 1912-17, actual substitution of recovered by virgin wool.

Period (b) 1917-22, relative substitution of virgin by recovered wool.

Period (c) 1922-27, actual substitution of virgin by recovered wool.

Period (d) 1927-32, relative substitution of recovered by virgin wool.

Period (e) 1932-37, relative substitution of virgin by recovered wool.

This concurs reasonably closely with the price relatives of Uplands cotton, Lincoln, Port Philip, and Dorset Down wools to shoddy, although less conclusively with mungo (Appendix V-IV, (a) and (b)).¹ From these it can be seen that between 1912 and 1917 shoddy was becoming relatively more expensive, from 1917 to 1922 the price relatives favoured shoddy

1. This would seem to be explained by the fact that an important market for the diminished production of mungo in the inter-war years was in the manufacture of service and public sector uniform cloth which permitted greater price stability under long-term contract agreements.

TABLE V(xxix)

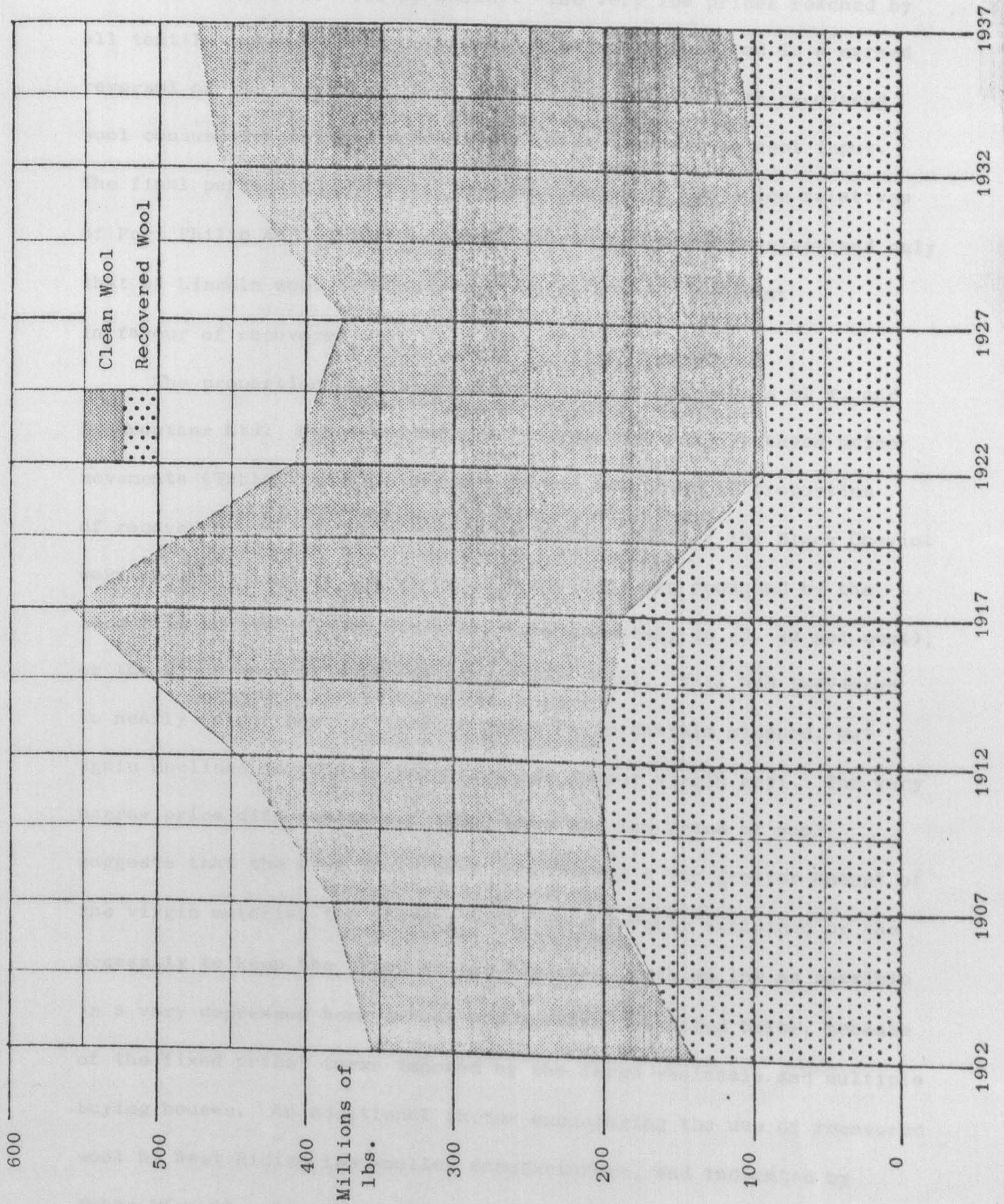
Estimated United Kingdom consumption of shoddy and
mungo and wool fibres, 1914-1939 (000s lbs.).

Year	(a) Shoddy & Mungo Retained	(b) Total Clean Weight of wool, Mohair etc. & Shoddy & Mungo	(c) (a) as a % of (b)	(d) (a) as a % of clean wool
1914	190,000	576,100	32.98	49.21
5	200,000	856,900	23.34	30.45
6	210,000	721,200	29.12	41.08
Av. 1917				
-19	135,300	688,100	19.66	24.93
1920	108,500	648,100	16.74	20.11
1	50,800	418,900	12.13	13.80
2	64,000	586,100	10.92	12.26
3	78,700	368,200	21.37	27.18
4	159,600	501,400	31.80	46.69
5	112,000	436,300	25.67	34.53
6	90,400	470,300	19.22	23.80
7	72,100	464,000	15.54	18.40
8	103,000	478,000	21.55	27.47
9	94,900	492,200	19.28	23.89
1930	86,900	507,100	17.14	20.68
1	95,000	575,400	16.51	19.78
2	95,000	583,700	16.28	19.44
3	108,000	585,600	18.44	22.61
4	108,300	539,700	20.01	25.10
5	110,600	571,100	19.37	24.02
6	108,000	613,200	17.61	21.38
7	127,100	582,900	21.80	27.88
8	130,000	627,400	20.72	26.14
1939	139,900	693,100	20.18	25.29

Source: (a) Chapter III, Appendix I, Table III-I(f).
(b) and (d) Table V(vi)

Fig. V(ii)

Estimated United Kingdom Consumption of
Clean and Recovered Wool, 1902-1937
(Quinquennial Means).



in 1921 and 1922 only, and from 1922 to 1927 the relative upward movement in wool prices, particularly of Port Philip wool, encouraged some substitution of wool by shoddy. The very low prices reached by all textile raw materials between 1927 and 1932 resulted in a marked reversal of the previous trend, the actual small rise in recovered wool consumption being exceeded by a large increase in wool input. The final period 1932-1937 is less well defined, the price relatives of Port Philip and Dorset Down wool remaining fairly constant and only that of Lincoln wool to shoddy indicating a price movement in favour of recovered wool.

The proportion of recovered wool used in the blends of W. and E. Crowther Ltd. between 1914 and 1939 broadly reflect these price movements (Table V(xxx)). Evident is the reduction in proportion of recovered wool in the blends of 1920 and 1923 for the Black Cheviot warp when compared to the blend of a similar warp produced by the same firm in 1907 (Table V(xxiii), approximately 20 cf. 42 per cent), or the Black warp of 1910 (15 cf. 53 per cent). This had increased to nearly 64 per cent in 1927 as price differentials widened, but again declined in 1928 as they began to favour virgin wool. The very narrow price differential of 1932, when the low price of wool suggests that the firm could have substituted a far greater amount of the virgin material for shoddy, would seem largely explained by the necessity to keep the price of the finished cloth as low as possible in a very depressed home market and perhaps, as noted below, because of the 'fixed price' terms imposed by the large wholesale and multiple buying houses. An additional factor encouraging the use of recovered wool by West Riding low woollen manufacturers, and indicated by Table V(xxxi), was the consistently larger proportion of the rising consumption of clean wool used by the worsted section in the 1930s.

TABLE V(xxx) Blends for some Cheviot and Saxony Tweed type suitings and cloths, 1914-1939

Date	Manufacturer	Blend	Raw Materials	Percentage Proportions	Cost per lb. (pence)
1914	W.&E. Crowther Ltd.,	Khaki Weft	Blue XBred & Khaki English Wool: Lt. Khaki Serge	<u>76.54/23.46</u>	18/4½
1917	"	"	Blue drab XBred: Khaki Serge	<u>38.29/61.71</u>	36/13
1920	"	Black Chvt WP.	Black wool: Black Jackets	<u>79.74/20.26</u>	55½/19
"	"	Blue Grey Cheviot WP.	Blk.&Lt. Stain Scd. Wool: Blk Jackets & Clippings	<u>78.81/21.19</u>	55½/19
1923	"	Black Warp	Black Wool & Slipe Wool: Sorted Cheviot Waste: Blk Trousers	<u>60/25/15</u>	15/8/10
1927	"	Black Warp	Black 70's Noils & Spinners Waste: Blk Cotton: Super Blk Mungo	<u>27.27/9.09/63.64</u>	32/13½/9
1928	"	Dark Lovatt Cheviot WP.	Dark, Light Grey, Blue, Yellow & Black Scd. Wool: Blue Grey Military Mungo	<u>81.06/18.94</u>	23½/5½
1932	"	Black Warp	Blk. Scd. Wool Etc.: Blk Worsteds	<u>46.91/53.09</u>	8½/5½
1937	"	"	Blk Slipe, Laps & Locks: Blk Cheviots, Fancy & New Clips	<u>70.42/29.58</u>	15½/8½
1939	"	Khaki	White/Indigo Scd. Lamb's: New Khaki Worsteds, Serge & Bedfords	<u>68.28/31.72</u>	19/18

Source: W. and E. Crowther Ltd. MSS., loc. cit., Lot Books 3-17.

TABLE V(xxxi)

Proportion of clean wool consumed by the United
Kingdom woollen and worsted industries in various
years, 1924-1937 (000s lbs.).

Year	Woollen section	%	Worsted section ¹	%	Total retained ² (estimated clean weight)
1924	56,250	16.5	285,550	83.5	341,800
1930	195,783	46.6	224,417	53.4	420,200
1933	168,040	35.2	309,560	64.8	477,600
1934	156,571	36.3	274,829	63.7	431,400
1935	153,048	33.3	307,452	66.7	460,500
1937	177,411	38.9	278,389	61.1	455,800

Source: 1. Fifth Census of Production, Final Report, 1935, op. cit., p. 66; Final Report on the Census of Production for 1948, op. cit., 6, C, Table 7;
2. Table V(vi).

Whilst the proportions for 1924 strongly support the 1920-39 peak in that year for the consumption of recovered wool, they are misleading to a large extent as they reflect the large stock carry-over by firms of the war-time accumulated B.A.W.R.A. holdings liquidated at low prices between 1921 and 1922.¹ Nevertheless, it is clear from the production census data on the weight of tops produced by the worsted section, that the trend apparent from 1907 and 1912 was sustained during the inter-war years and that the amount of clean wool available to the woollen sector continued to fluctuate slightly above one third of the total estimated clean weight of wool retained in the United Kingdom.

The full impact of a war-time economy was not felt by the

1. Committee on Industry and Trade, op. cit., III, II, 170; G.H. Wood, loc. cit., p. 508.

West Riding woollen manufacturing sector until early 1916 when the War Office obtained powers to control stocks of English wool at 35 per cent above prices ruling in July 1914 and, for the duration of the war, an agreement to purchase the entire Australian and New Zealand clip.¹ Although the use of recovered wool was excluded from all but a small range of cloths manufactured for the services, the large quantity of wool required to equip each man at the front, estimated at 30 to 36 lbs. of clean scoured wool, persuaded the War Office to extend the use of recovered wool in army cloths in 1917, assisted by a thorough collection and salvaging operation of unserviceable military cloth under the control of the Government Rag Dept at Dewsbury.² The free market permitted in wool waste and rags, the former coming under control in 1917 and the latter in July 1918, and the commitment of between 70 to 80 per cent of woollen manufacturing capacity to military contracts³, combined with the dwindling supply of domestic woollen rags to produce a sharp upward movement in the

1. Profiteering Act, P.P. 1920 (Cmd. 858), XXIII, 645.

2. The Statist, 22.1.1916, p. 155; D.M. Zimmern, loc. cit., p. 28.

3. Profiteering Act, P.P. 1920, op. cit., 661. This included large orders from France, Servia, and Russia - the Belgian, north-eastern French, and Russian-Polish woollen cloth industries being seriously disrupted. By November 1914, orders totalling over 10,000 miles of army cloth had been placed by the War Office, and in 1915 it was estimated that the 5,000 looms in the Colne and Holme Valley district alone had produced some 250 miles of military cloth. G. and J. Stubley, for example, claimed to have manufactured 'millions of yards' of khaki serge, greatcoat cloth, and blankets between 1914 and 1918. G.R. Carter, 'Clothing the Allies' Armies', E.J., 25, 1915, pp. 98-100; W. Leach, 'Wool and War', Socialist Review, Jan. 1918, p. 21; G. and J. Stubley Ltd., op. cit., p. 11.

relative price of recovered wool. Thus on the decontrol of wool prices in March 1919 together with abundant supplies of wool (the only major source of supply outside War Office control had been South America) and the release of domestic and overseas buying power deprived of good quality woollen cloth, demand moved strongly away from high priced cloth made of remanufactured materials to all wool goods of fine quality.¹ Indeed, in attempting to assess the degree of short run super-normal profits in the West Riding woollen industry, the sub-committee of the 1920 Profiteering Act pointed out that it was 'impossible to get exact comparisons' for the purpose of costing tweed cloth 'as the types of cloth which have been manufactured since the war are of somewhat better quality than those manufactured in pre-war days'.²

The completion of the B.A.W.R.A. sales in 1922 further depressed demand for remanufactured wool to levels one quarter to one third of those pre-war, the actual percentage proportion consumed in the years 1921-23 (Table V(xxix)) being somewhat less than indicated owing to the abnormal stock holding of wool by the industry between 1921 and 1924. The shortage and high price of wool, caused by drought in Australia and substantial re-exports as world demand for wool tissues rose, coalesced with a shift in domestic and overseas consumer preference towards cheaper woollens to stimulate a sharp rise in consumption of recovered wool from the end of 1923, and an intense but short-lived trade boom in the Heavy Woollen District during 1924.³ From this date onwards

1. The Statist, 7.6.1919. p. 1040; W.R., 1.4.1920, p. 925; A.H. Cole, op. cit., II, p. 72; H. Dawson and Sons and Co. Ltd., Statistical Review of the Wool and Wool Textile Trades 1912-27, 1928, vi.

2. Profiteering Act, P.P. 1920, op. cit., 661.

3. Yorkshire Post Trade Review, 12.1.1923, p. 14; 12.1.1924, p. 18; A.N. Shimmin (1925), loc. cit., p. 5.

however, the consumption of recovered wool declined to depressed levels and only began to stage a mild recovery from 1934/5, consolidated by military orders from 1937 to 1939.

There is little doubt, as noted in Chapter III, that a major factor explaining the relative and absolute decline in consumption of recovered wool in the inter-war period was the loss of price competitiveness compared to virgin wool; whereas the consumption of shoddy, mungo, and extract fluctuated approximately 20 to 30 per cent either side of 100 million lbs. from 1925 to 1937, clean wool consumption steadily increased between 1923 and 1936 by 74 per cent. Three additional factors exerted a strong influence on demand for the products of the Heavy Woollen District; in the first place a structural change in overseas markets, secondly, fierce competition from foreign manufacturers in the home market until 1932, and thirdly, a marked change in domestic demand for wool-based textiles.

The decline in exports of woollen fabrics between 1920 and 1939 is shown in Table V(xxxii), the rate of decrease intensifying from 1927 to 1932 until, by 1939, the level of exports was one third that of 1920.¹ A major characteristic of this decline in the period to 1930 was the rapidly diminishing importance of Far-Eastern, Australian, and North and South American markets, offset to some extent by an actual increase from 1927 in exports to European countries;² from 1931

1. Export figures were reclassified in 1920 from linear to square yards and also included a wide range of wool-based fabrics not included previously. Because the width of cloths exported prior to 1914 cannot be determined accurately, it is not possible to produce comparable figures by means of a satisfactory conversion factor. Exports in 1920-21 were distorted by the inclusion of civilian cloth made from war-time acquired materials and sent to the devastated areas together with government surplus cloth and blankets sold by the British Realisation Department, see G.H. Wood, loc. cit., pp.503-5, 517, 519.

2. *ibid.*, pp. 521-22. The timing of the decline in exported woollen fabrics was obscured by the 'unreal and unjustified' boom in trade with the Far East between 1923 and 1925, largely to Japan for re-export to China; but for this, the decline in exports would have coincided more with the domestic economic depression beginning in 1921-22.

TABLE V(xxxii)

Exports of woollen fabrics, 1920-1939(000s square yards)

Year	000s sq. yds.	Year	000s sq. yds.	Year	000s sq. yds.
1920	187,233	1927	130,914	1934	68,940
1	76,556	8	128,556	5	71,208
2	121,591	9	108,185	6	78,184
3	148,556	1930	79,043	7	79,875
4	164,752	1	56,331	8	58,908
5	132,174	2	53,537	1939	59,355
1926	119,357	1933	61,307		

Source: B.R. Mitchell and P. Deane, op. cit., p. 197.

the level of demand increased slightly, only to fall back in 1938-39 with the unexpected collapse of raw material prices. The severity of the loss of export markets in British woollen fabrics can be compared to the experience of the worsted sector where the quantity of fabric exported fell by slightly over one half from 77.3 million square yards (m.s.y.) in 1920 - admittedly a substantially lower exported output than that of woollens - to 34.1 m.s.y. in 1939.¹ Overall, however, the wool textile industries of Britain's two largest competitors in the pre-war period, France and Germany, fared far worse from the world contraction in exported wool tissues as Table V(xxxiii) indicates, the Economist remarking in 1935 as overseas markets began to stage a revival

'For the time being Yorkshire appears to be safely entrenched as the world's leading wool manufacturing and export sector'.²

1. B.R. Mitchell and P. Deane, op. cit., p. 197.

2. The Economist, CXXIV, 26.9.1936, p. 553. Between 1935-38 the United Kingdom share of wool tissue exports (in square yards) was 48 per cent.

TABLE V(xxxiii)

Exports of wool tissues, 1924-1935(000s square yards).

Year	France	Germany	Italy	Japan
1924	49,700	22,000	17,500	very small
1929	36,200	34,500	23,200	"
1933	12,000	13,800	17,200	10,200
1934	8,800	9,900	18,300	20,200
1935	N/A	N/A	N/A	21,300

Note: (a) The data are not strictly comparable as no allowance is made for differences in weight of goods exported.

(b) Japanese exports exclude goods to Formosa and Korea.

Source: Imperial Economic Committee, The Economist, CXX, 30.3.1935, p. 713; CXXIV, 26.9.1936, p. 552.

The loss of the Japanese market, a conspicuous buyer in the 'boom' of 1923-24 and one which had previously taken from 25 to 30 m.s.y. of British wool cloth, was compounded by the extremely rapid growth of its own wool textile industry and the penetration by this of Britain's traditional markets in India and other Far Eastern countries.¹ Indeed, the single most important feature of international trade in wool textiles between 1920 and 1939 was not a lack of competitiveness on the part of United Kingdom manufacturers, but the similar expansion and import substitution by new or rejuvenated wool textile sectors in the dominions, India, China, Argentina, and other countries, behind high tariff barriers and frequently with the assistance of British plant, managerial expertise, and skilled operatives.² No

1. W.R., 14.12.1933, p. 1382; The Economist, CXX, 30.3.1935, p. 713.

2. Yorkshire Observer Trade Review, 5.1.1931, p. 22; The Economist, CXXXV, 1939, p. 493; G.C.Allen, British industries and their organisation (1970), p. 277. The imposition of ad valorem and weight duties by Canada in November 1930, previously a good market for West Riding low tweeds, had stimulated at least one manufacturer (George H. Hirst and Co., of Batley) to partly close one mill and transfer plant and key workers to Ontario. Yorkshire Post, 8.1.1931, p. 17.

matter how much Yorkshire desired a 'free competitive market' this was not to be, for by 1935 export markets, which in 1925 had accounted for approximately one half of the total output of United Kingdom wool textiles, were taking one third of a markedly diminished output.¹

The decline in export markets for United Kingdom woollen textiles could have but one implication for West Riding manufactures, as the Yorkshire Observer noted in 1931.

'There is no concealing the fact that we have been steadily losing our share of the world's trade and have been driven back more and more on the home market'²

Whilst Heavy Woollen District manufacturers were enjoying the short-lived revival in exports in 1923-24, imported retained wool tissues had increased portentously from just over 10 to 31 m.s.y. between 1920 and 1924, rising progressively as exports of United Kingdom woollen fabrics reached their lowest levels to a peak of 51.9 m.s.y. in 1931 (Table V(xxxiv)). Increasingly alarmed at this development, West Riding manufacturers strongly pressed their arguments for import duties to the Safeguarding of Industries Woollen and Worsted Committee, appointed in 1925 to examine specifically the complaints of the Bradford dress goods trade on rising French and German imports, but supported also by other West Riding interests including the Heavy Woollen District Manufacturers Association.³ By 1929 no section of the West Riding wool textile industry had not been adversely affected by the combined influence of decreasing export demand, high tariffs, and increasing 'unfair' price competition in a depressed home market,

1. The Economist, CXX, 30.3.1935, pp. 713-14.

2. Yorkshire Observer Trade Review, 5.1.1931, p. 22.

3. Board of Trade, Safeguarding of Industries. Report of the Woollen and Worsted Committee, P.P., 1929-30 (Cmd. 3355), XVII, 577.

TABLE V (xxxiv)

Imports of Woollen and Worsted Fabrics, 1920-1937.

Year	000s sq. yds.	Value £(000s)	Year	000s sq. yds.	Value £(000s)
1920	10,477	3,798	1929	39,141	6,991
1	9,834	3,080	1930	39,642	6,554
2	13,575	2,980	1	51,946	6,798
3	23,778	4,848	2	7,817	734
4	31,386	6,458	3	7,780	736
5	37,428	7,715	4	5,280	606
6	39,235	7,193	5	4,881	607
7	41,043	7,471	6	6,113	763
1928	43,229	8,026	1937	9,853	1,160

Source: Statistical Abstracts for the United Kingdom, 1920-1937.

fabrics of 'doubtful wearing abilities' from the low woollen industries of France, Germany, Italy, and Czechoslovakia being sold

'... at prices with which local manufacturers could not compete, differences ranging from 6^d to as much as 2^s/6^d per yard.'¹

The effects of the decision to leave the Gold Standard closely followed by the imposition in November 1931 of a 50 per cent ad valorem duty on all imported wool tissues was to immediately curtail the hitherto rising trade in imported woollen cloths, which fell back to 7.8 m.s.y. in 1932 and continued declining until 1936 notwithstanding a relaxation of the tariff to 20 per cent in 1932.² Although 1932 was seen as a 'disastrous year' for the Bradford worsted and Huddersfield fine cloth trades, the currency depreciation and import duties were heralded as an 'invigorating influence on the heavy woollen trade of

1. Yorkshire Observer Trade Review, 7.1.1929, p. 24. It was alleged in 1931 that 'in many cases there has been an obvious piracy of patterns by Continental manufacturers' of Yorkshire tweeds. Yorkshire Post, 8.1.1931, p. 17.

2. G.C. Allen, op. cit., p. 278.

Dewsbury and Batley'.¹ This prediction proved accurate for although imports of cheap woollen fabrics from the recovered wool industry of Prato continued, the virtual exclusion of overseas competition enabled the Heavy Woollen District and Colne Valley trade to exploit the mild revival in domestic and overseas demand beginning in 1933 which gathered strength until 1936-37 when demand again weakened with all the signs of the onset of another severe depression in 1938-39.²

The increasing reliance that West Riding low woollen manufacturers were obliged to place on the home markets (Table V(xxxv)) rendered them particularly vulnerable to fluctuations in domestic demand, a factor which had been of considerably less influence in the decades preceding 1914 when over half of their output had been exported. The larger proportion of West Riding low woollen cloth manufactured for the domestic market had been in tweed cloths and heavy overcoatings,³ but with the loss of traditional overseas markets low woollen cloths became increasingly exposed to the vagaries of real income levels, changing fashions, and competition from new fabrics. Following the collapse of the 1919-20 boom in which consumer preference had shifted to fine quality woollen and worsted goods, the low woollen industry was able to take advantage of the relatively higher price of wool as real incomes came under pressure and consumer demand for clothing became more price elastic between 1923 and 1925.⁴ For the remainder of the 1920s however, the Heavy Woollen District moved into a severe depression as fashion began to favour lighter weight cloths manufactured

1. Yorkshire Observer Trade Review, 23.1.1933, p. 29; 11.1.1934, p.17; Textile Argus Annual Review, 27.1.1933, p. 10.

2. *ibid.*, 2.2.1934, p. 6; Yorkshire Post Trade Review, 10.1.1935, p. 15; 9.1.1936, p. 16; 26.1.1939, p.19; Yorkshire Observer Trade Review, 25.1.1937, p. 26; 24.1.1938, p. 24; 23.1.1939, p. 24; The Economist, CXXIV, 26.9.1936, p. 532.

3. Profiteering Act, P.P. 1920, *op. cit.*, 661.

4. Whilst the cost of living index for clothing had risen 30 per cent between 1914 and 1925, other components had increased substantially more - food by 72 per cent, fuel and lighting by 80 per cent, and rent by 48 per cent. A.N.Shimmin (1925), *loc. cit.*, p. 18.

TABLE V(xxxv)

Distribution of output of United Kingdom wool
tissues, 1924-1934 (million square yards).

Year	Total output	Exported	Retained	% Retained
1924	420	228	192	46
1930	315	114	201	64
1934	380	102	278	73

Source: Textile Recorder, LXII, June 1944, p. 63.

from fine wools. Low and falling prices from 1929 enabled a greater substitution of recovered by virgin wool, particularly as a large proportion of effective demand for wool clothing passed to the middle classes with demand for cheap tweeds and serges weakening still further as the staple industries became very depressed.¹ In addition to falling textile raw material prices, an important factor contributing to the marked fall in clothing prices (Table V (xxxvi)) was the relationship between the many small and medium-sized woollen manufacturers and the large wholesale and multiple clothing houses who, from ca. 1930, were able to exploit the intense price competition induced by overcapacity to purchase cloth under a much-disliked 'fixed price' policy.² Although some manufacturers attempted to increase market imperfections by concentrating on short production runs of special designs and textures, many were obliged to accept orders from the multiples which

'... while being acceptable as regards size, could only be taken by the woollen manufacturer accompanied by cost-cutting.'³

1. A.N. Shimmin (1938), loc. cit., p. 473. The Yorkshire Post Trade Review noted that low domestic rag collections reflected an apparent tendency for many to wear their clothes longer^{for} than usual 8.1.1931, p.18.

2. W.R., 2.11.1933, p. 999; A.N. Shimmin (1938), loc. cit., p. 471.

3. Textile Recorder, LXII, June 1944, p. 63.

TABLE V(xxxvi)

Ministry of Labour cost of living index, clothing and'all items' (1914 = 100).

Year	Clothing ¹	All items
1925	125-130	176
1930	111	158
1935	87	143

1. Note: This index was based on consumption patterns of 1901/2 - the indicated fall would have been greater as it included several items not commonly worn in 1935.

Source: (i) clothing, A.N. Shimmin (1925), loc. cit., p. 18; The Economist, CXXXV, 1939, p. 494.

(ii) all items, B.R. Mitchell and P. Deane, op. cit., p. 478.

This was partly achieved by increasing the proportion of recovered wool in blends, an expedient resorted to more frequently as domestic demand began to revive and wool prices fluctuated sharply between 1936 and 1938.¹

The final factor operating to exert a major influence on the demand and supply side of the woollen sector was the growing popularity from the 1920s of knitted fabrics using increasing quantities of wool and artificial fibres.² Although artificial fibres were little used in the manufacture of woollen cloths in the 1930s³ they were particularly suited to the new demand from the hosiery trade, The Economist observing in 1935 that

'... a century of reliance upon the great natural qualities of wool as an article of dress is now outworn. In lustre and range of colour rayon has beaten wool, and these qualities have evidently outweighed in the minds of many consumers the warmth and durability of wool'.⁴

1. Crossbred wool, for example, rose from 1^s/2^d lb. in July 1936 to 2^s/1^d lb. in August 1937, falling to 1^s/1^d lb. in January 1938. *ibid.*, p.63.

2. G.C. Allen, op. cit., p. 276.

3. D.C. Hague, The Economics of Man-made Fibres (1957), p. 242. A trade writer noted in 1930 that the new man-made fibre 'blendia' would not displace recovered wool as it possessed neither its felting nor colour properties. Textile Argus Annual Review, 20.1.1930, p.15. See also J. Harrop, 'The Growth of the Rayon Industry in the Inter-War Years', Y.B.E.S.R., 20, 2, Nov.1968, p. 75.

4. The Economist, CXX, 30.3.1935, p. 713. 523

Perhaps this may have been too extreme a view, but there seems little doubt that the gains of Langley, Leicester, and Nottingham were at the expense of cheap loom fabrics from the West Riding, particularly in leisure wear.¹ Moreover, an important implication of the growth in demand for knitted clothing was the increasing consumption of worsted yarn by the hosiery trade, a factor partly explaining the absolute and relative rise in the quantity of wool used by the worsted sector between 1930 and 1935 (Table V(xxxi)).² This, and the rising consumption of wool in the manufacture of the popular grey flannels, as well as in the upholstery and carpet trades,³ strongly suggests that faced with an expansion of domestic and overseas markets from 1933, a change in fashion favouring cheap tweeds, saxonies, and meltons, and the need to keep costs low, the woollen sector was again obliged to turn to recovered wool to augment available supplies of virgin wool (Table V(xxxvii)).

TABLE V(xxxvii).

Extent to which recovered wool augmented the consumption of clean wool by the United Kingdom woollen manufacturing sector, 1930-1937.

Year	Shoddy and mungo as a % of clean wool	Year	Shoddy and mungo as a % of clean wool
1930	44.4	1935	72.3
1933	64.3	1937	71.6
1934	69.2		

Source: Tables V(xxix), V(xxxi).

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1. The Economist, CXXXV, 1939, p. 494; E.W.Pasold, op. cit., p. 279 et seq.
 2. G.C. Allen, op. cit., p. 277. The output (by value) of the hosiery trade in 1935 was 19 per cent rayon and other man-made fibres, 51 per cent wool (mainly worsted yarn), 16 and 13 per cent cotton and silk. D.C. Hague, op. cit., p. 172.
 3. Together with large exports of tops in the 1930s, this would seem to explain the apparent paradox of declining total production of the wool textile industry between 1924 and 1934 of 9.5 per cent and an increase in clean wool consumption of 8.6 per cent.

There is little to suggest that West Riding woollen manufacturers could have responded more effectively to conditions in the inter-war period than they did, given the characteristic multiple firm structure of the industry. A certain amount of rationalisation through amalgamation or closure, particularly between 1929 and 1932, saw the strengthening of some firms and the elimination of others, but unlike the cotton industry there had been no large scale re-capitalisation during the post-war boom, and 'fears that yesterday's fate of Lancashire will be tomorrow's of Yorkshire' were for the most part avoided.¹ The Wool Record favourably commented on the 'greater adaptability' shown by West Riding woollen manufacturers compared to the worsted sector in 'meeting rapidly changing conditions', and, contrasting their goods with those produced in Scotland noted

'... the very fine tweed effects that are being produced by the Yorkshire mills ... the ranges being shown are remarkable, and they give faithful reproductions of effects to be seen in cloths of almost double their price ... of 5^s/- (per yard)'.²

Notwithstanding the cheapness and quality of West Riding low tweeds and woollens in the interwar period it is clear that had not imports been discouraged from 1931 the contraction of the Heavy Woollen District would have been more severe than it was. Whilst the low price of wool, growing international price competition for woollen rags, and a plentiful supply of noils provides an important if partial explanation of the marked decline in consumption of recovered wool, the major reason was the loss of export markets as an increasing

1. Yorkshire Observer Trade Review, 7.1.1929, p. 24; The Economist, CXX, 30.3.1935, p. 714.

2. W.R., 31.8.1933, p. 476. This compares with a pre-1914 average price of 2^s/- per yard and the price of a similar Yorkshire cloth in 1919 of 8^s/- per yard. Profiteering Act, P.P. 1920, op. cit., 665.

number of countries attained self-sufficiency in the manufacture of low woollens and the inability of domestic demand to make up for this loss. Between 1929 and 1939 two fifths of the export trade of the United Kingdom wool textile industry had disappeared and home consumption of wool tissues in 1937 was three quarters that of 1912.¹ Although the West Riding woollen manufacturing and recovered wool sector emerged relatively unscathed when compared to the experience of other staple industries during this period, there was more than a ring of truth in the observation of a trade writer in the not dissimilar conditions of 1895 that 'as a rule they prosper or decline together'.²

1. The Economist, CXXXV, 1939, p. 493; G.C. Allen, op. cit., p. 278.

2. H.E., 28.12.1895.

CHAPTER VI

A century of opposition to "shoddy".

Addressing the British Association at Leeds in 1858 on 'The Woollen Manufacture of England', Baines drew the attention of his audience to the 'extraordinary dimensions' to which the Yorkshire shoddy trade had grown, lamenting that it had been 'long regarded with disapprobation as a dishonest adulteration'.¹ Why, he asked, 'should not the wool of the sheep undergo a second manufacture' when the British paper industry relied for the bulk of its raw material on the supply of used cotton rags and waste?² Clapham, nearly 80 years later similarly observed that whereas paper-making 'had acquired a certain well-bred eminence in spite of its connection with the dust-bin and the "rag and bone" man', shoddy had proved 'a godsend for men of letters out of love with their own day',³ an attitude which persisted even as the West Riding shoddy industry entered its long period of decline after the First World War. The following discussion will examine the more important sources of opposition to the use of shoddy in the manufacture of woollen cloth and the reasons why these criticisms, sometimes not without justification, continued to haunt the industry through the nineteenth and into the twentieth century.

There seems little doubt that in the 1820s a small number of West Riding woollen manufacturers were beginning to become alarmed at the growth in the use of shoddy. Whilst the more outlying districts of the Yorkshire industry had traditionally used flocks, thrums, and other wool wastes as a method of cheapening coarse cloth, notwithstanding a long succession of legislation prohibiting their use, the market for these

1. E. Baines, loc. cit., p. 100.

2. *ibid.*, p. 101; D.C. Coleman, *op. cit.*, p. 338.

3. J.H. Clapham (1932), *op. cit.*, II, pp. 37, 39.

goods had been predominantly local, although increasingly to meet the growing American demand for the lowest slave cloths.¹ Moreover, the trade had been necessarily limited by the inherent inelasticity in the supply of wool wastes, dependent almost entirely on the intensity of activity in the wool textile industry, sometimes forcing low woollen manufacturers to buy their wastes from far afield.² Shoddy, on the other hand, not only provided a supply of raw material independent of and markedly cheaper than wool but, in the better qualities torn from fine knitted rags, could be blended with good wool to produce a fair imitation of all-wool cloths at considerably less cost. A second source of opposition in the 1820s came from the English wool growing and merchanting interests, already feeling the effects of increasing substitution of English clothing wool by German and Spanish wool, who feared that the rapid growth in the use of shoddy would further threaten to prolong the depression of wool prices which had begun in 1819.

These two sources of opposition were aired publicly in London to the 1828 Select Committee on the State of the British Wool Trade, although not by the leading West Riding manufacturers giving evidence but by the wool staplers Legg from Bermondsey and Sutcliffe from Huddersfield.³ Both argued that the continued growth in the use of shoddy, supplemented by increasing imports of foreign rags, would depress still further the demand for low English and Scottish wools. Hubbard, a Leeds woolstapler, informed the Committee that a few months before he had attended a meeting in Wakefield 'to petition the legislature to prohibit the introduction' of woollen rags in cloth

1. *ibid.*, p. 38.

2. Hallas, an Ossett woollen cloth manufacturer, was purchasing 'sham noyls' and 'white hosing waste' from Nottingham in 1797. J. Goodchild, 'Pildacre Mill: an early West Riding Factory', Textile History, I, 3, 1968-70, p. 344.

3. Select Committee, P.P. 1828, *op. cit.*, 538, 635.

manufacture, but as this failed to materialise and as he candidly admitted that his own view had changed to one of support for low cloths made with shoddy and coarse English and Scottish wool, West Riding low woollen manufacturing interests would appear to have put their case persuasively.¹ Legg, as proxy for 'one of the largest manufacturers' in the Dewsbury district, claimed that the reputation of English woollen cloths would be 'injured' unless the Government stopped the import of woollen rags, portentously juxtaposing the term shoddy with the allegation that goods made from it were 'for sale and not for wear' - a sentiment not shared by Sutcliffe and other witnesses or the manufacturers Cook, Gott, Nussey, and Varley, all of whom used shoddy or bought in and merchanted shoddy cloth.² Whilst it is clear from their evidence that price was all-important in maintaining and increasing exports of low cloth to the American and continental markets, this did not prevent Southey from castigating woollen manufacturers in 1829 for producing

'... flimsy articles ... manufactured for rapid sale and for the foreign market. Formerly their aim was to produce substantial articles ... now it is how to make the largest quantity with the smallest expenditure of materials.'³

To this groundswell of criticism a new dimension was added by the prominent Leeds surgeon Thackrah, who, in his pathbreaking and systematic study into the effects of occupation on health and longevity, drew

1. *ibid.*, 658.

2. Sutcliffe appears to have been careful not to prejudice his West Riding trade. Many of the witnesses outside of the West Riding were ignorant of the development of shoddy; Fison, a Thetford wool dealer, typically answering 'I only heard of it since I have been in town' (652), Nussey had brought samples of cloth, druggets, and paddings together with samples of the wool and shoddy used to make them to show to the Committee (699) and admitted that it was possible but 'seldom done' to reconvert his flushing and drugget cloths into shoddy for working up again (700). Cook, in contrast to his later stand against shoddy, freely observed that he used ragwool in piece goods sold in the domestic, American, and German markets (849).

3. R. Southey, Colloquies on the Progress and Prospects of Society (1829), II, p. 247.

attention to shoddy grinding in Batley and Dewsbury and the deleterious effect the dust produced by the 'devils', in the form of 'shoddy fever', had on the operatives.

'Men suffer more, and those who commence the employ after adult age are often obliged to abandon it. Indeed very few persons remain for several years at the machine.'¹

Unlike many of the occupations he investigated, however, he did not find any deaths directly attributable to 'shoddy fever' - a term used to describe the catarrh-like respiratory condition usually experienced when men returned to their machines after 'some days absence'. Sir George Head, in his 'Home Tour' of 1835 similarly but less critically observed the 'thick clouds' of dust generated in a Batley Carr rag grinding apartment

'... the boys and girls who attend the mill ... appear covered from head to foot with downy particles that entirely obscure their features, and render them in appearance like so many brown moths'.²

These conditions were brought to the attention of a much wider public in 1836 when the Yorkshire correspondent of The Times seized on a recent prosecution under the Factory Act at Dewsbury with the headline 'Gross violation of the Factory Act at Batley'. Those who were ignorant of this relatively new branch of the West Riding trade were informed, in a style somewhat less restrained than that of Head, that in the 'shoddy hole' or rag grinding compartment of woollen manufacturers Taylor, Ibbotson and Co.

1. C.T.Thackrah, 'The Effects of Arts, Trades and Professions ... on Health and Longevity' (1832), A. Meicklejohn, The Life, Work, and Times of Charles Turner Thackrah, Surgeon and Apothecary of Leeds 1795-1833 (1957), pp. 65-66; G. Kitson Clark, 'The Leeds Elite', The University of Leeds Review, 17, 1974-5, p. 239.

2. G. Head, op. cit., p. 147. A similar description appeared in White's West Riding Directory of 1837 with the qualification that rag grinding was a 'lucrative employment'. op. cit., II, p. 50.

' ... the atmosphere is so impure as to render it necessary for the workmen constantly to wear handkerchiefs tied across the mouth to keep out the innumerable particles which would otherwise be drawn into the lungs and destroy the health'.¹

The outrage generated by this case, which had involved the almost continuous employment of four boys in the 'shoddy hole' from 6 a.m. on a Friday to 4 p.m. on a Sunday evening, provoked a sharp debate in the House of Commons following Baker's special report to Russell in June 1836.² The Leeds Mercury, a nationally influential newspaper whose editorship had just passed to Edward Baines junior, cautiously observed under their reprint of The Times article that 'the distinction acquired by these gentlemen (Taylor and Ibbotson) is, we earnestly trust, an unrivalled one'.³ This view was not entirely supported by Baker, whose letter to Russell was reproduced in full the following week under the headline 'The Batley case of cruelty'.⁴

However much the users of shoddy in the West Riding may have hoped that the unwelcome glare of publicity accorded them in the press and Parliament would eventually subside, the broadside levelled at them by Knaresborough M.P. Busfield Ferrand in 1842 served to stimulate a fresh wave of adverse publicity which was to establish firmly the synonymy of shoddy with 'fraud'. Ferrand, a radical or 'Oastlerite' Tory and nephew of William Busfield, M.P. for Bradford, had long associated himself with the interests of the working classes by his

1. The Times, 16.6.1836.

2. Reports of the Inspectors of Factories, P.P. 1836 (353), XLV, 221; P.P. 1837 (73), XXXI, 58; The Times, op. cit., and v. supra p.250.

3. L.M., 2.7.1836.

4. ibid., 9.7.1836. This case raised again the common complaint of the Inspectors that local magistrates - on this occasion the two Dewsbury magistrates - were openly hostile to the Act. Baker's elaborately planned prosecution to secure a maximum fine of £80 being reduced arbitrarily to £20 by the Dewsbury magistrates - a point completely missed by Marx who chose to dwell on the alleged Quaker origins of the 'accused gentlemen' and their refusal to take the oath. No reference to this was made in The Times report and only one partner attended court. K. Marx Capital (1976 edn.), pp. 351-2N; The Times, 16.6.1836.

outspoken criticism of the new Poor Law and his wish to see the Factory Acts more rigorously applied. On taking his seat in Parliament in 1841 he had continued his agitation against poverty and, in particular, against the alleged abuses perpetrated by mill owners as the economy moved deeper into the depression which had commenced in 1837. In February and April of 1842 he launched a two-pronged attack in the Commons on the Truck system and the 'Frauds of Manufacturers' - his timing achieving maximum impact in a year in which unemployment was at record levels and Chartist agitation intense. His first speech singled out the practices of excessive flouring and sizing of calico in Lancashire and the use of shoddy in the West Riding, 'christened by the manufacturers and workpeople of Yorkshire the "devil's dust"', reading to the House a highly critical letter sent to him by 'an English merchant'.

'Things are worse and worse in Huddersfield ... I wish you could get a full account of this shoddy trade; it is monstrous. They now put scarcely any wool in their yarn, only just as much as will keep the devil's dust together. The rags, as you know, are collected from the most filthy holes in London and Dublin and are brought from the most unhealthy regions, infected by the plague and every epidemic, and of course they are full of deadly poison. B- S- has a boat load of this rubbish, and also buys a good deal of the Dewsbury people. When his goods are made up, the first time they are worn they split up, and then the game begins. Mr.- informs me that B- S- has sent out (to America) a large quantity of "doe-skins" charged 5^s/9^d per yard, which have proved to be not worth one farthing - not worth tailor's wages ... Thus the manufacture is leaving us as fast as it can - thanks to the knavery of our avaricious, covetous, cheating, canting selves'.¹

1. Leeds Intelligencer, 5.3.1842. Ferrand seems to have been taken less seriously in the House than by the manufacturers he criticised, the Intelligencer noting 'While Mr. Ferrand was reading the above extract Colonel Sibthorp who had been conspicuous in cheering the Hon. Member in the course of his speech, was observed to leave the House and soon afterwards return with a large orange, which he presented to Mr. Ferrand amidst roars of laughter'.

Shortly after publishing his speech 'John Bull' of the Tory Leeds Intelligencer observed to Ferrand, 'the "devil's dust" is an article much more in common use than you think',¹ advice that he did not ignore when in April he resumed his attack in the Commons calling for a Select Committee to investigate truck and the 'frauds' of a number of trades including the practices of the 'infamous rogues' and 'scoundrels' of the West Riding shoddy-cloth trade.² Citing laws dating from Richard II against woollen cloth 'falsely wrought with divers wools', he drew attention to two letters he had received from long-established Yorkshire manufacturers in response to his first speech, one, of 'fifty years standing', commenting

'You have not overstated anything as respects this neighbourhood, for I do not think there is a manufacturer of flushings, druggets, paddings or pilot cloths, but who uses less or more of the ground-up rags called generally shoddy or resurrection wool - indeed, so much is it in use, that even the carpet manufacturers are now consuming considerable quantities, and the rugs making for Government are not free from it.'³

The second, from a Leeds broadcloth manufacturer was more specific.

'There is a manufacturer in this town (who is at present a member of the Whig-Radical town council) who has made it a regular practice to buy old stockings and grind them up, and mix them along with his wool in manufacturing blue-cloths. He was thus enabled to undersell⁴ his honest neighbours, who used nothing but wool'.

In both these attacks Ferrand had astutely drawn together the many strands of opposition to the West Riding shoddy trade, some of

1. Leeds Intelligencer, 12.3.1842.

2. Hansard's Parliamentary Debates, 1842, op. cit., pp. 823-835; The Times, 20.4.1842.

3. Hansard, op. cit., p. 833. The internal evidence of this letter, with its reference to shoddy in government blankets and familiarity with the 1828 Select Committee proceedings, strongly suggests that it may have been written by Thomas Cook (v. *supra* p. 399.). Ferrand also published as a pamphlet a critical letter he had received from 'a Factory Operative of 25 years experience' with a detailed account of rag-pulling and which, from its reference to the Yorkshire trade, would appear to have originated from the West of England. W. Busfield Ferrand, The Manufacturers, their System, and their Operatives (1842 - Goldsmith collection).

4. Hansard, op. cit., p. 834.

which had surfaced, albeit briefly, in 1828 - the deception of the consumer, unfair competition, the unwholesomeness of the raw material, the costs to the domestic wool growers and the 'imposition and cruelty' on the operatives as evidenced, he reminded the House, by the 1836 Taylor Ibbotson case. Whilst reaction in the Commons may have verged on flippancy, the voice of the West Riding in the form of the Leeds press took the accusations with far greater seriousness. The Leeds Intelligencer noted with some satisfaction the 'unbounded rage' of the 'neighbouring editor' of the Whig paper at Ferrand's speech 'for daring to unmask the hypocrisy and tyranny of the Millocrats and Cotton Lords'.¹

The Leeds Mercury countered with a detailed rebuttal of Ferrand's allegations observing that the term 'Devil's dust' was unknown in the Leeds district until read in his speech and pointing out that the extensive use of rags by the paper industry had not been mentioned.

'If woollen cloth, when worn to rags, is still capable of being reduced again to the state of wool and made into a useful though inferior fabric, what man of common sense would presume to find fault'.²

More pertinent was the Mercury's estimate that the 40 or 50 rag machines in the Batley and Dewsbury district made a direct contribution to the employment of some 4,000 operatives (or, including their dependents, 10,000 persons), 'whose occupation must cease if the rag machines were stopped'.³

Nevertheless, the Northern Star reprinted Ferrand's second speech under the headline 'The Truck System and the "Devil's Dust"', no doubt prompting the fiery Lancashire Chartist J.R. Stephens to proclaim

1. Leeds Intelligencer, 12.3.1842.

2. L.M., 19.3.1842.

3. *ibid.* This appears consistent with Baker's comments in 1836 that the Batley district was 'entirely employed in the manufacture of shoddy cloths and blankets' and the census of population figures for 1841 - Batley (7,076), Dewsbury (10,600), Soothill (4,453) and Thornhill (3,941). R.M. Hartwell, *op. cit.*, p. 277.

'Mungo, thy days are numbered' in his speeches to the Northern industrial workers.¹ Perhaps the shoddy 'millocrats' of the West Riding could not be accused of exercising sole monopoly over hypocrisy'. Concurrent with their report of Ferrand's attack on 'Devil's Dust', the Northern Star carried a large advertisement by a Leeds retailer in Briggate for druggets at 1^s/2^d yd., doeskins at 1^s/6^d yd., and broadcloths from 5^s/- yd., all 'warranted perfect' - prices which, as any with knowledge of the woollen trade knew, would not have been possible if made of pure wool.²

Chartist orators were not alone in evoking 'devil's dust', for Disraeli, who had been introduced to the West Riding by Ferrand,³ cast the orphan 'Devil's dust' a member of the Union and 'the leading spirit of the Shoddy-court Literary and Scientific Institute' in his socially significant novel Sybil of 1845.⁴ In the same year, German readers of Engels' 'Condition of the Working Class' were informed in a style much influenced by Ferrand, that

' ... if a working man once buys himself a woollen coat for Sunday, he must get it from one of the cheap shops where he finds bad, so-called "Devil's-dust" cloth, manufactured for sale and not for use, and liable to tear or grow threadbare in a fortnight...'⁵

Carlyle, the impact of whose works relied to a large extent on the use of imaginative metaphors, also inveighed against 'Devil's dust - accursed of God and Man' in Past and Present of 1843, with his analogy of 'sham' clothing to what he saw as the obscured realities of contemporary values and politics.⁶ In a particularly critical passage in his essay 'No. 111 "Downing Street"' he compared the government and its officials to the

1. Northern Star, 23.4.1842, 30.4.1842; S. Jubb (1860) op. cit., p. 112; J.H. Clapham (1932) op. cit., II, p. 39.

2. Northern Star, 7.5.1842 et seq. Advertisement of H. Higgins, 78 Briggate, Leeds, "Sale of Woollen Cloths". Fenton, speaking of the early 1840s, recollected that a good broadcloth cost 30^s/- a yard and 'only inferior sorts could be bought retail', T.M., 15.10.1881, p. 366.

3. A. Briggs, Victorian Cities (1968), p. 142.

4. B. Disraeli, Sybil (1845), p. 123 et seq.

5. F. Engels, The Condition of the Working Class in England in 1844 (1952 edn.) p. 67.

6. T. Carlyle, Past and Present (1843-1869 edn.) p. 257.

sweating system

' ... that the coat they bring us out is the sorrowfullest fantastic mockery of a coat, a mere intricate artistic network of tradition and formalities, an embroiled reticulation made of web-listings, and superannuated thrums and tatters, undurable to no grown Nation as a coat, is mournfully clear!'¹

Again, in 1849, the shoddy cloth trade of the West Riding was subjected to a highly critical examination by Angus Reach, a travelling provincial correspondent of the Morning Chronicle, whose articles appeared with the more objective and sensitive contributions of Mayhew. Reach, who inspected the two 'company' mills, Albion and Bridge Mills of Batley, described the undoubtedly appalling working environment in a highly-spiced journalistic style but pointed out that neither the rag sorters nor the shoddy grinders 'will admit that (they) found the trade injurious'.² No doubt his comment that the cloth so produced was 'coarse and little serviceable' may well have been different had he seen those made by well-established manufacturers such as Taylor or Nussey.

Two questions may be asked here - to what extent did West Riding manufacturers deserve the epithet 'shoddy' and the accusations of 'devil's dust', and secondly, did this opposition inhibit or retard the growth of this relatively new branch of the West Riding woollen sector to ca. 1850?

There seems little doubt that a number of manufacturers were prepared to sacrifice quality for short-run profit maximisation and, as Cook bitterly observed of his competitor Jeremiah Carter of Ossett in

1. ibid., 'Latter-Day Pamphlets', Thomas Carlyle's Works (1850) p. 80. Carlyle was once reputed to have asked Sir James Kitson junior, the Leeds locomotive builder and Liberal, "Leeds is a great shoddy manufacturing town, is it not?" to which Kitson rejoined, "Do you know, Mr. Carlyle, what shoddy is? You write a great deal about shoddy", explaining how shoddy was manufactured into cheap clothing for the masses. Carlyle was said to have replied reflectively, "Ah, I had not heard that aspect of the question". W.T.W., 28.6.1924, p. 16.

2. Batley and Birstall Civic Society, op. cit., p. 3. The Morning Chronicle article was reproduced in an edited form in Mayhew's London Labour and the London Poor, II, 1851, pp. 34-35.

1838, to cultivate personal relationships with government inspectors in order to circumvent Board of Ordnance rules against shoddy.¹ Jubb, writing in 1860, candidly admitted that the 'habitual caution on the part of the public' towards shoddy cloth had been enhanced by 'lapses of the Manufacturers themselves' in placing 'defective goods' on the market.² Whilst manufacturers were ultimately responsible for the quality of their goods and the reputation of the trade in general, he argued, both the merchants and the public must accept part of the blame. This would seem fair comment - merchants rigorously specified price and quality of cloth, often imposing extended credit facilities, much complained of by the trade,³ leaving manufacturers with little option but to produce a good-looking cloth exhibiting a desirable 'handle' as cheaply as possible. Once the cloth had left the manufacturer's hands no control over subsequent price or representations as to its quality was possible - indeed, the advance in techniques of producing good mungo pilots or broadcloths in imitation of pure wool goods can be seen as conducive to easier deception on the part of the merchant and retailer. As Baines observed in 1858,

'If the cloth made of shoddy and mungo is sold for what it really is, no one is deceived'.⁴

But what proportion of the blame for deception could be laid at the door of the manufacturer? Clearly, retailers such as Higgins in Briggate were unlikely to sell cloths containing shoddy and mungo for pure wool goods, as their pricing indicates, but could the same be said for the slop working trade outside of the West Riding such as the

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1. v. supra p. 399 n. ; F.J. Glover (1959) op. cit., p. 703.
 2. S. Jubb (1860) op. cit., p. 2.
 3. A.J. Topham, op. cit., p. 6.
 4. E. Baines, loc. cit., p. 101.

Nicoll brothers of Regent Street¹ or the travelling cloth sellers offering 'giniwine West o' Hingland broadcloth' in the rural districts?²

On the other hand, the nature of public demand, particularly in the 1840s, for cheap but good looking cloths can be seen as a powerful stimulus to the increasing admixture of shoddy and mungo. Mayhew, and later Jubb and others, noted 'a rabies' on the part of the public for ever cheaper goods, a tailor employed by a previously high-quality West End house, for example, informing him in 1849 that the fashion for cheap tweed overcoats commencing in 1845 had transformed the trade as customers continually demanded the lower prices advertised by East End slop shops.³

Thus it would seem that West Riding manufacturers were only partly to blame for the production of poor quality goods, and in all likelihood, only a small proportion of firms deliberately manufactured severely defective cloth for so long as merchants in domestic and overseas markets would accept them. Certainly, the psychological and semantic associations of shoddy cloth - the working up of worn-out rags into a pretending cloth of ephemeral endurance - were to firmly establish a perennial aunt sally. The transformation of the technical term shoddy from a noun to an adjective in everyday language would seem to have been a phenomenon of the 1840s, stimulated by Ferrand's widely-publicised views on more intellectual ground prepared by such works as Carlyle's Sartor Resartus of 1831 and Heroes and Hero Worship of 1841 with their literary analogies to clothing.⁴ Indeed, by 1851 the Christian Socialist could deprecate the 'Spiritual Shoddy' they saw

1. E.P. Thompson and E. Yeo (eds.), The Unknown Mayhew (1971), pp. 39-40. H.J. and D. Nicoll, who reacted strongly to Mayhew's criticism, advertised themselves as 'Paletot Makers and woollen manufacturers'. Perry's Bankrupt and Insolvent Gazette, XXII, 1849.

2. F. Fenton, T.M., 15.7.1881, p. 251.

3. H. Mayhew, loc. cit., p. 227, letter XVI - 11.12.1849.

4. E.D. Mackerness, 'The Voice of Prophecy: Carlyle and Ruskin', The Pelican Guide to English Literature (1970), 6, p. 295.

in much of the clerical teachings of the day,

'... there is too large a proportion of "shoddy" mixed up with the little that might otherwise be harmless - and, unfortunately, the people can't detect it'.¹

But, as Chamber's Edinburgh Journal observed in 1847

'... it looks very well, and many a man who shudders at the idea of a coat from Holywell Street or Rag Fair, arrays himself with complacency in the worn-out covering of a German peasant'.²

The effects of unfavourable public attitudes generated in the 1840s on the growth in use of recovered wool in the West Riding is less easy to estimate. Jubb saw it as 'perhaps, temporarily injurious to trade', a conclusion supported to some extent by the estimated stable consumption of shoddy and mungo between ca. 1835 and ca. 1844.³ Imports of woollen rags which had remained at static levels between 1837 and 1844 declined significantly until 1849, but this was offset by an estimated rise in the collection of domestic rags from 1845 and a marked rise in imports of pulled ragwool from 1835. It would appear that other variables, such as the depressed trading conditions of the 1840s and the relative cheapness and abundance of cotton textiles could claim a more important influence on the consumption of recovered wool between 1835 and 1844, rather than the adverse publicity stimulated by Ferrand. Indeed, Jubb was of the opinion that the efforts of Ferrand and others may have 'promoted the interests assailed, ultimately, by directing attention and enquiry to the subject', a view that appears to be borne out by the praise bestowed on the 'new material' by the Jurors at the 1851 Great Exhibition and by Redgrave in his report of the 1855 International Exhibition at Paris.⁴

1. The Christian Socialist, I, 29, 17.5.1851, p. 230. (I am indebted to Mr. John Butler of the University of York for this reference).

2. Chamber's Edinburgh Journal, VII, 1847, p. 23.

3. S. Jubb (1860) op. cit., p. 112.

4. ibid., pp. 112-113; Great Exhibition of the Works of Industry of all Nations, 1851, op. cit., II, pp. 485, 769; Reports of the Inspectors of Factories, P.P. 1856(2031), XVIII, 274. 540

The attempts by Baines in 1858 and, more particularly, Jubb in 1860, to draw attention to the growth of the shoddy trade of the Heavy Woollen District represents the first major step taken by two of the more public-spirited representatives of the West Riding trade to counter the accumulated criticisms of shoddy and to dispel the hellish connotations of Ferrand's 'devil's dust'. Jubb's work must be seen in this light, for there is little reason to doubt that he achieved his aim to write a 'candid, impartial and moderate' account of the trade. If his treatment of the 'Rise and Progress' of shoddy manufacture was seen as mildly contentious by some contemporaries,¹ his description of the 'Present Position' furnished a wealth of detailed statistical and technical information that appears to have caused some consternation to trade interests by its frankness,² as perhaps did his 'Advice to Manufacturers' against producing defective goods which would damage the 'reputation and success' of the West Riding trade.³ Whilst no records exist of the size of the first and only impression of his book, it was printed and distributed simultaneously in London, Manchester, and Batley and stimulated a lengthy and detailed article under the rubric 'Devil's Dust' in the widely-read Chambers's Journal in 1861, which enthusiastically commended Jubb on his 'very candid' exposition.⁴ With a list and description, sometimes with prices, of 22 varieties of cloth containing shoddy and mungo (27 in the Chambers's article) and the garments into which they were made up, no longer could critics level the accusation of deception at Yorkshire goods with such unassailable justification.⁵

Jubb's suggestion that past antagonism may have helped to direct

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1. B.R., 4.12.1880, 11.12.1880, 24.12.1880.
 2. H. Burrows, op. cit., p. 43.
 3. S. Jubb (1860), op. cit., pp. iii-iv, 1-4.
 4. Chambers's Journal, 1861, op.cit., pp. 103-5.
 5. S. Jubb (1860) op. cit., pp. 40-56; Chambers's Journal op. cit., p.104.

a more objective 'enquiry' into the industry would seem to be confirmed by the factual references that were beginning to appear in statistical compendiums and works of reference from the late 1850s and early 1860s. The authoritative Encyclopaedia Britannica reprinted in its 1860 edition McCulloch's observations on Baines' estimates of wool consumption and particularly his figures on the consumption of shoddy.

'The third item in this estimate is a significant one. It refers to a branch of the Woollen trade which is wholly the growth of the present century. In its early days, the novelty was always spoken of, if not with direct reprobation, at least with reserve and distrust. But when shoddy weaving began to attain an eminent degree of commercial success, it became the fashion to compliment it, as "one of the triumphs of art and civilisation"'.¹

A sentiment similarly expressed in the Juror's reports on the 1862 International Exhibition and by Redgrave in his 1864 report to the Factory Inspectorate in which he claimed that the 'prejudice has entirely subsided as regards the "shoddy" trade'.² The 1866 and 1868 editions of Chambers' Encyclopaedia noted as 'quite surprising' the 'excellent finish now given to woollen cloths containing a large proportion of shoddy' but that 'the prejudice against it is scarcely yet overcome'.³

To some extent this may have reflected the intense American reaction against the use of shoddy by domestic woollen manufacturers during the Civil War, who, after 1862, had supplied the greater proportion of woollen cloths and flannels to both armies.⁴ Indeed, The Cornhill Magazine of 1865 was adamant that the deprecatory usage of the adjective 'shoddy' in the United States was solely a result of its abuse by American

1. Encyclopaedia Britannica (8th edn., 1860), XIV, p. 918.

2. Jury Report of the International Exhibition, 1862, C. Tomlinson, op.cit., pp. 59-60; Reports of the Inspectors of Factories, P.P. 1864 (3309), XXII, 661.

3. Chambers' Encyclopaedia (1866), VIII, p. 689; 1868, X, p. 266.

4. v. supra p. 414.

manufacturers during the Civil War, aided and abetted, it was claimed, by 'confiding officials' in the ordnance.¹ Far from reflecting on the quality of West Riding cloth, the manufacture of uniforms 'loaded with cheap, short, and unskilfully blended shoddy' much of which still contained broken cotton warps, was almost entirely produced by domestic American manufacturers.²

Assisted by Bristowe's investigations of 1865 into the rag sorting sector in the West Riding in which he found no

'... evidence that infectious diseases had been brought to (the rag sorters) through the agency of rags, or that any fear prevailed among them on the subject'³

the dominant theme of many accounts of the trade after 1860 stressed two aspects of particular appeal to the social conscience and utilitarian philosophy of the Victorian middle class. The facility with which it had brought the price of woollen goods to 'within the reach of the humblest classes'⁴ and the conversion of hitherto waste products into 'useful and comfortable articles of clothing'.⁵ Indeed, as one authority claimed, manufacturers of pure wool goods were 'deeply indebted' to shoddy for keeping the cost of wool from reaching 'ruinous prices',

1. The Cornhill Magazine, XII, July-December 1865, pp. 43-59. Under the title 'The Shoddy Aristocracy of America' the writer noted the 'catastrophies' regularly occurring with American made uniform cloth as described by an 'observing troubadour' of 1861. "March!" said the Colonel; "forward march!" Crack went the seams in halves! A hundred steps, a hundred men Showed just two hundred calves!' (p. 45). See also E.D. Fite, op. cit., pp. 84-85.

2. National Waste Review (New York), 'The History of Reworked Wool', in W.T.W., 22.11.1930, p. 27; The Cornhill Magazine, op. cit., p. 45; T.M., 1902, p. 277; E.D. Fite, op. cit., p. 85. It is worth noting again that whilst Day and his contemporary West Riding rag merchants were importing considerable quantities of good quality new cloth rags from the New England mills during the Civil War, American manufacturers provided the major market for extract or carbonised wool, a material which the Yorkshire trade would not touch.

3. Report of the Medical Officer of the Privy Council, P.P. 1866 (3645), XXXIII, 624.

4. Chamber's Encyclopaedia, 1868, op. cit., p. 266.

5. Jury Report of the International Exhibition, 1862, C. Tomlinson, op. cit., p. 59.

an observation no doubt meeting with the approval of those who could afford the fine cloths from the West of England and Huddersfield or the tweeds of Galashiels.¹

From the late 1860s the newly discovered shoddy trade of the West Riding was borne, along with its more eminent contemporaries of the chemical, ferrous, and paper industries, on the tide of interest generated by the 'economy which science introduces into industrial pursuits'.² Jubb was invited to deliver paper to the Bradford meeting of the British Association in 1873 entitled 'On the Shoddy Trade',³ and, in 1875, the Department of Science and Art commissioned P.L. Simmonds to mount an exhibition in Bethnal Green Museum under the theme 'The Utilization of Waste Products' in which shoddy and shoddy cloth was prominently displayed.⁴ Indicative of the mid-Victorian change in attitude towards the use of recovered wool in woollen cloth, Simmonds, in an address to the Royal Society of Arts in 1883, observed

'There are many who may be disposed to regard the shoddy manufacture as a business to be despised, but the political economist discovers in it a most important source of wealth - wealth resulting from the application of skilled labour to the utilization of material once worthless, but now contributing⁵ no mean sums annually to the wealth of nations'.

Even the patrons of Gilbert and Sullivan's 'The Gondoliers' could sympathise with the Grand Inquisitor's lament on the rising price of shoddy, and in 1872 the literary journal All the Year Round under the editorship of

1. *ibid.*

2. For example, 'Waste Not' Chamber's Journal, 6, 4th series, 1869, pp. 807-9; 'Utilization of Wastes', The British Almanack, 1874, pp. 25-46; 'Waste Products made useful' (Lord Playfair), The North American Review, 155, 1892, pp. 560-68.

3. British Association, 1873, Transactions of the Sections, pp. 194-95; H.E., Supplement, 27.9.1873, p.2.

4. T.M., 15.2.1875, p.59.

5. Journal of Fabrics and Textile Industries, 12.1.1883, p.4, from a paper presented on 'The Utilization of Waste'; there were however, a number of inaccuracies in his account. Simmonds had organised the 1881 International 'Wool and Woollen Manufacturers' exhibition at the Crystal Palace in which recovered wools from many countries had formed a substantial part of the raw materials exhibit together with a Walker and Smith rag machine

Dickens had published an informative and balanced account of the shoddy trade in which the blame for deception was firmly laid at the door of the retailer.¹ Whilst West Riding manufacturers were commended for providing low priced meltons, tweeds, or pilot cloths 'that will render a fair amount of useful service', a withering attack was levelled at the cotton textile industry whose excessive use of china clay in sizing yarn 'chokes and overweighs nearly all the calico now made' - a theme frequently raised in the West Riding press and the technical journals.² It seems clear that by the 1870s the use of recovered wool was broadly acknowledged as a legitimate method of cheapening woollen goods, and if its durability was impaired, this was offset by the increasing preference of the mass of consumers towards fashionable clothes in which this factor was of less importance than price, design, handle, and finish. Detailed articles on blending and processing shoddy and mungo together with notes of new developments by rag machine makers were featured regularly in the technical press of the textile industry from the early 1880s - although, apart from technical treatises such as McLaren's Spinning Woollen and Worsted of 1884, contributions from West Riding manufacturers were less forthcoming than those from their overseas counterparts.³

Although the trade had become sufficiently well established in the last quarter of the nineteenth century to safely ignore the occasional criticism from members of the public and the more persistent opposition

1. W.S. Gilbert, Selected Operas (First series, 1939 edn.), 'The Gondoliers' (first produced 7.12.1889), Act II, p. 183; All the Year Round, 1872, op. cit., pp. 246-47.

2. H.E., 1.1.1887; Journal of Fabrics and Textile Industries, 12.8.1888, p. 15; see also, A.J. Marrison, 'Great Britain and her rivals in the Latin American cotton piece-goods market, 1880-1914', B.M. Ratcliffe (ed.), loc. cit., p. 336.

3. op. cit. McLaren was proprietor of Springfield Mill, Keighley. Technical articles were mostly of American origin and reprinted from their journals; for example, a series on 'How to start and run a Woollen Mill successfully' (Industrial Record), T.M., 15.8.1879 et seq., or 'The Preparation and Manufacture of Cotton and Wool Mixtures' by an 'Ontario manufacturer', T.M., 15.4.1889, pp. 155-57.

from the Scottish tweed industry, the technical journals were usually quick to respond to what they saw as uninformed, unjustified, or merely biased comment. Lady Bective was summarily disposed of by the Textile Manufacturer in 1881 as was also a letter in the same year to the Rochdale Observer blaming the depression of the Rochdale flannel industry on its use of shoddy, and in 1890 the journal was in full agreement with the novelist Mrs. Lynn Linton who wrote to the Graphic

' ... inveighing in trenchant English against the rage for cheapness in every department of industrial life, the insane desire of everybody to get twenty shillings worth of goods for nineteen shillings'¹

If the British consumer demanded cheap woollen goods, then manufacturers were only too willing to meet this demand and, as Dickens' All the Year Round had observed in 1872, shoddy cloth was 'worth what it had cost'.² Nevertheless, this did not prevent the Huddersfield Examiner from criticising lapses in the quality of Dewsbury goods in 1889, and in 1896, when it soundly castigated manufacturers of president cloths who were complaining of poor demand.

' ... and no wonder, for in the neighbourhood, if not in the town, some wretchedly poor stuff has been sent abroad, stuff which a well-known businessman says will do more harm to the Yorkshire cloth trade than a dozen strikes'³

Of more immediate concern to the West Riding trade, however, was the effect of the prohibitions on the importation of woollen rags during the continental cholera epidemics of 1884-5, and, more importantly, 1892-3. These prohibitions had been ordered by the Local Government Board on the assumption that woollen rags could convey cholera, an allegation strongly

1. T.M., 15.11.1881, p. 395; 15.3.1881, p.100; 15.9.1890, p.418.

2. op. cit., p.247.

3. H.E., 28.12.1889, 24.12.1896.

refuted by West Riding interests, some of whom may have remembered the adverse publicity generated by Ferrand 50 years before. The West Riding case rested on the evidence of Bristowe in 1866, the Pollution of Rivers Commission of 1867, and Parsons in 1886; in which woollen rags, unlike cotton rags used by the paper industry, were found not to be associated with the transfer of diseases such as smallpox - indeed only one such case had been reported at a Wakefield shoddy mill in 1861.¹ Although West Riding interests were able to secure a partial relaxation of the prohibition in early 1893 and a complete lifting of the ban from August 1893, the health and safety of rag sorters, which had been queried by Factory Inspector Meade-King in 1891, began to attract increasing attention as the 1867 definition of workshops was widened.² Subsequent enquiries in 1904, 1907, and 1909 found the standard of cleanliness in West Riding rag-sorting mills, if not at some of the metropolitan and city warehouses, of a high order. A conclusion supported by the International Labour Office in a special report of 1923 in which the risk of infection from woollen rags in the British shoddy industry was found to have been historically low.³

Whilst the West Riding rag and shoddy industry had succeeded in defending its interest and the continuity of supply of its raw materials without attracting more than minimal publicity in the press, growing

1. Report of the Medical Officer ..., P.P. 1866 (3645), XXXIII, 624; Pollution of Rivers Commission, P.P. 1867 (3850), XXXIII, XX; Report of the Local Government Board, P.P. 1886 (4844-1), XXXI, 555, 559.

2. Reports of the Inspectors of Factories and Workshops, P.P. 1890-91 (c 6330), XIX, 475-77.

3. Reports of the Inspectors of Factories and Workshops, P.P. (1904) Part I: 1905 (cd. 2569), X, 412-13; P.P. 1907 (c.3586), X, 98-100; P.P. 1909 (c. 4664), XXI, 438, 505; 'Rag Trade Hygiene in All Countries' (I.L.O., 1923), W.T.W., 25.4.1923; pp. 23-32. Two smallpox epidemics, in 1871 and 1875, were noted in the I.L.O. report as being traced to some shoddy mills near Brimscombe in Gloucestershire (see also the T. Mcy, 15.7.1905). Conditions in the flocking trade were regulated by the Rag Flock Act of 1911 and the Rag Flock Regulations of 1912. Flock manufacturers had traditionally used the lowest classes of rags for mattress stuffing usually without washing or disinfection. T.M., 15.6.1887, pp. 256-7; H. Burrows, op. cit., p. 54.

agitation against the use of shoddy in the United States was beginning to be noted. This debate had been initiated by the American economist David Wells in the columns of the New York World in 1891 in which he claimed a 'direct connection' between the use of shoddy in American woollen cloth and morbidity, caused by rags 'impregnated with disease'.¹ Wells was widely known for his opposition to the high American protective tariffs which, he alleged, sheltered domestic wool growing and manufacturing interests with the result that only 28 per cent of American woollen goods contained pure wool.²

'There seems to be a consensus of opinion among experts that owing to the encouragement of our tariff the Americans have far surpassed the Englishman in making bogus woollen fabrics. There is little doubt that we have succeeded in making immeasurably poorer goods than any one else has ever put together'.³

The powerful National Association of Wool Manufacturers countered with 'scathing criticism' of Wells' allegations in the New York and Boston press as well as in their own journal, but American wool growing interests, already concerned at the increasing substitution of domestic wools by shoddy in cheap cloth, began to organise their own campaign against the use of shoddy. In May 1902 the National Live Stock Association, representing the wool growers, introduced the 'Grosvenor Shoddy Bill' to the House of Representatives Committee on Ways and Means in which detailed production census data on shoddy output since 1860 was used to support their demands for separate labelling, distinguishing between pure and mixed (i.e., cotton warped and shoddy) woollen goods.⁴

1. Bulletin of the National Association of Wool Manufacturers, 1891, op. cit., pp. 333-34 et seq.

2. *ibid.*, p.334.

3. *ibid.*, p.346.

4. Shoddy vs. Pure Wool, Congressional Document No. 413, 1902, op. cit., pp. 1-27.

Kittredge, editor of the Boston Journal of Commerce and well known to West Riding manufacturers for his lectures on American wool textile manufacturing methods,¹ enlisted the assistance of the Textile Manufacturer through their American contemporary journal, Textile World, in publishing an article defending the use of recovered wool in the United States and Britain.² The Textile Manufacturer, however, was not solely interested in providing a platform for the American manufacturing lobby, for the publicity generated by the American wool growers agitation had stimulated similar action amongst their counterparts in the United Kingdom. At the annual meeting of the Council of the Central Associated Chambers of Agriculture in London in October 1902 the Shropshire representative moved a resolution calling on the government to bring woollen goods containing shoddy, mungo, and mixed fibres under the Merchandise Marks Act. In reply the journal pointed out that

' ... the many grades of shoddy and mungo and the various mixings of wool and cotton tend more towards imitation of merino wools and there is very little chance of anybody buying any of these substitutes in mistake for British wool'

and that the cost of labelling some £170 millions of material produced in 1903 would be prohibitive.³

Thus, nearly three-quarters of a century after the wool growers opposition articulated through Legg and Sutcliffe to the 1828 Select Committee had been aired, British wool growers hostility to the use of shoddy again surfaced, but their case, slender as it was in 1828, was even weaker in 1902. If the quality of domestic clothing wool had been unsatisfactory to West Riding manufacturers in 1828, developments in cloth manufacture and the types of domestic wool produced in the

1. v. supra, pp. 380-81.

2. T.M., 1902, p. 277.

3. ibid, 1903, p. 361.

intervening 74 years had brought about a situation in which restrictions on the use of recovered wool would have benefited domestic growers only marginally, the 'faint protest dying away' in 1903.¹

Fierce competition and high tariff barriers in world markets in the last quarter of the nineteenth century had served to concentrate an even larger proportion of West Riding export output in the colonial and dominion market - a market in which certain preferential tariffs had been sought and gained. Concerned at the rising level of imports of cheap tweeds and cloths from the West Riding, Australian and Canadian manufacturing interests mounted a virulent campaign to discredit Yorkshire goods in 1905 and 1908.² Unwilling or unable to sustain allegations of dishonest adulteration, for recovered wool had been and continued to be used by their own domestic woollen manufacturers,³ both campaigns appealed strongly to public feelings on grounds of hygiene in a style reminiscent of Ferrand's merchant in 1842. An Australian mill manager, giving evidence to the Royal Commission on the Commonwealth Tariff, claimed that West Riding goods were manufactured from 'the filthy cast-off garments from all the reeking dens of the civilised earth' and argued that Australian manufacturers were much in favour of restricting their importation.⁴ Whilst this opposition was not considered sufficiently damaging to West Riding interests to warrant action by the Chambers of Commerce,⁵ the criticisms levelled by the Canadian Manufacturers

1. T.M., 1903, p. 2.

2. v. suprapp. 446-97.

3. Walker and Smith had sold a 14 inch mungo rag machine to Collins Bros. of Victoria in ca. 1895-7 (Sales Ledger No. 5, 5.4.1895-6.4.1900 loc. cit.) and Wilson Knowles had supplied an 18 inch machine to the Warraumbool Woollen Mill Co. (Victoria) in 1910 (Sales Ledger 3.1.1908-12.4.1912, entry 13.5.1910, loc. cit.). From 1893, Walker and Smith supplied a number of machines to Ontario and Quebec woollen mills (Sales Ledger No. 4, 23.1.1889 et seq.). It would seem reasonable to assume that other West Riding machine makers, as well as American manufacturers, also sold rag machines to Australian and Canadian mills from the late nineteenth century.

4. T.M. 1905, p. 182.

5. ibid. The response in the Textile Manufacturer can only be described as one of contemptuous amusement.

Association in 1908 stimulated a more energetic response to the contention

' ... that cloth produced in British woollen mills was composed of disease-infected rags and rubbish, including sweepings of floors, cobwebs from musty walls, and all manner of garbage¹

Although the combined West Riding Chambers of Commerce could afford to ignore the 'glib use of adjectives' common to both attacks, the reaction to the Canadian criticisms was viewed with some concern for three reasons. In the first place they had been published in a widely-read and influential Canadian trade journal; secondly, trade conditions in all markets had progressively worsened with the effects of the 1907 commercial crisis in the United States, and thirdly, as the Canadian market had been a particularly lucrative one since the preferential tariff of 1897, it was feared that elimination of the 5 per cent difference between British and German woollen goods would effectively diminish West Riding exports to a very competitive market.² Canadian manufacturing opposition, however, 'had little effect' as a trade commentator observed in 1910, and 'large quantities' of low priced West Riding goods continued to be demanded by Canadian merchant houses.³

Equally unsustainable were allegations made by Sir Joseph Walton in October 1914 that many West Riding manufacturers were using shoddy in cloth ordered by the War Office - provoking sharp reactions in the trade press.⁴ Whereas the admixture of recovered wool was permitted in

1. D.R., 24.2.1908, Quoted from Industrial Canada, August 1907.

2. Report of the Tariff Commission, op. cit., II, II, 1781. Evidence of Edward Fisher; D.R., 24.2.1908.

3. ibid., 1.1.1910.

4. W.R., 29.10.1914; W.T.W., 16.1.1915, p. 6.

varying proportions in cloth produced for the French, Belgian, Russian, and the English Territorial Associations' uniforms,¹ and in War Office blankets and rugs, strength requirements of 431 lbs. for warp and 388 lbs. for weft in army cloths necessitated strict raw material quality control by manufacturers.² Although a few firms may have used shoddy initially, the dangers of rejected cloth were great as the Yorkshire Observer noted in 1916.

'It is well-known... that the tests imposed by the War Office in regard to khaki cloths for the British Army make it exceedingly risky to use shoddy in their manufacture, and it is certain that the great majority of contractors have scrupulously observed the conditions.'³

The 'London attacks' were never substantiated nor were any official complaints published,⁴ and by 1917 fears that wool stocks might prove inadequate together with the necessarily short life of all uniform cloth persuaded the War Office to allow a proportion of shoddy in khaki serge, greatcoats, shirting flannels, and other cloths.⁵

Renewed hostility to the use of shoddy reappeared in the United States in 1919-1920, and concerned that this might influence consumer behaviour in Britain, a trade writer observed

'Judging from the pamphlets which have recently reached this country, it is even yet necessary to have a campaign of propaganda to educate public opinion in favour of re-worked wool'⁶

Such a campaign, however, was unnecessary, for pent-up war-time demand and rising real incomes in the short lived boom of 1919-1920 had decisively shifted consumer preference towards pure wool fabrics and

1. W.R., 29.10.1914.

2. The Yorkshire Observer Trade Review, 1914, quoted in W.T.W., 2.1.1915, p.12.

3. The Yorkshire Observer Trade Review, 1915, quoted in W.T.W., 1.1.1916, p.19.

4. G.R. Carter, 'Clothing the Allies' Armies', E.J., 25, March 1915, p. 101.

5. The Yorkshire Observer Trade Review, 1917, quoted in W.T.W., 5.1.1918, p. 3. Although specifications on many cloths were altered during the course of the war strength tests were never relaxed, and cloths delivered in 1918 containing a small admixture of shoddy were equal in strength to those of 1914 manufactured from virgin wool. W.R., 1.4.1920, p. 32.

6. ibid.

away from 'cheap shoddy materials'.¹ The remarks of Sir Edward Stockton to a joint meeting of the Textile Institute and the Bradford Textile Society in Bradford in 1928 that the artificial silk industry 'had practically killed what was known as the "rag and shoddy trade"' was condemned briefly by the trade press,² but by this time, with consumption of recovered wool approximately one third to one half of the pre war levels, the West Riding trade had more pressing matters on which to focus its attention.

Whilst it would be disingenuous to dismiss a century of opposition to shoddy as reflecting primarily the disaffection of various vested interests it would seem remarkable that the aura surrounding 'shoddy' generated a persistency of criticism experienced by no other industrial raw material or product over such a long period.³ The rag and shoddy trade could not be accused of being alone in the use of a raw material with unpleasant associations - the paper, glue, and leather industries were but three others - nor could allegations of the health risks of rag sorting and grinding, bad though they were in a number of firms, be compared with the far greater respiratory risks present in the Sheffield knife grinding industry, coal mining, or any number of other occupations.⁴ Undoubtedly the opponents of shoddy could exploit fully a deep-seated psychological fear of wearing clothing manufactured

1. W.R., 12.2.1920, p. 13.

2. The Times, 10.1.1928; W.R., 26.1.1928, p. 201.

3. It is interesting to note that in February 1953, Elaine Burton, Labour M.P. for South Coventry, asked the President of the Board of Trade in the House of Commons if he was aware of the extent 'that the structural strength of wool cloths is debased by the inclusion of large percentages of remanufactured shoddy ... to the detriment of the consumer'. The initial response from Peter Thornycroft in defence of the use of shoddy was followed by a detailed reply in March from the Batley and Dewsbury M.P.s and Henry Strauss, Parliamentary Secretary to the Board of Trade, after consultation with the Shoddy Trade Association. W.T.W., 21.2.1953, p. 6; 14.3.1953, p. 25.

4. See for instance, T. Oliver (ed.), Dangerous Trades (1902), or Diseases of Occupations (1908).

from worn-out rags of unknown origin that existed to a far lesser degree in writing on paper made from cotton rags, using glue manufactured from old bones, or wearing leather gloves dressed with the products of Mayhew's 'pure finders'. The sincerity of the opposition by some manufacturers and wool growers is similarly undoubted, either from their fears of unfair competition, damage to the reputation of British woollen goods, or from declining demand and poor prices paid for domestic fleeces. Justifiable as these criticisms may have been, however, the overriding economic reality of demand for cheap woollen cloths for the mass market could not be ignored and much less served by adherence to some arbitrarily determined standards of quality. Indeed, the efforts of Jubb and Baines were directed as much at informing the public on the legitimacy of recovered wools as they were at answering uninformed criticism from contemporary woollen manufactures, be they in Yorkshire, the West of England, or Scotland. Fenton's series of articles of 1880-1881 on 'Woollen Shoddy' were published in two widely-read textile journals and the Batley and Dewsbury press, generating much interest and debate in the correspondence columns.¹ The Wool Record prefaced a series of historical and technical articles by Howard Priestman in 1920 on 'The Heavy Woollen Trade - the use and economic value of shoddy' by observing

'The fact remains that there is a tremendous amount of ignorance and prejudice where shoddy is concerned and the articles ... should help to remove some of the fallacies and misconceptions which have arisen from the indiscriminate use of the word as applied to the textile industry'.²

1. Wool and Textile Fabrics, 1881, op. cit.; T.M., 1881 op.cit.; B.R., 1880 op. cit.

2. W.R., 8.4.1920, p. 13.

- an opinion supporting Priestman, who noted that this applied 'even in Yorkshire'.¹

Equally justified were criticisms of poor quality cloth, not so much when the selling price clearly implied that little pure wool was present, but when cloth containing shoddy or mungo was represented as made of pure wool and sold at comparable prices. Manufacturers such as Jubb were well aware that whilst bad cloth had been produced, the merchant and retailer could also be blamed for misrepresentation and there was little manufacturers could do to prevent this. Certainly, work carried out by Holden and Taylor of the Textile Industries Department at Leeds University in 1922 suggested that the admixture of medium grade shoddy immediately reduced the strength of woollen cloth, although it was possible to make as good a cloth from a 50 per cent shoddy 50 per cent wool blend as it was from increasing the wool content to 75 per cent.²

Whilst Heavy Woollen District manufacturers resented what they perceived as the more irrational and unjustified opposition to their use of recovered wool, there is no evidence to suggest that this opposition directly retarded the rapid growth of those sectors of the wool textile industry manufacturing or consuming shoddy in the period prior to the 1920s and 1930s. Perhaps indicative of the attitude that West Riding manufacturers held on shoddy were the remarks of Mark Oldroyd, M P for Dewsbury and director of the largest mill in the Heavy Woollen District, who, when addressing a meeting in Dewsbury Town Hall in 1889

' ... observed, with a twinkle in his eye, that some people had been wicked enough to insinuate that the manufacturers of Dewsbury sometimes put material other than wool into their cloth, and that, though the borough

1. *ibid.*, 1.4.1920, p. 32.

2. *ibid.*, 4.1.1923, p. 16.

crest had a fleece in it, the texture of the cloth sent all over the world by the town scarcely entitled the Corporation to adopt that symbol.¹

The reasons for the decline in consumption of shoddy and mungo between the wars, temporarily arrested during the Second World War and the period to ca. 1955, had little to do with past or current opposition to its use. They were to be found in changing consumer preferences, rising standards of living and, most importantly, a marked erosion of the major historical attribute of recovered wool - its price competitiveness with pure wool.

An overview - recovered wool in perspective.

This study has shown that the overall contribution of shoddy and mungo to the growth of the West Riding woollen industry in the period to ca. 1914 was little short of impressive - an achievement which was even more creditable when viewed against the persistently unfavourable criticism directed at the Yorkshire industry for the greater part of the nineteenth century. Indeed, much of this appears to have overlooked the undoubted benefits to social welfare, a point not missed by Clapham who observed that without the innovation of shoddy 'the later nineteenth century would have been chillier or dirtier, or both'.²

If the performance of different firms in the shoddy and mungo manufacturing sector was sometimes 'patchy' - as the evidence of profitability and productivity between 1880 and 1914 indicates - there

1. T.M., 15.10.1889, p. 484. Oldroyd had joined his father's business in 1862 and became managing director when it took on limited liability in 1873. He was knighted in 1919. W.R., 22.4.1920, p. 13.

2. J.H. Clapham (1932), op. cit., p. 39.

appears little to suggest that the sector as a whole did not respond effectively to the demands made upon it by woollen cloth manufacturers. In providing a raw material which was an inferior substitute, both competitive with and complementary to wool, the efficiency of the rag merchanting and recovered wool sectors is best judged from the remarkably low and stable price levels achieved by shoddy and mungo over long periods of time, a conclusion confirmed by any examination of surviving mill records.

Because of the unique position of the industry and the very limited control it could exercise over the upper price of its output, it was highly dependent upon the degree of marketing success of the woollen industry, and in this, as has been suggested, West Riding manufacturers did not fail. It could be argued that the woollen industry was only responding to conditions on the demand side as real incomes of a growing proportion of the working population in domestic and overseas markets began their long secular rise from ca. 1850. Certainly, as the per capita figures for clean as distinct from greasy wool consumption in Europe and North America demonstrate, it was clearly inevitable that recovered wool would increasingly be utilised by world textile industries to meet demand for low-cost clothing.¹ On the other hand, by careful attention to pricing, quality, and finish of traditional cloths, the development of new fabrics, and in seizing available opportunities to expand sales, West Riding manufacturers showed that they were fully prepared to challenge continental competitors in the home or overseas market. If a major reason for the strength of the West Riding low woollen industry in this period was one of intense

1. Between 1850 and 1886 greasy wool consumption in Europe and North America rose from 2.96 lbs. to 4.89 lbs. per capita (65 per cent), but in the clean state from 1.93 lbs. to 2.66 lbs. per capita (38 per cent). A. Sauerbeck (1887) op. cit., p. 1.

specialisation in the production of cheap goods for a growing mass market, this was to prove a signal weakness in the interwar years when price differentials between virgin and recovered wool narrowed markedly, coinciding with unforeseen structural changes on the demand side. Inasmuch as the Yorkshire industry was in turn exploiter and victim of changing demand for low-priced woollen fabrics, then entrepreneurial performance would seem to have been above any major criticism.

The tendency of past work on the wool textile industry to ignore or underestimate the quantitative contribution of recovered wool to the growth and development of the West Riding woollen industry was noted at the beginning of this study. This would seem to be explained by the uncritical acceptance of the published figures on 'greasy' wool consumption as an accurate indicator of the raw material input of the industry - an assumption which, among other things, markedly diminishes the proportionate significance of recovered wool. The approach adopted here in constructing or accepting various estimates has deliberately erred on the side of caution, but the conclusions drawn from them appear clear. Future work on the West Riding wool textile industry will need to accord far greater attention to the use of recycled wool fibres and the implications of this on the pattern of development of the industry in the nineteenth and twentieth centuries.

Appendix I-I to I-II, Chapter I.

Appendix I-I

(i) Some important types of woollen rag¹

(a) Soft rags

Berlins.

Sometimes known as fine stockings; they comprised old, fine quality, knitted rags and produced a fairly short stapled shoddy.

Cheviots.

These were generally classed as mungo rags but in certain qualities were used to make shoddy. Originating from the coarser types of woven milled woollens, cheviots were re-used in the manufacture of cheap imitation Harris, Donegal, or similar tweed cloths.

Flannels.

A wide range of qualities and shades in which some of the lower grades were blended with cotton. Flannel rags containing cotton were either re-used as such or carbonised to produce extract wool.

Merinos.

Sorted from the finest women's soft worsted material to manufacture a good-stapled 'thready' shoddy which was then further opened on a Garnett machine before subsequent use.

Serges.

A term used in the rag merchanting sector to describe (a) cross-bred worsteds of below 50s quality having a woollen weft and decorative effects, or (b), all woollen rags, including the better quality cheviots, as well as cloths in black, navy, and blue. Shoddies from this class were sometimes blended with stockings to give a coarse, rough, but lustrous fibre.

1. N.C. Gee, Shoddy and Mungo Manufacture: its development, ancilliary process, methods, and machinery. (Manchester, 1950), pp. 12-14; H.S. Bell, op. cit., pp. 179-181; The Waste and Scrap Trades Handbook (2nd edition, 1948), pp. 255-66.

Stockings

A generic term used by the trade to cover all types of knitted material as well as stockings and socks. The larger garments, such as pullovers and cardigans, were known as 'comforters' and all produced a shoddy of fairly long staple.

(b) Hard or mungo rags

Fine, medium, and coarse cloth.

These were the original mungo rags having a heavily-milled or felted finish from men's dress coats, military, or uniform cloth. They also included the heavier serge cloths.

Worsteds

These comprised heavy men's cloth in black, blue, grey, or steel shades, and depending upon the degree of hardness, were manufactured into either shoddy or mungo.

(c) Mixed wool/cotton rags

Linseys, linceys, or challies

Terms used to describe rags containing separate threads of cotton or linen such as flannels, shirtings, or stockings, which were usually carbonised to produce extract.

Angolas

Angola flannels or union flannels were made of wool and cotton blended and spun into one yarn containing in various qualities from 20 to 80 per cent cotton.

(ii) Sources of new and old woollen rags.¹

(a) New clips.

These originated from the workrooms of tailors, costumiers, clothinghouses, cap makers, mantle makers, hosiery factories, and other users of woollen fabrics such as railway carriage lining manufacturers. The main source was from the costumiers and clothiers of large cities in the United Kingdom, Paris, Berlin, Brussels, Rome, and Constantinople, with smaller supplies from Spain, Scandinavia, Russia, Australia, New Zealand, South America, India, and Japan. The types of material included worsteds, fine cloth, serges, chevots, gabardines, merinos, and hosiery. The best clips - from clothier's fine worsteds or costumier's light cloth, velour, and mantle clips - came from London and Paris, closely followed by Brussels; those from Berlin were generally of a lower quality. Large quantities of new clips came from the ready-made clothing areas of the North, London, and the Midlands, in medium and coarse qualities of serges, black and blue worsteds, chevots, steel-grey, light, and dark cloth.

(b) Old rags - domestic supplies

Stockings

The three nineteenth century 'standard stockings' were the Hambro (or Hamburg), the London, and the Scotch. The first disappeared towards the end of the nineteenth century, but the two surviving classes persisted well into the twentieth century. Fine stockings came mainly from the South, South-East, and the West Country, medium from the Midlands and North, coarse quality but strong-stapled stockings from Scotland.

1. Based on a paper presented to the Batley and District Textile Society by C.R. Spedding, 'Rags and Shoddies: Their Uses and Sources', W.T.W., 5.2.1927, pp. 8-9, 12.2.1927, pp. 5-7.

Merinos and serges

. Woollen rags from 'dress goods' in standards that remained constant from the 1870s to the 1930s. Black and blue serges and merinos, especially the finer qualities, came from the South, South-East, and South-West, coarser material was collected in Lancashire, Yorkshire, the Midlands, and Scotland. The South coast provided light coloured materials, for example cashmeres, delaines, and mousselaines, with darker colours generally coming from the North. Blankets and flannels of the highest quality were sent from Scotland, second best qualities from the South and South-West.

For supplies of men's wear woollen rags, the South provided the cleanest and soundest worsteds, cloth, and fine serges; the East, West, North, and agricultural districts supplied mainly tweeds and cheviots with blue worsteds and blue serges predominating in the Midlands, Lancashire, and Yorkshire.

Overseas supplies

The best qualities of stockings come from Holland, but by the 1920s the increasing admixture of cotton, shoddy, and other materials in knitted goods had reduced considerably their value to Yorkshire. An important class of rags in the late nineteenth and early twentieth century was old mungo cloth, particularly from the United States, France, Germany, and Belgium.

France

Paris was the chief centre for fine quality woollen rags. Those from the South-East and South-West were mainly coarse home-spun cloths in 'whites', blankets, knitted materials, and tweeds. From Brittany came the unique class of rags known as 'molletons' - neither coarse nor fine but with a soft handle and flannel-like appearance from

women's long dresses with a finer quality being worn by men.

Germany

A good source of stocking-type woollen rags in the early nineteenth century, the bulk of German rags comprised mungo buckskin and mantle cloth in the later nineteenth century, the brightest colours coming from the North and darker colours from the South and East.

Italy

Italy provided fine cloth from men's and ladies' wear in the South, and heavier cloth from the industrial districts of the North. The heaviest goods came from the mountainous frontier districts in various qualities of heavy tweeds, overcoatings, blankets, vests, and socks, most of which were home-carded and spun. The wool, however, tended to be brittle because of poor pasture, and recovered wool from the rags was consequently used only for low-grade yarns in the West Riding.

Belgium

A source of woollen rags similar to those of France, although many of the flannel rags from dresses as well as coarse stockings were made from inferior half-wool materials and could only be used in the flocking trade.

Russia, Bulgaria, and Servia

These countries were important sources of coarse stockings, blankets, and greatcoat materials made from local wool and were imported in large quantities to the West Riding.

North Africa, Morocco, Tunis, Algiers, Turkey, Asia Minor

Exporters of mainly white, coarse-textured hand-spun pure wool blankets and 'burnous' (cloaks).

U.K. colonies, Australia, New Zealand, and Canada

All were sources of stockings and knitted goods very similar to the high quality London and Scotch standards. Many woollen rags of the best qualities were originally manufactured in the United Kingdom, such as flannel shirtings, whites, army flannels, worsteds, and serges (new clips). The coarser qualities, particularly those from Canada where the domestic woollen industry used much shoddy, were of little value to the West Riding trade.

Appendix I-II

Some cloths manufactured in the Heavy Woollen District in the nineteenth century.

Beavers

Stoutly made cloths with little or no dressing or finishing and only the face 'pared'. They were then milled thoroughly to present a hard, compact, and weatherproof finish.

Cassimeres and Kerseymeres

Finished similar to Doeskins, but of a slightly different construction. Kerseymeres were double-milled to give a more compact finish.

Doeskins

A well-dressed cloth in imitation of animal fur, commonly hand-woven until the 1860s, the finish being further refined in the 1870s with improvements to the milling machine.

Druggets

A very low cloth, mixed, unraised, and frequently plaided. Used mainly as carpet underlay or as a protection for expensive carpets, the demand declined with the innovation of felted cloth. Paddings were a similar cloth, used mainly in the tailoring and slop trade as stiffening material for collars.

Duffels

A stout cloth, well raised with a soft finish. Similar but superior to Flushings, in drab, and from ca. 1860, a range of different colours.

Flushings

A coarse, heavy and well-raised cloth which, with Druggets, were

the staple cloths of the Heavy Woollen District until ca. 1840-50. Finished very lightly, they were produced in blue and drab, weighing from 1½ to 3lbs. per yard (54 inches wide) and by 1860 were manufactured mainly for the Admiralty.

Meltons

A similar cloth to Beavers, having a more finely pored finish on one side.

Moscows and Presidents

'Reversible' cloths of stout construction, in effect two cloths woven into one with a coarser coloured or plain backing and either all-wool or union. Used for heavy overcoatings.

Pilots

The 'staple article of the shoddy manufacture' (Jubb); stout but well finished and commonly piece-dyed blue, although other colours such as black and brown were popular. Made of all-wool or union (cotton warped), Pilot Cloth was used largely by seamen and for work coats and overcoats.

Tweeds

Imitation Scottish tweeds began to be made in the West Riding in the 1840s, some of the early cloths having patterns printed on them. Lightly finished, Yorkshire tweeds combined shoddy and mungo with dyed cotton to provide some strength. Used for ladies' mantlings, overcoats, and particularly, men's and boy's suits.

Witneys

Finished with a furry face for ladies' mantles or a neater face for overcoats, commonly with a marbled or clouded colour in the 1850s and dark colours from ca. 1860. Yorkshire-manufactured 'Witney' blankets were prevented from using the term in 1909.

Source: G.P. Bevan (ed) British Manufacturing Industries (1876), pp.47-48; S. Jubb (1860) op. cit., pp. 41-57; G. & J. Stubble Ltd., A Century of Cloth-Making (1950), pp. 16-17.

Appendix II-I, Chapter II.

APPENDIX II-I (contd.)

Insolvency of (a) West Riding woollen manufacturers; (b) shoddy and mungo manufacturers, (c) rag, shoddy, and mungo merchants in Batley, Dewsbury, Heckmondwike, Ossett, and Morley, 1871-1900.

Year	(a)	(b)	(c)	Year	(a)	(b)	(c)
1871	29	-	4	1886	11	2	5
2	19	2	4	7	4	-	4
3	17	1	13	8	14	-	2
4	38	2	8	9	27	4	5
5	42	2	2	1890	16	-	6
6	28	5	8	1	26	1	3
7	34	7	6	2	13	1	5
8	24	3	7	3	-	2	3
9	27	5	15	4	19	2	7
1880	19	2	6	5	12	1	3
1	18	2	6	6	5	-	5
2	25	3	8	7	15	1	5
3	20	4	16	8	17	1	4
4	14	5	14	9	5	2	9
1885	15	-	6	1900	9	-	2

- Source:- 1, 2, and 3. Perry's Bankrupt Weekly Gazette, XLIII 1870
 and (a), (b), (c) to LIV 1881
Perry's Gazette, LV 1882 to LXXIII 1900
Textile Manufacturer, 18.1.1875 to 15.12.1900
Journal of Fabrics, 12.2.1882 to 12.12.1885
Journal of Fabrics Industries, 12.1.1885 to 12.10.1885
4. B.R. Mitchell and P. Deane, Abstract of British Historical Statistics (Cambridge 1962), p. 476.
- 5 and 6. Chapter V, Appendix V-I.

Appendices and Tables III-I to III-IV, Chapter III.

APPENDICES to Chapter III

- III-I - (i) Notes on the tables
(ii) Notes on the estimate of United Kingdom shoddy and mungo consumption and production and the weight of domestic woollen rags collected, 1820-1939.
- III-II - Imports, by country.
- (a) Woollen rags, 1819-1850
 - (b) Woollen rags, 1851-1870, including shoddy and mungo 1871-1902
 - (c) Woollen rags, 1903-1939
 - (d) Shoddy and mungo, 1861-1870
 - (e) Shoddy and mungo, 1903-1933
- III-III - Exports, by country or annual total.
- (a) Foreign and colonial woollen rags re-exported, 1860-1939
 - (b) United Kingdom woollen rags, 1901-1939
 - (c) Foreign and colonial shoddy and mungo re-exported, 1861-1870, 1903-1933.
- III-IV - (a) Woollen rag prices, 1911-1939
(b) Index of woollen rag prices, 1911-1939.

APPENDIX III-I (i) Notes on the tables.

The quantitative data on United Kingdom recovered wool consumption and import/export statistics of woollen rags, shoddy, and mungo which form an important element of this and the two subsequent chapters, are based upon information contained in publications of the Bradford Chamber of Commerce and the Trade, Navigation and Commerce returns.¹ Because these sources have been used to construct a number of estimates, including the domestic output of recovered wool and a comparison of the relative proportions of recovered and virgin wool consumed by the United Kingdom woollen industry, the following discussion outlines the major problems encountered in an assessment of their comprehensiveness and their reliability.

The import and export statistics in the Trade and Navigation accounts.

These have been used in a number of tables showing the importation of woollen rags and recovered wool, the re-export of woollen rags and the export of domestically produced shoddy and mungo which have been reproduced in the text or as appendices to the present chapter and Chapter IV.² A major deficiency in the official statistics of imports of woollen rags and overseas produced shoddy and mungo, with the exception of the years 1861 to 1870, was that until 1903 separate classifications distinguishing between the two were not made. Until 1861 the large annual importation of recovered wool was

1. F.J. Hooper and Bradford Chamber of Commerce, v. *infra* p.583. Trade, Navigation and Commerce, annual and monthly accounts. Annual Statements of the Trade of the United Kingdom.

2. Discussion of the detail changes made from time to time in the Trade and Navigation classification and their implications are referred to in the text or noted under the relevant table.

amalgamated with imported wool, and from 1871 to 1902 recovered wool and woollen rags were aggregated under the classification 'Rags, woollen - Applicable to other uses than manure, torn up or not'.¹ The absence of figures on foreign produced shoddy and mungo was unsatisfactory for several reasons, the most important of these being the difficulty they presented in estimating the growth in domestic rag-pulling capacity and, secondly, in pinpointing the timing of the decline in imported ragwool between the large imports of the 1860s and the very small imports after 1903, when separate classifications were again resumed.

The estimates of the quantity of imported ragwool have thus been based on an examination of the Hull Customs Bills of Entry. From the 1820s, Hull appears to have handled the greater proportion of imported woollen rags and shoddy destined for the West Riding and by 1860 Jubb had estimated that about three quarters of overseas shoddy and mungo were landed there.² From a comparison of the annual weight of imported woollen rags and shoddy in the Trade and Navigation accounts with the quarterly returns sent by the Hull Customs House to London, it appears that between 1870 and 1885 just under half of the total imports passed through Hull, declining to approximately one third in the period 1890 to 1900.³

The following estimates are from the daily lists of ship's inventories landing at Hull between Monday and Saturday each week and entered in the section 'Ships Reported Inwards' in the weekly

1. The classification used in the monthly accounts was 'Woollen Rags, Torn up or not, to be used as wool'. Trade, Navigation and Commerce, Annual Accounts, P.P. 1872. (C. 615, I to III), LVI, 55 et seq.

2. J.T. and J.T. MSS., loc. cit., Waste Book, 31.3.1834-31.12.1851. Mill Book, 13.9.1838-23.2.1850. Thomas Taylor bought all his imported rags from Hull importers in the 1830s. See also F. Fenton, T.M., 15.7.1881, p. 252. S. Jubb (1860) op. cit., p. 24.

3. Small tonnages landed at Goole and Grimsby after 1870 have not been included.

issue of the Bill of Entry.¹ Susequent to this, imported goods were then reclassified according to the Board of Trade import categories and listed under a separate heading 'Goods entered from the Ship-for home consumption' from which the monthly returns were compiled and sent to London. Owing to the complexity involved in extracting the information required here from daily manifests of each vessel at one of the busiest nineteenth century ports on the East coast, data were selected for the years 1835-53, 1858-61, for five year intervals from 1870 to 1895, and for the year 1903. For each of these years the manifests of all ships landing in January and July were examined, with additional checks in either March or September, to ascertain an estimate of the annual volume of ragwool and woollen rags landed at Hull. All manifests were expressed in terms of the form of container used (casks, boxes, or crates), those for shoddy and woollen rags, as for wool, being in bales. An estimate of the total importation of overseas produced shoddy and mungo between 1835 and 1849 was made, assuming that three quarters of this was landed at Hull and that a bale of shoddy weighed approximately two packs (480 lbs.).² From 1850, when the greater proportion of woollen rags imported were destined for the West Riding woollen

1. H.M. Customs and Excise, Commissioners' Library, King's Beam House, Hull Bill of Entry, CL8, 1831-34, 1903. Humberside County Council, Central Library, Hull, Hull Bill of Entry, 1832, Jan. 1835-July 1853, Jan. 1858-Dec. 1898, (hereafter referred to as H.B. of E.). No records for Hull survive prior to 1831 nor for the remaining months of 1853 to January, 1858. It has been assumed that the proportions of woollen rags and shoddy landed at Hull were representative of those being landed at other ports.

2. H.D. MSS., loc. cit., Sales Day Book 19.1.1848-20.1.1864.

industry, a ratio between the number of bales of rags and bales of shoddy has been calculated on the basis that the typical weight of a bale of pressed rags was about four hundred weight (448 lbs.).¹ The indicated ratios are shown in Table III-I(a) below.

TABLE III-I(a) Ratios of bales of shoddy and mungo to bales of woollen rags landed at Hull, 1850-1903.

YEAR	SHODDY, MUNGO:RAGS	YEAR	SHODDY, MUNGO:RAGS
1850-1853	1 : 1	1875	1 : 1.68
1858-1859	1 : 0.6	1880	1 : 2.23
1860	1 : 1.1	1885	1 : 7.57
1861	(1:0.8) 1 : 0.78	1890	1 : 9.53
1870	(1:1.1) 1 : 0.82	1895	1 :13.24
		1903	(1:25.6) 1 :22.86

Source: H.C.B. of E., loc. cit.

A comparison of the ratios obtained from the Hull Custom Bills of Entry with years for which the Board of Trade published detailed figures of each category, namely between 1861 and 1870 and from 1903, indicates that the ratios achieve a satisfactory degree of correspondence (values in parenthesis).

For the period between 1870 and 1903 the ratios were adjusted equally on an annual basis between the five year observation points.

1. *ibid.*, correspondence and invoices of J. O'Niell, 1864. These figures can only be regarded as very approximate prior to ca. 1860 as bales could vary from anything between 435 lbs. to 570 lbs. From 1860-1870 hydraulic presses were used by the majority of shippers to ensure regular weights and sizes for ease of transport, and it would seem reasonable to assume that the standard weights of a 'continental' bale of rags of four hundredweight and two packs for shoddy and mungo prior to 1914 would have been used for most of this period. 15th Annual Report of the Local Government Board 1885-6, PP, 1886, (4844-1) XXXI, 553, and information kindly supplied by Mr. T. Day.

Clearly, this procedure lacks precision by assuming a constant relationship between the two variables in the intervening four year periods. The intention was, however, to smooth the trend conclusively indicated by the five year observations between 1870 and 1903 in order to ascertain the approximate timing and rate of decline in the importation of overseas produced recovered wool, and to relate this to the substitution by domestic manufacturing capacity. As discussed in the text, evidence from the trade directories and other sources indicates a marked expansion of domestic capacity beginning in the mid 1870s, which although checked after ca. 1880, had more than doubled in the Heavy Woollen District between 1870 and 1901.¹ This was accompanied by a corresponding diminution in the number of specialist ragwool merchants who had previously obtained a large proportion of their raw material from overseas suppliers.² There is no evidence from contemporary trade reports in the press or the textile journals between ca. 1870 and ca. 1900 to indicate that the fairly rapid substitution of imported ragwool from 1880 was sufficient to cause special comment, or that special conditions obtained in any year to suggest that the method used here to progressively adjust the relative proportions of rags and shoddy would have led to significantly different figures.³

Table III-I(b) sets out the estimated importation of shoddy and mungo based on the weight of imported woollen rags between 1850 and 1860 (with an additional allowance of 25 per cent),⁴ and

1. v. supra, Table IV(viii), p. 274.

2. v. supra, Table II(viii), p. 72.

3. v. supra, p. 176.

4. Assuming that Hull handled threequarters of all imported rags and recovered wool between 1850 and 1860.

the disaggregated proportions from 1871 to 1902. Table III-I(c) incorporates these estimates with the Board of Trade figures for 1861-70 and from 1903, after converting to lbs. weight and adjusting to the nearest 100,000 lbs. These tables have been used, in conjunction with Hoopers' estimates of the total United Kingdom consumption of shoddy and mungo from 1820, to calculate the domestic collection of woollen rags, and, hence, the quantity of both domestic and imported rags converted to shoddy and mungo by the woollen industry.

Valuations.

Between 1823 and 1854 imports of woollen rags were given an 'Official Value of importation' which was purely a notional value for dutiable purposes until 1845.¹ In 1854, a new valuation, 'Real or computed value of the importations' appeared in the Customs ledgers, and although there is no indication of the way in which this was assessed, it was very probably based on importers' valuations or from documents accompanying the bills of lading.²

A comparison with known prices of woollen rags indicates that Customs valuations were markedly less than Dewsbury values. Day was buying 'America old dark grey' at approximately 26^s/- cwt. in 1858, whereas the mean Customs valuation of all American imports was 5^s/- cwt. Valuations from 1861 appear to be more accurate. The small import

1. G.N. Clark, Guide to English Commercial Statistics (1938). Although Clark is concerned with the eighteenth century it is known that prior to 1853 the import valuations on 'free goods' were based on out-of-date figures. The accuracy of the actual import figures are considered to be reliable.

2. P. Deane and W.A. Cole, British Economic Growth 1688-1959 (Cambridge 1969), p. 197.

of 70 tons of rags from the U.S. in 1861 (not listed separately in Table III-II(a)), has a mean valuation of $35^s/7^d$ cwt. which corresponds closely with Day's buying price from his American dealer, of 'American Old Grey' at $37^s/4^d$. As Day was an active buyer of American rags in this period it would seem likely that the Customs used importers valuations. Random comparison for the 1870s, 1880s, and 1890s, insofar as the official valuations include also the more expensive shoddy and mungo, compare approximately with rag prices appearing in the press and other sources. From ca. 1900 valuations were based upon information supplied by importers.¹

Origin of imports and destination of exports.

Although the reliability of the published returns had been improved since the mid-1870s, dissatisfaction with the accuracy of the Board of Trade statistics collected by the Customs House on the wool textile industry continued to be aired, particularly in Bradford. Under the guidance of Sir Jacob Behrens, the Bradford Chamber of Commerce began issuing their own set of statistics for the wool textile industry, persuaded perhaps by the very detailed figures that Behrens supplied to the 1867 Pollution of Rivers Commission.² Submitting evidence to the Royal Commission on the Depression in Trade and Industry in 1886, Behrens alleged that the Customs were

'... much less scrupulous in their statistics of "free goods" than those for dutiable goods'

1. By 1900 the Annual Statements were prefaced as follows:-
'Statements of quantities and values based on declarations of importers and exporters as subsequently checked by Customs Officials. Values of imports - c.i.f; Values of exports - f.o.b.'

2. Third Report of the Commissioners (Rivers Aire and Calder), PP 1867 (3850) XXXIII, 248.

and made the specific criticism that the

'... returns would be much more useful if they gave the origin and the destination of our imports and exports'¹

It was not until 1904 that this criticism was met by the Customs House and the Board of Trade. From that date, statistics on imports and exports were collected in two series, Volumes I and II and a Supplement, all returns after 1908 adopting the format of the Supplement. The important distinction between the two series was that the Supplement specified the country of original consignment of imported goods and not as previously, the country of shipment. Exports were similarly credited to the country of ultimate destination and not shipment.

The preface to the 1904-1908 Supplements points out that nearly all goods from Switzerland and a large proportion of those consigned from Italy and Austria-Hungary were sent via France, Holland, Belgium, and Germany. A large proportion of German goods however, reached the U.K. via Belgium and Holland. Using the definition of consignment and not shipment, the total quantity of goods imported from Germany was therefore greater, and those from France, Belgium, and Holland was 'considerably less' than was shown on all returns prior to the 1904 Supplement.²

A comparison of the two sets of statistics between 1904 and 1908 for United Kingdom imports of shoddy and mungo is consistent with this explanation. The new classification indicates that the amount imported from Germany varied between 30 and 90 per cent more than the old classification, with imports from Holland and Belgium being

1. Second Report of the Royal Commission on the Depression in Trade and Industry, PP 1886 (C4715) XXII, Part I, Minutes of Evidence, 507.

2. Trade, Navigation and Commerce, PP 1906 (Cd 3282) CXIV, iv.

between 70 and 90 per cent less, the difference between the three countries balanced by imports from Austria-Hungary. The figures for imported woollen rags, whilst not displaying such a marked disparity, were similarly misleading. Actual imports from Germany varied between 30 and 50 per cent more than those recorded under the previous classification and for Holland and Belgium they were from 20 to 40 per cent less. As there were no imports of rags from Austria-Hungary between 1904 and 1908, the understatement of imports from Germany was probably balanced by small transshipments from Switzerland and Italy.

The new classification, as the Board of Trade cautioned, could not distinguish between country of origin and country of consignment of imported goods which had undergone a transfer of ownership. Reuss, commenting in the Waste Trade World in 1914 appreciated this difficulty.

'I have grave doubts whether all those "German rags" are really of German origin and are not to a considerable extent rags from other countries (i.e., Russia, Austria, Hungary, Switzerland) which pass in transit through Germany and German ports ... and enter England as "German products" through no fault of the Board of Trade"¹

The figures in the 'imports by country' tables for the nineteenth century in this appendix must therefore be read with the foregoing caveat in mind. By the 1860s, with certain exceptions, great strides had been made in the development of a railway network on the continent, which, together with the inland waterway systems, had established well-used routes to the major ports.² It would thus seem reasonable to assume that the approximate percentage discrepancies

1. W.T.W., 3.1.1914, p. 3.

2. T. Kemp, Industrialisation in Nineteenth-century Europe (Edinburgh, 1971 edn.). Hamburg, for example, was the chief port for Austria and central Germany. A. Ure (1861) op. cit., p. 711.

of 1904 to 1908 relating to imported woollen rags and recovered wool from Belgium, Germany, and Holland, and to a lesser extent Austria-Hungary, Italy, France, Switzerland, and Russia, would have applied for most of the period from ca. 1860 to 1904.

The export classifications appear to be more accurate with little difference indicated from a comparison between the two sets of statistics between 1904 and 1908. Although it is very probable that a proportion of United Kingdom exports of shoddy and mungo to Germany were transhipped through Belgium or Holland from 1860, the small totals for these countries relative to those of Germany (Table IV-I, p. 640) indicate that the tonnage incorrectly accredited could not have been significant. From 1904 only those goods exported to countries with no seaboard were classified according to the port of discharge.¹

1. Trade, Navigation and Commerce, Annual Accounts, P.P. 1904 (Cd. 2043, 2081) XC, x.

(ii) Estimates of the total consumption and production of shoddy and mungo in the United Kingdom, 1820-1939.

No official returns or statistics on the output or consumption of recovered wool or the domestic collection of woollen rags in the United Kingdom were made in the nineteenth century.¹ Neither were statistics recorded of the domestic wool clip, or more importantly, the domestic consumption of wool textiles, from which estimates of the consumption of recovered wool can be made by using the import and export figures from the Trade and Navigation returns. Thus, any attempt to construct an estimate of the weight of domestic woollen rags collected for manufacture into shoddy and mungo or the actual consumption of recovered wool by the woollen branch of the industry on an annual basis faces difficulties of some magnitude. From 1907, however, the various Censuses of Production provide accurate figures, supplemented for most years between 1928 and 1937 by estimates of the Imperial Economic Committee (I.E.C.).

The only series of statistics on the consumption of animal fibres by the United Kingdom wool textile industry were those published privately by the Bradford Chamber of Commerce in 1898, with quinquennial figures from 1795 until 1864 and annual figures thereafter. This series was compiled by Frederick Hooper, secretary and statistician to the Chamber, who revised and updated them until 1906 when his work was continued by other members of the statistical department.² Hooper's

1. Jubb, in his address to the British Association at Bradford in 1873, noted that 'there are no statistics showing the extent of the trade in the aggregate, though it is desirable that there were'. (loc. cit., p. 194).

2. F.J. Hooper, Statistics relating to the City of Bradford and the Woollen and Worsted Trades of the United Kingdom (Bradford, 1898 and 1903); Bradford Chamber of Commerce, Statistics Relating to the Woollen and Worsted Trades of the United Kingdom (Bradford, 1908). 1904-08; 1909-14, 1915, 1917, 1919, 1925-34, 1936-8, 1940.

work appears to have been regarded highly, being used by Bowley and later, Hoffman, who based his output index of 'woollen yarn' (i.e., worsted and woollen yarn) from 1865 on Hooper's data which had been reproduced in the Statistical Tables of 1909.¹ The unofficial Tariff Commission of 1905 also used Hooper's estimates, as did the 'Balfour' committee of 1928 and, more recently, the 1947 Board of Trade Working Party report on the wool textile industry.² Hoffman noted that the estimates for the consumption of wool and shoddy were 'reasonably accurate' and Deane and Cole, after carefully comparing Hooper's series for the first half of the nineteenth century with contemporary estimates, adopted the wool and shoddy figures as 'rough estimates' and those after 1850 as 'reasonably reliable'.³ Thus, Hooper's work has provided an important statistical basis for much of the published material, both official and scholarly, on the United Kingdom wool textile industry since ca. 1900.⁴

It would appear, however, that attempts at verification of his estimates have concentrated solely on figures of the domestic wool clip which Hooper took from those published by the London wool brokers Helmuth Schwartz from 1860.⁵ His estimates of shoddy and mungo consumption, which varied from between 16 to 25 per cent of the total United Kingdom consumption of animal fibres 1860-1904, have been

1. A.L. Bowley, 'Note on Statistics of the Woollen Industries', E.J., XV, 1905, p. 585; W.G. Hoffmann, British Industry 1700-1950 (Oxford, 1965 edn.), p. 259; Statistical Tables and Charts relating to British Foreign Trade and Industry, PP, 1909 (4954), C11, 864-5.

2. Report of the Tariff Commission (1905) 2, The Textile Trades. Part 2, Evidence on the Woollen Industry, section VIII, Table 2; Committee on Industry and Trade (1928), III, p. 166; Board of Trade Working Party Reports (1947), Wool, Part I, p. 32.

3. W.G. Hoffmann, op. cit., p. 259; P. Deane and W.A. Cole, op. cit., p. 193.

4. see also E.M. Sigsworth and J.M. Blackman, loc. cit., p. 133; A. Barnard, The Australian Wool Market 1840-1900 (Melbourne, 1958), p.218; C.T. Saunders, 'Consumption of Raw Materials in the United Kingdom: 1851-1950', J.R.S.S., CXV, Series A, III, 1952, p. 321.

5. A. Sauerbeck, Production and Consumption of Wool, (1887).

accepted without question.

Hooper provides only a terse explanatory note in the 1898 edition on the method he used to calculate these figures

'I have been unable to obtain any reliable estimate later than the year 1860 as to the consumption of shoddy, etc., in this country, and the estimates given in this table are based mainly upon the ascertained imports of woollen rags'.¹

It is not clear how he did this as his estimates do not exhibit a constant relationship with the Board of Trade import statistics of woollen rags and ragwool, although there is some evidence that he may also have adjusted the annual estimates, for instance in 1880, according to fluctuations in the price of wool. It seems highly probable that he used his own extensive knowledge of the wool textile industry, supplemented perhaps by information gained informally from Bradford wool merchants, in order to arrive at his final estimates.²

Given the paucity of information on domestic production and consumption of wool textiles it would appear hazardous to calculate the possible consumption of shoddy as a proportion of virgin wool, or to estimate the likely domestic weight of woollen rags, including imported woollen goods, which could have been collected to supplement the importation of foreign rags and shoddy. Hooper's figures have thus been accepted in a modified form after close comparison with a number of contemporary estimates. By adjusting his figures of recovered wool consumption with the import statistics of woollen

1. F.J. Hooper, op. cit., 'Preface'.

2. F.J. Hooper, 'The Woollen and Worsted Industries of Yorkshire', W.J. Ashley, British Industries (1903), pp. 93-118.

rag and shoddy to show the collection of domestic woollen rags, the plausibility of his calculations have been compared with the indicated per capita domestic rag collections of three countries; Denmark (1869-72), the Republic of Ireland (1924-40) and the United States (1880, 1890, 1900) together with the Census of Production figures for 1907 and 1912.

The following tables contain the various estimates and calculations used to verify Hooper's figures.

III-I(d) - a chronological sequence of contemporary estimates

III-I(e) - data from the Census of Production and the I.E.C.

III-I(f) - Hooper's estimates and adjusted figures.

III-I(g) - a comparison of the weight of domestic woollen rags or shoddy produced from them for various countries with figures from Hooper's estimates.

From a comparison of Hooper's estimates with those in Table III-I(d) the following adjustments have been made and are incorporated in Table III-I(f), column (a).

YEAR(S)	HOOPER'S ESTIMATE ('000s lbs)	NEW ESTIMATE ('000s lbs)	YEAR(S)	HOOPER'S ESTIMATE ('000s lbs)	NEW ESTIMATE ('000s lbs)
Av. 1820-24	5,000	1,000	Av.		
Av. 1825-29	10,000	2,500	1860-		
Av. 1830-34	20,000	7,000	64	45,000	66,000
Av. 1835-39	10,000	-	1865	50,000	79,000
Av. 1840-44	10,000	-	6	55,000	83,000
Av. 1845-49	20,000	-	7	60,000	71,000
Av. 1850-54	30,000		8	65,000	75,000
Av. 1855-59	35,000	52,000	9	70,000	74,000
			1870	70,000	75,000
			1	85,000	

Hooper's figures for the period 1820 to 1834 have been revised downward to correspond more closely with Nussey's estimate given to the Select Committee in 1828. Whilst Hooper observes that his estimates for the period to 1860 were based on 'reliable' sources he provides no

further information and it is possible that he may have consulted some of the older generation of manufacturers in the Heavy Woollen District with a knowledge of the trade. Although Nussey informed the Select Committee that the production of shoddy 'cannot be more than 9,000 packs' it should nevertheless be borne in mind that the nature of the enquiry on the dramatic fall in price and demand for English clothing wool may have been conducive to a conservative estimate.¹ However, Jubb noted in 1860 that the output of the early rag machines 'was small, being only about one fourth of the produce of one now' (i.e., about 84,000 lbs. p. a. in ca. 1820-35) and thus Hooper's estimate would imply that there were about 120 rag machines operating between 1825 and 1829 and twice that number in the succeeding quinquennium.² This would not seem consistent with later evidence, Baines' Leeds Mercury noting in 1842 that

'... there never were more than 50 machines employing in the whole only 25 men and 50 boys ...'³

and a combined figure based on Jubb's and Baker's estimates of 1858 for the Heavy Woollen District (excluding Huddersfield) indicating 141 machines then in use.⁴ Clearly, there were rapid advances in machine output between the 1820s and 1858 and this would have resulted in the replacement of many of the older inefficient machines, but evidence suggests that it was not until after the 1830s that the original configuration of the rag machine was altered from two feeding points to one.⁵ The revised estimates for 1820-1834 are thus based on a probable 25 to 35 rag machines in the West Riding indicated by Jubb's

1. J. Bischoff (1842) op. cit., p. 180.

2. S. Jubb (1860) op. cit., p. 20. see also output figures, Table IV(i).

3. L.M. 19.3.1842.

4. v. *supra* Table IV(v).

5. v. *supra* pp.217-19.

output information and Nussey's estimate for 1828 and including the small but growing proportion of imported ragwool. From 1835 to 1854 Hooper's figures appear consistent with the growth in number of machines between 1842 and 1858, a steady increase in output per machine, and imports of shoddy and mungo.

Hooper's series has been revised upward from 1855 until 1870 to reflect the very strong consensus amongst the various contemporary estimates. He appears to have based his mean of the quinquennium 1855-59 on Jubb's figure of West Riding production for 1858, but this did not, as Jubb pointed out, include imported shoddy and mungo. The estimate of this from the Hull Customs Bills of Entry between 1858-59 and 1860 (Table III-I(c)) is close to Baines' figure of approximately 9 to 10 million lbs. from Germany alone in 1857 but less than Jubb's 'rough estimate' of 10,000 tons per annum (22.4 million lbs.).¹ The revised estimate for 1855-59 is the mean of Baines, Jubb, and Ure, and that for 1860-64 slightly more than the mean of Ure, the 1862 Jury, and Behrens.² The annual figures for 1866 to 1870 have been adjusted to indicate the likely increase in consumption taking place at the end of the Civil War boom in 1866 (imported shoddy and mungo increased by 20 per cent compared to 1865), the drop in consumption in 1867 and stable if slightly fluctuating levels from 1868 to 1870.

From 1871, Hooper's series appears to agree with all but three of the contemporary estimates. Jubb conceded in his paper to the 1873 meeting of the British Association that his estimate was 'rough' and it is clearly far too low being less than the Board of Trade figures for

1. E. Baines, op. cit., p. 102; S. Jubb (1860) op. cit., p. 24..

2. These estimates are consistent with the annual output of about 200 rag machines in the mid-1860s based on Jubb's 1858 output figures for one machine of between 260,000 to 336,000 lbs. per annum. (v. supra Table IV(i)).

imported woollen rags and shoddy for 1872 of some 65 million lbs. irrespective of the domestic woollen rag collection. The estimates of Simmonds (1883) and Smith (1886) similarly bear little relation to the net imports of woollen rags and shoddy and ignore entirely the large domestic collection. The difference between Hooper's series and the following estimates for various years is small:-

1879 - <u>Textile Manufacturer</u>	+ 10 per cent
1879/80 - F. Fenton (weight of woollen rags less a 20 per cent allowance + 2 per cent for loss on remanufacture)	+ 2 per cent
1883 - W.S.B. McLaren	- 4 per cent
1891/92 - Dewsbury Chamber of Commerce (less 20 per cent loss)	+ 7.5 per cent
1903 - C. Ogden and P. Macaulay	- 6.6 per cent
Av. 1909-13 - D. Zimmern	- 7.5 per cent
1913 - <u>Waste Trade World</u>	+ 2.5 per cent

Thus from 1871 until the various Census of Production and I.E.C. figures commencing in 1907 (Table III-I(e)) it would appear that Hooper's estimates, and those of the Bradford Chamber of Commerce after 1906, would seem to reflect reasonably accurately the annual consumption of shoddy and mungo in the United Kingdom.

All Census of Production and I.E.C. figures have been adjusted to show the net weight of recovered wool available for consumption in the United Kingdom after deducting exports (Table IV-I, p.640).

The original production figure of 170 million lbs. for 1924 has been retained in Table III-I(f). The 1930 Census of Production did not include output of firms with less than 10 employees and excluded also firms in Northern Ireland. This accounts for the smaller revised figure for 1924 on the 1930 classification and indicates,

on the basis that such firms accounted for 9 per cent of production in 1924,¹ that the production figures for 1930, 1933-35, and 1937 should be marginally higher (although some of these smaller firms may well have ceased production by 1930).

The estimates of the I.E.C. would seem reasonably accurate, the Committee calculating them

'... on the basis of the activity of rag-pulling machines from the periodical censuses taken under the joint auspices of the Worsted Spinners' Federation Ltd. and the Woollen and Worsted Trades' Federation of Bradford'.²

As the Bradford Chamber of Commerce series on shoddy and mungo consumption was discontinued as 'not available from 1932', the estimates for the years 1938 and 1939 have been based on a prewar mean of woollen rag production of 120 million lbs suggested by M.J. Schwartz of the U.S. Department of Commerce in 1951.³

Reliable data on the capacity of the recovered wool industry for the nineteenth century from which Hooper's estimates may be checked are virtually non-existent. Although the Factory Returns enumerated 'Shoddy Factories' separately from the woollen and worsted sections of the industry from 1867/8 they noted only the number of factories, power, number of employees, spindles, carding engines, and power looms.⁴ No indication is given of the number of rag machines until the last and very detailed return of 1904 and consequently no output figures can be calculated. Moreover the returns refer to mills spinning or weaving, or combining both processes, and as such provide only an imperfect picture of West Riding firms who presumably

1. Final Report of the Fourth Census of Production, 1930, p. 79.

2. W.T.W., 20.11.1937, p. 5.

3. World Wool Digest, II, 6.9.51, p. 11.

4. Report of the Departmental Committee on Factory Statistics, P.P. 1895 (C 7608) XIX, 596.

ground rags for their own use. Those mills or firms falling within the definition of this study, and, indeed, within the West Riding meaning of 'shoddy or mungo manufacturers' - firms whose principal activity lay in converting woollen rags into ragwool - were most probably entered under the 'unenumerated' classification which provided information of numbers employed only. Furthermore, the inclusion of a large number of 'shoddy factories' in Lancashire from 1867/8 throws serious doubt on the reliability of the returns for this category, an error tacitly admitted in 1904.

'The particulars for shoddy factories in Lancashire and Cheshire given in the 1890 Returns were those of cotton waste, which is outside the scope of the present Return'.¹

As in the present study, the criterion determining the classification of mills in one of the three categories in 1904 was 'that of the principal material employed'², but it is interesting to note, no doubt to the great surprise of those in Bradford, the observation in the Return that

'... rag grinding is also returned as a process in worsted factories'³

A mistake which would seem to have arisen from the inclusion of Garnett, Droussette, or carding machines used to open tightly packed wool prior to subsequent processing in worsted yarn or cloth manufacture.

The Factory Returns are therefore of little assistance as either a means of accurately reflecting the growth of the shoddy and mungo manufacturing sector or in enabling a rough check to be made on

1. Return of Woollen, Worsted, and Shoddy Factories, and of Machinery, 1904, P.P. 1904 (293), LXXXVI, 1121.

2. *ibid.* The preparation of this return appears largely to have been the result of the efforts of the Bradford Chamber of Commerce. F.J. Hooper (1904) *op. cit.*, p. 4.

3. In the first edition of his 'Statistics' Hooper observed 'It is almost unnecessary to mention that shoddy is not used in the Bradford district' ('Preface'). The confusion was understandable, for Garnett-type machines were used by the larger shoddy manufacturers and woollen manufacturers for opening hard woven rags and wastes.

Hooper's estimates for the return years. It has, however, been possible to compare the collection of domestic rags on a per capita basis from Hooper's figures with those of several countries, including the United Kingdom for 1907 and 1912, where the respective figures relate almost wholly to domestically-produced rags. This is set out in Table III-I(g).

The figures for Denmark between 1869 and 1872 relate to total exports of woollen rags (exclusive of rags converted into shoddy and exported from Denmark) and suggest the high level of reclamation possible from a predominantly rural population. The per capita figures for Irish woollen rags, on the other hand, are for imports into the United Kingdom only and may possibly understate actual exports as they do not include consignments exported direct to other countries; evident, however, is the marked increase in weight collected in response to rising rag prices from 1933. Finally, the production censuses of the United States between 1880 and 1900 provide per capita weights of recovered wool produced almost exclusively from U.S. domestic sources. With the exception of 1880, when duties on imported foreign rags were low (re-exports of 4.2 million lbs. from the U.K. have been deducted), an insignificant proportion of recovered wool produced in the United States was manufactured from foreign rags - a supply constraint clearly reflected in the consistently lower per capita production figures.¹ Hooper's data (final column), adjusted for imports and exports of rags and recovered wool to indicate per capita shoddy and mungo production from United Kingdom woollen rags only, would thus appear to be reasonably plausible, particularly when compared with the very high per capita recovered wool production (also adjusted for imports and exports)

1. Congressional Document No. 413, op. cit., p. 18. The duty of 10 cents lb. on imported woollen rags was regarded as 'a practically prohibitory duty' with the exception of the Wilson tariff between 1895-97 when no duty applied.

from domestic woollen rags indicated by the 1907 and 1912 Censuses of Production.

Finally, Table III-I(h) indicates the gross weight of domestic woollen rags collected in the United Kingdom and calculated from column (c) in Table III-I(f). In these estimates a fibre reclamation yield of 75 per cent in converting rags to shoddy has been used for imported rags and one of 85 per cent for domestic rags. In 1828, Nussey claimed a 70 and 80 per cent yield respectively from imported and domestic woollen rags, a figure that had changed little by 1937 when the I.E.C. estimates were based on a 75/85 per cent yield on figures supplied by the Extract Wool and Merino company of Dewsbury.¹ Jubb, in 1860, estimated an overall 75 per cent yield, and his brother, shoddy manufacturer John Jubb, informed the 1867 Rivers Pollution committee that wastage was slightly less than 15 per cent on both imported and domestic rags.² Whilst other figures indicate a yield of between 77 and 90 per cent, the conversion rates chosen probably reflect the likely yield obtained for woollen rags for much of the period examined here.³

1. J. Bischoff (1842) op. cit., p. 181; W.T.W., 20.11.1937, p. 5. The lower yield on imported rags was most probably because of the higher moisture content gained in shipping.

2. S. Jubb (1860) op. cit., p. 22; Pollution of Rivers, op. cit., xxi.

3. The German Census of Production for 1907 indicated a fibre yield of 77.86 per cent. (W.T.W., 18.5.1912, p. 18). Wood, in 1931, assumed a 90 per cent yield from woollen rags. G.H. Wood, 'Essay on Changes in the Distribution of British Overseas Trade in Wool Textiles during the Past Ten Years' Weltwirtschaftliches Archiv, Bd. XXXIII, 1931, p. 509.

TABLE III-I(b)

Imports of woollen rags 1850-1860, and woollen rags, shoddy and mungo 1871-1902 on which the estimate of shoddy and mungo imports have been based.

YEAR	WOOLLEN RAGS (a) IMPORTED (TONS)	SHODDY AND MUNGO (TONS)		RATIO OF SHODDY TO RAGS, 1:
Av. 1850-				
54	1,945	2,431(+25%)		1.0
Av. 1855-				
59	2,750	6,875(+25%)		0.6
1860	5,934	7,417(+25%)		1.1
	<u>WOOLLEN RAGS, SHODDY and MUNGO IMPORTED</u>		<u>NET IMPORT OF WOOLLEN RAGS</u>	
1871	24,219	12,170	12,049	0.99
2	29,302	13,566	15,736	1.16
3	24,897	10,685	14,212	1.33
4	25,981	10,392	15,589	1.50
5	25,415	9,483	15,932	1.68
6	28,847	10,339	18,508	1.79
7	33,408	11,520	21,888	1.90
8	32,376	10,756	21,620	2.01
9	33,309	10,676	21,623	2.12
1880	41,256	12,773	28,483	2.23
1	35,265	8,201	27,064	3.30
2	37,511	6,985	30,526	4.37
3	35,767	5,554	30,213	5.44
4	31,022	4,131	26,891	6.51
5	32,642	3,809	28,833	7.57
6	30,526	3,407	27,119	7.96
7	31,670	3,387	28,283	8.35
8	31,643	3,249	28,394	8.74
9	31,335	3,093	28,242	9.13
1890	34,659	3,292	31,367	9.53
1	37,037	3,286	33,751	10.27
2	25,232	2,101	23,131	11.01
3	32,986	2,587	30,399	11.75
4	31,117	2,307	28,810	12.49
5	37,616	2,642	34,974	13.24
6	36,687	2,376	34,311	14.44
7	33,259	1,999	31,260	15.64
8	30,152	1,690	28,462	16.84
9	32,390	1,701	30,689	18.04
1900	30,695	1,517	29,178	19.24
1	30,786	1,436	29,350	20.44
2	33,156	1,464	31,692	21.64

Source: Column (a) 1850-1860, P.R.O., CUST.5, 7-70 and 71.
1871-1902, Trade, Navigation and Commerce,
Annual Accounts.

TABLE III-I(c)

United Kingdom imports of shoddy and mungo (estimated
1825-1860, 1871-1902), 1825-1939.

YEAR	WEIGHT(lbs)	VALUE(£)	YEAR	WEIGHT(lbs)	VALUE(£)
Av.1825-29	50,000	-	1894	5,200,000	-
Av.1830-34	100,000	-	5	5,900,000	-
Av.1835-39	150,000	-	6	5,300,000	-
Av.1840-44	500,000	-	7	4,500,000	-
Av.1845-49	2,000,000	-	8	3,800,000	-
Av.1850-54	5,400,000	-	9	3,800,000	-
Av.1855-59	15,400,000	-	1900	3,400,000	-
1860	16,600,000	-	1	3,200,000	-
1	17,028,480	283,791	2	3,300,000	-
2	20,097,280	334,938	3	3,002,302	27,589
3	22,099,840	405,487	4	3,542,628	33,014
4	22,482,880	493,611	5	3,815,467	36,066
5	20,867,840	435,829	6	2,786,097	41,827
6	22,843,520	399,763	7	3,306,562	44,126
7	21,224,000	279,721	8	3,041,289	44,876
8	21,797,440	226,309	9	4,512,128	66,495
9	24,192,000	243,010	1910	6,837,114	97,280
1870	21,224,000	239,394	1	5,456,819	80,363
1	27,300,000	-	2	2,901,798	41,286
2	30,400,000	-	3	3,724,973	53,841
3	23,900,000	-	4	6,256,940	90,153
4	23,300,000	-	5	3,569,596	56,415
5	21,200,000	-	6	3,138,034	95,202
6	23,200,000	-	7	1,019,697	36,469
7	25,800,000	-	8	1,203,741	54,132
8	24,100,000	-	1919	888,048	38,155
9	23,900,000	-	1920	1,817,984	86,849
1880	28,600,000	-	1	271,600	6,180
1	18,400,000	-	2	2,960,720	55,598
2	15,600,000	-	3	4,122,048	73,256
3	12,400,000	-	4	3,396,288	61,168
4	9,300,000	-	5	1,247,344	24,116
5	8,500,000	-	6	2,200,912	31,064
6	7,600,000	-	7	1,399,888	30,171
7	7,600,000	-	8	1,324,400	24,483
8	7,300,000	-	9	763,392	17,701
9	6,900,000	-	1930	420,560	9,454
1890	7,400,000	-	1	641,760	10,561
1	7,400,000	-	2	107,296	1,795
2	4,700,000	-	3	54,432	1,080
3	5,800,000	-	4	10,080	352
			5	336	26
			1936-39	NIL	

Source:- 1825-34, J. Bischoff (1842) op.cit., p. 181; F. Fenton, T.M.
15.7.1881, p.252.
1835-60, estimated from H.C.B. of E., loc. cit.
1861-70, Trade, Navigation and Commerce, Annual Accounts.
1871-1902, estimated from H.C.B. of E. and ibid.
1903-35, Annual Statement of the Trade of the U.K.

TABLE III-I(d).

Contemporary estimates of production of shoddy, mungo, (S)
or consumption of woollen rags (R).

YEAR	SOURCE/AUTHOR	NOTES	WEIGHT ('000s lbs.)	
1828	J. Nussey (Select Committee) ¹	9,000 packs p.a.	2,160	S
1858	E. Baines ²	Shoddy 30,000,000) Mungo 15,000,000)	45,000	S
1858	S. Jubb (1860) ³	51,840,000 lbs rags mfd. into Shoddy 25,920,000) Mungo 12,960,000) 38,880,000) Imported (approx.) 22,400,000)	61,380	S
1859/60	A. Ure ⁴		50,000	S
1862	<u>Reports of the Inspectors of Factories</u> ⁵		109,130	S
1862	Jury of the Internatl. Exhibition, Crystal Palace ⁶	U.K. mfd. 40,000,000) Imported 25,000,000)	65,000	S
1864	<u>Pollution of Rivers Report</u> ⁷	U.K. mfd. 52,000,000) Imported 22,482,000)	74,483	S
1865	<u>Chamber's Encyclopaedia</u> ⁸	U.K. mfd. 52,000,000) Imported 22,000,000) 'Extract' 5,000,000)	79,000	S
1867	<u>'All the Year Round'</u> ⁹		100,000	S
1873	S. Jubb (1873) ¹⁰	Shoddy 40,000,000) Mungo 20,000,000)	60,000	S
1879	<u>The Textile Manufacturer</u> ¹¹	(includes imported mungo)	100,000	S
1879/80	F. Fenton ¹²	Domestic and foreign rags to Dewsbury and Batley.	153,216	R
1883	P.L. Simmonds ¹³	U.K. mfd.	40,000	S
1883/84	W.S.B. McLaren ¹⁴		125,000	S
1886	W. Smith ¹⁵	(includes 'imported material') 'more than'	60,000	S
1891/92	Dewsbury Chamber of Commerce ¹⁶		116,480	R

cont.

TABLE III-I(d). Cont.

YEAR	SOURCE/AUTHOR	NOTES	WEIGHT ('000s lbs.)
1903	C. Ogden and P. Macaulay ¹⁷		150,000 S
Av. 1909 -1913	D. Zimmern ¹⁸		225,000 S
1913	<u>Waste Trade World</u> ¹⁹		200,000 R
1916/17	<u>Waste Trade World</u> ²⁰		116,480 R
1918/19	<u>The Statist</u> ²¹		200,000 S
1919/20	<u>Wool Year Book</u> ²²		174,720 R

1. J. Bischoff (1842) op. cit., p. 180. Nussey's calculation is based upon an estimate of the number of rag machines (not stated), the number of pieces made, the amount of shoddy consumed in making cloth in his mill, and the number of carding and scribbling machines employed in the trade. Cook thought that 1/7th or 1/8th of the rags used were imported. Select Committee, PP 1828 (515) VIII, 549.
2. E. Baines, op. cit., p. 103. He notes that this estimate is 'below (one) furnished me by one of the most experienced and largest dealers in the article, and supported by the judgement of two of the principal manufacturers of Batley'.
3. S. Jubb (1860) op. cit., p. 22.
4. A. Ure, The Philosophy of Manufacturers (1861) p. 753. Ure states '... ragwool is now utilised to the extent of at least 50,000,000 lbs. annually (equal to more than one third of our yearly importations of colonial and foreign wools)'.
5. Reports of the Inspectors of Factories, PP. 1863 (3076) XVIII, 267. Baker estimated that total consumption of all wool, waste, hair, shoddy and mungo in 1862 as 327,391, 334 lbs., of which 'it has been estimated to me as one third' was 'remanufactured wool'. This figure included noils, brokes, and other wool wastes which were, strictly speaking, not remanufactured materials.
6. C. Tomlinson, The Useful Arts and Manufactures of Great Britain (ca.1862), p. 59.
7. Third Report of the Commissioners appointed to enquire into ... the Pollution of Rivers. 1867 (3850) XXXIII, 248. Estimate supplied by Jacob Behrens.
8. Chambers' Encyclopaedia (1868), X, p. 264. Although stated as estimated for 1865, this figure was probably based on the previous estimate by Behrens, but includes in addition, a figure for 'extract' ragwool.
9. All the Year Round, VIII, 27.7.1872, p. 247. Writing in 1872, the journal observed that 'five years ago it was estimated that a hundred million pounds of ... rag wool were worked-up annually ... and now the quantity must be much more. About 4/5 is home produce, the rest imported...'
10. S. Jubb (1873), Huddersfield Examiner 27.2.1873, p. 2. - from a paper read to the British Association meeting at Bradford. Jubb stated that 'The quantity of shoddy used in the trade was estimated roughly at 40,000,000 lbs.; that of mungo 20,000,000 lbs.'
11. T.M., 15.12.1879, p. 428, '... we now manufacture more than 100,000,000 lbs. of rags and imported mungo'.
12. T.M., 15.8.1881, p. 288. Fenton estimated the weight of rags entering Dewsbury and Batley per annum from observations of railway and canal traffic 'during a given time'. This figure would seem more realistic than an estimate of 805,013,582 lbs. of domestic rags collected in 1879/80 which he later suggests.
13. P.L. Simmonds, in the Journal of Fabrics and Textile Industries 12.1.1883, p. 4. (from a paper read to the Royal Society of Arts).
14. W.S.B. McLaren, Spinning Woollen and Worsted (1884), p.187. 'It is said that 125,000,000 lbs. of shoddy, mungo, etc., are manufactured into cloth every year' in England alone'.

15. W. Smith, Morley, Ancient and Modern (1886), p. 305. '... there would be used in England, annually, more than sixty-million pounds of shoddy and mungo'.
16. D.R., 22.10.1892. The Dewsbury Chamber of Commerce, in a letter to the L.G.B., stated that 'with some hundreds of rag machines in full work the consumption of woollen and linsey rags is far above 1,000 tons a week'.
17. C. Ogden and P.J. Macaulay, Gain or Loss - under Preference, Protection or Retaliation. (Bradford 1903), p. 21. They estimated the quantity of U.K. produced ragwool 'roundly' at 150,000,000 lbs. per annum.
18. D.M. Zimmern, loc. cit., p. 12. 'In the five years preceding the War, the annual U.K. consumption (of woollen rags and shoddy) was estimated at 225 million lbs....'.
19. W.T.W., 18.1.1913. '... more than 200 million lbs. of rags used in the Dewsbury district'.
20. W.T.W., 5.2.1927. 'Before a Royal Commission held during the War, it was proved at that period 1,000 tons (of rags) were consumed each week in Britain...'.
21. The Statist, 7.6.1919. Total U.K. consumption of shoddy and mungo was '... estimated at more than 200 million lbs. per annum'.
22. Wool Year Book (Manchester 1921), op. cit., p. 71. 'The rag market normally consumes about 1,000 tons of foreign rags weekly, and probably more than 500 tons weekly of rags of English production'.

TABLE III-I(e)

Census of Production figures and estimates of the
Imperial Economic Committee of production of shoddy
and mungo in the United Kingdom.

YEAR	SOURCE	WEIGHT('000s lbs)
1907	Census of Production	221,000
1912	Census of Production	204,000
1924(i)	Census of Production	170,000
1924		
(ii)	Census of Production	154,993
1928	Imperial Economic Committee	110,000
1930	Census of Production	90,617
1931	Imperial Economic Committee	98,000
1932	Imperial Economic Committee	99,000
1933	Census of Production	117,773
1934	Census of Production	120,258
1935	Census of Production	119,869
1936	Imperial Economic Committee	117,000
1937	Census of Production	135,833

SOURCE - 1907-1924(i) Final Report on the Third Census of Production of the United Kingdom, 1924, I, p. 78.

1924(ii), 1930, Final Report of the Fourth Census of Production, 1930, p. 78.

1928, 1931-32, 1936, Waste Trade World, 20.11.1937, p. 5, 19.11.1938, p. 7.

1933-35, Final Report of the Fifth Census of Production, 1935, p. 66.

1937, Final Report on the Census of Production for 1948, p. 6.

TABLE III-I(f)

Estimate of (a) United Kingdom consumption of shoddy and mungo, (b) production of shoddy and mungo from domestic and imported woollen rags, and (c) from domestic woollen rags only, 1820-1939.('000s lbs.).

YEAR	(a)	(b)	(c)	YEAR	(a)	(b)	(c)
Av.1820-24	1,000	1,000	800	1897	130,000	139,795	88,941
Av.1825-29	2,500	2,500	2,200	8	125,000	134,664	88,395
Av.1830-34	7,000	7,000	6,000	9	125,000	134,890	84,493
Av.1835-39	10,000	9,850	8,250	1900	130,000	139,540	91,652
Av.1840-44	10,000	9,500	7,600	1	135,000	142,528	93,680
Av.1845-49	20,000	18,000	16,700	2	140,000	146,504	94,001
Av.1850-54	30,000	24,600	21,300	3	140,000	149,273	98,460
Av.1855-59	52,000	36,600	32,200	4	180,000	184,248	119,894
Av.1860-64	66,000	46,000	37,879	5	180,000	189,186	131,244
1865	79,000	65,824	56,977	6	190,000	202,848	137,301
6	83,000	66,909	57,842	7	210,000	221,000	150,358
7	71,000	53,146	44,665	8	180,000	185,565	123,954
8	75,000	55,580	44,863	9	205,000	208,734	136,427
9	74,000	53,855	44,007	1910	226,000	231,120	143,520
1870	75,000	58,467	45,691	1	210,000	215,965	129,354
1	85,000	66,106	45,929	2	193,459	204,000	120,904
2	95,000	72,629	46,319	3	205,000	214,731	126,613
3	95,000	75,744	52,016	4	190,000	192,411	125,142
4	100,000	84,226	58,063	5	200,000	201,099	163,428
5	100,000	90,184	64,258	6	210,000	213,231	183,727
6	100,000	83,285	54,807	Av.			
7	105,000	87,994	57,521	1917			
8	105,000	92,633	60,301	-19	135,300	138,735	105,545
9	110,000	97,528	66,685	1920	108,500	115,550	68,880
1880	140,000	124,357	83,254	1	50,800	53,550	44,579
1	120,000	116,375	75,114	2	64,000	68,908	38,314
2	125,000	124,085	77,759	3	78,700	139,131	101,571
3	120,000	119,795	85,073	4	159,600	170,000	105,787
4	110,000	113,478	85,740	5	112,000	120,584	66,955
5	105,000	108,555	61,954	6	90,400	94,541	52,030
6	100,000	108,472	63,710	7	72,100	78,119	44,094
7	100,000	108,461	61,994	8	103,000	110,000	76,689
8	100,000	111,565	64,517	9	94,900	100,950	61,930
9	100,000	115,603	68,684	1930	86,877	90,617	56,101
1890	120,000	128,696	76,210	1	95,000	98,000	63,506
1	130,000	136,403	79,869	2	95,000	99,000	81,053
2	100,000	109,533	71,298	3	107,978	117,773	93,576
3	120,000	130,993	81,186	4	108,341	120,258	97,232
4	120,000	131,029	83,228	5	110,630	119,869	102,274
5	140,000	149,679	96,038	6	107,957	117,000	86,790
6	140,000	149,614	94,389	7	127,078	135,833	94,213
				8	130,000	134,101	110,902
				1939	135,000	139,895	115,318

Note:- Column(a) based on F.J. Hooper, op. cit., and other estimates (Tables III-I(d), III-I(e)). 1938, 1939 World Wool Digest, II, 6.9.1951, p. 11.

Column (b) is (a) less imported shoddy and mungo (Trade and Navigation accounts 1861-1870, and estimates 1871-1902) plus exported shoddy, mungo, and flecks. (Tables III-I(c) and IV-I, p.639).

Note: cont.

Column (c) is (b) less net imports of foreign woollen rags (Tables III-I (b), II(a,c,), III(a)) adjusted to show a 75 per cent fibre reclamation yield (1820-34 indicates rag imports of $\frac{1}{8}$ th of total used. Nussey in Bischoff, op. cit., p. 180.).

TABLE III-I(g)

Weight of shoddy and mungo or woollen rags produced annually
per capita from domestic sources only.

PERIOD OR YEAR(S)	COUNTRY	RAGS(R) OR SHODDY(S)	WEIGHT PER CAPITA(lbs)	HOOPER (YEAR)	WEIGHT PER CAPITA FROM COL.(c) Table III-I(f) (lbs)
Av. 1869-72	DENMARK	R	2.23	1865 1870	1.91 1.46
1880	U.S.A.	S	0.95	1875	1.96
1890	U.S.A.	S	0.98	1880	2.41
1900	U.S.A.	S	0.99	1885 1890	1.72 2.03
1907	U.K.	S	3.53	1895	2.44
1912	U.K.	S	2.79	1900	2.23
Av. 1924-33	REPUBLIC OF IRELAND	R	0.60		
Av. 1934-40	REPUBLIC OF IRELAND	R	1.36		

Source Denmark - Reports respecting the Export Duty on Rags in Foreign Countries, PP, 1874 (C.994), LXVIII, 473.
Trade, Navigation and Commerce, Annual Accounts

U.S.A. - from the Tenth, Eleventh and Twelfth Census of Woollen Manufactures, Congressional Document No. 413, 'Shoddy vs. Pure Wool', (Washington 1902), pp.13 and 15.
Trade, Navigation and Commerce, op. cit.

U.K. - Final Report on the Third Census of Production (1924) op. cit., p. 78.
Annual Statements of the Trade of the U.K. (The per capita figures include an 85 per cent yield for domestic rags exported. This category was not enumerated separately prior to 1901)

Republic of Ireland -

Trade, Navigation and Commerce, op. cit.

Population figures from :- B.R. Mitchell, European Historical Statistics, 1750-1950 (1975).
Department of Commerce House Document No. 93-78.
Historical Statistics of the United States (Washington, 1975).
B.R. Mitchell and P. Deane, Abstract of British Historical Statistics (Cambridge 1962).
(England, Wales, Scotland and Ireland).

TABLE III-I(h)

Estimated gross weight of domestic woollen rags collected
for consumption in the United Kingdom, 1820-1939 (tons weight).

YEAR	TONS	YEAR	TONS	YEAR	TONS	YEAR	TONS
Av. 1820-24	410	1881	38,563	1906	70,489	1933	48,041
Av. 1825-29	1,129	2	39,921	7	77,193	4	49,918
Av. 1830-34	3,080	3	43,676	8	63,637	5	52,507
Av. 1835-39	4,235	4	44,018	9	70,041	6	44,557
Av. 1840-44	3,902	5	31,807	1910	73,682	7	48,368
Av. 1845-49	8,574	6	32,708	1	66,409	8	56,936
Av. 1850-54	10,935	7	31,827	2	62,071	1939	59,203
Av. 1855-59	16,531	8	33,123	3	65,002		
Av. 1860-64	19,447	9	35,262	4	64,247		
1865	29,252	1890	39,126	5	83,903		
6	29,696	1	41,004	6	94,324		
7	22,931	2	36,604	Av. 1917			
				-19	54,186		
8	23,032	3	41,680	1920	35,362		
9	22,593	4	42,729	1	22,886		
1870	23,457	5	49,305	2	19,670		
1	23,580	6	48,458	3	52,146		
2	23,780	7	45,662	4	54,310		
3	26,705	8	45,381	5	34,374		
4	29,809	9	43,378	6	26,712		
5	32,990	1900	47,053	7	22,637		
6	28,137	1	48,095	8	39,372		
7	29,531	2	48,259	9	31,794		
8	30,958	3	50,549	1930	28,818		
9	34,236	4	61,553	1	32,604		
1880	42,742	5	67,380	2	41,612		

Source - Table III-I(f), column (c), adjusted upwards by 15 per cent to give gross weight.

TABLE III-II(a)

United Kingdom imports of Woollen Rags
1819-1850, showing country from which
shipped. (TONS WEIGHT)

Source:- (i) 1819-1822
An Account of Woollen Rags Imported into
Great Britain, P.P. 1823 (222), XIII, 669.
(ii) 1823-1850
Customs (Import) Ledgers. P.R.O. CUST. 5.

COUNTRY	1819 ¹	1820	1821	1822	1823	1824	1825	1826	1827	1828	1829	1830	1831	1832	1833	1834	1835	1836	1837	1838	1839	1840
GERMANY - HANSEATIC TOWNS	116	134	186	151	348	340	585	404	297	402	224	326	169	490	382	467	379	360	634	732	985	813
DENMARK	-	-	-	-	-	-	31	-	-	22	-	-	-	-	44	60	54	150	331	161	197	145
ITALY	-	-	-	-	-	-	-	-	-	12	-	-	-	-	-	10	-	-	-	-	-	-
OTHER ²	-	-	-	-	3	2	1	21	24	2	40	86	1	10	44	15	28	378	118	163	81	94
TOTAL	116	134	186	151	351	342	617	425	321	438	264	412	170	500	470	552	461	888	1,083	1,056	1,263	1,052

Note: 1. Six months to 5th January 1820

2. Includes shipments from East Indies, Russia, Sweden, Portugal, British West Indies, and Holland.

1841 1842 1843 1844 1845 1846 1847 1848 1849 1850

GERMANY - HANSEATIC TOWNS	728	487	841	704	721	515	749	274	668	2,763
DENMARK	103	177	192	130	81	221	-	25	34	47
BELGIUM	314	341	172	172	78	192	78	93	-	-
OTHER	55	125	98	135	119	46	18	-	10	35
TOTAL	886	1,103	1,472	1,141	999	974	845	392	712	2,845

TABLE III-II(b)

United Kingdom

Imports of woollen rags (1851-1870) including
shoddy and mungo (1871-1902) showing country from
which shipped, 1851-1902 (TONS WEIGHT)

- Source: (i) 1851-1860
Customs (Import) Ledgers, P.R.O. CUST. 5.
- (ii) 1861-1900
Trade, Navigation and Commerce, Annual Accounts.
- (iii) 1900-1902
Annual Statements of the Trade of the
United Kingdom.

Note:- (i) Separate totals for the importation of woollen rags are available between 1851-1870. From this date the Board of Trade aggregated woollen rags, shoddy and mungo: the total imports of shoddy and mungo 1861-1870 are included here to provide comparability for the period 1861-1902.

(ii) Average values have been calculated in £ and are indicated thus (0.00) with the exception of 1861-1870 when the values in £.s.d. are available.

(iii) Values 1871-1902 reflect the higher price of shoddy and mungo included and are therefore not strictly comparable with the figures for 1851-1870.

COUNTRY	1851	1852	1853	1854	1855	1856	1857	1858	1859	1860
GERMANY	1,318	1,216	1,750	(8) 1,753	(8) 1,389	(10) 1,343	(12) 1,066	(15) 1,156	(15) 951	(15) 1,085
ITALY	-	57	43	(5) 105	(5) 269	(5) 215	(5) 328	(5) 328	(5) 537	(29.5) 348
U.S.A.	-	33	35	(5) 138	(5) 304	(5) 335	(5) 285	(5) 595	(5) 823	(42.75) 1,080
TURKISH DOM.	-	-	-	-	-	(10) 52	(12) 150	(15) 116	(15) 217	(15) 320
AUSTRALASIA	-	-	-	-	-	(5) 139	(5) 176	(5) 249	(5) 191	-
FRANCE	-	-	-	-	-	-	-	-	(5) 43	(15) 1,604
OTHER ¹	63	89	28	(5) 253	(5) 378	(5) 259	(5) 307	(5) 550	(5) 999	(15) 1,497
TOTALS	1,381	1,395	1,856	2,249	2,340	2,343	2,312	2,994	3,761	5,934

Note: () - AVERAGE PRICE PER TON £.

1. Includes shipments from Belgium, Holland, Syria, Palestine, Egypt, India, and South Africa.

	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870
GERMANY	(19.17.6) 542	(20.13.4) 723	(23.10.3) 912	(24.2.8) 1,288	(23.6.6) 1,054	(22.14.7) 942	(20.13.0) 640	(19.4.0) 653	(19.0.0) 589	(18.10.0) 436
ITALY	(26) 299	-	-	(25.14.4) 134	-	(23.16.8) 254	(23.0.0) 358	(24.0.0) 170	-	(23.10.0) 149
FRANCE	(14.2.6) 836	(30.0.0) 1,711	(30.19.8) 2,638	(30.5.1) 2,106	(28.8.0) 2,076	(26.10.10) 2,034	(26.0.0) 2,161	(25.4.0) 3,348	(24.2.0) 3,447	(22.10.0) 4,396
HOLLAND	(15.0.0) 235	(20.14.4) 273	(23.12.3) 629	(24.2.2) 659	(23.5.2) 785	(22.14.4) 685	(20.9.0) 626	(19.4.0) 698	(19.0.0) 881	(18.18.0) 1,037
BELGIUM	(15) 181	(20.11.10) 194	(23.13.0) 640	(24.3.6) 983	(23.4.1) 863	(22.15.11) 948	(20.9.0) 776	(19.4.0) 1,000	(19.0.0) 449	(18.8.0) 1,201
TURKEY	(6.4.9) 326	-	(11.18.1) 279	-	-	-	-	-	-	-
SPAIN	(23.7.9) 263	(30.0.0) 289	-	-	-	-	-	-	-	-
OTHER	(17.15.0) 464	(15.17.2) 946	(19.7.1) 458	(22.14.9) 435	(23.1.0) 490	(21.18.7) 736	(21.19.0) 498	(19.8.6) 322	(20.4.0) 532	(17.13.0) 519
RAGS	3,146	4,136	6,556	5,605	5,268	5,599	5,059	6,191	5,898	7,738
SHODDY	7,507	8,972	9,866	10,037	9,316	10,198	9,485	9,731	10,801	9,475
TOTAL	10,653	13,108	15,422	15,642	14,584	15,797	14,544	15,922	16,699	17,213

Note:- see below.

Note:-

(i) Small shipments from the U.S.A. have been included in 'Other', but have high values, viz.

1861 70 tons @ £35.12/- per ton

1862 88 tons @ £36.6/- per ton

(ii) Two shipments from Russia included in 'Other'

1862 234 tons @ £18.16/- per ton

1863 53 tons @ £22.8.4 per ton

(iii) One shipment from Sweden included in 'Other'

1864 143 tons @ £24.3.1 per ton

(iv) Five shipments from Australia included in 'Other'

1865 145 tons @ £14 per ton

1866 258 tons @ £14.4.9 per ton

1867 192 tons @ £14.12/- per ton

1868 86 tons @ £15 per ton

1869 69 tons @ £15.6/- per ton

	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880
GERMANY	(30.14) 5,926	(23.60) 7,311	(21.05) 6,545	(18.65) 7,082	(23.09) 6,899	(21.01) 8,978	(19.91) 10,411	(19.86) 9,770	(18.64) 9,435	(21.00) 13,088
ITALY	(23.54) 439	(22.67) 866	(24.44) 674	(23.55) 384	(24.06) 360	-	-	-	-	-
U.S.A.	-	-	-	-	(21.81) 397	-	-	-	-	-
FRANCE	(13.06) 7,565	(12.81) 9,890	(13.13) 7,021	(16.27) 7,500	(18.87) 7,335	(17.50) 7,896	(17.25) 8,646	(18.30) 9,384	(16.56) 10,155	(16.26) 11,693
HOLLAND	(28.55) 3,593	(23.79) 3,916	(23.94) 3,474	(23.35) 2,575	(26.58) 3,309	(24.49) 3,117	(22.04) 3,321	(23.18) 3,709	(20.26) 4,019	(21.70) 4,766
BELGIUM	(18.86) 3,170	(17.08) 4,172	(22.04) 3,922	(30.84) 4,600	(31.74) 4,500	(34.08) 5,400	(36.09) 6,491	(37.19) 5,819	(27.33) 6,521	(22.33) 7,252
SPAIN	(19.24) 512	(22.00) 392	-	-	-	-	-	-	-	-
DENMARK	(17.06) 912	(18.90) 1,223	(20.13) 960	(21.76) 1,158	(21.88) 1,238	(24.11) 1,527	(23.08) 1,684	(19.69) 2,160	(17.96) 1,681	(24.89) 1,657
CHANNEL ISLANDS	(9.23) 1,496	(9.91) 1,023	(9.99) 1,006	(10.22) 729	-	-	-	-	-	-
OTHER	(13.85) 606	(17.90) 509	(18.87) 1,225	(19.06) 1,553	(19.20) 1,377	(18.78) 1,929	(10.66) 2,855	(18.50) 1,534	(17.40) 1,495	(17.31) 2,810
TOTAL	24,219	29,302	24,827	25,581	25,415	28,847	33,408	32,376	33,309	41,256

Note: Two shipments from Turkey included in 'Other'
1876 - 467 tons at £19.09 per ton
1877 - 766 tons at £20.21 per ton

	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890
GERMANY	(23.13) 10,904	(21.63) 10,846	(19.40) 10,382	(21.95) 8,368	(21.33) 6,841	(20.07) 7,093	(20.31) 6,348	(19.52) 6,776	(20.50) 6,156	(20.44) 8,382
ITALY	-	-	(27.11) 107	-	-	-	-	(24.24) 266	(20.69) 242	(20.69) 154
U. S. A.	-	-	-	(20.00) 209	(14.41) 1,045	(14.72) 137	(16.02) 173	-	(20.33) 122	-
FRANCE	(16.86) 9,735	(18.73) 11,767	(18.38) 10,153	(18.76) 7,357	(18.42) 9,460	(20.00) 10,369	(20.79) 12,085	(20.65) 12,604	(22.76) 12,665	(21.71) 11,181
HOLLAND	(21.58) 4,315	(19.01) 4,300	(19.59) 3,814	(19.03) 3,922	(18.33) 3,739	(20.30) 5,014	(19.33) 4,387	(19.26) 3,813	(19.23) 4,067	(19.18) 4,354
BELGIUM	(27.85) 5,868	(31.32) 6,159	(28.80) 6,818	(27.55) 7,053	(26.85) 7,078	(27.14) 4,133	(25.36) 4,717	(25.61) 4,615	(24.50) 4,197	(22.50) 5,780
DENMARK	(23.17) 1,743	(21.72) 1,858	(20.58) 2,737	(21.41) 2,561	(20.67) 2,803	(21.42) 2,267	(20.92) 2,102	(21.17) 1,535	(19.84) 1,536	(19.95) 2,333
NORWAY	(23.68) 512	(26.79) 439	(26.04) 520	(25.42) 446	(24.47) 311	(17.83) 352	(24.74) 432	(25.20) 475	(26.67) 387	(25.07) 463
TURKEY	(14.95) 721	(17.18) 611	(19.81) 471	(15.45) 350	(14.96) 298	(13.44) 206	(11.83) 301	(11.57) 410	(10.19) 588	(8.88) 447
AUSTRALASIA	(20.21) 202	(27.27) 214	(28.05) 248	(27.01) 280	(21.22) 313	(17.63) 305	(18.64) 336	(17.18) 266	(17.88) 299	(17.55) 335
EGYPT	-	-	(20.82) 104	-	(12.77) 258	-	(12.86) 201	(13.91) 227	(11.57) 604	(11.42) 618
SWEDEN	-	-	-	-	-	(26.21) 114	(23.10) 149	(19.64) 177	-	(18.49) 262
OTHER	(16.81) 1,265	(17.14) 1,317	(16.84) 413	(15.73) 476	(11.19) 196	(12.20) 536	(14.23) 439	(14.93) 479	(13.13) 472	(15.96) 350
TOTAL	35,265	37,511	35,767	31,022	32,642	30,526	31,670	31,643	31,335	34,659

	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900	1901	1902
GERMANY	(20.26) 11,060	(20.60) 7,516	(20.39) 7,497	(21.14) 7,993	(19.79) 11,714	(20.06) 10,341	(20.07) 9,443	(19.99) 8,763	(19.40) 10,207	(20.13) 8,462	(19.20) 7,586	(19.90) 7,888
ITALY	(19.55) 278	(16.86) 435	(19.62) 454	(20.00) 270	(19.28) 393	(19.21) 727	(19.59) 382	(18.57) 416	(18.83) 521	(19.58) 351	(20.24) 275	(19.95) 412
U.S.A.	-	-	-	-	(15.43) 491	(18.68) 524	(20.50) 162	(14.37) 123	(23.12) 194	-	(22.69) 172	-
FRANCE	(22.02) 10,898	(20.97) 5,818	(20.64) 9,918	(21.47) 9,257	(20.68) 10,302	(19.94) 9,350	(20.53) 10,433	(21.21) 9,019	(20.97) 8,598	(19.73) 8,122	(20.54) 8,658	(20.97) 10,310
HOLLAND	(19.09) 4,367	(19.93) 3,958	(20.06) 5,549	(20.22) 4,225	(19.11) 4,842	(15.72) 5,094	(16.71) 4,816	(17.12) 3,237	(15.68) 4,385	(17.08) 4,419	(17.36) 4,689	(16.14) 5,331
BELGIUM	(22.31) 5,579	(20.67) 2,646	(20.68) 4,237	(19.84) 4,220	(18.10) 5,320	(17.58) 5,860	(16.94) 4,046	(18.11) 4,635	(17.03) 4,889	(17.33) 4,477	(17.59) 4,806	(17.58) 5,340
DENMARK	(19.97) 2,231	(18.34) 2,193	(19.92) 2,483	(19.85) 2,762	(19.64) 2,270	(19.38) 1,999	(19.31) 1,503	(18.86) 1,259	(19.15) 1,127	(19.83) 1,708	(19.71) 1,312	(19.79) 1,247
NORWAY	(27.62) 432	(25.16) 427	(25.29) 359	(23.18) 383	(24.25) 407	(25.03) 503	(25.94) 330	(22.86) 196	(20.54) 372	(20.31) 263	(21.29) 300	(21.38) 343
TURKEY	(12.91) 402	(10.64) 382	(13.73) 398	(9.77) 262	(9.88) 432	(13.90) 212	(12.83) 164	-	(12.55) 109	(13.37) 166	(12.22) 149	(13.78) 100
AUSTRALASIA	(18.33) 311	(19.75) 273	(15.79) 441	(17.60) 278	(19.66) 244	(21.24) 405	(19.62) 361	(21.18) 384	(22.85) 448	(23.44) 324	(22.06) 319	(20.50) 352
EGYPT	(15.35) 263	(9.95) 527	(12.52) 454	(9.25) 353	(13.20) 474	(17.80) 769	(17.77) 660	(11.94) 909	(17.45) 502	(13.89) 391	(15.29) 171	(10.63) 142
SWEDEN	(17.43) 428	(19.90) 586	(19.95) 524	(19.90) 631	(18.24) 386	(18.36) 311	(18.73) 135	(18.50) 171	(19.70) 183	(18.68) 368	(20.48) 345	(18.16) 313
OTHER	(16.80) 788	(14.19) 471	(9.88) 672	(12.65) 483	(15.02) 341	(13.79) 592	(15.43) 823	(14.03) 1,040	(16.05) 854	(15.90) 1,644	(16.96) 1,120	(18.20) 1,378
TOTAL	37,037	25,232	32,986	31,117	37,616	36,687	33,258	30,152	32,390	30,695	29,902	33,156

TABLE III-II(c)

Imports of woollen rags into the U.K.,
1903-1939, showing value per ton per
country and country from which shipped.

Source: Annual Statements of the Trade of the U.K.

Notes:-

- (i) Data in the official tables have been converted to tons weight from,
 - (a) 1903-1907 - pounds weight.
 - (b) 1919-1939 - hundredweights.
- (ii) Average values have been calculated and are shown in £ and decimals thereof per ton and indicated thus (0.00).

WOOLLEN RAGS.

£ PER TON
TONS

	1903 ¹	1904	1905	1906	1907	1908	1909	1910
RUSSIA	(20.61) 383	(20.67) 512	(19.92) 561	(20.12) 1,197	(19.98) 1,366	(19.99) 1,394	(19.97) 2,208	(20.05) 2,286
SWEDEN	(18.67) 374	(18.80) 276	(18.47) 185	(19.42) 317	(19.89) 454	(19.90) 635	(19.45) 589	(20.08) 365
NORWAY	(19.81) 187	(19.40) 211	(21.78) 240	(20.56) 260	(19.79) 390	(19.02) 232	(17.57) 377	(18.79) 324
DENMARK	(20.19) 1,021	(19.61) 843	(20.09) 1,127	(20.75) 1,303	(20.16) 1,411	(19.45) 2,227	(19.42) 1,569	(19.76) 1,685
GERMANY	(19.90) 7,126	(19.73) 10,773	(18.44) 13,599	(21.99) 15,555	(22.60) 15,952	(20.74) 11,587	(19.49) 10,691	(19.02) 11,203
NETHERLANDS	(16.93) 5,333	(16.94) 4,929	(17.57) 4,541	(19.77) 4,863	(19.91) 5,068	(17.03) 4,372	(17.10) 4,246	(16.61) 3,831
BELGIUM	(17.98) 3,612	(17.19) 3,352	(16.96) 3,842	(17.48) 3,572	(17.47) 4,502	(17.47) 3,254	(19.03) 3,143	(19.57) 3,786
FRANCE	(20.20) 10,827	(18.74) 16,026	(18.60) 13,380	(20.99) 13,590	(20.91) 16,207	(21.10) 9,060	(21.70) 11,431	(21.66) 14,425
ITALY	(19.91) 281	(20.66) 402	(22.05) 486	(21.52) 346	(22.04) 315	(19.83) 325	(19.57) 321	(20.21) 403
TURKEY	-	(17.49) 128	(16.51) 173	(17.08) 453	(19.13) 354	(16.74) 256	(18.65) 304	(21.32) 673
U.S.A.	-	-	-	(15.78) 236	(15.57) 1,571	(15.81) 3,605	(17.43) 8,815	(18.12) 16,787
OTHER FGN.	(15.64) 647	(16.47) 655	(16.68) 471	(19.17) 484	(21.13) 450	(14.39) 342	(13.96) 422	(19.25) 641
AUSTRALIA	(19.16) 281	(22.97) 355	(23.99) 390	(23.92) 524	(24.21) 532	(25.23) 564	(24.74) 602	(25.31) 487
CANADA	(20.87) 351	(23.00) 394	(26.38) 228	(23.08) 510	(25.33) 434	(23.27) 1,014	(18.67) 1,488	(19.42) 1,879
OTHER BRITISH POSSESSIONS	(15.10) 219	(16.62) 87	(20.17) 115	(24.13) 141	(22.48) 153	(17.33) 192	(17.91) 208	(22.09) 169
TOTAL	30,641	38,943	39,338	43,351	49,159	39,059	46,414	58,944

615

1. Country from which shipped; 1904-1939, country from which consigned.

WOOLLEN RAGS.

£ PER TON
TONS.

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
RUSSIA	(20.36) 1,514	(20.06) 1,729	(20.02) 2,207	(20.11) 874	-	-	-	-	-	-
SWEDEN	(20.31) 395	(19.93) 500	(19.98) 476	(20.94) 285	-	-	-	-	-	(98.14) 202
NORWAY	(20.23) 245	(20.20) 327	(17.54) 181	-	-	-	-	-	(75.28) 270	(62.49) 358
DENMARK	(19.58) 1,680	(19.73) 1,440	(19.36) 1,827	(21.03) 1,275	(34.26) 595	(39.32) 383	(53.53) 244	-	(75.76) 448	(77.10) 513
GERMANY	(18.71) 10,313	(20.04) 14,722	(21.25) 14,946	(20.59) 7,084	-	-	-	-	-	(64.43) 651
NETHERLANDS	(16.04) 3,943	(16.97) 3,832	(18.77) 3,917	(23.64) 6,065	(29.36) 4,832	(44.22) 4,279	(54.63) 1,711	-	(44.61) 2,707	(83.17) 1,875
BELGIUM	(19.82) 3,370	(19.54) 3,005	(20.14) 2,989	(20.35) 2,409	(36.41) 266	-	-	-	(78.06) 1,962	(86.43) 2,642
FRANCE	(22.15) 11,892	(23.47) 7,870	(23.29) 10,111	(23.93) 7,178	(25.39) 5,594	(35.87) 6,164	(54.84) 7,921	(79.39) 6,475	(77.47) 14,320	(75.91) 11,711
ITALY	(20.43) 411	(20.23) 389	(20.00) 691	(21.69) 585	-	-	-	-	-	(120.34) 109
TURKEY	(23.50) 428	(22.91) 525	(22.76) 488	(23.82) 870	(34.76) 608	(47.80) 499	(49.50) 205	-	(74.86) 302	(63.28) 934
EGYPT	-	-	-	-	-	-	-	-	(64.07) 521	(47.95) 942
MOROCCO	-	-	-	-	(49.42) 440	(49.41) 304	(64.76) 389	(91.90) 1,417	(99.96) 571	(88.67) 260
U.S.A.	(18.92) 19,123	(15.43) 12,656	(15.89) 11,301	(17.93) 10,263	(25.35) 7,433	(48.31) 3,678	(66.60) 5,299	(60.50) 1,002	(92.41) 11,037	(109.30) 4,560
OTHER FGN.	(20.62) 738	(20.83) 873	(25.58) 975	(28.22) 1,073	(22.70) 739	(24.11) 725	-	(69.75) 178	(101.50) 314	(68.56) 1,634
AUSTRALIA	(27.74) 473	(30.78) 481	(31.59) 536	(29.85) 550	(41.14) 518	(61.58) 623	(78.63) 291	-	(107.42) 707	(137.04) 550
CANADA	(19.02) 1,673	(24.19) 1,278	(10.32) 1,941	(12.46) 1,439	(36.71) 912	(41.46) 948	(69.82) 977	(126.39) 169	(130.13) 1,096	(150.53) 656
OTHER BRITISH POSSESSIONS	(25.21) 140	(23.95) 239	(24.20) 207	(27.11) 221	(26.20) 586	(41.74) 739	(63.79) 791	(72.63) 578	(81.75) 729	(117.36) 695
TOTAL	56,338	49,886	52,793	40,177	22,423	17,700	17,837	9,696	34,984	28,292

WOOLLEN RAGS.	£ PER TON TONS.										
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930	
SOVIET UNION	-	-	(27.18) 425	(25.97) 445	(26.20) 2,290	(31.75) 1,302	(23.79) 312	(25.29) 791	(28.35) 2,639	(17.04) 4,970	
ESTONIA	-	-	-	-	(58.46) 557	(36.95) 198	-	-	-	-	
LATVIA	-	-	-	-	(28.36) 548	(24.58) 364	(32.00) 452	-	(35.05) 174	-	
SWEDEN	-	(39.98) 142	(40.96) 169	(49.58) 729	(45.47) 627	(46.58) 557	(43.22) 351	(42.02) 361	(41.94) 404	(38.89) 152	
NORWAY	(41.84) 103	(38.47) 324	(32.88) 358	(31.42) 477	(30.85) 461	(32.20) 370	(30.11) 310	(29.14) 267	(29.73) 252	(28.82) 136	
DENMARK	(35.75) 311	(35.84) 914	(36.19) 606	(42.39) 1,742	(43.58) 1,670	(43.54) 1,178	(40.58) 1,061	(39.49) 1,132	(39.17) 866	(37.11) 588	
GERMANY	(29.09) 116	(24.00) 1,021	(29.13) 785	(38.33) 2,661	(39.57) 5,567	(32.70) 6,137	(34.12) 3,911	(33.97) 4,230	(33.03) 5,034	(31.53) 3,540	
NETHERLANDS	(31.94) 1,005	(31.43) 3,621	(31.42) 3,679	(32.12) 5,499	(33.72) 3,907	(33.39) 2,870	(30.39) 2,025	(31.32) 2,274	(33.12) 2,269	(28.88) 2,242	
BELGIUM	(30.80) 776	(29.95) 2,420	(32.33) 3,842	(34.25) 5,014	(41.69) 2,777	(33.92) 2,457	(36.36) 1,837	(36.26) 1,990	(35.24) 2,194	(29.60) 2,127	
FRANCE	(52.34) 2,139	(41.42) 5,427	(35.74) 7,840	(37.98) 11,114	(47.60) 7,740	(47.67) 5,567	(48.04) 4,836	(41.90) 3,958	(37.55) 4,306	(34.64) 3,191	
ITALY	-	(32.33) 157	(46.92) 157	(44.62) 400	(52.65) 274	(41.15) 192	(37.43) 745	(42.28) 299	(47.16) 247	(45.23) 124	
AUSTRIA	-	-	-	-	(44.01) 272	(35.13) 247	(38.52) 261	-	-	-	
TURKEY	-	-	(35.02) 273	(37.08) 515	(48.63) 168	(47.99) 141	(52.25) 125	-	(66.54) 324	-	
EGYPT	-	(33.22) 116	(37.90) 164	(34.28) 261	(45.30) 240	-	(33.68) 100	-	(41.58) 117	(30.32) 157	
JAPAN	-	-	-	-	-	(42.30) 222	(43.27) 134	(36.50) 100	-	-	
U.S.A.	(73.48) 167	(40.51) 2,371	(38.08) 2,318	(40.68) 4,132	(46.04) 1,926	(45.05) 1,555	(40.70) 1,223	(42.20) 1,413	(42.73) 1,205	(32.71) 836	
OTHER FGN.	(54.17) 100	(27.92) 514	(38.66) 656	(42.64) 2,382	(45.42) 850	(45.87) 250	(41.74) 157	(45.69) 481	(49.33) 283	(34.46) 288	
IRISH FREE STATE	-	-	(29.24) 346	(31.49) 1,103	(35.83) 1,061	(30.51) 776	(28.64) 854	(30.92) 920	(29.66) 868	(21.38) 614	
BRITISH INDIA	(66.90) 100	-	-	(47.94) 172	(75.24) 138	(63.88) 106	(58.31) 139	(52.00) 105	-	-	
AUSTRALIA/NZ	(82.68) 162	(55.46) 416	(65.60) 414	(80.35) 349	(85.29) 371	(67.39) 600	(71.70) 626	(76.37) 600	(71.81) 791	(51.23) 776	
CANADA	(65.14) 352	(50.02) 705	(45.48) 637	(48.30) 1,139	(63.46) 535	(59.79) 425	(45.37) 887	(45.72) 990	(55.91) 1,110	(43.55) 798	
OTHER BRITISH COUNTRIES	(25.95) 97	(29.12) 185	(36.09) 209	(35.01) 176	(35.98) 170	(32.96) 119	(28.21) 115	(30.02) 77	(46.48) 227	(35.44) 198	
TOTAL	5,428	18,333	22,878	38,310	32,149	25,633	20,461	19,988	23,310	20,737	

WOOLLEN RAGS £ PER TON
TONS.

	1931	1932	1933	1934	1935	1936	1937	1938	1939
SOVIET UNION	(12.81) 1,637	(6.90) 469	-	-	-	-	-	-	-
SWEDEN	(35.54) 218	-	(32.89) 114	(27.62) 164	(34.23) 132	(29.89) 296	(51.38) 438	(44.58) 174	(39.08) 169
NORWAY	(27.73) 135	-	-	(26.36) 109	(29.78) 134	(30.17) 286	(46.84) 376	(47.53) 241	(49.99) 107
DENMARK	(37.26) 597	(35.14) 312	(33.07) 439	(25.76) 222	(27.14) 134	(27.12) 460	(34.93) 839	(29.08) 354	(24.25) 331
GERMANY	(28.53) 3,258	(18.57) 1,774	(24.53) 1,783	(28.62) 920	(33.20) 465	(28.73) 350	(35.93) 221	-	-
NETHERLANDS	(21.46) 3,533	(13.81) 2,368	(11.96) 3,804	(12.29) 3,013	(15.09) 1,953	(26.63) 3,271	(30.10) 4,470	(15.33) 2,171	(27.12) 2,344
BELGIUM	(22.32) 3,472	(24.82) 1,801	(25.55) 2,585	(27.89) 2,287	(28.90) 1,871	(30.81) 4,353	(43.33) 4,262	(41.93) 1,473	(32.04) 2,306
FRANCE	(25.75) 5,459	(27.74) 2,051	(29.95) 3,041	(25.97) 3,276	(22.73) 1,859	(29.54) 3,880	(36.64) 5,860	(40.22) 3,416	(41.32) 3,025
EGYPT	-	(33.36) 119	-	(33.62) 155	(31.81) 183	(37.24) 261	(47.00) 294	(41.65) 190	(39.72) 240
U. S. A.	(29.18) 647	(20.56) 414	(19.09) 623	(20.06) 799	(20.89) 560	(28.14) 741	(34.36) 1,299	(35.95) 1,887	(46.38) 2,177
OTHER FGN. COUNTRIES	(27.72) 299	(29.93) 245	(18.47) 360	(31.47) 375	(24.76) 518	(25.53) 1,179	(36.12) 2,962	(27.51) 1,563	(34.81) 814
EIRE	(18.85) 455	(14.40) 478	(15.39) 809	(16.64) 1,482	(19.28) 1,541	(20.59) 1,781	(26.99) 1,989	(21.24) 1,391	(21.85) 1,809
BRITISH INDIA	-	-	-	(39.61) 151	(41.81) 150	(52.87) 128	(63.65) 158	(48.21) 144	(51.49) 193
AUSTRALIA/NZ	(38.56) 560	(36.84) 347	(47.67) 477	(56.01) 596	(60.93) 716	(63.21) 787	(79.21) 973	(66.29) 617	(57.23) 740
CANADA	(37.40) 598	(34.35) 325	(40.49) 328	(47.37) 141	(48.02) 243	(40.89) 126	(51.72) 476	(46.48) 188	(45.79) 239
OTHER BRITISH COUNTRIES	(27.21) 82	(24.59) 66	(26.58) 117	(32.45) 102	(22.97) 34	(21.84) 128	(23.26) 220	(21.07) 223	(13.52) 241
TOTAL	20,950	10,769	14,480	13,792	10,493	18,027	24,837	14,032	14,735

TABLE III-II(d)

United Kingdom imports of Shoddy and Mungo,
1861-1870, showing countries from which shipped
(TONS WEIGHT)

Source:- Trade, Navigation and Commerce,
Annual Accounts.

Note:- Values per lb. are from official mean
value of annual imports per ton.

COUNTRY	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870
GERMANY	2,101	2,495	3,321	3,092	3,822	3,753	2,880	3,514	4,088	3,835
ITALY	210	262	404	235	186	136	-	-	-	-
FRANCE	435	407	176	184	208	161	125	252	463	-
HOLLAND	1,490	1,706	2,198	2,022	1,705	1,863	2,061	1,963	2,386	1,569
BELGIUM	1,549	2,163	2,118	1,978	1,337	1,715	1,782	1,653	1,715	1,843
SPAIN	-	-	189	221	228	174	155	193	223	375
DENMARK	691	687	588	614	523	833	938	925	965	1,003
TURKEY	-	-	100	643	222	367	319	182	184	260
U.S.A.	788	743	399	669	573	860	838	839	302	-
OTHER	243	509	373	379	512	336	387	210	475	590
TOTAL	7,507	8,972	9,866	10,037	9,316	10,198	9,485	9,731	10,801	9,475
AVERAGE PRICE PER lb (d)	3.4 ^d	4 ^d	4.4 ^d	5.3 ^d	5.0 ^d	4.2 ^d	3.2 ^d	2.5 ^d	2.4 ^d	2.6 ^d

NOTE:- (i) Germany includes consignments from Austrian Territories, Hamburg, Bremen, and Prussia.

(ii) 'Other' includes consignments from Australia, Egypt, Argentina, Russia, and Sweden.

TABLE III-II(e)

Imports of Shoddy and Mungo into the U.K.,
1903-1933, showing countries
from which consigned.

Source: Annual Statements of the Trade of
the United Kingdom.

Notes:-

- (i) In order to present the data in a standardised form, the units of weight have been recalculated from the original returns into pounds (lbs) weight from hundredweights, 1919-1933.
- (ii) The value in pence (d.) per (lb) has been calculated from the gross value of annual consignments, country-by-country.

lbs. d. per lb.

	1903 ¹	1904	1905	1906	1907	1908	1909	1910
GERMANY	(2.90) 633,480	(2.71) 895,320	(2.46) 1,048,005	(3.51) 1,169,167	(3.56) 1,224,513	(4.12) 1,057,737	(4.20) 822,793	(4.33) 1,020,650
NETHERLANDS	(2.18) 634,310	(2.77) 115,602	(2.25) 99,662	(3.63) 62,856	(2.68) 64,784	(5.21) 46,706	(4.11) 58,440	(4.97) 177,416
BELGIUM	(2.25) 836,146	(2.26) 124,426	(2.40) 247,280	(2.82) 185,590	(4.54) 34,080	(4.82) 39,856	(3.52) 26,434	(3.18) 88,195
FRANCE	(2.17) 328,600	(1.74) 756,484	(2.00) 849,178	(3.38) 207,980	(3.23) 674,053	(3.07) 599,534	(2.89) 1,045,493	(2.65) 1,669,986
AUSTRIA-HUNGARY	-	(2.37) 972,710	(2.34) 850,218	(4.52) 811,070	(4.80) 414,228	(5.30) 440,762	(5.16) 378,836	(5.37) 334,464
PORTUGAL	-	-	-	-	(4.28) 672	(3.03) 40,365	(3.59) 310,587	(3.62) 213,236
U.S.A.	-	-	-	(2.4) 11,200	(1.41) 292,506	(1.96) 424,363	(3.13) 1,185,282	(3.30) 1,999,771
OTHER FOREIGN	(1.50) 499,990	(1.84) 660,492	(2.10) 606,976	(2.36) 199,949	(2.15) 444,387	(2.19) 365,414	(3.47) 651,673	(3.11) 1,075,187
BRITISH POSSESSIONS	(.88) 69,776	(2.43) 17,594	(2.66) 114,148	(2.28) 138,285	(2.29) 157,339	(1.65) 26,552	(3.39) 32,590	(3.24) 258,209
TOTAL	3,002,302	3,542,628	3,815,467	2,786,097	3,306,562	3,041,289	4,512,128	6,837,114

1. Country from which shipped; 1904-1933, country from which consigned.

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
GERMANY	(4.26) 793,069	(4.14) 786,926	(3.79) 968,468	(4.12) 846,016	-	-	-	-	-	(3.74) 27,104
NETHERLANDS	(5.17) 42,454	(4.98) 60,846	(4.97) 59,576	(5.21) 44,464	(2.82) 2,464	-	-	-	-	(5.53) 13,888
BELGIUM	(5.37) 55,799	(4.07) 53,148	(3.15) 168,896	(3.24) 15,528	-	-	-	-	(9.95) 18,337	(20.78) 3,696
FRANCE	(2.85) 814,465	(2.89) 795,803	(3.21) 1,244,531	(3.17) 3,311,918	(4.14) 2,259,252	(7.78) 2,427,893	(8.87) 806,810	(10.87) 1,157,046	(10.78) 27,950	(11.30) 618,352
AUSTRIA- HUNGARY	(5.23) 335,323	(4.99) 20,160	(4.42) 7,056	-	-	-	-	-	-	-
PORTUGAL	(4.16) 74,704	(3.60) 62,857	(3.38) 142,050	(2.99) 102,654	-	-	-	-	-	-
U.S.A.	(3.20) 2,235,420	(3.21) 132,844	(3.57) 47,698	(4.13) 345,156	(3.06) 585,343	(4.87) 331,034	(7.77) 103,570	-	(9.93) 338,500	(13.29) 770,000
OTHER FOREIGN	(3.49) 887,598	(3.05) 646,357	(3.55) 785,851	(3.54) 1,271,775	(4.21) 474,664	(5.29) 97,987	(7.86) 3,360	(12.34) 175	(11.43) 143,792	(10.85) 185,696
BRITISH POSSESSIONS	(3.39) 217,987	(3.21) 342,857	(3.19) 300,847	(3.50) 319,429	(3.21) 247,873	(5.47) 331,320	(7.18) 105,957	(8.03) 51,520	(10.21) 359,452	(6.80) 199,248
TOTAL	5,456,819	2,901,798	3,724,973	6,256,940	3,569,596	3,138,034	1,019,697	1,208,741	888,048	1,817,984

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
RUSSIA	-	-	-	-	(3.52) 201,600	(2.59) 963,200	-	(3.17) 388,528	-	-
SWEDEN	(8.08) 30,352	(6.85) 22,288	(4.63) 68,656	(5.25) 59,920	-	-	-	-	-	-
DENMARK	(1.75) 1,232	(4.55) 869,904	(4.05) 2,071,216	(4.44) 849,520	-	-	-	-	-	-
GERMANY	(4.07) 12,096	(2.75) 71,792	(6.94) 35,504	(4.08) 226,688	(8.35) 84,448	(4.02) 310,464	(7.39) 83,552	(5.90) 95,648	(6.26) 195,664	-
NETHERLANDS	(8.25) 2,240	-	(3.14) 16,800	(3.76) 69,328	-	-	-	-	-	-
BELGIUM	(1.93) 11,200	(3.02) 51,296	(4.04) 234,192	(4.02) 72,912	-	-	-	-	-	-
FRANCE	(6.44) 27,552	(7.33) 150,304	(5.84) 117,152	(6.65) 361,536	(5.87) 258,496	(6.61) 130,816	(5.64) 182,448	(5.27) 181,664	(8.55) 54,544	-
AUSTRIA	(6.43) 13,664	(3.58) 57,120	(9.32) 30,128	(9.29) 22,512	-	-	-	-	-	-
EGYPT	(3.86) 34,720	(4.35) 1,187,088	(4.01) 266,896	(5.84) 12,320	-	-	-	-	-	-
U.S.A.	(4.21) 96,320	(6.05) 114,576	(3.94) 84,672	(3.70) 407,008	(4.26) 266,896	(4.39) 215,936	(5.26) 359,856	(3.96) 402,976	(4.22) 346,416	-
OTHER FOREIGN COUNTRIES	(7.39) 34,496	(3.72) 295,344	(4.28) 566,384	(4.25) 695,296	(4.51) 335,104	(3.84) 307,104	(6.38) 229,152	(6.89) 92,512	(7.04) 65,968	(5.46) 318,192
IRISH REPUBLIC	-	-	(3.02) 220,416	(3.17) 613,088	-	-	-	-	-	-
CANADA	-	(6.94) 23,520	(5.46) 323,344	(3.71) 2,912	-	-	-	-	-	-
OTHER BRITISH POSSESSIONS	(11.21) 7,728	(3.79) 117,488	(4.65) 86,578	(3.55) 3,248	(2.08) 100,800	(2.64) 273,392	(4.11) 544,880	(5.44) 163,072	(6.23) 100,800	(5.18) 102,368
TOTAL	271,600	2,960,720	4,122,048	3,395,288	1,247,344	2,200,912	1,399,888	1,324,400	763,392	420,560

	1931	1932	1933
FOREIGN COUNTRIES	(1.06) 562,912	(4.47) 86,688	(4.82) 53,424
BRITISH POSSESSIONS	(3.18) 78,848	(2.12) 20,608	(1.43) 1,008
TOTAL	641,760	107,296	54,432

TABLE III-III(a)

Woollen rags of foreign and colonial
origin re-exported 1860-1939

Source:- (i) 1860-1900
Trade, Navigation and Commerce
Annual Accounts.
(ii) 1901-1939
Annual Statements of the Trade
of the United Kingdom.

Notes:- (i) All figures have been converted
to tons weight, and the average
value per ton calculated.

(ii) Figures for 1871-1902 include
shoddy, mungo, etc.

YEAR	WEIGHT (TONS)	VALUE (£)	AV. VALUE PER TON (£)	YEAR	WEIGHT (TONS)	VALUE (£)	AV. VALUE PER TON (£)
1860	4	80	20.00	1901	274	5,569	20.39
1	-	-	-	2	440	12,530	28.48
2	12	287	23.92	3	395	8,113	20.54
3	38	1,004	26.42	4	637	12,897	20.25
4	59	1,561	26.44	5	4,849	99,196	20.46
5	2	49	24.50	6	4,335	88,604	20.44
6	202	4,739	23.46	7	7,110	143,039	20.12
7	21	481	22.90	8	2,386	48,525	20.34
8	12	270	22.50	9	3,374	69,215	20.51
9	37	818	22.11	10	6,801	136,644	20.09
70	133	2,766	20.80	1	4,784	98,416	20.57
1	39	566	14.51	2	426	11,052	25.94
2	75	1,249	16.65	3	342	7,313	21.38
3	88	1,024	11.64	4	136	2,803	20.61
4	16	307	19.19	5	-	-	-
5	500	7,770	15.54	6	138	5,250	38.04
6	1,557	30,972	19.89	7	197	7,880	40.00
7	3,749	63,032	16.81	8	-	-	-
8	2,375	36,627	15.42	9	3,051	209,188	68.56
9	3,264	47,667	14.69	1920	512	47,394	92.57
80	4,017	62,237	15.49	1	88	3,634	41.29
1	2,504	42,901	17.13	2	122	3,664	30.03
2	2,951	45,505	15.42	3	521	15,384	29.53
3	9,545	139,558	14.62	4	88	5,331	60.58
4	10,380	150,255	15.74	5	227	11,989	52.81
5	1,094	16,292	14.89	6	329	12,548	38.14
6	465	6,753	14.52	7	208	10,098	48.55
7	624	8,144	13.05	8	160	8,288	51.80
8	389	6,541	16.81	9	84	4,503	53.61
9	314	5,185	16.51	30	192	7,103	36.99
90	125	2,634	21.07	1	418	9,328	22.32
1	100	2,400	24.00	2	86	2,120	24.65
2	372	6,238	16.77	3	77	2,326	30.21
3	752	15,288	20.33	4	86	3,881	45.13
4	357	7,426	20.80	5	20	568	28.40
5	3,045	59,657	19.59	6	45	2,086	46.35
6	1,439	28,405	19.74	7	63	3,541	56.21
7	990	19,712	19.91	8	223	10,459	46.90
8	921	14,129	15.34	1939	106	3,575	33.73
9	691	12,507	18.10				
1900	673	12,731	18.92				

TABLE III-III(b)

Exports of U.K. Woollen rags

1901-1939

- (i) Summary of gross annual weight and value with average price per ton.
- (ii) Table showing countries to which exported.

Source: Annual Statements of the Trade of
the United Kingdom.

Note: (i) Summary of gross annual weight, value, and average value per ton.

1919-1939 - weight in hundredweights.

The average price per ton in £ has been calculated from the data.

(i) Summary of gross annual weight, value, and average value per ton.

YEAR	WEIGHT (TONS)	VALUE (£)	AV. VALUE PER TON (£)
1901	2,137	39,561	18.51
2	2,112	60,230	28.52
3	2,884	91,273	31.65
4	1,735	57,914	33.38
5	1,865	75,634	40.55
6	2,247	113,138	50.35
7	2,730	133,838	49.02
8	2,555	104,500	40.90
9	3,050	141,893	46.52
10	2,963	148,194	50.01
1	2,945	146,490	49.74
2	3,427	188,319	54.95
3	4,155	222,920	53.65
4	3,812	193,602	50.79
5	700	48,097	68.71
6	434	39,930	92.00
7	27	3,736	138.37
8	10	2,748	274.80
9	400	52,028	130.07
20	1,079	142,783	132.33
1	2,028	107,235	52.88
2	10,354	815,989	78.81
3	4,755	478,135	100.55
4	6,710	866,996	129.21
5	10,293	1,210,531	117.61
6	10,045	1,068,916	106.41
7	11,635	1,170,091	100.57
8	13,818	1,324,231	95.83
9	11,888	1,111,810	93.52
30	6,972	528,912	75.86
1	8,758	327,635	37.41
2	5,782	235,239	40.68
3	11,507	446,281	38.78
4	14,437	764,312	52.94
5	18,689	1,104,500	59.10
6	18,625	1,296,548	69.61
7	22,120	1,776,634	80.32
8	20,789	1,340,721	64.49
1939	12,899	957,528	74.23

(ii) Table showing countries to which exported.

RAGS - U.K. PRODUCE.

	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
RUSSIA	-	696	1,010	344	533	568	620	452	568	520
GERMANY	900	920	814	502	455	684	1,087	1,186	1,455	1,189
FRANCE	247	136	138	390	527	478	398	304	373	559
BELGIUM	194	-	-	-	-	-	-	-	-	-
U.S.A.	92	-	-	-	13	102	92	2	35	-
OTHER FOREIGN COUNTRIES	303	208	361	322	217	296	396	549	563	669
BRITISH POSSESSIONS	311	152	561	177	120	119	137	62	56	26
TOTAL	2,137	2,112	2,884	1,735	1,865	2,247	2,730	2,555	3,050	2,963

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
RUSSIA	343	336	414	741	-	-	-	-	-	-
SWEDEN/ DENMARK	-	-	-	-	-	-	-	-	33	66
GERMANY	1,382	1,793	1,899	1,160	-	-	-	-	-	552
NETHERLANDS	-	-	-	-	-	-	-	-	100	6
BELGIUM	-	-	-	370	-	-	-	-	183	67
FRANCE	550	607	1,011	624	304	133	4	2	14	76
ITALY	-	-	-	40	294	226	-	8	2	2
U. S. A.	-	-	-	758	30	26	1	-	-	253
OTHER FOREIGN COUNTRIES	649	684	735	95	64	49	22	-	25	33
BRITISH POSSESSIONS	21	7	96	24	8	-	-	-	43	24
TOTAL	2,945	3,427	4,155	3,812	700	434	27	10	400	1,079

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
SOVIET UNION	-	-	-	-	-	-	-	-	79	1,452
NORWAY	-	-	-	-	-	-	-	-	53	188
DENMARK	-	-	-	-	-	-	-	-	99	64
POLAND	-	-	-	-	-	42	26	260	255	205
GERMANY	1,126	784	761	1,189	1,426	1,530	2,894	2,948	3,013	1,435
BELGIUM	86	95	102	95	96	98	225	249	182	75
FRANCE	41	212	133	88	249	389	240	838	666	427
ITALY	-	-	-	-	-	-	-	-	335	97
CZECHOSLOVAKIA	-	-	-	-	-	116	354	385	597	307
U.S.A.	602	8,851	2,975	4,208	7,411	6,955	7,008	7,915	5,924	2,338
OTHER FOREIGN COUNTRIES	158	388	440	847	669	681	639	979	463	279
BRITISH COUNTRIES	15	24	344	283	442	234	249	244	222	105
TOTAL	2,028	10,354	4,755	6,710	10,293	10,045	11,635	13,818	11,888	6,972

	1931	1932	1933	1934	1935	1936	1937	1938	1939
SOVIET UNION	5,786	1,923	3,746	3,705	3,562	4,598	5,388	5,840	2,250
NORWAY	183	314	424	554	405	487	625	699	1,466
DENMARK	209	395	706	1,271	478	333	314	216	224
POLAND	116	224	1,325	2,159	3,080	4,444	3,852	3,839	2,299
GERMANY	1,130	1,444	1,725	2,222	3,883	1,839	3,862	3,153	894
NETHERLANDS	-	-	-	466	496	385	666	517	218
BELGIUM	46	87	116	140	451	581	749	465	193
FRANCE	233	297	1,004	733	1,009	1,209	1,292	1,243	850
SPAIN	-	-	-	124	510	187	-	-	-
ITALY	62	62	645	1,218	2,119	30	1,043	2,087	1,125
AUSTRIA	-	-	-	406	533	767	895	360	304
CZECHOSLOVAKIA	190	258	290	314	419	544	445	418	366
U.S.A.	382	280	627	315	688	1,928	1,265	603	2,620
OTHER FOREIGN COUNTRIES	383	476	859	549	637	675	1,062	1,112	829
CANADA	-	-	-	207	344	561	620	197	142
OTHER BRITISH COUNTRIES	38	22	38	54	75	57	40	40	13
TOTAL	8,758	5,782	11,507	14,437	18,689	18,625	22,120	20,789	12,899

TABLE III-III(c)

Shoddy and mungo of foreign and
colonial manufacture re-exported
1861-1870, 1903-1933

Source:- (i) 1861-1870
Trade, Navigation and Commerce
Annual Accounts.
(ii) 1903-1933
Annual Statements of the Trade
of the United Kingdom.

Note:-
(a) 1861-70 - figures converted from
tons to pounds weight.
(b) 1919-1933 - figures converted from
hundredweights to pounds weight.

The average value per pound has been
calculated.

YEAR	WEIGHT (lbs)	VALUE (£)	AV. VALUE d.per lb.
1861	241,920	4,026	3.99
2	185,920	3,114	4.02
3	107,520	1,954	4.36
4	51,520	1,133	5.28
5	125,440	2,620	5.01
6	120,960	2,117	4.20
7	22,400	296	3.17
8	22,400	238	2.55
9	123,200	1,238	2.41
70	64,960	738	2.73
1903	88,255	4,552	12.38
4	357,216	2,425	1.63
5	40,420	603	3.58
6	21,000	294	3.36
7	5,500	104	4.54
8	17,874	314	4.22
9	36,512	488	3.21
10	831,975	10,203	2.94
1	349,925	4,939	3.39
2	114,249	1,422	2.99
3	452,312	5,966	3.16
4	66,241	937	3.39
5	6,594	290	10.55
6	-	-	-
7	-	-	-
8	-	-	-
9	28,896	1,568	13.02
1920	178,752	8,942	12.01
1	40,656	1,421	8.39
2	116,592	3,900	8.03
3	100,688	2,160	5.15
4	55,440	1,875	8.12
5	331,520	7,513	5.44
6	283,472	6,226	5.27
7	286,048	6,668	5.59
8	664,608	16,177	5.84
9	84,224	1,658	4.72
1930	57,904	1,050	4.35
1	68,432	856	3.00
2	32,816	831	6.08
3	33,936	346	2.45

TABLE III-IV(a)

Woollen rag prices, 1911-1939, (shillings per cwt.)

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Old Black Cloth	11	12	10	10	32	55	70	90	80	88	26	25	26	28	22	18	18	18	18	16
Old Blue Cloth	11	12	10	10	24	50	66	85	76	80	23	21	18	23	18	15	15	17	17	16
New Blue Worsted	-	-	-	-	-	215	260	415	460	112	120	120	123	156	160	145	140	140	135	90
Old Black & Blue Worsted	22	24	23	25	50	100	110	146	195	310	52	60	60	73	62	54	57	58	54	44
New Tailors Clips	-	-	-	-	-	-	-	-	-	180	40	40	54	70	-	48	48	52	50	35
New Black Worsted	-	-	-	-	-	220	260	430	-	124	140	138	150	155	100	100	110	110	112	83
Blue Serge	21	23	23	23	48	68	140	135	130	130	22	22	23	33	32	23	26	29	29	23
Black Serge	21	23	21	22	48	100	110	140	170	194	33	39	43	43	42	30	32	31	29	25
Fine Merinos	22	22	21	23	44	65	120	140	180	180	42	50	50	53	56	45	44	42	38	25
White Flannels	58	60	69	70	90	112	122	188	217	250	70	120	120	180	140	120	125	140	115	75
English Stockings	38	38	40	38	64	90	169	190	195	220	36	53	62	86	74	56	54	66	58	35
Scotch Stockings	48	-	-	52	76	130	-	245	-	240	44	62	72	100	-	65	60	73	68	43
Best Coloured Berlins	38	39	41	42	61	82	169	190	275	200	70	85	90	127	110	70	84	88	90	50
Best Black Berlins	19	28	42	40	78	124	185	275	350	163	76	86	84	117	100	70	84	78	93	56

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cont.

TABLE III-IV(a) Cont.

	1931	1932	1933	1934	1935	1936	1937	1938	1939
Old Black Cloth	14	11	15	15	16	27	18	17	40
Old Blue Cloth	14	11	10	12	15	25	16	15	35
New Blue Worsted	85	62	98	90	94	130	117	105	130
Old Black & Blue Worsted	37	24	36	39	42	56	54	48	70
New Tailors Clips	27	17	36	37	44	55	50	30	40
New Black Worsted	80	62	98	100	102	140	117	120	155
Blue Serge	19	14	25	35	36	43	46	34	56
Black Serge	26	21	31	33	37	44	48	40	55
Fine Merinos	23	17	31	34	38	51	52	45	70
White Flannels	63	49	85	85	90	120	90	80	130
English Stockings	37	33	61	60	60	73	74	72	140
Scotch Stockings	43	35	64	64	65	78	76	76	120
Best Coloured Berlins	46	40	68	75	75	84	83	74	135
Best Black Berlins	51	50	84	88	80	95	90	86	130

Note: Published prices from ca. 1911 were commonly held by the trade to be approximately 10 per cent above current Dewsbury prices, and were used primarily as a basis for negotiating export contracts. W.R., 27.8.1959, p. 224.

Source: W.T.W., and W.R., 1911-1939 (December prices). Leeds City Council, Archives Department, Extract Wool Holdings Ltd. MSS., Eli Townend (Ossett), Purchase Ledgers 1.1.1906-12.3.1913, 20.4.1913-31.3.1922, for series 'white flannels' and 'best coloured berlins' 1911-1920.

TABLE III-IV(b)

Index of woollen rag prices (1912 = 100)

	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Old Black Cloth	83	83	267	458	583	750	667	733	217	208	217	233	183	150	150	150	150	133
Old Black & Blue Worsted	96	104	208	417	458	608	812	1292	217	250	250	304	258	225	237	242	225	183
Blue Serge	100	100	209	296	609	587	565	565	96	96	100	143	139	100	113	126	126	100
Fine Merinos	95	104	200	295	545	636	818	818	191	227	227	241	254	204	200	191	173	114
White Flannels	115	117	150	187	203	313	362	417	117	200	200	300	233	200	208	233	191	125
English Stockings	105	100	168	237	445	500	513	579	95	139	163	226	194	147	142	174	153	92
Best Cld. Berlins	105	108	156	210	433	487	705	513	179	218	231	326	282	179	215	226	231	128
Best Black Berlins	150	143	279	443	661	982	1250	582	271	307	300	418	357	250	300	279	332	200
Composite Index	106	107	205	318	492	608	711	687	173	206	211	274	237	182	196	202	198	134
	1931	1932	1933	1934	1935	1936	1937	1938	1939									
Old Black Cloth	117	92	125	125	133	225	150	142	333									
Old Black & Blue Worsted	154	100	150	162	175	233	225	200	292									
Blue Serge	83	61	109	152	156	187	200	148	243									
Fine Merinos	104	77	141	155	173	232	236	204	318									
White Flannels	105	82	143	143	150	200	150	133	217									
English Stockings	97	87	160	158	158	192	195	189	368									

cont.

TABLE III-IV(b) cont.

	1931	1932	1933	1934	1935	1936	1937	1938	1939
Best Cld. Berlins	117	103	174	192	192	215	213	190	346
Best Black Berlins	182	179	300	314	286	339	321	307	464
Composite Index	120	98	163	175	178	228	211	189	323

Appendix IV-I, Chapter IV.

Appendix IV-I

Exports of United Kingdom produced shoddy, mungo,
and extract wool 1860-1939 (lbs. weight), showing
countries to which shipped and value per lb.

Source: Trade, Navigation, and Commerce, Annual
Accounts.
Annual Statements of the Trade of the
United Kingdom.

- Note: (a) 1860-1870, includes small exports of wool flocks.
(b) 1871-1881, includes small exports of 'foreign wool,
dressed in the United Kingdom' and wool flocks.
(c) 1882-1903, includes small exports of flocks.
(d) 1904-1939, shoddy, mungo, and extract only.
(e) Until 1904, exports were to countries of shipment not
consignment, v. supra Appendix III-I(i)
(f) Value per lb. in pence (d.) indicated by brackets
above weight shipped to each country per annum.

	1860	1861	1862	1863	1864	1865	1866	1867	1868	1869	1870
Russia				(10.22)							(5.05)
				25,872							275,520
Sweden											(6.91)
											192,304
German *			(7.10)	(8.99)	(7.74)	(7.09)	(6.65)	(5.98)	(5.36)	(4.47)	(4.77)
Ports etc.			138,656	82,208	33,200	687,568	674,128	1,182,496	1,093,792	1,526,784	1,674,400
Holland			(13.68)	(11.91)	(13.72)	(10.74)	(15.83)				
			151,536	126,896	272,608	453,040	328,944				
Belgium	(8.71)	(8.20)	(9.26)	(10.92)	(8.12)	(7.34)	(7.76)	(5.89)	(5.18)	(4.95)	(5.03)
	418,544	683,312	1,527,120	1,256,640	1,782,032	2,101,792	1,546,272	885,248	1,020,656	1,477,056	805,616
France		(5.84)	(6.94)	(15.81)	(7.37)	(5.95)	(6.16)	(4.85)	(5.32)	(7.30)	(9.32)
		211,232	192,640	569,520	243,712	554,064	649,488	474,544	345,184	588,560	1,107,232
U.S.A.	(3.79)	(3.81)	(4.02)	(4.37)	(4.78)	(4.22)	(4.27)	(4.22)	(3.00)	(3.53)	(2.34)
	4,034,800	2,702,336	3,391,360	3,024,672	4,224,976	3,651,984	3,494,960	521,248	100,128	286,832	442,288
Others	(6.22)	(5.81)	(7.55)	(5.92)	(6.18)	(3.69)	(8.70)	(5.98)	(4.17)	(5.46)	(4.87)
	232,848	216,272	150,640	154,112	55,328	243,600	58,912	306,208	183,008	167,888	193,648
Total	4,686,192	3,813,152	5,551,952	5,239,920	6,911,856	7,692,048	6,752,704	3,369,744	2,376,752	4,047,120	4,691,008

* Includes Austrian Territories 1863, Prussia 1868-1870.

	1871	1872	1873	1874	1875	1876	1877	1878	1879	1880
Russia	(8.17) 98,498	(7.19) 359,340	(8.52) 272,399	(6.28) 1,420,500	(8.35) 2,505,500	(7.61) 953,372	(5.17) 1,786,595	(7.69) 2,172,600	(7.86) 3,019,800	(7.67) 3,460,500
Sweden*	(6.74) 281,591	(6.24) 402,626	(8.04) 403,815	(8.11) 601,312	(10.55) 626,260	(12.31) 563,047	(9.77) 584,413	(10.18) 477,100	(11.03) 484,500	(12.05) 803,600
Germany	(6.78) 3,219,019	(6.25) 3,241,210	(8.36) 1,277,959	(8.11) 2,452,406	(7.60) 4,163,525	(7.66) 2,833,397	(7.20) 3,712,167	(10.26) 6,396,200	(9.70) 6,215,400	(11.40) 4,818,800
Holland	(13.93) 113,956	(11.03) 127,413	(6.27) 172,830							
Belgium	(13.07) 1,127,502	(10.34) 920,142	(9.32) 366,556	(5.33) 593,256	(4.21) 1,216,450	(5.87) 599,230	(5.21) 839,100	(6.39) 1,259,000	(7.54) 807,400	(7.90) 1,278,200
France	(6.18) 1,795,977	(6.43) 982,032	(5.02) 802,388	(3.88) 685,631	(6.60) 1,703,670	(6.14) 991,451	(6.55) 1,309,277	(10.32) 1,058,000	(11.91) 509,100	(16.36) 1,201,400
U.S.A.	(4.10) 1,625,019	(5.06) 1,866,890	(4.34) 1,296,198	(4.23) 1,556,801	(7.37) 1,004,807					(5.67) 697,100
Other Foreign Countries	(7.26) 105,213	(7.97) 116,734	(17.36) 85,838	(11.68) 194,180	(8.87) 205,147	(8.87) 503,615	(9.65) 567,913	(9.11) 363,400	(9.27) 406,000	(8.95) 708,300
Total	8,366,775	8,016,387	4,677,983	7,504,086	11,426,359	6,444,112	8,799,465	11,726,300	11,442,200	12,967,900

* Includes shipments to Norway from 1873.

	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890
Russia	(7.62) 2,479,400	(6.89) 2,895,400	(6.21) 1,414,700	(4.00) 958,700	(3.99) 825,600	(3.10) 1,099,500	(3.23) 1,481,400	(3.07) 1,392,500	(3.49) 1,265,700	(5.33) 719,800
Sweden & Norway	(12.69) 1,212,900	(7.27) 1,172,600	(8.23) 1,270,700	(7.49) 1,475,600	(6.82) 1,477,100	(5.86) 1,725,300	(6.05) 1,692,200	(6.00) 2,321,300	(6.26) 2,858,800	(6.32) 2,535,400
Denmark	-	-	-	-	-	-	(4.13) 354,800	(4.51) 313,400	(5.00) 558,300	(5.47) 407,200
Germany	(9.64) 6,787,500	(8.47) 7,661,400	(7.92) 6,467,700	(6.97) 6,240,700	(6.31) 5,470,100	(5.50) 8,163,600	(5.55) 7,098,800	(5.60) 9,607,800	(5.76) 12,483,300	(6.29) 8,940,900
Holland	-	-	-	(5.20) 783,700	(4.66) 670,600	(5.17) 528,500	(5.67) 467,200	(5.88) 510,200	(5.67) 679,900	(6.11) 558,200
Belgium	(6.28) 1,733,100	(5.65) 1,388,900	(5.67) 1,667,900	(4.36) 1,866,800	(4.71) 1,993,800	(3.72) 2,451,900	(3.67) 2,058,600	(3.99) 1,768,900	(4.74) 2,054,400	(4.88) 834,500
France	(9.84) 979,300	(7.16) 375,700	(6.57) 371,500	(5.94) 665,600	(4.40) 715,800	(4.12) 1,091,400	(3.47) 1,643,400	(3.69) 2,156,400	(4.12) 1,834,400	(4.92) 1,403,000
Portugal							(6.07) 194,400	(6.47) 294,600	(6.85) 396,200	
U.S.A.	(7.33) 269,900						(4.97) 233,400	(4.90) 145,200	(4.62) 147,900	(7.19) 55,900
Other Foreign Countries	(9.05) 1,013,500	(7.00) 1,237,000	(7.02) 1,043,400	(6.68) 749,400	(6.44) 729,400	(5.64) 757,300	(7.02) 479,100	(6.93) 159,500	(6.92) 191,500	(8.84) 83,300
Canada				(3.59) 277,600			(3.97) 527,400	(4.22) 259,200	(4.40) 139,900	(7.98) 106,300
British Possns.	(4.79) 205,300	(5.36) 8,500	(4.93) 11,200	(4.49) 14,600	(4.79) 205,300	(5.36) 8,500	(4.93) 11,200	(4.49) 14,600	(4.64) 22,000	(4.06) 29,700
Total	14,745,600	14,731,000	12,235,900	12,730,500	12,087,700	16,103,600	16,047,500	18,843,400	22,537,000	16,070,400

	1891	1892	1893	1894	1895	1896	1897	1898	1899	1900
Russia	(5.11) 565,000	(5.05) 378,900	(4.60) 1,445,900	(5.28) 1,742,400	(5.25) 1,680,500	(6.12) 1,307,300	(5.48) 1,865,900	(5.52) 1,508,200	(5.37) 1,364,500	(6.39) 1,877,200
Sweden & Norway	(6.61) 2,334,600	(6.15) 2,026,900	(5.82) 2,532,300	(5.71) 2,974,300	(5.56) 2,965,200	(5.55) 2,915,700	(5.41) 2,753,400	(5.65) 2,618,100	(6.12) 2,464,600	(5.95) 2,155,200
Denmark	(5.94) 368,900	(5.77) 324,800	(5.83) 471,800	(5.48) 475,700	(4.91) 560,500	(5.06) 486,200	(5.25) 456,700	(5.37) 446,600	(5.77) 469,800	(5.96) 581,700
Germany	(6.19) 8,261,600	(5.94) 9,091,000	(5.83) 9,719,100	(5.53) 8,898,600	(5.57) 8,169,800	(5.34) 7,943,900	(5.70) 6,886,100	(5.72) 7,041,100	(6.13) 6,810,200	(6.13) 5,657,100
Holland	(6.63) 314,400	(5.63) 344,500	(5.06) 635,400	(5.23) 670,600	(5.14) 570,000	(4.61) 535,100	(4.82) 515,400	(5.24) 420,900	(5.20) 453,900	(5.52) 445,200
Belgium	(5.61) 618,100	(4.68) 819,000	(5.47) 765,500	(6.43) 419,100	(7.00) 424,800	(5.47) 534,300	(5.73) 516,600	(5.74) 386,600	(6.76) 774,800	(5.46) 697,900
France	(5.25) 803,100	(4.30) 659,200	(5.99) 506,600	(5.02) 338,600	(4.75) 316,400	(5.21) 373,900	(4.72) 569,600	(4.32) 369,200	(5.67) 350,300	(5.62) 515,700
Portugal	(7.05) 262,900	(7.08) 311,700	(7.01) 414,500	(6.64) 281,200	(6.81) 367,500	(6.71) 506,700	(6.99) 421,200	(5.34) 579,500	(6.58) 751,400	(7.33) 793,400
U.S.A.							(3.28) 162,800			
Other foreign countries	(7.66) 145,900	(6.06) 225,900	(7.31) 134,800	(5.04) 291,400	(4.98) 485,300	(4.26) 290,100	(6.89) 69,100	(5.52) 100,300	(5.39) 198,000	(3.70) 75,300
Channel Islands	(3.55) 7,300									
Canada	(5.90) 64,000	(6.57) 40,700	(5.70) 141,500	(5.31) 89,000	(6.22) 39,000					
Other* British Possns.	(5.93) 18,300	(3.95) 16,200	(4.50) 20,700	(4.54) 16,400	(5.29) 18,400	(3.22) 46,200	(5.44) 5,600	(2.95) 39,200	(3.47) 62,800	(3.88) 139,100
Total	13,764,100	14,238,800	16,788,100	16,197,300	15,597,400	14,935,800	14,272,800	13,449,700	13,700,300	12,937,800

* Includes Australia from 1891.

	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910
Russia	(5.98) 1,590,200	(5.33) 1,299,500	(6.05) 1,147,000	(6.50) 687,000	(6.08) 2,017,200	(6.59) 2,285,100	(7.41) 1,604,200	(7.63) 924,800	(6.49) 848,700	(6.65) 864,540
Sweden	(5.87) 1,191,500	(5.69) 785,900	(5.06) 1,279,000	(5.51) 825,400	(5.75) 1,777,800	(6.10) 1,925,900	(6.58) 1,861,700	(6.79) 1,073,900	(6.82) 949,500	(6.55) 1,413,900
Norway	(4.77) 568,100	(5.47) 499,400	(5.38) 517,900	(5.37) 480,300	(5.72) 790,900	(6.76) 946,000	(7.31) 946,000	(6.91) 851,200	(6.69) 814,000	(6.62) 961,200
Denmark	(5.55) 683,100	(5.73) 520,000	(5.79) 753,100	-	-	-	-	-	-	(7.15) 851,800
Germany	(5.29) 4,750,200	(5.02) 4,430,600	(5.26) 5,385,800	(6.34) 2,422,400	(7.06) 3,941,800	(7.53) 4,557,300	(8.06) 3,818,300	(7.76) 2,138,700	(7.47) 2,081,300	(7.21) 3,702,300
Holland	(4.90) 346,400	(4.96) 418,400	(4.98) 595,000	(5.03) 284,800	(5.19) 744,800	(5.83) 852,800	(6.04) 944,800	(5.73) 508,500	(6.17) 437,600	(5.99) 631,200
Belgium	(3.98) 467,000	(4.32) 300,400	(5.56) 426,100	(5.86) 359,500	(6.49) 862,600	(7.46) 1,076,100	(8.63) 739,500	(7.90) 374,000	(7.66) 274,500	(6.31) 466,200
France	(4.92) 347,600	(4.94) 317,500	(4.49) 520,900	(5.72) 411,000	(6.71) 459,600	(7.51) 885,100	(8.18) 843,800	(7.25) 456,000	(6.52) 461,900	(6.58) 702,900
Portugal	(7.06) 668,800	(6.79) 943,900	(6.97) 1,129,100	(7.53) 969,200	(8.27) 896,100	(8.40) 1,008,700	(8.75) 1,268,800	(8.33) 910,100	(7.77) 1,072,300	(7.95) 1,259,000
Japan				(5.83) 813,200	(6.73) 163,300	(9.59) 231,200	(8.26) 303,600	(14.62) 75,700	(11.43) 7,200	
Other foreign countries	(5.77) 22,300	(4.95) 78,200	(5.28) 235,700	(5.71) 384,300	(6.03) 1,011,900	(6.44) 1,519,600	(7.48) 1,344,700	(7.70) 1,092,800	(7.61) 1,014,900	(7.93) 705,000
Canada										(7.11) 390,200
British Possns.	(3.88) 109,800	(3.95) 189,600	(4.55) 285,600	(5.33) 153,200	(5.47) 335,300	(6.03) 346,300	(7.69) 573,500	(7.18) 200,000	(7.43) 284,000	(7.23) 7,500
Total	10,745,000	9,783,400	12,275,200	7,790,300	13,001,300	15,634,100	14,188,900	8,606,500	8,245,900	11,956,600

	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Russia	(6.29) 1,008,900	(7.08) 1,301,000	(7.28) 1,594,600	(7.22) 1,048,700	(7.65) 131,500	(14.44) 50,700	-	-	(28.87) 422,576	(27.10) 1,063,664
Sweden	(6.60) 1,533,700	(6.64) 1,909,300	(7.12) 2,025,200	(7.35) 962,000	(8.92) 431,200	(14.76) 354,300	(14.15) 7,800		(24.56) 1,339,632	(34.08) 633,136
Norway	(6.64) 801,100	(6.66) 902,700	(6.94) 1,035,100	(7.16) 586,100	(9.03) 846,200	(11.83) 1,175,800	(12.50) 320,000		(20.28) 1,062,768	(25.09) 642,096
Denmark	(6.91) 862,600	(6.93) 1,058,100	(6.96) 1,130,300	(7.53) 618,000	(9.97) 516,500	(13.16) 708,800	(13.92) 483,600		(22.45) 1,761,424	(31.03) 446,096
Germany	(6.88) 3,024,200	(6.90) 2,913,200	(7.57) 2,678,300	(7.97) 1,984,300	-	-	-		(32.45) 211,232	(19.44) 653,744
Holland	(5.99) 637,200	(6.11) 809,900	(5.93) 938,300	(6.32) 519,400	(10.14) 1,012,000	(13.53) 2,445,400	(16.11) 1,843,000		(22.70) 2,573,872	(27.79) 1,468,544
Belgium	(7.43) 387,600	(7.63) 476,200	(8.10) 660,400	(8.97) 370,000	-	-	-		(27.86) 842,352	(23.68) 1,181,040
France	(7.21) 494,600	(7.57) 572,700	(7.74) 770,200	(8.02) 374,800	(8.66) 397,200	(18.33) 265,300	(12.79) 198,900	(20.44) 21,600	(25.43) 802,592	(24.73) 1,430,352
Portugal	(7.34) 1,231,700	(7.28) 1,189,100	(8.63) 1,364,000	(8.39) 1,171,200	(9.87) 439,800	(13.54) 606,800	(16.24) 529,100	(15.36) 41,000	(23.76) 189,392	(31.55) 294,336
Other foreign countries	(8.12) 1,076,200	(7.68) 1,920,700	(7.52) 893,600	(7.37) 968,200	(10.24) 870,800	(15.15) 529,100	(18.06) 275,700	(18.99) 5,800	(30.65) 212,912	(22.67) 889,056
Canada	(6.87) 359,400	(6.86) 386,800	(6.68) 363,000	(6.76) 149,500	(12.95) 124,100	(14.89) 230,900	(18.50) 156,300	(25.37) 80,100	(29.78) 35,392	(17.17) 162,736
British Possns.	(7.65) 3,700	(9.86) 2,800	(6.42) 3,400	(5.04) 15,700	(6.00) 100	(14.90) 1,900	(20.00) 100		(30.00) 2,800	
Total	11,420,900	13,442,500	13,456,000	8,667,900	4,769,400	6,369,000	3,814,500	148,500	9,454,144	8,867,600

	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
Soviet Union	-	-	-	-	-	-	-	-	(10.71) 465,135	(9.18) 885,920
Finland	(11.38) 364,896	(9.26) 412,944	(8.86) 612,976	(10.69) 789,152	(11.62) 396,816	(8.18) 458,864	(8.97) 370,048	(8.69) 453,936	(9.98) 577,920	(8.74) 166,656
Sweden	(11.34) 266,224	(10.72) 987,616	(11.27) 1,355,648	(11.29) 1,437,408	(12.97) 728,560	(9.88) 564,928	(9.75) 446,768	(9.99) 511,056	(9.65) 559,328	(8.42) 431,200
Norway	(10.47) 150,752	(10.00) 356,160	(10.61) 412,272	(14.19) 235,536	(13.06) 169,680	(7.43) 319,088	(8.92) 385,616	(8.83) 359,296	(8.39) 314,944	(11.50) 69,328
Denmark	(12.93) 109,200	(12.25) 327,264	(11.59) 584,528	(13.72) 833,728	(13.17) 382,480	(12.99) 93,520	(9.37) 216,384	(11.00) 275,296	(10.70) 255,360	(10.11) 180,320
Germany	(8.25) 601,552	(8.82) 789,488	(11.52) 2,276,288	(15.03) 4,161,696	(14.09) 3,271,856	(10.32) 2,327,584	(10.55) 3,257,296	(11.78) 2,144,912	(12.01) 2,147,376	(12.50) 665,280
Holland	(10.62) 307,776	(11.39) 435,008	(12.60) 427,168	(16.14) 528,304	(12.26) 514,752	(12.28) 252,000	(10.24) 386,960	(10.21) 702,800	(11.80) 616,112	(10.06) 317,968
Belgium	(5.93) 171,584	(6.77) 239,904	(7.45) 183,568	(12.67) 331,856	(11.81) 634,928	(9.27) 298,256	(8.56) 422,016	(8.53) 691,600	(8.84) 690,032	(8.45) 347,424
France	(11.60) 68,320	(9.93) 127,568	(10.13) 114,912	(16.62) 495,824	(16.56) 290,640	(10.83) 142,800	(10.72) 103,936	(9.48) 500,192	(7.81) 216,496	(6.56) 207,088
Portugal	(22.22) 42,672	(13.33) 46,480	(13.56) 124,656	(14.72) 204,400	(15.06) 63,280	(12.87) 18,592	(13.47) 126,672	(14.92) 177,408	(15.37) 41,888	-
Japan	(37.91) 7,280	(11.77) 164,976	(10.94) 600,880	(10.60) 1,306,256	(13.41) 327,152	(15.60) 5,600	(10.35) 31,136	(12.24) 300,272	-	-
U.S.A	(7.65) 563,696	(7.75) 4,276,832	(11.56) 2,785,216	(17.12) 2,348,752	(17.22) 1,422,512	(13.15) 649,264	(12.52) 500,304	(15.79) 410,480	(13.68) 221,088	(12.11) 215,600
Other foreign countries	(22.13) 267,680	(8.02) 614,208	(11.04) 427,280	(14.29) 680,288	(12.30) 961,968	(11.75) 692,944	(8.80) 552,048	(11.24) 398,608	(12.17) 459,424	(8.88) 608,048
Canada	(9.77) 100,240	(9.58) 80,080	(8.08) 199,584	(14.24) 109,760	(13.76) 302,736					
British Possns.	(17.14) 112	(6.76) 10,976	(5.52) 60,256	(7.93) 250,656	(7.10) 364,112	(7.49) 518,672	(9.02) 619,808	(12.48) 205,968	(9.85) 247,520	(10.03) 66,192
Total	3,021,984	8,869,504	10,165,232	13,713,616	9,831,472	6,342,112	7,418,992	7,131,824	6,812,624	4,161,024

	1931	1932	1933	1934	1935	1936	1937	1938	1939
Soviet Union	(3.06) 867,216	(3.11) 343,504	(2.75) 3,301,760	(3.74) 2,603,216	(4.53) 1,497,552	(6.41) 1,360,464	-	-	-
Finland	(7.83) 106,736	(7.99) 203,952	(7.82) 367,360	(7.64) 719,600	(8.00) 635,040	(9.59) 654,752	(11.11) 850,192	(10.52) 380,240	(10.49) 358,176
Sweden	(7.62) 374,976	(7.40) 283,472	(6.11) 631,792	(7.58) 2,064,272	(7.29) 1,666,896	(8.50) 1,605,520	(10.08) 1,476,160	(7.19) 971,264	(8.57) 869,120
Norway	(4.46) 142,576	(8.93) 21,728	(7.12) 71,456	-	-	-	-	-	-
Denmark	(7.31) 219,296	(7.68) 233,856	(7.73) 264,992	(7.65) 460,096	(7.50) 459,312	(8.12) 297,808	(8.45) 355,600	(8.76) 163,520	(9.61) 188,496
Poland	-	-	-	(6.91) 285,936	(5.27) 561,904	(6.75) 643,664	(9.43) 104,496	(7.67) 107,744	(3.76) 55,552
Germany	(7.41) 561,314	(6.57) 1,104,768	(7.76) 2,321,648	(8.19) 1,820,672	(8.91) 589,232	(10.23) 252,672	(9.99) 521,360	(12.07) 86,016	(10.92) 102,592
Netherlands	(7.73) 121,856	(6.52) 471,744	(8.33) 442,176	(8.55) 623,280	(9.21) 966,112	(9.34) 1,666,112	(12.08) 1,801,856	(11.00) 1,111,040	(11.11) 1,730,288
Belgium	(7.26) 149,408	(4.43) 535,024	(4.81) 626,304	(6.96) 492,352	(8.19) 316,400	(9.11) 336,224	(9.98) 422,912	(8.91) 154,896	(9.53) 221,536
France	(7.28) 46,480	(5.65) 101,136	(4.80) 148,064	(6.24) 568,848	(7.93) 235,088	(8.31) 350,112	(9.40) 428,624	(6.21) 89,824	(7.47) 167,216
Italy	-	-	-	(9.80) 665,840	(5.41) 543,088	-	(10.29) 77,952	(9.39) 95,536	(3.64) 6,720
China	-	-	-	(9.57) 327,712	(7.80) 201,936	(8.58) 387,072	(10.15) 661,248	(10.71) 224	(10.39) 60,032
U.S.A.	(7.49) 100,016	(11.33) 26,880	(14.18) 141,680	(10.06) 92,960	(8.47) 110,208	(16.03) 182,784	(18.61) 349,552	(16.04) 115,248	(16.35) 211,344
Other Foreign Countries	(7.68) 177,408	(4.86) 1,010,352	(4.64) 1,347,248	(8.77) 950,544	(8.76) 745,472	(9.68) 660,464	(12.06) 850,752	(11.55) 588,000	(9.64) 490,672
British Countries	(7.97) 137,872	(7.95) 71,680	(8.54) 184,912	(6.89) 251,776	(6.10) 711,088	(7.68) 645,456	(9.80) 853,888	(10.78) 246,064	(9.86) 432,768
Total	3,005,184	4,408,096	9,849,392	11,927,104	9,239,328	9,043,104	8,754,592	4,109,616	4,894,512

Appendix V-I to V-V, Chapter V.

Appendix V-I

Wool, Cotton, Shoddy, and Mungo

Price Series, 1801-1939.

Note:- Prices in Tables VI, VII(a), and VII(b) are expressed in pence (d.) and decimals thereof per lb.

WOOL, COTTON, SHODDY AND MUNGO PRICE SERIES 1800 - 1939

Year	U.S. Uplands		Port Phillip		Laid		Dorset Down	Laid		Shoddy	Mungo
	Cotton	Lincoln Half Hoq	AV Fleece	Dorset Down	Cheviot	Highland		Cheviot	Highland		
1801	18.000	12.500	-	19.000	-	-	-	-	-	-	-
1802	16.000	12.000	-	19.000	-	-	-	-	-	-	-
1803	12.500	12.000	-	20.000	-	-	-	-	-	-	-
1804	14.000	13.500	-	22.000	-	-	-	-	-	-	-
1805	16.500	14.250	-	27.000	-	-	-	-	-	-	-
1806	18.250	13.500	-	22.000	-	-	-	-	-	-	-
1807	14.500	9.500	-	24.000	-	-	-	-	-	-	-
1808	22.000	9.500	-	21.000	-	-	-	-	-	-	-
1809	20.000	13.500	-	36.000	-	-	-	-	-	-	-
1810	15.250	13.500	-	28.000	-	-	-	-	-	-	-
1811	12.500	11.500	-	17.000	-	-	-	-	-	-	-
1812	16.750	12.500	-	20.000	-	-	-	-	-	-	-
1813	23.000	14.000	-	23.000	-	-	-	-	-	-	-
1814	29.500	19.000	-	26.000	-	-	-	-	-	-	-
1815	20.750	22.000	-	23.000	-	-	-	-	-	-	-
1816	18.250	16.000	-	18.000	-	-	-	-	-	-	-
1817	20.130	15.000	-	24.000	-	-	-	-	-	-	-
1818	20.000	22.000	-	30.000	-	-	20.500	10.625	-	-	-
1819	13.500	16.500	-	19.000	-	-	10.750	5.000	-	-	-
1820	11.500	16.500	-	17.000	-	-	10.500	4.750	-	-	-
1821	9.500	14.000	-	15.000	-	-	9.500	4.750	-	-	-
1822	8.250	12.000	-	15.000	-	-	6.750	2.875	-	-	-
1823	8.250	11.250	-	15.000	-	-	4.870	2.750	-	-	-
1824	8.500	12.000	-	14.000	-	-	7.125	3.000	-	-	-
1825	11.630	17.500	-	16.000	-	-	8.125	5.125	-	-	-
1826	6.750	13.000	-	10.000	-	-	6.500	2.625	-	-	-
1827	6.500	11.500	-	9.000	-	-	6.500	3.000	-	-	-
1828	6.380	11.000	-	8.000	-	-	4.750	2.875	2.500	-	-
1829	5.750	10.000	-	6.500	-	-	4.875	2.250	2.250	-	-
1830	6.880	9.000	-	9.500	-	-	5.125	2.375	3.500	-	-
1831	6.000	12.000	-	13.500	-	-	9.250	4.000	4.250	-	-

WOOL, COTTON, SHODDY AND MUNGO PRICE SERIES 1807 - 1939 (Contd)

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip Av Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1832	6.630	13.000	-	12.000	7.500	3.625	3.750	-
1833	8.500	14.000	-	17.000	9.625	5.250	4.500	-
1834	8.630	15.500	-	18.500	11.375	3.125	4.750	-
1835	10.250	15.500	-	16.500	9.875	5.125	3.750	-
1836	9.880	16.000	-	18.000	11.500	6.000	4.250	-
1837	7.000	13.500	-	12.000	6.500	3.625	3.500	-
1838	7.000	14.000	-	16.000	10.375	4.000	3.500	3.250
1839	7.880	17.000	16.000	17.000	9.500	5.000	3.500	3.250
1840	6.000	12.500	17.000	13.500	8.750	4.250	3.250	3.000
1841	6.250	12.500	16.000	11.000	8.000	3.375	2.750	2.500
1842	5.380	11.000	13.000	10.250	6.625	3.000	2.500	2.250
1843	4.630	10.000	12.000	10.250	5.125	2.750	2.500	2.000
1844	4.880	11.000	14.000	12.500	8.250	3.375	3.000	2.500
1845	4.130	13.000	18.500	13.750	8.000	4.000	3.250	2.500
1846	4.880	13.000	16.000	12.500	6.625	4.125	2.750	2.500
1847	6.130	12.000	14.000	11.750	6.625	3.375	2.750	3.750
1848	4.130	11.000	13.000	9.000	5.125	2.650	2.750	3.500
1849	5.130	10.000	15.000	10.250	7.125	3.000	2.500	3.500
1850	7.000	11.000	17.000	11.750	8.125	4.125	2.750	4.500
1851	5.500	12.500	17.000	12.250	7.000	4.250	3.000	5.000
1852	5.310	13.625	18.000	13.000	7.000	4.250	2.750	4.630
1853	5.750	16.000	18.000	17.250	10.250	5.875	3.000	5.160
1854	5.380	15.500	17.000	11.750	6.750	4.000	4.000	5.620
1855	5.630	13.000	18.000	14.000	8.375	4.375	3.000	5.530
1856	6.310	16.000	21.000	16.000	10.125	5.500	3.500	4.750
1857	7.750	20.500	23.000	18.000	10.750	6.750	4.250	6.430
1858	6.880	15.625	20.000	14.750	8.000	4.750	3.250	6.140
1859	6.750	18.625	19.000	17.750	10.625	5.625	4.500	5.620
1860	6.250	20.125	19.000	19.500	13.500	5.250	5.500	6.120
1861	8.560	19.500	18.000	16.000	11.625	6.000	5.000	6.800
1862	17.250	20.500	16.000	17.750	11.125	6.875	5.000	6.800

WOOL, COTTON, SHODDY AND MUNGO PRICE SERIES 1863 - 1939 (Contd)

Year	U.S.		Port		Dorset Down	Laid		Shoddy	Mungo
	Uplands Cotton	Lincoln Half Hog	Phillip Av Fleece	Cheviot		Highland			
1863	23.250	22.625	22.000	14.125	20.750	8.125	5.250	6.620	
1864	27.500	27.375	20.000	17.500	24.000	9.375	5.500	7.080	
1865	19.000	25.750	18.000	13.250	21.250	8.000	5.870	7.330	
1866	15.500	23.500	23.000	13.500	18.000	7.500	5.500	7.300	
1867	10.880	18.875	20.000	9.375	16.500	6.000	5.250	7.290	
1868	10.500	17.500	17.000	11.250	15.750	4.375	5.000	7.430	
1869	12.130	18.125	16.000	11.125	13.750	4.625	4.700	6.850	
1870	9.940	16.750	15.000	9.625	13.000	4.750	4.250	6.480	
1871	8.560	21.375	21.250	11.625	17.750	6.750	4.500	6.330	
1872	10.560	25.375	25.750	15.875	21.500	9.750	5.000	5.850	
1873	9.000	24.500	25.000	8.750	18.500	5.250	5.500	5.950	
1874	8.000	20.750	23.500	11.250	17.250	5.625	4.500	5.750	
1875	7.380	19.750	22.000	14.250	18.250	7.125	4.500	5.160	
1876	6.250	17.750	20.250	11.000	16.000	5.375	4.500	5.450	
1877	6.310	16.250	20.250	11.750	17.000	5.500	4.750	5.700	
1878	6.130	15.000	20.000	11.000	15.250	5.000	5.000	5.200	
1879	6.310	12.500	18.750	8.000	12.000	3.500	5.000	5.500	
1880	6.940	15.125	21.500	11.000	15.000	5.500	5.000	4.810	
1881	6.440	12.375	19.500	9.500	14.000	3.625	4.500	4.450	
1882	6.630	11.250	19.750	8.000	15.000	4.125	4.750	4.640	
1883	5.750	10.000	19.000	7.750	13.500	3.750	4.370	4.640	
1884	6.000	10.000	18.250	7.750	13.000	3.750	4.180	4.550	
1885	5.630	9.875	16.500	7.250	11.000	3.500	3.870	4.250	
1886	5.130	10.000	15.500	7.750	11.500	3.750	3.940	4.370	
1887	5.500	10.500	15.750	9.000	13.000	4.000	3.870	4.170	
1888	5.560	10.375	15.750	8.250	10.500	4.000	3.750	3.830	
1889	5.940	11.000	17.250	7.750	12.000	4.000	3.780	3.350	
1890	6.000	11.000	16.000	7.750	11.500	4.000	3.590	3.720	
1891	4.690	9.750	14.750	7.625	11.500	4.000	3.000	3.940	
1892	4.190	8.750	13.000	7.500	10.500	3.875	3.250	4.500	
1893	4.630	10.250	12.750	7.250	10.500	3.750	3.330	4.370	

WOOL, COTTON, SHODDY AND MUNGO PRICE SERIES 1800 - 1939 (Contd)

Year	U.S.		Port		Dorset Down	Laid		Shoddy	Mungo
	Uplands Cotton	Lincoln Half Hog	Phillip AV Fleece	Cheviot		Highland			
1894	3.810	10.125	11.750	7.000	3.750	3.200	4.120		
1895	3.810	12.000	12.000	7.000	3.750	3.210	4.120		
1896	4.320	11.500	13.000	7.500	3.750	3.080	4.370		
1897	3.940	9.625	12.250	6.250	3.750	3.620	4.620		
1898	3.310	8.750	13.250	5.750	3.750	3.920	4.620		
1899	3.560	8.250	17.250	5.750	3.750	4.000	4.680		
1900	5.500	7.875	15.750	5.500	3.500	4.660	4.680		
1901	4.750	6.875	13.000	4.250	3.125	4.250	3.870		
1902	4.880	6.250	15.000	4.250	3.125	4.250	3.870		
1903	6.030	7.250	16.000	5.500	3.750	4.500	4.120		
1904	6.600	10.125	16.000	8.000	4.750	6.250	4.120		
1905	5.090	12.375	17.250	9.750	5.250	5.750	3.560		
1906	5.950	13.375	18.000	9.750	6.125	6.125	3.810		
1907	6.550	12.250	18.000	-	5.875	6.000	4.250		
1908	5.720	8.500	15.750	-	-	5.500	4.120		
1909	6.330	9.000	17.750	-	-	5.750	4.120		
1910	8.000	9.875	18.250	-	-	6.000	3.560		
1911	7.040	10.000	17.250	-	-	6.000	3.950		
1912	6.450	10.500	17.500	-	-	6.000	3.660		
1913	7.010	12.375	18.000	-	-	9.000	3.660		
1914	6.410	12.625	18.500	-	-	9.250	5.420		
1915	5.870	17.375	21.375	-	-	13.000	6.750		
1916	9.000	20.000	32.750	-	-	15.500	10.670		
1917	16.550	20.875	46.500	-	-	17.500	14.000		
1918	22.300	18.750	47.250	-	-	23.000	17.500		
1919	19.650	22.625	67.000	-	-	27.000	17.000		
1920	23.140	22.000	79.875	-	-	35.000	19.330		
1921	9.400	8.600	31.875	-	-	7.500	9.500		
1922	12.100	9.750	39.000	-	-	7.000	6.750		
1923	15.250	12.000	43.680	-	-	6.500	6.690		
1924	16.260	18.875	53.440	-	-	15.250	6.750		

WOOL, COTTON, SHODDY AND MUNGO PRICE SERIES 180¢ - 1939 (Contd)

Year	U.S.		Port		Dorset		Laid		Shoddy		Mungo
	Uplands	Lincoln	Phillip	Av Fleece	Down	Cheviot	Highland				
1925	12.640	17.200	41.060	20.500	-	-	-	10.500	7.440		
1926	9.400	15.000	36.500	18.500	-	-	-	7.000	6.620		
1927	9.540	15.340	38.060	22.750	-	-	-	6.500	7.190		
1928	10.920	17.910	37.000	27.000	-	-	-	8.000	7.160		
1929	10.260	16.060	35.375	22.500	-	-	-	9.500	7.340		
1930	7.490	10.750	18.280	15.000	-	-	-	6.375	6.560		
1931	5.900	8.500	14.700	12.500	-	-	-	5.500	6.520		
1932	5.240	5.780	15.000	12.750	-	-	-	6.500	6.020		
1933	5.540	5.780	19.900	14.500	-	-	-	6.125	5.830		
1934	6.680	7.000	21.250	16.000	-	-	-	6.375	5.750		
1935	6.710	7.340	20.100	16.000	-	-	-	6.625	5.830		
1936	6.700	10.420	24.700	15.250	-	-	-	6.250	6.080		
1937	6.430	16.900	26.900	21.000	-	-	-	8.690	6.110		
1938	4.930	11.900	18.600	15.500	-	-	-	8.375	6.500		
1939	5.950	17.200	17.900	17.000	-	-	-	7.500	6.660		

Appendix V-II(a)

Five Year Moving Averages; Wool,
Cotton, Shoddy, and Mungo, 1803-1937.

FIVE YEAR MOVING AVERAGES WOOL, COTTON, SHODDY AND MUNGO PRICES

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip AV Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1803	15.400	12.850	-	21.400	-	-	-	-
1804	15.450	13.050	-	22.000	-	-	-	-
1805	15.150	12.550	-	23.000	-	-	-	-
1806	17.050	12.050	-	23.200	-	-	-	-
1807	18.250	12.050	-	26.000	-	-	-	-
1808	18.000	11.900	-	26.200	-	-	-	-
1809	16.850	11.500	-	25.200	-	-	-	-
1810	17.300	12.100	-	24.400	-	-	-	-
1811	17.500	13.000	-	24.800	-	-	-	-
1812	19.400	14.100	-	22.800	-	-	-	-
1813	20.500	15.800	-	21.800	-	-	-	-
1814	21.650	16.700	-	22.000	-	-	-	-
1815	22.326	17.200	-	22.800	-	-	-	-
1816	21.726	18.800	-	24.200	-	-	-	-
1817	18.526	18.300	-	22.800	-	-	-	-
1818	16.676	17.200	-	21.600	-	-	-	-
1819	14.926	16.800	-	21.000	-	-	-	-
1820	12.550	16.200	-	19.200	11.600	5.600	-	-
1821	10.200	14.050	-	16.200	8.474	4.025	-	-
1822	9.200	13.150	-	15.200	7.749	3.625	-	-
1823	9.226	13.350	-	15.000	7.274	3.700	-	-
1824	8.676	13.150	-	14.000	6.674	3.275	-	-
1825	8.326	13.050	-	12.800	6.624	3.300	-	-
1826	7.952	13.000	-	11.400	6.600	3.325	-	-
1827	7.402	12.600	-	9.900	6.150	3.175	-	-
1828	6.452	10.900	-	8.600	5.550	2.625	-	-
1829	6.302	10.700	-	9.300	6.100	2.900	-	-
1830	6.328	11.000	-	9.900	6.300	3.025	3.250	-
1831	6.752	11.600	-	11.700	7.275	3.500	3.650	-
1832	7.328	12.700	-	14.100	8.575	3.675	4.150	-

FIVE YEAR MOVING AVERAGES WOOL, COTTON, SHODDY AND MUNGO PRICES (Contd)

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip Av Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1833	8.002	14.000	-	15.500	9.525	4.225	4.200	-
1834	8.778	14.800	-	16.400	9.975	4.625	4.200	-
1835	8.852	14.900	-	16.400	9.775	4.625	4.150	-
1836	8.552	14.900	-	16.200	9.925	4.375	3.950	-
1837	8.402	15.200	-	15.900	9.550	4.750	3.700	-
1838	7.552	14.600	-	15.300	9.325	4.575	3.600	-
1839	6.826	13.900	-	13.900	8.625	4.050	3.300	-
1840	6.502	13.400	-	13.550	8.650	3.925	3.100	-
1841	6.028	12.600	14.800	12.400	7.600	3.675	2.900	2.850
1842	5.428	11.400	14.400	11.500	7.350	3.350	2.800	2.600
1843	5.054	11.500	14.700	11.550	7.200	3.300	2.800	2.350
1844	4.780	11.600	14.700	11.850	6.925	3.450	2.800	2.350
1845	4.930	11.800	14.900	12.150	6.925	3.525	2.850	2.650
1846	4.830	12.000	15.100	11.900	6.925	3.505	2.900	2.950
1847	4.880	11.800	15.300	11.450	6.700	3.430	2.800	3.150
1848	5.454	11.400	15.000	11.050	6.725	3.455	2.700	3.550
1849	5.578	11.300	15.200	11.000	6.800	3.480	2.750	4.050
1850	5.414	11.625	16.000	11.250	6.875	3.655	2.750	4.226
1851	5.738	12.625	17.000	12.900	7.900	4.300	2.800	4.558
1852	5.788	13.725	17.400	13.200	7.825	4.500	3.100	4.982
1853	5.514	14.125	17.600	13.650	7.875	4.550	3.150	5.188
1854	5.676	14.825	18.400	14.400	8.500	4.800	3.250	5.138
1855	6.164	16.200	19.400	15.400	9.250	5.300	3.550	5.498
1856	6.390	16.125	19.800	14.900	8.800	5.075	3.600	5.694
1857	6.664	16.750	20.200	16.100	9.575	5.400	3.700	5.694
1858	6.788	18.175	20.400	17.200	10.600	5.575	4.200	5.812
1859	7.238	18.875	19.800	17.200	10.900	5.675	4.500	6.222
1860	9.138	18.875	18.400	17.150	10.975	5.700	4.650	6.296
1861	12.412	20.275	18.800	18.350	12.200	6.375	5.050	6.392
1862	16.562	22.025	19.000	19.600	13.575	7.125	5.250	6.684
1863	19.112	23.150	18.800	19.950	13.525	7.675	5.324	6.926

FIVE YEAR MOVING AVERAGES WOOL, COTTON, SHODDY AND MUNGO PRICES (contd)

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip AV Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1864	20.500	23.950	19.800	20.350	13.900	7.975	5.424	7.026
1865	19.226	23.625	20.600	20.100	13.550	7.800	5.474	7.124
1866	16.676	22.600	19.600	19.100	12.975	7.050	5.424	7.286
1867	13.602	20.750	18.800	17.050	11.700	6.100	5.264	7.240
1868	11.790	18.950	18.200	15.400	10.975	5.450	4.940	7.070
1869	10.402	18.525	17.850	15.350	10.600	5.300	4.740	6.876
1870	10.338	19.825	19.000	16.350	11.900	6.050	4.690	6.588
1871	10.038	21.225	20.600	16.900	11.400	6.225	4.790	6.292
1872	9.212	21.750	22.100	17.600	11.425	6.425	4.750	6.072
1873	8.700	22.350	23.500	18.650	12.350	6.900	4.800	5.808
1874	8.238	21.625	23.300	18.300	12.225	6.625	4.800	5.632
1875	7.388	19.800	22.200	17.400	11.400	5.775	4.750	5.602
1876	6.814	17.900	21.200	16.750	11.850	5.725	4.650	5.452
1877	6.476	16.250	20.250	15.700	11.200	5.300	4.750	5.402
1878	6.388	15.325	20.150	15.050	10.550	4.975	4.850	5.332
1879	6.426	14.250	20.000	14.650	10.250	4.625	4.850	5.132
1880	6.490	13.250	19.900	14.250	9.500	4.350	4.850	4.920
1871	6.414	12.250	19.700	13.900	8.850	4.100	4.724	4.808
1882	6.352	11.750	19.600	14.100	8.800	4.150	4.560	4.618
1883	6.090	10.700	18.600	13.300	8.050	3.750	4.334	4.506
1884	5.828	10.225	17.800	12.800	7.700	3.775	4.222	4.490
1885	5.602	10.075	17.000	12.400	7.900	3.750	4.046	4.396
1886	5.564	10.150	16.350	11.800	8.000	3.800	3.922	4.234
1887	5.552	10.350	16.150	11.600	8.000	3.850	3.842	3.994
1888	5.626	10.575	16.050	11.700	8.100	3.950	3.786	3.888
1889	5.538	10.525	15.900	11.700	8.075	4.000	3.598	3.802
1890	5.276	10.175	15.350	11.200	7.775	3.975	3.474	3.868
1891	5.090	10.150	14.750	11.200	7.575	3.925	3.390	3.976
1892	4.664	9.975	13.650	10.950	7.425	3.875	3.274	4.130
1893	4.226	10.175	12.850	10.650	7.275	3.825	3.198	4.210
1894	4.152	10.525	12.500	10.400	7.250	3.775	3.214	4.296

FIVE YEAR MOVING AVERAGES WOOL, COTTON, SHODDY AND MUNGO PRICES (Contd)

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip Av Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1895	4.102	10.700	12.350	10.200	7.000	3.750	3.288	4.320
1896	3.838	10.400	12.450	9.900	6.700	3.750	3.406	4.370
1897	3.788	10.025	13.550	9.750	6.450	3.750	3.566	4.482
1898	4.126	9.200	14.300	9.900	6.150	3.700	3.856	4.594
1899	4.212	8.275	14.300	9.400	5.500	3.575	4.090	4.494
1900	4.400	7.600	14.850	9.250	5.100	3.450	4.216	4.344
1901	4.944	7.300	15.400	9.650	5.050	3.450	4.332	4.244
1902	5.552	7.675	15.150	10.000	5.500	3.650	4.782	4.132
1903	5.470	8.575	15.450	10.550	6.250	4.000	5.000	3.908
1904	5.710	9.875	16.450	12.000	7.350	4.600	5.375	3.896
1905	6.044	11.075	17.050	12.800	-	5.150	5.725	3.972
1906	5.982	11.325	17.000	12.700	-	-	5.925	3.972
1907	5.928	11.100	17.350	13.050	-	-	5.825	3.972
1908	6.510	10.600	17.550	13.050	-	-	5.875	3.972
1909	6.728	9.925	17.400	12.600	-	-	5.850	4.000
1910	6.708	9.575	17.300	12.850	-	-	5.850	3.882
1911	6.966	10.350	17.750	13.950	-	-	6.550	3.790
1912	6.982	11.075	17.900	14.150	-	-	7.250	4.050
1913	6.556	12.575	18.525	15.950	-	-	8.650	4.688
1914	6.948	14.575	21.625	17.600	-	-	10.550	6.032
1915	8.968	16.650	27.425	19.450	-	-	12.850	8.100
1916	12.026	17.925	33.275	21.250	-	-	15.650	10.884
1917	14.674	19.925	42.975	27.950	-	-	19.200	13.200
1918	18.128	20.850	54.675	34.650	-	-	23.600	15.716
1919	18.208	18.570	54.500	33.500	-	-	22.000	15.482
1920	17.318	16.345	53.000	32.850	-	-	19.900	14.032
1921	15.908	14.995	52.286	32.950	-	-	16.600	11.854
1922	15.230	14.245	49.574	29.400	-	-	14.250	9.804
1923	13.130	13.285	41.811	22.300	-	-	9.350	7.426
1924	13.130	14.565	42.736	22.950	-	-	9.250	6.850
1925	12.618	15.683	42.548	23.500	-	-	9.150	6.938

FIVE YEAR MOVING AVERAGES WOOL, COTTON, SHODDY AND MUNGO PRICES (Contd)

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip Av Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1926	11.752	16.865	41.212	23.800	-	-	9.450	7.032
1927	10.552	16.302	37.599	22.250	-	-	8.300	7.150
1928	9.522	15.012	33.043	21.150	-	-	7.475	6.974
1929	8.822	13.712	28.683	19.950	-	-	7.175	6.954
1930	7.962	11.800	24.071	17.950	-	-	7.175	6.720
1931	6.886	9.374	20.651	15.450	-	-	6.800	6.454
1932	6.170	7.562	17.826	14.150	-	-	6.175	6.136
1933	6.014	6.880	18.190	14.350	-	-	6.225	5.990
1934	6.174	7.264	20.190	14.900	-	-	6.375	5.902
1935	6.412	9.488	22.570	16.550	-	-	6.813	5.920
1936	6.290	10.712	22.310	16.750	-	-	7.263	6.054
1937	6.144	11.752	21.640	16.950	-	-	7.488	6.236

Appendix V-II(b)

Nine Year Moving Averages; Wool,
Cotton, Shoddy, and Mungo, 1805-1935.

NINE YEAR MOVING AVERAGES WOOL, COTTON, SHODDY AND MUNGO PRICES

Year	U.S.		Lincoln Half Hog	Port Phillip AV Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
	Uplands Cotton	Down							
1805	16.861	12.250	-	-	23.333	-	-	-	-
1806	16.556	12.361	-	-	24.333	-	-	-	-
1807	16.167	12.306	-	-	24.111	-	-	-	-
1808	16.639	12.361	-	-	24.111	-	-	-	-
1809	17.639	12.417	-	-	24.222	-	-	-	-
1810	19.083	12.944	-	-	24.111	-	-	-	-
1811	19.361	13.889	-	-	24.222	-	-	-	-
1812	19.778	14.611	-	-	23.556	-	-	-	-
1813	19.570	15.222	-	-	23.889	-	-	-	-
1814	19.570	16.167	-	-	23.222	-	-	-	-
1815	19.376	16.500	-	-	22.222	-	-	-	-
1816	19.254	17.056	-	-	22.222	-	-	-	-
1817	18.452	17.222	-	-	21.667	-	-	-	-
1818	16.820	17.000	-	-	20.778	-	-	-	-
1819	14.459	16.139	-	-	19.556	-	-	-	-
1820	13.098	15.028	-	-	18.556	-	-	-	-
1821	12.362	15.194	-	-	18.333	-	-	-	-
1822	10.876	14.972	-	-	16.778	9.402	4.611	-	-
1823	9.376	13.806	-	-	14.444	7.847	3.764	-	-
1824	8.584	13.194	-	-	13.222	7.180	3.528	-	-
1825	7.946	12.472	-	-	12.056	6.555	3.250	-	-
1826	7.654	11.917	-	-	11.444	6.069	2.986	-	-
1827	7.404	11.917	-	-	11.278	6.347	3.111	-	-
1828	7.224	12.111	-	-	10.944	6.639	3.208	-	-
1829	7.224	12.333	-	-	11.278	6.917	3.458	-	-
1830	6.891	12.111	-	-	11.556	7.278	3.236	-	-
1831	7.280	12.389	-	-	12.278	7.653	3.514	-	-
1832	7.656	12.889	-	-	13.278	8.206	3.847	3.722	-
1833	7.724	13.167	-	-	13.722	8.403	3.931	3.833	-
1834	7.863	13.611	-	-	14.778	9.014	4.125	3.972	-
1835	7.974	14.500	-	-	15.611	9.500	4.417	3.972	-

NINE YEAR MOVING AVERAGES WOOL, COTTON, SHODDY AND MUNGO PRICES (Contd)

Year	U.S.		Port		Dorset Down	Laid		Highland	Shoddy	Mungo
	Uplands Cotton	Lincoln Half Hog	Phillip Av Fleece	Cheviot		Highland				
1836	7.974	14.556	-	9.444	15.611	4.444	3.861	-		
1837	7.932	14.500	-	9.500	15.500	4.417	3.750	-		
1838	7.586	14.167	-	9.167	14.750	4.167	3.528	-		
1839	7.141	13.556	-	8.472	13.833	4.125	3.278	-		
1840	6.544	13.056	-	8.292	13.389	3.931	3.194	-		
1841	5.906	12.722	-	7.903	12.917	3.708	3.083	-		
1842	5.670	12.667	13.611	7.917	12.972	3.764	3.000	2.639		
1843	5.573	12.444	15.167	7.500	12.500	3.694	2.917	2.694		
1844	5.157	11.778	14.833	7.014	11.611	3.433	2.833	2.722		
1845	5.060	11.500	14.611	6.833	11.250	3.294	2.750	2.778		
1846	5.143	11.333	14.722	6.847	11.333	3.378	2.750	3.000		
1847	5.157	11.500	15.167	6.889	11.556	3.517	2.806	3.306		
1848	5.232	11.903	15.833	7.097	11.861	3.683	2.833	3.598		
1849	5.329	12.458	16.278	7.319	12.389	3.961	2.833	3.893		
1850	5.468	12.736	16.111	7.181	12.167	3.961	2.917	4.240		
1851	5.551	12.736	16.333	7.375	12.333	3.989	2.944	4.577		
1852	5.571	13.181	17.111	7.764	12.806	4.225	3.028	4.688		
1853	5.973	14.236	18.222	8.329	13.806	4.681	3.194	5.013		
1854	6.168	14.861	18.778	8.486	14.306	4.875	3.278	5.307		
1855	6.140	15.708	19.000	8.764	14.972	5.042	3.472	5.431		
1856	6.223	16.556	19.222	9.486	15.778	5.153	3.750	5.556		
1857	6.584	17.208	19.222	10.000	16.111	5.347	4.000	5.797		
1858	7.862	17.708	19.000	10.097	16.167	5.458	4.222	5.979		
1859	9.848	18.500	19.556	10.917	17.167	5.917	4.361	6.090		
1860	12.278	20.097	19.778	11.931	18.278	6.472	4.639	6.262		
1861	13.688	21.181	19.444	12.276	18.861	6.750	4.902	6.549		
1862	14.549	21.514	19.444	12.583	18.861	6.833	5.041	6.646		
1863	14.993	21.875	19.444	12.736	19.056	6.972	5.263	6.773		
1864	15.410	21.750	19.222	12.806	18.833	6.833	5.319	6.974		
1865	16.063	21.528	18.889	12.542	18.194	6.764	5.230	7.056		
1866	16.217	21.222	18.556	12.319	17.861	6.625	5.147	7.020		

NINE YEAR MOVING AVERAGES WOOL, COTTON, SHODDY AND MUNGO PRICES (Contd)

Year	U.S.		Lincoln Half Hog	Fort Phillip Av Fleece	Dorset Down	Laid		Mungo
	Uplands Cotton	Shoddy						
1867	15.251	6.091	21.319	19.139	17.861	6.611	5.091	6.968
1868	13.841	5.063	21.625	19.556	17.944	6.792	5.063	6.882
1869	11.786	5.063	21.306	20.111	17.333	6.333	5.063	6.757
1870	10.563	4.911	20.750	20.722	16.889	6.069	4.911	6.581
1871	9.661	4.800	20.333	20.611	16.917	6.028	4.800	6.343
1872	9.147	4.717	20.208	20.639	16.861	5.958	4.717	6.139
1873	8.681	4.689	20.069	21.000	17.000	6.083	4.689	5.947
1874	8.014	4.722	19.722	21.444	17.167	6.125	4.722	5.763
1875	7.611	4.806	19.250	21.861	17.056	5.986	4.806	5.654
1876	7.431	4.861	18.556	21.889	16.750	5.847	4.861	5.486
1877	6.973	4.806	17.111	21.194	15.917	5.167	4.806	5.330
1878	6.710	4.722	15.639	20.611	15.528	5.042	4.722	5.184
1879	6.460	4.708	14.444	20.111	15.111	4.833	4.708	5.061
1880	6.307	4.672	13.361	19.694	14.528	4.458	4.672	4.993
1881	6.232	4.602	12.486	19.278	13.972	4.250	4.602	4.860
1882	6.107	4.512	11.792	18.750	13.361	4.056	4.512	4.712
1883	6.037	4.412	11.292	18.278	13.111	3.944	4.412	4.598
1884	5.953	4.250	11.056	17.944	12.944	4.000	4.250	4.412
1885	5.842	4.112	10.597	17.472	12.611	3.833	4.112	4.250
1886	5.793	4.011	10.444	17.083	12.333	3.875	4.011	4.169
1887	5.578	3.817	10.278	16.528	11.944	3.861	3.817	4.091
1888	5.404	3.692	10.139	15.861	11.611	3.875	3.692	4.076
1889	5.252	3.598	10.167	15.250	11.333	3.875	3.598	4.056
1890	5.050	3.523	10.194	14.722	11.306	3.903	3.523	4.041
1891	4.903	3.442	10.417	14.333	11.139	3.903	3.442	4.013
1892	4.772	3.354	10.528	14.028	10.833	3.875	3.354	4.036
1893	4.592	3.340	10.444	13.639	10.722	3.847	3.340	4.123
1894	4.300	3.356	10.194	13.194	10.389	3.819	3.356	4.264
1895	4.029	3.401	9.889	13.333	10.222	3.792	3.401	4.371
1896	4.119	3.586	9.681	13.444	10.139	3.736	3.586	4.453
1897	4.181	3.697	9.472	13.444	9.833	3.653	3.697	4.383

NINE YEAR MOVING AVERAGES WOOL, COTTON, SHODDY AND MUNGO PRICES (Contd)

Year	U. S.		Lincoln Half Hog	Port		Dorset Down	Laid		Shoddy	Mungo
	Uplands Cotton	Phillip AV Fleece		Cheviot	Highland					
1898	4.209	13.694	9.028	9.639	5.917	3.583	3.799	4.328		
1899	4.456	14.167	8.708	9.667	5.750	3.583	3.943	4.328		
1900	4.766	14.611	8.500	9.861	5.861	3.694	4.281	4.328		
1901	4.851	15.083	8.597	10.222	6.056	3.861	4.578	4.238		
1902	5.074	15.722	9.014	10.833	6.444	4.125	4.856	4.148		
1903	5.434	16.250	9.403	11.250	-	4.361	5.087	4.107		
1904	5.674	16.083	9.431	11.306	-	-	5.254	4.044		
1905	5.767	16.306	9.556	11.611	-	-	5.375	3.982		
1906	6.128	16.889	9.889	12.250	-	-	5.569	3.948		
1907	6.368	17.139	10.306	12.694	-	-	5.764	3.957		
1908	6.414	17.306	10.667	13.028	-	-	5.931	3.906		
1909	6.460	17.528	10.917	13.500	-	-	6.236	3.854		
1910	6.607	17.667	10.944	13.611	-	-	6.625	4.061		
1911	6.598	18.042	11.389	14.444	-	-	7.389	4.388		
1912	6.870	19.681	12.250	15.361	-	-	8.444	5.101		
1913	8.073	23.097	13.625	16.778	-	-	9.778	6.199		
1914	9.848	26.375	14.708	18.056	-	-	11.694	7.694		
1915	11.142	31.792	16.125	21.889	-	-	14.028	9.188		
1916	12.931	38.750	17.458	26.694	-	-	17.250	10.897		
1917	13.259	40.347	17.247	26.833	-	-	17.417	11.546		
1918	13.824	42.681	16.956	27.278	-	-	17.194	11.889		
1919	14.807	45.478	16.886	28.500	-	-	16.889	12.030		
1920	15.961	49.041	17.053	29.361	-	-	17.139	12.030		
1921	16.366	49.964	16.742	29.306	-	-	16.583	11.671		
1922	15.571	48.853	16.089	28.778	-	-	15.417	10.851		
1923	14.153	47.832	15.710	28.528	-	-	13.583	9.097		
1924	13.183	44.499	15.186	26.194	-	-	11.472	8.603		
1925	11.752	39.554	14.526	22.472	-	-	8.639	7.271		
1926	11.540	38.044	14.765	22.444	-	-	8.514	6.944		
1927	10.851	35.344	14.626	21.611	-	-	8.347	6.919		
1928	9.739	32.157	13.935	20.194	-	-	8.347	6.844		

NINE YEAR MOVING AVERAGES WOOL, COTTON, SHODDY AND MUNGO PRICES (Contd)

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip AV Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1929	8.548	12.480	28.431	18.444	-	-	7.333	6.742
1930	7.686	11.347	26.229	17.944	-	-	6.875	6.554
1931	7.587	10.496	24.107	17.667	-	-	6.833	6.467
1932	7.271	9.949	22.923	16.833	-	-	6.806	6.343
1933	6.772	9.837	21.801	16.167	-	-	6.882	6.227
1934	6.180	9.374	19.937	15.389	-	-	6.757	6.133
1935	6.009	9.536	19.894	15.611	-	-	6.882	6.144

Appendix V-III

Price Indices; Wool, Cotton, Shoddy,
and Mungo, 1801-1939 (1839=100).

WOOL, COTTON, SHODDY AND MUNGO PRICE INDICES 1801-1939
(1839 = 100)

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip Av Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1801	228	73	-	111	-	-	-	-
1802	203	70	-	111	-	-	-	-
1803	158	70	-	117	-	-	-	-
1804	177	79	-	129	-	-	-	-
1805	209	83	-	158	-	-	-	-
1806	231	79	-	129	-	-	-	-
1807	184	55	-	141	-	-	-	-
1808	279	55	-	123	-	-	-	-
1809	253	79	-	211	-	-	-	-
1810	193	79	-	164	-	-	-	-
1811	158	67	-	100	-	-	-	-
1812	212	73	-	117	-	-	-	-
1813	291	82	-	135	-	-	-	-
1814	374	111	-	152	-	-	-	-
1815	263	129	-	135	-	-	-	-
1816	231	94	-	105	-	-	-	-
1817	255	88	-	141	-	-	-	-
1818	253	129	-	176	215	212	-	-
1819	171	97	-	111	113	100	-	-
1820	145	97	-	100	110	95	-	-
1821	120	82	-	88	100	95	-	-
1822	104	70	-	88	71	57	-	-
1823	104	66	-	88	51	55	-	-
1824	107	70	-	82	75	60	-	-
1825	147	102	-	94	85	102	-	-
1826	85	76	-	58	68	52	-	-
1827	82	67	-	52	68	60	-	-
1828	80	64	-	47	50	57	71	-
1829	72	58	-	38	51	45	64	-
1830	87	52	-	55	53	47	100	-

WOOL, COTTON, SHODDY AND MUNGO PRICE INDICES 1801-1939 (Contd)
 (1839 = 100)

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Philip Av Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1831	76	70	-	79	97	80	121	-
1832	84	76	-	70	78	72	107	-
1833	107	82	-	100	101	105	128	-
1834	109	91	-	108	119	62	135	-
1835	130	91	-	97	103	102	107	-
1836	125	94	-	105	121	120	121	-
1837	88	79	-	70	68	72	100	-
1838	88	82	-	94	109	80	100	100
1839	100	100	100	100	100	100	100	100
1840	76	73	106	79	92	85	92	76
1841	79	73	100	64	84	67	78	69
1842	68	64	81	60	69	60	71	61
1843	58	58	75	60	53	55	71	61
1844	61	64	87	73	86	67	85	76
1845	52	76	115	80	84	80	92	76
1846	61	76	100	73	69	82	78	76
1847	77	70	87	69	69	67	78	115
1848	52	64	81	52	53	53	78	107
1849	65	58	93	60	75	60	71	107
1850	98	64	106	69	85	82	78	138
1851	69	73	106	72	73	85	85	153
1852	67	80	112	76	73	85	78	142
1853	72	94	112	101	107	117	85	158
1854	68	91	106	69	71	80	114	172
1855	71	76	112	82	88	87	85	170
1856	80	94	131	94	106	110	100	146
1857	98	120	143	105	113	135	121	197
1858	87	91	125	86	84	95	92	188
1859	85	109	118	104	111	112	128	172
1860	79	118	118	114	142	105	157	188
1861	108	114	112	94	122	120	142	209
1862	218	120	100	104	117	137	142	209

WOOL, COTTON, SHODDY AND MUNGO PRICE INDICES (Contd)
(1839 = 100)

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip Av Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1863	295	133	137	122	148	162	150	203
1864	348	161	125	141	184	187	157	217
1865	241	151	112	125	139	160	167	225
1866	196	138	143	105	142	150	157	224
1867	138	111	125	97	98	120	150	224
1868	133	102	106	92	118	87	142	228
1869	153	106	100	80	117	92	134	210
1870	126	98	93	76	101	95	121	199
1871	108	125	132	104	122	135	128	194
1872	134	149	160	126	167	195	142	180
1873	114	144	156	108	92	105	157	183
1874	101	122	146	101	118	112	128	176
1875	93	116	137	107	150	142	128	158
1876	79	104	126	94	115	107	128	167
1877	80	95	126	100	123	110	135	175
1878	77	88	125	89	115	100	142	160
1879	80	73	117	70	84	70	142	169
1880	88	88	134	88	115	110	142	148
1881	81	72	121	82	100	72	128	136
1882	84	66	123	88	84	82	135	142
1883	72	58	118	79	81	75	124	142
1884	76	58	114	76	81	75	119	140
1885	71	58	103	64	76	70	110	134
1886	65	58	96	67	81	75	112	134
1887	69	61	98	76	94	80	110	128
1888	70	61	98	61	86	80	107	117
1889	75	64	107	70	81	80	108	103
1890	76	64	100	67	81	80	102	114
1891	59	57	92	67	80	80	85	121
1892	53	51	81	61	78	77	92	138
1893	58	60	79	61	76	75	95	134
1894	48	59	73	63	73	75	91	126

WOOL, COTTON, SHODDY AND MUNGO PRICE INDICES 1801-1939 (Contd)
 (1839 = 100)

Year	U.S. Upland Cotton	Lincoln Half Hog	Port Phillip Av Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1895	48	70	75	58	73	75	91	126
1896	54	67	81	60	78	75	88	134
1897	50	56	76	55	65	75	103	142
1898	42	51	82	52	60	75	112	142
1899	45	48	107	58	60	75	114	144
1900	69	46	98	63	57	70	133	144
1901	60	40	81	45	44	62	121	119
1902	61	36	93	51	44	62	121	119
1903	76	42	100	64	57	75	128	126
1904	83	59	100	69	84	95	178	126
1905	64	72	107	79	97	105	164	109
1906	75	78	112	88	102	122	175	117
1907	83	72	112	75	117	117	171	130
1908	72	50	98	61	-	-	157	126
1909	80	52	110	79	-	-	164	126
1910	101	58	114	79	-	-	171	109
1911	89	58	107	75	-	-	171	121
1912	81	61	109	82	-	-	171	112
1913	88	72	112	94	-	-	257	112
1914	81	74	115	85	-	-	264	166
1915	74	102	133	132	-	-	371	207
1916	114	117	204	123	-	-	442	328
1917	210	122	290	136	-	-	500	430
1918	282	110	295	147	-	-	657	540
1919	249	133	418	282	-	-	771	523
1920	293	129	499	329	-	-	1000	594
1921	119	50	199	89	-	-	214	292
1922	153	57	243	117	-	-	200	207
1923	193	70	273	150	-	-	185	205
1924	206	111	334	177	-	-	435	207
1925	160	101	256	120	-	-	300	228
1926	119	88	228	108	-	-	200	203

WOOL, COTTON, SHODDY AND MUNGO PRICE INDICES 1801-1939 (Contd)

(1839 = 100)

Year	Uplands Cotton	Lincoln Half Hog	Phillip Av Fleece	Dorset Down	Laid Cheviot	Laid Highland	Shoddy	Mungo
1927	121	90	237	133	-	-	185	221
1928	138	105	231	158	-	-	228	220
1929	130	94	221	132	-	-	271	225
1930	95	63	114	88	-	-	182	201
1931	74	50	91	73	-	-	157	200
1932	66	34	93	75	-	-	185	185
1933	70	34	124	85	-	-	175	179
1934	84	41	132	94	-	-	182	176
1935	85	43	125	94	-	-	189	179
1936	85	61	154	89	-	-	178	187
1937	81	99	168	123	-	-	248	188
1938	62	70	116	91	-	-	239	200
1939	75	71	111	100	-	-	214	204

Appendix V-IV(a)

Price Relatives; Wool and Cotton
to Shoddy, 1839-1938.

PRICE RELATIVES WOOL AND COTTON TO SHODDY 1839 - 1938

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip Av Fleece	Dorset Down	Laid Cheviot	Laid Highland
1839	100	100	100	100	100	100
1840	121	126	86	116	100	108
1841	98	106	78	121	92	116
1842	104	110	87	118	102	118
1843	122	122	94	118	133	129
1844	139	132	97	116	98	126
1845	176	121	80	115	109	115
1846	127	102	78	106	113	95
1847	101	111	89	113	113	116
1848	150	121	96	150	147	147
1849	109	122	76	118	94	118
1850	88	121	73	113	91	95
1851	123	116	80	118	116	100
1852	116	97	69	102	106	91
1853	118	90	75	84	79	72
1854	167	125	107	165	160	142
1855	119	111	75	103	96	97
1856	125	106	76	106	94	90
1857	123	100	84	115	107	89
1858	105	101	73	106	109	96
1859	150	117	108	123	115	114
1860	198	133	133	137	110	149
1861	131	124	126	151	116	118
1862	65	118	142	136	121	103
1863	50	112	109	122	101	92
1864	45	97	125	111	85	83
1865	69	110	149	133	120	104
1866	80	113	109	149	110	104
1867	108	135	120	154	153	125
1868	106	139	133	154	120	163

PRICE RELATIVES WOOL AND COTTON TO SHODDY 1839-1938(Contd)

Year	U.S. Uplands Cotton	Lincoln Half Hog	Port Phillip Fleece	Dorset Down	Laid Cheviot	Laid Highland
1869	87	127	134	167	114	145
1870	96	123	130	159	119	127
1871	118	102	96	123	104	94
1872	105	95	88	112	85	72
1873	137	109	100	145	170	149
1874	126	104	87	126	108	114
1875	137	110	93	119	85	90
1876	162	123	101	136	111	119
1877	168	142	107	135	109	122
1878	184	161	113	159	123	142
1879	177	194	121	202	169	202
1880	161	161	105	161	123	129
1881	158	177	105	156	128	177
1882	160	204	109	153	160	164
1883	172	213	105	156	153	165
1884	156	205	104	156	146	158
1885	154	189	106	171	144	157
1886	172	193	116	167	138	149
1887	159	180	112	144	117	137
1888	152	175	109	175	124	133
1889	144	168	100	154	133	135
1890	134	159	102	152	125	127
1891	144	149	92	126	106	106
1892	173	180	113	150	117	119
1893	163	158	120	155	125	126
1894	189	154	124	144	124	121
1895	189	130	121	156	124	121
1896	162	131	108	146	112	117
1897	206	183	135	187	158	137
1898	266	219	136	215	186	149
1899	253	237	106	196	190	152

PRICE RELATIVES WOOL AND COTTON TO SHODDY 1839-1938(Contd)

Year	U.S. Uplands Cotton	Lincoln Half-Hog	Port Philip Av. Fleece	Dorset Down	Laid Cheviot	Laid Highland
1900	192	289	135	211	233	190
1901	201	302	149	268	275	195
1902	198	336	130	237	275	195
1903	168	304	128	200	224	170
1904	214	301	178	257	211	187
1905	256	227	153	207	169	156
1906	233	224	156	198	171	143
1907	206	237	152	228	-	146
1908	218	314	160	257	-	-
1909	205	315	149	207	-	-
1910	169	294	150	216	-	-
1911	192	294	159	228	-	-
1912	211	280	156	208	-	-
1913	292	356	229	273	-	-
1914	325	356	229	310	-	-
1915	501	363	278	281	-	-
1916	387	377	216	359	-	-
1917	238	409	172	367	-	-
1918	232	597	222	446	-	-
1919	309	579	184	273	-	-
1920	341	775	200	303	-	-
1921	179	428	107	240	-	-
1922	130	350	82	170	-	-
1923	95	264	67	123	-	-
1924	211	391	130	245	-	-
1925	187	297	117	250	-	-
1926	168	227	87	185	-	-
1927	152	205	78	139	-	-
1928	165	217	98	144	-	-
1929	208	288	122	205	-	-
1930	191	288	159	206	-	-

PRICE RELATIVES WOOL AND COTTON TO SHODDY 1839-1938(Contd)

Year	U.S.		Lincoln		Port Philip		Dorset		Laid	
	Uplands Cotton	Half Hog	Half Hog	AV Fleece	Down	Cheviot	Highland			
1931	212	314		172	215	-	-	-	-	
1932	280	544		198	246	-	-	-	-	
1933	250	514		141	205	-	-	-	-	
1934	216	443		137	193	-	-	-	-	
1935	222	439		151	201	-	-	-	-	
1936	209	291		115	200	-	-	-	-	
1937	306	250		147	201	-	-	-	-	
1938	385	341		206	262	-	-	-	-	

Appendix V-IV(b)

Price Relatives; Wool and Cotton
to Mungo, 1839-1938.

PRICE RELATIVES WOOL AND COTTON TO MUNGO 1839 - 1938

Year	U.S.				Dorset Down	Laid Chevlot	Laid Highland
	Uplands Cotton	Lincoln Half Hoq	Philip AV Fleece	Port			
1839	100	100	100	100	100	100	100
1840	121	126	86	116	100	100	108
1841	96	104	76	118	90	90	113
1842	101	107	85	115	100	100	115
1843	105	105	81	101	115	115	110
1844	124	118	87	104	88	88	113
1845	146	100	66	95	90	90	95
1846	124	100	76	104	110	110	92
1847	149	164	132	166	166	166	171
1848	205	167	132	205	201	201	201
1849	164	184	115	178	142	142	178
1850	156	215	130	200	162	162	168
1851	221	209	144	212	209	209	180
1852	211	177	126	186	194	194	167
1853	219	168	141	156	147	147	135
1854	252	189	162	249	242	242	215
1855	239	223	151	207	193	193	195
1856	182	155	111	155	137	137	132
1857	201	164	137	187	174	174	145
1858	216	206	150	218	223	223	197
1859	202	157	145	165	154	154	153
1860	237	159	159	164	132	132	179
1861	193	183	186	222	171	171	174
1862	95	174	209	200	178	178	152
1863	68	152	148	166	137	137	125
1864	62	134	173	153	117	117	116
1865	93	149	200	180	161	161	140
1866	114	162	156	213	157	157	149
1867	162	201	179	230	228	228	186
1868	171	223	215	247	193	193	262

PRICE RELATIVES WOOL AND COTTON TO MUNGO 1839 - 1938 (contd)

Year	U.S.			Port			Dorset Down	Laid Cheviot	Laid Highland
	Uplands Cotton	Lincoln Half Hog	Phillip AV Fleece	Uplands Cotton	Lincoln Half Hog	Phillip AV Fleece			
1869	137	198	210	137	198	210	262	179	228
1870	157	203	213	157	203	213	261	197	209
1871	179	155	146	179	155	146	186	159	143
1872	134	120	112	134	120	112	142	107	92
1873	160	127	117	160	127	117	169	198	174
1874	174	144	120	174	144	120	174	149	157
1875	169	136	115	169	136	115	147	105	111
1876	211	160	132	211	160	132	177	145	156
1877	218	184	138	218	184	138	175	142	159
1878	207	181	128	207	181	128	179	139	160
1879	211	231	144	211	231	144	241	201	241
1880	168	168	110	168	168	110	168	128	134
1881	167	188	112	167	188	112	165	136	188
1882	169	215	115	169	215	115	161	169	173
1883	197	244	120	197	244	120	179	175	189
1884	184	241	122	184	241	122	184	172	186
1885	183	224	126	183	224	126	203	171	185
1886	206	231	139	206	231	139	200	165	178
1887	185	209	130	185	209	130	168	136	160
1888	167	191	119	167	191	119	191	136	146
1889	137	160	96	137	160	96	147	127	128
1890	150	178	114	150	178	114	170	140	142
1891	205	212	131	205	212	131	180	151	151
1892	260	270	170	260	270	170	226	176	179
1893	231	223	169	231	223	169	219	176	178
1894	262	213	172	262	213	172	200	172	168
1895	262	180	168	262	180	168	217	172	168
1896	248	200	165	248	200	165	223	171	178
1897	284	253	186	284	253	186	258	218	189
1898	338	278	173	338	278	173	273	236	189
1899	320	300	134	320	300	134	248	240	192

PRICE RELATIVES WOOL AND COTTON TO MUNGO 1839 - 1938 (Contd)

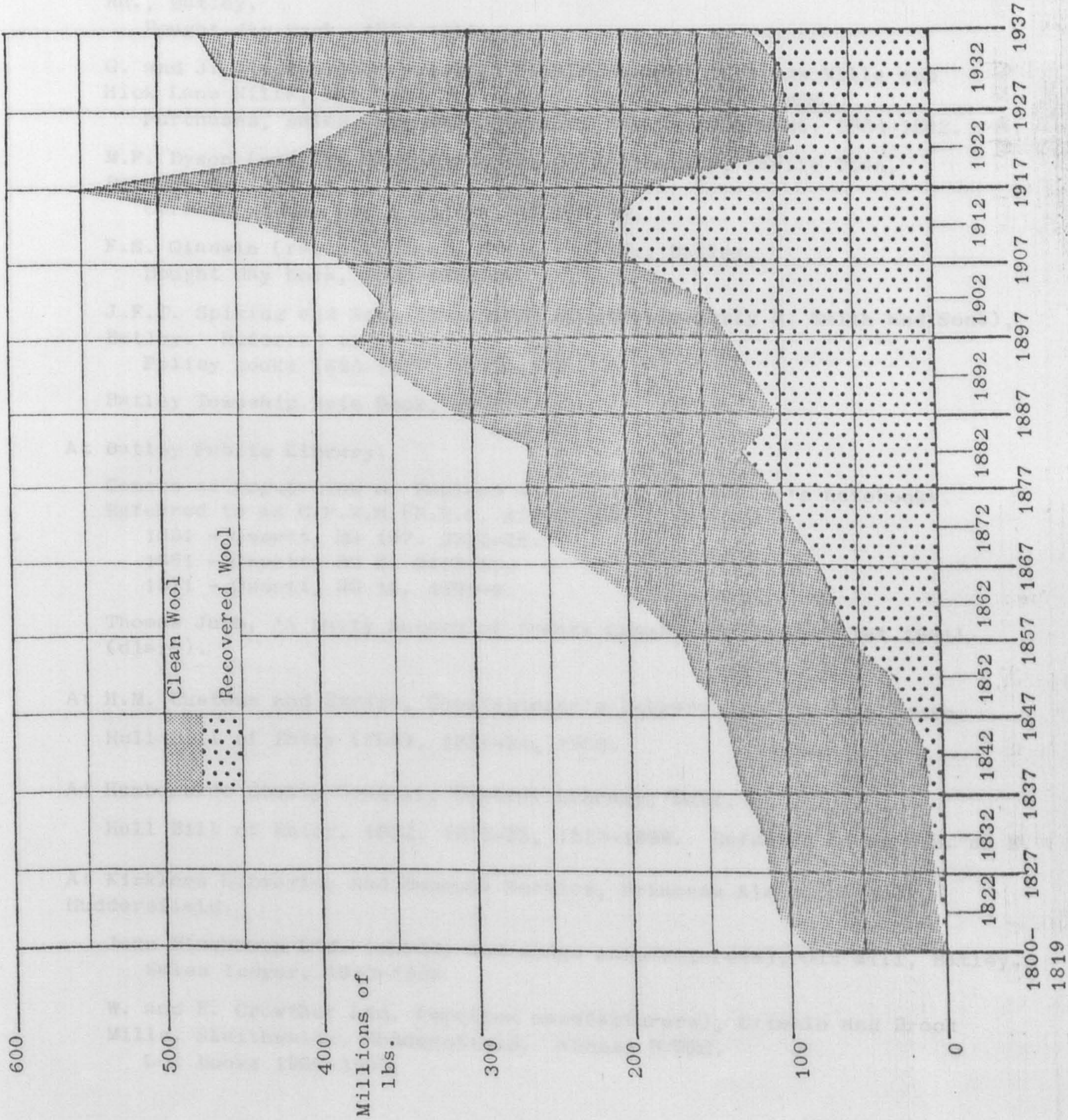
Year	U.S.			Port		Dorset Down	Laid Cheviot	Laid Highland
	Uplands Cotton	Lincoln Half Hog	Phillip Av Fleece					
1900	208	313	146	228	252	205		
1901	198	297	146	264	270	191		
1902	195	330	127	233	270	191		
1903	165	300	126	196	221	168		
1904	151	213	126	182	150	132		
1905	170	151	101	137	112	103		
1906	156	150	104	132	114	95		
1907	156	180	116	173	-	111		
1908	175	252	128	206	-	-		
1909	157	242	114	159	-	-		
1910	107	187	95	137	-	-		
1911	135	208	113	161	-	-		
1912	138	183	102	136	-	-		
1913	127	155	100	119	-	-		
1914	204	224	144	195	-	-		
1915	279	202	155	156	-	-		
1916	287	280	160	266	-	-		
1917	204	352	148	316	-	-		
1918	191	490	183	367	-	-		
1919	210	393	125	185	-	-		
1920	202	460	119	180	-	-		
1921	245	584	146	328	-	-		
1922	135	363	85	176	-	-		
1923	106	292	75	136	-	-		
1924	100	186	61	116	-	-		
1925	142	225	89	190	-	-		
1926	170	230	89	187	-	-		
1927	182	245	93	166	-	-		
1928	159	209	95	139	-	-		
1929	173	239	101	170	-	-		
1930	211	319	176	228	-	-		

PRICE RELATIVES WOOL AND COTTON TO MUNGO 1839 - 1938 (Contd)

Year	U.S.			Port		Dorset Down	Laid Cheviot	Laid Highland
	Uplands Cotton	Lincoln Half Hog	Phillip Av Fleece	Phillip Av Fleece				
1931	270	400	219		273	-	-	
1932	280	544	198		246	-	-	
1933	255	526	144		210	-	-	
1934	209	429	133		187	-	-	
1935	210	416	143		190	-	-	
1936	220	306	121		210	-	-	
1937	232	189	111		152	-	-	
1938	322	285	172		219	-	-	

Appendix V-V Estimated United Kingdom Consumption of Clean and Recovered Wool, 1800-1937
 (Quinquennial Means)

Alfred Briggs and Sons (Woolen Manufacturers), Leeds
 Mill notices of 1850-1854, Mill books 1855-1891 although the records of the latter have been lost with the exception of A. G. and J. Stabler, it has been possible to identify the material used in the industry. See P. Hudson, *ibid.*, p. 210.
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