

"Now Thus — Now Thus"

1826

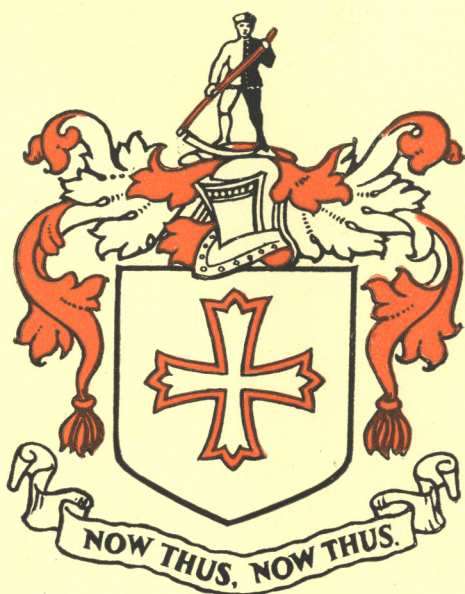
1926

PILKINGTON BROTHERS LIMITED

Glass Manufacturers

ST. HELENS
LANCS

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FOR PRIVATE CIRCULATION

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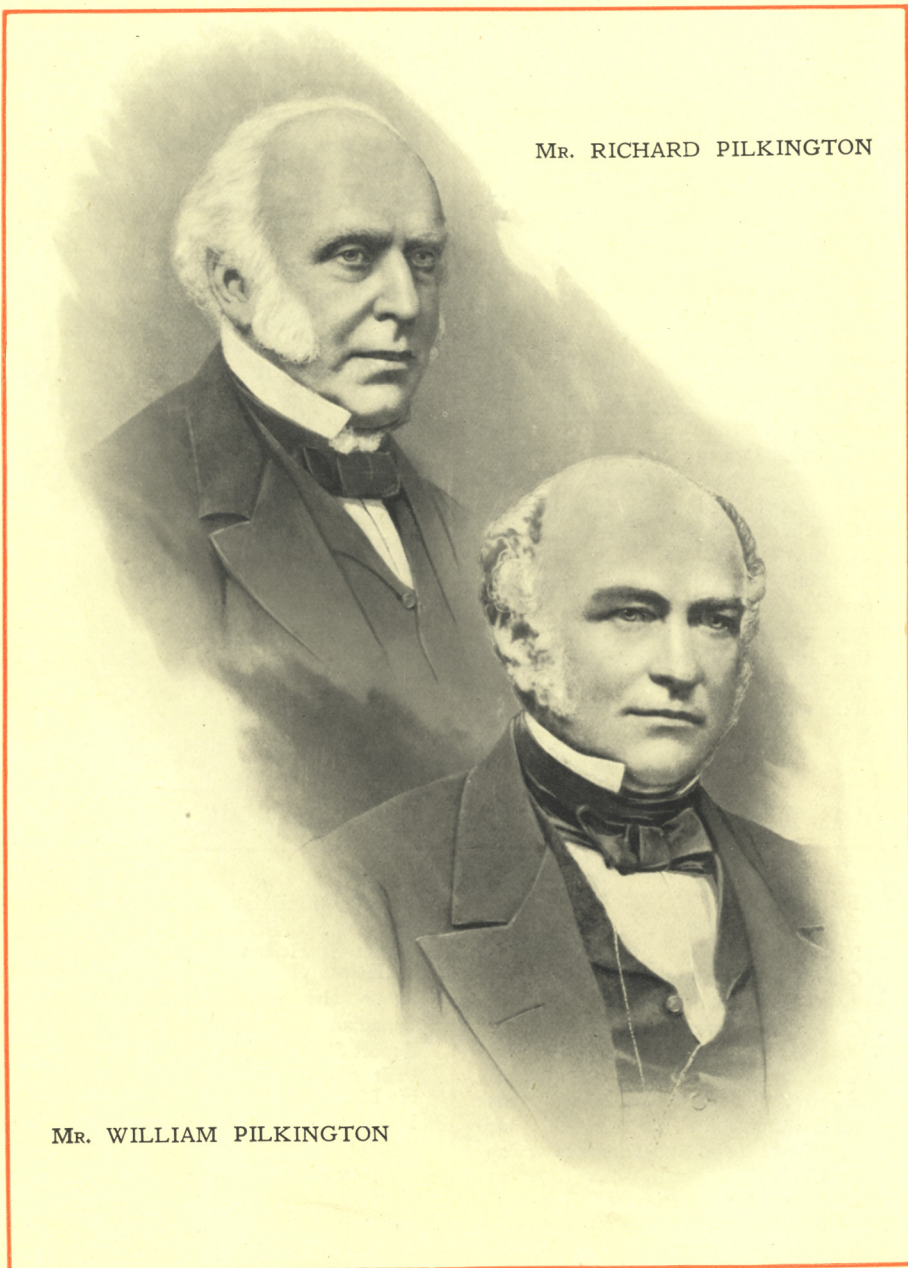
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T H E F O U N D E R S



“Now Thus—Now Thus”

1826

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THE PILKINGTON FAMILY

WE may appropriately borrow the Pilkington family motto by way of title for this short history of St. Helens and window glass-making during the past hundred years.

There is a tradition that Leonard Pilkington, Lord of Pilkington Tower (from whom the Pilkington family trace their descent), held a command under Harold, the last of the Saxon Kings, at the Battle of Hastings (1066). During the pursuit following upon the death of Harold, Leonard Pilkington disguised himself as a mower and so escaped from the victorious Normans. To commemorate the event to which he owed his life, he took for his crest a mower and scythe with the motto, “Now thus—now thus,” intending thereby to indicate the rapid change from a man of arms to a man of peace. The Pilkington family still retain and use this crest and motto, and, as will be seen later, they have, when the need has arisen, been ready to reverse the change adopted by their ancestor by becoming men of arms from men of peace.

As a matter of historical interest it may be mentioned that after the Battle of Bosworth (1485) Henry VII rewarded Sir Thomas Stanley for his assistance by creating him the first Earl of Derby, and shortly afterwards conferred upon him almost all the estates forfeited in the North, including those of the then Sir Thomas Pilkington, who fought on the side of Richard III, the defeated King.

The Pilkingtons take pride in being a Lancashire family. The name “Pilkington” itself provides evidence from which we may reasonably infer that before the Norman Conquest (1066) the family was established at, and gave its name to, the small township of Pilkington, near Rivington, at which latter place Bishop Pilkington in 1566 founded a Grammar School. Reference to this is contained in the Pilkington Picture which is reproduced on page 7. This picture, which hung in the Church at

Rivington, commemorates the death in 1551 of Richard Pilkington who built the Church, and records the facts that James, his son, became Bishop of Durham in 1560 and opened the School and Church at Rivington in 1566. The figures represent Richard Pilkington and his seven sons (including the Bishop of Durham) on one side and his wife and their five daughters on the other.

For more than 100 years the history of the glass-making branch of the family has been closely interwoven with that of St. Helens. Its members are by birth and by sentiment attached to St. Helens and they yield to none in local patriotism. In spite of the heavy responsibilities and demands of a large business, they have found, and still find, time to take a very active interest in the affairs of the town and district, the result being that there are few public bodies or institutions with which they are not connected. One of the Directors, the late Col. Richard Pilkington, represented the Newton Division in the House of Commons ; both he and his brother, the late Col. Windle Pilkington were Mayors, Aldermen, and Freeman of St. Helens ; Mr. William Pilkington, Senr., Mr. William Pilkington, Junr., Mr. Thomas Pilkington, Col. Windle Pilkington, and Col. Wm. Lee Pilkington each held the office of Deputy Lieutenant of the County, as now does Lord Cozens-Hardy, one of the present Directors ; many of them have been Justices of the Peace, and four members of the family (including Miss Evelyn Pilkington, daughter of Col. Richard Pilkington) are at present members of the Town Council.

These facts are given merely to indicate the inter-relationship, one is perhaps justified in saying the inter-dependence, of Town and Industry, and to explain the loyalty of the Firm to the Town and of its Employees to the Firm, upon which the success of the Industry and possibly also the rapid growth of the Town have depended.

1926 was the Centenary year of Pilkingtons' connection with the glass-making industry and, by a coincidence, the Jubilee year of the Plate glass manufacturing side of their business.



THE PILKINGTON PICTURE

OLD ST. HELENS

BEFORE describing the course of events since 1826, it may be of interest to say something of St. Helens and glass manufacture before that date.

St. Helens, as the name of a village, does not appear to be of very ancient date. It stands on the converging corners of four much older Townships, Eccleston, Windle, Parr, and Sutton, from the combination of which, wholly or in part, the Township of St. Helens eventually arose.

St. Helens is so called from the Church or Chapel of that name (variously spelt—Saint Eleyne's, St. Ellen's, Ellins, and St. Helins) which was situated in the township of Windle. One of the earliest records of this Chapel appears to be in 1552 when the Commissioners made their return of Church goods in the West Derby Hundred. They reported that there was "one chalis and a lyttle belle belongynge to Seynt Eleyne's Chapell." Thomas Parr of Parr in 1558 bequeathed 10/- "to be a stocke towards fyndynge of a preest at Sainct Elyn's Chapell in Hardshae." In 1592 it is recorded that the Chapel was in a state of disrepair and in 1614 it was given by Katherine and James Downbell, the then patrons, to certain Trustees "to the intent that divine service may be continued in the chapell and to the intent that the same now being in great decaie might be repaired for the ease of our loving neighbours of Hardshaighe (Hardshaw), Windle, Parr, Sutton, Haidocke, and Eccleston and of their posterity."

In 1615 the Trustees commenced the erection of a new chapel which was completed in 1621.

During the Commonwealth this Chapel was used as a Presbyterian meeting-place. After the Restoration (1660) no attempt, as far as is known, was made by the Church of England to recover the Chapel, which accordingly remained in the hands of the Presbyterians for another 30 years. Baptisms are entered in the Prescott registers in 1677 and 1684 as having been performed by "nonconformist preachers at St. Helens."

The first move to dispossess the Presbyterians was made in 1687 when Bishop Cartwright records that "Mr. Venables and his brother brought Mr. Byrom of Prescott to me, who desired to have



ST. HELENS, 1834

a curate in St. Helens chapel, into which the Presbyterians are now intruded, which I promised him." (The Mr. Byrom referred to lived at Parr Hall and was Lord of the Manor of Parr—the Byroms having succeeded the Parrs.) No immediate result appears to have followed, but John Byrom persevered and in April, 1692, the registration of the Chapel as a Presbyterian meeting-place was prevented. On the appointment of a curate in 1710 the congregation at St. Helens divided ; part conformed, but the rest established an Independent meeting-place, the origin of the present Independent (Congregational) Church, which was rebuilt in 1826.

The tower was added to the Church in 1750 and in 1816 the Church was enlarged and reconstructed and was dedicated to St. Mary (in place of St. Helen). The old Church was burnt down in December, 1916, and a fine new one, built on the old site, was consecrated by the Bishop of Liverpool on 10th November, 1926, and was dedicated to Saint Helen.

It is probable that there had been for centuries something of a small village here clustered round the Chapel. We know that the " King's Head Inn," formerly on the site of the present General Post Office, was built in 1629, that a school was built in the Chapel Yard in 1670 and that a stone-built meeting-house of the Society of Friends near the old Chapel existed in 1679. The hearth-tax list of 1666 records 27 houses of three hearths or more in the township of Windle. Many of these would probably have been in the vicinity of the Chapel. Yet the village cannot have had any importance as it does not appear as a village in 16th, 17th, and 18th century maps of Lancashire although St. Helens *Chapel* is shown. It is significant, too, that no mention of St. Helens is made in Blundell's Diary (1702-1728), although his journeys often brought him into this district and he frequently refers to its neighbours Rainford, Prescott, Wigan, Warrington, and " Eckleston." Even Thatto Heath was apparently of more importance at that time than the embryo St. Helens, as it is mentioned at least twice by Blundell, one of the entries in his Diary being :—1721, June 22nd, " Will : Carefoot came home with some Glass Bottles from Thatway Heath."

The growth and development of St. Helens from such a small beginning is a striking example of history written in terms of

geography. St. Helens owes everything to its coal. The coal brought the canal. The canal and coal together brought the original glass works to Ravenhead and other industries to the town. These in turn brought the railway. Thus coal has been responsible for changing, for good or ill, a peaceful agricultural country-side into a busy industrial centre. We learn from the autobiography of Adam Martindale, who was born in 1623 at Moss Bank, that coal mines were being worked in the St. Helens district in 1629 and there is evidence which makes it probable that coal was being "got" here as early as 1557.

The development of coal-mining in the district necessitated the finding of an outlet for trade and this led to the construction of the Sankey Canal. An Act of Parliament was passed in 1755 for the purpose of making the Sankey Brook navigable from St. Helens to the Mersey. This was not successful and further powers were obtained by a new Act in 1761 for cutting an entirely new water-way, distinct from the brook, to communicate with the Mersey at Fiddler's Ferry, a distance of 12 miles. No trade water-way, cut out of the solid land, had previously existed in England. This was the first canal. The work was completed by the year 1762 at a cost of £220,000. The Canal had a long and prosperous career until it could no longer compete successfully with the quicker means of conveyance offered by the railway.

OLD RAVENHEAD WORKS

ATTRACTED by a plentiful supply of coal, good sand, the transport facilities offered by the Canal, and the nearness of the port of Liverpool, the British Cast Plate Glass Company established a Works at Ravenhead (St. Helens) in 1773. Their method of manufacture was a great innovation since, as the name of the Company implies, they made Plate glass by casting and rolling it after the French method. Before the establishment of the Ravenhead Works, Plate glass made in England had been blown and not cast. According to D'Août-Nicolay, a Belgian authority, the process of manufacturing Plate glass by casting was invented by Lucas de Nehou in 1691 and was begun at Saint-Gobain (France) in 1693 by a Company formed by Colbert in 1665 to

wrest from Venice the monopoly of making mirrors. But for a long time after this date the older method of making small plates by the blowing process was continued side by side with the casting of large plates. The reason for this was no doubt due to the fact that it was more economical to make small plates by blowing, as the value of the smaller pieces obtained by cutting a large plate is reduced out of all proportion to the value of the original plate. The blowing of Plate glass did not pass into general disuse on the Continent until 1763. The new method of manufacture introduced by the British Cast Plate Glass Company was really the origin of the modern Plate glass industry in England.

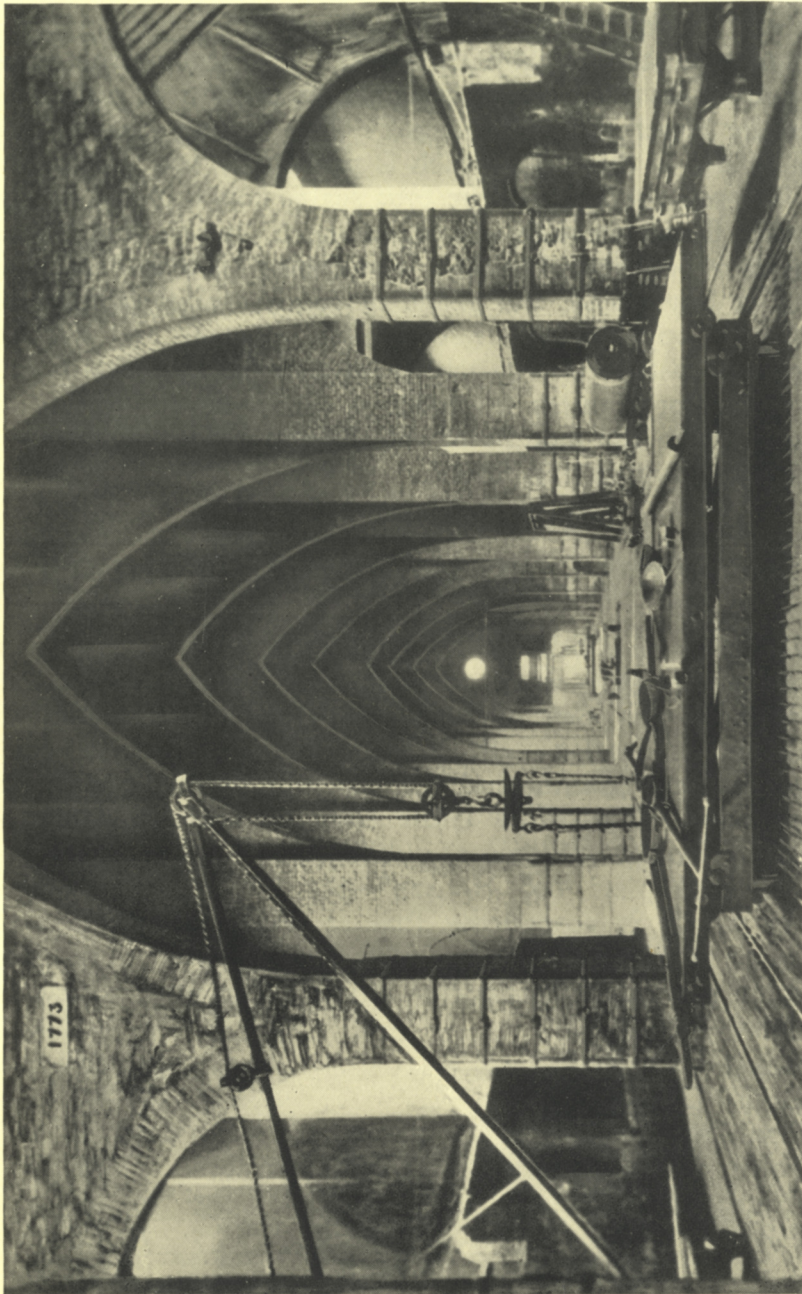
Owing probably to heavy taxation the original Company did not make much progress and the concern was taken over by a new Company called the British Plate Glass Company in 1798.

The works at Ravenhead occupied about 30 acres, cost about £40,000, and was enclosed by a wall inside which were the workmen's dwellings.

As the new method of manufacture was a French process, the Company imported skilled workmen from France. There is a tombstone in Windleshaw Abbey Burial Ground (St. Helens) dated 1787 and inscribed "John B. F. G. de la Bruyère. He was the first who brought to Perfection a Work of very considerable Magnitude and Importance to the Commercial Interest of the British Nation—the Cast Plate Glass Manufactory."

The secrets of manufacture were jealously guarded and the Act incorporating the Company provided the penalty of transportation for a term not exceeding seven years for any person breaking into the manufactory with intent to steal or damage glass or tools. From 300 to 400 men were employed in the Works. In 1789 a steam engine was erected to grind and polish the plates of glass, both of which processes had hitherto been done by hand. This steam engine was at the time considered to be "a very curious piece of mechanism."

The seals of the two Ravenhead Companies, prints of which may be found in the *Illustrated Itinerary of Lancashire* or Baines' *History of the County of Lancaster*, are very interesting in so far as they indicate the early methods of manufacture and the progress made between 1773 and 1798. The seal of the first Company shows a single workman pouring a small pot of "metal"



OLD CASTING HALL, RAVENHEAD

(molten glass), suspended by chains over a small table or trough, at the end of which is a roller like a large rolling-pin, apparently to be manipulated by himself alone. The seal of the second Company shows that a crane had now been introduced presumably to lift the larger pot of "metal." The casting-table is much larger as also is the roller which is pushed by two men at each end. The solitary figure of the 1773 seal is now replaced by eight workmen, thus indicating the beginning of "team work" which continues to be essential to-day. The casting-table in France, and at first at Ravenhead, was made of copper supported by solid masonry. Copper was, however, liable to crack and was later replaced by cast-iron. The table shown in the 1798 seal is fitted with castors or runners to enable it to be moved quickly and conveniently to the mouths of the different annealing ovens, to which the glass was transferred.

EARLY PRICES AND SIZES OF PLATE GLASS

THE price of polished Plate glass in those days was so extraordinarily high—more so when one remembers the much greater purchasing power of money then—that it is remarkable that it could find any market at all. It appears to have been used chiefly for mirrors and coaches and the windows of the most palatial houses only. *The Plate Glass Book* (a book of tables for calculating footage and values) published in 1758 gives the price of a silvered plate 60" \times 42 $\frac{1}{2}$ "—the largest mentioned—as £81 17 0. It is noteworthy that in those days there was a recognised tariff for the various operations necessary to transform the rough plate into the finished article. The price is made up as follows :—

					£	s.	d.
Rough Plate (60" \times 42 $\frac{1}{2}$")..	..	..	..	..	37	10	0
Excise Duty .. ..	..	..	..	..	18	15	0
Grinding .. ..	..	..	..	..	7	12	8
Polishing .. ..	..	..	..	..	7	12	8
Cutting with Diamond .. ..	..	..	..	..	2	14	0
Silvering .. ..	..	..	..	..	7	12	8
					<hr/> £81 17 0 <hr/>		

The Compiler of these Tables (a "Glass-house Clerk") states that "it is not usual, of late, to Diamond-cut the edges of Glasses put into French Frames." The charge for cutting is a good reason for this economy!

A Tariff of the Prices of Polished Plates of Glass of the British Plate Glass Manufactory issued in 1794 shows the price of a plate 117" \times 75" to be £404 12 0!

The method of manufacture precluded the production of plates of any great size. Blundell thinks it worthy of recording in his Diary that in January, 1716, he "was at ye New Exchange (London) and there saw a Looking Glass as was in one peece 86 Inshes Long and 44 Insh wide Valewed at £130." In 1833 the Governor of the British Plate Glass Co. in evidence before the Excise Commission stated that the ordinary dimensions of cast plates were about 96" \times 60". The *Illustrated Itinerary of Lancashire* (1842) states that "by casting, plates have been obtained measuring 160" \times 80". One now at the Reform Club-House in Pall Mall is about 150" \times 90", and supposed to be the most perfect plate in the world." Little progress in size seems to have been made for many years, as in Gregson's *Portfolio of Fragments* (1869) there is a statement that "the British Plate Glass Company makes plates as large as 142" \times 72". It is interesting here to note that "The Window of the Empire," exhibited by Pilkington Brothers Ltd. at the British Empire Exhibition at Wembley in 1924-5, was 288" long, 168" wide, $\frac{3}{8}$ " thick, and weighed 1,700 lbs. (rather more than three-quarters of a ton).

S T. H E L E N S G R O W I N G

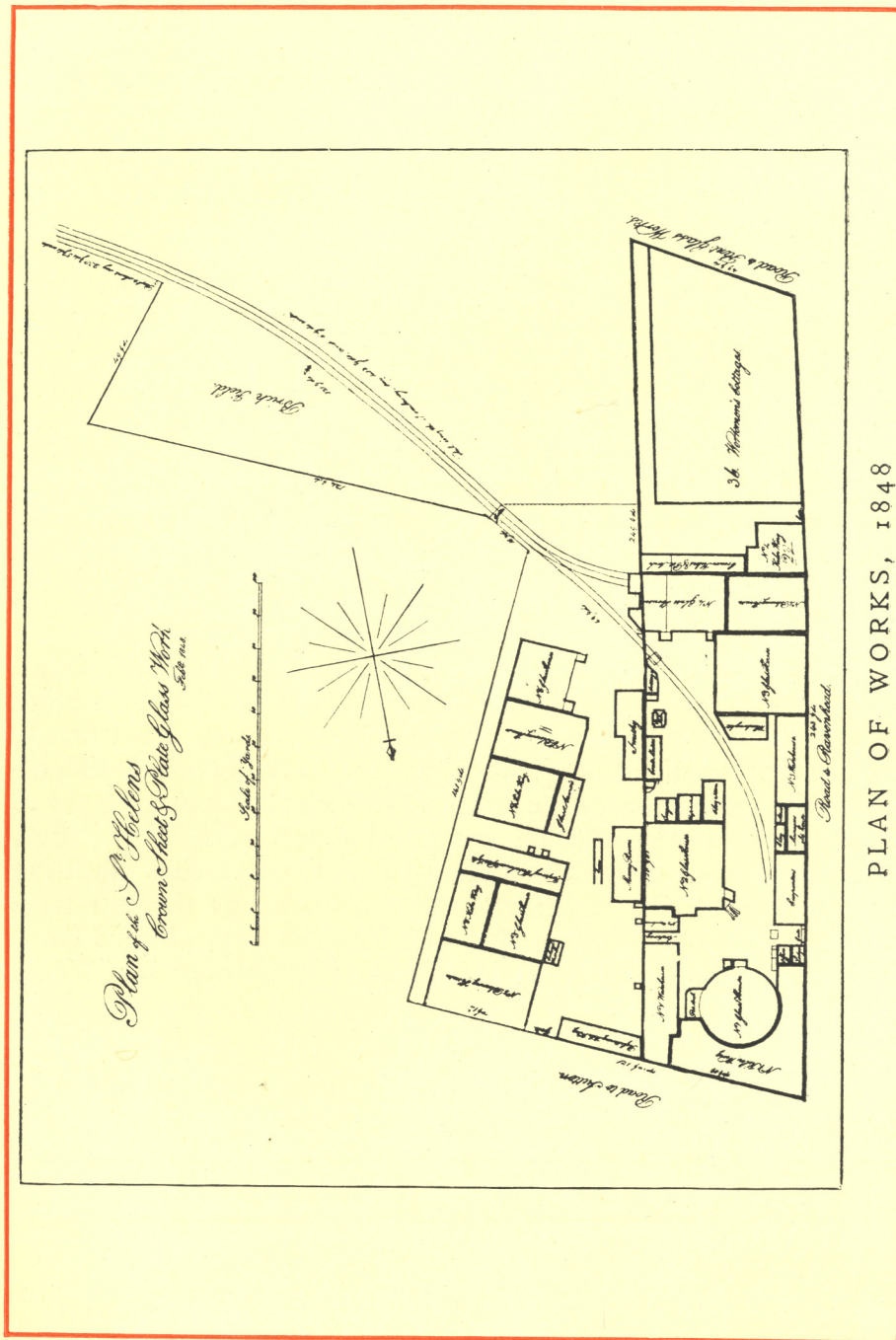
IN addition to glass-making other industries were attracted to St. Helens by the abundant coal supplies and the canal. In 1780 a smelting works was built at Greenbank by Messrs. Hughes Williams & Co., the ore being brought by water from their Parys mine in Anglesey. An iron foundry was established as early as 1798 by Messrs. Lee Watson & Co. (William Pilkington, "Roby Will," married Lee Watson's daughter). The copper smelting works was closed down in 1815, but was followed by several similar undertakings.

Lady Kenyon, writing in 1797, says, " St. Helens was a poor little place when I passed through it 30 years ago ; and now is a very neat pretty country town." Its industries were still in their infancy !

By 1800 St. Helens had become a small town comparable with Ormskirk. The united population of its four constituent townships in 1801 was 7,570.

That St. Helens was now becoming a place of some importance is shown by the fact that in 1804 it raised eight volunteer companies of Infantry commanded by James Fraser, at a time when local corps were being raised throughout the whole country to resist the threatened French invasion. The St. Helens contingent was larger than most of those raised by other districts in Lancashire except Manchester and Liverpool.

Such then was the position of St. Helens in 1826. Its rateable value was about £8,000, its population was increasing, and its industrial history had commenced, but it was still in a state of transition. It had as yet no corporate life, no legal entity. Its existence still had reference to the four townships on the corners of which it stood. There was no railway, no gas, no public water supply, no Town Hall, no Post Office, no market buildings, and none of the public institutions which now exist. England itself was in a similar state of transition. George IV was on the throne, to be followed by William IV before Victoria became Queen. The later stages of the Napoleonic Wars were as recent history to the people of those days as the Great War is to us. Waterloo had been fought and won only eleven years before. England was passing through a period of depression and unrest very similar to that which we have experienced since the Great War. The Corn Laws were in force, not to be repealed for another 20 years. The First Reform Bill and the First Factory Act were still to be passed. The opening of the first railway line in the country—between Stockton and Darlington—was an outstanding event of the previous year, and riots, caused by the introduction of machinery into industry, were not uncommon.



PLAN OF WORKS, 1848

1826. PILKINGTONS ENTER THE GLASS - MAKING INDUSTRY

IT was in this year (1826) that the name of Pilkington came to be associated with the glass-making industry. William and Richard Pilkington, two of the original founders of the Firm, were the sons of Dr. Wm. Pilkington who had come to St. Helens from Horwich near Rivington, a locality with which the Pilkington family had, as already stated, been associated for generations. Dr. Pilkington had an extensive practice in St. Helens and lived in Church Street at a time when Church Street, Tontine Street, and Liverpool Road were composed principally of private residences ! In course of time Dr. Pilkington retired to Windle Hall, taking all his family with him except William, who continued to reside at the house in Church Street. In his retirement Dr. Pilkington turned his attention to farming the lands round Windle Hall, the site of the Cowley Hill Plate Works being part of his farm.

What, apart from a spirit of enterprise, induced William Pilkington, then a young man of 26 years of age, with three other local gentlemen to enter the glass-making industry is uncertain, though local tradition attributes the cause to the financial difficulties of the proprietors of the small glass works taken over by them. The purchase was effected by Deed dated 16th May, 1826, whereby a piece of land containing 1 acre, 26 perches (abutting on the present Grove Street) and the buildings thereon were conveyed by John William Bell and Thomas Bell, Glass Manufacturers, to Peter Greenall (Member of Parliament for Wigan, who had married Dr. Pilkington's daughter), James Bromilow, John Barnes, and William Pilkington as tenants in common. These partners carried on the manufacture of Crown window-glass as the St. Helens Crown Glass Company.

CROWN GLASS

A DESCRIPTION of the manufacture of Crown glass is not called for here, it being sufficient to remark that Crown glass differed from cylinder Sheet glass, the manufacture of which had



THESE are to certify, that Mr. *W^m Pilkington*
 hath diligently attended the Practice of SURGERY in this Hof-
 pital for these *Six Months* last past. Witness our Hands the *21st*
 Day of *April* 1786 *Thanning*
John Hunter
Chawkins
W^m Walker

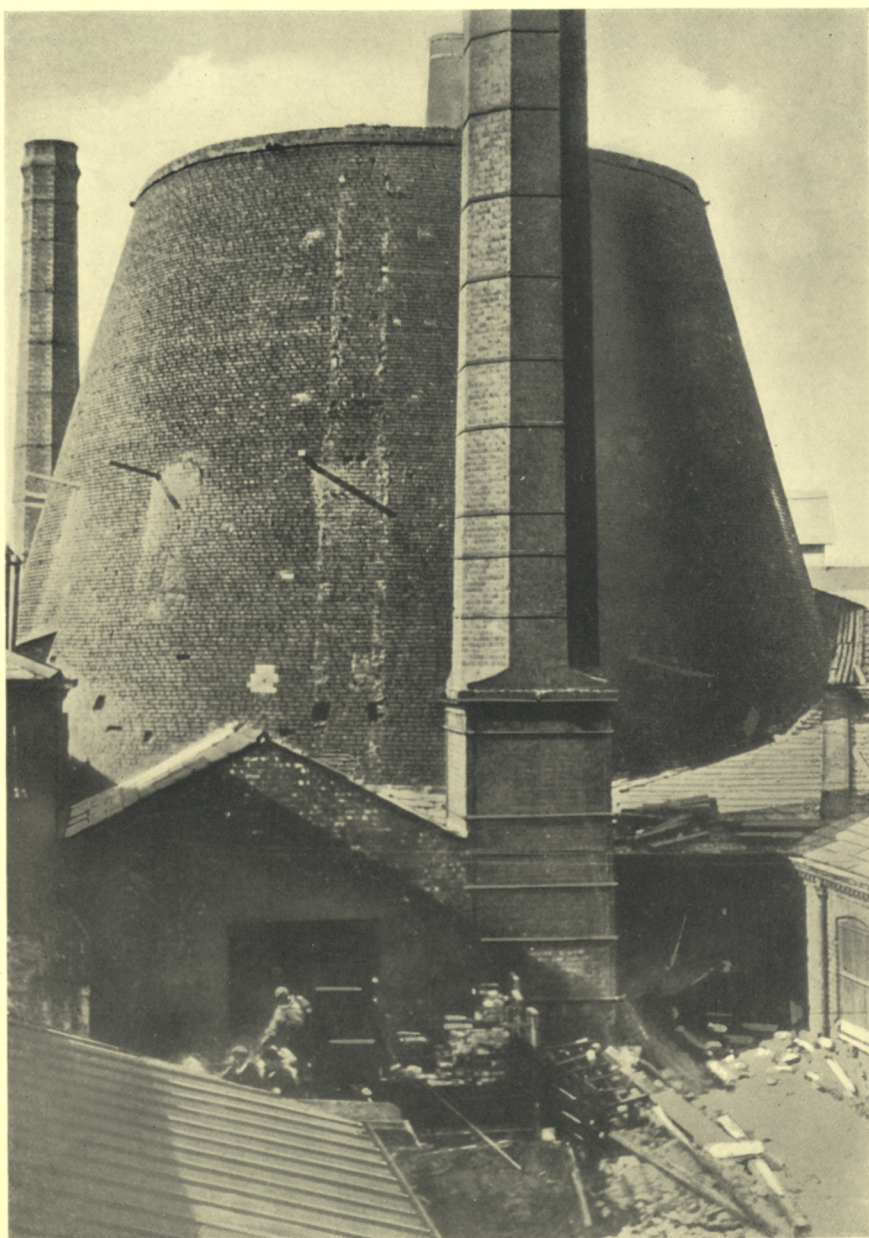
ST. GEORGE'S HOSPITAL CERTIFICATE OF DR. WILLIAM PILKINGTON, 1786

not yet been introduced into England, by the fact that it was made in large discs instead of in cylinders. The centres of these discs, owing to the method of manufacture, were thick and uneven and the squares of window-glass were cut from the edges to avoid the centre "bull's eye" or "bullion." The centres, being very coarse and irregular, were, of course, the cheapest and were used for glazing small cottages and stables. This method of manufacture is still carried on to-day, but only to meet the demand for "bullions" (the scrap of other days) which are in request for the antique effect they give to glazing. Hundreds of such bullions were supplied by Pilkingtons for the Old London Bridge at the Wembley Exhibition. The name Crown Glass Works still attaches to the Sheet Works, although the making of Crown glass (except for the bullions just referred to) disappeared very many years ago.

The partners in the newly-formed Company proceeded to build what later came to be known as the "Old Cone" and the "First House," two landmarks which have only recently and with reluctance been demolished to make way for the continued demands of development and expansion. Glass was first made at the new works on February 14th, 1827.

In April, 1828, John William Bell and Thomas Bell retired from the business as also did James Bromilow and John Barnes in January, 1829, leaving Peter Greenall and William Pilkington as the remaining partners. William Pilkington was later joined by his elder brother, Richard, and in December, 1848, Gilbert Greenall, the executor of Peter Greenall, transferred to William Pilkington and Richard Pilkington all Peter Greenall's interest in the business. The *London Gazette* of 30th January, 1849, contains a formal notice that the partnership formerly subsisting between Peter Greenall, Richard Pilkington and William Pilkington is dissolved and that all debts will be received and paid by Richard Pilkington and William Pilkington, the surviving and continuing Partners. From this date the business came under the sole control of the Pilkingtons and it is only within recent years that anyone other than a Pilkington has become a Director. The name of the Firm continued to be the St. Helens Crown Glass Company, although the only partners were Richard and William Pilkington.

There are in the Firm's possession several letters written between the years 1831 and 1839 by William Pilkington to Richard



THE OLD FIRST HOUSE

Pilkington and sent from various towns in England, Scotland, and Ireland, visited by William in eager search for business. From brother to brother they deal partly with private family matters, but are chiefly concerned with business and the difficulties and problems of manufacture and sale. It is interesting to note that in those early days William, the salesman, was in close touch with Richard, the manufacturer, on questions affecting the actual process. This constant intercommunication between the manufacturing and commercial sides has always been considered to be of first importance and on it has been based the policy of the Directors. William's letters, revealing all the anxious enthusiasm of the keen salesman, may be said to be the first "Traveller's Reports" of the Firm. The following is a typical extract :—

" I hope that every exertion will be used at present to send good work. Tell Blanshard that I have seen glass from Richardson's without any rim or selvedge *at all* and some Birmingham glass with very little indeed. I am not overstating facts. I could not have believed it had I not seen it. As therefore it is possible to be done, *we must if possible* do the same—and without it we need not attempt to send glass here (London). I have done better than I expected in getting orders but I repeat that they are all given as trial orders and our future will depend on our present exertion, in fact if the glass is good I believe I could here sell all we make. The price however is low and squares shockingly so."

This letter indicates that even in the early days quality was recognised as being of the greatest importance and from this has sprung the Firm's policy of always endeavouring to make the best glass and thereby giving Customers confidence in the quality of glass of British manufacture.

On the Warehouse side, probably more than on the Manufacturing or Sales sides, the Directors have had to rely on the judgment of their Staff and they have been fortunate in having as Warehouse Managers men of wide experience and critical ability. Among those who have held these responsible positions may be mentioned the two Blackledges, Louis, who was Warehouse Manager at the Cowley Hill Works, and his brother William, who for many years held a similar position at the Sheet Works.

“ THE FOUR ” — THE BUILDERS OF THE SECOND GENERATION

IT was not until each of the original founders introduced two sons into the business that the Firm became Pilkington Brothers.

The sons of Richard were William Windle (unofficially known among the Employees as “ Windle Will ”) and Richard, and the sons of William were William (“ Roby Will ”) and Thomas. It was due to the successful experiments, unsparing energy, and far-seeing enterprise of the second generation that the Firm was able to withstand the devastating competition of Foreign manufacturers which overwhelmed almost all other glass works throughout the country. The very highly developed and efficient glass-making industry of the Continent, and particularly of Belgium, has the enormous advantage of a seven-day week. Unlike their foreign competitors, Pilkingtons have always made a practice of restricting week-end work to the barest minimum demanded by the process. It will therefore be understood that it has been possible to maintain the industry in England only by the active and unremitting personal attention of the Directors and of others in responsible positions.

It may be mentioned here that at the Geneva Convention in 1924 Pilkingtons and their Employees gave their strongest support to an endeavour, unfortunately unsuccessful, to persuade Continental glass works to adopt British hours and conditions of work. The objection was raised that, glass-making being a continuous process, the week-end stoppage was not possible. Such was the answer given to a Firm who had proved the possibility but had faced the inconvenience and cost !

The Firm and its Employees owe their position to-day to the sure foundation laid by the four partners of the second generation, who found the business a struggling local concern and left it a world-wide organisation. Other British glass works failed through the lack of foresight of their Directors and their failure to accumulate reserves, but these men with unselfish confidence put back into their business a large proportion of the profits earned by it.

The partnership between the four members of the second generation was a very well-balanced one. Undoubtedly a large part of the subsequent success of the concern came not only from the individual abilities of the four, who may each be said to have been pre-eminent in his own sphere, but also from the happy way in which these abilities were blended.

The two William Pilkingtons were more particularly the manufacturing partners. (The younger of the two adopted as his second name "Windle" to distinguish him from his cousin "Roby William" and they were generally known as "Mr. Windle" and "Mr. William" respectively.) The other two, Richard and Thomas, were responsible for the commercial side.

The manufacturing and commercial sides worked in very close touch, so that the extension and progress of the former were directed to what was the best end from the point of view of the latter. Furthermore, in each of the two branches (manufacturing and commercial) the conservative and progressive elements were equally balanced.

William ("Roby") though more conservative than his cousin, Windle, was a man of independent judgment, strong character, and common sense, qualities which were of great value to his three partners.

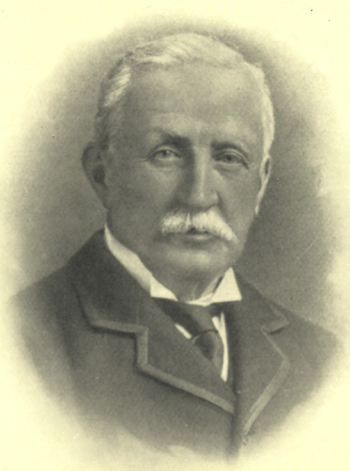
Windle was not only a manufacturer and inventor of marked ability, but he had the aptitude, not always found in inventors, for carrying out his ideas successfully on a large commercial scale. He was fortunate in having the ability to inspire enthusiasm and friendship in those who worked with him.

In their many experiments and undertakings he and the other Directors received the most encouraging support from their able and enthusiastic assistants, among whom may be mentioned (as typical of others) John Edmundson (a cousin of the John Edmundson whose reminiscences form an Appendix) who was Manager of the Sheet Works ; J. J. Wenham, Head Constructional Engineer, who played an important part in the carrying out of extensive alterations in the Sheet Works ; W. R. Thompson, Manager of the Cowley Hill Works ; T. Jenkinson, Engineer at the same Works ; and George Hewitt, formerly a glass Blower, who became Manager of the Casting Hall at Cowley Hill.

“ T H E F O U R ”



MR. WILLIAM ("ROBY") PILKINGTON



MR. THOMAS PILKINGTON



COL. WILLIAM WINDLE PILKINGTON



COL. RICHARD PILKINGTON

Mention should also be made of the very valuable work done by Douglas Herman who was in charge of the Laboratories. A Chemist of distinction when he entered the service of the Firm, with a wide knowledge of the chemical industry of Europe, he applied his special gifts to the problems of the Glass Industry and became an expert authority on clays, sands, and raw materials generally.

On the commercial side there was a repetition of the excellent balance between the progressive and conservative temperaments possessed by the manufacturing Directors. Thomas Pilkington, the senior of the two commercial Partners, brought to the business great shrewdness, pertinacity, and a conservative outlook, which, in his particular sphere—that of finance—were of the utmost importance. His support therefore was of great weight and help to the progressive commercial policy of Richard Pilkington, the youngest of the four. “Colonel Richard,” as he was generally known later, was a man of great ability and foresight. The main lines along which the business developed and which characterise it to-day were due to his courage, enterprise, and far-seeing policy. The large part which from his early days he took in the Town’s affairs, and later in national politics in which he was a strong Imperialist, is so well known as to need only this passing reference.

T H E T H I R D G E N E R A T I O N

IN course of time the sons of these four partners were brought into the business as workers and as actual, not merely nominal, Directors of the Firm’s activities.

In 1884 William (“Roby”) brought in two sons—William Lee and George Herbert—one on the manufacturing, the other on the commercial side—an arrangement evidently intended as a precedent for other sons coming into the business to ensure as far as possible the two sides being equally balanced in the Directorate.

William Lee, who held the rank of Colonel in the Lancashire Yeomanry, was greatly respected by the Sheet glass-makers with whom he was in daily touch. He retired from active Directorship in January, 1907, but returned to give his help during the Great

FORMER DIRECTORS



1. COL. WILLIAM LEE PILKINGTON
2. MR. HENRY WILLIAM PILKINGTON
3. MR. ARTHUR RICHARD PILKINGTON

4. MR. GEORGE HERBERT PILKINGTON
5. MR. ERNEST SINCLAIR PILKINGTON
6. MR. ALAN DOUGLAS PILKINGTON

War, on the termination of which he again retired in failing health and died in December, 1919. Like his father before him he was Chairman of the St. Helens Conservative Party.

His brother, George Herbert, who is happily still living, took up the commercial side and, in addition to thus helping Richard Pilkington, assumed the duties of his Uncle Thomas when the latter retired in July, 1898. "Mr. Herbert" himself retired in January, 1907, but is still remembered by very many Employees for his genial and kindly manner which made him very popular with all with whom he came in contact.

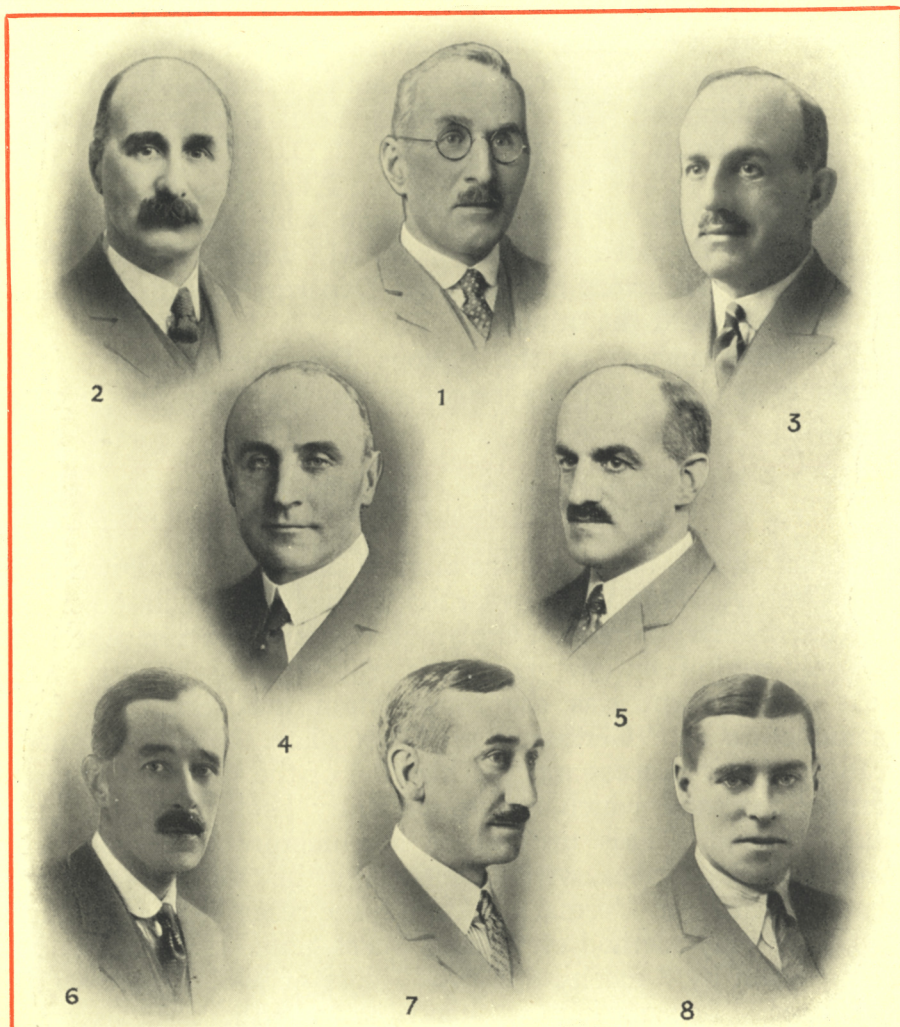
In December, 1902, the Firm suffered a great loss in the early death of Henry William, son of Windle, who though actively associated with the business for a comparatively short time only, gave promise of being a worthy successor to his father, from whom he had inherited the pioneer spirit, quick insight, and the ability to form conclusions, assisted by experience, but unfettered by precedent. Had he lived to fulfil the promise of his early years, there is little doubt that he would have left his mark on the later history of the Firm.

About the same time his cousin, Ernest Sinclair, son of Richard, who had gone out to the South African war as Lieutenant in the Lancashire Yeomanry, retired from active participation in the business.

Reference should here be made to Arthur Richard, the second son of Richard, who came into the business in 1892. Several years on the manufacturing side gave him a valuable practical experience which he later brought to the commercial side for which he had a decided aptitude. On the death of Col. Windle in 1914, he became Chairman of the Directors. He was of a kindly and considerate nature and a keen sportsman. He took an active interest in the Recreation Club, for which he played football on several occasions. Unfortunately the shadow of increasing ill-health hung over the last few years of his life and he died in January, 1921.

The only other former Director still living but not now actively associated with the business is Alan Douglas Pilkington, (son of Thomas Pilkington), who joined the Firm in 1904 and held the position of Secretary. The state of his health prevented "Mr. Alan" from being passed for military service, but he continued

PRESENT DIRECTORS AND SUB-DIRECTORS



Directors

- | | |
|---|--------------------------------------|
| 1. MR. RICHARD AUSTIN PILKINGTON
<i>Chairman</i> | 4. THE LORD COZENS-HARDY |
| 2. MR. ALFRED CECIL PILKINGTON | 5. MAJOR GUY REGINALD PILKINGTON |
| 3. COL. WILLIAM NORMAN PILKINGTON | 6. MAJOR GEOFFREY LANGTON PILKINGTON |

Sub-Directors

- | | |
|---|--|
| 7. MR. WILLIAM STUART TUNNOCK
<i>Secretary</i> | 8. MAJOR RONALD MORCE WEEKS
<i>General Manager, Cowley Hill Works</i> |
|---|--|

his active Directorship during the Great War and the difficult period immediately following it, when his services were particularly valuable. To the great regret of all the continued unsatisfactory state of Mr. Alan's health compelled him to retire in 1920.

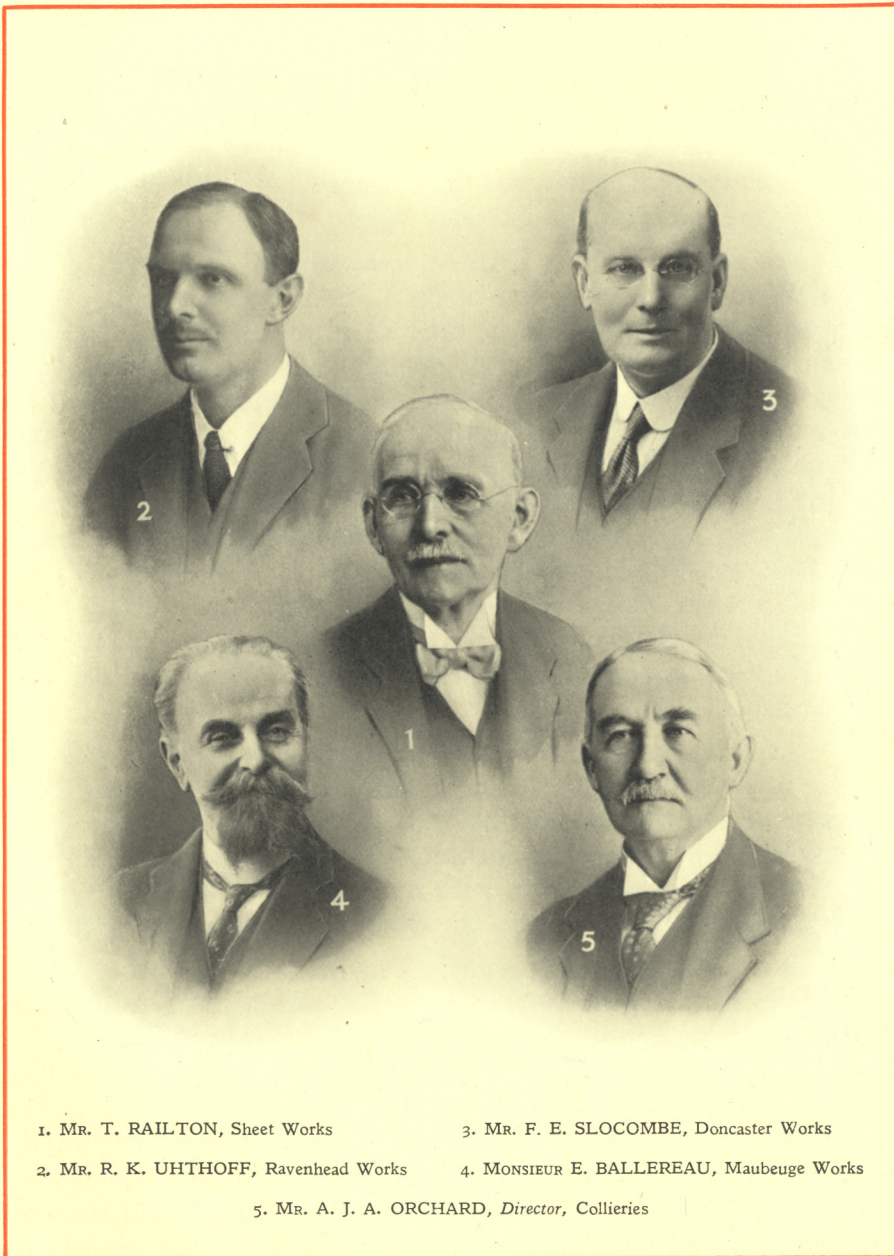
The present active Directors are six in number, Mr. Richard Austin Pilkington, J.P., Mr. Alfred Cecil Pilkington, Colonel William Norman Pilkington, D.S.O., T.D., J.P., Lord Cozens-Hardy, D.L., J.P., Major Guy Reginald Pilkington, D.S.O., T.D., and Major Geoffrey Langton Pilkington, with two sub-Directors, Mr. W. S. Tunnock and Major R. M. Weeks, D.S.O., M.C. Each of the Directors has his own Department and is in daily consultation with the others.

The relationships of the various Directors to the original founders may be seen by reference to the table on pages 40 and 41.

S H E E T G L A S S

AS has already been said, the original partners in the Firm made Crown glass and, except for Plate, which was much too expensive for ordinary purposes, Crown glass was at that time practically the only kind of window-glass made or used in this country. The next development was the introduction into England of the manufacture of "German" or Sheet glass. The outstanding feature of this process was the blowing of the "metal" into the form of a cylinder which was subsequently "split" longitudinally and flattened. This method of manufacture was brought to England from France, where the form of the cylinder was longer than that made in Germany. Until quite recently this continued to be the only method of making Sheet glass. Its place is now being taken by "machine drawn" glass of which more will be said later. The making of "hand blown" Sheet glass requires an extraordinary degree of skill and judgment. The blower is given instructions to make cylinders which will, when split and flattened, give sheets of certain thickness and size. For this the gatherer has to gauge the amount of "metal" to be gathered on the end of his blow-pipe; the blower has to judge the correct diameter and length of the cylinder which will give a sheet of the required size and thickness, and in the process of blowing he has

PRESENT WORKS MANAGERS



to manipulate the " metal " by swinging and rotating it in such a way as to ensure an even thickness throughout the cylinder.

It will be understood that the new method of manufacture could not be carried on at first in this country without importing skilled foreign workmen, who brought with them their own names for the various tools used. This explains why so many of the names and terms used in glass-making to-day are of foreign origin although in many cases they are almost unrecognisable corruptions of the original French and Belgian words.

In 1832 Robert Lucas Chance, one of the founders of the present Firm of Messrs. Chance Bros., Ltd., of Birmingham and Glasgow, introduced this new process into England and at the same time imported a number of French and Belgian Sheet glass-makers. In this enterprise Robert Lucas Chance was assisted by Georges Bontemps, a celebrated French glass manufacturer. For many years Chance Bros.' Sheet glass was generally recognised as superior to the foreign product. The cylinders were blown larger than had been the custom on the Continent ; they were allowed to become cold before being split ; they were split cleanly with a diamond instead of being hacked with iron shears ; they were reheated in a specially constructed kiln and were flattened on a bed or " lagre " of smooth glass instead of on an iron plate covered with sand.

In 1841 Pilkingtons followed the example set by Robert Lucas Chance and commenced the manufacture of Sheet glass. This necessitated the importation of skilled workmen from the Continent from whom the local workmen gradually learned the secrets and methods of manufacture, with the result that to-day there are no more skilled glass-makers in the world than those of St. Helens.

Improvements have continually been made in the process, the most important of which—the use of " tanks "—will be referred to later. Improvements in the interests of the workmen have been the introduction of wheeled " carriages " for carrying the weight of the cylinder while it is being blown, and the use of compressed air instead of the workman's own breath for blowing the cylinder. Both these improvements have enabled larger cylinders to be made and at the same time have rendered the work of the glass-maker less arduous and more healthy. (See Appendix.) In the Report of

the Excise Inquiry published in 1835 it appears that out of 30 English window-glass manufacturers, 28 made Crown glass, whereas 2 only made "broad" or Sheet glass.

E X C I S E D U T Y O N G L A S S

NOT only had the English glass industry to struggle against foreign competition, but it was also very seriously handicapped by oppressive duties on finished glass and on glass in the process of manufacture.

Three duties were payable to the Excise :—

- (1) An annual payment for each glass-house for a licence to manufacture glass.
- (2) A payment per pound on all glass melted in the pots and ready for use.
- (3) A payment per pound on the excess in weight of manufactured glass over 40 per cent (later 50 per cent) of the calculated weight of molten glass.

Two "Officers of Excise" at least were quartered in every glass works and as the duties were payable partly on the worked and partly on the unworked glass, it was their business to register the total weight of glass melted in the pots and to prevent the removal of any piece of manufactured glass which had not been weighed and taxed. A manufacturer in his evidence before the Commissioners of Excise in 1833 described the internal condition of a glass factory under Excise regulations as follows :—

"Our business premises are placed under the arbitrary control of a class of men to whose will and caprice it is most irksome to have to submit and this under a system of regulations most ungraciously inquisitorial. We cannot enter into parts of our own premises without their permission. We have in the course of the week's operations to serve some 60 or 70 notices on these, our masters."

On the same occasion Robert Lucas Chance said :—

"These (the notices) are so numerous that I have them printed by the thousand. We have to give notices all day long."

William Pilkington, Senr., is reported to have stated that at one time the Firm had in stock upwards of £16,000 worth of

glass which was not likely to be purchased, but every ounce of which had been taxed.

The Commissioners in the summary of results of their enquiries stated among other things that the regulations presented a great impediment to experimental research and also operated as a direct hindrance to successful competition with foreign countries. The result was that the duties were finally repealed in 1845—an event of prime importance in the history of glass-making in this country. (See Appendix.)

At the same time the industry was to some extent protected by an import duty on glass and encouraged by a bounty on exported glass. It was not the manufacturers' fault that the bounty exceeded the import duty, and it did not require a great degree of commercial ingenuity to take advantage of this fact and make money by exporting glass merely to import it again, as it is believed was done by some of the struggling works !

The removal of the Excise duties gave a great impetus to those Firms who were able to compete with the foreigners on their own level, but the removal of the import duty, by facilitating the introduction of vast quantities of foreign glass, caused the extinction of many small works which depended on protection for an existence.

PROGRESS OF BRITISH PLATE GLASS CO. (R A V E N H E A D)

THE British Plate Glass Company was continuing to make progress at Ravenhead. Baines' *Gazetteer of Lancashire* (1825) records that the glass made by this Company was finished in such a manner "as to render it perfectly free from that mistiness to which the foreign fabrics are subject." The *Illustrated Itinerary of Lancashire* (1842) states that "the Company has thriven beyond all expectation or precedent, so as to render the British Plate glass superior to that of any other country." The same authority in dealing with the Ravenhead Works gives other interesting information of which the following are extracts :—

"At the first establishment of this manufactory the workmen were brought over from France. But now the great majority of

the persons employed are Englishmen and they have acquired a proficiency in the manufacture superior to that of either the French or the Venetian artisans." (St. Helens workmen were proving their skill and adaptability in Plate glass-making as in Sheet glass-making.)

"Great jealousy is manifested by the proprietors in keeping secret the details of their processes—questions are answered with caution and any very minute inquiry is evaded. This proceeds more from a dread of foreign than domestic rivalry."

"The English mirror Plates are produced larger than the French and are universally confessed to be superior; and they could be produced at a cheaper rate but for the duty which exceeds 2s. 9d. per superficial foot."

"The foundry at Ravenhead is the largest apartment under one roof in Great Britain, being 113 yards in length by a little over 50 in breadth."

"A species (of glass) intended to supersede the Plate has been lately manufactured in the Town, and is called German glass (referred to above) made by foreign workmen principally Belgian, introduced by Mr. Pilkington in 1841. This glass is not cast as Plate glass is, but made somewhat in the mode of window or Crown glass, and intended as a cheap substitute for Plate."

THE LONDON AND MANCHESTER PLATE GLASS CO.

A LOCAL rival to the Ravenhead works was found in the London and Manchester Plate Glass Company which, until 1845 known as the Liverpool and Manchester Plate Glass Company, established works at Sutton (St. Helens) in 1836. In 1868 this Company extended its activities by becoming lessees of the Ravenhead Works, which had already, three years earlier, been leased to Sir Edward Sullivan, James Sivewright and John Crossley, from whom the assignment of the lease was obtained. In 1895, however, the London and Manchester Plate Glass Co., in liquidation, surrendered to the British Plate Glass Co. all the premises comprised in the lease. The Works at Sutton were also closed, the last glass being sent out in July, 1903. The Sutton Works was bought by Pilkingtons in February, 1906.

T H E C H E M I C A L I N D U S T R Y

ALTHOUGH this review deals primarily with the connection between St. Helens and window glass-making, it must not be thought that the Town depended entirely on the fortunes of this industry. Besides its coal mines, copper-smelting works and iron foundries, it had until quite recently a long and close connection with the Chemical industry, which brought with it employment, prosperity, and pungent fumes. The pioneer of the Chemical industry in St. Helens was Josias Christopher Gamble (the father of the late Sir David Gamble) who in partnership with James Muspratt (a founder of the United Alkali Company) erected chemical works here in 1829. The partnership, however, lasted for two years only, when Muspratt left the Firm. The industry encountered bitter opposition from the agricultural interests and to avoid legal proceedings for damages and injunctions Gamble was obliged to pay liberal compensation. The industry, however, continued to flourish in Lancashire and it has left the Town only within the last few years to be concentrated at Widnes.

C O N T I N U E D G R O W T H O F S T . H E L E N S

THE Town progressed and developed with its industries. In 1830 the railway between Manchester and Liverpool was opened and two years later was followed by the St. Helens and Runcorn Gap Railway, which was built by local manufacturers and traders. It is interesting to recall the fact that trials of steam locomotives had taken place at Rainhill (near St. Helens) in October, 1829, when a prize of £500, offered for competition, was won by the "Rocket."

The St. Helens & Runcorn Gap Railway and the Sankey Canal were amalgamated in 1845, and in 1864 the united concern was purchased by the L. & N. W. Railway Co. with a guarantee of very low rates for traffic. The connection of the Great Central Railway Co. with the Town is of much later date, this line not having been opened until 1895, though construction was begun seven years earlier. A Gas Company for the lighting of the rapidly growing Town was incorporated in 1832, and about the same time

a Water Company was established, water pipes being first laid in the Town in 1844. Both these undertakings were eventually taken over by the local public authorities. Market sheds were opened in 1843, the market hall in 1850, and the covered market in 1889.

A Town-Hall was built by an association of "proprietors" in 1839. This was burnt down in 1871 and the present Public Town Hall was opened in 1876.

St. Helens in 1842 is described as "originally an inconsiderable village, now a very thriving town and likely to rise into a place of very considerable importance." But the effect of this optimistic description is rather marred by its continuation which states that "St. Helens is uninteresting in appearance, straggling and irregular; built of red brick; is ill-paved, dirty and lies low."

It may be said here that St. Helens suffers from a reputation for unattractiveness which it no longer deserves. The derelict buildings, chiefly abandoned chemical works, which are to be seen from the railway, give a wrong impression of the Town. Many improvements are taking place, roads are being widened, and the centre of the Town is being opened out by the removal of old buildings and the setting back of the building line. It must be admitted that in former days chemical fumes and smoke were very prevalent, but to-day the atmosphere compares very favourably with that of any other industrial town. St. Helens is fortunate in being on the western fringe of the Lancashire industrial area with a stretch of open country between it and the sea which is about 12 miles away. This favourable position gives the Town attractions which are denied to its more confined neighbours.

Just as the year 1845 was momentous in the history of the glass-making industry, so it was in the history of the Town, for it was in that year that it began to assume an official individuality apart from its constituent Townships. St. Helens was in 1845 created an Urban Sanitary Authority with a Board of Improvement Commissioners, of which Board Windle Pilkington later became a member and eventually Chairman. Windle and Richard Pilkington took a prominent part in the efforts which brought about the incorporation of the Borough in 1868, and curiously enough when the first elections took place the former was elected for two wards.

The first Mayor was Col. (afterwards Sir) David Gamble. The Charter of Incorporation included the whole of the Townships

of Sutton and Parr and parts of the Townships of Eccleston and Windle. In 1876 a grant of arms was made by the Herald's College to the newly-incorporated Borough, in 1882 it obtained a separate Commission of the Peace, in 1885 it became a Parliamentary Borough and in 1889 a County Borough. By the St. Helens Corporation Act of 1893 the division of the Borough into different Townships was abolished and the whole Borough, then extended, formed the Township of St. Helens. In 1898 the boundaries were again extended by the inclusion of a further small portion of the Township of Eccleston.

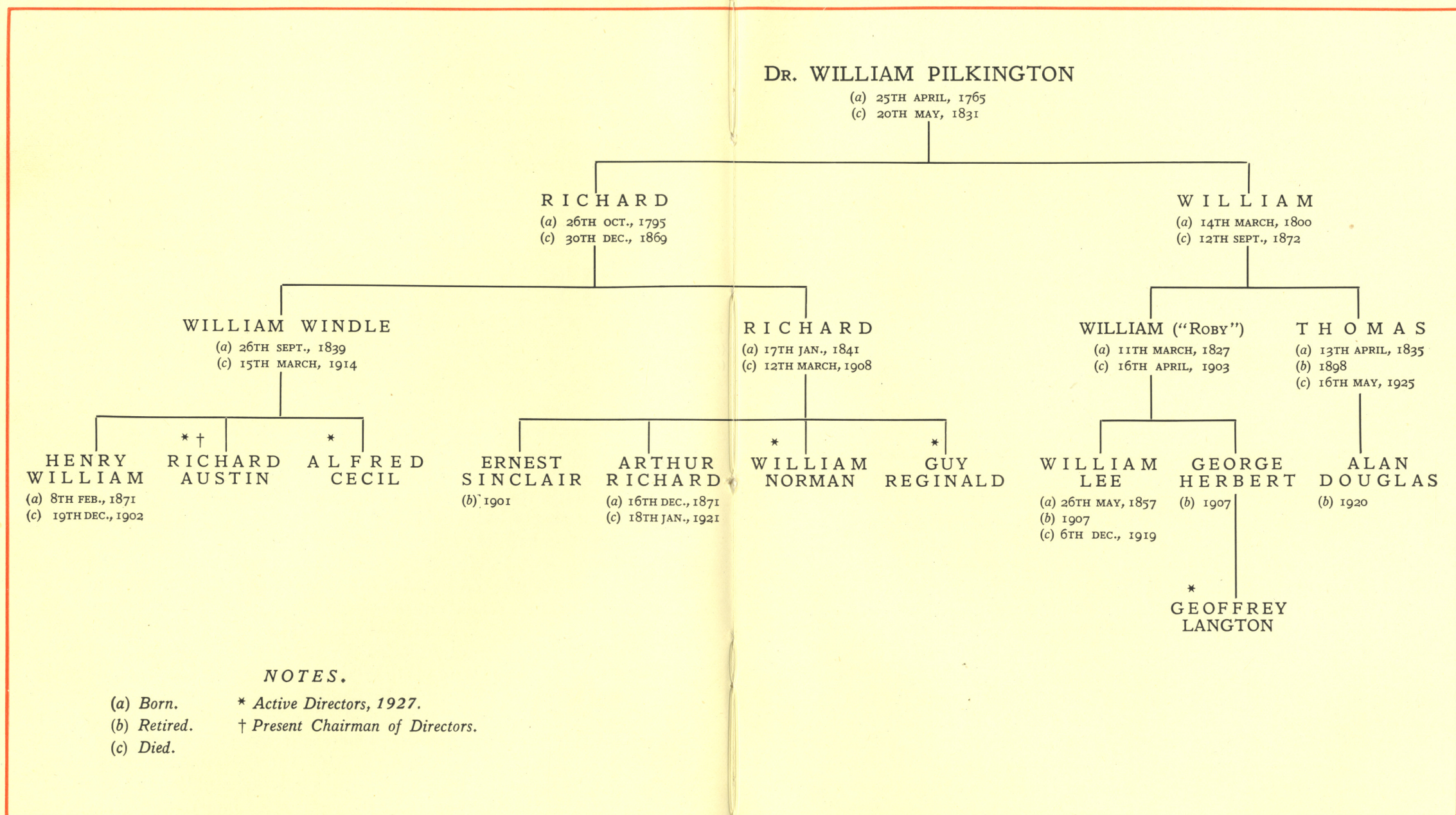
DEVELOPMENT OF GLASS-MAKING INDUSTRY

THE glass-making industry, revived by the removal of the Excise duties in 1845, continued to make headway. A very important development came in 1847 when James Hartley of Sunderland patented the process of manufacturing a new variety of glass called "Rolled Plate." Glass so manufactured is still called "Hartley's Plate" in many parts of the North of England. Chances and Pilkingtons both made Rolled Plate under Hartley's patent and to-day this method of manufacture is a very important branch of the industry. Developments of the Rolled Plate process brought Cathedral and Figured Rolled glass and to Chances belongs the distinction of having perfected the process of making the sheets between two rollers, thus giving the reverse of the sheet a brilliant instead of a dull surface.

In 1896 Pilkingtons began to make "wired" glass, which is a glass re-inforced by wire to make it fire-resisting. The adoption of this new manufacture was largely due to successful experiments carried out by Windle Pilkington. The Firm also acquired patents from France and America for use in connection with the new process. For many years Pilkingtons were the only manufacturers of this kind of glass in England.

The new cylinder method of manufacturing Sheet glass was making rapid strides for, whereas it was stated before the Commissioners of Excise in 1833 that Crown glass was almost universally used for glazing, yet all the buildings of the Great Exhibition in 1851 (less than 20 years later) were glazed with

T R E E S H O W I N G R E L A T I O N S H I P O F D I R E C T O R S



Sheet glass. Chances supplied nearly a million square feet of Sheet glass for the original Crystal Palace in Hyde Park and a further three-quarters of a million feet when the Crystal Palace was re-erected at Sydenham in 1852. The history of the glass Industry in England is indicated by the facts that 17 window-glass manufacturers exhibited at the 1851 Exhibition (see Appendix), 10 at the 1862 Exhibition, and two only, Chances and Pilkingtons, at the British Empire Exhibition at Wembley in 1924 and 1925.

Interesting details of the progress of Pilkingtons were given in a paper on "The Manufacture of Blown Window Glass" read by Mr. Henry Deacon (at one time Works Chemist) before the Architectural and Archæological Society of Liverpool in 1851. He says :—"At the commencement there were about 40 or 50 hands, but the Company now have in different departments, and exclusive of the Colliery, between 800 and 900 in their employment, 560 of whom may truly be called glass-makers. The rest are employed in the Warehouses as assorters, cutters, packers and loaders, as makers of pots, bricks, and other articles of clay, and in the different trades of carpenters, wheelwrights, sawyers, bricklayers, masons, smiths, mechanics, engine-drivers, carters and plumbers."

THE GLASS WORKS SCHOOL

"**T**HEN there is a functionary of quite another class—the schoolmaster. Many boys are employed and, working at uncertain hours, often all night, no regular day or night school would receive them as scholars. A school was therefore established at the Works for the use only of such as are actually employed. (See Appendix.) Under 16 years of age the attendance is compulsory at times arranged each day by the schoolmaster and different managers and foremen. The number in the school both above and below that age is 117. The discipline fines of the Works go to buy books for a library for the use of the work-people. Only from 40 to 50 regularly avail themselves of it, but it is to be hoped from the greater care bestowed on the education of the young glass-makers that the number of readers will in time increase.

The weekly product of the Works is about 80 tons of glass, in making which 650 tons of coal are consumed."

It may be not inappropriate to point out that undesirable as the half-time system was according to our modern ideas as to the age at which boys should start working, yet at that time the establishment of Works Schools and the provision of part-time education was a distinctly progressive step taken by the Employer for the benefit of his Employees.

Introduced at a time when there was no free education and when there was no obligation on the Employer to make such provision, Works Schools provided for boys the opportunity for education which they might otherwise have been entirely without.

In 1852 Pilkingtons took over the Ecclestone Crown Glass Works which had been established before Pilkingtons came into the industry by a Mr. Mackie who left the Ravenhead Company for this purpose. Subsequently Mr. Mackie was joined by Mr. West, the firm becoming Mackie and West and later still Mackie, West & Co., when Mr. Holt of Liverpool joined the firm. After some vicissitudes the business passed into the hands of a Mr. Hadland and on his failure the Works was purchased by Pilkingtons. Mr. Hadland's failure was the result of legal proceedings against him for an infringement of Hartley's patent process of making Rolled Plate.

ROYAL VISIT, 1865

IN 1865 Her late Majesty Queen Alexandra, then Princess of Wales, visited the Ravenhead Works—a visit commemorated in the names of "Alexandra Terrace" and "Alexandra Drive" which adjoin the Works.

FURNACES AND "TANKS"

THE next landmark in the history of Sheet glass manufacture was the introduction of "tanks." In the early days of glass-making, both Plate and Sheet, the raw materials were melted in pots in furnaces heated with wood. About 1752 at Tour-la-Ville

and about 1763 at Saint-Gobain attempts had been made to substitute coal for wood, but with such little success that in 1819 the Saint-Gobain Co. purchased further large forests to ensure their supplies. By 1829 the Saint-Gobain Co. melted in a coal furnace and "fined" in a wood furnace. In the melting furnace the pots were fixed and the metal was transferred to the pots in the fining furnace by means of a copper ladle. In 1850 melting and fining took place in the same furnace heated with wood, but without transfer from the melting pot to the "fining" pot, this being a dangerous operation and one that caused great loss of glass. Very shortly afterwards Gay-Lussac succeeded in melting and fining in the same pot in a furnace heated with coal.

The introduction of the Siemens regenerative gas furnace in 1861 is an event of the greatest importance in the history of glass-making. Originally invented for the Iron and Steel Industry, the furnace was adapted for the glass industry and was first used for Plate glass making at Recquignies in 1865. The first Plate glass works in Belgium to adopt the Siemens furnace were Sainte Marie d'Oignies and Floreffe in 1869. The great advantages of gas furnaces over coal are that they give purer glass, the melting process is very much quicker, use can be made of less fusible materials, which produce a glass less liable to "weather," larger pots and larger furnaces can be used and there is a marked economy in fuel.

The invention of the Siemens furnace led to the innovation in Sheet and Rolled Plate glass-making of melting the raw materials in "tanks" instead of in pots. The different method of manufacture, however, still necessitated the use of pots for making Plate glass. Windle Pilkington, realising the possibilities which this invention held for the glass industry, carried out experiments and eventually from 1889 onwards constructed tanks which were far superior to any on the Continent both in size and efficiency. A tank has this great advantage over pots, that whereas the latter were not always ready and thus work was apt to be intermittent, the former gives a constant flow of metal always ready for use. The raw materials are put in at one end, and gradually melted and refined, until the metal arrives at the blowers' end at the correct temperature and in the right condition for immediate and continuous working. This invention revolutionised the manufacture



SHEET WORKS, ST HELENS



COWLEY HILL WORKS, ST HELENS



RAVENHEAD WORKS, ST HELENS

of Sheet and Rolled Plate glass, and it is to this that Pilkingtons largely owe the prominent position they have held in the manufacture of Sheet glass during the last 50 years. The great increase in their Works demanded vast quantities of fuel and, to ensure a constant supply of coal, Pilkingtons decided to extend their colliery interests by amalgamating their St. Helens Colliery with the Ravenhead Colliery Co., Ltd., to form the St. Helens Collieries Co., Ltd., in 1876. To-day the collieries are an important branch of their undertakings.

EXTENSION OF SHEET WORKS

THE Sheet Works was extended by the purchase of further land for the erection of new and much better-equipped glass-houses on what is now called the "Jubilee side" of the Works. This extension resulted in a largely increased output and British Sheet Glass made at St. Helens soon achieved a world-wide reputation for its high quality. The next step was to build two more fully-equipped large Sheet tanks (known in the Works as the "Third House Range" and the "Fourth House Range") to replace the remaining old glass-houses.

Many people will remember the familiar and picturesque sight, to be seen when travelling by train to Liverpool, of the glass-makers in their white overalls, standing on the verandahs over the canal, cooling the glowing metal gathered on the end of their blow-pipes.

The famous First House which was built under the Old Cone at the corner of Grove Street and Watson Street still continued to make excellent glass and was last worked in 1915.

PILKINGTONS AND PLATE GLASS

HAVING now firmly established their position in the manufacture of Sheet glass and Rolled Plate, Pilkingtons turned their attention to Polished Plate glass which was for them an entirely new undertaking. At this time there were six works in

England making Polished Plate. These belonged to The British Plate Glass Co., The Union Plate Glass Co., The London and Manchester Plate Glass Co.—all these being situated in St. Helens—The Thames Plate Glass Co. (London), The Birmingham Plate Glass Co. (Birmingham), and The Tyne Plate Glass Co. (South Shields).

FOREIGN COMPETITION, ESPECIALLY BELGIAN

BEFORE the Franco-German War (1870-1) the Plate glass used in this country was supplied by English and French manufacturers. During that war the French Plate glass factories closed down, resulting in a boom in Plate glass manufacture in England. At the same time advantage was taken of the opportunity to establish additional factories for the making of Plate glass in Belgium and thus began the severest competition which English manufacturers have had to meet.

The prominent position in the Plate glass industry occupied to-day by Belgium, a comparatively small country, calls for some explanation. After the Revolution in 1830 Belgium separated from Holland and from this date its industrial development was greatly accelerated. The first Belgian Plate glass works was established at Sainte Marie d'Oignies in 1836, although some years earlier cast glass was made in Belgium by d'Artigues at his works at Vonêche, but, unable to compete with England and France, he had had to abandon the struggle. Before the Franco-German war therefore the Belgian output of Plate glass was relatively small compared with that of England, where several Plate glass works were successfully established. In 1851, at the time of the London Exhibition, England produced between three and four times as much Plate glass as Belgium and considerably more than France and Belgium together.

As has been said, the closing down of the French factories during the Franco-German war encouraged Belgium to establish more glass works and during the next twenty years several works were built, among them being Auvelais, Moustier, Saint Roch and Charleroi. Owing to trade depression and the large increase in

output to which the new works contributed, the very high prices current immediately after the Franco-German war were not long maintained and were followed by a serious and rapid slump. A notable result of this reduction of price was a greatly increased demand for Plate glass, as its comparatively low price allowed of its being used much more extensively for glazing. Hitherto a luxury for the few, it could now for the first time be used for ordinary purposes by the many. But the fall in price and the increasing competition from Belgium had a disastrous effect on the Plate glass industry in England. Some of the works soon found themselves in financial difficulties and were compelled to shut down. So keen became Continental, and especially Belgian, competition that only one Plate glass works in England—Pilkingtons—has managed to survive.

It will naturally be asked why England, formerly foremost in the manufacture of Plate glass, should be unable to maintain the advantages of an old-established industry against the competition of new rivals. The answer may well be given by the Belgians themselves. D'Août-Nicolay (in 1906) says, "Belgium is not the least responsible country for increasing output, as it is the best situated for good and cheap production. We have plenty of men, both managers and workmen, who have been trained in the industry. We have all round us at a short distance (almost on the spot) coal, sand, wood, clay, sulphate of soda, limestone, everything necessary for manufacture, and everything required in the construction of works and equipment. We have almost at the gates of our works an unequalled seaport to which we have access by water and by rail. We have plenty of capital and well-known thrift and the low cost of living gives us manual labour at a cheap rate."

To these natural advantages may be added the even greater one (already referred to) of working seven days a week which, in a continuous process such as glass-making, is of very great importance from the point of view of costs. The much longer hours of work and lower wages gave Belgium advantages with which the English Plate glass manufacturers, with the one exception, found it impossible to compete. Moreover, since the Great War the complete disorganisation of Foreign exchanges has greatly increased the advantage held by Continental competitors.

The output of Belgium increased from 60,000 square metres in 1851 to 2,500,000 square metres in 1906, and of this latter quantity nine-tenths was exported. D'Août-Nicolay says, "We are succeeding in spite of everything in getting behind the customs barriers of the U.S.A. ; we are establishing ourselves in Australia, Canada, Spain and the Far East, and lastly we have the biggest share of the English market."

COWLEY HILL WORKS (1876)

IN spite of the competition of other Plate Glass Works in England, the increasing competition from the Continent, and the severe depression in trade generally, Pilkingtons with courage and determination began the erection of a large and well-equipped Plate Glass Works at Cowley Hill (St. Helens). The first intention had been to erect the new Works as an extension of the Sheet Works. It was realised, however, that one of the greatest problems which other Plate Glass Works had to face was the removal and disposal of waste sand. For this reason it was, of course, of great advantage to have the Works on an elevation, so that the water and sand from the grinding benches could be readily carried off by making use of the natural fall of the ground. This was one of the chief reasons which led Pilkingtons to discard the originally-intended site and to look for a suitable position on higher ground. This they found at Cowley Hill. In course of time, however, owing to the great accumulations of such deposits, it would have become impossible to distribute further waste sand over the settling areas by gravity only. Fortunately, however, before the situation became acute, Mr. William Smith of the London and Manchester Plate Glass Company had been successful in working out a method of pumping which enabled the waste sand to be distributed over areas which were higher than the site of the Works itself thus solving a very serious problem. It is of interest to note here that literally millions of tons of waste sand have been dumped in suitable open spaces in the neighbourhood of the Works and that the whole of the sand forming these huge deposits was originally taken from the bed of the Mersey. Incidentally the removal of this sand from the river has improved the port of Liverpool by assisting the dredging operations of the Estuary.

The Casting Hall at the new Works was 781 feet long, the largest in the world, and it contained as many as 60 kilns. Plate glass was first made in these Works on 14th July, 1876. A piece of the glass first "founded" remains in the Firm's possession as a memento, and examination shows that even this first glass was of good quality. Thus began a new era in the history of the Firm and to-day the Plate glass branch of the business forms probably the most important part of the Firm's activities.

GRINDING AND POLISHING PLATE GLASS

IN earlier days, and before Pilkingtons were engaged in Plate glass-making, the processes of grinding and polishing the rough plate were carried out on small square immovable tables. In the grinding (the first stage in the removing of the uneven surface) one plate of glass was laid on the table and its surface was ground smooth by moving another plate up and down upon it with sand and water between as an abrasive. When the grinding had been completed the glass was transferred to the polishing tables. Before the introduction of machinery both these processes had to be carried out by hand. According to a record of 1765 grinding took 36 hours and polishing 72 hours. It is of interest to note that in the early days of Plate glass manufacture in France the glass was sent in its rough state to Paris to be polished, the object being to reduce the loss caused by breakage in transit by not incurring the additional expense of polishing until the safe arrival of the glass at its destination. By 1865 machinery had reduced the length of time necessary for grinding to 28 hours and for polishing to 24 hours. To-day, of course, newer methods and improved machinery have reduced these times very considerably. From 1880 onwards experiments were taking place on the Continent for using movable tables for carrying the glass direct from the grinding to the polishing machine. The Belgian works at Auvelais had adopted this new method in 1888 as shortly afterwards did the works at Oignies. The name chiefly connected with this improvement in the process is that of M. Malevez. To enable Pilkingtons to keep abreast of the times it was necessary to scrap their old machines about 1893 and to install new equipment on

HOME SALES MANAGERS



1. MR. E. A. EVANS, Head Office

2. MR. J. H. BRIDGE	...	...	Glasgow	4. MR. P. BAIN	...	...	Sheffield
3. MR. A. S. PLATT	...	...	London	5. MR. E. H. GREENALL	...	...	Nottingham
				6. MR. J. BARNETT,	Bristol		

the Malevez system. After a short time only this in turn was superseded by still further improved machinery.

While the machinery itself was undergoing change, so also was the motive power. The invention of the Steam-engine had towards the end of the 18th century enabled the industry to discard the laborious and lengthy hand process. Steam power was originally installed at the Cowley Hill Works, but gave place for a short time to gas engines. The most important advance in this respect, however, was achieved by the electrification of the machinery which was carried out on the suggestion and under the direction of Messrs. O'Gorman and Cozens-Hardy, Consulting Engineers. Mr. E. H. Cozens-Hardy (now Lord Cozens-Hardy) later joined the Board of Directors, of which, as already stated, he is still a member.

PLATE GLASS LEHR

AS always, the Directors were restless in their efforts to improve. In 1893 Windle Pilkington began experiments with the idea of annealing Plate glass in a lehr, a thing which other experts held to be impossible. These experiments were encouraging in that they proved the possibility of the idea, and in 1902 the Firm successfully established a mechanically-operated annealing lehr for Plate glass. In 1749, according to the author of "Nature Display'd," annealing had taken as long as a fortnight. This time was very much reduced and, immediately before the introduction of the lehr, annealing occupied three or four days and was carried out in bricked-up kilns. With the lehr, however, annealing now became a continuous process, taking about as many hours as previously it had taken days. The principle of the lehr is the mechanical moving of the sheets or plates of glass through a series of kilns or ovens of gradually diminishing temperatures until by the time the glass emerges at the end of the lehr it is perfectly annealed. In connection with the experiments and construction of the first lehr a close secrecy was observed, so successfully that when a Plate glass lehr was built in Belgium 8 years later it created a great sensation and was proclaimed as the first in Europe.

HOME SALES MANAGERS



In this connection it is interesting to recall an article in *The Manchester Guardian* in September, 1903, dealing with the various reasons why Plate glass-making did not flourish in England. It says: "Now dealing with the last argument advanced, that the English maker has been too conservative, too slow to adopt later and better means of manufacture, it must be frankly confessed that this is only too true." The same article goes on to charge the manufacturers with "an entire absence of that spirit of enterprise so necessary to keep abreast of the times." At that time Pilkingtons had been operating their Plate glass lehr for 12 months but had not advertised it!

CANADIAN DEPOTS AND WORKS

THE increased output of glass demanded wider markets and to seek these Richard Pilkington visited the United States and Canada. As a result of his visit a Depot was opened at Busby Lane, Montreal, the first of a chain of Depots which now extends from Halifax in the East to Vancouver in the West. Eight in number they are situated at Halifax, Montreal, Toronto, Hamilton, Winnipeg, Calgary, Edmonton and Vancouver, with a Central Office at Toronto.

Later, in 1912, with a view to supporting its Canadian trade and protecting some Canadian patents, the Firm decided to establish a Works at Thorold, Ontario, in the Niagara peninsula. This Works, finished in 1914, was built at an unfortunate time, as it had barely started making glass when the Great War broke out. The glass-makers who had gone out from St. Helens to start the Works mostly enlisted in Canada or returned to England to do so, but fresh men were trained and the work was carried on for 10 years until 1924. After the War, however, the depreciation in the continental exchanges reduced the small measure of protection which the Industry originally enjoyed in Canada. The continental practice of continuous working in Glass Factories through the week-end far outweighed what effective protection was left, and in July, 1924, the Works was closed down, greatly to the regret of all who had taken part in its establishment.

CANADIAN DEPOT MANAGERS



1. MR. J. E. HARRISON, *General Manager*

2. MR. W. N. SWAN ... Toronto

3. MR. H. A. ANDERTON, Vancouver

4. MR. F. V. TRUESDALE, Calgary and Edmonton

5. MR. H. R. HARRISON Montreal

6. MR. H. C. LEGG Halifax

7. MR. R. M. BRYSON Hamilton

8. MR. W. H. HALL Winnipeg

FOREIGN DEPOTS


IN addition to the Canadian Depots the Firm had established Depots in Paris and Naples. Similar distributing centres have since been set up in Buenos Aires, Bahia Blanca, Rio de Janeiro and Shanghai. The Firm also has its own Offices and Resident Representatives in other towns in South America, in Hong Kong, and in Australia, New Zealand, South Africa and India.

THE MAUBEUGE WORKS

APART from Thorold, the only other actual manufacturing which the Firm has undertaken abroad is at its French Works which was started in 1893. Before that time Plate glass was imported from St. Helens to France and sold through the medium of the Firm's Depot in Paris. In 1893 an increased French duty on Plate glass came into force and in order to protect their connection Pilkingtons built a small Works in French territory. The site chosen was on the banks of the River Sambre close to the old fortified city of Maubeuge and within two or three miles of the Belgian frontier. The Works was not without its neighbours, two other French Works being already established near by also on the Sambre, and within a comparatively short distance were situated several of the large Belgian Plate Glass Works on the banks of the same river between Charleroi and Namur.

The Maubeuge Works, though small in size, produced good Plate glass which was chiefly sold in the French market. The building of a Plate glass lehr and the equipment of the Furnace Hall with new machinery were interrupted by the outbreak of War in 1914, which almost immediately cut off all intercourse between St. Helens and Maubeuge. The Works, although between two of the larger frontier forts, at first escaped any serious damage. The buildings were used alternately by the French and the Germans as a Hospital and for other War purposes. It was not, however, till the later stages of the War that they suffered serious and systematic destruction and pillage. Whether it was because the Works was owned by an English Firm or because one of the

EXPORT SALES MANAGERS



1. MR. H. L. KIMMINS, Head Office

2. MR. J. THORPE, Cuba (*Formerly Representative in Canada and U.S.A.*) (Died 8th November, 1927)

3. MR. J. BROOKS Buenos Aires

4. MR. S. JONES Rio de Janeiro

5. MR. H. MEES Australia

6. MR. F. W. BUTCHER New Zealand

7. MR. J. L. KIMMINS China

8. MR. P. NORBURY South Africa

9. MR. P. HILTON India

10. CAPT. F. C. GORDON Paris

first German Zeppelins had come to grief on the lightning conductors of one of the chimneys, the Maubeuge Works seemed to be singled out by the Germans for attention, and when recovered in 1919 was little more than a heap of ruins. It was determined to rebuild the Works on the same site, and with the help of the St. Helens Staff and organisation, this was carried out on modern lines, the new Works being finished in August, 1921.

P I L K I N G T O N S B U Y R A V E N H E A D

IN 1901 Pilkingtons took over the Ravenhead Works from the British Plate Glass Company who had been running the Works since 1895 when, as previously mentioned, the lease was surrendered by the London and Manchester Plate Glass Company. Pilkingtons continued the manufacture of Plate glass at Ravenhead until early in 1917 when this branch of the manufacture was wholly undertaken by the Cowley Hill Works. Ravenhead now makes Cathedral and Ornamental glass, shades and cells and miscellaneous articles, and includes the Glass Bending Department.

“ D R A W N ” G L A S S

THE next revolutionary and far-reaching development in Sheet glass manufacture was the introduction by Pilkingtons in 1909 of an ingenious American process of mechanically drawing and blowing large cylinders which, after being cut up into suitable lengths, are split and flattened in practically the same manner as hand-blown cylinders. The process of drawing is almost entirely mechanical and cylinders as large as 40 ft. in length and 8 ft. in circumference are made in this way. (The largest hand-blown cylinder is about 7 ft. in length and 4 ft. in circumference.) The mechanical lowering of these huge cylinders of brittle glass from the perpendicular position in which they are drawn to the horizontal position into which they have to be placed for handling and cutting purposes is perhaps the most spectacular sight amongst the many wonders of glass-making. The bulk of the glass first made by this process was not up to the Pilkington quality, but

ceaseless experiments have resulted in continual improvements and to-day machine-drawn glass competes successfully with hand-blown glass and is in some ways its superior. One of the most important of the improvements referred to was the invention and perfecting by Windle Pilkington of an automatic device for correlating the pressure of air which blows the cylinder with the speed at which the cylinder is drawn.

It is a matter of the greatest regret to the Firm that its Centenary should coincide with the superseding of the old and highly-skilled trade of glass-blowing by more modern mechanical processes. In addition to the process above referred to, there are other mechanical methods of manufacture which produce flat sheets of glass directly instead of through the intermediate form of cylinders. The best known of the "flat-drawn" processes is the invention of M. Fourcault, a Belgian Engineer. This process has now been established in many countries as one of the chief methods of making window-glass.

It should not be overlooked that the United States is now a very large producer of all kinds of glass, including Plate glass and machine-drawn Sheet glass. Its huge output has considerably increased the difficulties of competition which the British manufacturer has to face.

ROYAL VISIT, 1913

IN July, 1913, the Firm was honoured by Their Majesties King George and Queen Mary who made a tour of inspection of the Cowley Hill Works. His Majesty marked the occasion of his visit by "starting up" a new 6,000 h.p. Parsons-Siemens Geared Turbo-Generator which the Queen graciously christened the "King George."

THE GREAT WAR

THE next period in the history of the Firm in common with the history of the country was that of the Great War. As stated at the outset, Pilkingtons have a military tradition as well as a history as glass-makers. Many members of the family have

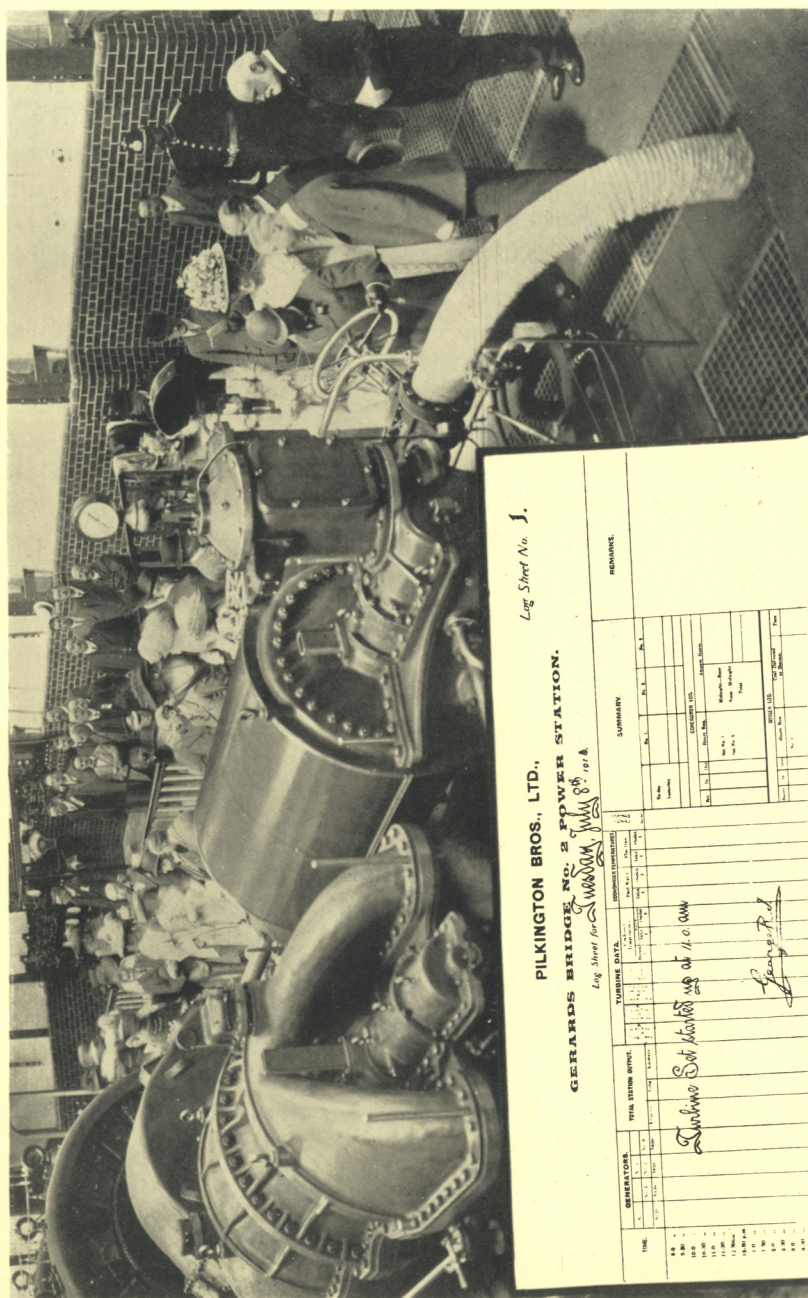
been actively associated with the Volunteer and Territorial Movements. The local Volunteer Corps was first formed in 1860 and Windle and Richard Pilkington were among the first to be sworn in. Col. Windle took over the command of the Regiment from Sir David Gamble in 1889 and he was succeeded in the command by his brother, Col. Richard, in 1901. For his work in connection with the Volunteers and for his other public services, Col. Richard in 1905 was awarded the honour of Companion of the Order of the Bath (C.B.). The local Territorial Battalion, the 5th Prince of Wales Volunteers South Lancashire Regiment, is now commanded by Col. W. N. Pilkington, D.S.O., T.D., a son of Col. Richard. His brother, Major G. R. Pilkington, D.S.O., T.D., holds rank under him, and very many of the Employees of the Firm have been and still are connected with the Battalion.

During the Boer War four members of the family, Ernest, Lionel, and Charles (sons of Colonel Richard) and Thomas Douglas (elder son of Thomas) saw active service in South Africa, the last-mentioned of whom, a Lieutenant in the Royal Dragoons, was killed in action in July, 1900.

During the Great War the following Directors and members of their families held Commissions in His Majesty's Forces :— Mr. R. A. Pilkington, Col. W. N. Pilkington, D.S.O., T.D., Major G. R. Pilkington, D.S.O., T.D., Major G. L. Pilkington and Major R. M. Weeks, D.S.O., M.C. (present Directors), and Major E. S. Pilkington, Col. L. E. Pilkington, C.M.G., and Col. C. R. Pilkington, C.M.G. (brothers of Col. W. N. and Major G. R. Pilkington).

The Firm also did everything in its power to encourage its Employees to join the Fighting Services and before the end of the War nearly 5,000 men had enlisted mostly as volunteers and many decorations were won. It is to be recorded with sorrow and pride that nearly 500 of these gave their lives for their country. Their names appear in the "Roll of Honour" on pages 79 to 93.

The Firm was among the very first to grant generous weekly allowances to wives and dependants of Employees on active service and undertook to find employment for the men on their return—an undertaking that was faithfully honoured, in spite of the difficulties of the immediate post-war period.



VISIT OF THE KING AND QUEEN, 1913 HIS MAJESTY STARTING UP THE NEW TURBINE

It will be realised that with nearly half the men on active service the various processes of manufacture were carried on under the greatest difficulties, but in spite of those difficulties the Firm produced glass of such kinds and in such quantities that it may be said with pardonable pride that England was fortunate in having two such progressive and well-equipped Firms as Chances and Pilkingtons on whom she could rely for such glass as was required by His Majesty's Forces and without whose loyal assistance naval and military operations would have been very seriously handicapped.

Naturally a large part of the Works had to be closed. Plant that could be kept going was largely devoted to the supply of glass required by Government Departments.

The needs of the country received the first consideration and in consequence supplies for civil and domestic purposes had to be severely rationed. This was done by Pilkingtons with such systematic thoroughness and fairness that the Government never considered it necessary to control either distribution or price—a fact of which the Firm, in days of widespread and far-reaching Government control, had every reason to feel proud.

M U N I T I O N S

THE Firm early in the War gave up a large part of its Works and plant to the making of munitions. Remembering the wonderful development in the production of munitions, not only for our own Forces but for those of our Allies, which the country later achieved, it is easy to forget how dire was the need for these supplies in the earlier days. All Engineering Shops which could be adapted to make shells were needed. In the St. Helens district a committee for this purpose was formed under the chairmanship of Lord Cozens-Hardy (then the Hon. Edward Cozens-Hardy), one of the Directors.

The old side of the Cowley Hill Works was turned into a Munition Shop in July, 1915, employing at the start about ten men and boys. Extensions being quickly made, it was necessary to introduce female labour and by the end of the War the Employees

numbered 1,300 females and 500 males. The Factory held a very high place in the country for output and efficiency. It produced a total of 650,000 shells and 400,000 shell noses, it rectified 15,000 other shells and it completed 30,000 further shells, which had already been partly manufactured by other local Firms. Very few Munition Shops produced more, or even as many, shells per machine with less machine scrap and with such a high percentage of female and unskilled labour. Without doubt these excellent results were very largely due to the fact that the profits were devoted to establishing and maintaining the Pilkington Special Hospital for Disabled Soldiers and Sailors.

THE PILKINGTON SPECIAL HOSPITAL

THIS was started in 1916 at Ravenhead where a portion of the Works was allotted to it. The success of the Special Hospital, with the development of which Lord Cozens-Hardy was also chiefly associated, arose largely out of the practical experience in France of Dr. James R. Kerr, Ch.M., a surgeon of great ability, who before the War was the Works Doctor. The Hospital specialised in orthopædic treatment for men disabled in the War, who required all that surgical knowledge and post-operative treatment could do for them. There was an ever-increasing demand on the accommodation of the Hospital both for in-patient and out-patient treatment and its size had to be quadrupled. The splendid work done by the Hospital was acknowledged by those who were qualified to judge, and hundreds of disabled soldiers and sailors owe to the treatment they received at the Special Hospital their ability to earn a livelihood to-day.

Owing to the welcome and expected falling-off in the demand for this specialised treatment for ex-Service men the Hospital was closed at the beginning of 1925.

During the whole of the War period the Firm by liberal financial assistance encouraged those who stayed at home to subscribe to the Government Loans which were raised from time to time to carry on the War.

The Armistice in November, 1918, brought with it difficulties and problems of re-organisation and re-construction.

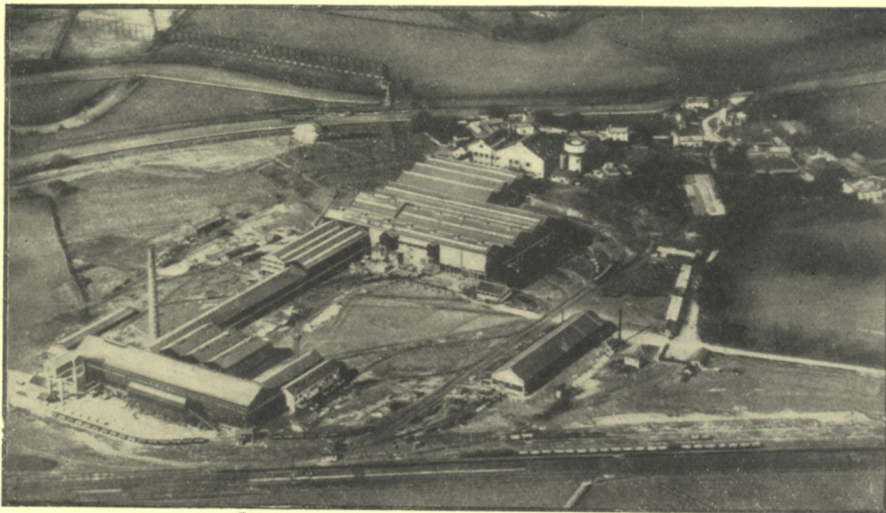
THE INDUSTRIAL COUNCIL

IN 1917 the Firm had taken an important step in its relations with its Employees by recognising the principle of "collective bargaining." Early in 1919 the St. Helens Plate and Sheet Glass Industrial Council was formed, thus recognising the joint interest of the Firm and its Employees in the fortunes and progress of the Industry.

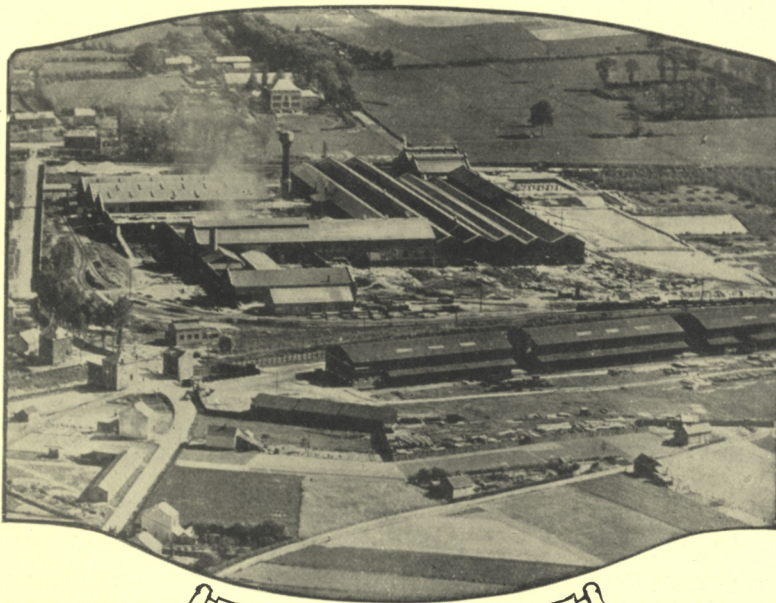
It will be quite understood that in the difficult period which followed the partial return to normal work after the War and in the very serious depression and unrest which have since occurred, the Industrial Council has had to deal with many matters of great difficulty and complexity. The opportunity which the Council gives for the frank discussion of such matters has undoubtedly marked this step as one of the first importance in the history of the Industry. It is a pleasure to record that the relations between the Directors and their Employees, both directly and as represented by the Industrial Council, have been very amicable even during the period of severe depression, when the most drastic cutting of costs has been necessary to enable the Firm to maintain its position in the Industry, and to continue to find employment for its thousands of workpeople. In this connection may be emphasised the fact that the active interest of the Directors in the business leads to the happy position in which masters and men have personal knowledge of and direct access to each other. All alike are employees of the Firm and all are workers in the Industry on which they depend.

DONCASTER PLATE GLASS WORKS

AS the Cowley Hill Works had been largely given up to the making of munitions during the War, the re-organisation and re-conditioning necessary to reconvert it into a Plate glass factory with pre-war capacity were so considerable as to lead the Directors, pending its reconstruction, to decide on the erection of an entirely new Plate Glass Works in the vicinity of Doncaster, a site chosen because of its nearness to good supplies of coal. In the construction of this Works the Directors had the experience and lessons of



DONCASTER WORKS



MAUBEUGE WORKS

nearly 50 years of Plate glass-making behind them and the result was one of the most finely equipped glass factories in the world. The first glass was made at Doncaster in July, 1921.

G A R D E N V I L L A G E S C H E M E S

AS the Works was erected in the open country four miles outside Doncaster, it was decided to build a Garden Village to provide homes for the workpeople. To-day the Garden Village contains upwards of 350 houses in addition to a Church, School, Village Hall, Recreation Rooms and other Village institutions.

A Garden Village scheme was also contemplated on the Eccleston Hall Estate on the outskirts of St. Helens and towards this about 125 houses and bungalows have been erected for Employees.

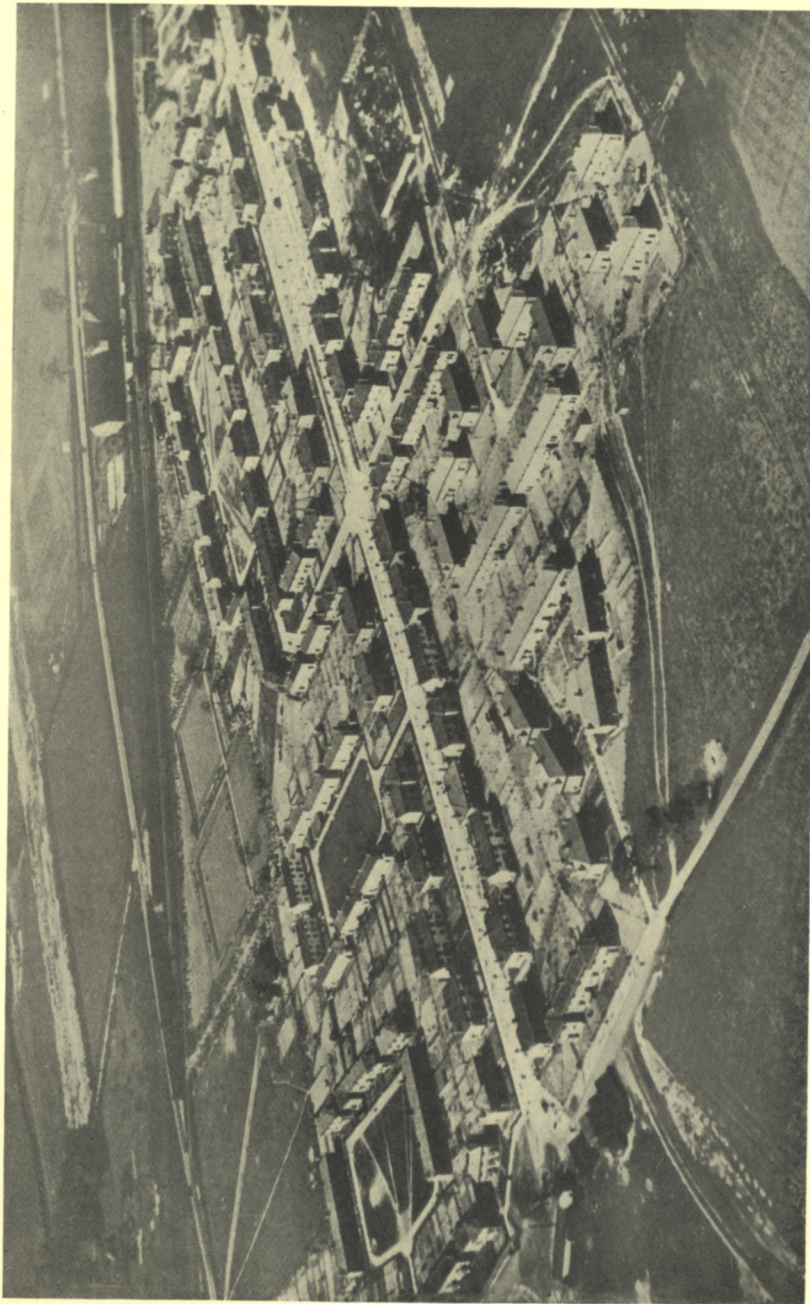
The Estate Department of the Firm has a large nursery which provides trees, shrubs and plants for the Garden Villages and Recreation Grounds both in St. Helens and Doncaster.

R O Y A L V I S I T , 1 9 2 1

THE Town was honoured by a visit of H.R.H. The Prince of Wales on July 6th, 1921. His Royal Highness had signified his intention of visiting and inspecting the Cowley Hill Works and the Firm had made arrangements accordingly, but, unfortunately, to the great disappointment of the Directors and their Employees, an overcrowded programme prevented him from carrying out his intention. The Prince, who inspected the local ex-Service men on the Pilkington Recreation Club's Football Ground at City Road, had a very enthusiastic reception in the Town.

1 9 2 6

TO-DAY the Firm owns three large Glass works in St. Helens, in addition to Collieries and a Brick works, Works at Doncaster and Maubeuge, and Depots or representatives in many parts of the world. Its Employees now number over 13,000 of



THE GARDEN VILLAGE, DONCASTER WORKS

R E C R E A T I O N



RUSKIN DRIVE GROUNDS

R E C R E A T I O N



BOWLING GREENS, COWLEY HILL



BOWLING GREENS, RAVENHEAD

whom more than 1,000 have over 25 years' service. There are still working 14 men who have been with the Firm for 50 years or more. The number of 50 years' service men has recently been reduced owing to the introduction in 1925 of a Workmen's Pension Scheme which contemplates retirement at the age of 60 and not later than 65. There are at present 92 Pensioners with over 50 years' service and 104 with between 40 and 50 years' service with the Firm.

The welfare of their Employees has always been a matter of great interest to the Directors. A Superannuation Fund for members of the Staff was established in 1918. Thrift is encouraged by a Works Savings Bank, which pays a generous rate of interest on deposits, and also by a scheme of Life Insurance at reduced premiums. Each Works has its own Surgery and Canteens, and Dental Clinics have been established at the Sheet Works, Cowley Hill Works and Doncaster Works. Recreation Clubs, attached to the St. Helens and Doncaster Works, make provision for all forms of recreation and sport. A Staff Association formed in 1922 now has a large number of members for whom it provides Educational and Social entertainment.

THE FIRM'S INDEBTEDNESS TO ITS EMPLOYEES

THIS brief history cannot be concluded without expressing the Firm's indebtedness to the loyalty and skill of its Employees, who have worked side by side with the Directors to establish the business which it is the privilege and responsibility of the present generation to carry on. There are to-day amongst the Employees representatives of many families connected with the Firm from its earliest days—a tradition of service of which the Directors are justly proud.

Looking back over the years a few names seem to stand out more prominently. Some of those who were engaged on the manufacturing side have already been mentioned. On the commercial side there are Thomas Champion and Y. G. Adams, who for many years were in charge of the Home and Export Sales Departments respectively. J. Mather, whose son R. H. Mather succeeded Thomas Champion as Head of the Home Sales Department, long held the responsible position of Head of the



MAIN HALL — HEAD OFFICE

General Office. Outstanding in service as in stature is J. H. Dickinson, Senr., whose experience and wise counsel were of great value to the business, while W. H. Lackland, more recently with us, and the last of his generation of worthy and loyal assistants, gave long and valued service as Cashier and later as Head of the General Office.

Skilled as undoubtedly were those who helped to establish and consolidate the business, the Firm is fortunate in having in its service to-day men of no less skill, enthusiasm and experience, but it would be difficult and invidious to mention by name those who are first among their equals.

CONCLUSION

THE pioneers of the first generation have passed away ; the undaunted builders of the second generation are gone ; to their successors they have left a tradition of courageous enterprise, strenuous endeavour, and duty done.

The fortunes of Town and Industry are peculiarly interwoven. The progress of the one has been largely dependent on the progress of the other. The population of the Town has risen from about 5,000 in 1826 to over 100,000 in 1926. St. Helens owes its development partly to its coal and partly to the energy and skill of its sons and daughters. An encouraging gospel of hard work and resulting success is ever before us in the Town's motto :—

“ EX TERRA LUCEM.”

G. T. R.



A P P E N D I X

(We are fortunate in being able to reproduce the following reminiscences of an old Glass-maker. John Edmundson was born in 1834 and died in 1913 in his 79th year. He was father-in-law of Mr. E. T. Lever, the present Manager of the Timber Yard, and of Mr. W. G. Moore, of the General Office, to the latter of whom we are indebted for these notes which are in John Edmundson's own language, having been taken down during conversations with him.)

JOHN EDMUNDSON'S REMINISCENCES

IN the year 1844 I commenced work at the Glass Works, being then ten years of age. The Works at that time consisted of two Crown Houses, and one Sheet House, about 30 men being employed for the manufacture of Crown glass, and 20 for Sheet.

In addition, there was the Smithy employing two blacksmiths, one wheelwright, one crate maker, one box maker, three sawyers, and an engineman who attended to the engine for making clay for the pots. There were two Crown sorters, G. Houghton and R. Haslam, three Sheet sorters, Hy. Taylor being one of them, also one packer. J. Rimmer was the Manager of the Warehouse. A Frenchman named Dumany was the Manager of the Blowers ; his remains lie at Old Windleshaw.

The Chemist was Mr. Deacon who afterwards had a chemical works at Woodend. (*Note.*—Mr. Deacon later gave his name to the well-known Deacon process for the recovery of sulphur, of which he was the inventor.)

In all there would be about 100 employees. (*Note.*—An 1849 wages book shows this number to have increased to about 400.)

Greenall was the name over the door at this time.

After spending some time carrying clay for the making of pots, I was then engaged "pushing" for the flatteners, and spent a certain time as block lad and blowing shades. At 17 I commenced blowing Sheet glass. The size made in 16 oz. and 21 oz. was 43" long \times 30/32" wide, only a few of the workmen making 26 oz.

The workmen were chiefly French and Belgian ; a number, however, came from the North country and from Birmingham.

The entire weight of the piece had to be borne by the arms. When carrying the piece, it was usual to rest the left elbow on your side for support, and with continually doing this, our sides were as horny as our hands.

The crane at this time was fixed on the opposite side of the staging, and each time it was required the boy had to place it forward. The Frenchmen thought very little of a blower if he could not describe a circle overhead with his cylinder.

In the Works there were no water taps at this time, water for drinking or other purposes being supplied by wells. There was no gas, the only light being obtained by candles.

The 8th House I might describe as the Blowers' Nursery. It was here that we young St. Helens apprentices spent our time in blowing shades, by this means getting an insight into blowing and from here in course of time were drafted off to blow the cylinders for the making of Sheet glass.

TAX ON GLASS. Previous to 1845 all glass manufactured was taxed. After the glass was flattened and piled in the kilns for annealing, gates were brought and fastened over the kiln mouth and locked ; the Exciseman then inserted his rule, taking the measurement of the glass that was in the kiln at the time. When the glass was annealed, the Excise officer unlocked the gates, and in his presence the glass, sheet by sheet, was placed in a crate and weighed, the duty being paid on the weight of the glass manufactured.

Some little time before the tax was expected to be taken off, a large quantity of glass already packed up in crates was stored in the Works Yard. It had been lying there so long that grass was growing out of the crates and resembled a small green hill. The crates were labelled, bound with red tape, and sealed on each side. When the tax was repealed, the tape, etc., was stripped off the crates, and the first train load of glass leaving the Works on which no tax had been paid, was celebrated by a prop being fastened on the end wagon, attached to which was a red and green plaid shawl of Anne Brogan, the woman employed who stuffed the crates.

LONDON EXHIBITION, 1851. The Firm were represented at this, the first Exhibition. A large Stained Plate Glass illustrating St. Michael overthrowing the dragon was executed in the Staining Department. This Department was started about 1846 under Mr. Ralph Edmundson, my uncle. At the Exhibition a large shade was also shown ; it was a large shade for those days. A man could stand underneath it and, as there were no mechanical appliances, it was considered a great achievement. After the metal had been gathered for making it, it took three men to carry it to the mould, the blowpipe being supported underneath by two men with an iron bar. During the blowing process, a number of the most robust workmen were employed for this part of its manufacture. Owing to the large quantity of metal and to keep this sufficiently hot and pliable, each man had a turn at the blowpipe, taking a mouthful of brandy and injecting this down the blowpipe.

PAY DAY. In my young days there were no tallies, or small tin boxes in which the wages were counted, but at the hour appointed you proceeded to the Pay Office where Mr. Richard Pilkington had charge of the wages ledger. You called out your name, and Mr. Richard then referred to the Ledger for the amount which was due to you, and Mr. James Varley or Mr. Ross counted the necessary coins and handed them to you.

FLAT YARD. (*Note.*—Flat=Barge.) About the spot where the Men's Dining Room now stands, there used to be a Flat Yard, most of the traffic to the Town being by canal.

The Miller was to be seen at the Old Mill (which is now the Glass House Schools) receiving his grain in the Flats arriving by the canal, St. Helens being only a village.

When a Flat that had been built in the yard was ready for launching, the day was generally kept as a great holiday, men, women and children flocking to see the event. On one occasion my brother and I were present to see one of the launches, having slipped out of the Works during the dinner-time to see the boat, decorated with colours, slip down the well-greased blocks into the Canal.

One little incident in this connection I well remember, my brother receiving a blow on the head by someone having thrown a stone. He quickly returned to his work, and during the

afternoon, Mr. Roby Pilkington, as was his custom, came through the Flattening Kilns, and on noticing Will's head bandaged up, inquired the cause. My brother had to admit that he had been watching the launching, and someone had thrown a stone. Mr. Roby replied that he had thrown the stone without any intention of hurting anyone, and was very sorry. He promptly put his hand in his pocket and gave him a shilling, remarking at the time, he supposed he would not mind another stone for another shilling.

A relic of the Flat Yard was discovered when excavating for a tank recently, a small old boat having been found on the spot I have referred to.

Two festive occasions I well recollect. The first was Mr. Roby Pilkington's coming of age which was celebrated in the 1st Warehouse over the pot loft which was decorated for the purpose, one of the decorations being a table of Crown glass silvered and placed in a prominent position.

The 4th Warehouse which was quite new was chosen for the festivities for Mr. Roby Pilkington's wedding, and a right good time we all had.

There were long intervals of rest occasioned when the Sheet glass was made out of pots, and after rambling the country we would return of an evening to the Works Lodge to discuss the events of the day. The newspaper of this time cost 10d. and was subscribed for by a number of us. We had our cricket ground in Kirkland Street, and one of the pot lofts was lent by the Firm for our Dancing Room.

The majority of us youths had had but very little education and to improve ourselves attended a night class. The schoolmaster was, I remember, a typical Scotchman and had no light task before him, for I am afraid we were rather unruly. On more than one occasion Dick Sidler who was a strapping youth, had defied his authority, with the result that there was a stand-up fight which more than once ended by them rolling together on the floor, but in the finish the schoolmaster showed himself the victor.

We would also assemble at the Schools on Sunday mornings and march off to our respective churches and chapels. One Sunday morning after attending the Independent Sunday School, instead of going to chapel afterwards, I had a ramble in the country and

on returning down Denton's Green met Mr. Richard Pilkington and tried my best not to be noticed, but I was not to escape, Mr. Richard giving me a lecture for not also attending chapel. This is my first recollection of Mr. Windle Pilkington, he being a little boy dressed in kilts and glengarry cap, his father holding him by the hand.

Well do I remember when the Volunteer movement was commenced, a number of us workmen having our first march out dressed in our ordinary clothes and armed with nothing more deadly than a stout stick.

The nearest point where we could see a railway train was St. Helens Junction where the Liverpool and Manchester train passed. The guard sat on the top of the front coach in a kind of armchair arrangement. All the goods coming into the Town by rail were received in the Works Yard where you would see the grocers' carts, etc., taking their loads away. There was no Railway Station in St. Helens either for goods or passengers.

Looking back after 60 years' service I am pleased to say I have been spared to see great changes, from the small Works it was when I was a boy to now the largest Glass Works in the world. The little Village is now a Town of great industry.

ACKNOWLEDGMENT

The compiler of this record acknowledges his indebtedness to the following sources of information :—

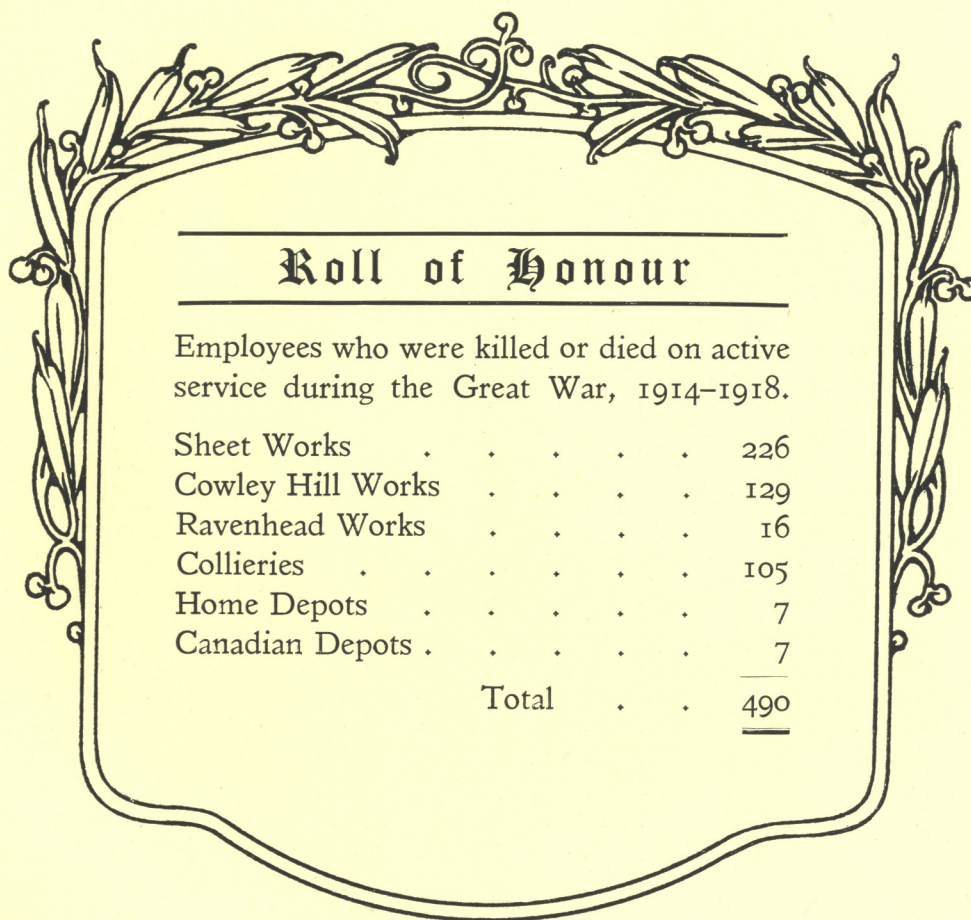
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MR. WILLIAM SMITH,
COL. R. W. H. THOMAS,

THE DIRECTORS,
HIS COLLEAGUES,
and
HIS FATHER.

ST. HELENS, LANCS, 1927.



Roll of Honour					
Employees who were killed or died on active service during the Great War, 1914-1918.					
Sheet Works	.	.	.	.	226
Cowley Hill Works	.	.	.	.	129
Ravenhead Works	.	.	.	.	16
Collieries	.	.	.	.	105
Home Depots	.	.	.	.	7
Canadian Depots	.	.	.	.	7
Total	.	.	.	.	<u>490</u>

S H E E T W O R K S

AINSWORTH, GEORGE	5th South Lancs.
ALMOND, JOHN	17th King's Liverpool.
ANDERTON, WILLIAM H.	5th South Lancs.
ANDREWS, FRANK L.	5th South Lancs.
ASHALL, FRANCIS	Royal Field Artillery.
ASHBY, JOHN J.	2nd South Lancs.
ASHCROFT, HAROLD	Coldstream Guards.
ASHCROFT, JOHN	5th South Lancs.
ASHTON, THOMAS	King's Shropshire Light Infantry.
ATHERTON, EDWARD	Norfolk.
ATHERTON, PETER	Royal Field Artillery.
ATHERTON, T. PERCY	1st King's Liverpool.
AUSTWICK, JOSEPH	2nd Royal Welch Fusiliers.
BACON, ROBERT	Loyal North Lancs.
BAMBER, JAMES E.	Royal Dublin Fusiliers.
BARNES, AUBREY	17th King's Liverpool.
BARTON, RICHARD	Loyal North Lancs.
BESLEY, EDWIN	King's Liverpool.
BILLINGTON, ARTHUR	East Lancs.
BLAKE, WILLIAM G.	11th South Lancs.
BONNEY, ARTHUR	Lancashire Fusiliers.
BONNEY, DAVID	Royal Army Service Corps.
BOOTH, ALFRED	5th South Lancs.
BOYES, HENRY V.	Royal Engineers.
BRADY, JAMES	3rd South Lancs.
BRIERS, HARRY	5th King's Liverpool.
BRISCOE, JOHN	8th King's Own Royal Lancaster.
BROMILOW, EDWARD	8th South Lancs.
BURKHILL, THOMAS	5th South Lancs.
BURNS, ROBERT	5th South Lancs.
BURROWS, GEORGE R.	13th King's Liverpool.
BUTLER, ALBERT	36th Machine Gun Corps.
BYROM, EDWIN	5th South Lancs.
CANNING, GEORGE	5th South Lancs.
CARNEY, JAMES	5th South Lancs.
CARRINGTON, THOMAS	2nd South Lancs.

CARROLL, MATTHEW	.	.	.	.	.	11th South Lincs.
CARTER, HENRY	.	.	.	.	.	5th South Lincs.
CARTWRIGHT, JOHN	.	.	.	.	.	18th Manchester.
CATTERALL, HARRY	.	.	.	.	.	Royal Army Medical Corps.
CATTERALL, WILLIAM	.	.	.	.	.	King's Liverpool.
CHESWORTH, GEORGE	.	.	.	.	.	5th South Lincs.
CLARE, JOHN	.	.	.	.	.	South Wales Borderers.
CLARKE, GEORGE F.	.	.	.	.	.	King's Royal Rifles.
COLLINS, JAMES	.	.	.	.	.	2nd South Lincs.
COLVILLE, JOHN J.	.	.	.	.	.	Manchester.
CONQUEROR, JAMES	.	.	.	.	.	5th South Lincs.
COOK, ROBERT	.	.	.	.	.	5th South Lincs.
COX, CHARLES	.	.	.	.	.	Lancashire Fusiliers.
CRITCHLEY, PETER	.	.	.	.	.	Royal Army Veterinary Corps.
CROMPTON, JAMES	.	.	.	.	.	2nd South Lincs.
CUNLIFFE, FRANK	.	.	.	.	.	Royal Army Service Corps.
CUNNINGHAM, JOHN	.	.	.	.	.	5th South Lincs.
CURRY, JOHN	.	.	.	.	.	5th South Lincs.
DAVIES, ROBERT	.	.	.	.	.	11th South Lincs.
DAVIES, WILLIAM	.	.	.	.	.	5th South Lincs.
DEAN, GEORGE	.	.	.	.	.	5th South Lincs.
DEARY, HUGH	.	.	.	.	.	5th South Lincs.
DENTON, WILLIAM	.	.	.	.	.	Royal Engineers.
EDINGTON, JAMES	.	.	.	.	.	5th South Lincs.
EDINGTON, SAMUEL	.	.	.	.	.	King's Own Royal Lancaster.
EDMUNDSON, HARRY	.	.	.	.	.	1st Herefordshire.
EDWARDS, ALBERT	.	.	.	.	.	11th South Lincs.
FAIRCLOUGH, JOHN	.	.	.	.	.	5th South Lincs.
FAIRHURST, WILLIAM	.	.	.	.	.	Royal Engineers.
FAIRHURST, WILLIAM A.	.	.	.	.	.	5th South Lincs.
FEARNLEY, ARTHUR	.	.	.	.	.	Royal Engineers.
FEARNLEY, CHARLES S.	.	.	.	.	.	Royal Engineers.
FILLINGHAM, THOMAS	.	.	.	.	.	5th South Lincs.
FILLINGHAM, WILLIAM	.	.	.	.	.	Royal Field Artillery.
FINNERAN, WILLIAM	.	.	.	.	.	Grenadier Guards.
FORSHAW, WILLIAM	.	.	.	.	.	11th South Lincs.
FOY, JOSEPH	.	.	.	.	.	Lancashire Fusiliers.
FRODSHAM, JOHN	.	.	.	.	.	11th South Lincs.

GANNON, WILLIAM	4th Gloucestershire.
GARNER, JOSEPH	11th South Lancs.
GASKELL, WILLIAM	18th King's Liverpool.
GERRARD, SYDNEY	5th South Lancs.
GERRARD, WILLIAM	Royal Welch Fusiliers.
GLOVER, JAMES F.	6th Manchester.
GLOVER, RICHARD	5th South Lancs.
GOUGH, ALBERT	5th South Lancs.
GRAHAM, ALFRED	5th South Lancs.
GREEN, JOHN	5th South Lancs.
GREENALL, GILBERT	2nd Royal Fusiliers.
GREENALL, JAMES	5th South Lancs.
GREGSON, THOMAS	Royal Army Service Corps.
GROVES, FREDERICK	Royal Engineers.
HAMMOND, JOHN	5th South Lancs.
HARPER, GEORGE	Royal Engineers.
HARPER, WILLIAM	5th South Lancs.
HARRISON, JAMES	1st Loyal North Lancs.
HARRISON, JOHN	6th King's Liverpool.
HART, WILLIAM E.	Royal Welch Fusiliers.
HATELIE, RICHARD D.	5th South Lancs.
HEATON, WILLIAM A.	4th South Lancs.
HENDERSON, WILLIAM L.	Royal Defence Corps.
HEWITT, JOHN E.	5th South Lancs.
HEYES, JAMES	King's Own Yorkshire Light Infantry.
HILL, CHARLES	East Lancs.
HILL, LEO	11th Cheshire.
HILL, SAMUEL (1)	4th King's Liverpool.
HILL, SAMUEL (2)	11th South Lancs.
HOBART, JOHN	19th Lancashire Fusiliers.
HODGSON, ALFRED	5th South Lancs.
HOLLOWS, ARTHUR	Queen Victoria Rifles.
HOPE, DAVID	5th South Lancs.
HOUGHTON, MATTHEW E.	11th South Lancs.
HOUGHTON, WILLIAM	King's Liverpool Scottish.
HOWARD, ISAIAH	8th South Lancs.
HOWARTH, JOHN	6th Lancashire Fusiliers.
HULME, JOSEPH E.	Royal Fusiliers.
HUNT, JAMES	Labour Corps.
HUNT, SAMUEL J.	5th South Lancs.

HURST, PETER	5th South Lincs.
HURST, SAMUEL	5th South Lincs.
HUSSEY, HAROLD S.	19th London.
ILLIDGE, WILLIAM	6th South Lincs.
IRELAND, CHARLES	5th South Lincs.
JACKSON, THOMAS R.	Royal Army Medical Corps.
JOHNSON, ARTHUR	11th South Lincs.
JOHNSON, JOHN	5th South Lincs.
JOHNSON, ROBERT	Royal Engineers.
JONES, HARRY	Cheshire.
JONES, WILLIAM	5th South Lincs.
KINDER, WILLIAM	5th South Lincs.
KINSEY, JOHN J.	Manchester.
KNIGHT, SAMUEL	South Wales Borderers.
KNOWLES, WILLIAM	7th Worcestershire.
LAMBERT, LOUIS	11th South Lincs.
LARGE, HENRY	Loyal North Lincs.
LARGE, JOHN	2nd South Lincs.
LATHAM, WILLIAM	5th South Lincs.
LEA, PETER	6th South Lincs.
LEDGER, EDWARD	Black Watch.
LETHBRIDGE, EDWARD	Royal Dublin Fusiliers.
LITHERLAND, THOMAS	5th South Lincs.
MACAULEY, WILLIAM S.	5th South Lincs.
MAKIN, ROBERT H.	11th South Lincs.
MARSH, HERBERT C.	2nd South Lincs.
MARSH, ROBERT C.	6th South Lincs.
MATHER, RALPH	Royal Army Medical Corps.
MCCULLY, ROBERT	5th South Lincs.
MCDERMOTT, JOHN	Royal Engineers.
McLOUGHLIN, JOSEPH	5th Manchester.
MERCER, GEORGE W.	17th King's Liverpool.
MIDDLEHURST, JAMES T.	2nd Coldstream Guards.
MILLS, PETER T.	11th South Lincs.
MILNES, ARTHUR S.	Royal Warwickshire.
MOLYNEUX, JOSEPH	11th South Lincs.
MOORE, BERNARD	2nd South Lincs.

MORRIS, ROBERT	5th South Lancs.
MORTON, WILLIAM	5th South Lancs.
MOUSDELL, CHARLES H.	5th South Lancs.
MOUSDELL, GEORGE	3rd Monmouthshire.
MULHEARNE, JAMES	South Wales Borderers.
MULLEN, WALTER	11th South Lancs.
MUSTARD, WILLIAM J.	11th South Lancs.
NAYLOR, THOMAS	8th Loyal North Lancs.
NEWTON, THOMAS J.	19th Lancashire Fusiliers.
NORBURY, RICHARD	Royal Field Artillery.
OWEN, THOMAS	Lancashire Fusiliers.
OWEN, WILLIAM	King's Liverpool.
PALMER, SYDNEY	3rd South Lancs.
PARKER, JOHN J.	11th South Lancs.
PARR, GEORGE	11th South Lancs.
PARR, WILLIAM	Royal Engineers.
PEARCE, JOHN	5th South Lancs.
PENDLEBURY, FREDERICK	11th South Lancs.
PENNINGTON, EDWARD	2nd South Lancs.
PHILLIPS, ALBERT (1)	5th South Lancs.
PHILLIPS, ALBERT (2)	5th South Lancs.
PICKAVANCE, DAVID	5th South Lancs.
PIGOTT, WILLIAM	5th South Lancs.
PLATT, HUGH	5th South Lancs.
PLATT, JOSEPH	Royal Army Medical Corps.
PRICE, JOHN	Royal Engineers.
REYNOLDS, WILLIAM	Lancashire Fusiliers.
RICHARDSON, JOHN T.	5th South Lancs.
RICHARDSON, JOSEPH J.	11th South Lancs.
RIGBY, WILLIAM	8th South Lancs.
RIMMER, WILLIAM	8th South Lancs.
ROUGHLEY, HENRY	11th South Lancs.
ROWLANDS, CHARLES	5th South Lancs.
ROWLEY, FREDERICK A.	Royal Inniskilling Fusiliers.
SALT, FRED W.	Loyal North Lancs.
SALT, STANLEY J.	9th Royal Fusiliers.
SAUNDERS, JOHN F.	5th South Lancs.

SEDDON, JOSEPH	.	.	.	.	.	.	18th King's Liverpool.
SEDDON, THOMAS	.	.	.	.	.	.	Royal Field Artillery.
SELLARS, JOSEPH	.	.	.	.	.	.	5th South Lincs.
SHEERAN, PATRICK	.	.	.	.	.	.	6th South Lincs.
SHEVLAN, CHARLES E.	.	.	.	.	.	.	5th South Lincs.
SLATER, ROBERT	.	.	.	.	.	.	11th South Lincs.
SMITH, ALBERT H.	.	.	.	.	.	.	Welsh Guards.
SMITH, CHARLES G.	.	.	.	.	.	.	3rd King's Liverpool.
SMITH, JOHN	.	.	.	.	.	.	7th South Lincs.
SPRINGTHORPE, WILLIAM	.	.	.	.	.	.	6th South Lincs.
SUTTON, GEORGE	.	.	.	.	.	.	Loyal North Lincs.
SWIFT, JOSEPH	.	.	.	.	.	.	Royal Defence Corps.
TABERN, SAMUEL	.	.	.	.	.	.	Household Cavalry.
TEMPLE, JOHN	.	.	.	.	.	.	5th South Lincs.
THELWELL, FRED	.	.	.	.	.	.	6th South Lincs.
TOPPING, JOSEPH	.	.	.	.	.	.	11th South Lincs.
TRAVERSE, HERBERT	.	.	.	.	.	.	Lancashire Fusiliers.
TROTTER, JOHN T.	.	.	.	.	.	.	11th South Lincs.
TWIST, THOMAS	.	.	.	.	.	.	King's Own Royal Lancaster.
TYSON, FREDERICK J.	.	.	.	.	.	.	King's Liverpool Scottish.
WAITE, RICHARD	.	.	.	.	.	.	Royal Engineers.
WALLIS, A. CECIL	.	.	.	.	.	.	5th South Lincs.
WATERWORTH, JOSEPH	.	.	.	.	.	.	5th South Lincs.
WATKINSON, JOHN	.	.	.	.	.	.	Royal Field Artillery.
WEBSTER, THOMAS	.	.	.	.	.	.	11th South Lincs.
WELLMAN, HENRY	.	.	.	.	.	.	Royal Engineers.
WELSBY, JOHN	.	.	.	.	.	.	6th South Lincs.
WHALLEY, THOMAS	.	.	.	.	.	.	5th South Lincs.
WHITTAKER, FRANK	.	.	.	.	.	.	5th South Lincs.
WHITTLE, JOHN	.	.	.	.	.	.	3rd Lancashire Fusiliers.
WILLIAMS, THOMAS G.	.	.	.	.	.	.	13th King's Liverpool.
WILSON, JAMES (1)	.	.	.	.	.	.	5th South Lincs.
WILSON, JAMES (2)	.	.	.	.	.	.	5th South Lincs.
WILSON, WILLIAM	.	.	.	.	.	.	12th Manchester.
WINSTANLEY, ERNEST	.	.	.	.	.	.	5th South Lincs.
WISWALL, FRANK	.	.	.	.	.	.	5th South Lincs.
WOODIER, JOSEPH	.	.	.	.	.	.	5th South Lincs.
WRIGHT, WALTER V.	.	.	.	.	.	.	5th South Lincs.

C O W L E Y H I L L W O R K S

ABRAMS, THOMAS	.	.	.	.	.	5th South Lancs.
ADAMSON, WILLIAM	.	.	.	.	.	5th South Lancs.
ASHTON, WILLIAM	.	.	.	.	.	Royal Welch Fusiliers.
ATHERTON, HARRY	.	.	.	.	.	5th South Lancs.
ATHERTON, HENRY	.	.	.	.	.	5th South Lancs.
BAINES, DANIEL	.	.	.	.	.	2nd South Lancs.
BALLANTYNE, MARK	.	.	.	.	.	5th South Lancs.
BATES, WILLIAM	.	.	.	.	.	5th South Lancs.
BEARD, JOSEPH	.	.	.	.	.	11th South Lancs.
BESLEY, THOMAS	.	.	.	.	.	11th South Lancs.
BURNS, JAMES	.	.	.	.	.	5th South Lancs.
BURROWS, FRED	.	.	.	.	.	Royal Army Medical Corps.
BUTLER, HENRY	.	.	.	.	.	Royal Engineers.
CALDWELL, THOMAS	.	.	.	.	.	5th South Lancs.
CAREY, JOSEPH	.	.	.	.	.	5th South Lancs.
CASE, W. T.	.	.	.	.	.	King's Own Royal Lancaster.
CHISNALL, JOSEPH	.	.	.	.	.	11th South Lancs.
CHISNALL, THOMAS	.	.	.	.	.	3rd South Lancs.
CLARKE, HAROLD G.	.	.	.	.	.	Lancashire Fusiliers.
CLARKE, MOSES	.	.	.	.	.	5th South Lancs.
CLIFFE, ADAM	.	.	.	.	.	King's Liverpool.
CLIFFE, LAWRENCE	.	.	.	.	.	2nd South Lancs.
CLIFFE, WILLIAM R.	.	.	.	.	.	2nd South Lancs.
COOK, CECIL	.	.	.	.	.	Royal Army Medical Corps.
CRATCHLEY, HENRY	.	.	.	.	.	4th South Lancs.
CRITCHLEY, J. J.	.	.	.	.	.	Loyal North Lancs.
CULLEY, ARTHUR	.	.	.	.	.	5th South Lancs.
CULLEY, GEORGE	.	.	.	.	.	South Lancs.
DALTON, SAMUEL L.	.	.	.	.	.	11th South Lancs.
DAVIES, JOHN	.	.	.	.	.	5th South Lancs.
DEAN, GEORGE E.	.	.	.	.	.	Royal Engineers.
DILLON, EDWARD	.	.	.	.	.	6th South Lancs.
DILLON, THOMAS	.	.	.	.	.	11th South Lancs.
DINGSDALE, JOSEPH	.	.	.	.	.	South Wales Borderers.
DOLAN, HENRY O.	.	.	.	.	.	Machine Gun Corps.
DOLAN, JOHN	.	.	.	.	.	5th South Lancs.

FAIRHURST, WILLIAM	.	.	.	.	.	5th South Lancs.
FARNEN, DAVID	.	.	.	.	.	5th South Lancs.
FINNEY, JOHN J.	.	.	.	.	.	7th South Lancs.
FINNIGAN, THOMAS	.	.	.	.	.	5th South Lancs.
FRODSHAM, RICHARD	.	.	.	.	.	Lancashire Fusiliers.
GABBITAS, THOMAS E.	.	.	.	.	.	5th South Lancs.
GARNER, WILLIAM L.	.	.	.	.	.	Royal Engineers.
GASKELL, AUSTIN	.	.	.	.	.	Royal Army Medical Corps.
GERRARD, HAROLD	.	.	.	.	.	Lancashire Fusiliers.
GERRARD, WILFRED	.	.	.	.	.	5th South Lancs.
GIBBONS, THOMAS	.	.	.	.	.	4th King's Liverpool.
GIBSON, THOMAS	.	.	.	.	.	5th South Lancs.
GLEAVE, JAMES	.	.	.	.	.	Machine Gun Corps.
GRAHAM, JOHN	.	.	.	.	.	5th South Lancs.
GRAYSON, JOHN	.	.	.	.	.	King's Own Royal Lancaster.
GRUNDY, JOHN (1)	.	.	.	.	.	6th South Lancs.
GRUNDY, JOHN (2)	.	.	.	.	.	South Lancs.
GUEST, HENRY	.	.	.	.	.	Royal Engineers.
HALSALL, JAMES	.	.	.	.	.	8th Loyal North Lancs.
HARCOMBE, FRANK	.	.	.	.	.	5th South Lancs.
HARRISON, JOHN	.	.	.	.	.	2nd South Lancs.
HARRISON, JOSEPH	.	.	.	.	.	Lancashire Fusiliers.
HEATON, JOSEPH	.	.	.	.	.	Royal Dublin Fusiliers.
HELM, JOHN W.	.	.	.	.	.	Lancashire Fusiliers.
HEYES, JOHN	.	.	.	.	.	4th South Lancs.
HOLDEN, JOHN	.	.	.	.	.	5th South Lancs.
HOLLAND, LAWRENCE	.	.	.	.	.	11th South Lancs.
HORRIDGE, JOSEPH	.	.	.	.	.	2nd South Lancs.
HOWARD, CLEMENT	.	.	.	.	.	Royal Army Medical Corps.
HOWDEN, ROBERT	.	.	.	.	.	South Lancs.
HUNDLEY, WILLIAM	.	.	.	.	.	5th South Lancs.
JACKSON, JAMES	.	.	.	.	.	2nd South Lancs.
JOHNSON, W. A.	.	.	.	.	.	5th South Lancs.
KANE, EDWARD	.	.	.	.	.	2nd South Lancs.
KELLY, THOMAS	.	.	.	.	.	Lancashire Fusiliers.
KENNEY, WILLIAM	.	.	.	.	.	11th South Lancs.

LANGLEY, JAMES	.	.	.	.	.	7th Royal Fusiliers.
LARGE, DANIEL	.	.	.	.	.	Royal Garrison Artillery.
LEE, JOSEPH H.	.	.	.	.	.	7th South Lancs.
LEIGH, JOSEPH	.	.	.	.	.	5th South Lancs.
LEWIS, THOMAS	.	.	.	.	.	5th South Lancs.
LYON, EDWARD	.	.	.	.	.	5th South Lancs.
MAHER, MICHAEL	.	.	.	.	.	5th South Lancs.
MARTIN, HARRY	.	.	.	.	.	5th South Lancs.
MARTIN, SAMUEL	.	.	.	.	.	11th South Lancs.
MATHER, WILLIAM E.	.	.	.	.	.	5th South Lancs.
MCDONALD, WILLIAM	.	.	.	.	.	King's Liverpool Scottish.
MCINTEE, HENRY	.	.	.	.	.	4th Lancashire Fusiliers.
MIDDLEHURST, ALFRED	.	.	.	.	.	Loyal North Lancs.
MIDDLEHURST, RICHARD	.	.	.	.	.	Royal Welch Fusiliers.
MILLER, JACOB	.	.	.	.	.	4th South Lancs.
MOONEY, GEORGE	.	.	.	.	.	Lancashire Fusiliers.
NAYLOR, ALFRED J.	.	.	.	.	.	5th South Lancs.
NAYLOR, THOMAS	.	.	.	.	.	11th South Lancs.
OAKES, WILLIAM	.	.	.	.	.	11th South Lancs.
O'NEILL, WILLIAM T.	.	.	.	.	.	Royal Engineers.
O'REILLY, HENRY	.	.	.	.	.	11th South Lancs.
PAYNTER, MATTHEW	.	.	.	.	.	Royal Engineers.
PENDLEBURY, JAMES	.	.	.	.	.	6th South Lancs.
PICKAVANCE, JAMES	.	.	.	.	.	5th South Lancs.
PORTER, WILLIAM	.	.	.	.	.	12th Rifle Brigade.
POTTER, JAMES	.	.	.	.	.	2nd South Lancs.
POWNALL, LOUIS C.	.	.	.	.	.	10th King's Liverpool Scottish.
PYE, ARTHUR	.	.	.	.	.	5th South Lancs.
RATCLIFFE, THOMAS	.	.	.	.	.	4th York and Lancaster.
RIGBY, EDWARD	.	.	.	.	.	4th South Lancs.
ROBERTSHAW, JOSEPH	.	.	.	.	.	5th South Lancs.
SCOTT, ARTHUR	.	.	.	.	.	11th South Lancs.
SCOTT, EDMUND	.	.	.	.	.	Royal Engineers.
SEDDON, WILLIAM	.	.	.	.	.	6th South Lancs.
SEPHTON, WILLIAM	.	.	.	.	.	Lancashire Fusiliers.

SHEPARD, WILLIAM	.	.	.	.	.	Royal Garrison Artillery.
SMITH, EDWARD	.	.	.	.	.	Royal Engineers.
SMITH, JOHN	.	.	.	.	.	Royal Engineers.
SMITH, JOSEPH	.	.	.	.	.	7th South Lincs.
STEVENSON, THOMAS	.	.	.	.	.	East Lincs.
STUBBS, ARTHUR	.	.	.	.	.	11th South Lincs.
SWINDELLS, JOHN	.	.	.	.	.	2nd South Lincs.
TAYLOR, EDWIN	.	.	.	.	.	King's Own Royal Lancaster.
TAYLOR, GEORGE	.	.	.	.	.	5th South Lincs.
THOMPSON, JAMES	.	.	.	.	.	3rd Dragoon Guards.
TIERNEY, JOSEPH	.	.	.	.	.	King's Royal Rifles.
TOPPING, JOHN W.	.	.	.	.	.	Manchester.
TOPPING, THOMAS	.	.	.	.	.	5th South Lincs.
VALENTINE, ROBERT	.	.	.	.	.	3rd South Lincs.
WARREN, HENRY	.	.	.	.	.	Royal Welch Fusiliers.
WEBSTER, JOB	.	.	.	.	.	11th South Lincs.
WHITTLE, SYLVESTER	.	.	.	.	.	King's Liverpool.
WILKINSON, HERBERT	.	.	.	.	.	11th South Lincs.
WILKINSON, JOSEPH	.	.	.	.	.	11th South Lincs.
WILSON, JOB	.	.	.	.	.	11th South Lincs.
WILSON, WILLIAM	.	.	.	.	.	Royal Engineers.
WOODS, JOHN	.	.	.	.	.	11th South Lincs.

R A V E N H E A D W O R K S

BATESON, WILLIAM	.	.	.	.	.	5th South Lincs.
BRACKEN, WILLIAM	.	.	.	.	.	5th South Lincs.
BROPHY, MICHAEL	.	.	.	.	.	5th South Lincs.
DENTON, EVAN	.	.	.	.	.	2nd South Lincs.
DOYLE, DANIEL	.	.	.	.	.	6th South Lincs.
EATON, THOMAS E.	.	.	.	.	.	5th South Lincs.
ELLIOTT, HENRY	.	.	.	.	.	11th South Lincs.
FEARNLEY, ARTHUR	.	.	.	.	.	Royal Engineers.
FORBER, WILLIAM	.	.	.	.	.	Royal Garrison Artillery.

GILL, EDMUND P.	. . . . .	5th South Lancs.
HILL, ALBERT	. . . . .	16th Cheshire.
McNALLY, PETER	. . . . .	1st South Lancs.
MITCHELL, JOHN	. . . . .	H.M.S. "Invincible."
ROUGHLEY, PETER	. . . . .	Royal Engineers.
STOTT, JAMES	. . . . .	5th Lancashire Fusiliers.
WILCOCK, JAMES	. . . . .	6th South Lancs.

C O L L I E R Y

ATHERTON, JOHN	. . . . .	2nd South Lancs.
ATHERTON, WILLIAM	. . . . .	11th South Lancs.
BARRETT, MICHAEL	. . . . .	Lancashire Fusiliers.
BATE, ERNEST	. . . . .	1st Lancashire Fusiliers.
BOKEN, JAMES	. . . . .	Welch.
BOLTON, E.	. . . . .	Royal Engineers.
BOLTON, THOMAS	. . . . .	5th South Lancs.
BRADY, JAMES	. . . . .	5th South Lancs.
BRENNAN, JOSEPH	. . . . .	2nd South Lancs.
BRIDGEHAM, JAMES	. . . . .	Royal Naval Division.
BRIERS, JAMES	. . . . .	2nd York and Lancaster.
BROMILOW, JOSEPH	. . . . .	Royal Army Medical Corps.
BRUNSKILL, LEWIS	. . . . .	Royal Engineers.
BRUNT, JOSEPH	. . . . .	2nd South Lancs.
BULL, ARTHUR	. . . . .	H.M.S. "Goliath."
BURGESS, JOHN H.	. . . . .	Loyal North Lancs.
BURROWS, CHARLES	. . . . .	11th South Lancs.
BYATT, JOHN W.	. . . . .	Royal Fusiliers.
CARR, PETER	. . . . .	5th South Lancs.
CARTER, HERBERT	. . . . .	Royal Engineers.
CORDWELL, JOSEPH	. . . . .	King's Shropshire Light Infantry.
COTTERILL, WILLIAM	. . . . .	11th South Lancs.
COTTINGTON, JOHN	. . . . .	4th South Lancs.

CRITCHLEY, HENRY	Loyal North Lancs.
CRITCHLEY, WILLIAM	5th South Lancs.
CULLEY, JOHN	Lancashire Fusiliers.
CUNNINGHAM, JOHN	5th South Lancs.
DYER, HENRY	12th Manchester.
DYER, WILLIAM	2nd South Lancs.
EAMES, ROBERT W.	Royal Field Artillery.
EDWARDS, EDWARD	1st Labour Corps.
FARRELL, JAMES	5th South Lancs.
FORMBY, ROBERT	1st Cheshire.
FOSTER, WILLIAM	11th South Lancs.
FRODSHAM, SAMUEL	6th South Lancs.
GALLAGHER, GEORGE	11th South Lancs.
GALLAGHER, JAMES	Royal Engineers.
GILL, CHARLES	11th South Lancs.
GLOVER, JOSEPH	5th South Lancs.
GRADY, THOMAS	5th South Lancs.
GRIFFITHS, JOHN B.	11th South Lancs.
GRIFFITHS, PETER	5th South Lancs.
HALLWOOD, THOMAS	5th South Lancs.
HARDMAN, ANDREW	Royal Welch Fusiliers.
HARRISON, JOSEPH	Labour Corps.
HARRISON, LUKE	3rd Royal Welch Fusiliers.
HELSEBY, WILLIAM	11th South Lancs.
HOUGHTON, ALBERT	Royal Engineers.
HUGHES, DAVID	11th South Lancs.
HUGHES, WILLIAM	Royal Welch Fusiliers.
HULL, JOHN	5th South Lancs.
JACKSON, JOSEPH	5th South Lancs.
JONES, JOHN	5th South Lancs.
KAY, WILLIAM	5th South Lancs.
KINDER, JAMES	Royal Fusiliers.
LAIRD, SAMUEL	Royal Fusiliers.
LAIRD, WILLIAM	5th South Lancs.

LANE, JOHN W.	.	.	.	.	.	7th South Lancs.
LEADBETTER, SAMUEL	.	.	.	.	.	Military Foot Police.
LEDGER, JAMES	.	.	.	.	.	6th South Lancs.
LEDWITH, JOSEPH	.	.	.	.	.	2nd South Lancs.
LENTON, HARRY	.	.	.	.	.	11th South Lancs.
LEYLAND, JOHN	.	.	.	.	.	Royal Inniskilling Fusiliers.
LEYLAND, PETER	.	.	.	.	.	4th South Lancs.
LONG, JOHN	.	.	.	.	.	5th South Lancs.
LYNN, JOHN E.	.	.	.	.	.	5th South Lancs.
MAYLIN, JAMES	.	.	.	.	.	Labour Corps.
MCCORMICK, JOHN	.	.	.	.	.	H.M.S. "Good Hope."
McHALE, EDWARD T.	.	.	.	.	.	Loyal North Lancs.
MOLYNEUX, JOHN	.	.	.	.	.	Royal Field Artillery.
MOLYNEUX, WILLIAM	.	.	.	.	.	6th Manchester.
MOONEY, JAMES	.	.	.	.	.	2nd South Lancs.
MURPHY, JAMES	.	.	.	.	.	8th South Lancs.
NASH, T. B.	.	.	.	.	.	3rd King's Liverpool.
NEARY, JOHN	.	.	.	.	.	2nd South Lancs.
NEARY, THOMAS	.	.	.	.	.	5th South Lancs.
PICKAVANCE, THOMAS	.	.	.	.	.	5th South Lancs.
POVEY, THOMAS	.	.	.	.	.	5th South Lancs.
POWNALL, ALFRED	.	.	.	.	.	Royal Engineers.
RILEY, EDWARD	.	.	.	.	.	6th South Lancs.
RILEY, THOMAS	.	.	.	.	.	2nd South Lancs.
ROBINSON, ARCHIBALD	.	.	.	.	.	Machine Gun Corps.
RONEY, DANIEL	.	.	.	.	.	19th Lancashire Fusiliers.
RONEY, ALBERT E.	.	.	.	.	.	11th South Lancs.
ROWLEY, ALBERT	.	.	.	.	.	Royal Engineers.
SANDERSON, GEORGE	.	.	.	.	.	11th South Lancs.
SANDFORD, JOHN W.	.	.	.	.	.	5th South Lancs.
SHAW, JAMES	.	.	.	.	.	5th South Lancs.
SHERRATT, FRED	.	.	.	.	.	9th South Lancs.
SIMPSON, THOMAS	.	.	.	.	.	5th South Lancs.
SLEVIN, EDWARD	.	.	.	.	.	11th Royal Welch Fusiliers.
SMITH, PATRICK	.	.	.	.	.	Royal Engineers.
STENSON, THOMAS	.	.	.	.	.	6th Loyal North Lancs.
STOKES, H. S.	.	.	.	.	.	5th South Lancs.
SWIFT, JOHN	.	.	.	.	.	4th South Lancs.

TICKLE, ALFRED	.	.	.	.	.	.	11th South Lancs.
TIERNEY, CHARLES	.	.	.	.	.	.	2nd York and Lancaster.
TRAVERSE, JAMES	.	.	.	.	.	.	5th South Lancs.
WALKER, GEORGE A.	.	.	.	.	.	.	Royal Engineers.
WALKER, JOHN F.	.	.	.	.	.	.	5th South Lancs.
WALTON, R.	.	.	.	.	.	.	6th South Lancs.
WESTERMAN, JOHN	.	.	.	.	.	.	6th South Lancs.
WILDMAN, WILLIAM	.	.	.	.	.	.	6th South Lancs.
WILKS, GEORGE	.	.	.	.	.	.	Royal Air Force.
WILSON, JAMES	.	.	.	.	.	.	6th South Lancs.

HOME DEPOTS

BOWMAN, G.	.	.	.	.	.	.	Royal Fusiliers.
BRIDGE, JOSEPH R.	.	.	.	.	.	.	Royal Warwickshire.
CRITCHLEY, GEORGE	.	.	.	.	.	.	12th London.
GARVEY, J.	.	.	.	.	.	.	31st Royal Fusiliers.
GILL, H.	.	.	.	.	.	.	Loyal North Lancs.
PULLIN, STANLEY	.	.	.	.	.	.	15th Durham.
WHITTOME, HENRY J.	.	.	.	.	.	.	15th Royal Welch Fusiliers.

CANADIAN DEPOTS

DOUGAN, WILLIAM A.	.	.	.	.	.	.	Canadian Expeditionary Force.
DOWNES, J.	.	.	.	.	.	.	Canadian Expeditionary Force.
GRISDALE, G. LIONEL	.	.	.	.	.	.	Canadian Expeditionary Force.
PARSELLI, J.	.	.	.	.	.	.	Italian Army.
SMEATHAM, J.	.	.	.	.	.	.	Canadian Expeditionary Force.
SWAN, P. R.	Canadian Expeditionary Force.
WINDSOR, A.	Canadian Expeditionary Force.

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