

The Early History of our Firm.

By Ernest F. Lang.

Charles Frederick Beyer—(1)

SOME 24 years had elapsed since the opening of the Manchester and Liverpool Railway before Messrs. Beyer, Peacock & Co. entered the field of locomotive designing and building. The plans of its founders were therefore based upon the experience already accumulated by the earlier builders and formulated into definite first principles in the mind of Mr. Charles Beyer.

Mr. Beyer was fortunate in securing the partnership of Mr. Richard Peacock, the practical experience in railway working and great business ability of the latter forming a perfect complement to the technical genius of the former.

At the beginning the venture was aided financially by Mr. Geach, a London Banker, whose acquaintance Mr. Peacock had made when designing rolling stock for the East Indian Railway. On Mr. Geach's death his executors called in his loan to the firm and it was then that Mr. Henry Robertson found the necessary additional capital and came in as sleeping partner.

The early history of the Firm will be developed by way of a series of biographies,

of which that of its chief founder is at once the most interesting and romantic. An exhaustive search for the necessary particulars has revealed a story that vividly portrays the hard school, which the circumstances of his early career provided, and furnishes an example of the power of a strong character to rise supreme to all difficulties, towards honour and success, that would indeed have delighted the author of *Self-Help*.



Charles Frederick Beyer was a native of Plauen, in Vogtland, Saxony, a region presenting, both as regards nature and its inhabitants, many of the characteristics of our own Yorkshire. He was born on the 14th May, 1813, and was the son of poor parents who supported themselves by hand-loom weaving. They were unable to give their children more than the usual elementary education demanded by the

State and, as they intended to train their son Charles to their own occupation, he was, in due time, bound to a three years' apprenticeship, to a master-weaver. Early in life the lad used to amuse himself by making little models of buildings, to the delight of his mother, who imagined thereby

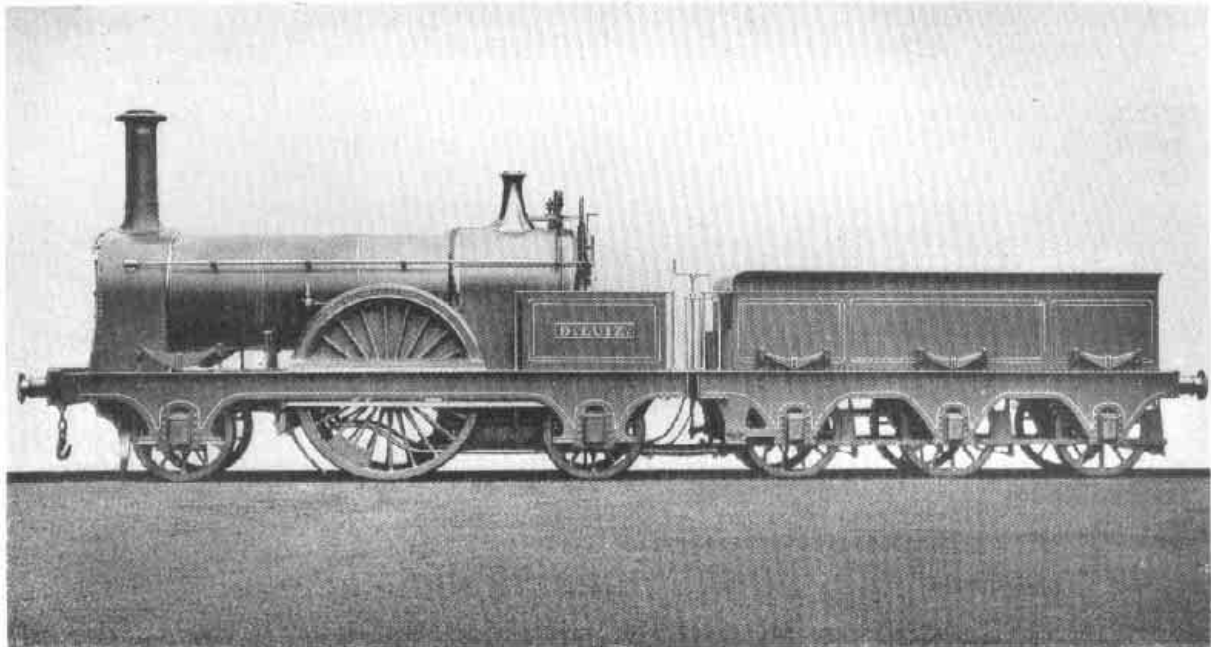
a future architect in her son Charles. It so happened, when he was about 12 years of age, that a young architect settled in Plauen and, in order to encourage the taste which the boy exhibited, it was arranged that the hours in which he was free from school should be spent with the architect, who, in addition to giving lessons in drawing, taught arithmetic and geometry at a charge of about four shillings a quarter. So marked was his progress that, in a short time, a drawing of a head young Beyer had made was deemed worthy of being framed and taken home, being the first picture to adorn the walls of his father's parlour. Later, the young architect removed from Plauen, and it chanced that, whilst the experiment was being made of training his former pupil to the loom, the drawing above referred to was seen by a Mr. Von Seckendorf, an eminent medical gentleman, who had been called in to prescribe for an elder brother. "Who was the artist?" asked the gentleman. "My son, Charles," replied the father. "And what may your son Charles be doing?" "Oh, he is a weaver," was the answer. "A weaver!" "Yes, a weaver, and I am very well content for he is a good lad and pleases his master well." "But," continued Mr. Von Seckendorf, "he should go to Dresden to the Academy. A school has just been established there, a Polytechnic School. I will see about it; I will speak to the Kreishauptmann" (the chief district officer). This official accordingly sent the youth's sketches and papers to Dresden and gave in his name as soliciting to be admitted to the Polytechnic School. The father did not approve of this for he knew not where the means were to come from to maintain his son in the Capital for a period of years and great was his consternation when he received a summons to attend the chief officer, who wished to complete the arrangements regarding his son. As the sum of thirty thalers (£4 10s. 0d.) per annum was given by the State towards educating each boy entering the Polytechnic School, the father

said that Charles might go and try for six months, the dread of offending the questioner, rather than any idea of furthering his son's interests, prompting the reply. The apprenticeship was now cancelled at the instigation of the high official and Charles was sent to Dresden. It was here that the sort of metal of which he was made was first put to the test and a very severe test it proved. He studied hard and, as no pecuniary aid came from home, he had to exist upon only a small pittance. On many days his dinner cost but the sum of three pfennigs (less than one halfpenny) and, when the six months drew to a close, he seriously contemplated returning home. However, on consulting one of the professors, he was advised to struggle on and he therefore contrived to eke out his meagre resources by preparing papers for the use of the workshops and keeping some of the time books, for which services he received pay at the rate of three farthings per hour. To this period of his life belongs an incident which forcibly illustrates how severe were the conditions under which the future engineer grew up. As related by Mr. Beyer himself, this was as follows: "A benevolent lady of Dresden was in the habit of giving, every Friday, a good dinner to the two or three pupils of the Polytechnic School who had distinguished themselves most during the preceding week and I can still recall how eagerly I strove, week after week, to be one of the chosen few that I might not lose a meal which was almost necessary to my sustenance, so hardly was I obliged to live." He continued the struggle through the whole of four years and successfully completed his studies. During that period the whole of his expenses, including the 120 thalers in fees, did not exceed 410 thalers, i.e. £61 10s. 0d. or £15 7s. 6d. a year, an incredibly small amount, even considering the greater value of the thaler in those days.

From Dresden he went to Chemnitz where he remained two years, working in the machine shop of a Mr. Hanbold, where

he received for the first year six shillings a week as wages and, for the second, nine shillings weekly. So satisfactory was the progress which he made, that on its completion, which was in the summer of 1834, he received the sum of 300 thalers (£45) from the Saxon Government to enable him to visit England in order to report upon improvements in machinery, chiefly with regard to the spinning of cotton. Of this sum he expended £25 in a suitable outfit and the remainder for the expenses of the journey.

Returning home he made the desired report upon cotton spinning and received for the information £10 from the mill-owners of Chemnitz and also some additional payment from the Saxon Government. A joint-stock Company for cotton spinning was then formed in Chemnitz and he was invited to undertake the management. A company for a like object was also formed in Dresden and there too his services were sought. Both offers, however, were declined and in the latter part of the year (1834), being then 21 years of age, he travelled to Man-



The Celebrated "Don Luiz."

Through this commission he was brought into contact with the work of one of the greatest mechanical inventors of the day, Richard Roberts of the firm of Sharp, Roberts & Co. of Manchester, the author of the self-acting mule for spinning cotton by steam power, and many other patents, ranging from carpet looms, jacquard punching machines, and watchmaking and other automatic tools. The personality of Roberts imbued the ardent mind of young Beyer with a feeling akin to hero-worship and became, thenceforth, his lode-star.

chester, accompanied by one of his former teachers, Professor Schubert of Dresden, by whom he was introduced to Messrs. S. L. Behrens & Co., well-known merchants of that city. Through Mr. Behrens he obtained access to Mr. John Sharp, the head of the firm of Sharp, Roberts & Co., who found him work but not until after some little delay. Mr. Sharp seems to have been at once struck with the signs of character and ability shown by the young applicant and told him to come again on the following day. In the interval, however, he found

that the proposal to introduce a foreigner into the works roused such a storm of opposition that he did not venture to persist and, when Beyer appeared, he was obliged to tell him that he could not offer him an engagement. The deep chagrin of the young Saxon was so evident that Mr. Sharp, partly mistaking its meaning, opened his purse and offered him a sovereign. Young Beyer respectfully, but somewhat indignantly, declined to receive it, saying, "It is work that I want." Mr. Sharp was so impressed by the words and the look that accompanied them that he resolved to brave all consequences and engaged him on the spot. The anecdote is characteristic at once of the times and of Mr. Beyer's independent and manly nature. It has hitherto been connected with the name of Mr. Roberts, as the partner visited and whose kindly impulses were aroused, but it would appear, on the evidence now available, that the version here related is actually the correct one. The appointment thus obtained was, however, in a subordinate capacity as improver-draughtsman at a rate of wages which, during the first year, was little more than nominal, and did not exceed thirty shillings a week in the second year. There, notwithstanding his difficulties with regard to the English language, it came about that the readiness with which, as a mechanical draughtsman, he could put his ideas on paper speedily attracted the notice of Mr. Roberts whose fertile inventive genius often outran his power to do the like. Mr. Roberts soon discovered Beyer's great and valuable qualities, both as a mathematician and as a quick and true draughtsman; and as about this time Messrs. Sharp, Roberts & Co. commenced to turn their attention to the manufacture of locomotive engines, it fell to Mr. Beyer's lot to carry out, under Mr. Roberts's instructions, this branch of their business, and in this way to lay the foundation of his reputation as a designer of locomotives.

He thus speedily made his first mark

as a successful man by showing how great a value attaches to the careful preparation of mechanical designs, even when only the supplement to the ideas and inventive genius of a machinist such as Mr. Roberts was. Beyer, in fact, first initiated proper drawings in that establishment and, becoming the chief of the drawing office, held this position until Mr. Roberts retired from the firm in 1843 which then, under its new name of Messrs. Sharp Bros., engaged his services as chief engineer in place of the retiring partner. It would be difficult to conceive a more varied engineering experience than Mr. Beyer went through in working out into practical application the many ideas, covering so wide a range of mechanical construction, that flowed from the fertile brain of Mr. Roberts. Included in these were many nuclei of future locomotive developments and there is no doubt that the name of Roberts would stand out still more prominently in the early history of locomotive construction had not his mind, at the time, been so engrossed with his textile machinery inventions. His attention had been turned to locomotives as early as 1832, but it was not until later, when Mr. Beyer had been entrusted with this branch of work, that his firm began to take a prominent place as locomotive makers.

Railway building on the Continent quickly followed its initiation in this country, but for many years the demand for locomotives abroad was almost entirely fulfilled by English makers. It may be supposed, therefore, that this branch of engineering, in which England was supreme, as in fact in all other branches, was followed with immense interest abroad, particularly as transport is the first industrial requirement of any country. England was, and had been for generations, the Mecca towards which were turned the eyes of those in every part of the world who were engaged in developing the industries of their respective countries. Who has not heard of Czar Peter of Russia working as a shipwright in

Deptford? From the chronicles of the time, under review, I may therefore insert here the following:—

Frederick Augustus III., Elector of Saxony, was made King of that country by the French Emperor Napoleon in 1806 and took the title of Frederick Augustus I. His successor, Frederick Augustus II., made a tour of Great Britain in 1844, in the course of which he visited Manchester. A record of the tour written by Dr. Carus, the King's physician, relates that among the works visited were those of Sharp, Roberts & Co., where a Saxon named Beyer, who had been employed as manager for nine years, acted as guide.

In 1853, shortly after Mr. Stewart joined Sharp Bros., Mr. Beyer severed his connection with that firm and travelled for six or eight months in England and on the Continent.

Shortly after his return from his tour, he entered into partnership with Mr. Richard Peacock, who until then was locomotive and mechanical engineer to the Manchester, Sheffield and Lincolnshire Railway Co. An office was taken in Market Street and there the scheme for a new company was matured and the plans and drawings for the buildings and equipment of Gorton Foundry were worked out. In this, Mr. Beyer was assisted by a Mr. Thomas Molyneux who had also, up to that time, been in the employ of Sharp Bros., having in fact

originally started there as office boy to Mr. Roberts.

The partners purchased 12 acres of land contiguous to the railway at Gorton and, in assured conviction of success, the whole area was mapped out for workshops. The work of carrying out such necessary parts of the schemes as their means then permitted was undertaken with so much energy that whilst the first brick was laid on March 14th, 1854, the first locomotive, one for passenger service on the Great Western

Railway, was delivered on July 21st, 1855. The various sections of the Works were specially designed to admit of the gradual expansion of the whole without disturbing those portions first erected and it is a notable fact, which speaks well for the farsightedness of Mr. Beyer as to the

needs, in years to come, of a first-class locomotive factory, that for fifty years at least, the development of the Works proceeded on the lines originally conceived by him, and that in the process of extension no single workshop, as originally laid out, had to be pulled down. Mr. Beyer's powers of adapting means to the ends required, as displayed in the building of Gorton Foundry, leave but little room for doubt that if he had chanced to follow his early bent he would have distinguished himself as an architect.

The original covered-in area was only



View from Mr. Beyer's Study, Llantysilio.

one acre but extensions and business activities proceeded so rapidly that in a few years time Mr. Beyer felt the need of a personal assistant, one brought up in the same school of technical education and therefore acquainted with the fundamental basis of his theoretical knowledge and likely to be able to follow his ideas with exact understanding, who might qualify to become his right hand in things mechanical. He, therefore, in 1861, sent for a fellow-townsmen of his from Plauen, Hermann L. Lange, who, then a young man of 24, had received a technical training at the Karlsruhe Polytechnic School and at the engineering works of Egells in Berlin. No better choice could have been made. Three years later he had been advanced to the position of head of the Drawing Office and on his shoulders the mantle of Mr. Beyer was destined to descend.

To trace the development of the technical side of Mr. Beyer's genius, as applied to locomotive construction, it will be necessary to consider the influences that moulded it. Apart from Mr. Beyer's well-known love of beauty and form in constructional work, his own part in the progressive evolution of locomotive design had still more to do with his instinct for the soundest mechanical principles in whatsoever he undertook. This applies to machine construction generally as Mr. Roberts had early discovered. In Mr. Beyer natural mechanical instinct had been fortified by the best theoretical training his student years afforded. It was, for example, characteristic that Mr. Beyer regarded as unmechanical the then prevailing practice of attaching to the boiler anything in the nature of a rigid stay between the boiler and the frames, such as the slidebar bracket; and by altering such construction he gave the boiler free and unrestrained expansion.

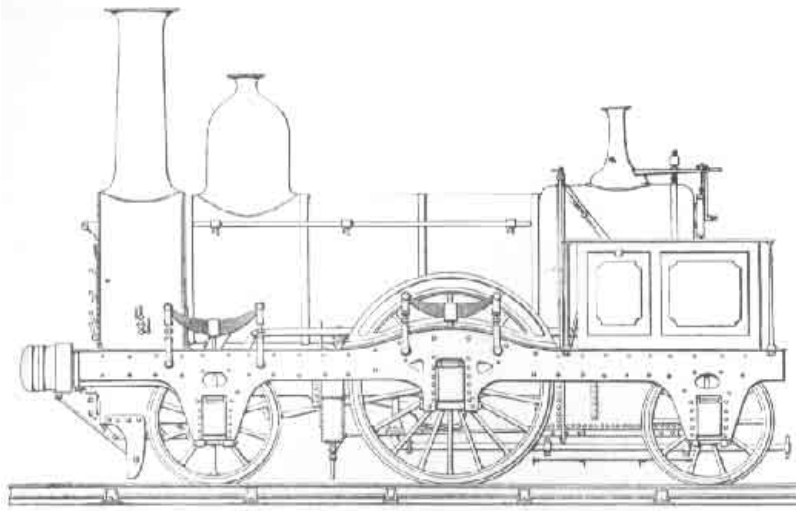
Also characteristic was his advocacy of the high boiler centre as against that of the low boiler centre of which his friend, Mr. Joseph Beattie, of the London & South

Western Railway, was the chief apostle, Mr. Beyer arguing that the problem was one of dynamics and not statics, and that the high boiler centre would conduce rather to steady running than the opposite.

So much could be said of Richard Roberts as the inventor and apostle of new ideas in the early days of locomotive construction as to render it advisable to deal with the same in a subsequent article. It can, however, be imagined how inspiring was the master to whom Beyer's manly qualities had brought him access. That the master had found a worthy disciple is indicated by the references to Beyer in Zerah Colburn's classical work on the history of locomotive engineering. An early one occurs in mentioning the fact that the engines made by Sharp, Roberts & Co. and by their successors Sharp Bros. most nearly represented what, for many years, was the favourite pattern upon English railways. A drawing of an engine by Sharp Bros. in 1847 follows with the remark that, although a growth from Mr. Roberts's designs, it bears evidence in many points to the taste and careful attention to detail of Mr. Beyer, who for some time after Mr. Roberts's retirement was the principal engineering authority at the Atlas Works.

In the section of Zerah Colburn's book dealing with examples of express locomotive engines with single driving wheels, a description is given of an express passenger-locomotive by Messrs. Beyer, Peacock & Co. for the South-Eastern Railway of Portugal. This was the celebrated "Don Luiz" that attracted so much attention at the Great Exhibition of 1862, no less by reason of its æsthetic beauty as by the excellence of the workmanship and the sound mechanical instinct shown in its construction. It may here be remarked that this engine is still running after 64 years of service. The description includes the following :

"The broad and comprehensive slab frame-plate here noticeable was introduced by Mr. Beyer many years ago



Engine built by Sharp Bros. in 1847.

and is now generally adopted in English practice. The extension of the two inside longitudinal frames along the firebox, formerly stopping short in front of it, is an important concession to good principle, and is a first rate practice as it connects the steam cylinders, driving axle, draw plates, and bolts directly and immovably together, and bears and transmits the entire strain of the steam in the cylinders, and the tractive force, to the train. The boiler is thus relieved of all strain from the working parts, from which formerly it was not free, and it suffered accordingly. The driving axle is made with only two bearings, inside the wheels, for which the guards are forged on the inside frame-plate, and the fore and hind axles have their bearings outside the wheels—an arrangement now generally adopted for its simplicity, and for the greater firmness of the frame,

and the increased duration or "life" of the crank-axle. The steam strain is, in fact, confined to the two inside frame-plates, and to the inside bearings of the axle, close to the cranks."

In the case of the Sharp Bros. engine of 1847 Colburn remarks that the position of the dome, near the chimney, gives the engine a hump-backed appearance, not in keeping with the otherwise

symmetrical and dainty features of the design. There was at one time much difference of opinion as to the best place for the dome, it having been found that when the steam was taken from directly over the firebox, as in most of the earlier engines, a good deal of water was carried over to the cylinders. It was attempted to avoid the consequences, rather than to remove the cause, and hence the dome was placed further forward by some makers until, as in Sharp's engines, it was set nearly against the chimney.

Messrs. Hawthorn, as early as 1839, obtained a patent for the use of a perforated



Old Llantysilio Hall.



View of River Dee, near Llantysilio Hall

steam pipe, intended to draw the steam from all parts of the steam room alike, and thus to dispense with the dome altogether. This was long employed in Messrs. Hawthorn's practice and was also followed in the case of Mr. Beyer's "Don Luiz" engine, which had no steam dome.

In the section relating to examples of goods locomotive engines, comparison is made between a mixed-traffic locomotive by Messrs. Beyer, Peacock & Co. for the Smyrna and Cassaba Railway and a goods locomotive designed elsewhere for the Great Southern and Western of Ireland, in which the superiority of Mr. Beyer's design in individual features is pointed out, the comparison concluding with the sentence:—"The two engines above, in part compared, afford useful examples of what to imitate and what to avoid—they exemplify direct and indirect action."

Mr. Beyer remained all his life a bachelor. Whilst with his old firm he had fallen in love with Miss Sharp, a daughter of one of the partners, but she, although strongly attracted towards Mr. Beyer, gave preference to another suitor. This was his first and only romance. Gorton Foundry was destined to become and remain his chief pre-occupation in life. Into this enterprise he brought all his genius, ambition and energy, with no other thought but the advancement of his profession. Success brought him fame and prosperity; yet for the latter he cared but little,

except as means to an end. This is revealed by an entry in his diary on the anniversary of his fiftieth birthday, in the following words:—"Have mercy upon me O Lord, and grant that the goods Thou has entrusted to my keeping may bear fruit to Thy Honour and Glory, through Jesus Christ."



New Llantysilio Hall

Mr. Beyer died on June 2nd, 1876, at his country residence, Llantysilio Hall, Llangollen, North Wales, at the age of 63. His health had been failing for some time previously. Doubtless a prolonged rest from work would have restored it, but "the ruling passion strong in death" he had ignored all warnings of doctors and friends.

Some time before the decline, which presaged his death, he had been made a magistrate, a testimony to his public worth. His benefactions to the land of his adoption were many and varied. Besides replacing

at his own cost the old parish church of Gorton by the fine edifice of St. James' and rebuilding, almost unaided, the school and rectory connected therewith, he contributed largely towards the cost of erect-

ing St. Marks' Church, Gorton and built schools for the same. He also defrayed the greater part of the cost of rebuilding the church upon his estate at Llantysilio and in his will provided for the augmentation of the Vicar's stipend. He also left a considerable sum for the erection of another church and parsonage not far from Gorton Foundry, the schools for which he had built upwards of twelve months before and, in addition, he left legacies, amounting in all to a large sum, to various public institutions and charities and to some of his draughtsmen and servants.

After the disposal of his property in Denbighshire to his godson, Henry Beyer Robertson, he left the residue of his estate for the benefit of the then Owens College, Manchester, towards the foundation and

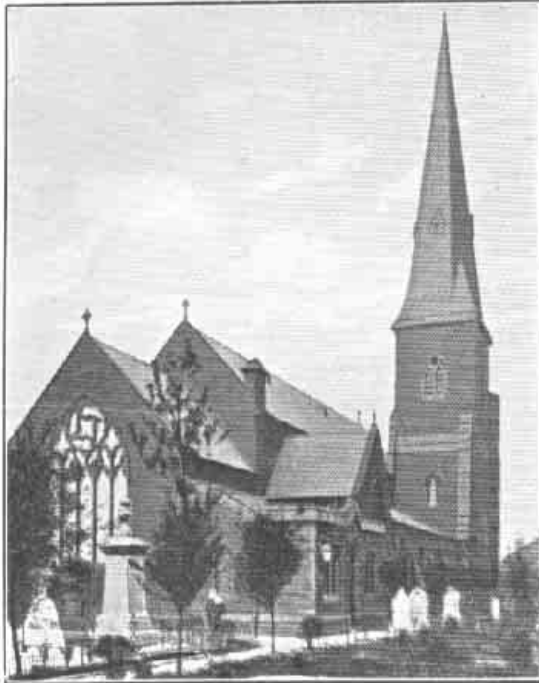
endowment of professorships in science, one of which, at least, was to be a chair of engineering in the said college. Here it may be mentioned that, so far back as 1860, Mr. Beyer had obtained an introduction to the then Principal, Professor Greenwood, and said to him that, being very familiar with the successful working of some of the Polytechnic Schools abroad, it had occurred to him that Owens College might with advantage develop such a school or department in connection with its scientific chairs. Even then he urged that a movement should

be begun for extending and rebuilding the College on a larger and more appropriate site than its then one in Quay Street. He was thus the first to suggest the college extension movement that led to the building of a new

Owens College in Oxford Road and which grew and developed in size and importance subsequently to attain the title of Victoria University. To the fund for the extension movement he had proposed Mr. Beyer was a munificent contributor. The general fund, engineering fund, physical laboratory endowment fund and jurisprudence fund all shared his generosity. It will thus be seen that he did not exclusively limit his interest to subjects with which he was himself connected. Professor Greenwood has stated that, from personal intercourse, he knew Mr. Beyer shared the opinion that the prosperity of such institutions was best secured when all the various branches of liberal and scientific knowledge were pursued in common. In his annual report to the Governors of Owens College in June, 1876,



View near Llantysilio Hall.



St. James' Church, Gorton

Professor Greenwood, speaking of Mr. Beyer said, "His munificent gifts towards the extension fund were not more conspicuous than the warm personal interest which he has always shown in the growth and prosperity of the College and by those who enjoyed his friendship his loss will long be severely felt."

My father, with whom Mr. Beyer had often discussed the lines upon which, according to their mutual experience, the principles and methods of the polytechnical schools abroad could equally successfully be introduced into this country, was consulted on this matter by Mr. Beyer's trustees. It is clear, from what has been recorded, that Mr. Beyer visualized in far perspective what is now represented by the Manchester College of Technology, born out of the

old Mechanics Institution erected in Cooper Street in the year 1824, as allied to our University in 1905, and with which it forms one harmonious whole combination of universal educational facilities of which our great city is justly proud.

The building of the Beyer laboratories to which the major part of Mr. Beyer's bequest, amounting to over £104,000 was applied, formed the second stage in the erection of the noble quadrangle forming the main portion of the University. They represented a concession to a principle rather than the fulfilment of the testator's idea but it was undoubtedly the best use to which the money could be put at the time, pending the growth of a wider and more public appreciation of the scope and requirements of technical education proper, and no better impulse towards creating this could, as events proved, have been found at the time. A sign of this, later on, was the building of the engineering laboratories at Cambridge in connection with that University.

Those who remember Mr. Beyer are still able to visualize him as a tall man with a slight stoop; his fine head with thinning, and somewhat straggling, hair and beard; the strong features and open countenance,



Llantysilio Church

serious yet kindly; the lofty dome-shaped forehead; the somewhat hollow cheeks and the deep-set eyes, remarkably blue and luminous, which gave him somewhat of the look of a visionary, of one who saw through and beyond everything. Conscientious to a degree, he expected as much from others. For him the almost only function of life was work. The severe hardships with which Mr. Beyer had to struggle during his early career made, it is believed, a considerable impression upon his character and gave his manner an appearance of harshness, much more apparent than real, which was sometimes keenly felt by youths who were seeking to be launched on the world through him as an employer. He did not spare himself and had, therefore, but little forbearance with those who showed a disposition to shirk duty. However "his bark was worse than his bite" and beneath his exterior was a kind and beneficent nature, which it may be said, was often generous to a fault and was, doubtless, frequently imposed upon.

An example of "the whirligig of time" is provided by the fact that Richard Roberts, after his retirement from Sharp, Roberts & Co., fell upon evil days before his end and had to be financially assisted by Mr. Beyer, who, in this manner, was able to repay in some small measure what he owed to his former master and inspirer.

Many stories are still extant of Mr. Beyer, which illustrate his thoroughness, in small as well as in large things, and his dislike of every form of pretence. They reveal him as being by no means a crusty old bachelor but a very human man of kindly instincts, with strong likes and dislikes, and possessed of a shrewd sense of humour.

The following is taken from an obituary notice in *The Engineer* of June 9th, 1876:—

"Mr. Beyer's strong point was elegance in design. He had a natural abhorrence of ugly forms and it cannot be doubted

that his influence has been strongly felt for good in the construction of modern locomotives. He would spend hours in elaborating a dainty curve and nothing which admitted of being improved in shape, without a sacrifice of efficiency, escaped his notice. Many anecdotes could be related showing how strongly he was influenced by the desire to obtain beauty of form. On one occasion he came into his Drawing Office and gave one of his leading apprentices a knob which he had just pulled off a drawer in his writing table. 'Do you see this,' said he. 'This is an ugly knob, draw me a pretty one.' Several knobs were drawn and the whole dinner hour was thus occupied. At last one was produced which pleased Mr. Beyer. 'This one will do, young man, this one will do. But you have lost your dinner in drawing knobs for me. Very good, come home and dine with me and I'll give you something good, something you will like much, something better than pretty knobs.' The narrator of this anecdote now holds an important position on an Austrian railway."

My own personal recollections of Mr. Beyer, apart from sundry visits to the works as a small boy, centre mostly round holiday visits with my parents to Llantysilio Hall. Mr. Beyer cared but little, if anything, for sport, but was much interested in his dairy farm and live stock. My father indulged in fishing and the Rev. George Philpot, the then Rector of St. James's, the church built by Mr. Beyer in Gorton, did some shooting. Nearby was the residence of Sir Theodore Martin, Queen Victoria's biographer, and the stately figure of Lady Martin, known to a past generation as Helen Faucit, the celebrated Shakespearian actress, could at times be seen feeding the peacocks on the lawn.

Mr. Beyer, who evidently believed in "improving the shining hour" even in the case of an irresponsible lively youngster,

once set the writer the task of gathering from the fences and hedges the wool that had got scraped off the sheeps' backs, promising sixpence for each pound of weight thus obtained. A volume that promised a rich reward was duly collected but the pecuniary results, after the weighing had taken place, were distinctly disappointing. To plagiarise the tale of the small boy who ended his recital of the story of Newton and the falling apple by saying "In this way he discovered gravity," the writer might conclude his own little story by saying "in this way, he discovered *specific* gravity."

No memoir of Mr. Beyer would be complete without mention of the fact that the Institute of Mechanical Engineers was founded in 1847 after a friendly meeting of engineers at his house in Cecil Street, Manchester. The rules were adopted on the motion of George Stephenson and seconded by Mr. Beyer, the former being elected president and the latter a vice-president. The two other vice-presidents were George E. McConnell, Locomotive Superintendent of the Southern Division of the London & North-Western Railway, Wolverton, subsequently well known for his improvements in railway practice, and Joseph Miller, London. The treasurer was a Mr. Chas. Geach of the Birmingham &

Midland Bank, Birmingham, who, as he died in 1855, is, presumably, to be identified with the Mr. Geach who, originally, helped to find the first capital for Messrs. Beyer, Peacock & Co.

For the first year of its existence the number of members of the Institution was 107 and the income £515. On the 31st December, 1925, the membership was 9,805, the income £33,963 and the value of the assets amounted to over £174,000.



Mr. Beyer's Tomb

The words *per aspera ad astra* could fittingly be inscribed as epitaph on the plain granite slab in Llantysilio churchyard that marks the last resting-place of Charles Frederick Beyer. His career can well furnish an example and an inspiration to the youth of a softer generation. The account of the same, herewith concluded, may

achieve something towards this end, if it serves to keep alive the memory of a man of singular purity and simplicity of character, whose history shows what great results may be achieved, even under the most unpromising circumstances, when great parts are united to untiring industry and are, moreover, directed by high principles and noble and unselfish aims.