



William Parsons, third Earl of Rosse
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*by the Earl of Rosse**

When seeking to tell the story of any one man's life and achievements, it is always well to look first at the background into which he was born.

William Parsons, subsequently to become third Earl of Rosse, came of a family which first crossed to Ireland from Leicestershire towards the end of the Elizabethan era, at almost exactly the time of the foundation of this College. His paternal ancestors had subsequently lived at Birr for eight consecutive generations and had become firmly rooted in the soil of Central Ireland. His mother came of a family of precisely similar stock, the Lloyds of Gloster, who shared in addition the strongly liberal convictions of the Parsons family, which were not too common among the Anglo-Irish gentry of that day.

His father, Sir Laurence Parsons, as he was at the time of his eldest son's birth, having succeeded as fifth baronet nine years previously, had been a prominent member of the Irish Parliament since 1782, first representing this University and subsequently his own county. He was one of the most vocal opponents there, as is well known, of the Act of Union, which was finally passed earlier in the year of his son's birth. Its passage into law was to him so severe a blow that it broke his heart as regards politics, and his interest in them waned almost to vanishing point from that moment. His lack of attendance at the House of Commons afterwards, where he continued to represent King's County, and later on at the House of Lords after succeeding his uncle to the Peerage, was viewed with disfavour by leading politicians, who regretted the loss of his considerable talent. But this led at least to a fortunate development for Birr and for his family. While his earlier years had been mostly centred in Dublin, because his main interests then lay there, his later ones were lived

* The Trinity Monday Memorial Discourse, 1968.

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almost exclusively at Birr. Throughout the time when his children were growing up he concerned himself with remodelling his home, both inside and out, on planning his estate and planting trees, and on laying out the town of Birr, which had hitherto been concentrated in haphazard mediaeval fashion round the Castle walls, in accordance with the principles of classic symmetry that were fashionable at that time. He was an amateur architect of some distinction, as were so many gentlemen of the period, and the individual style still evident in both the Castle and town is undoubtedly inspired by him, even though proficient clerks of works were employed to deal with the actual buildings. He was also something of a philosopher, with strong religious leanings, and from his early days he was a firm believer in Catholic Emancipation. He spoke often on the subject in Parliament and gave practical proof of his beliefs later in Birr by giving the land for the building of the Catholic Church as well as for the Protestant one. The latter celebrated its sesquicentenary in 1966 and the former is due to do so next year. The laying of its foundation stone was in fact the first public act performed by Lord Oxmantown, as he then was. This took place more than ten years before the official granting of Catholic Emancipation and, according to the late Monsignor Paddy Browne, the building is the earliest full-scale Catholic Parish Church in Ireland.

This, then, was the general atmosphere in which the subject of this discourse grew up. Many letters of the period, and in particular those of his father, have survived, and it is quite clear that the family was unusually closely knit and that its members were devoted to each other. William had two younger brothers, John and Laurence, and two sisters, Alicia and Jane. He himself was born at York in June 1800, though what brought his parents there then is not known, unless it were disillusion over the Act of Union. But excursions from Birr were to be very rare and they were usually occasioned by their mother's health, which seems always to have been precarious, though she succeeded in living eventually to the age of 85. Like many delicate people, she had a tender disposition and inspired universal affection.

The children's schooling took place entirely at home in their early years; both parents not only took an active part in supervising the education administered by a series of tutors and governesses, but at times they gave tuition themselves. Their father was a writer in both prose and poetry and was, therefore, qualified to instruct in letters as well as in politics and economics; while there is an old family tradition that the grounding in mathematics and science which was to come to

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such remarkable fruition in William originated with their mother. They must have formed an unusually self-contained unit, since few visitors came to the house, other than relatives. The rare exceptions were, however, often people of distinction, such as Maria Edgeworth, with whom their father carried on a lively correspondence over a long period. Another was Sir Robert Peel, who tried unsuccessfully to induce him to return to active politics.

In January, 1819, the two eldest boys entered this College. Apparently they did not ever reside regularly, only coming up from Birr for certain special sessions and for examinations, as was a frequent practice in those days. Unfortunately no information about the two years spent there has come to light, except that they both acquitted themselves so creditably that they were sent on to Magdalen College, Oxford. For an Irish boy this was an unusual step at that time and there must have been weighty reasons indeed to induce their father, in particular, to take it, both because of his political traditions and because of his own long-standing associations with Trinity. It can only be that his parental feelings came first and that their records so far were outstanding enough for them to deserve the very best education available to suit their special talents at the time. Presumably he was advised that this could be got even better at Oxford. It is interesting to note that throughout their early years John was considered the more brilliant in that he kept pace with his elder brother. He was to die of tuberculosis as a young man and therefore his early promise never reached fulfilment. But he would have had to be brilliant indeed to outstrip William, who proceeded to graduate in 1822 with first class honours in mathematics.

The following year William entered Parliament, where he represented King's County, as his father before him had done. He sat as a Whig and voted in favour of both Catholic Emancipation and the Reform Bill, but his real interests were not political and he resigned his seat in 1834 in order to have more time to devote to science.

His experiments concerning reflecting telescopes started soon after leaving Oxford, the first results being published as early as 1828 in the *Edinburgh Journal of Science*. The previous largest telescope in the world had been that constructed by Sir William Herschel at Slough; but, since he had died in 1822 without ever publishing any details about his methods of casting and polishing specula, much pioneer work had to be carried out before any actual construction could take place.

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When members of the Royal Astronomical Society visited Birr some ten years ago, in conjunction with their Annual Meeting held at Dublin that year, they pointed out that my great-grandfather's engineering achievements were as remarkable in their way as his astronomical discoveries. No expert advice of any kind was available to him; he was his own technician and all the work, much of it exceedingly complicated and delicate, had to be carried out by local men trained wholly by himself. The very tools and machinery, together with the furnaces in which to fashion them, had necessarily to be produced on the spot. After many experiments, he fixed on an alloy of copper and tin, in proportions of four to one, as the ideal material for a speculum; and he invented in 1828 a steam engine with which to grind it to the correct optical shape with absolute accuracy and then to polish it. The difficulties of such original work were immense and it was not until 1839 that a 3 foot speculum was finally cast and then mounted similarly to the Herschel instrument. Photographs of this exist today, since it continued to stand beside the Great Telescope for many years, and details of its construction were published by the Royal Society in 1840.

But, though the 3 foot telescope was responsible for some useful observations, the principal result was to stimulate him to go ahead at once with constructing a reflector of double that size, half again as large as the biggest ever before made. The greater the size the greater the strain on the very brittle material during the cooling process; and twice the speculum split. Refusing to be discouraged, he persisted in his efforts, which were finally crowned with success in 1843. Building on the structure with which to manoeuvre it had meanwhile gone ahead. Two solid stone walls 70 feet long and 50 feet high were built on either side, between which was slung a tube 58 feet long, at the base of which was placed the reflector. Owing to its unprecedented size, by the standards of that day, the practical difficulties of working it must alone have been well-nigh insuperable. It was unquestionably cumbersome to manoeuvre and a whole team of men had to be in constant attendance; and instant precision was essential, since its field of vision was distinctly limited. But its magnifying powers were so spectacularly greater than any previously available that these limitations scarcely mattered.

By the beginning of 1845 the Great Telescope, with its 6 foot reflector, was finally ready for use; and it was formally opened in typically Victorian style by a Church of Ireland Dean, walking throughout the length of the tube wearing a top hat, and with an

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umbrella raised over his head, to demonstrate its immense size. In March of that year the speculum received its final polishing and two distinguished astronomers, Dr T. R. Robinson of Armagh Observatory and Sir James South, were invited to participate in the first observations. The Irish climate is not exactly renowned for its clear skies and the equinoctial gales were exceptionally provoking that Spring; but there was just sufficient time in which to note the spiral character of the 'Whirlpool' nebula before the disastrous scale of the Great Famine became evident and all energies had to be diverted to fighting it.

This may be a good time at which to digress momentarily to personal family matters. My great-grandfather had married in 1836, Mary Wilmer-Field, a Yorkshire girl whose home was at Heaton Hall, just outside Bradford. His parents, from reasons of health and advancing age, handed over Birr Castle and went to live in the salubrious climate of Brighton. His father died there five years later at the age of 83 and his mother continued to live there till her death many years later.

Mathematicians have a reputation for aloofness and austerity. Whether it is generally justified I do not know, but if so my great-grandfather was most untypical. He was kindly and genial, and he inspired affection in his workmen equally with members of his own family. In view of his attainments, he was also singularly unpretentious and simple in his approach. When looking at any portrait of him, probably serenity is the quality that first comes to mind. His wife shone in her own right as a woman of high character and intelligence. Determined not to be altogether outdone by him, even in engineering, she used his forge to make great elaborate cast-iron gates which, when shut, enable the castle precincts to become an enclosed fortress to this day. Among other interests, she was a pioneer photographer and one of the founders of the Irish Photographic Society. The many distinguished visitors who came to Birr on account of the telescope had a uniformly high regard for both her personal and intellectual qualities. She was an equally devoted wife and mother and subsequently showed her conscientiousness with regard to her sons' education by taking a house in Dublin, when the two youngest entered this College shortly after their father's death.

It is said that my great-grandparents devoted all their time and most of their income to relief work throughout the time of the Famine. Not only did my great-grandfather take the widespread suffering very much to heart, but he had also weighty official responsibility as Lord

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Lieutenant of the County and Colonel of its Militia. Certain it is that astronomical observations with the Great Telescope only began in earnest in 1848; but after that date it was in almost continuous use. Though a considerable amount of work was done in connection with the planets, especially Jupiter, the main concentration was on the nebulae. Herschel had been able to see these with his telescope and had indeed speculated on the possibility that they might be galaxies, or star systems, outside and altogether separate from our own. But it had not been powerful enough for him to detect their spiral forms. It was reserved for the Birr telescope to make this vital discovery, which led directly to the conclusion, which is now proved to be correct, that these galaxies may be at least as numerous as the 100,000 million stars, or suns if you prefer, which compose our own. So distant are many of them that we do not see them as they are today, but as they were millions of years ago. When it is remembered that the dawn of our earliest civilisations, Egyptian or Sumerian, was a mere 6000 years ago, the ordinary human mind, such as mine, cannot fully comprehend such distances. But astronomers seemingly can and do.

In the mid-nineteenth century all this was totally uncharted ground. It was essential to record the observations accurately and photography was yet in its infancy, though it was to be much used in later recordings. The really exciting discoveries were all made in the early years and the details had necessarily to be drawn by hand at the time. Fortunately my great-grandfather was as able a draughtsman as he was an astronomer, quite surprisingly so when some of his drawings are placed alongside modern radio photographs of the same subject. In some ways, especially to an amateur, they give an even clearer effect. Sir Bernard Lovell, when he visited Birr two years ago and looked through the actual drawings, told us that they confirmed what he had always suspected, that he must have enjoyed unusually fine eyesight as well as powers of deduction. Such aptitude is apparently recorded of a number of noted astronomers of the past, among them Galileo.

Mr Patrick Moore, the distinguished present-day astronomer who recently lectured at Birr in connection with the centenary celebrations, points out that 'no other telescope in the world at that time could show the spiral shapes, because no other telescope could collect enough light. If astronomers wanted to see the spirals, they had to come to Birr Castle. Let it be added at once that Lord Rosse was only too ready to share his great telescope with others. All were made welcome

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and a steady stream of visitors came, from all over the world'. For more than half a century, to the end of my grandfather's life, Birr became an international scientific centre. Everything of moment achieved there, unlike so much astronomical work of the past, which had been mostly carried out by professionals, often anxious to keep their secrets to themselves, was recorded at once in the various scientific journals of the day, in the *Proceedings of the Royal Irish Academy* and *Royal Astronomical Society*, or in the *Philosophical Transactions of the Royal Society*.

Recognition was not slow in coming. He had become a member of the Royal Astronomical Society as long ago as 1824 and of the Royal Society in 1831. He presided at the British Association Meeting in Cork in 1843. He served as President of the Royal Society from 1849 to 1854, and received its Royal Medal in 1851. In that same year he was also a Commissioner of the Great Exhibition, in local celebration of which a memorable firework display was staged in front of Birr Castle, which was pictorially recorded in the *Illustrated London News* at the time.

Foreign honours also came his way. He had considerable correspondence with Russian scientists and was elected a member of the Imperial Academy of St Petersburg in 1853. Two years later, on the occasion of the Paris Exhibition of 1855, Napoleon III created him a Knight of the Legion of Honour. But there is reason to believe that, of all the honours bestowed on him, he appreciated the Irish ones most of all. From early years he was a member of the Royal Irish Academy; in 1845 he became a Knight of St Patrick; and in 1862 Chancellor of this University. This last signal distinction afforded him very special joy and provides the particular reason for this Discourse.

His health began to fail at the comparatively early age of 65 and he suffered a good deal during the last two years of his life. In the summer of 1867 a house was taken at Monkstown on the coast of Dublin Bay, so that he could benefit from the fresh sea-air. But a tumour developed on his knee and he died there on October 31st of that year.

Scientific discoveries continued to be made at Birr for a further forty years, to which brief reference should be made. The four sons of the house were educated at home by private tutors, all of whom were well versed in the sciences and acted also as practical assistants to their father in his astronomical work. One of them later became, as Sir Robert Ball, Astronomer Royal for Ireland. The eldest son,

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Lawrence, who succeeded as fourth Earl of Rosse, carried on the astronomical tradition and was possibly an even more ingenious mechanic than his father. Though he continued to make use of the Great Telescope for demonstration purposes he concentrated his main energies on discoveries concerning the Moon. He was the first man ever to measure its heat, with an instrument evolved by himself which still exists at Birr; and he also drew the first map of its surface, now seen to be surprisingly accurate. He too, as all of you present will know, became in later life the Chancellor of this University. The second son, Clere, became a highly successful railway engineer and was responsible for constructing railway lines throughout the world, especially in South America; while the youngest, Charles, became world-famous as the inventor of the steam-turbine. Only the third son, Randal, eschewed Science altogether and showed his individuality by becoming a Canon of the Church of England.

What importance should be accorded to my great-grandfather's work when it is viewed, as it now can be, in perspective? It has become increasingly evident with the years that he was altogether greatly ahead of his time. Though primarily an astronomer, the range of his scientific interests was extraordinarily wide. His engineering abilities have already been noted. He had an extensive knowledge of chemistry, which he put to good use. Also he was responsible for the first known proposal for the armour plating of warships when he composed an elaborate memoir on the subject for the Admiralty at the time of the Crimean War. By an odd coincidence the Secretary of State for War, to whom it was addressed, was my great-great-grandfather on my mother's side, the Earl of Lincoln. I am sorry to say that the Admiralty treated the proposal as disdainfully as they were later to treat his youngest son's original proposal for the steam-turbine thirty years later.

The tremendous contribution to knowledge of his discoveries in the skies was on the other hand fully and generally recognised in his day. At the same time many other scientists remained sceptical of certain of his more revolutionary deductions. They were inclined to think that he had read more into what he had seen than was actually warranted. It can be fatally easy for scientists to fall into just that error, but, as I have mentioned earlier, he did in fact enjoy outstanding powers of vision as well as of intellect. The advent of radio-astronomy has enabled us to know for certain how justified the deductions made by him from his observations with his telescope were. And quite extraordinarily correct they are mostly now proved to have

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been, and furthermore absolutely relevant to much of the pioneer work at present being undertaken with the aid of radio telescopes, though carried out more than a century ago.

Finally, I am deeply conscious and appreciative of the honour accorded to me in having been invited to give this Discourse. Its composition has been a real labour of love, both as a mark of humble personal respect for such a forbear and also as a token of affection for this College, together with reverence for the noble traditions enshrined here. In that respect at least, and in admiration for the store of learning amassed through the centuries within these walls, I can perhaps make some claim to parity with him. But in all others I have felt sadly unqualified and inadequate for the greatness of the theme on which I have enjoyed the privilege of speaking to so distinguished an audience.

It is Sir Bernard Lovell who first explained to me the relevance of much of my great-grandfather's work to that of today. It may be appropriate that he, who has real qualifications for passing judgment, should have the last word on this occasion. He could not attend the Birr centenary celebrations earlier this year because he was engaged on an extended lecture tour in the United States, but he sent the following message :

In conveying a message of respect and admiration on the occasion of these celebrations, I do so with deep humility, because the achievements of the third Earl of Rosse will live forever in the annals of astronomy. He succeeded in an almost impossible task, the measure of which can be appreciated when it is remembered that his telescope remained the largest in the world for three quarters of a century, and that in these islands his telescope was only superseded in size a few months ago—although all the resources of modern knowledge and technology and a vast sum of money were devoted to the task for two decades. It is a pleasant thought that this successor to the third Earl's telescope was built by the firm founded by his youngest son.

The Birr Telescope is a monument to the third Earl's skill in engineering and optics; the results he obtained with it are a remarkable tribute to his observational skill and to his insight that such a device would record more of the depths of the universe than man had yet conceived. I have before me two illustrations of the nebula in Canes Venatici—a galaxy more than ten million light years away in space. One is a drawing made by Lord Rosse as he saw it in the Birr Telescope. The other, a photograph taken a century later by the 200 inch telescope on Mount Palomar. The identity of the two is dramatic and the spiral form of the galaxy is shown with far greater clarity in the drawing. It is to the everlasting credit of Lord Rosse that he discovered the spiral structure of the nebulae, and thereby opened an avenue of exploration which today has led us into the inconceivable depths of space and time.