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Robert Le Rossignol

Engineer of the Haber Process

DERI SHEPPARD

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Never be a spectator of unfairness … the grave will supply enough time for silence.

Christopher Hitchens, 'Letters to a Young Contrarian', April 2005.

For my grandchildren,
Benjamin Fionn and Eiriol Gwenllian.
Gyda chariad, Tad-cu.

Preface

In the abstract to a recent paper for the Royal Society in London,[1] this author described Le Rossignol's long life in the following, 'matter-of-fact', terms.

> *In March 1908, the BASF at Ludwigshafen provided financial support to Fritz Haber in his attempt to synthesise ammonia from the elements. The process that now famously bears his name was demonstrated to BASF in July 1909. However, its engineer was Haber's private assistant, Robert Le Rossignol, a young British chemist from the Channel Islands with whom Haber made a generous financial arrangement regarding subsequent royalties. Le Rossignol left Haber in August 1909 as BASF began the industrialisation of their process, and took a consultancy at the Osram works in Berlin. He was interned briefly during WWI before being released to resume his occupation. His position eventually led to His Majesty's Government formulating a national policy regarding released British internees in Germany. After the war, Le Rossignol spent his professional life at the GEC laboratories in the UK, first making fundamental contributions to the development of high-power radio transmitting valves, then later developing smaller valves used as mobile power sources in the airborne radars of WWII. Through his share of Haber's royalties, Le Rossignol became wealthy. In retirement, Le Rossignol and his wife gave their money away to charitable causes.*

As befits an abstract, such a description only provides the outline of the paper, and although the body naturally continued to elaborate on many areas of Le

[1]Deri Sheppard, 'Robert Le Rossignol, 1884–1976; Engineer of the Haber Process', *Notes and Records*, **71**, 3, 263–296, (September 2017). Published online, **25 January 2017**. https://doi.org/10.1098/rsnr.2016.0019.

Rossignol's life, its focus—Le Rossignol as engineer—meant that many aspects of his humanity were left unexplored. This biography provides a first comprehensive contribution to the literature regarding Le Rossignol. His story is the 'missing link' in the history of the discovery of nitrogen 'fixation', a history which has undoubtedly been dominated by Fritz Haber. The omission has long been recognised by historians, but in writing this book, I have found it impossible to 'decant' Haber from Le Rossignol's life, the two men were partners and friends, and so aspects of their lives are often interwoven throughout.

Written in three parts, Part I covers the years from 1884 to 1909 and contains eight chapters. The first two describe the early lives of the two men, drawing parallels and contrasts relevant to the development of their professional and personal friendships—the latter lasting almost 30 years. Another chapter explains Germany's commitment to, and her dependence upon, the nitrate trade, whose perceived demise at the time provided the *reason d'être* for the creation of a 'fixation' technology. Yet another chapter describes the qualifications, experiences and interests Le Rossignol gathered before travelling to Karlsruhe. These in turn provide some insight as to why he was so well regarded by Haber, and so well placed to provide a solution to the problem of 'fixation'. The remaining four chapters are dedicated to the chemistry these men performed together, and the contracts Haber entered into with both BASF and Le Rossignol. With regard to the chemistry, I have re-visited their original papers of the period, and explained the work they performed together, revealing the boundaries between each man's contribution, so there can be no future misunderstanding of the 'division of work' these men undertook in partnership. The last chapter of the four explains the engineering Le Rossignol performed at Karlsruhe and his subsequent move to Osram in Berlin. Part I contains much archive material never published before. Some of the chapters are technical but they are supported by Appendices explaining thermodynamic theory if readers are so inclined to understand the latter rather than simply accept it.

Part II covers the years from 1909 to 1918 and contains a further six chapters. The first four of these describe Le Rossignol's move to Berlin and the nature of the work he did there. They continue with Haber's arrival at the Kaiser Wilhelm Institute in Berlin in 1911, the industrialisation of Le Rossignol's engineering by Carl Bosch, the 'patent wars' between BASF and rival firms upon which Haber's royalties depended, and the prelude to the First World War. These are relatively short chapters. The remaining chapters describe the wartime experiences of the two men, once again drawing attention to those aspects of Haber's life that were to impinge upon Le Rossignol. For example, Haber's membership of the 'Nitrate Commission'

and his support of BASF's ammonia synthesis that maximised his royalties, his involvement in gas warfare, a 'toxic brand' that came to dominate his memory, the suicide of his wife Clara—a parallel tragedy being suffered later by Le Rossignol where chemistry again played a part—and the devastation of Europe laid firmly at the door of Germany's industrialisation of the 'Haber' process. The final chapter describes Le Rossignol's war, his internment and his release to Berlin, the work he did there during the war and the concerns of His Majesty's Government in the UK regarding this work. The chapter concludes by discussing Le Rossignol's financial arrangements with Haber, and the considerations of the Swedish Academy regarding the 1918 Nobel Prize for Chemistry.

Part III covers the years from 1919 until Le Rossignol's death in 1976. It contains five chapters. The first of these covers the years from 1919 to 1930, including Le Rossignol's return from Germany, his unexpected interest in airships, the creation of the GEC Laboratories, the migration of the technology of 'fixation' out of Germany to France, the UK and the USA, the 'engineered' award of an individual Nobel Prize to Haber, the furore which followed the award, Le Rossignol's involvement with the cooled anode transmitting (CAT) valve and his contributions to that technology over the decade. During this time, Le Rossignol met Haber on a number of occasions both in Germany and the UK, and the chapter also discusses what we know of their financial arrangement which ended in 1924. The next two chapters cover the years from 1930 to 1949. The deaths of Le Rossignol's sons Peter Walter and John Augustin are dealt with here, along with further developments of CAT valves, Le Rossignol's contribution(s) to the BBC Droitwich super-broadcasting station which opened in 1934 and his role at the GEC during the Second World War. The latter revealing how the British government was intimately bound to its scientific and industrial base during the war. The final two chapters deal with Le Rossignol's retirement with his wife Emily at Penn, Buckinghamshire, their remarkable benevolence, and the memories of family and others who can still recall the couple's time there.

Cowbridge, Vale of Glamorgan, UK Deri Sheppard

Acknowledgements

In September 2005, my wife and I spent 2 weeks travelling the eastern seaboard of the USA acquainting ourselves with recently discovered family members whose forebears had emigrated from the UK at the turn of the last century. Having recently retired from my university lectureship in computer science, but being first-and-foremost a physical chemist—by training and inclination—I decided to use some of my 'down time' on the trip to 'gently' re-visit physical chemistry, not of course to keep up with modern developments, but to better understand the lives of some of those who had first defined the subject and attracted me to it.

One quiet evening with family in their elegant, traditional 'New England' home, I began reading Daniel Charles' biography of Fritz Haber.[2] For my generation, Fritz Haber was the 'stand out' physical chemist of his day. Many of us in the UK were of course familiar with the Haber process, the Haber-Bosch process and the Born-Haber cycle. Some were also familiar with Haber's contribution to electrochemistry. But few of us were familiar with the story of his life, he seemingly being a 'forgotten man' after his death in 1934.

On page 87 of Charles' book, I read the following passage:

> First, an extraordinary scientist joined Haber's laboratory, a young Englishman named Robert Le Rossignol, with a gift for solving practical problems of engineering. Haber did not know it yet, but the task that lay before him would

[2]Daniel Charles, Between Genius and Genocide, Jonathan Cape, London, (2005). ISBN-0-224-06444-4.

> require ingenious design of new experimental equipment. In this, Le Rossignol proved a master …

It was clear that Le Rossignol had a profound influence on the evolution of the 'Haber process', but I was amazed that, in my 'previous life', I had never heard of this fellow 'Brit'. Back home, an exhaustive search on the Internet revealed an obituary of Le Rossignol written in 1977 by friend and colleague Ralph Chirnside, but otherwise a dearth of biographical evidence. Robert *who*? was clearly a question that needed attention. So, intrigued by the lines from Charles' book, and guided by Chirnside's 'road map' to Le Rossignol's life, I embarked on a biographical Odyssey to find out more of the man who helped create the most influential technology of the twentieth century. My first acknowledgments are therefore to Daniel Charles and Ralph Chirnside. Had I never encountered the work of the former, Le Rossignol's life would still be an enigma. Had I never encountered the work of the latter, the biographical effort involved may well have been beyond me. For after only a short time into my Odyssey, I realised that Le Rossignol had left little of himself behind and that which *was* left was fragmented and widely distributed. Every new 'nugget' of information regarding this man had to be 'hunted down' down.

It follows, therefore, that this book would have been impossible for me to write if it were not for the Internet and its 'world wide web' of accessible digitised material. The various instantaneous communication systems of the Internet allowed this 'virgin' biographer to effortlessly contact academics, members of the public, libraries and archives, charities, newspapers, public record offices and other concerned organisations, worldwide. The efforts of thousands of workers in digitising billons of photographs, newspapers, scientific papers, textbooks, certificates of births, deaths and marriages and compiling online resources such as 'Wikipedia', built an unparalleled digital 'honey pot', made sensible by the 'search engines', whose software 'incisions' cut through the 'fog of big data'. My journey across the web introduced me to many people, far too many to thank on an individual basis, but where their efforts have resulted in an element included in the book, such as a photograph or a letter, I have recorded this in the legend. Needless to say, many people who have helped me will go unrecognised.

But others I can recognise. Thanks, therefore, go to Professor Alwyn Davies FRS at UCL Chemistry Department for originally suggesting I write a paper for the Royal Society, for materials he has supplied and for his continued interest in the Le Rossignol story. To Professor Margit Szöllözi-Janze, University of Munich, for answering my many questions regarding her biography of Haber. To the Le Rossignol family for fully engaging with this

work, to Hede Hauser for her expert translations of various texts, to Mr. Christopher White, former Chairman of the Penn-Pennsylvania Trust for materials supplied, his knowledge and his enthusiasm and to Mr. T. B. Powell for many hours of discussion regarding Le Rossignol. Thanks also to Dr. Ben Marsden and the Royal Society editorial team for their expert guidance during the submission of my paper, the eventual publication of which was hugely influential in promoting an interest in the full biography.

Thanks also to Professors Bretislav Friedrich and Gerard Meijer at the Fritz-Haber-Institut der Max-Planck-Gesellschaft, Berlin for their interest in the Le Rossignol story and their invitations to speak to the Haber family and friends in Berlin on 16 May 2017, and later at the sesquicentennial of Haber's birthday at Harnack House, Berlin on 10 December 2018. And, to Professor Friedrich in particular, thank you for kindly introducing my work to Springer Publishing. I must also mention my editors (in chronological order!), Sabine Lehr and Angela Lahee, whose guidance, patience and understanding made the preparation of the text as stress free as possible.

The issue of copyright ownership regarding material published in this book has been a major concern for both Springer and myself. Consequently, strenuous efforts have been made to trace ownership wherever possible, and to attribute such material accordingly. In most cases, I have succeeded, but sometimes—where material dates back to the turn of the last century, appearing on the web as 'copyright unknown'—it has proved impossible. Such material has only been included when it has direct relevance to the story.

Finally, becoming a biographer has long been a dream for this author, but as a novice, I could hardly have picked a more difficult subject in Robert Le Rossignol! Over the 8 years or so it took to research and write his story, everyone involved played their part. I thank each one of you, whether recognised or not, for helping make a dream come true.

Cowbridge, UK Deri Sheppard
2020

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Part III The GEC Laboratories, the Second World War and Retirement

Part I

The Story of the Discovery of ‘Fixation’

1

Robert Le Rossignol

Robert Le Rossignol.
Courtesy of the Le Rossignol family and the Royal Society of Chemistry, London.

The early years, Victoria College, UCL and Ramsay.

To begin, at the beginning. It is spring …

The opening lines from Dylan Thomas', 'Under Milk Wood', 1954.

1.1 Introduction

In Karlsruhe, southern Germany, there is a monument. A twelve-metre steel tube pointing skywards at the intersection of Engesserstraβe and Fritz Haber-Weg. Rising among the buildings of the university, it commemorates the creation of the most influential technology of the 20th century, a technology to which many people on the planet today owe their existence. The monument is an old ammonia reactor belonging to the nearby BASF chemical works at Ludwigshafen and it stands in celebration of the 'fixation'

D. Sheppard, *Robert Le Rossignol*, Springer Biographies,
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of nitrogen.[1] 'Fixation' was conceived to nurture life. But when young, and growing innocently towards its destiny, it was 'radicalised' to support a munitions industry that has since sustained countless wars and conflicts.

The monument also stands as testament to the work of the men who discovered the technology, the 'fathers of fixation'. One of these was Fritz Jakob Haber; 'chemist, Nobel laureate, German, Jew'.[2] Even today, over three quarters of a century after his death, the reactor is sometimes found daubed in blood-red graffiti spelling the word '*Mörder*' (Murderer) as young German students recall Haber's role in the first World War.[3] Fritz Haber's legacy has polarised opinion in his own country. On the one hand 'the good German', on the other the 'father of chemical warfare', and whichever side we fall it is undeniable that his story has dominated the history of 'fixation'.

But there is another for whom this monument should equally stand. A young British 'Channel Islander'[4] whose work in partnership with Haber made a profound contribution to the discovery of 'fixation'. He was Robert Le Rossignol, and this is his story. It is the story of a kindly man with a simple uncomplicated philosophy of life. The grace of his nature was such that he rarely had a bad word to say of anyone. He was a man who walked alongside the scientific giants of his day. He knew triumph, but also deep tragedy which he suffered with a quiet dignity. And although his 'fingerprints' are to be found everywhere in the history of the discovery of the technology, history has abandoned his story, painting him in the shadows on a broad canvas of Haber's life. We cannot decant Haber from Le Rossignol, the two men were partners and friends, and what impacted Haber often shook Robert too. But if we take our time and gaze deeply enough, standing in the shadows we find another life, and another quite remarkable man. So, who was Robert Le Rossignol?

1.2 Early Years and School Days

Robert Le Rossignol was born in springtime, on 27 April 1884 at 17 David Place, St. Helier, Jersey. Robert was the third son of Augustin and Edith and the youngest of their four children (Plate 1.1).

When Robert was born his family had lived in Jersey for almost four hundred years but a common misconception[5] is that they were of Huguenot descent. 'Huguenot',[6] was the name given in 16th century catholic France to the protestant Calvinist minority which had penetrated all ranks of society,

Plate 1.1 17 David Place, St. Helier, today.Photograph courtesy of Google Earth Pro, street view, 2019

especially the nobility and the literate craftsmen. Given religious liberty by the 'Edict of Nantes', the Huguenots eventually established themselves as loyal subjects of the Crown. Later under Louis XIV, their position became insecure because they were increasingly perceived as a threat to the authority of the monarch. Gradually, their privileges were eroded and in 1685 Louis exiled all protestant pastors, at the same time forbidding the laity to leave. To the surprise of the government however, many did leave, often at great risk. Eventually, about 200,000 Huguenots escaped, settling largely in non-catholic Europe. About 50,000 came to Great Britain and the Channel Islands, with perhaps about 10,000 eventually moving on to Ireland. So, there are many inhabitants of these islands who have Huguenot blood in their veins, whether or not they still bear one of the hundreds of French names of those who took refuge here—incidentally, bringing the word 'refugee' into the English language. The link between the Huguenots and Jersey is strong. The Le Bailly's for example were Huguenots and they fled to Jersey in about 1749. Their story[7] has been handed down there, in various forms, and illustrates the dangers families faced when fleeing France.

> Thomas Le Bailly, dressed as a peasant,[8] took a horse with a pannier of apples on each side, the Bible in one pannier, his baby son in the other, his wife behind him, and went through the gates of Caen to escape in a fishing boat to Jersey. As they passed through the gates a suspicious guard thrust his sword into one of the panniers, and struck the one with the Bible—not the child!

By now, as 'enemies' of France, the Huguenots were welcomed here. However, they could not escape the accusations always levelled at immigrants—that their presence threatened jobs, standards of housing, public order, morality, hygiene and that they ate strange foods! For at least half a century they remained a recognisable minority, but they made their presence felt in many professions such as banking, commerce, industry, the book trade, the arts, the army, the stage and teaching. Although many retained their Calvinist organisation and worship, by about 1760 they had ceased to stand out as 'foreign', even following the path of Anglican conformity in religion which some had taken from the very beginning.[6]

The Huguenot story 'hangs well' on the Le Rossignol family, and many Huguenots named 'Le Rossignol' may well have arrived in Jersey via the French exodus. A family of Huguenot provenance was one of French lineage—possibly nobility—of protestant heritage, of literacy and a history of hundreds of years. Much of this also fits Robert's family, but that branch of the 'Le Rossignols' to which Robert belonged had an entirely different provenance. Family members[9] who still in live in Jersey vigorously dispute the Huguenot line and point to their family tree in S. J. Le Rossignol's *Historical Notes with special reference to the Le Rossignol Family*,[10] published in 1917. The book begins with the following quotation from Falle's *History of Jersey*[11];

> In the Island there are many ancient families, not only among the Seigneurs and Gentlemen of the first rank, but even amongst those of inferior quality, several of whom can reckon a descent which in some other countries very good gentlemen would be proud of.

Indeed, Robert's family were both ancient and of 'proud descent'. Their name, 'Le Rossignol'—literally 'the nightingale'—clearly establishes their French provenance, the prefix 'Le' often being regarded as 'aristocratic' in Jersey. G. R. Balleine[12] in *Some Jersey Surnames their Origin and Meaning* classifies this name as 'descriptive', originally being applied to someone who may have been a 'sweet singer', or indeed a 'chatterer', for 'rossignolerie' in old French meant 'chattering'. According to the *Historical Notes*[10] the earliest recorded Le Rossignol of Robert's family—Guillaume or 'Guille' ('William'),

appeared in Jersey around 1500, way before any Huguenot exodus and well before the first recorded influx of French Huguenots in 1548. Settling around St. Ouen in the west of the island, Guille may have been related to a 'black sheep' member of a family of minor French nobility on the borders of Brittany and Normandy (possibly 'William' Le Rossignol, who appeared about 1480), and down through the generations this branch of the Le Rossignols—just like the Huguenots—achieved a powerful presence in Jersey and indeed internationally, with family members prominent in banking, the judiciary, medicine, foreign service, business, academia and the military.

Mistaken provenance or not, what is certain is that Robert Le Rossignol was born into an established, anglicised, professional, protestant family. His father Augustin bore the given name of many generations of 'Le Rossignols'. Born in 1842,[10] he was educated firstly in Jersey, but subsequently in France at Rennes and Coutances, obtaining the French Bachelor of Science (B. és Sc.) in 1862. He then entered the London Hospital as a student of medicine becoming a Member of the Royal College of Surgeons in 1866 and gaining his Licentiate of the Royal College of Physicians in 1867. He took his M.D. Aberd at Marischal College Aberdeen in 1868, a choice which Robert later described as predicated on the fact that at the time there were just two Universities in England but *four* old Universities in Scotland.[23] He subsequently established a successful medical practise in St. Helier later the same year. Robert's mother Edith[13] (*née* Sorel, b. 1845), as befitted the wife of a professional man in Victorian times, ran the household.

Robert's birth would have brought great joy to Augustin and Edith, but for those islanders beyond the immediate Le Rossignol family, 1884 was an unremarkable year, 'enlivened' only by a visit from the UK President of the Board of Trade and a particularly severe winter's storm. The Reverend Alban E. Ragg describes aspects of Jersey at the time of Robert's birth.[14]

> The population of the island … was about 53,000, nearly 30,000 of whom resided in St. Helier. Its exports during the year were … bulls, 93; cows and heifers, 1,516; total, 1,609. Butter, 958 cwt. Fruit (raw) of all kinds, 19,613 cwt. and potatoes, 49,296 tons … 1884 was enlivened by a visit to the Island of the Right Hon. J. Chamberlain, M.P., then President of the Board of Trade, accompanied, in the Trinity House yacht Galatea, by Sir W. Vernon Harcourt, on June 3rd; The close of the year, however, proved disastrous, in that the Island was swept with one of the most terrific storms it has experienced, with resultant damage, not to houses and shipping alone, but to the coast and harbour works generally, accompanied on December 20th with the loss of the

> Guernsey trader Echo off the Corbiere, when six lives were lost, and on December 22nd by a breach in the pier at Greve-de-Lecq.'

Robert's father was a pillar of Jersey's society.[10] As M.D., Augustin held a highly prestigious position and naturally participated in the intellectual and social life of the Island. For example, in 1872 he took a Commission in the Town Regiment eventually retiring with the rank of Lieut-Colonel Surgeon. He was a founder member of the Societé Jersiaise,[15] established in January 1873 for the study of Jersey's archaeology, history, language and the conservation of the environment. He was a member from 1874 to 1910, honourary Secretary from 1881 to 1896, and President in 1897. During his career he became Honourary Surgeon to the local general hospital, and to the Jersey Dispensary. He was Medical Officer of the Jersey Orphan's Home for Girls and Inspector General of the Medical Staff at the Jersey Royal Militia. He was also a founder of the Jersey Medical Society; he acted as its secretary for some years and ultimately became its president. On 21 March 1903, he was elected a '*Jurat'* of the Royal Court of the island. (through French from mediaeval Latin, *jurat*, 'he swears,' the name given to a public official, in this case a magistrate). He was also an 'old Victorian', the name given to former pupils of Victoria College St. Helier, the island's only public school founded in 1852. In the same year as he became Jurat, he also became a member of the College committee (Plate 1.2).

Jersey at the time of Robert's birth was rural with farming and fishing the primary industries. For the ordinary population wages were low, £20 was about the annual income for the unskilled working class in relatively secure positions. Robert's provenance therefore ensured he enjoyed a privileged young life and the Le Rossignol home(s) reflected this. At the time of Robert's birth in David Place, in addition to Augustin, Edith, and siblings, Austen Clement (b. 27 October 1878), Herbert, ('Bertie'), Sorel (b. 07 November 1879) and Elsie Edith (b. 02 March 1881)[16] this busy little household included Margaret Brophy an Irish cook, Anne Billot and Anne Mollet—both quite elderly nurses—and Mary Ulrick a young housemaid. At the time David Place was a hub of Jersey commerce—many of the congregation in the local church of St. Mark's being described as 'well to do'. Today, David Place remains 'gentrified' with many medical and dental practises together with a still flourishing business community including many hotels. Even when Robert was 17 and then living at nearby Caesarea Place[17] St. Saviours Road, the household still employed servants. Rachel Jane Le Richie and Anne Louisa Way were nurse-domestic and housemaid respectively. By then however, Austen had left to study at Exeter College Oxford, 'Bertie' was employed as a

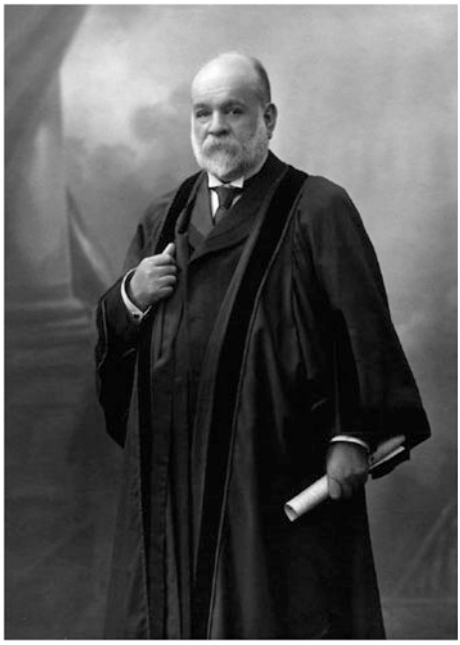

Plate 1.2 A magnificent photograph of Robert's father, Jurat Augustin Le Rossignol, circa 1903. Photograph courtesy of the Société Jersiaise.[15]

banker's Clerk at the Capital and Counties Bank in St. Helier, whilst Robert was shortly to leave for University College London.[10]

The education of all three Le Rossignol sons followed a familiar pattern viz., that of their father's at Victoria College.[18] In August 1847 the States of Jersey decided to purchase grounds from W. Le Breton, Esq. for £5,070 to erect a building capable of accommodating 300 pupils, using a financial provenance that dated back to Charles II who left land to Exeter, Pembroke, and Jesus Colleges at Oxford for the benefit of scholars from the Channel Islands. Victoria College (for boys only) opened on 29 September 1852 with the school motto *Amat Victoria Curam* (loosely, 'Victory favours those who take pains'). Augustin, then aged 10, entered as part of the first intake of 109 pupils, with the Victoria College 'index number' (VC_i) of 73—a number through which all previous pupil's provenance can still be traced.[18] Although French was the official language in Jersey, the new college was consciously patterned on the English public schools. Anglicisation of the Island was an objection raised to the building of the college, but the Bailiff of Jersey at the prize day on 31 July 1901 stated unequivocally, 'Well it has anglicised the Island, and in doing so it has done an excellent thing!'. From the beginning

then, the medium of instruction here was English and this was one of the causes for the subsequent decline in the use of French, as Jersey's élite families sent their sons to the new college. The decline was compounded by the fact that the college eventually assimilated the existing grammar schools of St. Mannelier and St. Anastase which had previously provided quality education for scholars from the east and west of the island respectively.

Dr. W. G. Henderson was appointed as the College's first Principal. He was just 34 years old and he was Principal during Augustin's stay, during the course of which he laid the foundations of the future prosperity of the College. Originally, the school was divided into Classical and Commercial sides. In 1855 a grant of £50 per year was made out of crown revenues for the establishment of a (Channel Island) 'Exhibition' (scholarship) to the University of Oxford. The Natural Sciences were introduced to the school in the mid 1860s but they struggled for a place in the curriculum. A laboratory was started but it met with little support, and by 1881 Natural Sciences were briefly discontinued only to be re-introduced shortly afterwards as the school tried to move away from the classics to a wider outlook. Even so, as time went on, the teaching at the College became rather stereotyped; many of the staff were getting on in years, and the demand for a more up-to-date education became more insistent. A committee was appointed to enquire into the administration of the College and subsequently, in 1892 G. S. Farnell—educated at the City of London School and Wadham College Oxford—was appointed to take the college further. Farnell became the College's fifth Head. He was an able scholar but this ability was firmly rooted in the classics and although determined to build on previous progress, this provenance may not have benefited the development of the sciences had he progressed. His career however, was terminated by an unfortunate accident. In November 1895 the College had a half-term holiday. Farnell went out to Plemont on the ruggedly beautiful north east coast of the island to join two of his staff who had started earlier. The day was foggy, and Farnell, who was rather short-sighted, in searching for his colleagues, missed his footing on the cliffs and was found dead at their base. Subsequently, in January 1896, L. V. Lester-Garland, Fellow of St. John's College, Oxford, became Principal. Lester-Garland's stewardship of the College lasted until 1911 and it would have influenced the education of all three Le Rossignol children[19] but none more profoundly than Robert (Plates 1.3, 1.4).

Like his predecessors, Lester-Garland was strongly in favour of classics as the foundation of education, but equally he had long been pressing for the development of the natural sciences in the College. His insistence eventually led to a new block of buildings containing laboratories and classrooms which

Plate 1.3 An early engraving of Victoria College, published in the Illustrated London News, 29 September 1852

Plate 1.4 Left to right, G. S. Farnell and L. V. Lester-Garland, headmasters of Victoria College during Robert's stay.[10]

opened in 1911, but this came far too late for Robert. Even so Robert had developed an early interest in chemistry. It was the inspired appointment of William H. Pryce Jones as Science Master[20] by Lester-Garland in 1898, and encouragement by an elder brother—certainly Austen, that fostered Robert's interest.

The difficulties that the natural sciences had encountered in the college—electric light and power were not available to the laboratories until 1931—meant that the proper practice of science must have been difficult. Robert therefore would have shown considerable initiative to have flourished. However, any inadequacies of Victoria College were more than compensated